

PARAMETER LIST

for

MAZATROL FUSION 640M

MANUAL No. : H735SA0013E

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.

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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. 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



- 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



- 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



- 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 M640T and M640MT.)



- 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.

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

- NOTE -

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1 INTRODUCTION

This text describes the meaning and setting of various parameters used for the MAZATROL FUSION 640M. Read this list carefully in order to make the best use of the possibilities of the MAZATROL FUSION 640M.

It is advisable to consult the Operating Manual as required.

- NOTE -

2 PRELIMINARY REMARKS

Parameters, which refer to constants specific to the NC machines and equipment and the data necessary for cutting operations, possess a very important meaning.

Parameters can be broadly divided into the following three types according to their meaning. User parameters and machine parameters are registered in the PARAMETER display, and data input/output parameters are registered in the DATA I/O displays corresponding to each I/O unit.

1. User parameters
The data required for processes such as point machining, linear machining, plane machining, and EIA/ISO programmed machining, is registered.
2. Machine parameters
Constants related to the servo motors and spindle motors, machine status data etc. are registered.
3. Data I/O parameters
The data required for connection to external units such as a CMT unit and a tape unit, is registered.

2

PRELIMINARY REMARKS

- NOTE -

3 FORMAT OF PARAMETER TABLES

Each parameter table is written in the following format:

Classification	[1]	Display title	[2]
-----------------------	-----	----------------------	-----

Address	Name	Description
[3]		[8]
	Program type	[4]
	Conditions	[5]
	Unit	[6]
	Setting range	[7]

- [1] Classification of parameters
- [2] Characters displayed at the upper left of the screen
- [3] Parameter address displayed on the screen
- [4] M: Valid for MAZATROL program
E: Valid for EIA/ISO program
- [5] Conditions under which a changed parameter becomes valid
- [6] Units of data displayed
- [7] Allowable range of data
- [8] Details or meaning of the parameter

- NOTE -

4 PRECAUTIONS

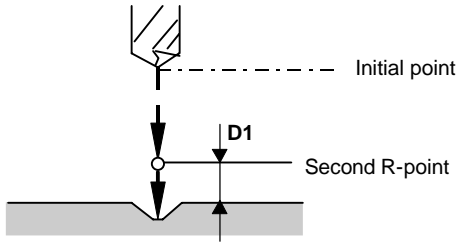
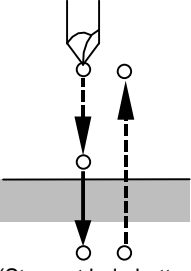
1. Details of the parameters may differ according to the machine used, the presence/absence of an option(s), the production time of the NC machines and equipment, etc. Therefore, do not use the parameters of other machines.
2. The parameter list is supplied in the form of data sheets within the NC electronic cabinet at shipment of the machines. Be careful not to lose the list.
3. Before making changes to details of a parameter, make sure that the parameter is the one to be changed.
4. If details of the parameter to be changed cannot be clearly understood, contact your MAZAK service center before making the changes.
5. When changing details of a parameter, maintain records of the old and new data.
6. If the particular machine is not used for a long time, then the battery to protect the parameter memory will run down. (Battery alarm)
In that case, errors will occur in the parameters and thus machine malfunctions may result. To prevent this, first check the existing details of the parameters closely against the separate parameter list and then make the necessary changes to the parameters.
7. In addition to the parameters listed in this document, those related to PLC (Programmable Logic Controller) are also available; refer to the OPERATING MANUAL of the machine for details of the PLC-related parameters and the PLC Parameter List in the ELECTRIC WIRING DIAGRAM.

4 PRECAUTIONS

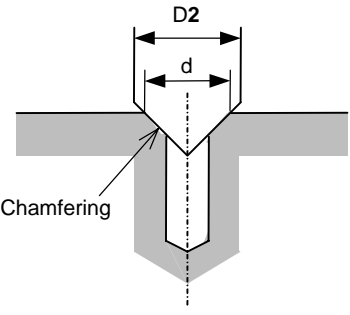
- NOTE -

5 USER PARAMETER

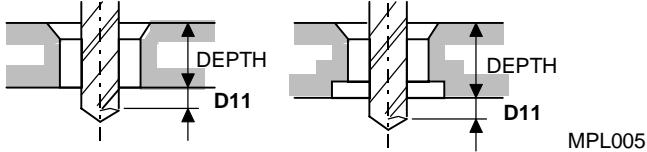
5-1 POINT (D)

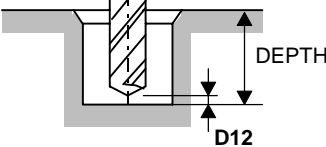
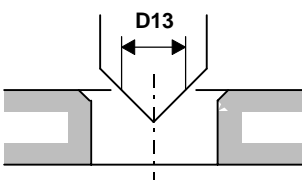
Classification		USER		Display title		POINT													
D1	Height of the second R-point during point machining			<p>Height of the second R-point</p>  <p>MPL001</p> <p>The height of the R-point during point machining is basically D41, however, it is changed to D1 under the following conditions.</p> <table border="1"> <thead> <tr> <th>Tool sequence</th> <th>Conditions</th> </tr> </thead> <tbody> <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> </tbody> </table>				Tool sequence	Conditions	Drill	- 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.	Reamer	- 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.						
	Tool sequence	Conditions																	
	Drill	- 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.																	
	Reamer	- 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.																	
	Program type	M																	
Conditions	Immediate																		
Unit	0.1 mm/0.1 inch																		
Setting range	-999 to 999																		
D2	Nominal diameter of spot-machining tool			<p>The nominal diameter of a spot-machining tool that is automatically set during automatic tool development.</p> <p>Example:</p> <table border="1"> <thead> <tr> <th>SNo.</th> <th>TOOL</th> <th>NOM-φ</th> <th>No.</th> <th>HOLE-φ</th> <th>HOLE-DEP</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CTR-DR</td> <td>(20.)</td> <td></td> <td>10.</td> <td>◆</td> </tr> </tbody> </table> <p style="text-align: center;">↑ D2</p>				SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	CTR-DR	(20.)		10.	◆
	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP													
	1	CTR-DR	(20.)		10.	◆													
	Program type	M																	
	Conditions	Immediate																	
Unit	1 mm/0.1 inch																		
Setting range	0 to 99																		
D3	Spot-machining hole bottom dwell time element in a spot cycle			<p>Z-axis feed dwell time at the hole bottom in a spot-machining spot cycle. Set this time in spindle revolutions.</p>  <p>(Stops at hole bottom.)</p> <p>MPL002</p> <p>When the spot-machining tool reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D3 revolutions, and then return to the original position at the rapid feedrate.</p>															
	Program type	M																	
	Conditions	Immediate																	
	Unit	1 revolution																	
	Setting range	0 to 9																	

Classification	USER	Display title	POINT
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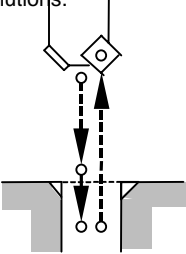
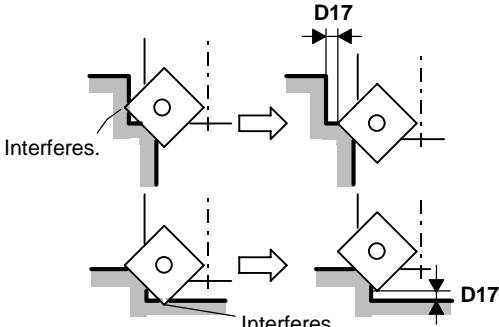
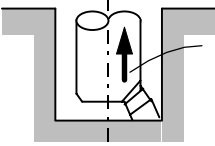
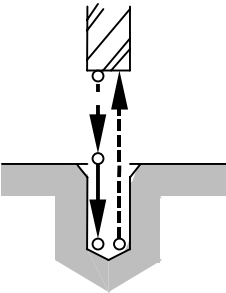
Address	Name	Description								
D4	Maximum allowable spot-chamfering hole diameter element	<p>Element used to set the maximum spot-chamfering hole diameter (d) during automatic tool development</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Spot-chamfering occurs if $d \leq D2 - D4$. If $d > D2 - D4$, the chamfering cutter is developed automatically.</p> </div> </div>								
	Program type	M								
	Conditions	Immediate								
	Unit	0.1 mm/0.01 inch								
	Setting range	0 to 99								
		MPL003								
D5	Prehole through speed during inversed spot-facing	<p>The feedrate of a tool as it is being passed through the prehole during an inversed spot-facing cycle</p> <p>Note: 0.5 mm/rev if this parameter setting is 0.</p>								
	Program type	M								
	Conditions	Immediate								
	Unit	100 mm/min / 10 inch/min								
	Setting range	0 to 99								
		MPL004								
D6	Drill-machining cycle setting element	<p>Element used to automatically set drill-machining cycles during automatic tool development</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Machining cycle</th> <th style="width: 50%;">Conditions</th> </tr> </thead> <tbody> <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> </tbody> </table>	Machining cycle	Conditions	Drilling cycle	$\frac{\text{DEPTH}}{\text{DIA}} \leq D6$	High-speed deep-hole drilling cycle	$D6 < \frac{\text{DEPTH}}{\text{DIA}} \leq D7$	Deep-hole drilling cycle	$D7 < \frac{\text{DEPTH}}{\text{DIA}}$
	Machining cycle	Conditions								
	Drilling cycle	$\frac{\text{DEPTH}}{\text{DIA}} \leq D6$								
	High-speed deep-hole drilling cycle	$D6 < \frac{\text{DEPTH}}{\text{DIA}} \leq D7$								
	Deep-hole drilling cycle	$D7 < \frac{\text{DEPTH}}{\text{DIA}}$								
Program type	M									
Conditions	Immediate									
Unit	—									
Setting range	0 to 9									
D7	Drill-machining cycle setting element									
	Program type	M								
	Conditions	Immediate								
	Unit	—								
	Setting range	0 to 9								

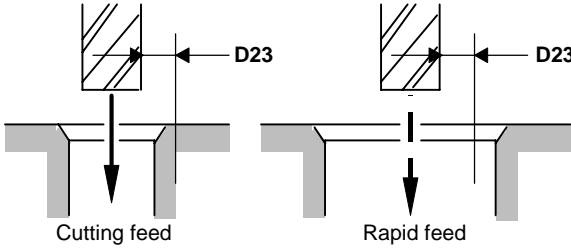
Classification	USER	Display title	POINT
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Address	Name	Description												
D8	Maximum diameter of holes machinable on one drill													
	Program type	M												
	Conditions	Immediate												
	Unit	1 mm/0.1 inch												
	Setting range	0 to 99												
<p>Element used to automatically set the number of drills which are automatically developed according to the hole diameter of the drill unit</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Number of drills developed</th> <th style="text-align: center;">Conditions</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">$DIA \leq D8$</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">$D8 < DIA \leq D9$</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">$D9 < DIA \leq D10$</td> </tr> <tr> <td style="text-align: center;">Alarm</td> <td style="text-align: center;">$D10 < DIA$</td> </tr> </tbody> </table>			Number of drills developed	Conditions	1	$DIA \leq D8$	2	$D8 < DIA \leq D9$	3	$D9 < DIA \leq D10$	Alarm	$D10 < DIA$		
Number of drills developed	Conditions													
1	$DIA \leq D8$													
2	$D8 < DIA \leq D9$													
3	$D9 < DIA \leq D10$													
Alarm	$D10 < DIA$													
D9	Maximum diameter of holes machinable on two drills													
	Program type	M												
	Conditions	Immediate												
	Unit	1 mm/0.1 inch												
	Setting range	0 to 99												
D10	Maximum diameter of holes machinable on three drills													
	Program type	M												
	Conditions	Immediate												
	Unit	1 mm/0.1 inch												
	Setting range	0 to 99												
D11	Through-hole/tap-prehole machining overshoot													
	<p>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</p> 													
	Program type	M												
	Conditions	Immediate												
	Setting range	0 to 99												
Unit	0.1 mm/0.01 inch													
<p>Example:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">SNo.</th> <th style="text-align: left;">TOOL</th> <th style="text-align: left;">NOM-φ</th> <th style="text-align: left;">No.</th> <th style="text-align: left;">HOLE-φ</th> <th style="text-align: left;">HOLE-DEP</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CTR-DR</td> <td>10.</td> <td>10.</td> <td>(21.) ←</td> <td>(DEPTH + D11)</td> </tr> </tbody> </table> <p>Note: See also parameter D30 for tapping units.</p>			SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	CTR-DR	10.	10.	(21.) ←	(DEPTH + D11)
SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP									
1	CTR-DR	10.	10.	(21.) ←	(DEPTH + D11)									

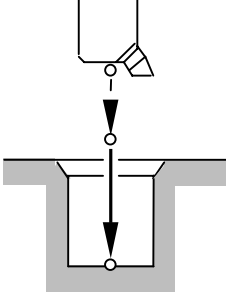
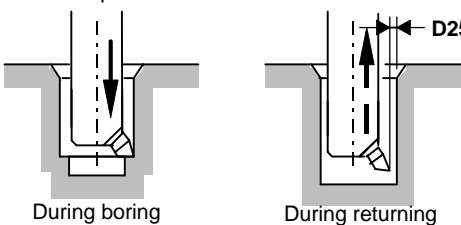
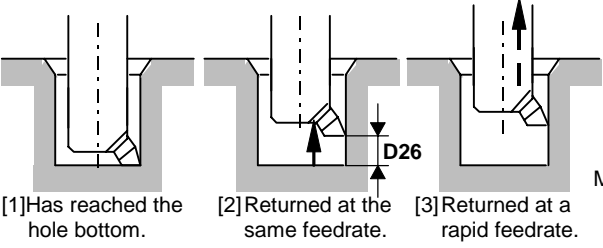
Classification		USER	Display title	POINT												
D12	Stop-hole machining hole-bottom clearance		<p>Element used to automatically set the hole-drilling depth during automatic tool development of stop-hole counter-boring and stop-hole boring units</p>  <p style="text-align: right;">MPL006</p> <p>Example:</p> <table border="1"> <thead> <tr> <th>SNo.</th> <th>TOOL</th> <th>NOM-φ</th> <th>No.</th> <th>HOLE-φ</th> <th>HOLE-DEP</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>DRILL</td> <td>10.</td> <td>10.</td> <td>19.</td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">↑ (DEPTH – tool tip compensation – D12)</p> <p>Note: This parameter is invalid when the residual hole diameter is not 0.</p>	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	DRILL	10.	10.	19.		
	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP										
	1	DRILL	10.	10.	19.											
	Program type	M														
	Conditions	Immediate														
Unit	0.1 mm/0.01 inch															
Setting range	0 to 99															
D13	Spot-machining hole diameter (fixed value)		<p>Hole diameter is automatically set during automatic tool development when spot-chamfering is not to be performed.</p>  <p style="text-align: right;">MPL007</p> <p>Example:</p> <table border="1"> <thead> <tr> <th>SNo.</th> <th>TOOL</th> <th>NOM-φ</th> <th>No.</th> <th>HOLE-φ</th> <th>HOLE-DEP</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CTR-DR</td> <td>20.</td> <td></td> <td>10.</td> <td>◆</td> </tr> </tbody> </table> <p style="text-align: center;">↖ D13</p>	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	CTR-DR	20.		10.	◆	
	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP										
	1	CTR-DR	20.		10.	◆										
	Program type	M														
	Conditions	Immediate														
Unit	1 mm/0.1 inch															
Setting range	0 to 99															
D14	Depth-of-cut setting element for drilling (ALMINUM)		<p>Element used to automatically set the depth-of-cut per drilling operation during automatic tool development</p> <p>HOLE-φ × D14 : when the material of the stock workpiece is AL (aluminum) in article MAT. 6</p> <p>HOLE-φ × D15 : when the material of the stock workpiece is other than AL in article MAT. 6</p>													
	Program type	M														
	Conditions	Immediate														
	Unit	0.1														
	Setting range	0 to 10														
D15	Depth-of-cut setting element for drilling (except AL)															
	Program type	M														
	Conditions	Immediate														
	Unit	0.1														
	Setting range	0 to 10														

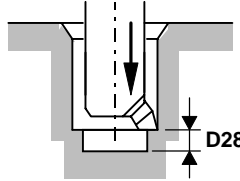
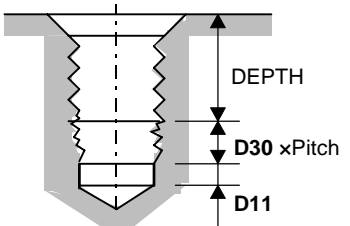
Classification	USER	Display title	POINT
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Address	Name		Description
D16	Hole-bottom dwell time for chamfering cutter or spot-machining tool in a chamfering cycle		<p>Z-axis feed dwell time at the hole bottom in the chamfering cycle of chamfering cutter or spot-machining tool. Set this time in spindle revolutions.</p>  <p>(Stops at hole bottom.)</p> <p>When the chamfering cutter reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D16 revolutions, and then return to the original position at the rapid feedrate.</p> <p>Note: This parameter is invalid for chamfering with true-circle processing.</p> <p style="text-align: right;">MPL008</p>
	Program type	M	
	Conditions	Immediate	
	Unit	1 revolution	
	Setting range	0 to 9	
D17	Interference clearance of chamfering cutter		<p>The clearance in order to prevent tool interference with a wall of the workpiece or with the hole bottom during a chamfering cycle</p>  <p style="text-align: right;">MPL009</p>
	Program type	M	
	Conditions	Immediate	
	Unit	0.1 mm/0.01 inch	
	Setting range	0 to 99	
D18	Return feedrate for reaming or boring (cycle 3)		<p>The feedrate at which the tool is returned from the hole bottom during reaming or boring.</p>  <p style="text-align: right;">MPL010</p> <p>Notes:</p> <ol style="list-style-type: none"> Valid only when the setting of ZFD for the reamer (tool sequence) is G01. Valid only when the setting of PRE-DIA for the boring tool (tool sequence) is CYCLE 3. If this parameter is 0, the tool is returned at the same feedrate as that of cutting.
	Program type	M	
	Conditions	Immediate	
	Unit	100 mm/min / 10 inch/min	
	Setting range	0 to 9	
D19	Hole-bottom dwell time for end milling		<p>Z-axis feed dwell time at the hole bottom in an end milling cycle. Set this time in spindle revolutions.</p>  <p>(Stops at hole bottom.)</p> <p>When the end mill reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D19 revolutions, and then return to the original position at the rapid feedrate.</p> <p>Note: This parameter is invalid for true-circle processing.</p> <p style="text-align: right;">MPL011</p>
	Program type	M	
	Conditions	Immediate	
	Unit	1 revolution	
	Setting range	0 to 999	

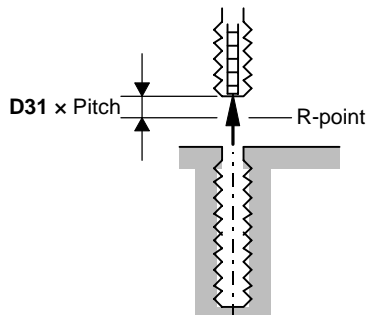
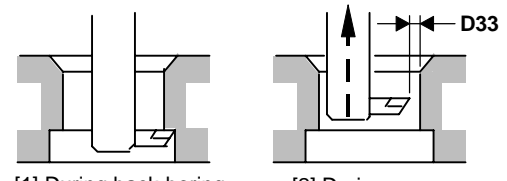
Classification	USER	Display title	POINT																				
D20	Radial depth-of-cut setting element for end milling		<p>Element used to automatically set the radial depth-of-cut per end milling operation</p> <p>Depth-of-cut = nominal diameter × D20</p> <p>Depth-of-cut is automatically set according to the value of this parameter when nominal diameter of the end mill is input.</p> <p>Example:</p> <table border="1"> <tr> <td>SNO.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td>HOLE-DEP</td> <td>PRE-DIA</td> <td>PRE-DEP</td> <td>RGH</td> <td>DEPTH</td> </tr> <tr> <td>1</td> <td>E-MILL</td> <td>20.</td> <td>40.</td> <td>10.</td> <td>30.</td> <td>◆</td> <td>0.</td> <td>12.</td> <td></td> </tr> </table> <p>(NOM-φ × D20) ↗</p>	SNO.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	PRE-DIA	PRE-DEP	RGH	DEPTH	1	E-MILL	20.	40.	10.	30.	◆	0.	12.	
	SNO.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	PRE-DIA	PRE-DEP	RGH	DEPTH													
	1	E-MILL	20.	40.	10.	30.	◆	0.	12.														
	Program type	M																					
	Conditions	Immediate																					
Unit	1%																						
Setting range	0 to 100																						
D21	Reference bottom-finishing allowance for end milling		<p>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.</p> <table border="1"> <thead> <tr> <th>Roughness</th> <th>Bottom-finishing allowance</th> </tr> </thead> <tbody> <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> </tbody> </table>	Roughness	Bottom-finishing allowance	0 to 3	0.0	4	D21	5	D21 × 0.7	6	D21 × 0.7 × 0.7	7	D21 × 0.7 × 0.7 × 0.7	8	D21 × 0.7 × 0.7 × 0.7 × 0.7	9	D21 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7				
	Roughness	Bottom-finishing allowance																					
	0 to 3	0.0																					
	4	D21																					
	5	D21 × 0.7																					
6	D21 × 0.7 × 0.7																						
7	D21 × 0.7 × 0.7 × 0.7																						
8	D21 × 0.7 × 0.7 × 0.7 × 0.7																						
9	D21 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7																						
Program type	M																						
Conditions	Immediate																						
Unit	0.1 mm/0.01 inch																						
Setting range	0 to 99																						
D22	Tapping-cycle dwell time		<p>Dwell time at the hole bottom or at the R-point. This value is valid when 1 is set for bit 0, 1 or 2 of parameter D91.</p>																				
	Program type	M																					
	Conditions	Immediate																					
	Unit	0.01 sec.																					
Setting range	0 to 99		<p>Note:</p> <p>This parameter is valid only when the setting for roughness of tapping (tool sequence) is FIX.</p>																				
D23	Prehole clearance for end milling		<p>The excess amount of prehole diameter over nominal diameter that is used to specify whether the Z-axis is to be moved at a rapid feedrate or at a cutting feedrate during true-circle processing with the end mill</p>																				
	Program type	M																					
	Conditions	Immediate																					
	Unit	1 mm/0.1 inch																					
Setting range	0 to 999		 <p>Cutting feed Rapid feed MPL012</p>																				

Classification	USER	Display title	POINT
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Address	Name	Description	
D24	Hole-bottom dwell time for boring	<p>Z-axis feed dwell time at the hole bottom in a boring cycle. Set this time in spindle revolutions.</p>  <p>(Stops at hole bottom.)</p> <p>When the boring bar reaches the hole bottom, the Z-axis will firstly stop moving until the spindle makes D24 revolutions, and then the spindle orientation will be performed.</p> <p>Note: This parameter is invalid if the roughness of the boring (tool sequence) is 0.</p> <p style="text-align: right;">MPL013</p>	
	Program type		M
	Conditions		Immediate
	Unit		1 revolution
	Setting range		0 to 9
D25	Boring-bar tip relief	<p>The amount of relief provided for the tip of a boring bar to be kept clear of the hole wall after spindle orientation</p>  <p style="text-align: right;">MPL014</p> <p>Notes:</p> <ol style="list-style-type: none"> Valid only when the setting for the prehole diameter of the boring (tool sequence) is CYCLE 1. For the relief direction of the tool tip, see the description of bit 3 and bit 4 of I14. 	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 99
D26	Boring or back-boring hole-bottom return	<p>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</p>  <p style="text-align: right;">MPL015</p> <p>[1]Has reached the hole bottom. [2]Returned at the same feedrate. [3]Returned at a rapid feedrate.</p> <p>Note: Not valid if the setting for the roughness of the boring (tool sequence) is 1.</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 99
D27	—	<p>Invalid</p>	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

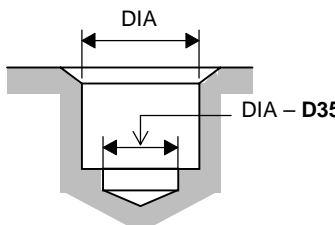
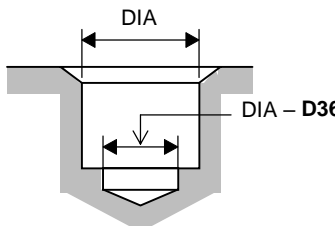
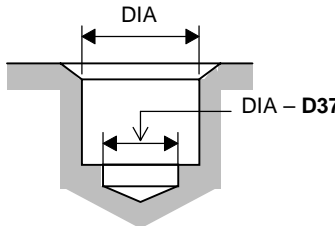
Classification		USER	Display title	POINT																								
D28	Name		Description																									
	Bottom-finishing amount of boring		<p>The distance which the boring bar is fed in at 70% of the original feedrate to finish the hole bottom</p>  <p style="text-align: right;">MPL016</p>																									
	Program type	M	The feedrate is reduced to 70% of the original value before the hole bottom is reached.																									
	Conditions	Immediate	Note:																									
	Unit	0.1 mm/0.01 inch	Not valid if the setting for the roughness of the boring (tool sequence) is 1.																									
Setting range	0 to 99																											
D29	Name		Description																									
	Chip removal time		<p>The time required for a chip removal tool to complete a chip removal operation after the tool has been positioned at the hole bottom</p>																									
	Program type	M																										
	Conditions	Immediate																										
	Unit	1 sec.																										
Setting range	0 to 99																											
D30	Name		Description																									
	Number of incomplete threads in tapping cycle		<p>To set number of incomplete threads in tapping cycle for metric screws and unified screws. In tapping, internal thread is tapped extra for the depth of (D30 × pitch) in the direction of Z.</p> <p>This is also used as an element for automatically determining hole-drilling depth in the automatic tool development of the tapping unit.</p>  <p style="text-align: right;">MPL07</p>																									
			Example:																									
			<table border="0"> <tr> <td>SN_o.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td>HOLE-DEP</td> </tr> <tr> <td>1</td> <td>DRILL</td> <td>10.</td> <td></td> <td>10.</td> <td>19.</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">↑</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">{DEPTH + D11 + (D30 × pitch)}</td> </tr> </table>		SN _o .	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	DRILL	10.		10.	19.						↑						{DEPTH + D11 + (D30 × pitch)}
	SN _o .	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP																						
1	DRILL	10.		10.	19.																							
					↑																							
					{DEPTH + D11 + (D30 × pitch)}																							
		<p>[Related parameter]</p> <p>D43: Number of incomplete threads in tapping cycle for piped screws</p>																										
Program type	M																											
Conditions	Immediate																											
Unit	1 thread																											
Setting range	0 to 9																											

Classification	USER	Display title	POINT
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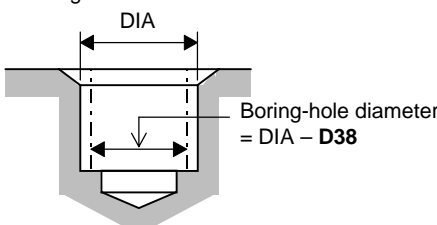
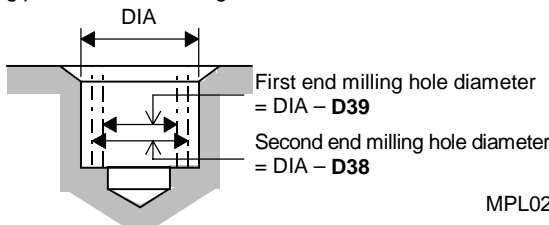
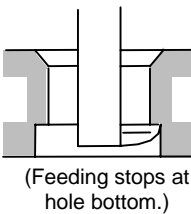
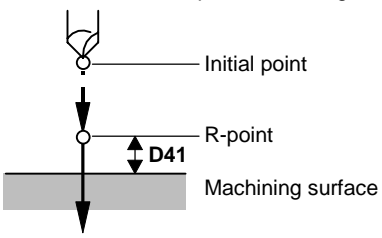
Address	Name	Description	
D31	Tapper elongation amount for tapping	<p>Excess amount of tool return due to elongation of the tapper during tapping cycle Set this value in spindle revolutions.</p>  <p style="text-align: right;">MPL019</p>	
	Program type		M
	Conditions		Immediate
	Unit		1 revolution
	Setting range		0 to 9
D32	Number of spindle revolutions until spindle CCW rotation begins in tapping cycle	<p>The number of inertial turns in tapping cycle that the spindle has rotated clockwise during the time from output of a spindle CCW rotation command to the start of spindle CCW rotation</p>	
	Program type		M
	Conditions		Immediate
	Unit		1 revolution
	Setting range		0 to 99
D33	Back-boring tool tip relief	<p>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</p>  <p style="text-align: right;">MPL019</p> <p>Note: For the relief direction of the tool tip, see the description of bit 3 and bit 4 of I14.</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 99
D34	—	<p>Invalid</p>	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

5 USER PARAMETER

Classification	USER	Display title	POINT
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Address	Name	Description												
D35	Prehole-drilling diameter setting element for reamer (drilling)	<p>Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining process is drilling.)</p>  <p style="text-align: right;">MPL020</p>												
	Program type	M												
	Conditions	Immediate												
	Unit	0.01 mm/0.001 inch												
	Setting range	0 to 999												
		<p>Example:</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td></td> </tr> <tr> <td>1</td> <td>DRILL</td> <td>10.</td> <td></td> <td>(10.)</td> <td>← (DIA - D35)</td> </tr> </table>	SNo.	TOOL	NOM-φ	No.	HOLE-φ		1	DRILL	10.		(10.)	← (DIA - D35)
SNo.	TOOL	NOM-φ	No.	HOLE-φ										
1	DRILL	10.		(10.)	← (DIA - D35)									
D36	Prehole-drilling diameter setting element for reamer (boring)	<p>Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining process is boring.)</p>  <p style="text-align: right;">MPL020</p>												
	Program type	M												
	Conditions	Immediate												
	Unit	0.01 mm/0.001 inch												
	Setting range	0 to 999												
		<p>Example:</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td></td> </tr> <tr> <td>1</td> <td>DRILL</td> <td>10.</td> <td></td> <td>(10.)</td> <td>← (DIA - D36)</td> </tr> </table>	SNo.	TOOL	NOM-φ	No.	HOLE-φ		1	DRILL	10.		(10.)	← (DIA - D36)
SNo.	TOOL	NOM-φ	No.	HOLE-φ										
1	DRILL	10.		(10.)	← (DIA - D36)									
D37	Prehole-drilling diameter setting element for reamer (end milling)	<p>Element used to automatically set the prehole-drilling diameter during automatic tool development of the reamer unit (When the pre-machining process is end milling.)</p>  <p style="text-align: right;">MPL020</p>												
	Program type	M												
	Conditions	Immediate												
	Unit	0.01 mm/0.001 inch												
	Setting range	0 to 999												
		<p>Example:</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td></td> </tr> <tr> <td>1</td> <td>DRILL</td> <td>10.</td> <td></td> <td>(10.)</td> <td>← (DIA - D37)</td> </tr> </table>	SNo.	TOOL	NOM-φ	No.	HOLE-φ		1	DRILL	10.		(10.)	← (DIA - D37)
SNo.	TOOL	NOM-φ	No.	HOLE-φ										
1	DRILL	10.		(10.)	← (DIA - D37)									

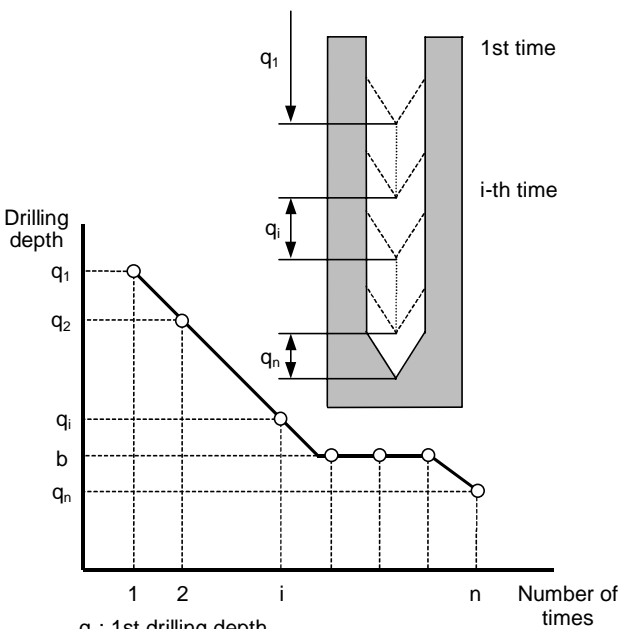
Classification	USER	Display title	POINT
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Address	Name	Description																		
D38	Reamer-prehole diameter setting element for boring or end milling																			
	Program type	M																		
	Conditions	Immediate																		
	Unit	0.01 mm/0.001 inch																		
	Setting range	0 to 999																		
		<p>1) In automatic tool development of the reamer unit, if the pre-machining process is boring:</p>  <p style="text-align: right;">MPL021</p> <p>Example:</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td></td> </tr> <tr> <td>1</td> <td>BOR BAR</td> <td>10.</td> <td></td> <td>(10.)</td> <td>← (DIA - D38)</td> </tr> </table>	SNo.	TOOL	NOM-φ	No.	HOLE-φ		1	BOR BAR	10.		(10.)	← (DIA - D38)						
SNo.	TOOL	NOM-φ	No.	HOLE-φ																
1	BOR BAR	10.		(10.)	← (DIA - D38)															
D39	Reamer-prehole diameter setting element for end milling																			
	Program type	M																		
	Conditions	Immediate																		
	Unit	0.01 mm/0.001 inch																		
	Setting range	0 to 999																		
		<p>2) In automatic tool development of the reamer unit, if the pre-machining process is end milling:</p>  <p style="text-align: right;">MPL022</p> <p>Example:</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td></td> </tr> <tr> <td>1</td> <td>E-MILL</td> <td>15.</td> <td></td> <td>(20.)</td> <td>← (DIA - D39)</td> </tr> <tr> <td>1</td> <td>E-MILL</td> <td>10.</td> <td></td> <td>(21.)</td> <td>← (DIA - D38)</td> </tr> </table>	SNo.	TOOL	NOM-φ	No.	HOLE-φ		1	E-MILL	15.		(20.)	← (DIA - D39)	1	E-MILL	10.		(21.)	← (DIA - D38)
SNo.	TOOL	NOM-φ	No.	HOLE-φ																
1	E-MILL	15.		(20.)	← (DIA - D39)															
1	E-MILL	10.		(21.)	← (DIA - D38)															
D40	Spot-faced hole bottom dwell time for inverted spot-facing																			
	Program type	M																		
	Conditions	Immediate																		
	Unit	1 revolution																		
	Setting range	0 to 9																		
		<p>Z-axis feed dwell time at the spot-faced hole bottom in an inverted spot facing cycle. Set this time in spindle revolutions.</p>  <p style="text-align: right;">MPL023</p> <p>When the inverted spot-facing tool reaches the hole bottom, firstly the Z-axis will stop moving until the spindle makes D40 revolutions, and then the rotational direction of the spindle will reverse.</p>																		
D41	R-point height during point-machining																			
	Program type	M																		
	Conditions	Immediate																		
	Unit	1 mm/0.1 inch																		
	Setting range	0 to 99																		
		<p>R-point height of each tool in the point-machining unit</p> <p>Example:</p>  <p style="text-align: right;">MPL024</p> <p>Notes:</p> <ol style="list-style-type: none"> For the inverted spot-facing unit or the back-boring unit, this parameter can also be used for setting the clearance amount at the hole bottom. See D1 and D42 also. 																		

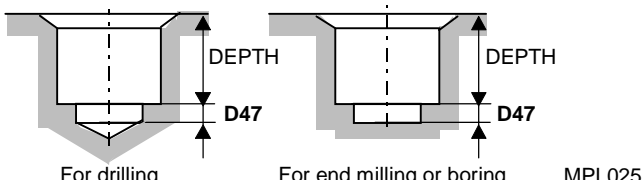
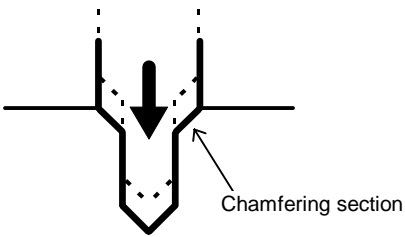
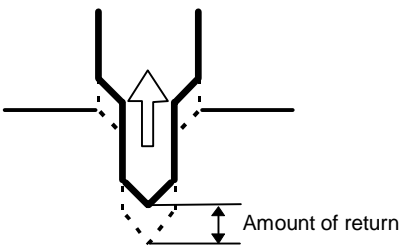
Classification	USER	Display title	POINT
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Address	Name	Description												
D42	Height of the third R-point during point machining	<div style="text-align: center;"> </div> <p>The height of the R-point during point machining is basically D41, however it is changed to D42 under the following conditions.</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">Tool sequence</th> <th style="text-align: center;">Conditions</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Drill</td> <td>- Bit 6 of parameter D91 is set to 1 (D42 valid). - There is a spot drill in the pre-machining tool sequence of the same unit.</td> </tr> <tr> <td style="text-align: center;">Chamfering cutter</td> <td>- Bit 7 of parameter D91 is set to 1 (D42 valid). - CYCLE 2 is selected for the machining cycle.</td> </tr> <tr> <td style="text-align: center;">Spot</td> <td>- Bit 7 of parameter D91 is set to 1 (D42 valid). - CYCLE 2 in the chamfering cycle is selected for the machining cycle.</td> </tr> </tbody> </table>	Tool sequence	Conditions	Drill	- Bit 6 of parameter D91 is set to 1 (D42 valid). - There is a spot drill in the pre-machining tool sequence of the same unit.	Chamfering cutter	- Bit 7 of parameter D91 is set to 1 (D42 valid). - CYCLE 2 is selected for the machining cycle.	Spot	- Bit 7 of parameter D91 is set to 1 (D42 valid). - CYCLE 2 in the chamfering cycle is selected for the machining cycle.				
Tool sequence	Conditions													
Drill	- Bit 6 of parameter D91 is set to 1 (D42 valid). - There is a spot drill in the pre-machining tool sequence of the same unit.													
Chamfering cutter	- Bit 7 of parameter D91 is set to 1 (D42 valid). - CYCLE 2 is selected for the machining cycle.													
Spot	- Bit 7 of parameter D91 is set to 1 (D42 valid). - CYCLE 2 in the chamfering cycle is selected for the machining cycle.													
	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Program type</td> <td style="text-align: center;">M</td> </tr> <tr> <td style="text-align: center;">Conditions</td> <td style="text-align: center;">Immediate</td> </tr> <tr> <td style="text-align: center;">Unit</td> <td style="text-align: center;">0.1 mm/0.01 inch</td> </tr> <tr> <td style="text-align: center;">Setting range</td> <td style="text-align: center;">-999 to 999</td> </tr> </table>	Program type	M	Conditions	Immediate	Unit	0.1 mm/0.01 inch	Setting range	-999 to 999					
Program type	M													
Conditions	Immediate													
Unit	0.1 mm/0.01 inch													
Setting range	-999 to 999													
D43	Number of incomplete threads in tapping cycle	<p>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) in the direction of Z.</p> <p>This is also used as an element for automatically determining hole-drilling depth in the automatic tool development of the tapping unit.</p> <div style="text-align: center;"> </div> <p>Example:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">SNo.</th> <th style="text-align: center;">TOOL</th> <th style="text-align: center;">NOM-φ</th> <th style="text-align: center;">No.</th> <th style="text-align: center;">HOLE-φ</th> <th style="text-align: center;">HOLE-DEP</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">DRILL</td> <td style="text-align: center;">10.</td> <td style="text-align: center;">10.</td> <td style="text-align: center;">10.</td> <td style="text-align: center;">(19.)</td> </tr> </tbody> </table> <p style="text-align: center;">↑ {DEPTH + D11 + (D43 × pitch)}</p>	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	DRILL	10.	10.	10.	(19.)
SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP									
1	DRILL	10.	10.	10.	(19.)									
	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Program type</td> <td style="text-align: center;">M</td> </tr> <tr> <td style="text-align: center;">Conditions</td> <td style="text-align: center;">Immediate</td> </tr> <tr> <td style="text-align: center;">Unit</td> <td style="text-align: center;">1 thread</td> </tr> <tr> <td style="text-align: center;">Setting range</td> <td style="text-align: center;">0 to 9</td> </tr> </table>	Program type	M	Conditions	Immediate	Unit	1 thread	Setting range	0 to 9					
Program type	M													
Conditions	Immediate													
Unit	1 thread													
Setting range	0 to 9													

Classification	USER	Display title	POINT
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Address	Name		Description
D44	Automatic calculation method for the amount of chamfering using the tapping unit		<p>This parameter specifies a method of automatic calculation of the amount of chamfering using the tapping unit.</p> <p>0: Calculation using the expression shown below Amount of chamfering = $\frac{(\text{MAJOR-}\phi + 2 \times \text{PITCH}) - \text{PRE-DIA}}{2}$</p> <p>1: Calculation using the same expression as for M32 Amount of chamfering = $\frac{\text{MAJOR-}\phi - \text{PRE-DIA}}{2}$</p> <p>Note: Select 1 if the loss of the threaded section by chamfering is likely.</p>
	Program type	M	
	Conditions	Immediate	
	Unit	—	
	Setting range	0, 1	
D45	Gradual decrements in drilling depth		 <p> q_1: 1st drilling depth q_i: i-th times drilling depth q_n: Residual hole depth b: Minimum drilling depth D46 $q_i = q_1 - \mathbf{D45} \times (i - 1)$ (If $q_i \geq b$) $q_i = b$ (If $q_i < b$) </p> <p>See D46.</p>
	Program type	M	
	Conditions	Immediate	
	Unit	0.01 mm/0.001 inch	
	Setting range	0 to 9999	
D46	Minimum gradual drilling depth		<p>Set the minimum gradual drilling depth. However, if the residual hole depth is smaller than D46, actual drilling depth will be the same as the residual hole depth.</p> <p>See D45.</p>
	Program type	M	
	Conditions	Immediate	
	Unit	0.01 mm/0.001 inch	
	Setting range	0 to 9999	

Classification	USER	Display title	POINT
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Address	Name	Description																											
D47	Reamer-prehole machining overshoot	<p>Element used to automatically set the hole depth of drilling, end milling and boring during automatic tool development of the reamer unit</p> 																											
	Program type	M																											
	Conditions	Immediate																											
	Unit	0.01 mm/0.001 inch																											
	Setting range	0 to 999																											
		<p>Example:</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td>HOLE-DEP</td> </tr> <tr> <td>1</td> <td>DRILL</td> <td>10.</td> <td>10.</td> <td>10.</td> <td>(21.) ← (DEPTH + D47)</td> </tr> </table>	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	1	DRILL	10.	10.	10.	(21.) ← (DEPTH + D47)															
SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP																								
1	DRILL	10.	10.	10.	(21.) ← (DEPTH + D47)																								
D48	Feed override for the section to be chamfered in the planetary tapping cycle	<p>Feed override for the section to be chamfered in the planetary tapping cycle</p> <p>Chamfering feed = Pre-hole machining feed in tapping tool sequence × D48/100</p> 																											
	Program type	M																											
	Conditions	Immediate																											
	Unit	%																											
	Setting range	0 to 999																											
D49	The amount of return at hole bottom during the planetary tapping cycle	<p>The amount of return at hole bottom during the planetary tapping cycle</p> <p>Specify data by the number of threads.</p> <p>Amount of return = Tapping pitch × D49/10</p> 																											
	Program type	M																											
	Conditions	Immediate																											
	Unit	0.1 thread																											
	Setting range	0 to 999																											
D50	Auto-set feed rate for pre-hole machining in the planetary tapping cycle	<p>The feed rate for pre-hole machining will be auto-set to D50 when the planetary tapping cycle is selected.</p> <table border="0"> <tr> <td>SNo.</td> <td>TOOL</td> <td>NOM-φ</td> <td>No.</td> <td>HOLE-φ</td> <td>HOLE-DEP</td> <td>PRE-DIA</td> <td>PRE-DEP</td> <td>RGH</td> <td>DEPTH</td> <td>C-SP</td> <td>FR</td> <td>M</td> <td>M</td> </tr> <tr> <td>1</td> <td>TAP</td> <td>M10.</td> <td>10.</td> <td>23.7</td> <td>PLANET</td> <td>0.15</td> <td>FIX</td> <td>P1.5</td> <td>50</td> <td>1.5</td> <td></td> <td></td> </tr> </table> <p style="text-align: center;">↑ D50</p>	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	PRE-DIA	PRE-DEP	RGH	DEPTH	C-SP	FR	M	M	1	TAP	M10.	10.	23.7	PLANET	0.15	FIX	P1.5	50	1.5		
	SNo.	TOOL	NOM-φ	No.	HOLE-φ	HOLE-DEP	PRE-DIA	PRE-DEP	RGH	DEPTH	C-SP	FR	M	M															
	1	TAP	M10.	10.	23.7	PLANET	0.15	FIX	P1.5	50	1.5																		
	Program type	M																											
	Conditions	Immediate																											
Unit	0.01 mm/rev 0.001 inch/rev																												
Setting range	0 to 999																												

Classification	USER	Display title	POINT
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Address	Name	Description
D51	Auto-set feed rate for planetary tapping cycle	<p>The feed rate will be auto-set to D51 when the planetary tapping cycle is selected.</p> <pre> SNO. TOOL NOM-φ No.HOLE-φ HOLE-DEP PRE-DIA PRE-DEP RGH DEPTH C-SP FR M M 1 TAP M10. 10. 23.7 PLANET 0.15 FIX P1.5 50 0.04 ↑ D51 </pre>
	Program type	M
	Conditions	Immediate
	Unit	0.01 mm/rev 0.001 inch/rev
	Setting range	0 to 999
D52 to D72	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
D73 to D77	Learning of cutting conditions (DEP-Z range)	<p>Specify DEP-Z range for the end mill and the face mill from the learning data of cutting conditions.</p> <p>When learning data on the condition that DEP-Z is in the following range has been stored in the memory, learning is not effectuated again.</p> <p>For a DEP-Z range of the end mill, set a value of "DEPTH/NOM-φ (at a unit of 0.1%)".</p> <p>0 to D73 DEP-Z range (for end mill) 1 D73 to D74 DEP-Z range (for end mill) 2 D74 to D75 DEP-Z range (for end mill) 3</p> <p>For a DEP-Z range of the face mill, set a value of "DEPTH (at a unit of 0.1 mm or 0.01 inch)".</p> <p>0 to D76 DEP-Z range (for face mill) 1 D76 to D77 DEP-Z range (for face mill) 2</p>
	Program type	M
	Conditions	Immediate
	Unit	0.1% (0.1 mm/0.01 inch)
	Setting range	0 to 1000

5 USER PARAMETER

Classification	USER	Display title	POINT
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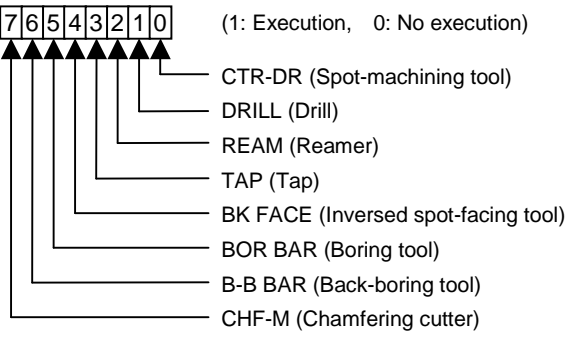
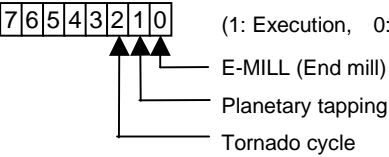
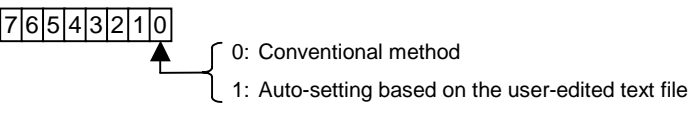
Address	Name	Description
D78 to D82	Learning of cutting conditions (WID-R range)	<p>Specify WID-R range for the boring bar, back boring bar and end mill from the learning data of cutting conditions.</p> <p>When learning data on the condition that WID-R is in the following range has been stored in the memory, learning is not effectuated again.</p> <p>For a WID-R range of the boring bar and back boring bar, set a value of "DEPTH (at a unit of 0.1 mm/0.01 inch)".</p> <p>0 to D78WID-R range (for boring bar and back boring bar) 1 D78 to D79.....WID-R range (for boring bar and back boring bar) 2</p> <p>For a WID-R range of the end mill, set a value of "DEPTH/NOM-φ (at a unit of 0.1%)".</p> <p>0 to D80WID-R range (for end mill) 1 D80 to D81.....WID-R range (for end mill) 2 D81 to D82.....WID-R range (for end mill) 3</p>
	Program type	M
	Conditions	Immediate
	Unit	0.1% (0.1 mm/0.01 inch)
	Setting range	0 to 1000
D83 to D90	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

Classification	USER	Display title	POINT
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Address	Name	Description																
D91	—	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> <tr><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td></tr> </table> </div> <div> <p>(1: Execution, 0: No execution)</p> <ul style="list-style-type: none"> — M04 is output after the tool has dwelled at the hole bottom during a tapping cycle. — The tool dwells after M04 has been output at the hole bottom during a tapping cycle. — The tool dwells after it has been returned to the R-point during a tapping cycle. — If a drill is used in the pre-machining of the centering drill cycle, the R-point height is set as D1. — The finishing tool path is shortened during a true-circle processing cycle (end milling). — The tool path is shortened during a true-circle processing cycle (chamfering). — If a pre-machining tool sequence is included in the same unit, the R-point height of the drill is set as D1 or D42. — The R-point height of the chamfering cutter during the cycle 2 is set as D42. — The R-point height of the spot-machining tool during the chamfering cycle (cycle 2) is set as D42. </div> </div>	7	6	5	4	3	2	1	0	▲	▲	▲	▲	▲	▲	▲	▲
	7	6	5	4	3	2	1	0										
	▲	▲	▲	▲	▲	▲	▲	▲										
	Program type	M																
	Conditions	Immediate																
Unit	Bit																	
Setting range	Binary, eight digits																	
D92	—	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> <tr><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td><td>▲</td></tr> </table> </div> <div> <p>(1: Execution, 0: No execution)</p> <ul style="list-style-type: none"> — During a true-circle processing (end milling) cycle, E17 is used for axial feed. — The R1-point height of the back spot facing is set as D1. — If a chamfering cutter is included in the pre-machining tool sequence of the same unit, the R-point height of the reamer is set as D1. — If a chamfering cutter is included in the pre-machining tool sequence of the same unit, the R-point height of the tapping is set as D1. — During planetary tapping, chips are ejected automatically prior to the threading process. </div> </div>	7	6	5	4	3	2	1	0	▲	▲	▲	▲	▲	▲	▲	▲
	7	6	5	4	3	2	1	0										
	▲	▲	▲	▲	▲	▲	▲	▲										
	Program type	M																
	Conditions	Immediate																
Unit	Bit																	
Setting range	Binary, eight digits																	

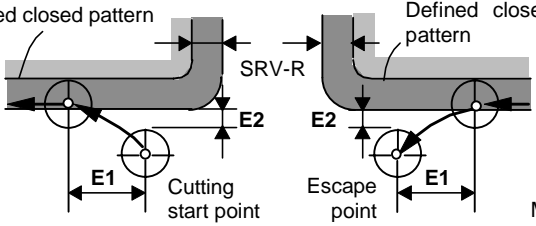
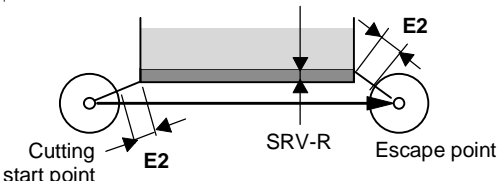
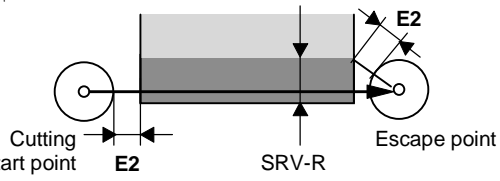
5 USER PARAMETER

Classification	USER	Display title	POINT
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Address	Name	Description
D93	—	Unidirectional positioning for point-machining  (1: Execution, 0: No execution)
	Program type	M
	Conditions	Immediate
	Unit	Bit
	Setting range	Binary, eight digits
D94	—	Unidirectional positioning for point-machining  (1: Execution, 0: No execution)
	Program type	M
	Conditions	Immediate
	Unit	Bit
	Setting range	Binary, eight digits
D95	—	The method of auto-setting a pipe tap (tapping unit or counterbore-tapping unit) in the program and the method of auto-setting a tapping tool diameter on the TOOL DATA display. 
	Program type	M
	Conditions	Immediate
	Unit	Bit
	Setting range	Binary, eight digits
D96 to D108	—	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

5-2 LINE/FACE/3D (E)

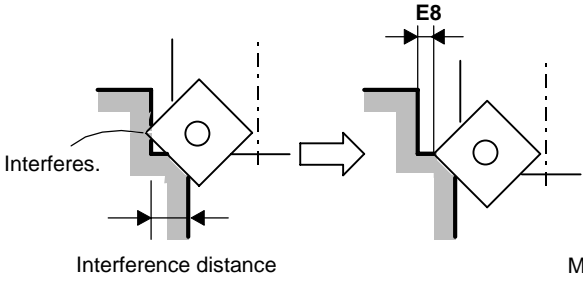
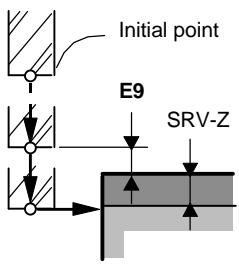
Classification	USER	Display title	LINE/FACE/3D
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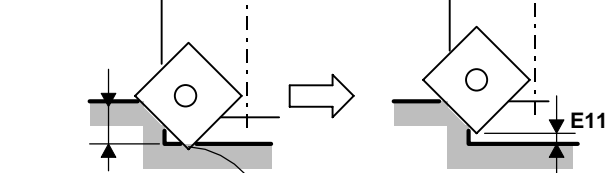
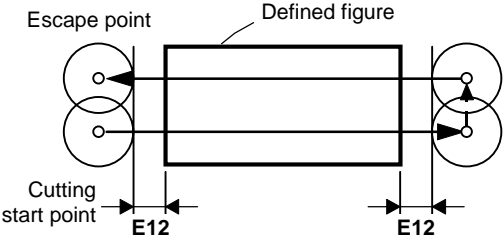
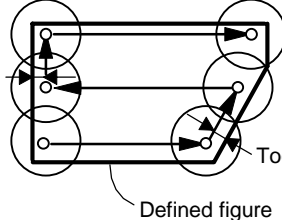
Address	Name	Description
E1	Closed-pattern cutting start point and escape point setting element	<p>Element used to set cutting start point and escape point for closed-pattern line- or face-machining</p> <p>Example:</p>  <p>[Applicable units]</p> <ul style="list-style-type: none"> - LINE OUT, LINE IN, CHMF OUT and CHMF IN - Wall finishing of STEP, POCKET, PCKT MT and PCKT VLY
	Program type	M
	Conditions	Immediate
	Unit	0.1 mm/0.01 inch
	Setting range	0 to 999
E2	Cutting start point and escape point setting element (the first clearance)	<p>Element used to set the cutting start point and escape point for line- or face-machining</p> <p>Example:</p> <p>$NOM-\phi/2 \geq SRV-R$</p>  <p>$NOM-\phi/2 < SRV-R$</p>  <p>[Applicable units]</p> <ul style="list-style-type: none"> - All line-machining units - Face-machining units other than FACE MIL, TOP EMIL, and SLOT <p>Notes:</p> <ol style="list-style-type: none"> 1. See the diagram of parameter E1 also. 2. Positioning of E2 at the escape point can be selected using E95, but only for line-machining units.
	Program type	M
	Conditions	Immediate
	Unit	0.1 mm/0.01 inch
	Setting range	0 to 999
E3	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

5 USER PARAMETER

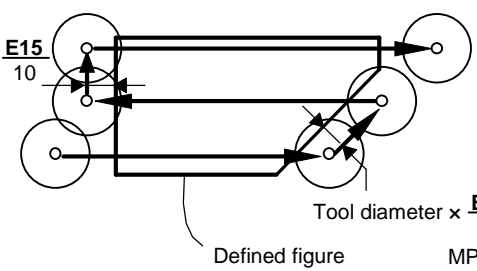
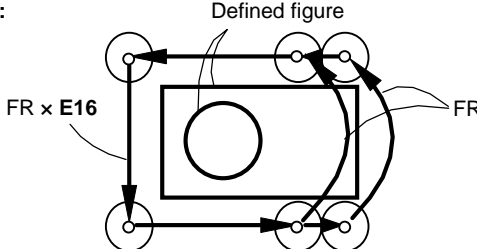
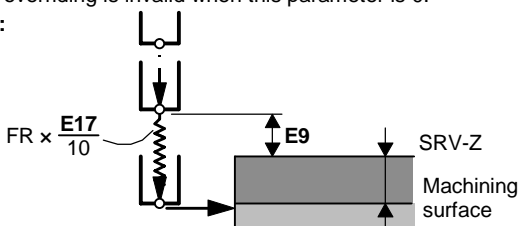
Classification	USER	Display title	LINE/FACE/3D																
E4	Reference allowance of finishing in radial direction		<p>The reference value of each finishing allowance R (FIN-R) which is automatically set when the roughness levels of the line- or face-machining units have been set</p> <p>The finishing 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.</p> <table border="1"> <thead> <tr> <th>Roughness</th> <th>FIN-R</th> </tr> </thead> <tbody> <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> </tbody> </table>	Roughness	FIN-R	0 to 3	0.0	4	E4	5	E4 × 0.7	6	E4 × 0.7 × 0.7	7	E4 × 0.7 × 0.7 × 0.7	8	E4 × 0.7 × 0.7 × 0.7 × 0.7	9	E4 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7
	Roughness	FIN-R																	
	0 to 3	0.0																	
	4	E4																	
	5	E4 × 0.7																	
	6	E4 × 0.7 × 0.7																	
7	E4 × 0.7 × 0.7 × 0.7																		
8	E4 × 0.7 × 0.7 × 0.7 × 0.7																		
9	E4 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7																		
Program type	M																		
Conditions	Immediate																		
Unit	0.1 mm/0.01 inch																		
Setting range	0 to 999																		
E5	Element used to set the cutting start point and escape point (the second clearance)		<p>Element used to set the cutting start point and escape point (the second clearance)</p> <p>E2 is used generally as a clearance on the X-Y plane, however, E5 is used when the condition meets both of 1) and 2) mentioned below.</p> <ol style="list-style-type: none"> There is pre-machining in the same unit. The parameter (E91 to E95) that makes E5 effective is set to ON (1). <p>[Applicable units] LINE OUT, LINE IN, STEP, POCKET, POCKET MT, PCKT VLY</p> <p>[Related parameters]</p> <table border="0"> <tr> <td>E91 bit 3</td> <td rowspan="5">} Parameter that effectuates E5 in the applicable unit.</td> </tr> <tr> <td>E92 bit 3</td> </tr> <tr> <td>E93 bit 3</td> </tr> <tr> <td>E94 bit 3</td> </tr> <tr> <td>E95 bit 7</td> </tr> </table>	E91 bit 3	} Parameter that effectuates E5 in the applicable unit.	E92 bit 3	E93 bit 3	E94 bit 3	E95 bit 7										
	E91 bit 3	} Parameter that effectuates E5 in the applicable unit.																	
	E92 bit 3																		
	E93 bit 3																		
	E94 bit 3																		
	E95 bit 7																		
Program type	M																		
Conditions	Immediate																		
Unit	0.1 mm/0.01 inch																		
Setting range	0 to 999																		
E6	Reference allowance of finishing in axial direction		<p>he reference value of each finishing allowance Z (FIN-Z) which is automatically set when the roughness levels of the line- or face-machining units have been set</p> <p>The finishing allowance Z 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.</p> <table border="1"> <thead> <tr> <th>Roughness</th> <th>FIN-Z</th> </tr> </thead> <tbody> <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> </tbody> </table>	Roughness	FIN-Z	0 to 3	0.0	4	E6	5	E6 × 0.7	6	E6 × 0.7 × 0.7	7	E6 × 0.7 × 0.7 × 0.7	8	E6 × 0.7 × 0.7 × 0.7 × 0.7	9	E6 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7
	Roughness	FIN-Z																	
	0 to 3	0.0																	
	4	E6																	
	5	E6 × 0.7																	
	6	E6 × 0.7 × 0.7																	
7	E6 × 0.7 × 0.7 × 0.7																		
8	E6 × 0.7 × 0.7 × 0.7 × 0.7																		
9	E6 × 0.7 × 0.7 × 0.7 × 0.7 × 0.7																		
Program type	M																		
Conditions	Immediate																		
Unit	0.1 mm/0.01 inch																		
Setting range	0 to 999																		

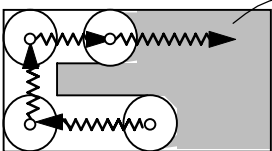
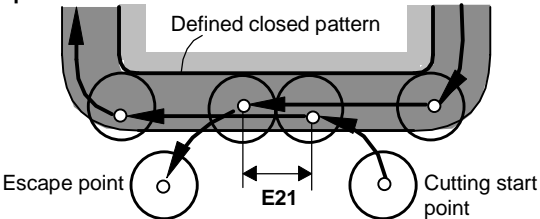
Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description									
E7	Allowance of cutting start point in axial direction (the second clearance)	<p>Allowance of cutting start point in axial direction For the line- or face-machining, E9 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.</p> <p>1) There is pre-machining in the same unit. 2) The parameter (E91 to E97) that makes E7 effective is set to ON (1).</p> <p>[Applicable units] All line-/face-machining units except the face milling and angular face unit.</p> <p>[Related parameters]</p> <table style="display: inline-table; vertical-align: middle;"> <tr> <td style="border: none;">E91 bit 2</td> <td rowspan="7" style="font-size: 3em; vertical-align: middle;">}</td> <td rowspan="7" style="border: none;">Parameter that effectuates E7 in the applicable unit.</td> </tr> <tr> <td style="border: none;">E92 bit 2</td> </tr> <tr> <td style="border: none;">E93 bit 2</td> </tr> <tr> <td style="border: none;">E94 bit 2</td> </tr> <tr> <td style="border: none;">E95 bit 6</td> </tr> <tr> <td style="border: none;">E96 bit 1</td> </tr> <tr> <td style="border: none;">E97 bit 2</td> </tr> </table>	E91 bit 2	}	Parameter that effectuates E7 in the applicable unit.	E92 bit 2	E93 bit 2	E94 bit 2	E95 bit 6	E96 bit 1	E97 bit 2
	E91 bit 2	}	Parameter that effectuates E7 in the applicable unit.								
	E92 bit 2										
	E93 bit 2										
	E94 bit 2										
E95 bit 6											
E96 bit 1											
E97 bit 2											
Program type	M										
Conditions	Immediate										
Unit	0.1 mm/0.01 inch										
Setting range	0 to 999										
E8	Radial interference clearance of chamfering cutter	<p>The amount of clearance that prevents interference of the chamfering cutter with the hole walls during face-machining</p>  <p style="text-align: right;">MPL028</p>									
	Program type	M									
	Conditions	Immediate									
	Unit	0.1 mm/0.01 inch									
	Setting range	0 to 999									
E9	Allowance of axial-cutting start position (the first clearance)	<p>Element used to set the position in which the cutting feed in axial direction is to be started after the line- or face-machining tool has been moved from the initial point toward the workpiece at a rapid feedrate</p> <p>Example:</p>  <p style="text-align: right;">MPL029</p>									
	Program type	M									
	Conditions	Immediate									
	Unit	0.1 mm/0.01 inch									
	Setting range	0 to 999									

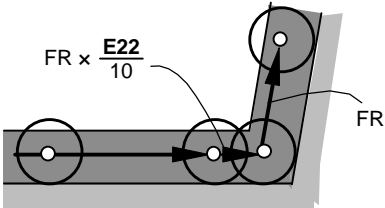
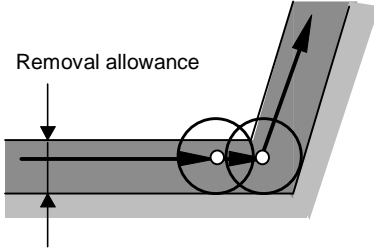
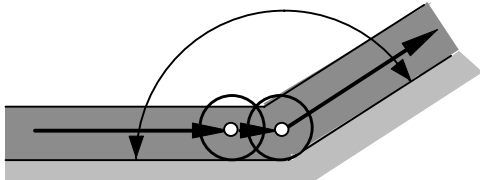
Classification	USER	Display title	LINE/FACE/3D
E10	Depth-of-cut-R automatic setting element (Face milling, End milling-top, End milling-step)		Element used to automatically set the radial depth-of-cut of the tool sequence in FACE MIL, TOP EMIL or STEP unit $WID-R = \frac{NOM-\phi \times E10}{10}$ Example: SNO. TOOL NOM-φ No. APRCH-X APRCH-Y TYPE ZFD DEP-Z WID-R R1 F-MILL 100A ? ? XBI ◆ 1. 19. ↑ $\frac{NOM-\phi \times E10}{10}$
	Program type	M	
	Conditions	Immediate	
	Unit	10%	
	Setting range	0 to 9	
E11	Axial interference clearance of chamfering cutter		The amount of clearance that prevents interference of the chamfering cutter with the hole bottom during chamfering 
	Program type	M	
	Conditions	Immediate	
	Unit	0.1 mm/0.01 inch	
	Setting range	5 to 40	
E12	Radial interference clearance of face milling unit and angular face milling unit		The amount of clearance that prevents interference between the tool and the figure during face milling Example: 
	Program type	M	
	Conditions	Immediate	
	Unit	0.1 mm/0.01 inch	
	Setting range	0 to 999	
E13	Tool path setting element for end milling-top unit		Element used to set the tool path internal to the figure for end milling-top unit Example: $\text{Tool diameter} \times \frac{E13}{10}$ 
	Program type	M	
	Conditions	Immediate	
	Unit	10%	
	Setting range	1 to 9	

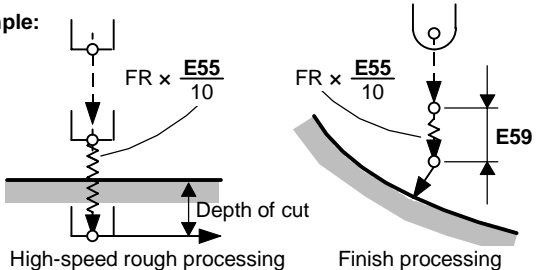
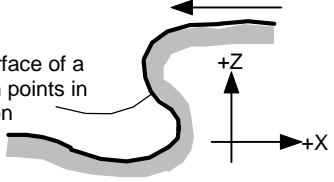
Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description																				
E14	Depth-of-cut-R automatic setting element (Pocket milling, Pocket milling-mountain, Pocket milling-valley)	Element used to automatically set the radial depth-of-cut of the tool sequence in POCKET, PCKT MT or PCKT VLY unit $WID-R = \frac{NOM-\phi \times E14}{10}$ Example: <table border="1" style="font-size: small;"> <tr> <td>SNO.</td><td>TOOL</td><td>NOM-φ</td><td>No.</td><td>APRCH-X</td><td>APRCH-Y</td><td>TYPE</td><td>ZFD</td><td>DEP-Z</td><td>WID-R</td> </tr> <tr> <td>R1</td><td>E-MILL</td><td>20.</td><td></td><td>?</td><td>?</td><td>CW</td><td>G01</td><td>10.</td><td>12.</td> </tr> </table> <div style="text-align: right; margin-top: 5px;"> $\frac{NOM-\phi \times E14}{10}$ </div>	SNO.	TOOL	NOM-φ	No.	APRCH-X	APRCH-Y	TYPE	ZFD	DEP-Z	WID-R	R1	E-MILL	20.		?	?	CW	G01	10.	12.
	SNO.	TOOL	NOM-φ	No.	APRCH-X	APRCH-Y	TYPE	ZFD	DEP-Z	WID-R												
	R1	E-MILL	20.		?	?	CW	G01	10.	12.												
	Program type	M																				
	Conditions	Immediate																				
Unit	10%																					
Setting range	0 to 9																					
E15	Tool path setting element for face milling-top unit (reciprocating short)	Element used to set the tool path external to the defined figure for reciprocating-short machining with face milling unit Example: 																				
	Program type	M																				
	Conditions	Immediate																				
	Unit	10%																				
	Setting range	1 to 9																				
E16	Peripheral-cutting feedrate override for end milling-mountain unit	Override value of the idle-cutting feedrate at which tool of end milling-mountain unit is to be moved around the outer form of the workpiece Note: Valid only when bit 0 of E91 is 1 and its bit 7 is 0. Example: 																				
	Program type	M																				
	Conditions	Immediate																				
	Unit	—																				
	Setting range	1 to 20																				
E17	Axial-cutting feedrate override	Override value of the feedrate at which the tool of a line- or face-machining unit (excluding face milling unit) is to be moved to the machining surface in an axial direction Notes: 1. Valid only when ZFD of tool sequence is G01. 2. Feed overriding is invalid when this parameter is 0. Example: 																				
	Program type	M																				
	Conditions	Immediate																				
	Unit	10%																				
	Setting range	0 to 9																				

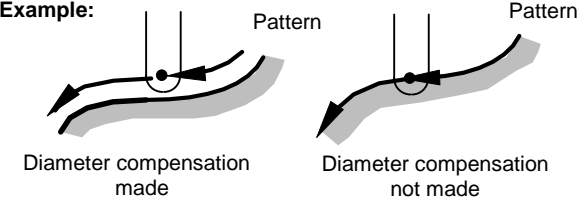
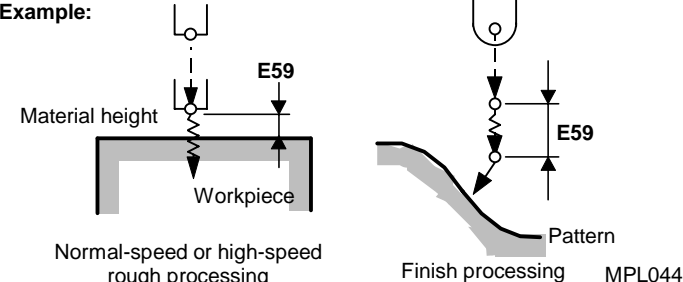
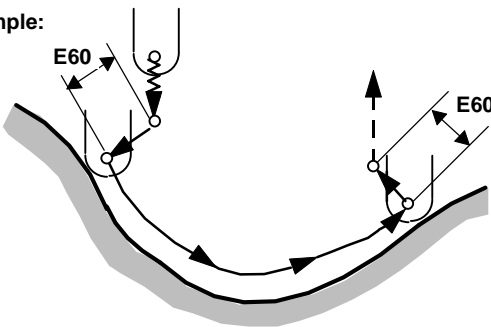
Classification		USER	Display title	LINE/FACE/3D
E18	Override in case of the overall width cutting for pocket-machining		<p>Override value of feedrate when the pocket-machining radial depth-of-cut becomes equal to the tool diameter</p> <p>Example:</p>  <p style="text-align: right;">$FR \times \frac{E18}{10}$</p> <p style="text-align: right;">MPL036</p>	
	Program type	M	<p>Note:</p> <p>Overriding for overall width cutting is not valid when this parameter is 0.</p> <p>[Applicable units]</p> <p>Rough-machining of POCKET, PCKT MT and PCKT VLY</p>	
	Conditions	Immediate		
	Unit	10%		
	Setting range	0 to 9		
E19	Returning feedrate override in case of bidirectional cutting for rough-machining of the end milling-slot unit.		<p>Override value of tool returning feedrate in the rough-machining process of the end milling-slot unit, when the bidirectional cutting is executed.</p> <p style="text-align: center;">$FR \times \frac{E19}{100}$</p> <p>Note:</p> <p>The override value is invalid, when bit 5 of parameter E96 is set to OFF, or this parameter is set to 0.</p> <p>[Applicable unit]</p> <p>Returning path in rough-machining of SLOT</p>	
	Program type	M		
	Conditions	Immediate		
	Unit	1%		
	Setting range	0 to 999		
E20	—		Invalid	
	Program type	—		
	Conditions	—		
	Unit	—		
	Setting range	—		
E21	Wall-cutting overlap in closed figure		<p>The amount of overlap of the wall-cutting start and end areas in closed-pattern line- or face-machining</p> <p>Example:</p>  <p style="text-align: right;">MPL037</p>	
	Program type	M	<p>[Applicable units]</p> <ul style="list-style-type: none"> - LINE OUT, LINE IN, CHMF OUT and CHMF IN - Wall finishing of STEP, POCKET, PCKT MT, PCKT VLY and SLOT 	
	Conditions	Immediate		
	Unit	0.1 mm/0.01 inch		
	Setting range	0 to 999		

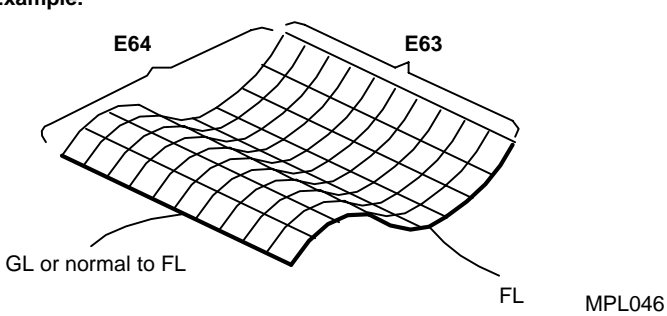
Classification	USER	Display title	LINE/FACE/3D
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Address	Name		Description						
E22	Override value of automatic corner overriding		<p>Override value of automatic corner overriding in line- or face-machining</p> <p>Example:</p>  <p style="text-align: right;">MPL038</p> <p>Note: Automatic corner overriding is invalid when this parameter is 0.</p> <p>[Applicable units] LINE RGT, LINE LFT, LINE OUT, LINE IN, STEP, POCKET, PCKT MT and PCKT VLY</p>						
	Program type	M							
	Conditions	Immediate							
	Unit	1%							
	Setting range	0 to 99							
E23	Effective removal allowance (upper limit) of automatic corner overriding		<p>The range of removal allowances (upper and lower limits) The automatic corner overriding becomes valid when the following line- or face-machining conditions are met:</p> $\text{Tool diameter} \times \frac{\mathbf{E24}}{100} \leq \text{Removal allowance} \leq \text{Tool diameter} \times \frac{\mathbf{E23}}{100}$  <p style="text-align: right;">MPL039</p> <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Machining</th> <th>Removal allowance</th> </tr> </thead> <tbody> <tr> <td>Line-rough machining</td> <td>(SRV-R) - (FIN-R)</td> </tr> <tr> <td>Face-rough machining</td> <td>(WID-R)</td> </tr> </tbody> </table>	Machining	Removal allowance	Line-rough machining	(SRV-R) - (FIN-R)	Face-rough machining	(WID-R)
	Machining	Removal allowance							
	Line-rough machining	(SRV-R) - (FIN-R)							
	Face-rough machining	(WID-R)							
	Program type	M							
Conditions	Immediate								
Unit	1%								
Setting range	1 to 99								
E24	Effective removal allowance (lower limit) of automatic corner overriding		<table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Machining</th> <th>Removal allowance</th> </tr> </thead> <tbody> <tr> <td>Line-rough machining</td> <td>(SRV-R) - (FIN-R)</td> </tr> <tr> <td>Face-rough machining</td> <td>(WID-R)</td> </tr> </tbody> </table>	Machining	Removal allowance	Line-rough machining	(SRV-R) - (FIN-R)	Face-rough machining	(WID-R)
	Machining	Removal allowance							
	Line-rough machining	(SRV-R) - (FIN-R)							
	Face-rough machining	(WID-R)							
	Program type	M							
Conditions	Immediate								
Unit	1%								
Setting range	1 to 99								
E25	Effective angle (upper limit) of automatic corner overriding		<p>The shape angle range (upper limit) The automatic corner overriding becomes valid when the following line- or face-machining conditions are met:</p> $\text{Shape angle} \leq \mathbf{E25}$  <p style="text-align: right;">MPL040</p>						
	Program type	M							
	Conditions	Immediate							
	Unit	1°							
	Setting range	1 to 179							

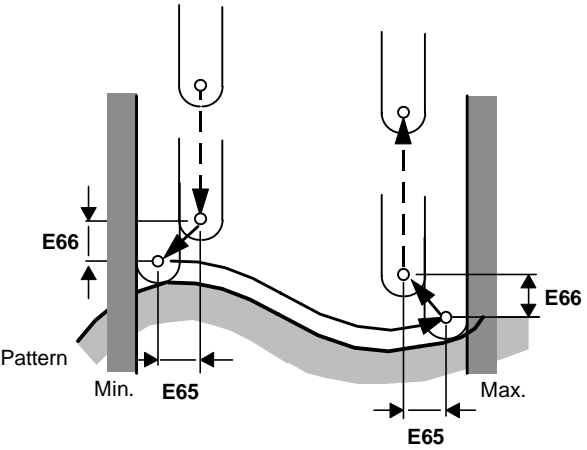
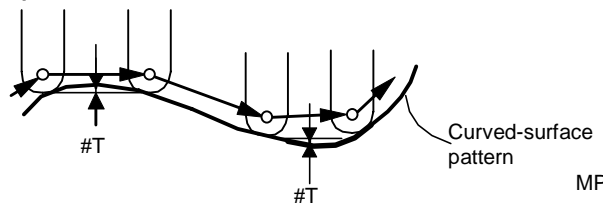
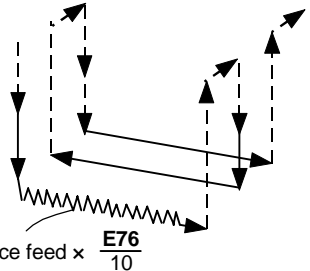
Classification		USER	Display title	LINE/FACE/3D
E26 to E54	Name		Description	
	—		Invalid	
	Program type	—		
	Conditions	—		
	Unit	—		
Setting range		—		
E55	3-D Axial cutting-feed overriding		Feed overriding for cutting a workpiece in an axial direction using a 3-D unit Example:	
	Program type		M	 <p>High-speed rough processing Finish processing MPL041</p>
	Conditions		Immediate	
	Unit		10%	
	Setting range		0 to 9	
E56	3-D Inversion check of curved-surface pattern		This parameter is used to select whether or not an alarm message is to be displayed if the curved surface of a defined pattern points in the - Z direction (normally, processing becomes impossible). 0: No alarm 1: Alarm Example:	
	Program type		M	 <p>The curved surface of a defined pattern points in the - Z direction MPL042</p>
	Conditions		Immediate	
	Unit		—	
	Setting range		0, 1	
E57	3-D Severity check of cutting pitch		This parameter is used to select whether or not processing is to be performed in strict accordance with the tool-sequence pitch data setting. 0: The pitch setting is not strictly observed. 1: The pitch setting is strictly observed.	
	Program type		M	Notes: 1. This parameter is invalid during high-speed rough processing. 2. The operation time becomes long if this parameter is set to 1.
	Conditions		Immediate	
	Unit		—	
	Setting range		0, 1	

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description	
E58	3-D Tool-diameter compensation	<p>This parameter is used to select whether or not 3-D tool-diameter compensation according to tool data is to be made for the curved surface of a defined pattern</p> <p>0: Diameter compensation made 1: Diameter compensation not made</p> <p>Example:</p>  <p style="text-align: right;">MPL043</p>	
	Program type		M
	Conditions		Immediate
	Unit		—
	Setting range		0, 1
E59	3-D Allowance of axial-cutting start position	<p>Element used to set the position in which the cutting feed in axial direction is to be started after the tool has been moved from the initial point toward the workpiece at a rapid feedrate</p> <p>Example:</p>  <p style="text-align: right;">MPL044</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 999
E60	3-D Normal cutting allowance	<p>The 3-D finish processing (cutting) allowance in the direction of the normal with respect to the defined pattern of the curved surface</p> <p>Example:</p>  <p style="text-align: right;">MPL045</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 999

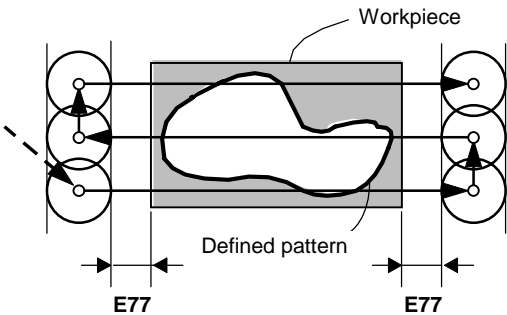

Classification		USER	Display title	LINE/FACE/3D
E61	3-D Search length for parallel cutting		The length of a short line segment which determines the next approximation point for tool-path creation Depending on the tool-sequence selected: E61 is applicable for //1 or //2, or E62 is applicable for J-1 or J-2 This value will be handled as 0.1 mm (or 0.01 inch) if 0 is set here.	
	Program type	M		
	Conditions	Immediate		
	Unit	0.1 mm/0.01 inch		
	Setting range	0 to 999		
E62	3-D Search length for right-angle cutting			
	Program type	M		
	Conditions	Immediate		
	Unit	0.1 mm/0.01 inch		
	Setting range	0 to 999		
E63	3-D Pattern display division segment (FL direction)		The number of segments into which the defined pattern of a curved surface is to be divided for display of the curved-surface pattern on the PATH CHECK display Example: 	
	Program type	M		
	Conditions	Immediate		
	Unit	—		
	Setting range	0 to 999		
E64	3-D Pattern display division segment (GL direction)		Note: This parameter is used for display of a curved-surface pattern, and thus the pattern displayed may slightly differ from the actual pattern of the curved surface to be machined.	
	Program type	M		
	Conditions	Immediate		
	Unit	—		
	Setting range	0 to 999		

Classification	USER	Display title	LINE/FACE/3D
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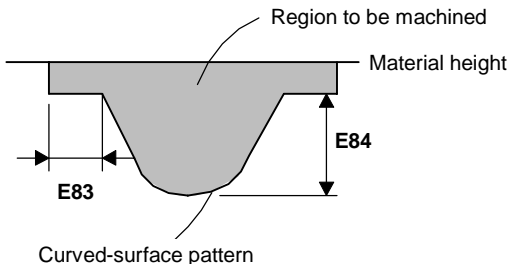
Address	Name	Description																				
E65	3-D Radial cutting allowance for area check																					
	Program type	M																				
	Conditions	Immediate																				
	Unit	0.1 mm/0.01 inch																				
	Setting range	0 to 999																				
		<p>The allowance of cutting a workpiece along the wall of the area which has been set using the area check function</p> <p>Example:</p>  <p style="text-align: right;">MPL047</p>																				
E66	3-D Axial cutting allowance for area check																					
	Program type	M																				
	Conditions	Immediate																				
	Unit	0.1 mm/0.01 inch																				
	Setting range	0 to 999																				
E67 to E75	3-D Processing error tolerance																					
	Program type	M																				
	Conditions	Immediate																				
	Unit	0.01 mm/0.001 inch																				
	Setting range	0 to 999																				
		<p>The processing error tolerance with respect to a curved-surface pattern which corresponds to a #T setting (1 through 9) of the tool sequence</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>#T</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> </tr> </thead> <tbody> <tr> <td>Address</td> <td>E67</td> <td>E68</td> <td>E69</td> <td>E70</td> <td>E71</td> <td>E72</td> <td>E73</td> <td>E74</td> <td>E75</td> </tr> </tbody> </table> <p>Example:</p>  <p style="text-align: right;">MPL048</p>	#T	1	2	3	4	5	6	7	8	9	Address	E67	E68	E69	E70	E71	E72	E73	E74	E75
#T	1	2	3	4	5	6	7	8	9													
Address	E67	E68	E69	E70	E71	E72	E73	E74	E75													
E76	3-D Entire-width override																					
	Program type	M																				
	Conditions	Immediate																				
	Unit	10%																				
	Setting range	0 to 9																				
		<p>The override value which becomes valid in case that the depth-of-cut in a radial direction becomes equal to the entire width (diameter) of the tool</p> <p>Example:</p>  <p style="text-align: center;">$\text{Tool-sequence feed} \times \frac{\mathbf{E76}}{10}$</p> <p style="text-align: right;">MPL049</p> <p>Note: Entire-width overriding is not valid when this parameter is 0.</p>																				

5 USER PARAMETER

Classification	USER	Display title	LINE/FACE/3D
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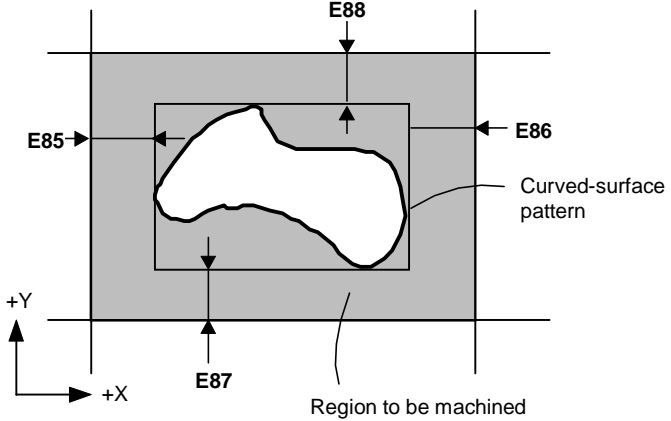
Address	Name	Description	
E77	3-D Radial cutting allowance for high-speed rough processing (workpiece size appointment)	<p>The clearance of high-speed rough processing (workpiece size appointment) between the tool and the figure</p>  <p style="text-align: right;">MPL050</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 999
E78	3-D Multiplying factor set for tolerance	0 : 100%	
	Program type		M
	Conditions		Immediate
	Unit		%
	Setting range		0 to 100
E79 to E82	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
E83	3-D Region of radial machining during high-speed rough processing (offset appointment)	<p>That amount of offset from a curved-surface pattern which determines the region of high-speed rough processing (offset appointment) in a radial direction</p>  <p style="text-align: right;">MPL051</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 9999

Classification	USER	Display title	LINE/FACE/3D
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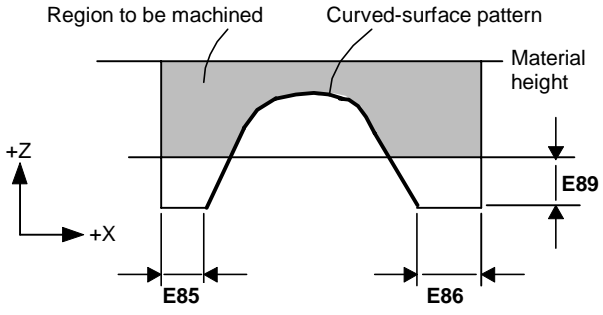
Address	Name	Description	
E84	3-D Region of axial machining during high-speed rough processing (offset appointment)	That distance from the bottom of a curved-surface pattern which determines the region of high-speed rough processing (offset appointment) in an axial direction Example:  <p style="text-align: right;">MPL052</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 9999

5 USER PARAMETER

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description	
E85	3-D Region of radial machining during high-speed rough processing: -X (workpiece size appointment)	<p>The factor that determines the region of high-speed rough processing (workpiece size appointment) in a radial direction</p>  <p style="text-align: right;">MPL053</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 9999
E86	3-D Region of radial machining during high-speed rough processing: +X (workpiece size appointment)		
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 9999
E87	3-D Region of radial machining during high-speed rough processing: -Y (workpiece size appointment)		
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 9999
E88	3-D Region of radial machining during high-speed rough processing: +Y (workpiece size appointment)		
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		0 to 9999

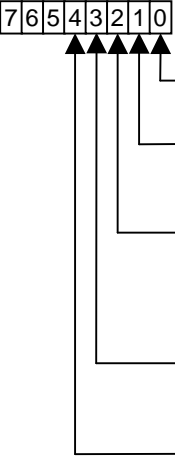
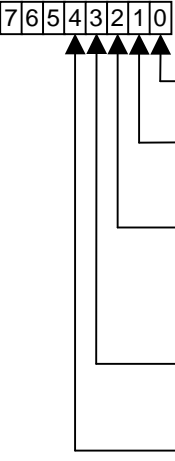
Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description
E89	3-D Region of axial machining during high-speed rough processing (workpiece size appointment)	That distance from the bottom of a curved-surface pattern which determines the region of high-speed rough processing (workpiece size appointment) in an axial direction Example:  <p style="text-align: right;">MPL054</p>
	Program type	M
	Conditions	Immediate
	Unit	0.1 mm/0.01 inch
	Setting range	0 to 9999
E90	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description								
E91	Tool-path pattern selection for end milling-mountain unit	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <table border="1" style="margin-bottom: 10px;"> <tr><td style="text-align: center;">7</td><td style="text-align: center;">6</td><td style="text-align: center;">5</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">2</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> 0: Machining from inside to outside 1: Machining from outside to inside 0: Cutting direction inversed 1: Cutting direction fixed 0: The R-point height is set always as E9. 1: The R-point height is set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively. 0: The clearance on X-Y plane is set always as E2. 1: The clearance on X-Y plane is set as E5 or E2 when there is or isn't pre-machining in the same unit, respectively. 1: Rapid feed up to the intended surface + E9 0: Tool path based on inside shape 1: Tool path based on outside shape </div> </div> <p>Notes:</p> <ol style="list-style-type: none"> If bit 0 = 0, tool path based on inside shape is selected automatically, irrespective of value of bit 7. If bit 0 = 1 and bit 7 = 0, fixed direction of cutting is selected automatically, irrespective of value of bit 1. Bit 4 becomes valid only for two or more rounds of cutting. <div style="text-align: center; margin-top: 20px;"> </div> <p style="text-align: right;">MPL055</p>	7	6	5	4	3	2	1	0
7	6	5	4	3	2	1	0			
	Program type	M								
	Conditions	Immediate								
	Unit	Bit								
	Setting range	Binary, eight digits								
E92	Tool-path pattern selection for pocket milling unit	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <table border="1" style="margin-bottom: 10px;"> <tr><td style="text-align: center;">7</td><td style="text-align: center;">6</td><td style="text-align: center;">5</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">2</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> 0: Machining from inside to outside 1: Machining from outside to inside 0: The R-point height is set always as E9. 1: The R-point height is set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively. 0: The clearance on X-Y plane is set always as E2. 1: The clearance on X-Y plane is set as E5 or E2 when there is or isn't pre-machining in the same unit, respectively. 1: Rapid feed up to the intended surface + E9 0: Tool path based on inside shape 1: Tool path based on outside shape </div> </div>	7	6	5	4	3	2	1	0
7	6	5	4	3	2	1	0			
	Program type	M								
	Conditions	Immediate								
	Unit	Bit								
	Setting range	Binary, eight digits								

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description
E93	Tool-path pattern selection for pocket milling-mountain unit	 <p> { 0: Machining from inside to outside { 1: Machining from outside to inside { 0: Cutting direction inversed { 1: Cutting direction fixed { 0: The R-point height is set always as E9. { 1: The R-point height is set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively. { 0: The clearance on X-Y plane is set always as E2. { 1: The clearance on X-Y plane is set as E5 or E2 when there is or isn't pre-machining in the same unit, respectively. { 1: Rapid feed up to the intended surface + E9 </p>
	Program type	M
	Conditions	Immediate
	Unit	Bit
	Setting range	Binary, eight digits
E94	Tool-path pattern selection for pocket milling-valley unit	 <p> { 0: Machining from inside to outside { 1: Machining from outside to inside { 0: Cutting direction inversed { 1: Cutting direction fixed { 0: The R-point height is set always as E9. { 1: The R-point height is set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively. { 0: The clearance on X-Y plane is set always as E2. { 1: The clearance on X-Y plane is set as E5 or E2 when there is or isn't pre-machining in the same unit, respectively. { 1: Rapid feed up to the intended surface + E9 </p>
	Program type	M
	Conditions	Immediate
	Unit	Bit
	Setting range	Binary, eight digits

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description						
E95	Tool-path pattern selection for line-machining unit	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>7 6 5 4 3 2 1 0</p> </div> <div style="margin-left: 20px;"> <p>For the 2nd and subsequent rounds of cutting: 0: Not via the approach point 1: Via the approach point</p> <p>For the 2nd and subsequent rounds of cutting: 0: Escape to the Z-axis initial point 1: No escape on the Z-axis</p> <p>1: Rapid feed up to the intended surface + E9</p> <p>1: Escape is set to a point where the tool comes out of the removal allowance.</p> <p>The R-point height for central, right hand, left hand, outside and inside linear machining is: 0: Set always as E9 1: Set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively.</p> <p>The X-Y plane clearance for outside and inside linear machining is: 0: Set always as E2 1: Set as E5 or E2 when there is or isn't pre-machining in the same unit, respectively.</p> </div> </div>						
		<p>- Bit 2</p> <p style="text-align: right;">MPL501</p>						
		<p>- Bit 3</p> <p style="text-align: right;">MPL502</p>						
		<p>- Bit 5</p> <p style="text-align: right;">MPL503</p>						
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Program type</td> <td style="width: 50%; text-align: center;">M</td> </tr> <tr> <td>Conditions</td> <td style="text-align: center;">Immediate</td> </tr> <tr> <td>Unit</td> <td style="text-align: center;">Bit</td> </tr> <tr> <td>Setting range</td> <td style="text-align: center;">Binary, eight digits</td> </tr> </table>	Program type	M	Conditions	Immediate	Unit	Bit
Program type	M							
Conditions	Immediate							
Unit	Bit							
Setting range	Binary, eight digits							

Note:
Bit 3 valid only for inside/outside linear machining unit.

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description	
E96	Tool-path pattern selection for end milling-slot unit	<p>0: The R-point height is set always as E9. 1: The R-point height is set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively.</p> <p>For the 2nd and subsequent rounds of cutting: 0: Not via the approach point 1: Via the approach point</p> <p>1: Rapid feed up to the intended surface + E9</p> <p>Returning feedrate override of the end milling-slot unit 0: Invalid 1: Valid</p>	
	Program type		M
	Conditions		Immediate
	Unit		Bit
	Setting range		Binary, eight digits
E97	Tool-path pattern selection for end milling-top unit	<p>0: The R-point height is set always as E9 1: The R-point height is set as E7 or E9 when there is or isn't pre-machining in the same unit, respectively.</p> <p>1: Rapid feed up to the intended surface + E9</p>	
	Program type		M
	Conditions		Immediate
	Unit		Bit
	Setting range		Binary, eight digits
E98	Cutting method selection for end milling-mountain, pocket milling-valley unit	<p>The 1st cutting amount exceeds the command value at end milling-mountain or pocket valley-machining.</p>	
	Program type		M
	Conditions		Immediate
	Unit		Bit
	Setting range		Binary, eight digits
E99	—		
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

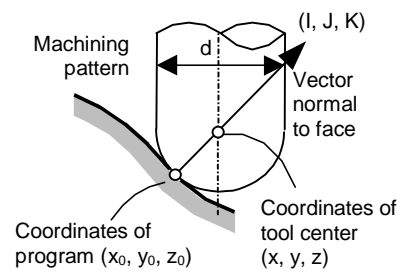
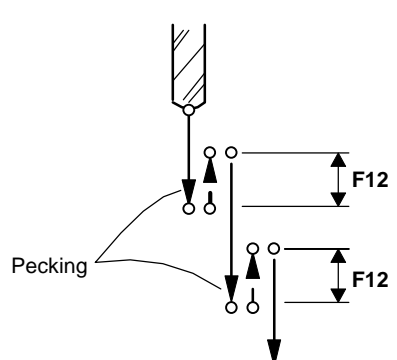
5 USER PARAMETER

Classification	USER	Display title	LINE/FACE/3D
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Address	Name	Description	
E100 to E103	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
E104	Tool path selection	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">7 6 5 4 3 2 1 0</div> <div style="font-size: 2em;">↑</div> <div style="margin-left: 10px;"> <p>This bit specifies the returning position for each cutting operation during face-machining.</p> <p>0: Clearance point</p> <p>1: Initial point</p> </div> </div>	
	Program type		M
	Conditions		Immediate
	Unit		Bit
	Setting range		Binary, eight digits
E105 to E108	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

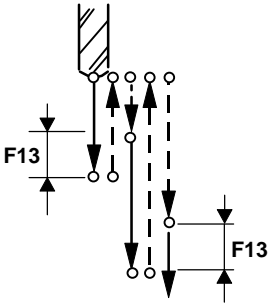
5-3 EIA/ISO (F)

Classification	USER	Display title	EIA/ISO
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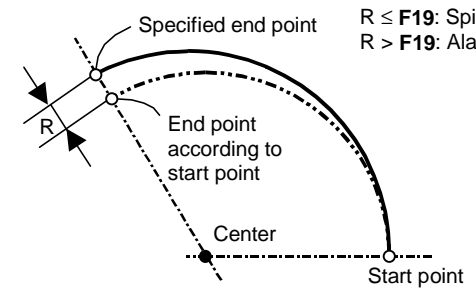
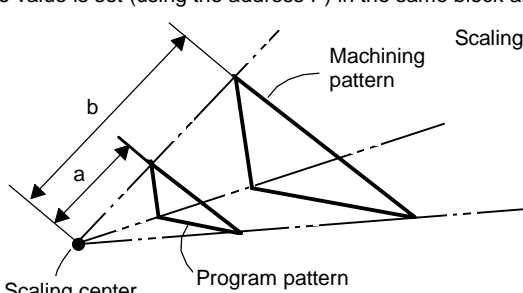
Address	Name	Description
F1 to F8	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
F9 F10	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
F11	Vector constant for 3-D tool-diameter compensation	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> $\begin{cases} x = x_0 + \frac{I}{F11} \times \frac{d}{2} \\ y = y_0 + \frac{J}{F11} \times \frac{d}{2} \\ z = z_0 + \frac{K}{F11} \times \frac{d}{2} \end{cases}$ </div> </div> <p style="text-align: right;">MPL057</p>
	Program type	—
	Conditions	Next block
	Unit	0.001 mm/0.0001 inch (0.001°)
	Setting range	0 to 99999999
		<p>Note: $F11 = \sqrt{I^2 + J^2 + K^2}$ if this parameter is 0.</p>
F12	Return amount of pecking in drill high-speed deep-hole cycle or in G73	Return amount of pecking in drill high-speed deep-hole cycle or in G73 tool path
	Program type	M·E
	Conditions	Next block
	Unit	0.001 mm/0.0001 inch
	Setting range	0 to 99999999
		 <p style="text-align: right;">MPL058</p>

5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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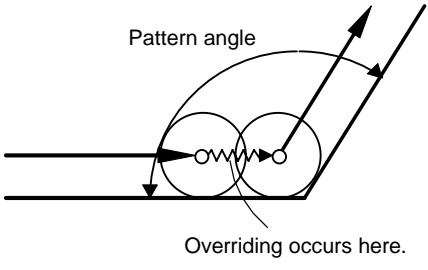
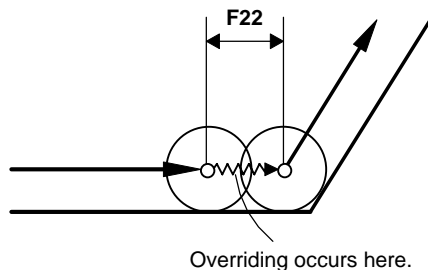
Address	Name	Description	
F13	Allowance amount of rapid-feed stop in deep-hole drilling cycle or in G83	<p>The allowance amount provided for the tool to stop moving at rapid-feed just in front of the preceding hole during a deep-hole drilling cycle or during G83 tool path</p>  <p style="text-align: right;">MPL059</p>	
	Program type		M·E
	Conditions		Next block
	Unit		0.001 mm/0.0001 inch
	Setting range		0 to 99999999
F14	Rotation center of coordinates (axis of abscissa)		
	Program type		—
	Conditions		After movement stop
	Unit		mm
	Setting range		0 to ±99999999
F15	Rotation center of coordinates (axis of ordinate)		
	Program type		—
	Conditions		After movement stop
	Unit		mm
	Setting range		0 to ±99999999
F16	Horizontal length of coordinate rotation	Vector of coordinate rotation (axis of abscissa)	
	Program type		—
	Conditions		After movement stop
	Unit		mm
	Setting range		0 to ±99999999

Classification	USER	Display title	EIA/ISO
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Address	Name	Description
F17	Vertical length of coordinate rotation	Vector of coordinate rotation (axis of ordinate)
	Program type	—
	Conditions	After movement stop
	Unit	mm
	Setting range	0 to ±99999999
F18	Angle of coordinate rotation	Vector of coordinate rotation (axis of abscissa)
	Program type	—
	Conditions	After movement stop
	Unit	0.001°
	Setting range	0 to ±180000
F19	Maximum permissible difference in arc radius	Maximum radius difference that causes spiral interpolation to be performed when the arc-drawing start point and end point radius that have been specified in the arc command do not agree.
	Program type	M·E
	Conditions	Next block
	Unit	0.001 mm/0.0001 inch (0.001°)
	Setting range	0 to 9999
		 <p style="text-align: right;">MPL060</p>
F20	Fixed value of scaling factor	That fixed value of the scaling factor which becomes valid in the case that no value is set (using the address P) in the same block as that of G51.
	Program type	E
	Conditions	Next command
	Unit	1/1000000
	Setting range	0 to 99999999
		 <p style="text-align: right;">MPL061</p>

5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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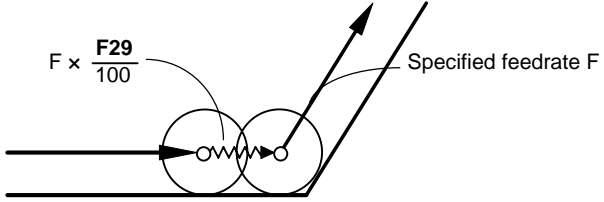
Address	Name		Description
F21	Maximum inside-corner angle available with automatic corner override (G62)		<p>The automatic corner override using the G62 code becomes valid when the following condition of the pattern angle is met: Pattern angle \leq F21</p> 
	Program type	E	
	Conditions	Next command	
	Unit	1°	
	Setting range	0 to 179	
F22	Deceleration area of automatic corner overriding (G62)		<p>The area in which automatic corner overriding using the G62 code occurs</p> 
	Program type	E	
	Conditions	Next command	
	Unit	0.001 mm/0.0001 inch (0.001°)	
	Setting range	0 to 99999999	
F23	—		Invalid
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	
F24	—		Not used.
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	

Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F25	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F26	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F27	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F28	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

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Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F29	Override value of automatic corner overriding (G62)	<p>The override value of automatic corner overriding using the G62 code</p>  <p style="text-align: right;">MPL064</p> <p>Note: The automatic corner overriding is invalid when this parameter is 0.</p>	
	Program type		E
	Conditions		Next command
	Unit		1%
	Setting range		0 to 100
F30	Fixed value	—	
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	88	
F31	Fixed value	—	
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	85	
F32	Fixed value	—	
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	65	

Classification	USER	Display title	EIA/ISO
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Address	Name	Description
F33	Fixed value	—
	Program type	—
	Conditions	—
	Unit	—
	Setting range	89
F34	Fixed value	—
	Program type	—
	Conditions	—
	Unit	—
	Setting range	86
F35	Fixed value	—
	Program type	—
	Conditions	—
	Unit	—
	Setting range	66
F36	Fixed value	—
	Program type	—
	Conditions	—
	Unit	—
	Setting range	90

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Classification	USER	Display title	EIA/ISO
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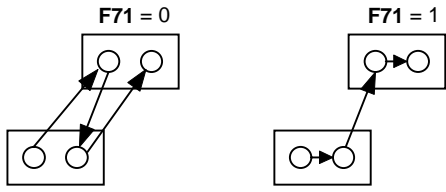
Address	Name	Description
F37	Fixed value	—
	Program type	—
	Conditions	—
	Unit	—
	Setting range	87
F38	Fixed value	—
	Program type	—
	Conditions	—
	Unit	—
	Setting range	67
F39	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
F40	Operating method selection in tape mode	0: Tape operation 1: Hard disc operation 2: IC memory card operation 3: Ethernet operation
	Program type	E
	Conditions	Immediate
	Unit	—
	Setting range	0 to 3

Classification		USER	Display title	EIA/ISO
F41	Name		Description	
	—		Not used.	
	Program type	—		
	Conditions	—		
	Unit	—		
	Setting range	—		
F42	Deceleration area r		Distance (r) between the starting point of movement at measuring speed and the measuring point This data is used when argument R is omitted in G37 command format. G37 Z_ Rr D_ F_ ;	
	Program type	E		
	Conditions	After movement stop		
	Unit	0.001 mm/0.0001 inch		
	Setting range	0 to 99999999	(G37)	
F43	Measurement area d		Range (d) where the tool should stop This data is used when argument D is omitted in G37 command format. G37 Z_ R_ Dd F_ ;	
	Program type	E		
	Conditions	After movement stop		
	Unit	0.001 mm/0.0001 inch		
	Setting range	0 to 99999999	(G37)	
F44	Measuring speed f		Measuring speed (f) This data is used when argument F is omitted in G37 command format. G37 Z_ R_ D_ Ff ; Standard setting 1 to 60000 mm/min 1 to 2362 inch/min	
	Program type	E		
	Conditions	After movement stop		
	Unit	1 mm/min / 1 inch/min		
	Setting range	0 to 120000	(G37)	

5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F45 F46	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F47 to F66	Common variable name	The name of the variable specified by the user macro SETVN is displayed (Name display only. No setting is possible on the PARAMETER display.) F47: Name of #500 : : F66: Name of #519	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F67	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F68	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

Classification		USER	Display title	EIA/ISO
F69	EIA/ISO program restart method		This parameter is used to select the method of specifying the EIA/ISO program restarting position. Two methods are available: 0: The whole program, including the subprograms, is subjected to this processing. Set the sequence number, block number and number of times of repetition as searched from the beginning part of the main program. 1: The subprogram including the desired restart position can be specified. After setting the work number of the corresponding program, set the sequence number, block number, and number of times of repetition as searched from the beginning part.	
	Program type	E		
	Conditions	Immediate		
	Unit	—		
	Setting range	0, 1		
F70	Availability of multiple-machining and designated number of repetitions in the EIA/ISO subprogram		When the EIA/ISO program is called up as a subprogram, this parameter is used to validate/invalidate multiple-machining and the specified number of times to restart the program. 0: Multiple-machining is effective for the EIA/ISO subprogram. Specified number of times to restart the EIA/ISO subprogram is effective. 1: Multiple-machining is ineffective for the EIA/ISO subprogram. Specified number of times to restart the EIA/ISO subprogram is ineffective.	
	Program type	—		
	Conditions	—		
	Unit	—		
	Setting range	0, 1		
F71	Machining order control		Tool priority and multiple-machining priority selection 0: Identical-tool priority function is executed first. 1: Multiple-machining function is executed first. Example: Multiple-machining of two workpieces using a spot drill 	
	Program type	M		
	Conditions	Immediate		
	Unit	—		
	Setting range	0, 1		
F72	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. 0: Invalid 1: Valid	
	Program type	—		
	Conditions	—		
	Unit	—		
	Setting range	0, 1		

MPL065

5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F73	M code execution time for time study	The tool-path check time study time that is accumulated each time an M code is output.	
	Program type		M·E
	Conditions		Immediate
	Unit		0.01 sec.
	Setting range		0 to 10000
F74	S code execution time for time study	The tool-path check time study time that is accumulated each time a S code is output.	
	Program type		M·E
	Conditions		Immediate
	Unit		0.01 sec.
	Setting range		0 to 10000
F75	T code execution time for time study	The tool-path check time study time that is accumulated each time a T code is output.	
	Program type		M·E
	Conditions		Immediate
	Unit		0.01 sec.
	Setting range		0 to 10000
F76	B code execution time for time study	The tool-path check time study time that is accumulated each time a B code is output.	
	Program type		M·E
	Conditions		Immediate
	Unit		0.01 sec.
	Setting range		0 to 10000

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F77	Basis rate for tool life judgment		<p>The basis rate for the NC to judge whether the tool is to be displayed in reverse display mode on the TOOL DATA display to indicate that the life of that tool is approaching expiry.</p> <p>If bit 2 in F82 is 0: When the rate of the operation time to the estimated life exceeds the setting of the F77 parameter, the program will judge the tool to be approaching expiry.</p> <p>If bit 2 in F82 is 1: When the residual life decreases below the setting of the F77 parameter, the program will judge the tool to be approaching expiry.</p> <p>Note: The above judgment function is invalid if this parameter is set to 0.</p>																																																																																																																																																																																																																								
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F78	—		<p>Not used.</p>																																																																																																																																																																																																																								
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F79	—		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; border: 1px solid black;">7</td> <td style="text-align: center; border: 1px solid black;">6</td> <td style="text-align: center; border: 1px solid black;">5</td> <td style="text-align: center; border: 1px solid black;">4</td> <td style="text-align: center; border: 1px solid black;">3</td> <td style="text-align: center; border: 1px solid black;">2</td> <td style="text-align: center; border: 1px solid black;">1</td> <td style="text-align: center; border: 1px solid black;">0</td> <td></td> </tr> <tr> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td style="text-align: center;">↑</td> <td></td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Holding of memory monitor address</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: No</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: Yes</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Key history function</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: Yes</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: No</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Tool search method</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: In order of TNo.</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: In order of TNo. of tools currently in use</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Selection of tap gear</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: M32 system</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: M640M system (M PLUS system)</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Display of tools currently in use</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: No</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: Yes</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Initial value of synchronous/asynchronous tapping during tapping tool registration</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: Synchronous tapping</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: Asynchronous tapping</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>This parameter is valid only when a sync tapping option is provided.</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>Display of a MAZATROL monitor window</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>0: Yes</td> </tr> <tr> <td colspan="7"></td> <td style="text-align: center;">{</td> <td>1: No</td> </tr> </table>	7	6	5	4	3	2	1	0		↑	↑	↑	↑	↑	↑	↑	↑									{	Holding of memory monitor address								{	0: No								{	1: Yes								{	Key history function								{	0: Yes								{	1: No								{	Tool search method								{	0: In order of TNo.								{	1: In order of TNo. of tools currently in use								{	Selection of tap gear								{	0: M32 system								{	1: M640M system (M PLUS system)								{	Display of tools currently in use								{	0: No								{	1: Yes								{	Initial value of synchronous/asynchronous tapping during tapping tool registration								{	0: Synchronous tapping								{	1: Asynchronous tapping								{	This parameter is valid only when a sync tapping option is provided.								{	Display of a MAZATROL monitor window								{	0: Yes								{	1: No
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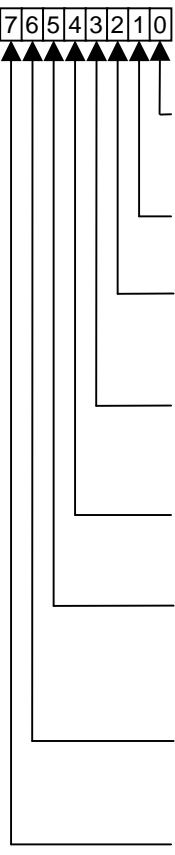
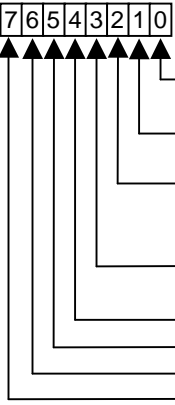
5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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Address	Name		Description								
F80	—		<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <table border="1" style="font-size: small;"> <tr><td style="text-align: center;">7</td><td style="text-align: center;">6</td><td style="text-align: center;">5</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">2</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> ↑ MAZATROL <ul style="list-style-type: none"> 0: Valid 1: Invalid ↑ Automatic display of the navigation window on the occurrence of an alarm <ul style="list-style-type: none"> 0: Display off 1: Display on ↑ MAINTENANCE CHECK display at power on <ul style="list-style-type: none"> 0: Not displayed 1: Displayed ↑ Third page of the MAINTENANCE CHECK display <ul style="list-style-type: none"> 0: Not displayed 1: Displayed ↑ Automatic display of the GRAPHIC MAINTENANCE display on the occurrence of an alarm <ul style="list-style-type: none"> 0: Display off 1: Display on ↑ Learning of cutting conditions <ul style="list-style-type: none"> 0: Invalid 1: Valid ↑ Editing on the CUTTING CONDITION LEARN display <ul style="list-style-type: none"> 0: Invalid 1: Valid ↑ Destination of spare tool correction by the workpiece measurement <ul style="list-style-type: none"> 0: Tool data general information 1: Tool data extended information </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0			
	Program type	M·E									
	Conditions	Immediate									
	Unit	Bit									
Setting range	Binary, eight digits										
F81	—		<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <table border="1" style="font-size: small;"> <tr><td style="text-align: center;">7</td><td style="text-align: center;">6</td><td style="text-align: center;">5</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">2</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> ↑ Program management function <ul style="list-style-type: none"> 0: Normal 1: Editing prohibited (in 9000's) ↑ <ul style="list-style-type: none"> 0: Normal 1: Displaying prohibited (in 9000's) ↑ Fixed value (0) ↑ Not used ↑ <ul style="list-style-type: none"> 0: Normal 1: Editing prohibited (in 8000, 9000's) ↑ <ul style="list-style-type: none"> 0: Normal 1: Displaying prohibited (in 8000, 9000's) ↑ Not used ↑ Not used </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0			
	Program type	M·E									
	Conditions	At power on									
	Unit	Bit									
Setting range	Binary, eight digits										

Classification		USER		Display title		EIA/ISO	
Address	Name		Description				
F82	—		<p>7 6 5 4 3 2 1 0</p> <ul style="list-style-type: none"> 0: Characteristics estimation result graph display off 1: Characteristics estimation results graph display on Basis for tool life judgment 0: Whether the rate of the operation time to the estimated life is greater than the setting of the F77 parameter 1: Whether the residual life is less than the setting of the F77 parameter VISUAL TOOL MANAGEMENT display 0: invalid 1: valid Data I/O operations in data I/O text file format 0: invalid 1: valid 				
	Program type	M·E					
	Conditions	Immediate					
	Unit	Bit					
	Setting range	Binary, eight digits					
F83	—		Not used.				
	Program type	—					
	Conditions	—					
	Unit	—					
	Setting range	—					

Classification	USER	Display title	EIA/ISO
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Address	Name	Description
F84	—	 <p> { Tool offset data is taken into account for the current-position counter during execution of EIA programs 0: No 1: Yes { Fixed cycle (B → J) 0: B 1: J { Spare tool search for EIA 0: Group number assignment 1: Tool number assignment { Timing to validate new workpiece offset data specified with a system variable 0: Valid when the workpiece offset is specified after a system variable is entered. 1: Valid immediately after a system variable is entered. { G92 system selection 0: M32, M PLUS or M640M system 1: M2 system { Incremental/absolute data command in high-speed machining mode 0: Always incremental data command 1: Based on the modal G90/G91 command valid before high-speed machining mode is turned on { Tape operation 0: Not operated until the buffer is full. 1: Operated at a unit of EOB. { When no tool data has been designated during EIA/ISO program execution with the MAZATROL tool length data validated. 0: Operation is executed. 1: Alarm state </p>
	Program type	M·E
	Conditions	At power on
	Unit	Bit
	Setting range	Binary, eight digits
F85	—	 <p> { Table rotation machining 0: Any time 1: Out of zone only { Disregard of radial interference check Linear type rotation axis 0: Rotation type 1: Linear type { Shortcut approach on the rotation axis 0: Ineffective 1: Shortcut Not used Not used Not used Not used </p>
	Program type	M·E
	Conditions	At power on
	Unit	Bit
	Setting range	Binary, eight digits

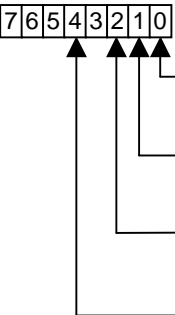
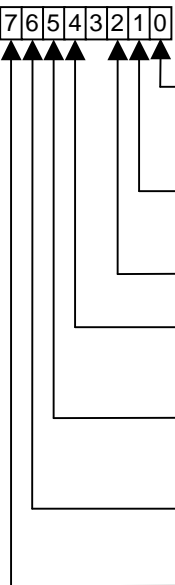
Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F86 F87	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

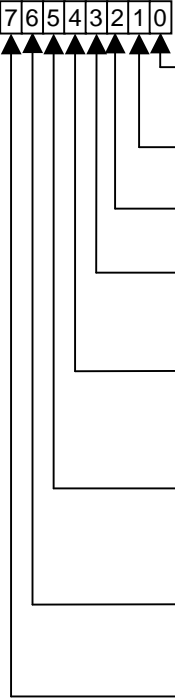
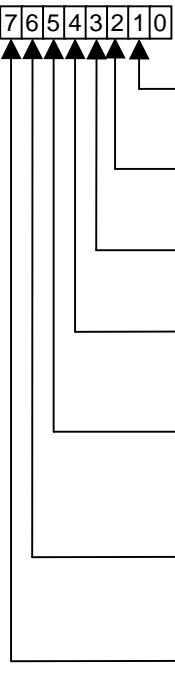
Classification	USER	Display title	EIA/ISO
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Address	Name	Description								
F88	—	<p>Set this parameter to specify functions related to the conversion from MAZATROL program into an EIA program.</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> <div style="margin-top: 5px;"> </div> </div> <div> <ul style="list-style-type: none"> Conversion of a part of program into sub-program (See Note.) Output method of G code for point machining 0: G code of fixed cycle 1: G code in 1 digit Output of G10 and G92.5 in conversion of WPC data 0: Not to output 1: To output Output of tool diameter correction G code 0: Not to output G code 1: To output G code Tool path modification caused by tool diameter correction 0: Correction is not included in path 1: Correction is included in path Fixed value (0) Fixed value (1) </div> </div> <p>Note: When bit 0 of F88 is set to 1 on converting to the EIA program, the line machining, groove machining, face machining portions in the MAZATROL program are respectively programmed as subprograms.</p> <p>Example:</p> <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Common unit</p> <p>[1] : FACE MIL [4]</p> <p>[2] : LINE CTR [5]</p> <p>[3] : END</p> </div> <div style="width: 45%;"> <p>Notes:</p> <ol style="list-style-type: none"> Subprograms that can be called out of the MAZATROL program are not reprogrammed as subprograms of the EIA program. Manual program mode unit is not programmed as subprogram. It can be selected to make a subprogram with parameter. <p>F88 bit 0 { 1: To make subprogram 0: Not to make subprogram</p> </div> </div> <p style="text-align: center;">↓ Conversion into EIA program</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Main program</p> <pre>(WNo.1001); G17G0G40G54G64G90G94; G80; : [1] N1(UNO.2FACE-MIL); M98P1001H1; G1Z-2; : M98P1001H1; G0Z100; [2] N2(UNO.3LINE-CTR); M98P1001H2; G0Z-2; : N3(UNO.4END);[3] : M30; %</pre> </div> <div style="width: 45%;"> <p>Subprogram</p> <pre>N1(UNO.2FACE-MIL); G0X5.Y2.; G1X50.; : [4] G0X60.Y60.; M99; N2(UNO.3LINE-CTR); G2X10.Y10.R5.; G1X50.; : [5] G2X40.Y10.R5.; M99; %</pre> </div> </div> <div style="margin-left: 20px;"> <p>} Unit of machining units</p> <p>} Unit of machining units</p> </div>	7	6	5	4	3	2	1	0
7	6	5	4	3	2	1	0			
Program type	M·E									
Conditions	Immediate									
Unit	Bit									
Setting range	Binary, eight digits									

Classification	USER	Display title	EIA/ISO
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Address	Name		Description
F89	—		Set this parameter to specify functions related to the conversion from MAZATROL program into an EIA program  <ul style="list-style-type: none"> Output of shape data <ul style="list-style-type: none"> 0: Not to output 1: To output Change over synchronous tapping G code <ul style="list-style-type: none"> 0: To output G74/G84 1: To output G84.2/G84.3 Output of F command <ul style="list-style-type: none"> 0: To output 1: Not to output EIA conversion output destination <ul style="list-style-type: none"> 0: Standard area 1: Backup area
	Program type	M·E	
	Conditions	Immediate	
	Unit	Bit	
	Setting range	Binary, eight digits	
F90	—		Invalid
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	
F91	—		 <ul style="list-style-type: none"> In response to move command without decimal point: <ul style="list-style-type: none"> 0: Tool moves by 1/1. 1: Tool moves by 10/1. Coordinate system shift using a MAZATROL program: <ul style="list-style-type: none"> 0: Invalid 1: Valid Stroke inside check before movement <ul style="list-style-type: none"> 0: Stroke inside check before movement 1: Stroke outside check before movement Metric (Initial G20 is valid/invalid) <ul style="list-style-type: none"> 0: Metric 1: Inch In response to move command without decimal point: <ul style="list-style-type: none"> 0: Tool moves in 0.001 mm (0.0001 inch) increments. 1: Tool moves in 1 mm (1 inch) increments. G00 interpolation <ul style="list-style-type: none"> 0: G00 interpolation 1: G00 non-interpolation G33E command is for the number of threads per inch <ul style="list-style-type: none"> 0: G33E command is for the number of threads per inch 1: G33E command is for thread cutting with precise lead <p>Note: For changing bit 4 (millimeter/inch system), set M14 bit 7 to 0 once for zero point return execution if the simplified software OT function is effective (when machine parameter M14 bit 7 = 1, R2 bit 7 = 0). (This initialization is required when the simplified OT function is effective just for one axis.)</p>
	Program type	M·E	
	Conditions	At power on	
	Unit	Bit	
	Setting range	Binary, eight digits	

5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
F92	Name		 <p>7 6 5 4 3 2 1 0</p> <ul style="list-style-type: none"> { Modal at power-on or at reset (Initial G18) 0: G17 or G19 1: G18 { Modal at power-on or at reset (Initial G19) 0: G17 or G18 1: G19 { Fixed value (0), Dwell command always in time { Tool-length compensation (G43 or G44) axis 0: Program command axis 1: Z-axis fixed { Tool-diameter compensation (G41 or G42) start up/cancel type 0: Type A 1: Type B { Tool-diameter compensation (G41 or G42) interference check 0: Alarm stop occurs to prevent overcutting. 1: Tool path is changed to prevent overcutting. { Fixed-cycle hole-drilling axis 0: Plane selection using G17, G18 or G19 1: Z-axis fixed { Tool diameter compensation for an EIA/ISO program 0: Tool offset fixed 1: Tool data valid
	Program type	M·E	
	Conditions	At power on	
	Unit	Bit	
	Setting range	Binary, eight digits	
F93	Name		 <p>7 6 5 4 3 2 1 0</p> <ul style="list-style-type: none"> { Modal at power-on or at reset 0: G94 (Feed per minute) 1: G95 (Feed per revolution) { Modal at power-on or at reset 0: G91 (Incremental-value command) 1: G90 (Absolute-value command) { Tool length of tool data for EIA/ISO program 0: Invalid 1: Valid { Feedrate during machine lock 0: Specified feedrate 1: Rapid feedrate { Middle point during reference-point return 0: Return through middle point to reference point 1: Return directly to reference point { Single-block operation mode at user macro operation instruction 0: Single-block stop does not occur (for operation). 1: Single-block stop occurs (for test). { Fixed value (0)
	Program type	M·E	
	Conditions	At power on	
	Unit	Bit	
	Setting range	Binary, eight digits	

Classification	USER	Display title	EIA/ISO
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Address	Name	Description								
F94	—	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <table border="1" style="font-size: 8px;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> ↑ Movement to hole-drilling position in fixed-cycle mode <ul style="list-style-type: none"> 0: Depends on modal state (G00 or G01) 1: Fixed at rapid feedrate (G00) ↑ External deceleration signal valid <ul style="list-style-type: none"> 0: External deceleration signal valid 1: External deceleration signal invalid ↑ Tool length offsetting during G28/G30 execution <ul style="list-style-type: none"> 0: Offsetting is canceled 1: Offsetting is performed ↑ Modal at power-on or at reset <ul style="list-style-type: none"> 0: G01 (Linear interpolation) 1: G00 (Positioning) ↑ Tool command method using T codes <ul style="list-style-type: none"> 0: Assignment of group number on TOOL DATA display 1: Tool number (or pocket number) assignment ↑ Fixed value (0) ↑ Fixed value (1) ↑ Tool offset amount effectuated in an EIA/ISO program <ul style="list-style-type: none"> 0: effectuates tool offset amount on the TOOL OFFSET display. 1: effectuates tool offset amount for EIA/ISO program on the TOOL DATA display </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0		
	Program type	M·E								
	Conditions	At power on								
	Unit	Bit								
Setting range	Binary, eight digits									
F95	—	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <table border="1" style="font-size: 8px;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> ↑ Interrupt function using user macro instruction <ul style="list-style-type: none"> 0: Invalid 1: Valid ↑ Handling of macroprogram interruption and call <ul style="list-style-type: none"> 0: Handled as interruption 1: Handled as subprogram call ↑ Automatic return position to restart the program (Fixed to 1) <ul style="list-style-type: none"> 0: Automatic return 1: Manual return ↑ G00 (positioning) command feedrate for dry run <ul style="list-style-type: none"> 0: Rapid feedrate 1: Feedrate for dry run ↑ Manual-pulse interrupt amount cancellation with reset key <ul style="list-style-type: none"> 0: Invalid 1: Valid ↑ With reset key <ul style="list-style-type: none"> 0: Coordinate system corresponding to G54 1: Coordinate system unchanged. </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0		
	Program type	M·E								
	Conditions	At power on								
	Unit	Bit								
Setting range	Binary, eight digits									

5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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Address	Name	Description																				
F96	—	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> <div style="margin-top: 5px;"> </div> </div> <div> <ul style="list-style-type: none"> Selection of variable number for tool offset amount <ul style="list-style-type: none"> 0: 16001 to 16512, 17001 to 17512 1: 12001 to 12512, 13001 to 13512 Fairing function <ul style="list-style-type: none"> 0: Invalid 1: Valid Processing for arc command blocks in high-speed machining mode <ul style="list-style-type: none"> 0: Nonuniform feed 1: Uniform feed Selection of a corner judgment criterion in high-speed machining mode <ul style="list-style-type: none"> 0: Judgment from the angle relative to adjacent blocks 1: Judgment by excluding the small block (if present between large-angle blocks) Selection of a cutting feed clamping speed in high-speed machining mode <ul style="list-style-type: none"> 0: Minimum clamping speed of movable axes 1: Clamping speed based on the radius of the curvature </div> </div>	7	6	5	4	3	2	1	0												
7	6	5	4	3	2	1	0															
	Program type	M·E																				
	Conditions	At power on																				
	Unit	Bit																				
	Setting range	Binary, eight digits																				
F97	Selection of G code of the coordinates system to be used in the EIA conversion function	<p>To select G code modal of the coordinates system to be used in the EIA conversion function.</p> <table border="1" style="border-collapse: collapse; text-align: center; width: 100%;"> <thead> <tr> <th>Setting value</th> <th>Coordinates system</th> <th>Setting value</th> <th>Coordinates system</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>G54</td> <td>5</td> <td>G58</td> </tr> <tr> <td>2</td> <td>G55</td> <td>6</td> <td>G59</td> </tr> <tr> <td>3</td> <td>G56</td> <td colspan="2">-----</td> </tr> <tr> <td>4</td> <td>G57</td> <td>Others</td> <td>G54</td> </tr> </tbody> </table>	Setting value	Coordinates system	Setting value	Coordinates system	1	G54	5	G58	2	G55	6	G59	3	G56	-----		4	G57	Others	G54
Setting value	Coordinates system	Setting value	Coordinates system																			
1	G54	5	G58																			
2	G55	6	G59																			
3	G56	-----																				
4	G57	Others	G54																			
	Program type	M·E																				
	Conditions	Immediate																				
	Unit	—																				
	Setting range	0 to 255																				

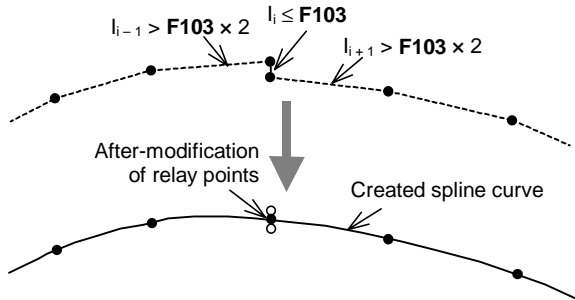
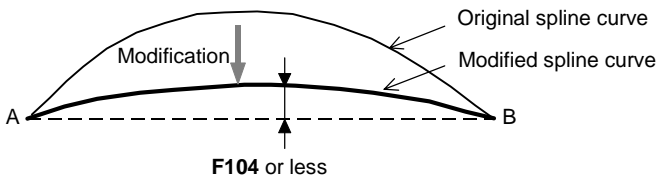
Classification	USER	Display title	EIA/ISO
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Address	Name	Description		
F98	Number of macro variable to be used in the EIA conversion function			
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; padding: 5px;"> <pre> : : : To the height of : ← cutting face : : #_=_; : Height of : cutting face : Macro variable (F98) : : M98P_H_; : : M30; : % </pre> </td> <td style="width: 50%; padding: 5px;"> <pre> N_() ; : : : G00Z_; ← Return on Z-axis : : X_Y_; ← Moves to the start point : of the next machining : on Z-axis : : G01Z#_; ← : XY_ ; : : Machining on Z-axis : : specified with the variable : : : M99; : % </pre> </td> </tr> </table>		<pre> : : : To the height of : ← cutting face : : #_=_; : Height of : cutting face : Macro variable (F98) : : M98P_H_; : : M30; : % </pre>	<pre> N_() ; : : : G00Z_; ← Return on Z-axis : : X_Y_; ← Moves to the start point : of the next machining : on Z-axis : : G01Z#_; ← : XY_ ; : : Machining on Z-axis : : specified with the variable : : : M99; : % </pre>
	<pre> : : : To the height of : ← cutting face : : #_=_; : Height of : cutting face : Macro variable (F98) : : M98P_H_; : : M30; : % </pre>	<pre> N_() ; : : : G00Z_; ← Return on Z-axis : : X_Y_; ← Moves to the start point : of the next machining : on Z-axis : : G01Z#_; ← : XY_ ; : : Machining on Z-axis : : specified with the variable : : : M99; : % </pre>		
	Program type	M·E	To specify the number of a macro variable to be used in the EIA conversion function. If any macro variable is not used, set to 0 . In case of output with a subprogram in the EIA conversion, the height of cutting face is set with a macro variable. Set to F98 the number of the macro variable to be used. (M) Main program (S) Sub program ← Rapid feedrate ← Cutting feedrate	
Conditions	Immediate			
Unit	—			
Setting range	100 to 199 500 to 999			
<p>Notes:</p> <ol style="list-style-type: none"> 3D machining cannot be output using subprograms. Subprogram is output in the absolute value (G90). <p>[Units that use macro variables] FACE MIL (cutting in one direction), TOP EMIL, POCKET, PCKT MT, PCKT VLY</p>				
F99	Offset amount for the subprogram WNo. to the main WNo. concerned in case of output with subprogram in the EIA conversion function			
	In case of output with subprogram in the EIA conversion function: Example: WNo. 10 When F99 is "20". EIA conversion (The WNo. of the converted program is assumed to be 1000.) Main WNo. 1000 Sub WNo. 1020 For the subprogram of the EIA conversion function, refer to F88 bit 0.			
	Program type	M·E		
	Conditions	Immediate		
	Setting range	1 to 99999998		
F100	Spline cancel length			
	If the commanded distance in a block exceeds the spline cancel length (F100), spline interpolation is not realized in this block even in the spline interpolation mode.			
	Program type	E		
	Setting range	0 to 999999		

Classification	USER	Display title	EIA/ISO
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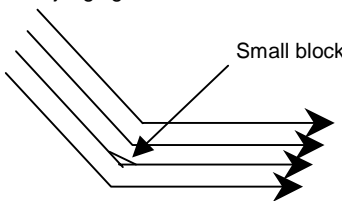
Address	Name	Description
F101	Spline cancel angle	<p>If the angle formed by two blocks exceeds the value set by the parameter F101, spline interpolation is not realized in these blocks even in the spline interpolation mode.</p> <p style="text-align: right;">MPL506</p>
	Program type	E
	Conditions	Immediate
	Unit	Degree
	Setting range	0 to 179
F102	Fine spline interpolation curve error (Block including the point of inflection)	<p>During block checking in the fine spline interpolation mode, if the spline curve of a specific block is judged to include an inflection point and the maximum chord error between the spline curve and the block is larger than the value of F102, the shape of the curve will be modified to reduce the maximum chord error below the value of F102.</p> <p style="text-align: right;">D735S0001</p>
	Program type	E
	Conditions	Immediate
	Unit	0.001 mm/0.0001 inch
	Setting range	0 to 99999999

Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F103	Spline interpolation fairing block length	<p>If a block whose length is less than the value of F103 is detected during fine spline interpolation, that block will be skipped and integrated (faired) into the preceding and succeeding blocks to create a spline curve.</p> <p>Suppose that the <i>i</i>-th block in the fine spline interpolation mode has a block length of l_i:</p> <p style="margin-left: 20px;">If l_{i-1} is greater than $F103 \times 2$ l_i is equal to or less than F103 l_{i+1} is greater than $F103 \times 2$</p> <p>then the ending point of the "<i>i</i> - 1" th block and the starting point of the "<i>i</i> + 1" th block will be modified to the middle point of the <i>i</i>-th block and this block will be deleted. A spline curve will be created from the sequence of points updated this way.</p>  <p style="text-align: right;">D735S0002</p>	
	Program type	E	<p>If the length of the starting block or ending block in the fine spline interpolation mode is smaller than the value of F103, processing will slightly differ from that described above. Refer to the relevant specification for further details.</p> <p>This parameter is effective when bit 1 of F96 is 1.</p>
	Conditions	Immediate	
	Unit	0.001 mm/0.0001 inch	
	Setting range	0 to 99999999	
F104	Fine spline interpolation curve error (Block including no inflection point)	<p>During block checking in the fine spline interpolation mode, if the spline curve of a specific block is judged to include no inflection point and the maximum chord error between the spline curve and the block is larger than the value of F104, the shape of the curve will be modified to reduce the maximum chord error below the value of F104.</p>  <p style="text-align: right;">D735S0003</p>	
	Program type	E	
	Conditions	Immediate	
	Unit	0.001mm/0.0001 inch	
	Setting range	0 to 99999999	
F105	—	Invalid	
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	

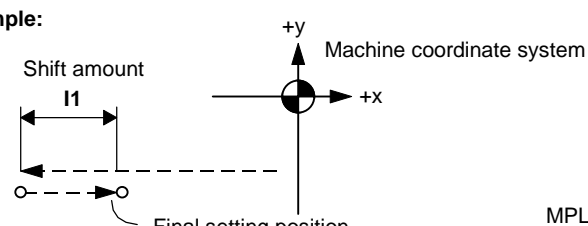
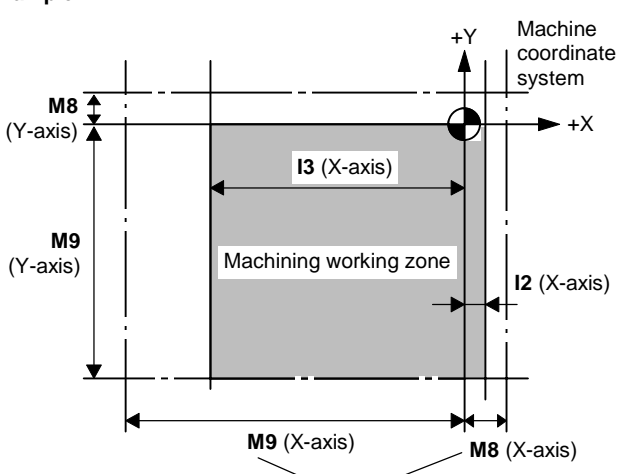
5 USER PARAMETER

Classification	USER	Display title	EIA/ISO
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Address	Name	Description	
F106	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
F107	Small block judgment length	<p>In a small-segment machining program, if a small block is present between large-angle blocks, optimum corner deceleration can be achieved by excluding the small block and then judging the total corner angle.</p> <p>Judgment length for judging the small block</p>  <p>This parameter is valid when bit 4 of F96 is 1.</p>	
	Program type		E
	Conditions		Immediate
	Unit		0.001 mm/0.0001 inch
	Setting range		0 to 99999999
F108	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

5-4 SOFT LIMIT (I)

Classification	USER	Display title	SOFT LIMIT
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Address	Name	Description	
I1	Shift amount of unidirectional positioning (G60)	<p>The amount and direction of shift from the final setting position during unidirectional positioning of the point-machining or during execution of G60.</p> <p>I1 < 0: Positioning in minus direction I1 > 0: Positioning in plus direction</p> <p>Example:</p>  <p style="text-align: right;">MPL091</p>	
	Program type		M·E
	Conditions		After stop of movement
	Unit		0.001 mm/0.0001 inch (0.001°)
	Setting range		0 to ±99999999
I2	Upper (plus direction) user soft-limit	<p>The parameter used to define the machine working zone in order to prevent machine interference with the workpiece or jigs. Set the coordinate values of the machine coordinate system.</p> <p>Example:</p>  <p style="text-align: right;">MPL092</p>	
	Program type		M·E
	Conditions		After stop of movement
	Unit		0.001 mm/0.0001 inch (0.001°)
	Setting range		0 to ±99999999
I3	Lower (minus direction) user soft-limit	<p>If the machine is likely to overstep its working zone, an alarm will occur and the machine will stop.</p> <p>Notes:</p> <ol style="list-style-type: none"> These parameters are valid only when bit 2 of I14 is 0. These parameters are invalid if I2 = I3. 	
	Program type		M·E
	Conditions		After stop of movement
	Unit		0.001 mm/0.0001 inch (0.001°)
	Setting range		0 to ±99999999
I4	—	Not used	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

5 USER PARAMETER

Classification	USER	Display title	SOFT LIMIT
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Address	Name	Description								
I5 to I10	—	Not used								
	Program type		—							
	Conditions		—							
	Unit		—							
	Setting range		—							
I11	Rotary center of a workpiece	Set the rotary center of a workpiece at a table angle of 0° for each axis in the machine coordinate system. (Valid only with dynamic compensation function and in manual operation)								
	Program type		E							
	Conditions		After stop of movement							
	Unit		0.001 mm/0.0001 inch							
	Setting range		0 to ±99999999							
I12	—	Not used								
	Program type		—							
	Conditions		—							
	Unit		—							
	Setting range		—							
I13	—	<div style="display: flex; align-items: center;"> <table border="1" style="margin-right: 10px;"> <tr> <td style="padding: 2px;">7</td><td style="padding: 2px;">6</td><td style="padding: 2px;">5</td><td style="padding: 2px;">4</td><td style="padding: 2px;">3</td><td style="padding: 2px;">2</td><td style="padding: 2px;">1</td><td style="padding: 2px;">0</td> </tr> </table> <div style="font-size: 2em;">}</div> <div style="margin-left: 10px;"> <p>Upon execution G28 (reference-point return):</p> <p>0: Memory-type zero-point return</p> <p>1: Watchdog-type zero-point return</p> <p>Upon manual zero-point return operation:</p> <p>0: Memory-type zero-point return (After power-on, however, watchdog-type zero-point return)</p> <p>1: Watchdog-type zero-point return</p> <p>Removal of control axes</p> <p>0: No (Not removed)</p> <p>1: Yes (Removed)</p> </div> </div>	7	6	5	4	3	2	1	0
	7		6	5	4	3	2	1	0	
	Program type		M·E							
	Conditions		After stop of movement							
	Unit		Bit							
Setting range	Binary, eight digits									

Classification	USER	Display title	SOFT LIMIT
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Address	Name	Description
I14	—	<p>7 6 5 4 3 2 1 0</p> <ul style="list-style-type: none"> ↑ { Mirror image with respect to the machine zero-point 0: Invalid 1: Valid ↑ { User software limits (I2, I3) 0: Valid 1: Invalid ↑ { Tool-tip relief after spindle orientation during execution of G75, G76, G86 or point-machining (boring or back-boring) 0: Required 1: Not required ↑ { Direction of the relief mentioned above 0: Plus 1: Minus
	Program type	M·E
	Conditions	After stop of movement
	Unit	Bit
	Setting range	Binary, eight digits
I15 I16	—	Not used
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

- NOTE -

6 MACHINE PARAMETER

6-1 CALL MACRO (J)

Classification	MACHINE	Display title	CALL MACRO
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G-code macroprogram call

No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	Unit	Setting range	Program type	Conditions	Description
J1	J5	J9	J13	J17	J21	J25	J29	J33	J37	—	0 to 999999999	M·E	Power on	Work number of the program to be called
J2	J6	J10	J14	J18	J22	J26	J30	J34	J38	—	0 to 999	M·E	Power on	The G-code number to be used for program call Note: Not possible to set G codes whose uses are predefined.
J3	J7	J11	J15	J19	J23	J27	J31	J35	J39	—	0 to 3	M·E	Power on	Calling type 0: M98 2: G66 1: G65 3: G66.1
J4	J8	J12	J16	J20	J24	J28	J32	J36	J40	—	—	—	—	Invalid

M-code macroprogram call

No. 1	No. 2	No. 3	No. 4	No. 5	Unit	Setting range	Program type	Conditions	Description
J41 10000090 (Fixed value)	J45 10000091 (Fixed value)	J49 10000092 (Fixed value)	J51 10000093 (Fixed value)	J57 10000001 (Fixed value)	—	0 to 999999999	M·E	Power on	Work number of the program to be called
J42 90 (Fixed value)	J46 91 (Fixed value)	J50 92 (Fixed value)	J54 93 (Fixed value)	J58 153 (Fixed value)	—	0 to 9999	M·E	Power on	The M-code number to be used for program call Note: Not possible to set M codes whose uses are predefined.
J43 0 (Fixed value)	J47 0 (Fixed value)	J51 0 (Fixed value)	J55 0 (Fixed value)	J59 0 (Fixed value)	—	0 to 3	M·E	Power on	Calling type 0: M98 2: G66 1: G65 3: G66.1
J44 0 (Fixed value)	J48 0 (Fixed value)	J52 0 (Fixed value)	J56 0 (Fixed value)	J60 0 (Fixed value)	—	—	—	—	Invalid
No. 6	No. 7	No. 8	No. 9	No. 10	Unit	Setting range	Program type	Conditions	Description
J61 10000002 (Fixed value)	J65	J69	J73	J77	—	0 to 999999999	M·E	Power on	Work number of the program to be called
J62 154 (Fixed value)	J66	J70	J74	J78	—	0 to 9999	M·E	Power on	The M-code number to be used for program call Note: Not possible to set M codes whose uses are predefined.
J63 0 (Fixed value)	J67	J71	J75	J79	—	0 to 3	M·E	Power on	Calling type 0: M98 2: G66 1: G65 3: G66.1
J64 0 (Fixed value)	J68	J72	J76	J80	—	—	—	—	Invalid

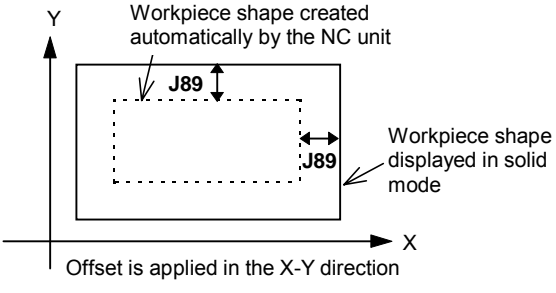
Classification	MACHINE	Display title	CALL MACRO
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Address	Name	Description	
J81	Rated Z-axial stalling torque for auto-pecking of the cutting load detection type	Set the rated stalling torque appropriate for the Z-axis driving motor.	
	Program type		M
	Conditions		Immediate
	Unit		0.1N·m
	Setting range		0 to 99999
J82	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. Note: 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.	
	Program type		M
	Conditions		Immediate
	Unit		0.1N·m
	Setting range		0 to 99999
J83	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. Note: 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.	
	Program type		M
	Conditions		Immediate
	Unit		0.1N·m
	Setting range		0 to 99999
J84	Cutting force calculation filter for auto-pecking of the cutting load detection type	Set the filter for the data which has been sampled at 3.5-msec intervals. If the entered value is "0", the data actually used will be 4 × 3.5 (msec).	
	Program type		M
	Conditions		Immediate
	Unit		3.5 msec
	Setting range		0 to 9999

Classification	MACHINE		Display title	CALL MACRO
J85	Tap display method in solid mode		0: Simplified display 1: Detailed display (display of threads. Refer to J86 and J87 .)	
	Program type	M		
	Conditions	Immediate		
	Unit	—		
	Setting range	0, 1		
J86	Thread pitch during detailed display of tap in solid mode		Valid when parameter J85 is set to 1.	
	Program type	M		
	Conditions	Immediate		
	Unit	0.1 mm/0.01 inch		
	Setting range	0 to 65535		
J87	Thread height during detailed display of tap in solid mode		Valid when parameter J85 is set to 1.	
	Program type	M		
	Conditions	Immediate		
	Unit	0.1 mm/0.01 inch		
	Setting range	1		
J88	Tool drawing accuracy in solid mode		As a larger value is set here, drawing accuracy increases.	
	Program type	M		
	Conditions	Immediate		
	Unit	—		
	Setting range	0 to 9		

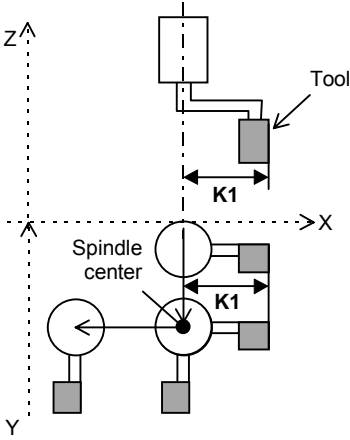
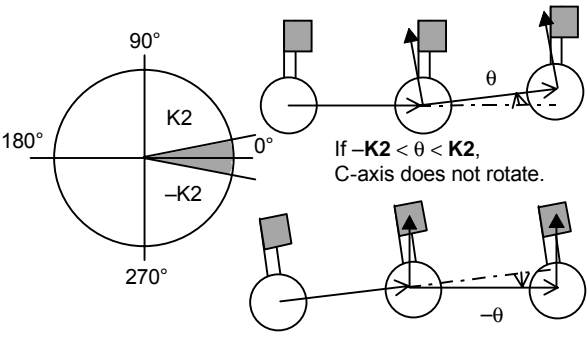
6 MACHINE PARAMETER

Classification	MACHINE	Display title	CALL MACRO
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Address	Name	Description	
J89	Amounts of offset for similar workpiece shape in solid mode	<p>It is possible to change the size of the workpiece drawn automatically when operation is changed over to the solid mode.</p>  <p>The diagram illustrates the effect of the J89 parameter. It shows a 2D coordinate system with X and Y axes. A dashed rectangle represents the 'Workpiece shape created automatically by the NC unit'. A solid rectangle represents the 'Workpiece shape displayed in solid mode'. The solid rectangle is larger than the dashed one, with the difference being the offset J89. Arrows indicate that the offset is applied in both the X and Y directions. Text labels include 'Workpiece shape created automatically by the NC unit', 'Workpiece shape displayed in solid mode', and 'Offset is applied in the X-Y direction'.</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.1 mm/0.01 inch
	Setting range		-99999999 to 99999999
J90 to J108	—	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

6-2 SPINDLE SKIP (K)

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description
K1	Rotational radius of the C-axis	<p>Distance from the center of the C-axis (spindle) to the nose of the tool</p> 
	Program type	E
	Conditions	Immediate
	Unit	0.001 mm/0.0001 inch
	Setting range	0 to 9999999
K2	Minimum rotational angle	<p>The minimum rotational angle of the C-axis at shaping block connections Rotational angle of the C-axis at block connections: θ The C-axis does not rotate if $\theta < K2$.</p> 
	Program type	E
	Conditions	Immediate
	Unit	0.001 deg
	Setting range	0 to 90000

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description	
K3	Shaping control axis	Identification number of the shaping control axis Specify the shaping control axis as follows: Example: Set "4" for a three-axis machine. Set "5" for a four-axis machine. Note1: Set the type of the axis which has been set on this parameter to the rotational axis (M13 bit 4 = 1). Note2: Set "Provided" of the servo off follow up of the axis which has been set on this parameter (M14 bit 0 = 1).	
	Program type		E
	Conditions		Immediate
	Unit		Axis number
	Setting range		3 to 6
K4 K5	Shaping control axis	Invalid	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
K6	Upper-limit setting for temperature increase alarm	Upper-limit setting for temperature increase alarm If a value outside the required setting range is entered, 67 degrees will be set.	
	Program type		—
	Conditions		At power on
	Unit		°C
	Setting range		1 to 127
K7	Unbalanced axis	Specify the axis that moves perpendicularly. 1 : The X-axis acts as the unbalanced axis. 2 : The Y-axis acts as the unbalanced axis. 4 : The Z-axis acts as the unbalanced axis.	
	Program type		M
	Conditions		Immediate
	Unit		—
	Setting range		1, 2, 4

Classification		MACHINE		Display title		SPINDLE SKIP																																									
Address	Name			Description																																											
K8 to K10	—			Not used.																																											
	Program type	—																																													
	Conditions	—																																													
	Unit	—																																													
	Setting range	—																																													
K11	Selection of language to be displayed			Set this parameter to change the display language. <table border="1" data-bbox="794 797 1366 1111"> <thead> <tr> <th>Setting</th> <th>Language</th> <th>Setting</th> <th>Language</th> </tr> </thead> <tbody> <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></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></td> <td></td> </tr> </tbody> </table>				Setting	Language	Setting	Language	0	English	9	Chinese	1	Japanese	10	Dutch	2	German	11	Korean	3	French	12	Portuguese	4	Italian	13	Danish	5	Spanish	14		6	Norwegian	15	Turkish	7	Swedish	16	Polish	8	Finnish		
	Setting	Language	Setting					Language																																							
	0	English	9					Chinese																																							
	1	Japanese	10					Dutch																																							
	2	German	11					Korean																																							
3	French	12	Portuguese																																												
4	Italian	13	Danish																																												
5	Spanish	14																																													
6	Norwegian	15	Turkish																																												
7	Swedish	16	Polish																																												
8	Finnish																																														
Program type	—																																														
Conditions	At power on																																														
Unit	—																																														
Setting range	0 to 16																																														
K12	Fixed value																																														
	Program type	—																																													
	Conditions	—																																													
	Unit	—																																													
	Setting range	Fixed to 0																																													

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description																													
K13 to K16	Maximum RPM of spindle in each speed range (range 1 to 4)																														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Address</th> <th colspan="4">Maximum number of speed ranges</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>K13</td> <td style="text-align: center;">○</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> </tr> <tr> <td>K14</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">M</td> <td style="text-align: center;">ML</td> </tr> <tr> <td>K15</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">MH</td> </tr> <tr> <td>K16</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> </tr> </tbody> </table>		Address	Maximum number of speed ranges				1	2	3	4	K13	○	L	L	L	K14	Invalid	H	M	ML	K15	Invalid	Invalid	H	MH	K16	Invalid	Invalid	Invalid	H
	Address	Maximum number of speed ranges																													
		1	2	3	4																										
	K13	○	L	L	L																										
K14	Invalid	H	M	ML																											
K15	Invalid	Invalid	H	MH																											
K16	Invalid	Invalid	Invalid	H																											
<p>Example:</p>																															
Program type	M·E																														
Conditions	At power on																														
Unit	1 min ⁻¹ (rpm)																														
Setting range	0 to 99999																														
K17 to K20	Maximum RPM of spindle in each speed range (range 5 to 8)																														
	Program type	—																													
	Conditions	—																													
	Unit	—																													
	Setting range	—																													
K21 to K24	Critical RPM of spindle in each speed range (range 1 to 4)																														
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Address</th> <th colspan="4">Maximum number of speed ranges</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>K21</td> <td style="text-align: center;">○</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> </tr> <tr> <td>K22</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">M</td> <td style="text-align: center;">ML</td> </tr> <tr> <td>K23</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">MH</td> </tr> <tr> <td>K24</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> </tr> </tbody> </table>		Address	Maximum number of speed ranges				1	2	3	4	K21	○	L	L	L	K22	Invalid	H	M	ML	K23	Invalid	Invalid	H	MH	K24	Invalid	Invalid	Invalid	H
	Address	Maximum number of speed ranges																													
		1	2	3	4																										
	K21	○	L	L	L																										
K22	Invalid	H	M	ML																											
K23	Invalid	Invalid	H	MH																											
K24	Invalid	Invalid	Invalid	H																											
Program type	M·E																														
Conditions	At power on																														
Unit	1 min ⁻¹ (rpm)																														
Setting range	0 to 99999																														

Note:
See the description of parameters **K13** through **K16**.

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description																													
K25 to K28	Critical RPM of spindle in each speed range (range 5 to 8)	Not used.																													
	Program type		—																												
	Conditions		—																												
	Unit		—																												
	Setting range		—																												
K29 to K32	Maximum RPM of spindle during tapping cycle (range 1 to 4)	The maximum number of revolutions per minute of the spindle in each speed range during a tapping cycle <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Address</th> <th colspan="4">Maximum number of speed ranges</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>K29</td> <td style="text-align: center;">○</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> </tr> <tr> <td>K30</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">M</td> <td style="text-align: center;">ML</td> </tr> <tr> <td>K31</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">MH</td> </tr> <tr> <td>K32</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> </tr> </tbody> </table>	Address	Maximum number of speed ranges				1	2	3	4	K29	○	L	L	L	K30	Invalid	H	M	ML	K31	Invalid	Invalid	H	MH	K32	Invalid	Invalid	Invalid	H
	Address			Maximum number of speed ranges																											
			1	2	3	4																									
	K29		○	L	L	L																									
	K30		Invalid	H	M	ML																									
K31	Invalid	Invalid	H	MH																											
K32	Invalid	Invalid	Invalid	H																											
Program type	M·E																														
Conditions	At power on																														
Unit	1 min ⁻¹ (rpm)																														
Setting range	0 to 99999																														
K33 to K36	Maximum RPM of spindle during tapping cycle (range 5 to 8)	Not used.																													
	Program type		—																												
	Conditions		—																												
	Unit		—																												
	Setting range		—																												
K37	External deceleration speed	The upper-limit value of the feedrates available while the external deceleration signal is ON <div style="text-align: center; margin-top: 10px;"> </div>																													
	Program type		M·E																												
	Conditions		Next block																												
	Unit		1 mm/min																												
	Setting range		0 to 120000																												

MPL508

Classification		MACHINE		Display title	SPINDLE SKIP
Address	Name			Description	
K38	Work number call during S-code macroprogram appointment			The work number of the macroprogram to be called during S-code macroprogram appointment (Programming of "S0000;" causes execution of the macroprogram whose work number is set using this parameter.) Note: This parameter is valid only when bit 2 of parameter K105 is 1.	
	Program type	M·E			
	Conditions	Next block			
	Unit	—			
	Setting range	0 to 999999999			
K39	Work number call during T-code macroprogram appointment			The work number of the macroprogram to be called during T-code macroprogram appointment (Programming of "T0000;" causes execution of the macroprogram whose work number is set using this parameter.) Note: This parameter is valid only when bit 3 of parameter K105 is 1.	
	Program type	M·E			
	Conditions	Next block			
	Unit	—			
	Setting range	0 to 999999999			
K40	Work number call during second auxiliary function macroprogram appointment			The work number of the macroprogram to be called during macroprogram appointment using the second auxiliary function Notes: 1. This parameter is valid only when bit 4 of parameter K105 is 1. 2. See the description of parameter K56 for details of the addresses available with the second auxiliary function.	
	Program type	M·E			
	Conditions	Next block			
	Unit	—			
	Setting range	0 to 999999999			
K41	G31 skipping speed			The feedrate during axis movement by G31 (skip function) If the same block as that of G31 contains an F command, then that feedrate becomes valid.	
	Program type	M·E			
	Conditions	Next block			
	Unit	1 mm/min			
	Setting range	0 to 120000			

Classification		MACHINE		Display title		SPINDLE SKIP	
Address	Name			Description			
K42	G31.1 skipping speed			<p>The feedrate during axis movement by G31.1 (multi-step skip function) If the same block as that of G31.1 contains an F command, then that feedrate becomes valid.</p>			
	Program type	E					
	Conditions	Next block					
	Unit	1 mm/min					
	Setting range	0 to 120000					
K43	G31.2 skipping speed			<p>The feedrate during axis movement by G31.2 (multi-step skip function) If the same block as that of G31.2 contains an F command, then that feedrate becomes valid.</p>			
	Program type	E					
	Conditions	Next block					
	Unit	1 mm/min					
	Setting range	0 to 120000					
K44	G31.3 skipping speed			<p>The feedrate during axis movement by G31.3 (multi-step skip function) If the same block as that of G31.3 contains an F command, then that feedrate becomes valid.</p>			
	Program type	E					
	Conditions	Next block					
	Unit	1 mm/min					
	Setting range	0 to 120000					
K45	—			<p>Not used.</p>			
	Program type	—					
	Conditions	—					
	Unit	—					
	Setting range	—					

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description																													
K46 to K49	Spindle speed during gear shifting (range 1 to 4)	The number of revolutions per minute of the spindle during shifting of gears thru the various ranges <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Address</th> <th colspan="4" style="text-align: center;">Maximum number of speed range</th> </tr> <tr> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">K46</td> <td style="text-align: center;">○</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> <td style="text-align: center;">L</td> </tr> <tr> <td style="text-align: center;">K47</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">M</td> <td style="text-align: center;">ML</td> </tr> <tr> <td style="text-align: center;">K48</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> <td style="text-align: center;">MH</td> </tr> <tr> <td style="text-align: center;">K49</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">Invalid</td> <td style="text-align: center;">H</td> </tr> </tbody> </table>	Address	Maximum number of speed range				1	2	3	4	K46	○	L	L	L	K47	Invalid	H	M	ML	K48	Invalid	Invalid	H	MH	K49	Invalid	Invalid	Invalid	H
	Address			Maximum number of speed range																											
			1	2	3	4																									
	K46		○	L	L	L																									
	K47		Invalid	H	M	ML																									
K48	Invalid	Invalid	H	MH																											
K49	Invalid	Invalid	Invalid	H																											
Program type	M·E																														
Conditions	At power on																														
Unit	1 min ⁻¹ (rpm)																														
Setting range	0 to 32767																														
K50 to K53	—	Not used.																													
	Program type		—																												
	Conditions		—																												
	Unit		—																												
	Setting range		—																												
K54	—	Not used.																													
	Program type		—																												
	Conditions		—																												
	Unit		—																												
	Setting range		—																												
K55	Minimum RPM of spindle	The minimum spindle revolutions per minute																													
	Program type		M·E																												
	Conditions		At power on																												
	Unit		1 min ⁻¹ (rpm)																												
	Setting range		0 to 32767																												

Classification	MACHINE	Display title	SPINDLE SKIP										
K56	Name		Selecting the address name of the second auxiliary function from among the following three types: <table border="1" data-bbox="865 398 1273 568"> <thead> <tr> <th>Address name</th> <th>Setting (HEX)</th> </tr> </thead> <tbody> <tr> <td>Invalid</td> <td>0</td> </tr> <tr> <td>A</td> <td>41</td> </tr> <tr> <td>B</td> <td>42</td> </tr> <tr> <td>C</td> <td>43</td> </tr> </tbody> </table> <p>Note: Do not use the same address for the axis name and the second auxiliary function.</p>	Address name	Setting (HEX)	Invalid	0	A	41	B	42	C	43
	Address name	Setting (HEX)											
	Invalid	0											
	A	41											
	B	42											
C	43												
Name of second auxiliary function													
Program type	E												
Conditions	At power on												
Unit	—												
Setting range	Hexadecimal two-digit 0, 41, 42, 43												
K57	Name		This parameter is used during S-code macroprogram appointment to select the method of calling the macroprogram whose work number has been set using the K38 parameter. <table border="1" data-bbox="865 842 1273 1012"> <thead> <tr> <th>Setting</th> <th>Calling method</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>M98 P□□□□</td> </tr> <tr> <td>1</td> <td>G65 P□□□□</td> </tr> <tr> <td>2</td> <td>G66 P□□□□</td> </tr> <tr> <td>3</td> <td>G66.1 P□□□□</td> </tr> </tbody> </table> <p>Note: Valid only when bit 2 of K105 is 1.</p>	Setting	Calling method	0	M98 P□□□□	1	G65 P□□□□	2	G66 P□□□□	3	G66.1 P□□□□
	Setting	Calling method											
	0	M98 P□□□□											
	1	G65 P□□□□											
	2	G66 P□□□□											
3	G66.1 P□□□□												
Type of S-code macroprogram appointment call													
Program type	M·E												
Conditions	Next block												
Unit	—												
Setting range	0 to 3												
K58	Name		This parameter is used during T-code macroprogram appointment to select the method of calling the macroprogram whose work number has been set using the K39 parameter. <table border="1" data-bbox="865 1263 1273 1433"> <thead> <tr> <th>Setting</th> <th>Calling method</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>M98 P□□□□</td> </tr> <tr> <td>1</td> <td>G65 P□□□□</td> </tr> <tr> <td>2</td> <td>G66 P□□□□</td> </tr> <tr> <td>3</td> <td>G66.1 P□□□□</td> </tr> </tbody> </table> <p>Note: Valid only when bit 3 of K105 is 1.</p>	Setting	Calling method	0	M98 P□□□□	1	G65 P□□□□	2	G66 P□□□□	3	G66.1 P□□□□
	Setting	Calling method											
	0	M98 P□□□□											
	1	G65 P□□□□											
	2	G66 P□□□□											
3	G66.1 P□□□□												
Type of T-code macroprogram appointment call													
Program type	M·E												
Conditions	Next block												
Unit	—												
Setting range	0 to 3												
K59	Name		This parameter is used during the second auxiliary function macroprogram appointment to select the method of calling the macroprogram whose work number has been set using the K40 parameter. <table border="1" data-bbox="865 1715 1273 1886"> <thead> <tr> <th>Setting</th> <th>Calling method</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>M98 P□□□□</td> </tr> <tr> <td>1</td> <td>G65 P□□□□</td> </tr> <tr> <td>2</td> <td>G66 P□□□□</td> </tr> <tr> <td>3</td> <td>G66.1 P□□□□</td> </tr> </tbody> </table> <p>Note: Valid only when bit 4 of K105 is 1.</p>	Setting	Calling method	0	M98 P□□□□	1	G65 P□□□□	2	G66 P□□□□	3	G66.1 P□□□□
	Setting	Calling method											
	0	M98 P□□□□											
	1	G65 P□□□□											
	2	G66 P□□□□											
3	G66.1 P□□□□												
Type of second auxiliary function macroprogram appointment call													
Program type	M·E												
Conditions	Next block												
Unit	—												
Setting range	0 to 3												

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description
K60	Fixed value	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	4
K61 to K63	Fixed value	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	1
K64	Fixed value	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	2
K65 to K67	Fixed value	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	1

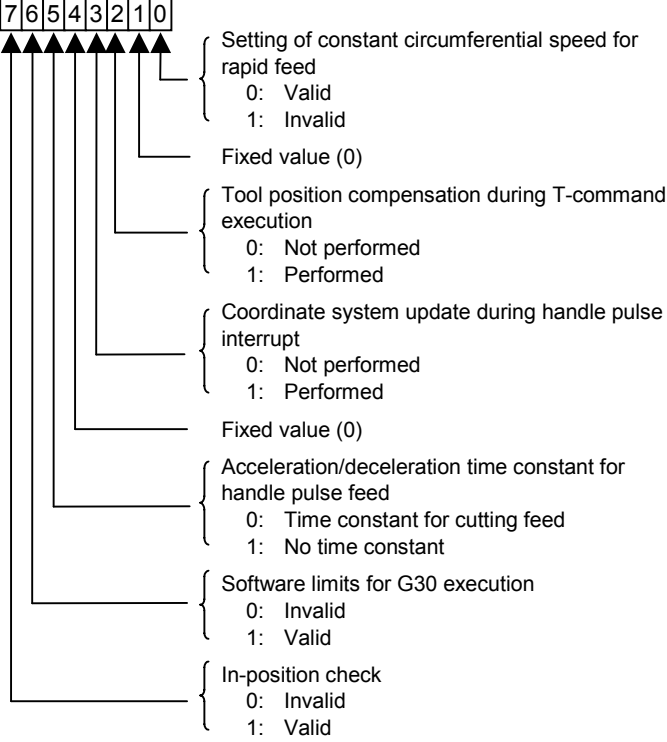
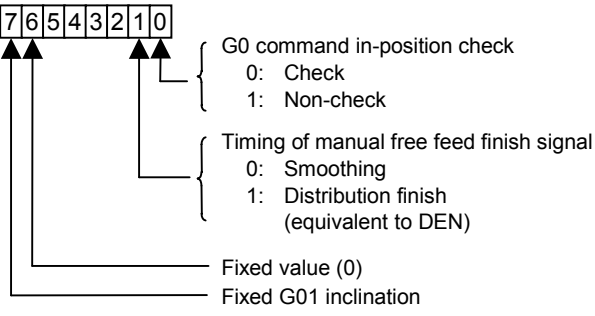
Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description
K68	Spindle-encoder gear ratio	<p> 00 : Direct connection of spindle and encoder 01 : 1/2 deceleration of encoder with respect to spindle 10 : 1/4 deceleration of encoder with respect to spindle 11 : 1/8 deceleration of encoder with respect to spindle </p> <p> 0 : Encoder provided 1 : Encoder not provided </p>
	Program type	M·E
	Conditions	Immediate
	Unit	Bit
	Setting range	Binary, eight digits
K69	G31.1 skip conditions	<p>(0: Invalid 1: Valid)</p> <p> SKIP-2 } SKIP-10 } HR353 SKIP-3 } </p> <p>Select the skip signal for G31.1 command.</p>
	Program type	E
	Conditions	After stop of movement
	Unit	Bit
	Setting range	Binary, eight digits
K70	G31.2 skip conditions	<p>(0: Invalid 1: Valid)</p> <p> SKIP-2 } SKIP-10 } HR353 SKIP-3 } </p> <p>Select the skip signal for G31.2 command.</p>
	Program type	E
	Conditions	After stop of movement
	Unit	Bit
	Setting range	Binary, eight digits
K71	G31.3 skip conditions	<p>(0: Invalid 1: Valid)</p> <p> SKIP-2 } SKIP-10 } HR353 SKIP-3 } </p> <p>Select the skip signal for G31.3 command.</p>
	Program type	E
	Conditions	After stop of movement
	Unit	Bit
	Setting range	Binary, eight digits

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description								
K72	G37 skip conditions	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> </div> <div> <p>(0: Invalid 1: Valid)</p> </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0		
	Program type	E								
	Conditions	After stop of movement								
	Unit	Bit								
Setting range	Binary, eight digits									
		Select the skip signal for the G37 command.								
K73	G4 skip conditions	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> </div> <div> <p>(0: Invalid 1: Valid)</p> </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0		
	Program type	E								
	Conditions	After stop of movement								
	Unit	Bit								
Setting range	Binary, eight digits									
		Select the skip signal for G4 command.								
K74 to K89	—	Invalid								
	Program type	—								
	Conditions	—								
	Unit	—								
	Setting range	—								
K90	Return override during full-synchronous tapping	<p>The overriding value for return from the hole bottom during a full-synchronous tapping cycle</p> <p style="text-align: right;">Programmed feedrate × $\frac{K90}{100}$</p>								
	Program type	E								
	Conditions	After stop of movement								
	Unit	1%								
	Setting range	0 to 999								
		<p>Note: This parameter is valid only when bit 6 of F94 is 1.</p> <p style="text-align: right;">MPL509</p>								

Classification	MACHINE	Display title	SPINDLE SKIP
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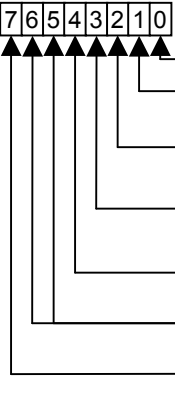
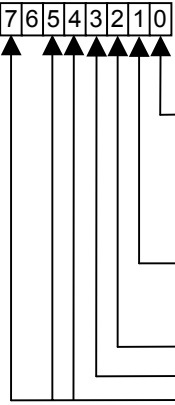
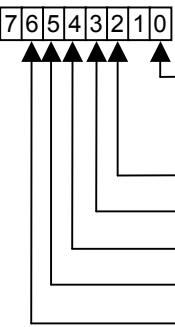
Address	Name	Description
K91 to K94	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
K95	—	
	Program type	M·E
	Conditions	After stop of movement
	Unit	Bit
	Setting range	Binary, eight digits
K96	—	
	Program type	M·E
	Conditions	After stop of movement
	Unit	Bit
	Setting range	Binary, eight digits

Classification	MACHINE	Display title	SPINDLE SKIP
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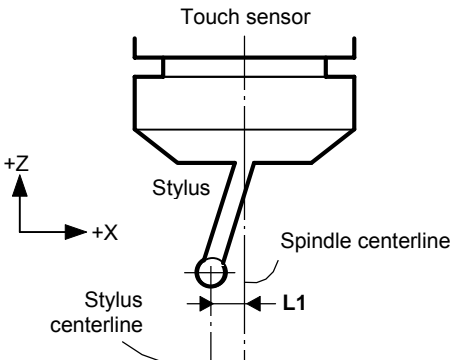
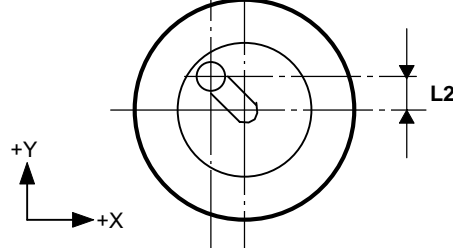
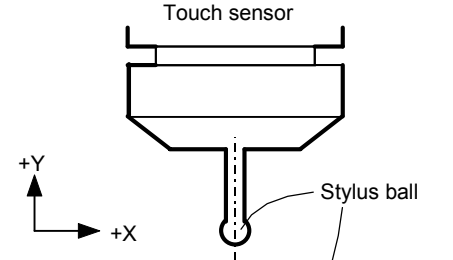
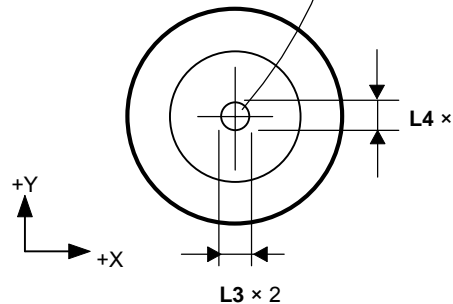
Address	Name	Description								
K97 to K100	Acceleration/deceleration time constant for full-synchronous tapping	<p>Time constant for linear acceleration/deceleration of the spindle speed and Z-axis feed control during a full-synchronous tapping cycle.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>K97: Speed range 1 K98: Speed range 2 K99: Speed range 3 K100: Speed range 4</p> </div> </div>								
	Program type	M·E								
	Conditions	After stop of movement								
	Unit	1 msec								
	Setting range	0 to 1800								
K101	—	Invalid								
	Program type	—								
	Conditions	—								
	Unit	—								
	Setting range	—								
K102	—	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">7</td><td style="width: 20px;">6</td><td style="width: 20px;">5</td><td style="width: 20px;">4</td><td style="width: 20px;">3</td><td style="width: 20px;">2</td><td style="width: 20px;">1</td><td style="width: 20px;">0</td> </tr> </table> </div> <div> <p>↑ Fixed value (0)</p> </div> </div>	7	6	5	4	3	2	1	0
	7	6	5	4	3	2	1	0		
	Program type	M·E								
	Conditions	At power on								
	Unit	Bit								
Setting range	Binary, eight digits									
K103 K104	—	<p>These parameters are automatically set within the system.</p> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">Setting prohibited</div>								
	Program type	—								
	Conditions	—								
	Unit	—								
	Setting range	—								

MPL510

Classification	MACHINE	Display title	SPINDLE SKIP
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Address	Name	Description
K105	—	 <p>Unused</p> <p>Fixed value (1)</p> <p>{ 0: S-code macro call invalid 1: S-code macro call valid</p> <p>{ 0: T-code macro call invalid 1: T-code macro call valid</p> <p>{ 0: Second auxiliary function macro invalid 1: Second auxiliary function macro valid</p> <p>Fixed value (0)</p> <p>{ 0: Input unit in millimeter 1: Input unit in inch</p>
	Program type	M·E
	Conditions	At power on
	Unit	Bit
	Setting range	Binary, eight digits
K106	—	 <p>Execution conditions for user macroprogram interrupt</p> <p>{ 0: Edge triggering (Performed just once when the interrupt signal is ON) 1: Status triggering (Repeatedly performed while the interrupt signal is ON)</p> <p>Start timing for user macroprogram interrupt</p> <p>{ 0: The block under execution is aborted and then the interrupt occurs immediately. 1: Interrupt occurs after completion of the block being executed.</p> <p>Fixed value (0)</p> <p>Fixed value (1)</p> <p>Fixed value (0)</p>
	Program type	M·E
	Conditions	At power on
	Unit	Bit
	Setting range	Binary, eight digits
K107	—	 <p>Feed forward valid/invalid</p> <p>Adjustable speed filter for the shape correction function</p> <p>7.1 ms filter</p> <p>14.2 ms filter</p> <p>28.4 ms filter</p> <p>56.8 ms filter</p> <p>Arc deceleration speed valid/invalid</p>
	Program type	—
	Conditions	—
	Unit	Bit
	Setting range	Binary, eight digits
K108	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

6-3 TABLE SENSOR (L)

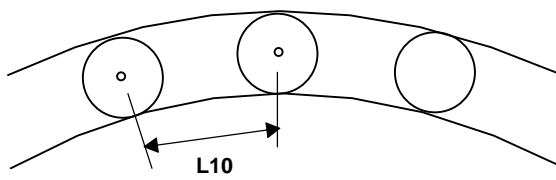
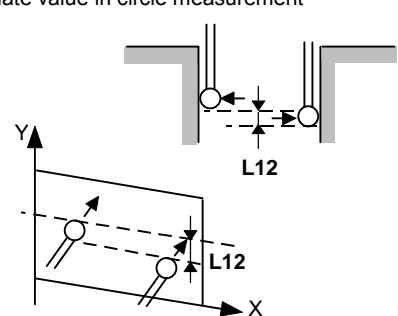
Classification		MACHINE	Display title	TABLE SENSOR
L1	Stylus eccentricity of touch sensor (X-component)		<p>The eccentricity of the stylus of the touch sensor with respect to the center of the spindle</p>  <p style="text-align: right;">MPL093</p>	
	Program type	M		
	Conditions	At power on		
	Unit	0.0001 mm/0.00001 inch		
	Setting range	0 to ±99999999		
L2	Stylus eccentricity of touch sensor (Y-component)		 <p style="text-align: right;">MPL093</p>	
	Program type	M		
	Conditions	At power on		
	Unit	0.0001 mm/0.00001 inch		
	Setting range	0 to ±99999999		
L3	Radius of stylus ball of touch sensor (X-component)		<p>The true radius value of the stylus ball of the touch sensor</p> 	
	Program type	M		
	Conditions	At power on		
	Unit	0.0001 mm/0.00001 inch		
	Setting range	0 to ±99999999		
L4	Radius of stylus ball of touch sensor (Y-component)		 <p style="text-align: right;">MPL094</p>	
	Program type	M		
	Conditions	At power on		
	Unit	0.0001 mm/0.00001 inch		
	Setting range	0 to ±99999999		

Note: These data are automatically set when calibration measurement is performed using the MMS unit.

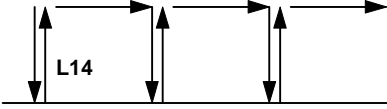
Note: These data are automatically set when calibration measurement is performed using the MMS unit.

Classification	MACHINE		Display title	TABLE SENSOR	
Address	Name		Description		
L5	Z-axis stroke for tip position memory (TEACH function)		<p>The distance from the spindle taper gage line to the table surface (or the reference block on the pallet) existing when the Z-axis is in the machine zero-point position</p> <p>The diagram illustrates two machine configurations. On the left, a V-type machine shows the spindle above the table. A vertical dimension line labeled L5 indicates the distance from the spindle taper gage line to the table surface. On the right, an H-type machine shows the spindle above a pallet. A vertical dimension line labeled L5 indicates the distance from the spindle taper gage line to the reference block on the pallet. Labels include Spindle, Machine zero point, Pallet, Reference block, and Table.</p> <p style="text-align: right;">MPL095</p>		
	Program type	M·E			
	Conditions	Immediate			
	Unit	0.0001 mm/0.00001 inch			
	Setting range	0 to ±99999999			
L6	Tool-breakage judgment distance for TBR function		<p>The minimum tool displacement by which the tool is judged to be a broken one as a result of execution of the tool breakage detection function</p> <p>If (registered tool length data) – (tool length data that has been measured during the detecting operation) \geq L6, then the tool is judged broken.</p>		
	Program type	M			
	Conditions	Immediate			
	Unit	0.0001 mm/0.00001 inch			
	Setting range	0 to ±99999999			
L7	Tool-breakage restoration mode for TBR function		<p>The parameter for selecting the type of restoration to be performed after tool breakage has been detected as a result of execution of the tool breakage detection function</p> <ol style="list-style-type: none"> 1: Single-block stop 2: Machining restarts from the next process. 3: Single-block stop occurs in a state where machining can be restarted from the next process. 		
	Program type	M			
	Conditions	Immediate			
	Unit	—			
	Setting range	1 to 3			
L8	Skipping stroke limit for MMS		<p>The maximum skipping movement distance for the measurement with the MMS unit</p> <p>An alarm message will appear if the touch sensor has not come into contact with the workpiece within this distance.</p>		
	Program type	M			
	Conditions	Immediate			
	Unit	0.0001 mm/0.00001 inch			
	Setting range	0 to ±99999999			

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description
L9	Selection of random ATC specifications	Set to 1 when the machine of the random ATC specifications is used. 0: Standard machine 1: Machine of random ATC specifications
	Program type	M·E
	Conditions	At power on
	Unit	—
	Setting range	0, 1
L10	Interval between magazine pockets	Set the interval between magazine pockets.  <div style="text-align: right;">MPL511</div>
	Program type	M·E
	Conditions	Immediate
	Unit	1 mm/0.1 inch
	Setting range	0 to 999
L11	Touch sensor's interference direction	Set the touch sensor's interference direction. 0: Non-interference (normal diameter) 1: To jut out in the direction of a pocket of higher number (Positive direction of magazine) 2: To jut out in the direction of a pocket of lower number (Negative direction of magazine)
	Program type	M·E
	Conditions	Immediate
	Unit	—
	Setting range	0 to 2
L12	Tolerance for manual measurement	Tolerance for Z coordinate value in circle measurement  <div style="text-align: right;">MPL512</div>
	Program type	M·E
	Conditions	Immediate
	Unit	0.0001 mm/0.00001 inch
	Setting range	0 to ±99999999

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description	
L13	Allowable angle for parallelism and right angle in manual measurement	Set the allowable angle for calculation of parallelism and right angle to be measured manually. Note: When error angle is smaller than the setting angle, the parallelism and right angle are calculated.	
	Program type		M
	Conditions		Immediate
	Unit		0.0001°
	Setting range		0 to ±900000
L14	Escapement for straightness measurement	Set an escape amount from a measurement point to the next point in straightness measurement.  <div style="text-align: right; margin-top: 10px;">MPL513</div>	
	Program type		M
	Conditions		Immediate
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L15	Macro program number for straightness measurement	Set macro program number for straightness measurement. Before shipment, the macro program is numbered "9999" at the factory.	
	Program type		M
	Conditions		Immediate
	Unit		—
	Setting range		0 to 99999999
L16 to L18	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description	
L19	Number of tools in tool magazine	Set the total number of tools to be put up in the tool magazine.	
	Program type		M·E
	Conditions		Immediate
	Unit		1 piece
	Setting range		1 to 960
L20	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
L21	Output type of index (rotary) table	Select the output type for the angle command of the indexing unit and the end unit of the MAZATROL program. 0: To select servo spindle (4th axis) 1: To select the code (the second auxiliary function) set by K56	
	Program type		M
	Conditions		Immediate
	Unit		—
	Setting range		0, 1

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description																								
L22 to L27, L97	Revolutions in the following spindle output diagrams: - MACHINING NAVIGATION-RESULT - MACHINING NAVIGATION-PPEDITION - Monitoring Functions																									
	Program type		M·E																							
	Conditions		Immediate																							
	Unit		min ⁻¹ (rpm)																							
	Setting range		0 to 99999999																							
L31 to L36, L98	Output in the following spindle output diagrams: - MACHINING NAVIGATION-RESULT - MACHINING NAVIGATION-PPEDITION - Monitoring Functions	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Point</th> <th style="text-align: center;">Cross axis: revolutions (Unit: min⁻¹ (rpm))</th> <th style="text-align: center;">Vertical axis: output (Unit: 1/100 kW)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">P0</td> <td style="text-align: center;">L22</td> <td style="text-align: center;">L31</td> </tr> <tr> <td style="text-align: center;">P1</td> <td style="text-align: center;">L23</td> <td style="text-align: center;">L32</td> </tr> <tr> <td style="text-align: center;">P2</td> <td style="text-align: center;">L24</td> <td style="text-align: center;">L33</td> </tr> <tr> <td style="text-align: center;">P3</td> <td style="text-align: center;">L25</td> <td style="text-align: center;">L34</td> </tr> <tr> <td style="text-align: center;">P4</td> <td style="text-align: center;">L26</td> <td style="text-align: center;">L35</td> </tr> <tr> <td style="text-align: center;">P5</td> <td style="text-align: center;">L27</td> <td style="text-align: center;">L36</td> </tr> <tr> <td style="text-align: center;">P6</td> <td style="text-align: center;">L97</td> <td style="text-align: center;">L98</td> </tr> </tbody> </table>	Point	Cross axis: revolutions (Unit: min ⁻¹ (rpm))	Vertical axis: output (Unit: 1/100 kW)	P0	L22	L31	P1	L23	L32	P2	L24	L33	P3	L25	L34	P4	L26	L35	P5	L27	L36	P6	L97	L98
	Point		Cross axis: revolutions (Unit: min ⁻¹ (rpm))	Vertical axis: output (Unit: 1/100 kW)																						
	P0		L22	L31																						
	P1		L23	L32																						
	P2		L24	L33																						
P3	L25	L34																								
P4	L26	L35																								
P5	L27	L36																								
P6	L97	L98																								
Program type	M·E																									
Conditions	Immediate																									
Unit	0.01 kW																									
Setting range	0 to 99999999																									
L28	Number of gears on spindle	Set the number of gears on the spindle. (1) For gear menu display 1: Number of gears displayed in menu..... 2 (without neutral) 2: Number of gears displayed in menu..... 2 (with neutral) 3: Number of gears displayed in menu..... 3 (with neutral) 4: Number of gears displayed in menu..... 4 (with neutral) 0, 5 to 8:..... No gear menu display (2) For automatic gear selection with the MAZATROL program																								
	Program type		M·E																							
	Conditions		Immediate																							
	Unit		1 gear																							
	Setting range		0 to 8																							
L29	Machine efficiency	Set machine efficiency. This value is used as average output calculation data for machining navigation. If the setting is 0, machine efficiency will become 90%.																								
	Program type		M																							
	Conditions		Immediate																							
	Unit		%																							
	Setting range		0 to 100																							

Classification	MACHINE	Display title	TABLE SENSOR
L30	Selection of machining navigation case introduction messages		<p>Select for each machine model the appropriate case introduction messages on MACHINING NAVIGATION-PREDICTION display. Specific data is preset for each machine model. Do not disturb the presettings.</p>
	Program type	M·E	
	Conditions	Immediate	
	Unit	—	
	Setting range	0 to 999	
L31 to L36	—		See L22 .
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	
L37	Minimum index angle of index table		<p>For the command to rotate the index table, specify the minimum index angle for angle command by the M code or B code.</p> <p>Note: This parameter is ineffective for the system with the NC rotary table.</p>
	Program type	M	
	Conditions	At power on	
	Unit	Degree	
	Setting range	0 to 180	
L38	M/B code for index of index table		<p>For the command to rotate the index table, select the turning direction and the M code number to be output.</p> <p>0 or 1: B code (0: Turning in the direction of CW, 1: Turning in the direction of CW/CCW/shortcut)</p> <p>2 to 9999: M code (Numeric value is the M code number to be output)</p> <p>Notes:</p> <ol style="list-style-type: none"> This parameter is ineffective for the system with the NC rotary table. Turning direction of the index table can be selected in the indexing unit only when this parameter is set to 1.
	Program type	M	
	Conditions	At power on	
	Unit	—	
	Setting range	0 to 9999	

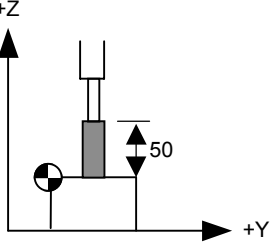
Classification	MACHINE		Display title	TABLE SENSOR
L39	Selection of execution/non execution of indexing unit		Specify the execution condition of the indexing unit. Execution of the indexing unit just before starting or at the end of machining of each tool sequence: 0: Won't be made when the index angle is the same as the preceding indexing unit execution. 1: Will be made unconditionally.	
	Program type	M		
	Conditions	At power on		
	Unit	—		
	Setting range	0, 1		
L40	Availability of specification of index table angle in end unit		Select availability to specify the index table angle in the end unit. 0: Enables to specify the angle. 1: Prohibits to specify the angle. Note: Set to 0 only for index table specification.	
	Program type	M		
	Conditions	At power on		
	Unit	—		
	Setting range	0, 1		
L41	Simultaneous operation of indexing unit with ATC		For execution of the indexing unit, specify the commanding order for movement to turning position, turning of the table and ATC. 0: Movement to turning position → Table turning → ATC 1: Movement to turning position → Table turning and ATC 2: Movement to turning position, table turning and ATC simultaneously take place. Note: In case of setting to 2, only the X-axis coordinates can be set at turning position of the indexing unit.	
	Program type	M		
	Conditions	At power on		
	Unit	—		
	Setting range	0 to 2		
L42	Initial value of index table angle		Select setting of the initial value (modal) of the index table angle for cyclic operation. 0: Actual table angle of the machine 1: Table angle indexed at present taken as 0°	
	Program type	M		
	Conditions	Immediate		
	Unit	—		
	Setting range	0, 1		

Classification	MACHINE		Display title	TABLE SENSOR
Address	Name		Description	
L43	Indication of index table angle		Select showing or not showing of the index table angle on the POSITION display. 0: Not to show 1: To show	
	Program type	M·E	Note: Set to 1 for the machine with the index table, or set to 0 for that of the NC rotary table.	
	Conditions	Immediate		
	Unit	—		
	Setting range	0, 1		
L44	Selection of automatic setting on/off for nose position correction of a drilling tool		Select whether automatic setting of the amount of tool nose position correction is to be made valid or invalid when entering the length of a drilling tool in the tool data or when measuring the tool length in the MDI mode. 0: Automatic setting valid 1: Automatic setting invalid	
	Program type	M·E		
	Conditions	Immediate		
	Unit	—		
	Setting range	0, 1		
L45	Index table angel command		Set the minimum unit of index table angle command for INDEX units, "ANGLE" in END units and B-codes in MANU PRO unit. 0: 1-deg 1 to 8: 1/1000 deg (MRJ2-CT specifications)	
	Program type	—	Note: Index table angle display on the POSITION display is valid only when L43 = 1 (index table angle display on). 0: 1-deg index table 1 to 7: Nth axis under MRJ2-CT specs. (N = 1 to 7) 8: Positioning table	
	Conditions	—		
	Unit	—		
	Setting range	0 to 8		
L46	Maximum number of pallets in pallet changing unit		Select change or no change of the pallet and specify the maximum number of pallets. 0 or 1: Not to change pallet 2 to 255: To change pallet (Numeric value indicates the maximum number of pallets.)	
	Program type	M	Note: When this parameter is set to 0 or 1, use of the pallet changing unit is prohibited.	
	Conditions	At power on		
	Unit	—		
	Setting range	0 to 255		

Classification		MACHINE		Display title		TABLE SENSOR	
Address	Name			Description			
L47	To prepare or not to prepare next pallet change			Select preparation of next pallet or not to do according to the pallet change mechanism. 0: Not to prepare next pallet 1: To prepare next pallet			
	Program type	M		Note: When this parameter is set to 1, it is possible to set the number of the next pallet in the pallet changing unit.			
	Conditions	At power on					
	Unit	—					
	Setting range	0, 1					
L48	—			Not used.			
	Program type	—					
	Conditions	—					
	Unit	—					
	Setting range	—					
L49	Simultaneous operation of pallet change with ATC			This parameter is used to select simultaneous operation of pallet change with the next ATC operation in execution of the pallet changing unit and the face definition unit, or not. 0: To operate ATC after pallet change 1: To operate pallet change and ATC simultaneously			
	Program type	M					
	Conditions	Immediate					
	Unit	—					
	Setting range	0, 1					
L50	Rewriting of head number			Rewriting of head number in MDI mode: 0: Impossible 1: Possible			
	Program type	—		(For five surface machining)			
	Conditions	Immediate					
	Unit	—					
	Setting range	0, 1					

Classification		MACHINE		Display title	TABLE SENSOR
Address	Name			Description	
L51	Tool command system in MDI operation			Tool command system in MDI operation (Tool on the spindle and next time tool) 0: Command of pocket number 1: Command of group number	
	Program type	M			
	Conditions	Immediate			
	Unit	—			
	Setting range	0, 1			
L52	Write of machining management data with macro variable			Rewriting of machining management data with macro variable (system variable) 0: Impossible 1: Possible	
	Program type	M			
	Conditions	Immediate			
	Unit	—			
	Setting range	0, 1			
L53	Showing of program number in PALLET MANAGEMENT display			Select showing or not showing of the work number in the PALLET MANAGEMENT display. 0: Not to show WNo. 1: To show WNo.	
	Program type	M			
	Conditions	Immediate			
	Unit	—			
	Setting range	0, 1			
L54	Selection of automatic operation mode			0: Invalid 1: FMS pallet ID operation mode 2: Pallet management operation mode	
	Program type	M			
	Conditions	Immediate			
	Unit	—			
	Setting range	0 to 2			

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description	
L55	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
L56	Method of measurement of coordinates by tool edge memorizing function (TEACH)	<p>0: Method by M2 tool edge memorizing function 1: Method by M32 tool edge memorizing function (for Z-axis only) 2: Method by M32 tool edge memorizing function (for X-, Y-, Z-axes)</p> <p>Method by M2 (distance from the tool tip to the zero point with the sign)-50</p> <p>Method by M32 (distance from the zero point to the tool tip with the sign).....50</p> <div style="text-align: right;">  <p>[Ex.]</p> </div> <p style="text-align: right;">MPL514</p>	
	Program type		M
	Conditions		Immediate
	Unit		—
	Setting range		0 to 2
L57	Rewriting of tool data during automatic operation	<p>Make it possible/impossible to rewrite tool data except on tools on the spindle in automatic operation on the EIA/ISO program.</p> <p>0: Impossible 1: Possible</p>	
	Program type		E
	Conditions		Immediate
	Unit		—
	Setting range		0, 1
L58	Head index angle indication system	<p>Select a head angle indication system for the five surface machining system.</p> <p>0: Indication corresponding to 90° index (0°, 90°, 180°, 270°) 1: Indication corresponding to 1° (5°) index</p> <p style="text-align: right;">(For five surface machining)</p>	
	Program type		E
	Conditions		Immediate
	Unit		—
	Setting range		0, 1

Classification	MACHINE	Display title	TABLE SENSOR
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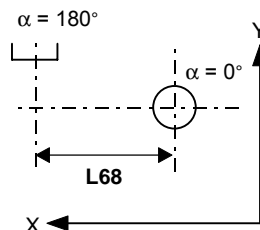
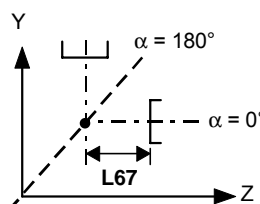
Address	Name		Description
L59	Input selection for HEAD OFFSET display		This parameter limits input items on the HEAD OFFSET display. 0: Data just on item "SPDL. CMD" can be input. 1: All data can be input. (For five surface machining)
	Program type	M·E	
	Conditions	Immediate	
	Unit	—	
	Setting range	0, 1	
L60	Head quantity		The total number of heads to be mounted in the spindle (For five surface machining)
	Program type	M·E	
	Conditions	Immediate	
	Unit	—	
	Setting range	0 to 10	
L61	Output timing of AHC and APC		Operation timing of automatic head change (AHC) and automatic pallet change (APC) 0: AHC first and then APC 1: APC first and then AHC 2: Simultaneous (For five surface machining)
	Program type	M·E	
	Conditions	Immediate	
	Unit	—	
	Setting range	0 to 2	

Classification	MACHINE	Display title	TABLE SENSOR
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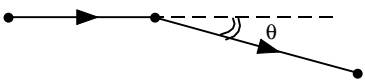
Address	Name	Description	
L62	Head relay point X1	<p>When "FIXED" is selected at the item "RELAY" in the face definition unit, the head arrives at the face for next machining through the point(s) specified by the parameters (to be set in the machine coordinates system). For the HV machining, the relay points (X1, Y1) and (X2, Y2) can be specified in the program (in the face definition sequence). For the five surface machining, the head goes through the four corners of a face where the two specified points are positioned in its diagonal line.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">MPL515 (For five-surface machining) (For HV machining)</p>	
	Program type		M
	Conditions		Immediate
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L63	Head relay point Y1		
	Program type		M
	Conditions		Immediate
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L64	Head relay point X2		
	Program type		M
	Conditions		Immediate
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L65	Head relay point Y2		
	Program type		M
	Conditions		Immediate
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description
L66	—	After EIA/ISO subprogram execution; 0: Return to head indexing point Z (Even if the T-code command is for the same tool.) 1: No return to head indexing point Z
	Program type	M
	Conditions	Immediate
	Unit	—
	Setting range	0, 1
		(For five-surface machining) (For HV machining)
L67	Length between the end surface of the spindle and the center of head rotation	Set the length from the end surface of the spindle to the center of head rotation for respective machines. (100 mm in usual)
	Program type	M·E
	Conditions	Immediate
	Unit	0.0001 mm/0.00001 inch
	Setting range	0 to ±99999999
		MPL516 (For HV machining)
L68	Head correction value X	Set for respective machines.
	Program type	M·E
	Conditions	Immediate
	Unit	0.0001 mm/0.00001 inch
	Setting range	0 to ±99999999
		MPL517 (For HV machining)
L69	Head correction value Y	Set for respective machines.
	Program type	M·E
	Conditions	Immediate
	Unit	0.0001 mm/0.00001 inch
	Setting range	0 to ±99999999
		(For HV machining)



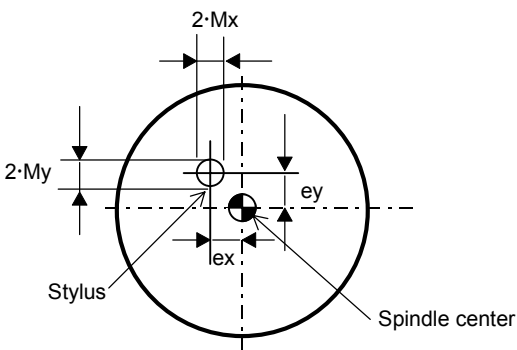
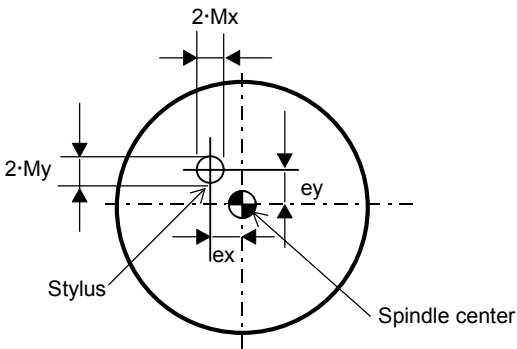
Classification	MACHINE	Display title	TABLE SENSOR						
L70	Axis movement from machining face on escapement		Specify the axes that simultaneously move from a machining face to the next machining face or in case of tool replacement. 0: Two (three) axes simultaneously move to the safety position. 1: Y-axis (or X- and Y-axes) moves to the safety position after Z-axis moved. The X-axis moves when a relay point (RELAY) or a fixed point (FIXED) is selected for the item "RELAY" in the face definition unit. (For HV machining)						
	Program type	M							
	Conditions	Immediate							
	Unit	—							
	Setting range	1, 0							
L71	Shift of basic coordinate for oblique face machining		For execution of the program for oblique face machining, specify to execute or not machining on the coordinate that is turned from the basic coordinate (set in WPC unit or in OFFSET unit) at an angle of the correction value for the B axis. 0: Machining on the coordinate that is turned from the basic coordinate at an angle of the correction value for the B axis 1: Machining on the basic coordinate specified in the program (For HV machining)						
	Program type	M·E							
	Conditions	Immediate							
	Unit	—							
	Setting range	1, 0							
L72	Coding of head turning axis		For HV machining, register the name (code) of the head turning axis for the item "POSITION" and the item "REMAIN" on the POSITION, WORK OFFSET and TOOL OFFSET displays respectively. Standard setting value = 0 <table border="1" data-bbox="849 1339 1294 1429"> <tr> <td>Axis name</td> <td>α</td> <td>C</td> </tr> <tr> <td>Setting value</td> <td>0</td> <td>0 × 43</td> </tr> </table> (For HV machining)	Axis name	α	C	Setting value	0	0 × 43
	Axis name	α	C						
	Setting value	0	0 × 43						
	Program type	M·E							
	Conditions	Immediate							
Unit	ASCII								
Setting range	Hexadecimal								
L73	—		Not used.						
	Program type	—							
	Conditions	—							
	Unit	—							
	Setting range	—							

Classification		MACHINE	Display title	TABLE SENSOR
L74	Name		Description	
	Cutting feedrate for pre-interpolational acceleration/deceleration control		Set the cutting feedrate for pre-interpolational acceleration/deceleration control.	
	Program type	M·E		
	Conditions	—		
	Unit	mm/min		
	Setting range	1 to 999999		
L75	Name		Description	
	Time constant for pre-interpolational linear control during cutting feedrate acceleration/deceleration		Set the time constant to obtain acceleration/deceleration of the cutting feedrate for pre-interpolational linear control.	
	Program type	M·E		
	Conditions	—		
	Unit	msec		
	Setting range	1 to 5000		
L76	Name		Description	
	Acceleration rate for high-speed cutting		Set the maximum cutting speed in the G61.1 mode at percentage to the maximum cutting speed in the G64 mode. Input of 0 is regarded as 100 %. 1000 or higher percent is disposed as 1000 %.	
	Program type	M·E		
	Conditions	—		
	Unit	%		
	Setting range	1 to 5000		
L77	Name		Description	
	Angle for deceleration at corner before interpolation		Set an angle for decelerating cutting feedrate at a corner. Input of 0 is regarded as 5°. Setting at an angle higher than 30° is disposed as 30°.	
				
			MPL518	
	Program type	M·E		
Conditions	—			
Unit	Degree			
	Setting range	0 to 30		

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description	
L78 to L83	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
L84	Correction value of alignment deviation X (Upper face)	<div style="text-align: center;"> <p style="text-align: right;">MPL519</p> </div> <p>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4)</p> <p>Note: The data is set automatically by execution of calibration measurement (on the upper face) with the MMS unit.</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L85	Correction value of alignment deviation Y (Upper face)	<p>(For five-surface machining)</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999

Classification	MACHINE	Display title	TABLE SENSOR
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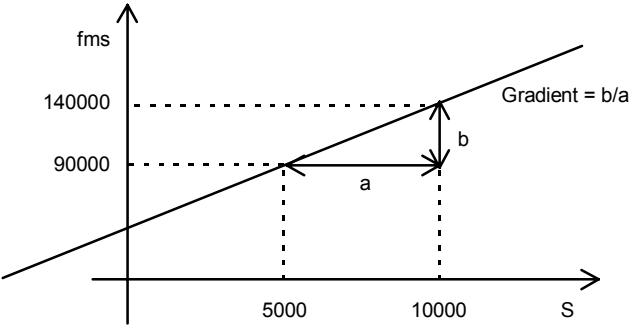
Address	Name	Description	
L86	Correction value of alignment deviation X (0-degree face)	 <p style="text-align: right;">MPL519</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L87	Correction value of alignment deviation Y (0-degree face)	<p>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4)</p> <p>Note: The data is set automatically by execution of calibration measurement (0-degree face) with the MMS unit.</p> <p style="text-align: right;">(For five-surface machining)</p>	
	Program type	M	
	Conditions	After stop of movement	
	Unit	0.0001 mm/0.00001 inch	
	Setting range	0 to ±99999999	
L88	Correction value of alignment deviation X (90-degree face)	 <p style="text-align: right;">MPL519</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L89	Correction value of alignment deviation Y (90-degree face)	<p>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4)</p> <p>Note: The data is set automatically by execution of calibration measurement (90-degree face) with the MMS unit.</p> <p style="text-align: right;">(For five-surface machining)</p>	
	Program type	M	
	Conditions	After stop of movement	
	Unit	0.0001 mm/0.00001 inch	
	Setting range	0 to ±99999999	

Classification	MACHINE	Display title	TABLE SENSOR
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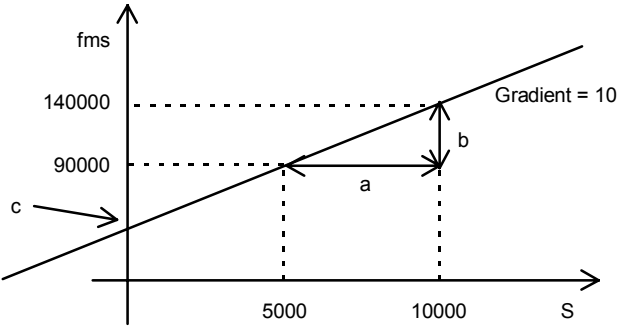
Address	Name	Description	
L90	Correction value of alignment deviation X (180-degree face)	<div style="text-align: center;"> </div> <p style="text-align: right;">MPL519</p> <p>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4)</p> <p>Note: The data is set automatically by execution of calibration measurement (180-degree face) with the MMS unit.</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L91	Correction value of alignment deviation Y (180-degree face)	<p style="text-align: right;">(For five-surface machining)</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L92	Correction value of alignment deviation X (270-degree face)	<div style="text-align: center;"> </div> <p style="text-align: right;">MPL519</p> <p>ex: Alignment deviation correction value on X-axis ey: Alignment deviation correction value on Y-axis Mx: Stylus radius in the X-axis direction (The setting of L3) My: Stylus radius in the Y-axis direction (The setting of L4)</p> <p>Note: The data is set automatically by execution of calibration measurement (270-degree face) with the MMS unit.</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999
L93	Correction value of alignment deviation Y (270-degree face)	<p style="text-align: right;">(For five-surface machining)</p>	
	Program type		M
	Conditions		After stop of movement
	Unit		0.0001 mm/0.00001 inch
	Setting range		0 to ±99999999

Classification		MACHINE		Display title	TABLE SENSOR
Address	Name			Description	
L94	Setting of shifting amount on X- and Y-axes in EIA/ISO tool length measurement			Setting of shifting amount on X- and Y-axes in automatic EIA/ISO tool length measurement 0: Impossible 1: Possible	
	Program type	E			
	Conditions	Immediate			
	Unit	—			
	Setting range	0, 1			
L95	Execution/non-execution of automatic setting of tool offset number in EIA/ISO tool length measurement			Select execution or non-execution of automatic setting of tool offset number in EIA/ISO tool length measurement. 0: Non-execution of automatic setting 1: Execution of automatic setting	
	Program type	E			
	Conditions	Immediate			
	Unit	—			
	Setting range	0, 1			
L96	Shift rate for automatic setting of tool offset number in EIA/ISO tool length measurement			Set a shift rate of tool number for automatic setting of tool offset number in EIA/ISO tool length measurement.	
	Program type	E			
	Conditions	Immediate			
	Unit	—			
	Setting range	0 to 960		Note: This parameter is effective only when L95 is 1.	
L97 L98	—			See L22 .	
	Program type	—			
	Conditions	—			
	Unit	—			
	Setting range	—			

Classification	MACHINE	Display title	TABLE SENSOR
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Address	Name	Description	
L99 to L103	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
L104	Spindle viscous friction coefficient "cms" for auto-pecking of the cutting load detection type	<p>If the "fms" value depends on spindle speeds, specify the gradient.</p> <p>Example: If "fms" is 90000 for an "S" value of 5000 and 140000 for S10000:</p>  <p>Since "cms" = (140000 – 90000) / (10000 – 5000) = 10, set "10" in L104 in the above example.</p>	
	Program type		M
	Conditions		Immediate
	Unit		—
	Setting range		0 to ±9999999

Classification	MACHINE	Display title	TABLE SENSOR
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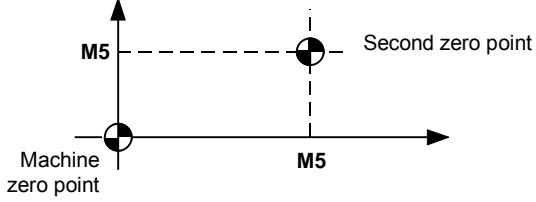
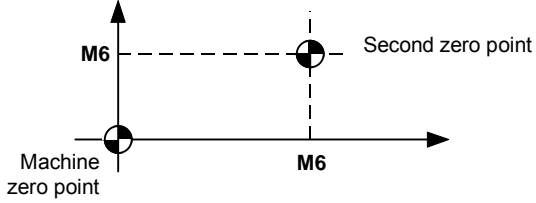
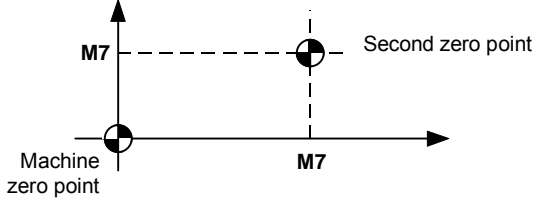
Address	Name	Description
L105	Spindle coulombic friction coefficient "fms" for auto-pecking of the cutting load detection type	
	<p>Set the value where the width of the flat section in the current feedback data matches estimated data.</p> <p>Example: If "fms" is 90000 for an "S" value of 5000 and 140000 for S10000, set "c" in L105.</p>  <p>Calculate "c" from the linear equation "y = (b/a) x + c". Since "c" = 90000 - (10 × 5000) = 40000, set "40000" in L105 in the above example.</p>	
	Program type	M
	Conditions	Immediate
	Setting range	0 to ±9999999
L106	—	
	Not used.	
	Program type	—
	Conditions	—
	Setting range	—
L107	Loft of tool path	
	<p>In the HV machining, loft (on the TRACE or TOOL PATH display) of the tool locus on the following coordinate is made by the EIA/ISO program.</p> <p>0: Loft on the standard coordinates system 1: Loft on the machine coordinates system</p> <p>Note: When 1 (loft on the machine coordinate) is selected, the loft does not correspond to the form made on the MAZATROL coordinates system. However, 1 makes a loft corresponding to the tool movement of the machine.</p> <p style="text-align: right;">(For HV machining)</p>	
	Program type	E
	Conditions	Immediate
	Setting range	0, 1

Classification	MACHINE	Display title	TABLE SENSOR	
Address	Name	Description		
L108	Fixed value			
	Program type			—
	Conditions			—
	Unit			—
	Setting range			0

6-4 FEED VEL. (M)

Classification	MACHINE	Display title	FEED VEL.
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Address	Name	Description	
M1	Rapid feedrate	<p>The feedrate for moving each axis under the G00 command during automatic operation The feedrate for moving each axis in either the manual rapid feed mode or the zero-point return mode</p> <p>Note: Initial zero-point return is performed at the feedrate set in parameter M2.</p>	
	Program type		M·E
	Conditions		After stop of movement
	Unit		1 mm/min (1 deg/min)
	Setting range		0 to 600000
M2	Feedrate for initial zero-point return	<p>The feedrate for moving each axis during initial zero-point return (reference-point return) at power on</p> <p style="text-align: right;">MPL520</p>	
	Program type		M·E
	Conditions		After stop of movement
	Unit		1 mm/min (1 deg/min)
	Setting range		0 to 600000
M3	Cutting feedrate limit	<p>The limit of cutting feedrate during automatic operation Even if a feedrate higher than this parameter setting is specified, the latter governs.</p>	
	Program type		M·E
	Conditions		After stop of movement
	Unit		1 mm/min (1 deg/min)
	Setting range		0 to 600000
M4	Offset of basic coordinates system	<p>The machine coordinating values of the point to which each axis is to move back under G28 command (first zero-point return).</p> <p style="text-align: right;">MPL521</p>	
	Program type		M·E
	Conditions		At power on
	Unit		0.001 mm/0.0001 inch
	Setting range		±99999999

Classification	MACHINE		Display title	FEED VEL.	
Address	Name		Description		
M5	Second zero-point coordinating value		The machine coordinating values of the point to which each axis is to move back under the G30 command (second zero-point return).		
					
	Program type	M·E	MPL521		
	Conditions	After stop of movement			
	Unit	0.001 mm			
Setting range	±99999999				
M6	Third zero-point coordinating value		The machine coordinating values of the point to which each axis is to move back under the G30P3 command (third zero-point return).		
					
	Program type	M·E	MPL521		
	Conditions	After stop of movement			
	Unit	0.001 mm			
Setting range	±99999999				
M7	Fourth zero-point coordinating value		The machine coordinating values of the point to which each axis is to move back under the G30P4 command (fourth zero-point return).		
					
	Program type	M·E	MPL521		
	Conditions	After stop of movement			
	Unit	0.001 mm			
Setting range	±99999999				

Classification	MACHINE	Display title	FEED VEL.
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Address	Name	Description
M8	Maximum software limit specified by manufacturer (+ direction)	
	Program type	M·E
	Conditions	After stop of movement
	Unit	0.001 mm
	Setting range	±99999999
M9	Maximum software limit specified by manufacturer (– direction)	
	Program type	M·E
	Conditions	After stop of movement
	Unit	0.001 mm
	Setting range	±99999999
M10	Command unit	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	1 to 50000
M11	Coding of address of axis	
	Program type	M·E
	Conditions	At power on
	Unit	—
	Setting range	&0 to &7F

The maximum moving zone permissible under the machine specifications
Set the machine coordinate values.

Example:

MPL522

Note:
This parameter is invalid when **M8 = M9**.

Select a unit of command from the following table and set it.

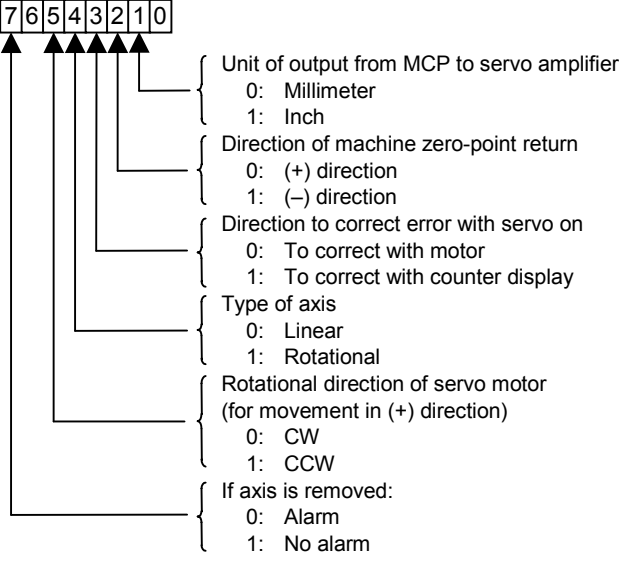
	* micron system				
	1000*	100*	10*	1*	0.1*
—	10000	1000	100	10	1
2° index	20000	2000	200	20	2
5° index	50000	5000	500	50	5

Register the address of each axis in hexadecimal numbers in ASCII code.

	X-axis	Y-axis	Z-axis	4th-axis	5th-axis	6th-axis
Address name	X	Y	Z	A	B	C
Set value	&58	&59	&5A	&41	&42	&43

↑ ↑ ↑
Fixed value

Classification	MACHINE	Display title	FEED VEL.
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Address	Name	Description
M12	Coding of incremental axis	
	Program type	M·E
	Conditions	At power on
	Unit	—
	Setting range	&0 to &7F
M13	Axis control flag	
	 <p style="margin-left: 40px;"> 7 6 5 4 3 2 1 0 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ </p> <ul style="list-style-type: none"> { Unit of output from MCP to servo amplifier 0: Millimeter 1: Inch { Direction of machine zero-point return 0: (+) direction 1: (-) direction { Direction to correct error with servo on 0: To correct with motor 1: To correct with counter display { Type of axis 0: Linear 1: Rotational { Rotational direction of servo motor (for movement in (+) direction) 0: CW 1: CCW { If axis is removed: 0: Alarm 1: No alarm 	
	Program type	M·E
	Conditions	At power on
	Unit	Bit
Setting range	Binary, eight digits	

Classification	MACHINE	Display title	FEED VEL.
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Address	Name	Description																					
M14	Axis control flag	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> ↑ Servo off follow-up 0: Not provided 1: Provided ↑ Processing during removal of the axis 0: Origin position held 1: Origin position not held ↑ Machine zero-point position 0: Fixed point for zero-point return using watchdogs 1: Position existing when power was turned on ↑ Absolute-value detection 0: Invalid 1: Valid </div> </div> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td colspan="2" rowspan="2"></td> <th colspan="2" style="text-align: center;">M14 bit 7</th> </tr> <tr> <th style="text-align: center;">0</th> <th style="text-align: center;">1</th> </tr> <tr> <th rowspan="2" style="text-align: center;">SV17 bit 7</th> <th style="text-align: center;">0</th> <td style="text-align: center;">Dog type</td> <td style="text-align: center;">Simplified detection position</td> </tr> <tr> <th style="text-align: center;">1</th> <td style="text-align: center;">Dog type</td> <td style="text-align: center;">Absolute detection position</td> </tr> </table>	7	6	5	4	3	2	1	0			M14 bit 7		0	1	SV17 bit 7	0	Dog type	Simplified detection position	1	Dog type	Absolute detection position
	7	6	5	4	3	2	1	0															
			M14 bit 7																				
			0	1																			
	SV17 bit 7	0	Dog type	Simplified detection position																			
1		Dog type	Absolute detection position																				
Program type	M·E																						
Conditions	At power on																						
Unit	Bit																						
Setting range	Binary, eight digits																						
M15 M16	—	Not used.																					
	Program type	—																					
	Conditions	—																					
	Unit	—																					
	Setting range	—																					
M17	—	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> </div> <div> <ul style="list-style-type: none"> ↑ 0: Invalid 1: Valid ↑ Linear acceleration/ deceleration ↑ First-order lag ↑ Second-order lag ↑ Exponential acceleration/ linear deceleration ↑ Linear acceleration/ deceleration ↑ First-order lag ↑ Second-order lag ↑ Exponential acceleration/ linear deceleration </div> </div> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">Rapid-feed acceleration/dece- leration type</td> <td style="text-align: center;">Linear acceleration/ deceleration</td> </tr> <tr> <td style="text-align: center;">First-order lag</td> </tr> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">Cutting-feed acceleration/dece- leration type</td> <td style="text-align: center;">Exponential acceleration/ linear deceleration</td> </tr> <tr> <td style="text-align: center;">Linear acceleration/ deceleration</td> </tr> </table>	7	6	5	4	3	2	1	0	Rapid-feed acceleration/dece- leration type	Linear acceleration/ deceleration	First-order lag	Cutting-feed acceleration/dece- leration type	Exponential acceleration/ linear deceleration	Linear acceleration/ deceleration							
	7	6	5	4	3	2	1	0															
	Rapid-feed acceleration/dece- leration type	Linear acceleration/ deceleration																					
		First-order lag																					
	Cutting-feed acceleration/dece- leration type	Exponential acceleration/ linear deceleration																					
Linear acceleration/ deceleration																							
Program type	M·E																						
Conditions	At power on																						
Unit	Bit																						
Setting range	Binary, eight digits																						

Note:
Time constants for each type of acceleration/deceleration control must be set using parameters **N1** through **N6**.

Classification		MACHINE		Display title		FEED VEL.	
Address	Name		Description				
M18	—						
	Program type	M·E					
	Conditions	At power on					
	Unit	Bit					
	Setting range	Binary, eight digits					

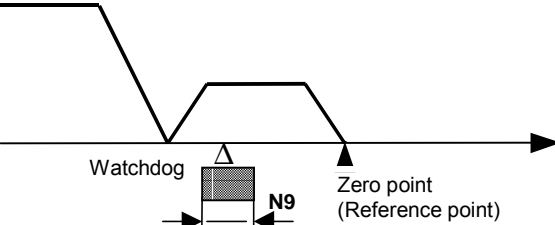
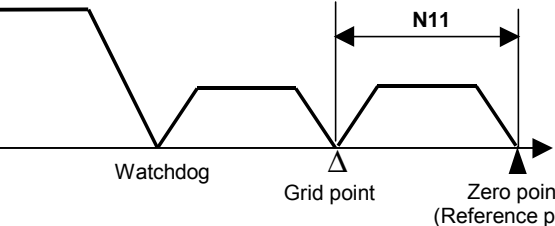
6-5 TIME CONST. (N)

Classification		MACHINE	Display title	TIME CONST.
N1	Time constant for pre-interpolational linear control during rapid feedrate acceleration/deceleration		Set the time constant to obtain acceleration/deceleration of the rapid feed rate for pre-interpolational linear control.	
	Program type	M·E	MPL523	
	Conditions	At power on	Note:	
	Unit	1 msec	This parameter is valid only when bit 0 of M17 is 1.	
Setting range	4 to 1800			
N2	Time constant for pre-interpolational linear control during cutting feedrate acceleration/deceleration		Set the time constant to obtain acceleration/deceleration of the cutting feedrate for pre-interpolational linear control.	
	Program type	M·E	MPL523	
	Conditions	At power on	Note:	
	Unit	1 msec	This parameter is valid only when bit 4 of M17 is 1.	
Setting range	4 to 1800			
N3	Rapid-feed time constant (First-order lag)		First-order lag time constant for rapid-feed acceleration/deceleration	
	Program type	M·E	MPL523	
	Conditions	At power on	Note:	
	Unit	1 msec	This parameter is valid only when either bit 1, 2 or 3 of M17 is 1.	
Setting range	4 to 5000			
N4	—		Not used.	
	Program type	—		
	Conditions	—		
	Unit	—		
	Setting range	—		

Classification	MACHINE	Display title	TIME CONST.
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Address	Name	Description
N5	Cutting-feed time constant (First-order lag)	<p>First-order lag time constant for cutting-feed acceleration/ deceleration</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(First-order lag)</p> </div> <div style="text-align: center;"> <p>(Exponential acceleration/ linear deceleration)</p> </div> </div> <p style="text-align: right;">MPL524</p>
	Program type	M·E
	Conditions	At power on
	Unit	1 msec
	Setting range	0 to 5000
		<p>Note: This parameter is valid only when either bit 5, 6 or 7 of M17 is 1.</p>
N6	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
N7	OT time	During external deceleration, the position loop is disconnected for the time interval set using this parameter and, as a result, the speed becomes zero.
	Program type	M·E
	Conditions	At power on
	Unit	1 msec
	Setting range	1 to 32767
N8	Creeping speed during initial zero-point return	<p>The feedrate at which each axis is moved back to the zero-point (reference point) after the zero-point watchdog LS (limit switch) has turned on in the initial operation after power-on.</p> <div style="text-align: center;"> </div>
	Program type	M·E
	Conditions	After stop of movement
	Unit	1 mm/min (1 deg/min)
	Setting range	1 to 60000

Classification	MACHINE	Display title	TIME CONST.
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Address	Name	Description
N9	Amount of grid ignorance during initial zero-point return	
	Program type	M·E
	Conditions	At power on
	Unit	0.001 mm (0.001°)
	Setting range	0 to 65535
		<p>The spacing at which the grid point is ignored during zero-point return (reference point return in the initial operation after power-on) after the zero-point watchdog LS (limit switch) is turned off. With this parameter, dispersion in position deviations of the zero point can be avoided.</p>  <p style="text-align: right;">MPL526</p> <p>Note: The amount of grid ignorance must not exceed 1 grid spacing.</p>
N10	Grid spacing	
	Program type	M·E
	Conditions	At power on
	Unit	mm (0.001°)
	Setting range	0 to 32767
N11	Zero-point shift amount	
	Program type	M·E
	Conditions	Immediate
	Unit	0.001 mm (0.001°)
	Setting range	0 to 65535
		<p>The distance from the grid point to the actual zero point that exists during zero-point return (reference zero-point return) in the initial operation after power-on.</p>  <p style="text-align: right;">MPL527</p>
N12	Rapid-feed backlash	
	Program type	M·E
	Conditions	At power on
	Unit	0.0005 mm (0.0005°)
	Setting range	±9999
		<p>The backlash amount to be corrected after the axis movement direction has been reversed in either the rapid-feed (G00) mode or manual mode (except handle-pulse feed mode)</p> <p>Note: Setting conditions: N12 < N13</p>

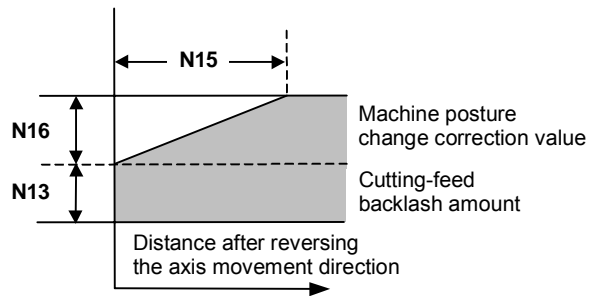
Classification	MACHINE	Display title	TIME CONST.
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Address	Name	Description
N13	Cutting-feed backlash	
	Program type	M·E
	Conditions	At power on
	Unit	0.0005 mm (0.0005°)
	Setting range	±9999
<p>Note: Setting conditions: N12 < N13</p>		
N14	—	
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
N15	Width to which the machine posture change correction is to be applied	
	Program type	M·E
	Conditions	At power on
	Unit	0.0005 mm
	Setting range	0 to 32767
N16	Machine posture change correction value	
	Program type	M·E
	Conditions	At power on
	Unit	0.0005 mm
	Setting range	0 to 65535

The backlash amount to be corrected after the axis movement direction has been reversed in either the cutting-feed (G01) mode or manual handle-pulse feed mode.

Note:
Setting conditions: **N12 < N13**

Not used.



6-6 OTHERS (S)

Classification	MACHINE	Display title	ANOTHER
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Address	Name	Description	
S1 S2	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
S3	Feed forward gain for the MAZAK Precision Rapid Boring Tornado Option	Set for each axis the feed forward gain for acceleration/deceleration before interpolation for the MAZAK Precision Rapid Boring Tornado Option.	
	Program type		M·E
	Conditions		Immediate
	Unit		0.1 %
	Setting range		0 to 1000
S4	Feed forward gain	Set for each axis the feed forward gain for acceleration/deceleration before interpolation.	
	Program type		M·E
	Conditions		Immediate
	Unit		%
	Setting range		0 to 99
S5	Rotational center of the table	Set for each axis the position of the rotational center of the table in the machine coordinates system. Also, set those positions for each machine. <div style="text-align: right;">(Dynamic compensation) (For HV machining)</div>	
	Program type		M·E
	Conditions		At power on
	Unit		0.001 mm/0.0001 inch
	Setting range		0 to 99999999

Classification	MACHINE	Display title	ANOTHER
S6	Absolute position detection parameter		When movement is beyond the length set by this parameter during the power off, it activates the alarm mode.
	Program type	M·E	
	Conditions	—	
	Unit	0.001mm/0.0001inch or 0.001°	
	Setting range	0 to ±99999999	
S7	Upper limit (on Z-axis) of machining range for table rotating machining I		This parameter specifies the range of rotating machining for the table rotating machining I (X-B machining). Set the upper limit (on Z-axis) of the machining range in the machine coordinates system. The machine recognizes that it is prohibited to move beyond this limit in the negative direction. (For HV machining)
	Program type	M·E	
	Conditions	At power on	
	Unit	0.001 mm/0.0001 inch	
	Setting range	0 to ±99999999	
S8 to S12	Reserve		
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	
S13	G00 in-position width		Set the in-position width for G00. The in-position check for G00 is effective when the parameter K103 bit 7 is 1. For utilizing the in-position width of G00, set the in-position width of the servo parameter SV024 to 0 to avoid trouble.
	Program type	M·E	
	Conditions	At power on	
	Unit	0.001 mm/0.0001 inch	
	Setting range	0 to 32767	

6 MACHINE PARAMETER

Classification	MACHINE	Display title	ANOTHER
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Address	Name	Description
S14	G01 in-position width	Set the inposition width for G01. The in-position check for G01 is effective when one of G09 (exact stop check), G61 (exact stop check mode) and the error detection is selected with the parameter K103 bit 7 set to 1. For utilizing the in-position width for G01, set the inposition width of the servo parameter SV024 to 0 to avoid trouble.
	Program type	M·E
	Conditions	At power on
	Unit	0.001 mm/0.0001 inch
	Setting range	0 to 32767
S15	—	Invalid
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
S16	Unbalanced axis torque offset	Set automatically after estimation of the characteristics.
	Program type	M
	Conditions	Immediate
	Unit	—
	Setting range	—

7 DATA I/O PARAMETER

7-1 CMT Parameter (CMT)

Parameter setting

The screenshot shows a dialog box titled "PARAM" with three dropdown menus and two buttons. The first dropdown is labeled "1. BAUDRATE:" and is set to "19200". The second dropdown is labeled "2. SAME WNo.:" and is set to "ALARM". The third dropdown is labeled "3. PORT:" and is set to "COM1". At the bottom of the dialog are "OK" and "CANCEL" buttons.

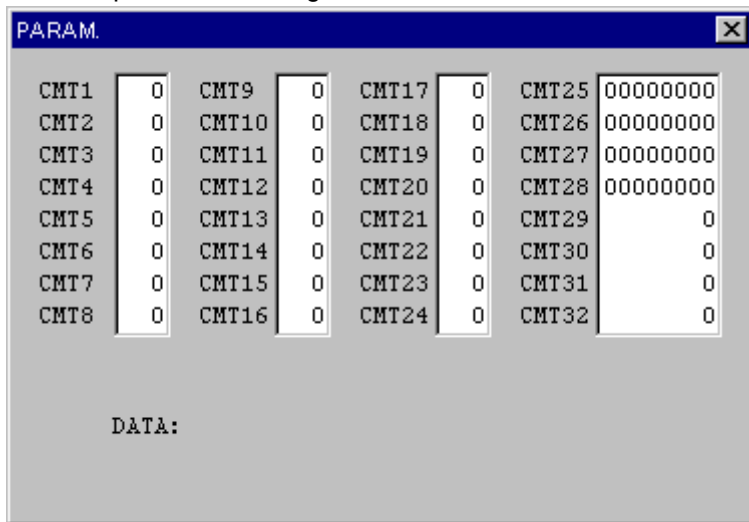
D735S0004E

Classification	DATA I/O	Display title	CMT PARAMETER								
Name		Description									
BAUDRATE		Baud rate for RS-232C interface Set values <table border="1" style="margin-left: 40px;"> <tr><td>110</td><td>4800</td></tr> <tr><td>300</td><td>9600</td></tr> <tr><td>1200</td><td>19200</td></tr> <tr><td>2400</td><td></td></tr> </table>		110	4800	300	9600	1200	19200	2400	
110	4800										
300	9600										
1200	19200										
2400											
Program type	M-E										
Conditions	At I/O startup										
Unit	—										
Setting range	110 to 19200										
SAME WNo.		Type of processing to be executed if the machining program of an existing work number is to be loaded <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Set values</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>ALARM</td> <td>Issues an alarm if the received work number already exists.</td> </tr> <tr> <td>OVER WRITE</td> <td>Overrides the program if the received work number already exists.</td> </tr> </tbody> </table>		Set values	Description	ALARM	Issues an alarm if the received work number already exists.	OVER WRITE	Overrides the program if the received work number already exists.		
Set values	Description										
ALARM	Issues an alarm if the received work number already exists.										
OVER WRITE	Overrides the program if the received work number already exists.										
Program type	M-E										
Conditions	At I/O startup										
Unit	—										
Setting range	—										

Classification	DATA I/O	Display title	CMT PARAMETER
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Name		Description								
PORT		CMT port selection								
		<table border="1"> <thead> <tr> <th>Set values</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>COM1</td> <td>CF22 serial ch3</td> </tr> <tr> <td>COM2</td> <td>CF22 serial ch4</td> </tr> <tr> <td>COM3</td> <td>CF21 serial ch1</td> </tr> </tbody> </table>	Set values	Description	COM1	CF22 serial ch3	COM2	CF22 serial ch4	COM3	CF21 serial ch1
		Set values	Description							
		COM1	CF22 serial ch3							
		COM2	CF22 serial ch4							
COM3	CF21 serial ch1									
Program type	M-E									
Conditions	At I/O startup									
Unit	—									
Setting range	—									

Detailed parameter setting



D735S0005E

Classification	DATA I/O	Display title	CMT PARAMETER
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Address	Name	Description
CMT1 to CMT24	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—

Classification	DATA I/O	Display title	CMT PARAMETER
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Address	Name	Description								
CMT25	—	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15px;">7</td><td style="width: 15px;">6</td><td style="width: 15px;">5</td><td style="width: 15px;">4</td><td style="width: 15px;">3</td><td style="width: 15px;">2</td><td style="width: 15px;">1</td><td style="width: 15px;">0</td> </tr> </table> <div style="margin-top: 5px;"> </div> </div> <div style="font-size: 2em; vertical-align: middle;">}</div> <div style="margin-left: 10px;"> <p>Type of processing to be executed if the tool quantity data within the NC memory mismatches that of the CMT</p> <p>0 : Issues an alarm if the tool quantity data mismatches.</p> <p>1 : Executes loading forcibly, even if the tool quantity data mismatches.</p> </div> </div>	7	6	5	4	3	2	1	0
	7		6	5	4	3	2	1	0	
	Program type		M·E							
	Conditions		At I/O startup							
	Unit		Bit							
Setting range	Binary, eight digits									
CMT26 to CMT32	—	Not used.								
	Program type		—							
	Conditions		—							
	Unit		—							
	Setting range		—							

7-2 TAPE Parameter (TAP)

Parameter setting

D735S0006E

Classification	DATA I/O	Display title	TAP PARAMETER
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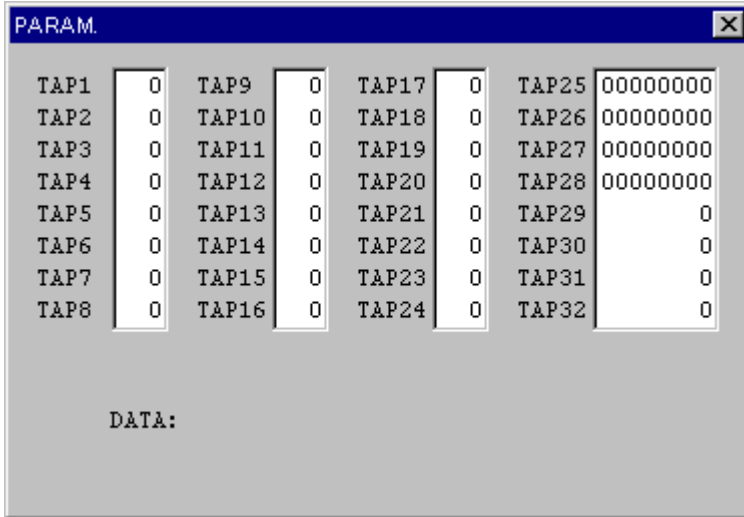
Name		Description								
BAUDRATE		Baud rate for RS-232C interface Set values								
Program type	M:E	<table border="1"> <tr><td>110</td><td>4800</td></tr> <tr><td>300</td><td>9600</td></tr> <tr><td>1200</td><td>19200</td></tr> <tr><td>2400</td><td>38400</td></tr> </table>	110	4800	300	9600	1200	19200	2400	38400
110	4800									
300	9600									
1200	19200									
2400	38400									
Conditions	At I/O startup									
Unit	—									
Setting range	110 to 38400									
DATA BIT		Number of data bits (parameter for RS-232C interface initialization) Set values								
Program type	M:E	<table border="1"> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> <tr><td>8</td></tr> </table>	5	6	7	8				
5										
6										
7										
8										
Conditions	At I/O startup									
Unit	—									
Setting range	5 to 8									

Classification		DATA I/O	Display title		TAP PARAMETER								
Name			Description										
PARITY			Parity check (parameter for RS-232C interface initialization)										
			Set values										
			<table border="1"> <tr><td>NONE</td></tr> <tr><td>ODD</td></tr> <tr><td>EVEN</td></tr> </table>			NONE	ODD	EVEN					
NONE													
ODD													
EVEN													
Program type	M·E												
Conditions	At I/O startup												
Unit	—												
Setting range	—												
STOP BIT			Number of stop bits (parameter for RS-232C interface initialization)										
			Set values										
			<table border="1"> <tr><td>1</td></tr> <tr><td>1.5</td></tr> <tr><td>2</td></tr> </table>			1	1.5	2					
1													
1.5													
2													
Program type	M·E												
Conditions	At I/O startup												
Unit	—												
Setting range	—												
HAND SHAKE			This parameter is used to select the method of handshaking to control the state of data transfer between the NC system and connected instrument.										
			<table border="1"> <thead> <tr> <th>Set values</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>RTS/CTS</td> <td>Complies with device connection RTS/CTS.</td> </tr> <tr> <td>NONE</td> <td>No control</td> </tr> <tr> <td>DC CONTROL</td> <td>Complies with control code DC1 through DC4</td> </tr> </tbody> </table>			Set values	Description	RTS/CTS	Complies with device connection RTS/CTS.	NONE	No control	DC CONTROL	Complies with control code DC1 through DC4
Set values	Description												
RTS/CTS	Complies with device connection RTS/CTS.												
NONE	No control												
DC CONTROL	Complies with control code DC1 through DC4												
Program type	M·E												
Conditions	At I/O startup												
Unit	—												
Setting range	—												
WAIT TIME			The waiting time for replies from the connected instrument during inputting or outputting. An alarm occurs if this time elapses following the final reply.										
Program type	M·E												
Conditions	At I/O startup												
Unit	0.1 sec.												
Setting range	0 to 65535												

Classification	DATA I/O	Display title	TAP PARAMETER
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Name		Description									
FORMAT		Selection of paper tape puncher output code <table border="1" style="margin-left: 20px; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Set values</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">ISO</td> <td>Paper tape punching in ISO code</td> </tr> <tr> <td style="text-align: center;">EIA</td> <td>Paper tape punching in EIA code</td> </tr> <tr> <td style="text-align: center;">ASCII</td> <td>Paper tape punching in ASCII code</td> </tr> </tbody> </table>		Set values	Description	ISO	Paper tape punching in ISO code	EIA	Paper tape punching in EIA code	ASCII	Paper tape punching in ASCII code
		Set values	Description								
		ISO	Paper tape punching in ISO code								
		EIA	Paper tape punching in EIA code								
		ASCII	Paper tape punching in ASCII code								
Program type	M·E										
Conditions	At I/O startup										
Unit	—										
Setting range	—										
SAME WNo.		Type of processing to be executed if the machining program of an existing work number is to be loaded <table border="1" style="margin-left: 20px; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Set values</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">ALARM</td> <td>Issues an alarm if the received work number already exists.</td> </tr> <tr> <td style="text-align: center;">OVER WRITE</td> <td>Overrides the program if the received work number already exists.</td> </tr> </tbody> </table>		Set values	Description	ALARM	Issues an alarm if the received work number already exists.	OVER WRITE	Overrides the program if the received work number already exists.		
		Set values	Description								
		ALARM	Issues an alarm if the received work number already exists.								
		OVER WRITE	Overrides the program if the received work number already exists.								
		Program type	M·E								
Conditions	At I/O startup										
Unit	—										
Setting range	—										
PORT		Tape port selection <table border="1" style="margin-left: 20px; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">Set values</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">COM1</td> <td>CF22 serial ch3</td> </tr> <tr> <td style="text-align: center;">COM2</td> <td>CF22 serial ch4</td> </tr> <tr> <td style="text-align: center;">COM3</td> <td>CF21 serial ch1</td> </tr> </tbody> </table>		Set values	Description	COM1	CF22 serial ch3	COM2	CF22 serial ch4	COM3	CF21 serial ch1
		Set values	Description								
		COM1	CF22 serial ch3								
		COM2	CF22 serial ch4								
		COM3	CF21 serial ch1								
Program type	M·E										
Conditions	At I/O startup										
Unit	—										
Setting range	—										

Detailed parameter setting



D735S0007E

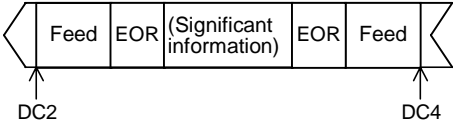
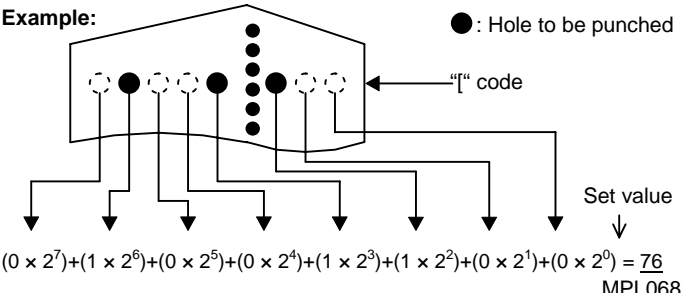
Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description														
TAP1	Type of terminator	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 30%;">Set values</th> <th>Terminator</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0</td><td>Without terminator</td></tr> <tr><td style="text-align: center;">1</td><td>EOB or EOR</td></tr> <tr><td style="text-align: center;">2</td><td>EOB only</td></tr> <tr><td style="text-align: center;">3</td><td>EOR only</td></tr> <tr><td style="text-align: center;">4</td><td>One character of your choice</td></tr> <tr><td style="text-align: center;">5</td><td>Two characters of your choice</td></tr> </tbody> </table>	Set values	Terminator	0	Without terminator	1	EOB or EOR	2	EOB only	3	EOR only	4	One character of your choice	5	Two characters of your choice
	Set values		Terminator													
	0		Without terminator													
	1		EOB or EOR													
	2		EOB only													
3	EOR only															
4	One character of your choice															
5	Two characters of your choice															
Program type	M·E															
Conditions	At I/O startup															
Unit	—															
Setting range	0 to 5															
TAP2	Terminator code 1	Effective only when TAP1 is set to 4 or 5.														
	Program type		M·E													
	Conditions		At I/O startup													
	Unit		—													
	Setting range		0 to 255													

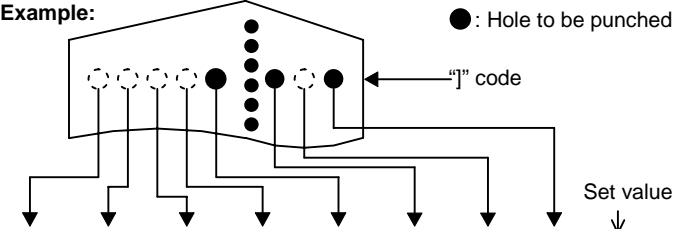
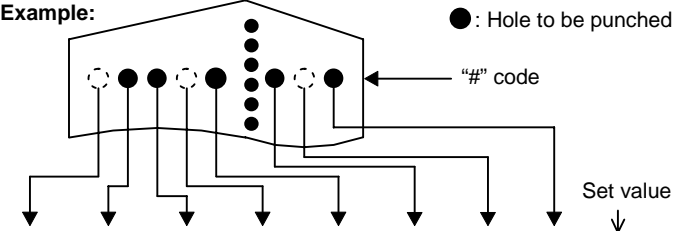
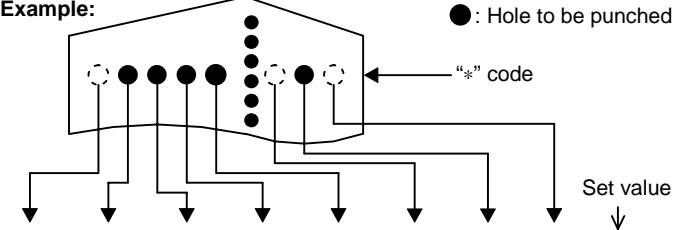
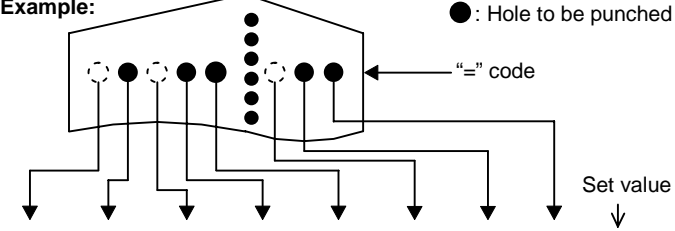
Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description																													
TAP3	Terminator code 2	Effective only when TAP1 is set to 5.																													
	Program type		M·E																												
	Conditions		At I/O startup																												
	Unit		—																												
	Setting range		0 to 255																												
TAP4	Output of CR during ISO code punching	This parameter is used to specify whether or not CR is to be placed in front of LF (separation of blocks) during ISO code punching. 0: No placement of CR 1: Placement of CR																													
	Program type		M·E																												
	Conditions		At I/O startup																												
	Unit		—																												
	Setting range		0, 1																												
TAP5	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. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 15%;">Set values</th> <th style="width: 15%;">Parity</th> <th style="width: 70%;">Hole-punching pattern of DC3 code</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">No assignment</td> <td style="text-align: center;"> <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> </tr> </table> </td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Assignment</td> <td style="text-align: center;"> <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> </tr> </table> </td> </tr> </tbody> </table>	Set values	Parity	Hole-punching pattern of DC3 code	0	No assignment	<table style="border-collapse: collapse; width: 100%;"> <tr> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> </tr> </table>	•	•	•	•	•	•	•	•	•	•	1	Assignment	<table style="border-collapse: collapse; width: 100%;"> <tr> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> </tr> </table>	•	•	•	•	•	•	•	•	•	•
	Set values		Parity	Hole-punching pattern of DC3 code																											
	0		No assignment	<table style="border-collapse: collapse; width: 100%;"> <tr> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> </tr> </table>	•	•	•	•	•	•	•	•	•	•																	
	•		•	•	•	•	•	•	•	•	•																				
	1		Assignment	<table style="border-collapse: collapse; width: 100%;"> <tr> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> <td style="width: 10%; text-align: center;">•</td> </tr> </table>	•	•	•	•	•	•	•	•	•	•																	
•	•	•	•	•	•	•	•	•	•																						
Program type	M·E																														
Conditions	At I/O startup																														
Setting range	0, 1																														
		Note: This parameter is valid only when HAND SHAKE is set to DC CONTROL.																													

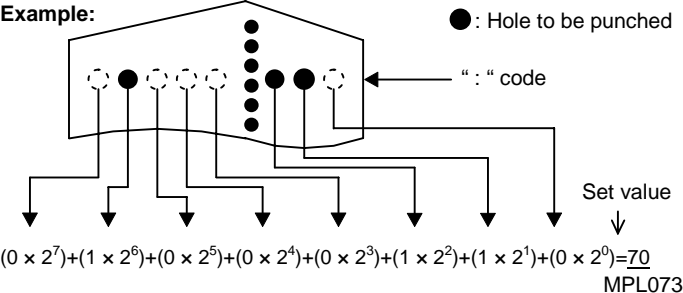
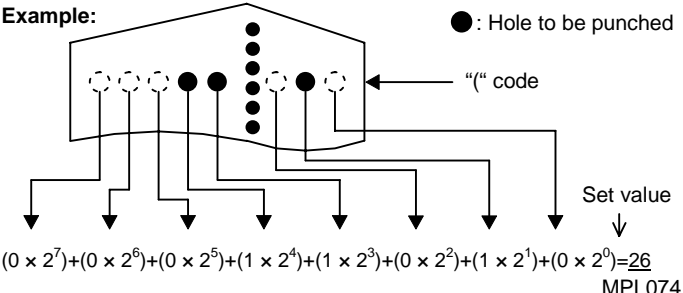
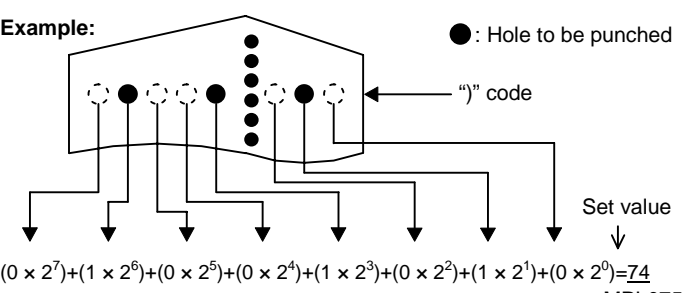
Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description										
TAP6	Feed section DC code output	<p>Select whether or not DC2 and DC4 codes are to be output to the feed sections which will be generated at the beginning and end of paper tape punching.</p> <p>Example:</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Set values</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Neither DC2 nor DC4 is output.</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Only DC2 is output.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Only DC4 is output.</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Both DC2 and DC4 are output.</td> </tr> </tbody> </table> <p>Note: This parameter is valid only when HAND SHAKE is set to DC CONTROL.</p>	Set values	Description	0	Neither DC2 nor DC4 is output.	1	Only DC2 is output.	2	Only DC4 is output.	3	Both DC2 and DC4 are output.
	Set values	Description										
	0	Neither DC2 nor DC4 is output.										
	1	Only DC2 is output.										
	2	Only DC4 is output.										
3	Both DC2 and DC4 are output.											
Program type	M·E											
Conditions	At I/O startup											
Unit	—											
Setting range	0 to 3											
TAP7 TAP8	—	Not used.										
	Program type	—										
	Conditions	—										
	Unit	—										
	Setting range	—										
TAP9	“I” code for paper tape reader/puncher for EIA	<p>This parameter is used to set a hole-punching pattern for the character code “I” onto a paper tape reader/puncher using EIA.</p> <p>Set an eight-digit binary number in decimal form.</p> <p>Example:</p>  <p style="text-align: right;">● : Hole to be punched</p> <p style="text-align: center;">← “I” code</p> <p style="text-align: right;">Set value ↓ $(0 \times 2^7) + (1 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (0 \times 2^0) = 76$ MPL068</p>										
	Program type	M·E										
	Conditions	At I/O startup										
	Unit	—										
	Setting range	0 to 255										

Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description
TAP10	"J" code for paper tape reader/puncher for EIA	<p>This parameter is used to set a hole-punching pattern for the character code "J" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form.</p> <p>Example:</p>  <p style="text-align: right;">● : Hole to be punched</p> <p style="text-align: right;">← "J" code</p> <p style="text-align: right;">Set value ↓</p> <p style="text-align: right;">$(0 \times 2^7) + (0 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) = 13$ MPL069</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255
TAP11	"#" code for paper tape reader/puncher for EIA	<p>This parameter is used to set a hole-punching pattern for the character code "#" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form.</p> <p>Example:</p>  <p style="text-align: right;">● : Hole to be punched</p> <p style="text-align: right;">← "#" code</p> <p style="text-align: right;">Set value ↓</p> <p style="text-align: right;">$(0 \times 2^7) + (1 \times 2^6) + (1 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) = 109$ MPL070</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255
TAP12	" " code for paper tape reader/puncher for EIA	<p>This parameter is used to set a hole-punching pattern for the character code " " onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form.</p> <p>Example:</p>  <p style="text-align: right;">● : Hole to be punched</p> <p style="text-align: right;">← " " code</p> <p style="text-align: right;">Set value ↓</p> <p style="text-align: right;">$(0 \times 2^7) + (1 \times 2^6) + (1 \times 2^5) + (1 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (0 \times 2^0) = 122$ MPL071</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255
TAP13	"=" code for paper tape reader/puncher for EIA	<p>This parameter is used to set a hole-punching pattern for the character code "=" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form.</p> <p>Example:</p>  <p style="text-align: right;">● : Hole to be punched</p> <p style="text-align: right;">← "=" code</p> <p style="text-align: right;">Set value ↓</p> <p style="text-align: right;">$(0 \times 2^7) + (1 \times 2^6) + (0 \times 2^5) + (1 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 91$ MPL072</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255

Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description
TAP14	":" code for paper tape reader/puncher for EIA	This parameter is used to set a hole-punching pattern for the character code ":" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: 
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255
TAP15	"(" code for paper tape reader/puncher for EIA	This parameter is used to set a hole-punching pattern for the character code "(" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: 
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255
TAP16	")" code for paper tape reader/puncher for EIA	This parameter is used to set a hole-punching pattern for the character code ")" onto a paper tape reader/puncher using EIA. Set an eight-digit binary number in decimal form. Example: 
	Program type	M·E
	Conditions	At I/O startup
	Unit	—
	Setting range	0 to 255
TAP17	Selection of tape operation protocol	To select protocol of tape operation 0: To select usual tape operation 5: HD operation
	Program type	M·E
	Conditions	At power on
	Unit	—
	Setting range	0, 5

Classification	DATA I/O	Display title	TAP PARAMETER
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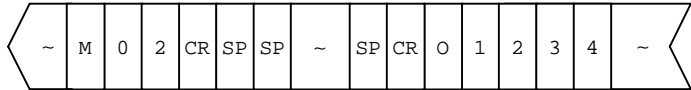
Address	Name	Description												
TAP18 to TAP20	Program end code of MAZATROL program DC control function	For paper tape reader/puncher, set a character string output to the program end of MAZATROL program by hexadecimal numbers of ASCII code. For example, when a character string of END is output to the program end: <table border="1" style="margin: 10px auto;"> <thead> <tr> <th></th> <th>TAP18</th> <th>TAP19</th> <th>TAP20</th> </tr> </thead> <tbody> <tr> <td>Character string</td> <td>E</td> <td>N</td> <td>D</td> </tr> <tr> <td>Set value</td> <td>45</td> <td>4E</td> <td>44</td> </tr> </tbody> </table> <p style="text-align: right;">(MAZATROL program DC control)</p>		TAP18	TAP19	TAP20	Character string	E	N	D	Set value	45	4E	44
			TAP18	TAP19	TAP20									
	Character string		E	N	D									
	Set value		45	4E	44									
	Program type		M											
Conditions	At I/O startup													
Unit	ASCII													
Setting range	Hexadecimal number													
TAP21 to TAP24	—	Not used.												
	Program type		—											
	Conditions		—											
	Unit		—											
	Setting range		—											
TAP25	Paper tape puncher parity-V check	<table border="1" style="margin: 10px auto;"> <tr> <td style="text-align: center;">7</td><td style="text-align: center;">6</td><td style="text-align: center;">5</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">2</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td> </tr> </table> <p style="text-align: right;"> { 0: No parity-V check during paper tape reading 1: Parity-V check during paper tape reading </p>	7	6	5	4	3	2	1	0				
	7		6	5	4	3	2	1	0					
	Program type		M·E											
	Conditions		At I/O startup											
	Unit		Bit											
Setting range	Binary, eight digits													
TAP26	Bit parameter related to paper tape reader/puncher	<table border="1" style="margin: 10px auto;"> <tr> <td style="text-align: center;">7</td><td style="text-align: center;">6</td><td style="text-align: center;">5</td><td style="text-align: center;">4</td><td style="text-align: center;">3</td><td style="text-align: center;">2</td><td style="text-align: center;">1</td><td style="text-align: center;">0</td> </tr> </table> <p style="text-align: right;"> { Data transfer of a paper tape program which have been punched by M2 0: Tape loading impossible 1: Tape loading possible { Input/output of the program name on punching/reading of a paper tape 0: No 1: Yes { Number of digits of work No. output 0: 8 digits 1: 4 digits { Input/output of material data on during punching/reading 0: Output of ASCII data in hexadecimal notation 1: Output in characters </p>	7	6	5	4	3	2	1	0				
	7		6	5	4	3	2	1	0					
	Program type		E											
	Conditions		At I/O startup											
	Unit		Bit											
Setting range	Binary, eight digits													

Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description								
TAP27		<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> </table> <div style="margin-top: 5px;"> ↑ </div> </div> <div> <p>To specify whether or not M99 is to be set as the program end code in reading of paper tape 0: Set as program end 1: Not set as program end</p> <p>To specify whether or not M02 is to be set as the program end code in reading of paper tape 0: Set as program end 1: Not set as program end</p> <p>To specify whether or not M30 is to be set as the program end code in reading of paper tape 0: Set as program end 1: Not set as program end</p> <p>To recognize the code "O" (or "O:") as the program end in reading of multiple programs (on one paper tape) 0: Yes 1: No</p> </div> </div>	7	6	5	4	3	2	1	0
		7	6	5	4	3	2	1	0	
		Bit parameter related to program end code (M) for paper tape reader								
		Program type	E							
		Conditions	At I/O startup							
Unit	Bit									
Setting range	Binary, eight digits									
TAP28	-	Not used.								
		Program type	-							
		Conditions	-							
		Unit	-							
		Setting range	-							
TAP29	Number of characters in feed section for paper tape puncher	The number of characters in NULL (feed) that are to be punched at the beginning and end of paper tape Example:								
		<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;"> <p style="margin: 0;">TAP29 characters</p> </div> </div>								
		Program type	E							
		Conditions	At I/O startup							
		Unit	1 character							
Setting range	0 to 65535									

MPL078

Classification	DATA I/O	Display title	TAP PARAMETER
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Address	Name	Description
TAP30	Number of characters in the space between O-number and program for paper tape puncher	<p>The total number of space-characters that are punched out between O-number and program section.</p>  <p style="text-align: center;">TAP30 characters</p> <p style="text-align: right;">MPL079</p>
	Program type	E
	Conditions	At I/O startup
	Unit	1 character
	Setting range	0 to 65535
TAP31	Number of characters in the space between programs for paper tape puncher	<p>The total number of space-characters that are punched out between programs when more than one program are punched onto paper tape.</p>  <p style="text-align: center;">Program ← TAP31 characters → Program</p> <p style="text-align: right;">MPL080</p>
	Program type	E
	Conditions	At I/O startup
	Unit	1 character
	Setting range	0 to 65535
TAP32	-	Not used.
	Program type	-
	Conditions	-
	Unit	-
	Setting range	-

7-3 DNC Parameter (DNC)

Parameter setting

The screenshot shows a dialog box titled "PARAM" with the following settings:

- 1. BAUDRATE: 19200
- 2. DATA BIT: 8
- 3. PARITY: NONE
- 4. STOP BIT: 2
- 5. WAIT TIME: 5.0 sec
- 6. SAME WNo.: ALARM
- 7. PORT: COM1

Buttons for "OK" and "CANCEL" are visible at the bottom.

D735S0008E

Classification	DATA I/O	Display title	DNC PARAMETER
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Name	Description																		
<table border="1"> <tr> <td style="width: 150px;">BAUDRATE</td> <td></td> </tr> <tr> <td>Program type</td> <td>M-E</td> </tr> <tr> <td>Conditions</td> <td>At I/O startup</td> </tr> <tr> <td>Unit</td> <td>—</td> </tr> <tr> <td>Setting range</td> <td>110 to 19200</td> </tr> </table>	BAUDRATE		Program type	M-E	Conditions	At I/O startup	Unit	—	Setting range	110 to 19200	<p>Baud rate for RS-232C interface</p> <p>Set values</p> <table border="1"> <tr><td>110</td><td>4800</td></tr> <tr><td>300</td><td>9600</td></tr> <tr><td>1200</td><td>19200</td></tr> <tr><td>2400</td><td></td></tr> </table>	110	4800	300	9600	1200	19200	2400	
BAUDRATE																			
Program type	M-E																		
Conditions	At I/O startup																		
Unit	—																		
Setting range	110 to 19200																		
110	4800																		
300	9600																		
1200	19200																		
2400																			
<table border="1"> <tr> <td style="width: 150px;">DATA BIT</td> <td></td> </tr> <tr> <td>Program type</td> <td>E</td> </tr> <tr> <td>Conditions</td> <td>At I/O startup</td> </tr> <tr> <td>Unit</td> <td>—</td> </tr> <tr> <td>Setting range</td> <td>5 to 8</td> </tr> </table>	DATA BIT		Program type	E	Conditions	At I/O startup	Unit	—	Setting range	5 to 8	<p>Number of data bits (parameter for RS-232C interface initialization)</p> <p>Set values</p> <table border="1"> <tr><td>5</td></tr> <tr><td>6</td></tr> <tr><td>7</td></tr> <tr><td>8</td></tr> </table>	5	6	7	8				
DATA BIT																			
Program type	E																		
Conditions	At I/O startup																		
Unit	—																		
Setting range	5 to 8																		
5																			
6																			
7																			
8																			

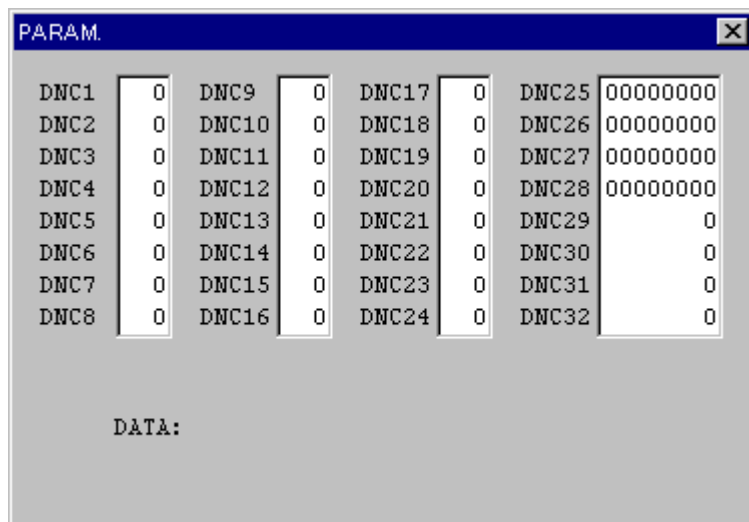
Classification	DATA I/O	Display title	DNC PARAMETER
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Name	Description														
<p>PARITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Program type</td> <td style="text-align: center;">E</td> </tr> <tr> <td>Conditions</td> <td style="text-align: center;">At I/O startup</td> </tr> <tr> <td>Unit</td> <td style="text-align: center;">—</td> </tr> <tr> <td>Setting range</td> <td style="text-align: center;">—</td> </tr> </table>	Program type	E	Conditions	At I/O startup	Unit	—	Setting range	—	<p>Parity check (parameter for RS-232C interface initialization)</p> <p>Set values</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr><td style="text-align: center;">NONE</td></tr> <tr><td style="text-align: center;">ODD</td></tr> <tr><td style="text-align: center;">EVEN</td></tr> </table>	NONE	ODD	EVEN			
Program type	E														
Conditions	At I/O startup														
Unit	—														
Setting range	—														
NONE															
ODD															
EVEN															
<p>STOP BIT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Program type</td> <td style="text-align: center;">E</td> </tr> <tr> <td>Conditions</td> <td style="text-align: center;">At I/O startup</td> </tr> <tr> <td>Unit</td> <td style="text-align: center;">—</td> </tr> <tr> <td>Setting range</td> <td style="text-align: center;">—</td> </tr> </table>	Program type	E	Conditions	At I/O startup	Unit	—	Setting range	—	<p>Number of stop bits (parameter for RS-232C interface initialization)</p> <p>Set values</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">1.5</td></tr> <tr><td style="text-align: center;">2</td></tr> </table>	1	1.5	2			
Program type	E														
Conditions	At I/O startup														
Unit	—														
Setting range	—														
1															
1.5															
2															
<p>WAIT TIME</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Program type</td> <td style="text-align: center;">E</td> </tr> <tr> <td>Conditions</td> <td style="text-align: center;">At I/O startup</td> </tr> <tr> <td>Unit</td> <td style="text-align: center;">0.1 sec.</td> </tr> <tr> <td>Setting range</td> <td style="text-align: center;">0 to 65535</td> </tr> </table>	Program type	E	Conditions	At I/O startup	Unit	0.1 sec.	Setting range	0 to 65535	<p>The waiting time for replies from the connected instrument during inputting or outputting. An alarm occurs if this time elapses following the final reply.</p>						
Program type	E														
Conditions	At I/O startup														
Unit	0.1 sec.														
Setting range	0 to 65535														
<p>SAME WNo.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Program type</td> <td style="text-align: center;">E</td> </tr> <tr> <td>Conditions</td> <td style="text-align: center;">At I/O startup</td> </tr> <tr> <td>Unit</td> <td style="text-align: center;">—</td> </tr> <tr> <td>Setting range</td> <td style="text-align: center;">—</td> </tr> </table>	Program type	E	Conditions	At I/O startup	Unit	—	Setting range	—	<p>Type of processing to be executed if the machining program of an existing work number is to be loaded</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Set values</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">ALARM</td> <td>Issues an alarm if the received work number already exists.</td> </tr> <tr> <td style="text-align: center;">OVER WRITE</td> <td>Overrides the program if the received work number already exists.</td> </tr> </tbody> </table>	Set values	Description	ALARM	Issues an alarm if the received work number already exists.	OVER WRITE	Overrides the program if the received work number already exists.
Program type	E														
Conditions	At I/O startup														
Unit	—														
Setting range	—														
Set values	Description														
ALARM	Issues an alarm if the received work number already exists.														
OVER WRITE	Overrides the program if the received work number already exists.														

Classification	DATA I/O	Display title	DNC PARAMETER
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Name		Description									
PORT		DNC port selection									
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Set values</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">COM1</td> <td>CF22 serial ch3</td> </tr> <tr> <td style="text-align: center;">COM2</td> <td>CF22 serial ch4</td> </tr> <tr> <td style="text-align: center;">COM3</td> <td>CF21 serial ch1</td> </tr> </tbody> </table>		Set values	Description	COM1	CF22 serial ch3	COM2	CF22 serial ch4	COM3	CF21 serial ch1
		Set values	Description								
		COM1	CF22 serial ch3								
		COM2	CF22 serial ch4								
COM3	CF21 serial ch1										
Program type	E										
Conditions	At I/O startup										
Unit	—										
Setting range	—										

Detailed parameter setting



D735S0009E

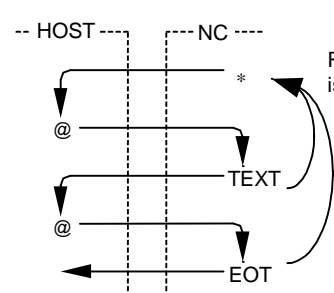
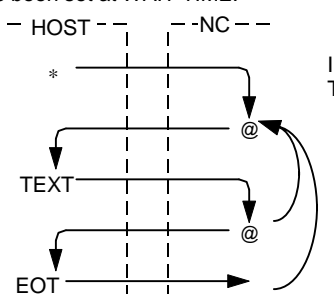
Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description																
DNC1	Type of terminator		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Set values</th> <th style="text-align: center;">Terminator</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Without terminator</td> </tr> <tr> <td style="text-align: center;">1</td> <td>EOB or EOR</td> </tr> <tr> <td style="text-align: center;">2</td> <td>EOB only</td> </tr> <tr> <td style="text-align: center;">3</td> <td>EOR only</td> </tr> <tr> <td style="text-align: center;">4</td> <td>One character of your choice</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Two characters of your choice</td> </tr> </tbody> </table>		Set values	Terminator	0	Without terminator	1	EOB or EOR	2	EOB only	3	EOR only	4	One character of your choice	5	Two characters of your choice
	Set values	Terminator																
	0	Without terminator																
	1	EOB or EOR																
	2	EOB only																
3	EOR only																	
4	One character of your choice																	
5	Two characters of your choice																	
Program type	E																	
Conditions	At I/O startup																	
Unit	—																	
Setting range	0 to 5																	

Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description																													
DNC2	Terminator code 1	Effective only when DNC1 is set to 4 or 5.																													
	Program type		E																												
	Conditions		At I/O startup																												
	Unit		—																												
	Setting range		0 to 255																												
DNC3	Terminator code 2	Effective only when DNC1 is set to 5.																													
	Program type		E																												
	Conditions		At I/O startup																												
	Unit		—																												
	Setting range		0 to 255																												
DNC4	—	Not used.																													
	Program type		—																												
	Conditions		—																												
	Unit		—																												
	Setting range		—																												
DNC5	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. <table border="1" style="margin: 10px auto; width: 80%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Set values</th> <th style="width: 15%;">Parity</th> <th style="width: 70%;">Hole-punching pattern of DC3 code</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">No assignment</td> <td style="text-align: center;"> <table style="border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">•</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> </tr> </table> </td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Assignment</td> <td style="text-align: center;"> <table style="border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">•</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> </tr> </table> </td> </tr> </tbody> </table>	Set values	Parity	Hole-punching pattern of DC3 code	0	No assignment	<table style="border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">•</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> </tr> </table>				●	•				●	●	1	Assignment	<table style="border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">•</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> </tr> </table>	●			●	•				●	●
	Set values		Parity	Hole-punching pattern of DC3 code																											
	0		No assignment	<table style="border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">•</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> </tr> </table>				●	•				●	●																	
					●	•				●	●																				
	1		Assignment	<table style="border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">•</td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black;"></td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> <td style="width: 15px; height: 15px; border: 1px solid black; text-align: center;">●</td> </tr> </table>	●			●	•				●	●																	
●			●	•				●	●																						
Program type	E																														
Conditions	At I/O startup																														
Unit	—																														
Setting range	0, 1																														

Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description
DNC6 to DNC8	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
DNC9	Number of NC transmission retries during DNC file transfer	<p>This parameter is used to set the number of times that the * code or TEXT is to be repeatedly transmitted to a host system in case that the @ code is not sent from the host system within the waiting time which has been set at WAIT TIME.</p>  <p style="text-align: right;">MPL081</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	Number of times
	Setting range	0 to 255
DNC10	Number of NC reception retries during DNC file transfer	<p>This parameter is used to set the number of times that the @ code is to be repeatedly transmitted to a host system in the case that the EOT code or TEXT from the host system is not received within the waiting time which has been set at WAIT TIME.</p>  <p style="text-align: right;">MPL082</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	Number of times
	Setting range	0 to 255
DNC11	Number of NC transmission/reception retries during DNC command message transfer	<p>This parameter is used to set the number of times that transmission/reception of command messages is to be repeated in the case that it is not correctly performed.</p> <p>This parameter has almost the same meaning as that parameters DNC9 and DNC10, except that command messages are interchanged in the case of DNC11 and files are interchanged in the case of DNC9 and DNC10.</p>
	Program type	M·E
	Conditions	At I/O startup
	Unit	Number of times
	Setting range	0 to 255

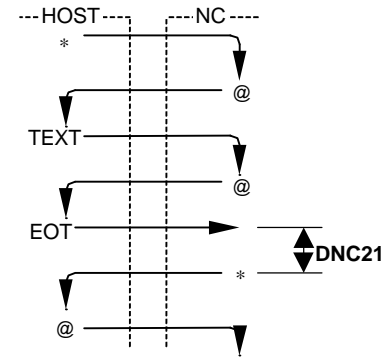
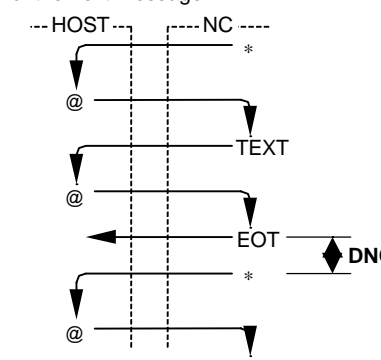
Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description
DNC12	@ waiting time during DNC transmission	
	Program type	M·E
	Conditions	At I/O startup
	Unit	0.1 sec.
	Setting range	0 to 255
		The NC waiting time from transmission of * or TEXT to reception of @ from the host system. Note: See the description of parameter DNC9 . MPL083
DNC13	, TEXT waiting time during DNC transmission	
	Program type	M·E
	Conditions	At I/O startup
	Unit	0.1 sec.
	Setting range	0 to 255
		The NC waiting time from transmission of @ or reception of EOT to reception of * or TEXT from the host system. Note: See the description of parameter DNC10 . MPL084
DNC14	EOT waiting time during DNC transmission	
	Program type	M·E
	Conditions	At I/O startup
	Unit	0.1 sec.
	Setting range	0 to 255
		The NC waiting time from transmission of @ to reception of EOT from the host system. Note: See the description of parameter DNC10 . MPL085
DNC15	NC stop time after reception of !	
	Program type	M·E
	Conditions	At I/O startup
	Unit	0.1 sec.
	Setting range	0 to 255
		The NC stop time from reception of ! from the host system to transmission of *. Code * is transmitted to the host system if the time that has been set with DNC15 elapses following reception of !. MPL086

Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description
DNC16	NC reset time after digital-out	
	Program type	M·E
	Conditions	At I/O startup
	Unit	0.1 sec.
	Setting range	0 to 255
DNC17	NC stop time from reception	
	<p>[For NC transmission] The NC stop time from reception of @ from the host system to transmission of EOT or TEXT</p>	
	<p>[For NC reception] The NC stop time from reception of * or TEXT from the host system to transmission of @</p>	
	Program type	M·E
	Setting range	0 to 255
DNC18	DNC command reply message waiting time	
	<p>The NC waiting time from transmission of command message EOT to reception of command reply message * from the host system.</p>	
	Program type	M·E
	Unit	0.1 sec.
	Setting range	0 to 255

Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name		Description
DNC19	DNC machine number		The numbers to be assigned to various machines in order to manage on the host system the tool data, parameters etc. that are specific to the machines being used
	Program type	M·E	
	Conditions	At I/O startup	
	Unit	—	
	Setting range	0 to 255	
DNC20	—		Not used.
	Program type	—	
	Conditions	—	
	Unit	—	
	Setting range	—	
DNC21	NC transmission stop time of DNC (from reception to transmission)		The NC stop time from reception of EOT from the host system to transmission of * of the next message  <p style="text-align: right;">MPL089</p>
	Program type	M·E	
	Conditions	At I/O startup	
	Unit	0.01 sec.	
	Setting range	0 to 255	
DNC22	NC transmission stop time of DNC (from transmission to transmission)		The NC stop time from transmission of EOT to the host system to transmission of * of the next message  <p style="text-align: right;">MPL090</p>
	Program type	M·E	
	Conditions	At I/O startup	
	Unit	0.01 sec.	
	Setting range	0 to 255	

Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description
DNC23 DNC24	—	Not used.
	Program type	—
	Conditions	—
	Unit	—
	Setting range	—
DNC25	Forced tool data loading	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">7 6 5 4 3 2 1 0</div> <div style="font-size: 2em;">}</div> <div style="margin-left: 10px;"> Select the type of processing to be executed if the tool quantity data within the NC memory mismatches that which has been transferred from the DNC memory. 0 : Issues an alarm if the tool quantity data mismatches. 1 : Executes loading forcibly, even if the tool quantity data mismatches. </div> </div>
	Program type	M·E
	Conditions	At I/O startup
	Unit	Bit
	Setting range	Binary, eight digits
DNC26	—	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">7 6 5 4 3 2 1 0</div> <div style="margin-left: 10px;"> (1: Valid, 0: Invalid) </div> </div> <ul style="list-style-type: none"> 1: After program reception, a search is made for the work number of that program. 1: Details of an alarm occurring in DNC are displayed. 1: Loading of programs having the same work number as that of the registered program in NC becomes impossible. 1: The function of the PROGRAM LOCK/ENABLE switch is released. 1: Tool data and tool files are processed in M32 format 1: Three digit G-format and G10 format codes input/output for MAZAK data transfer protocol (DNC) 1: Binary to ASCII format input/output of MAZAK data transfer protocol (DNC) 1: All programs having work numbers smaller than No. 9000 are erased at the start of program reception.
	Program type	M·E
	Conditions	At I/O startup
	Unit	Bit
	Setting range	Binary, eight digits

Note:
When both bit 5 and bit 6 are set to 1 (enable), this functions for three digit G-format and G10 format codes input/output.

7 DATA I/O PARAMETER

Classification	DATA I/O	Display title	DNC PARAMETER
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Address	Name	Description	
DNC27 DNC28	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—
DNC29	Number of retry times with detection of a physical error		
	Program type		M·E
	Conditions		At I/O startup
	Unit		Number of times
	Setting range		0 to 65535
DNC30 to DNC32	—	Not used.	
	Program type		—
	Conditions		—
	Unit		—
	Setting range		—

7-4 Extended Parameter

Detailed parameter setting

PARAM

DPR1	0	DPR9	0	IDD1	0	IDD9	0
DPR2	0	DPR10	0	IDD2	0	IDD10	0
DPR3	0	DPR11	0	IDD3	0	IDD11	0
DPR4	0	DPR12	0	IDD4	0	IDD12	0
DPR5	0	DPR13	0	IDD5	0	IDD13	0
DPR6	0	DPR14	0	IDD6	0	IDD14	0
DPR7	0	DPR15	0	IDD7	0	IDD15	0
DPR8	0	DPR16	0	IDD8	0	IDD16	0

DATA:

D7335S0051E

Classification	DATA I/O	Display title	EXTENDED PARAMETER
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Address	Name	Description																				
DPR1	Baud rate	Baud rate for RS-232C interface <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th>Set values</th><th>Baud rate</th><th>Set values</th><th>Baud rate</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td><td style="text-align: center;">110</td><td style="text-align: center;">4</td><td style="text-align: center;">4800</td></tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">300</td><td style="text-align: center;">5</td><td style="text-align: center;">9600</td></tr> <tr> <td style="text-align: center;">2</td><td style="text-align: center;">1200</td><td style="text-align: center;">6</td><td style="text-align: center;">19200</td></tr> <tr> <td style="text-align: center;">3</td><td style="text-align: center;">2400</td><td></td><td></td></tr> </tbody> </table>	Set values	Baud rate	Set values	Baud rate	0	110	4	4800	1	300	5	9600	2	1200	6	19200	3	2400		
	Set values	Baud rate	Set values	Baud rate																		
	0	110	4	4800																		
	1	300	5	9600																		
	2	1200	6	19200																		
3	2400																					
Program type	M·E																					
Conditions	At I/O startup																					
Unit	—																					
Setting range	0 to 6																					
DPR2	Stop bit	Number of stop bits (parameter for RS-232C interface initialization) <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th>Set values</th><th>Stop bit</th></tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td><td style="text-align: center;">1</td></tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">1.5</td></tr> <tr> <td style="text-align: center;">2</td><td style="text-align: center;">2</td></tr> </tbody> </table>	Set values	Stop bit	0	1	1	1.5	2	2												
	Set values	Stop bit																				
	0	1																				
	1	1.5																				
	2	2																				
Program type	M·E																					
Conditions	At I/O startup																					
Unit	—																					
Setting range	0 to 2																					

Classification	DATA I/O	Display title	EXTENDED PARAMETER
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Address	Name	Description																											
DPR3	—	Not used																											
	Program type		—																										
	Conditions		—																										
	Unit		—																										
	Setting range		—																										
DPR5 to DPR8	—	Not used																											
	Program type		—																										
	Conditions		—																										
	Unit		—																										
	Setting range		—																										
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. <table border="1" style="margin-top: 10px; width: 100%;"> <thead> <tr> <th style="width: 15%;">Set values</th> <th style="width: 20%;">Method</th> <th style="width: 65%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">None</td> <td>No control</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">DC control</td> <td>Complies with control code DC1 through DC4</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">RTS/CTS</td> <td>Complies with device connection RTS/CTS.</td> </tr> </tbody> </table>	Set values	Method	Description	0	None	No control	1	DC control	Complies with control code DC1 through DC4	2	RTS/CTS	Complies with device connection RTS/CTS.															
	Set values		Method	Description																									
	0		None	No control																									
	1		DC control	Complies with control code DC1 through DC4																									
	2		RTS/CTS	Complies with device connection RTS/CTS.																									
Program type	M·E																												
Conditions	At I/O startup																												
Unit	—																												
Setting range	0 to 2																												
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. <table border="1" style="margin-top: 10px; width: 100%;"> <thead> <tr> <th style="width: 15%;">Set values</th> <th style="width: 15%;">Parity</th> <th style="width: 70%;">Hole-punching pattern of DC3 code</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">No assignment</td> <td style="text-align: center;"> <table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">·</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">●</td> </tr> </table> </td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Assignment</td> <td style="text-align: center;"> <table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">·</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">●</td> </tr> </table> </td> </tr> </tbody> </table> <p>Note: This parameter is valid only when the handshaking method is set to DC control (DPR9 is set to 1).</p>	Set values	Parity	Hole-punching pattern of DC3 code	0	No assignment	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">·</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">●</td> </tr> </table>			●	·				●	●	1	Assignment	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">·</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">●</td> </tr> </table>	●		●	·				●	●
	Set values		Parity	Hole-punching pattern of DC3 code																									
	0		No assignment	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">·</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">●</td> </tr> </table>			●	·				●	●																
				●	·				●	●																			
	1		Assignment	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">·</td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px;"></td> <td style="width: 15px; height: 15px; text-align: center;">●</td> <td style="width: 15px; height: 15px; text-align: center;">●</td> </tr> </table>	●		●	·				●	●																
●		●	·				●	●																					
Program type	M·E																												
Conditions	At I/O startup																												
Unit	—																												
Setting range	0, 1																												

Classification	DATA I/O	Display title	EXTENDED PARAMETER
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Address	Name	Description															
DPR11	Feed section DC code output	<p>Select whether or not DC2 and DC4 codes are to be output to the feed sections.</p> <p>Example:</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td style="padding: 2px;">Feed</td> <td style="padding: 2px;">EOR</td> <td style="padding: 2px;">(Significant information)</td> <td style="padding: 2px;">EOR</td> <td style="padding: 2px;">Feed</td> </tr> </table> <p style="margin: 5px 0;"> ↑ DC2 ↑ DC4 </p> </div> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Set values</th> <th style="width: 85%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Neither DC2 nor DC4 is output.</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Only DC2 is output.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Only DC4 is output.</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Both DC2 and DC4 are output.</td> </tr> </tbody> </table> <p>Note: This parameter is valid only when the handshaking method is set to DC control (DPR9 is set to 1).</p>	Feed	EOR	(Significant information)	EOR	Feed	Set values	Description	0	Neither DC2 nor DC4 is output.	1	Only DC2 is output.	2	Only DC4 is output.	3	Both DC2 and DC4 are output.
	Feed	EOR	(Significant information)	EOR	Feed												
	Set values	Description															
	0	Neither DC2 nor DC4 is output.															
	1	Only DC2 is output.															
2	Only DC4 is output.																
3	Both DC2 and DC4 are output.																
Program type	M·E																
Conditions	At I/O startup																
Unit	—																
Setting range	0 to 3																
DPR12	Waiting time	<p>The waiting time for replies from the connected instrument during inputting or outputting. An alarm occurs if this time elapses following the final reply.</p>															
	Program type	M·E															
	Conditions	At I/O startup															
	Unit	0.1 sec.															
	Setting range	0 to 65535															
DPR13	Output format	<p>Selection of output code</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Set values</th> <th style="width: 15%;">Format</th> <th style="width: 70%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">ISO</td> <td>Output in ISO code</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">EIA</td> <td>Output in EIA code</td> </tr> </tbody> </table>	Set values	Format	Description	0	ISO	Output in ISO code	1	EIA	Output in EIA code						
	Set values	Format	Description														
	0	ISO	Output in ISO code														
	1	EIA	Output in EIA code														
	Program type	M·E															
Conditions	At I/O startup																
Unit	—																
Setting range	0, 1																

Classification	DATA I/O	Display title	EXTENDED PARAMETER
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Address	Name	Description										
DPR14	Port selection	Port selection <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 20%;">Set values</th> <th style="width: 20%;">Port</th> <th style="width: 60%;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">COM1</td> <td>CF22 serial ch3</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">COM2</td> <td>CF22 serial ch4</td> </tr> </tbody> </table>	Set values	Port	Description	0	COM1	CF22 serial ch3	1	COM2	CF22 serial ch4	
	Set values	Port	Description									
	0	COM1	CF22 serial ch3									
	1	COM2	CF22 serial ch4									
	Program type	M·E										
Conditions	At I/O startup											
Unit	—											
Setting range	0, 1											
DPR15	Number of characters in feed section	Number of characters in NULL (feed) Example: <div style="display: flex; justify-content: center; align-items: center; gap: 10px;"> <div style="text-align: center;"> DPR15 characters <table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px;">Feed</td> <td style="padding: 2px;">EOR</td> <td style="padding: 2px;">(Significant information)</td> <td style="padding: 2px;">EOR</td> <td style="padding: 2px;">Feed</td> </tr> </table> </div> <div style="text-align: center;"> DPR15 characters <table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px;">Feed</td> <td style="padding: 2px;">EOR</td> <td style="padding: 2px;">(Significant information)</td> <td style="padding: 2px;">EOR</td> <td style="padding: 2px;">Feed</td> </tr> </table> </div> </div>	Feed	EOR	(Significant information)	EOR	Feed	Feed	EOR	(Significant information)	EOR	Feed
	Feed	EOR	(Significant information)	EOR	Feed							
	Feed	EOR	(Significant information)	EOR	Feed							
	Program type	E										
	Conditions	At I/O startup										
Unit	1 character											
Setting range	0 to 65535											
DPR16	—	Not used										
	Program type	—										
	Conditions	—										
	Unit	—										
	Setting range	—										