Mazak

M32 PARAMETERS LIST

J THRU S

The Other Thoroughbred From Kentucky

3-60

G-code macroprogram

No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	Unit	Setting range	Type of program	Conditions	Description
J1	J5	J9	J13	J17	J21	J25	J29	J33	J37	-	0 - 999999999	M.E	Power on	Work number of the program to be called.
J2	J6	J10	J14	J18	J22	J26	J30	J34	J38	-	0 - 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 - 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 appointment

No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	Unit	Setting range	Type of program	Conditions	Description
J41	J45	J49	J53	J57	J61	J65	J69	J63	J77	-	0 - 999999999	M.E	Power on	Work number of the program to be called.
J42	J46	J50	J54	J58	J62	J66	J70	J74	J78	-	0 - 999	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	J47	J51	J55	J59	J63	J67	J71	J75	J79	-	0 - 3	M.E	Power on	Calling type 0: M98 2: G66 1: G65 3: G66.1
J44	J48	J52	J56	J60	J64	J68	J72	J76	J80	-	-	-	-	Invalid

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 1

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
J81	First deceleration point for spindle orientation.		M.E	1) Mag sensor type The angle at which the spindle enters the creeping speed zone after it has passed through the linear zone. 2) Encoder type The angle at which the spindle enters the creeping speed zone. Note: This parameter corresponds to the parameter PG1 in FR-SF.
	1° (1 msec)	0-500 (0-359)	Power on	
J82	Second deceleration point for spindle orientation.		M.E	The angle at which the spindle enters the spindle position loop after spindle orientation has been made in the creeping speed zone. Note: This parameter corresponds to the parameter PG2 in FR-SF.
	1°	0-360	Power on	
J83	Position loop gain of spindle during full-synchro tapping.		M.E	Position loop gain of the spindle during full-synchro tapping. Note: This parameter corresponds to the parameter PGC in FR-SF.
	0.25 rad/sec	1-32767	Power on	
J84	In-position range of spindle		M.E	The position error range in which the orientation complete signal is output. Note: This parameter corresponds to the parameter ZRZ in FR-SF.
	1/16°	0-640 (0-5760)	Power on	
J85	Orientation speed of spindle		M.E	The rotation speed of the spindle during its orientation time from reception of the M19 command to arrival at the first deceleration point. Note: This parameter corresponds to the parameter OSP in FR-SF.
	1 rpm	0-1000	Power on	

Note: ( ) is for the encoder type.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 1

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
J86	Creeping speed of spindle		M.E	The rotation speed of the spindle during its orientation time from passage through the first deceleration point to arrival at the second deceleration point. Note: This parameter corresponds to the parameter CSP in FR-SF.
	1 rpm	0-1000	Power on	
J87	Position shift amount of spindle		M.E	The orientation stop position. 1) Magnet sensor type The value obtained when the angle range from -5° to +5° is divided into 1024 segments and 2048 is set at the 0° position. 2) Encoder type The value obtained by dividing 360° into 4096 segments. Note: This parameter corresponds to the parameter PST in FR-SF.
	-- 10/1024° (360/4096°)	1536-2560 (0-4095)	Power on	
J88 ∫ J100				Invalid
J101	Control 1 for spindle orientation stop		M.E	Multiplication factor of the proportional term and integral term of the speed loop gain existing during orientation stop Note: This parameter corresponds to the parameter ORS1 in FR-SF.
	Bit	Binary 8 digits	Power on	
J102	Control 2 for spindle orientation stop		M.E	Control method used during orientation stop (Advance/delay control or PI control) Note: This parameter corresponds to the parameter ORS1 in FR-SF.
	Bit	Binary 8 digits	Power on	
J103	Control 3 for spindle orientation stop		M.E	Parameter related to the detector mounting direction, motor command direction, etc. Note: This parameter corresponds to the parameter ORS2 in FR-SF.
	Bit	Binary 8 digits	Power on	

Note: ( ) is for the encoder type.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 1

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
J104	Control 4 for spindle orientation stop		M.E	The motor rotation direction for orientation Note: This parameter corresponds to the parameter ORS2 in FR-SF.
	Bit	Binary 8 digits	Power on	
J105	Maximum speed of spindle motor		M.E	Maximum speed clamp value for the spindle motor (Set in 10 rpm units) Note: This parameter corresponds to the parameter TSP in FR-SF.
	1 rpm	0-32767	Power on	
J106	Zero speed of spindle motor		M.E	The rpm at which the spindle motor is judged to be at rest. Note: This parameter corresponds to the parameter ZSP in FR-SF.
	1 rpm	0-1000	Power on	
J107	Cushioning time constant of spindle		M.E	The time constant used to increase the spindle motor from zero to maximum speed. Note: This parameter corresponds to the parameter CSN in FR-SF.
	1 msec	0-32767	Power on	
J108	Spindle speed detection rate		M.E	The rate in percentage of the spindle motor speed which is detected from the maximum spindle motor speed. Note: This parameter corresponds to the parameter SDT in FR-SF.
	1%	0-100	Power on	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K1	Spindle torque limit factor		M.E	Limit factor of the torque limit signal (TL2) Note: This parameter corresponds to the parameter TLM in FR-SF.
	1%	0-120	Power on	
K2	Speed loop proportional gain of spindle		M.E	This parameter is used to set the proportional gain of the spindle speed loop. (A larger setting gives better speed response, but increases vibration or noise levels.) Note: This parameter corresponds to the parameter VKP in FR-SF.
	1 rad/sec	0-1000	Power on	
K3	Speed loop integral gain of spindle		M.E	This parameter is used to set the integral gain of the spindle speed loop. (Set this parameter to a value smaller than that of K2 (proportional gain).) Note: This parameter corresponds to the parameter VKI in FR-SF.
	1 rad/sec	0-1000	Power on	
K4	Selection of type of spindle position loop		M.E	At the start of synchronous tapping (when the speed loop changes over to the position loop): 0: Spindle orientation (zero-point return) stops if this parameter is set to "0". 1: Spindle orientation (zero-point return) does not stop if this parameter is set to "1". Note: This parameter corresponds to the parameter TYP in FR-SF.
	-	0.1	Power on	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K5 ⟩ K8	Spindle gear teeth quantity		M.E	The number of spindle gear teeth that engage with the motor gear.
	-	1-32767	Power on	

Address	Maximum number of gear stages			
	1	2	3	4
K5	0	L	L	L
K6	Invalid	H	M	ML
K7	Invalid	Invalid	H	MH
K8	Invalid	Invalid	Invalid	H

Spindle rotation speed =

$$\frac{\text{Motor rotation speed} \times \text{Number of motor gear teeth } (\boxed{K9} \sim \boxed{K12})}{\text{Number of spindle gear teeth } (\boxed{K5} \sim \boxed{K8})}$$

Note: These parameters correspond to the parameters GRA1 through GRA4 in FR-SF.

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K9 ⟩ K12	Spindle motor gear teeth quantity		M.E	The number of motor gear teeth that engage with the spindle gears.
	-	1-32767	Power on	

Address	Maximum number of gear stages			
	1	2	3	4
K9	0	L	L	L
K10	Invalid	H	M	ML
K11	Invalid	Invalid	H	MH
K12	Invalid	Invalid	Invalid	H

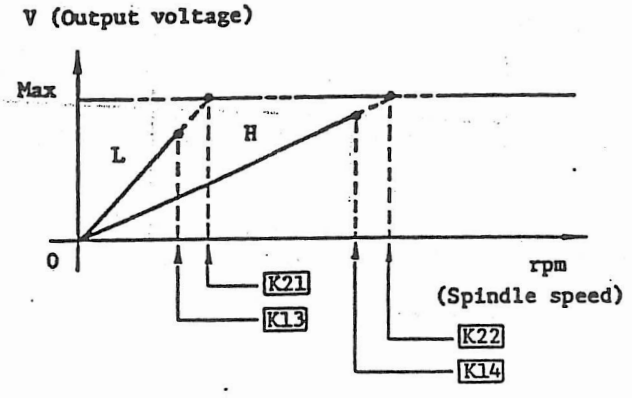
Note: These parameters correspond to the parameters GRB1 through GRB4 in FR-SF.

Classification	Machine	Display title	PARAMETER – MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K13 ⟆ K16	Maximum RPM of S-analog control spindle in each gear stage.		M.E	The maximum number of revolutions per minute of the spindle in each gear stage.
	1 rpm	0–99999	Power on	

Address	Maximum number of gear stages			
	1	2	3	4
K13	0	L	L	L
K14	Invalid	H	M	ML
K15	Invalid	Invalid	H	MH
K16	Invalid	Invalid	Invalid	H

(Example)

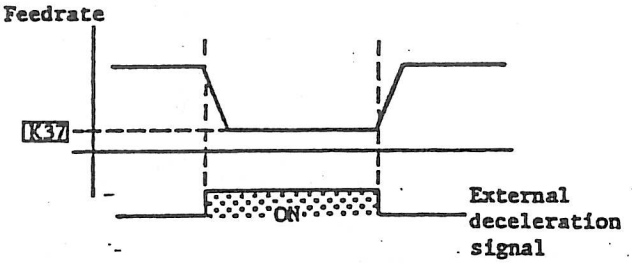


K17 ⟆ K20				Invalid

Classification	Machine	Display title	PARAMETER – MACHINE CONSTANT NO. 2

<table>
<tr><th rowspan="2">Address</th><th colspan="2">Name</th><th>Type of program</th><th rowspan="2">Description</th></tr>
<tr><th>Unit</th><th>Setting range</th><th>Conditions</th></tr>
<tr><td rowspan="2">K21
〜
K24</td><td colspan="2">Critical RPM of S-analog control spindle in each gear stage.</td><td>M.E</td><td rowspan="2">The critical number of revolutions per minute of the spindle in each gear stage.
<table><tr><th rowspan="2">Address</th><th colspan="4">Maximum number of gear stages</th></tr><tr><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>K21</td><td>0</td><td>L</td><td>L</td><td>L</td></tr><tr><td>K22</td><td>Invalid</td><td>H</td><td>M</td><td>ML</td></tr><tr><td>K23</td><td>Invalid</td><td>Invalid</td><td>H</td><td>MH</td></tr><tr><td>K24</td><td>Invalid</td><td>Invalid</td><td>Invalid</td><td>H</td></tr></table>Note: See the description of parameters K13 through K16 .</td></tr>
<tr><td>1 rpm</td><td>0–99999</td><td>Power on</td></tr>
<tr><td rowspan="2">K25
〜
K28</td><td colspan="2"></td><td></td><td rowspan="2">Invalid</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">K29
〜
K32</td><td colspan="2">Maximum RPM of S-analog control spindle during tapping cycle.</td><td>M.E</td><td rowspan="2">The maximum number of revolutions per minute of the spindle in each gear stage during a tapping cycle.
<table><tr><th rowspan="2">Address</th><th colspan="4">Maximum number of gear stages</th></tr><tr><th>1</th><th>2</th><th>3</th><th>4</th></tr><tr><td>K29</td><td>0</td><td>L</td><td>L</td><td>L</td></tr><tr><td>K30</td><td>Invalid</td><td>H</td><td>M</td><td>ML</td></tr><tr><td>K31</td><td>Invalid</td><td>Invalid</td><td>H</td><td>MH</td></tr><tr><td>K32</td><td>Invalid</td><td>Invalid</td><td>Invalid</td><td>H</td></tr></table></td></tr>
<tr><td>1 rpm</td><td>0–99999</td><td>Power on</td></tr>
<tr><td rowspan="2">K33
〜
K36</td><td colspan="2"></td><td></td><td rowspan="2">Invalid</td></tr>
<tr><td></td><td></td></tr>
</table>

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K37	External deceleration speed		M.E	The upper-limit value of the feedrates available while the external deceleration signal is ON.
	1 mm/min	1-120000	Next block	
K38	Work number call during S-code macroprogram appointment.		M.E	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".
	-	0 - 999999999	Next block	
K39	Work number call during T-code macroprogram appointment.		M.E	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".
	-	0 - 999999999	Next block	
K40	Work number call during second auxiliary function macroprogram appointment.		M.E	The work number of the macroprogram to be called during macroprogram appointment using the second auxiliary function. Note 1: This parameter is valid only when bit 4 of parameter K105 is "1". Note 2: See the description of parameter K56 for details of the addresses available with the second auxiliary function.
	-	0 - 999999999	Next block	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K41	G31 skipping speed		M.E	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.
	1 mm/min	1-120000	Next block	
K42	G31.1 skipping speed		E	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.
	1 mm/min	1-120000	Next block	
K43	G31.2 skipping speed		E	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.
	1 mm/min	1-120000	Next block	
K44	G31.3 skipping speed		E	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.
	1 mm/min	1-120000	Next block	
K45				Invalid
K46 ~ K49	Speed of S-analog control spindle during gear shifting.		M.E	The number of revolutions per minute of the spindle during shifting of gears thru the various ranges.
	1 rpm	0-32767	Power on	

Address	Maximum number of gear stages			
	1	2	3	4
K46	0	L	L	L
K47	Invalid	H	M	ML
K48	Invalid	Invalid	H	MH
K49	Invalid	Invalid	Invalid	H

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K50 ~ K53				Invalid
K54	Orientation RPM of S-analog control spindle.		M.E	The spindle revolutions per minute during spindle orientation.
	1 rpm	0-32767	Power on	
K55	Minimum RPM of S-analog control spindle.		M.E	The minimum spindle revolutions per minute.
	1 rpm	0-32767	Power on	
K56	Name of second auxiliary function.		E	Selecting the address name of the second auxiliary function from among the following three types:
	-	65,66,67	Power on	
K57	Type of S-code macroprogram appointment call.		M.E	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.
	-	0-3	Next block	

Address name	Setting
A	65
B	66
C	67

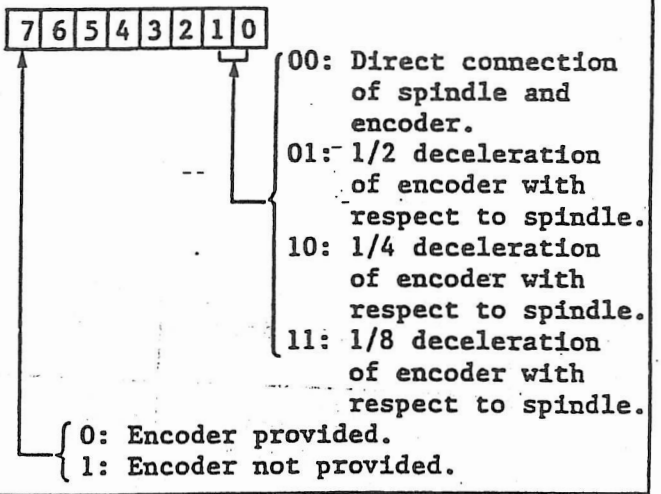
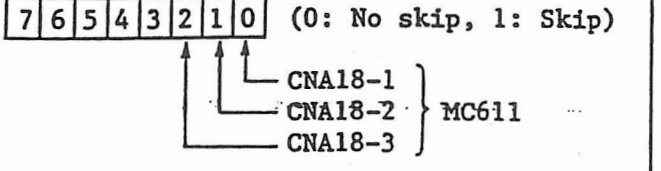
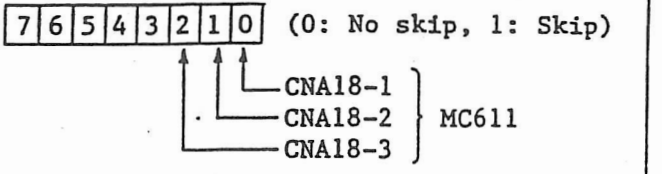
Setting	Calling method
0	M90 P □□□□
1	G65 P □□□□
2	G66 P □□□□
3	G66.1 P □□□□

Note: Valid only when bit 2 of [K105] is "1".

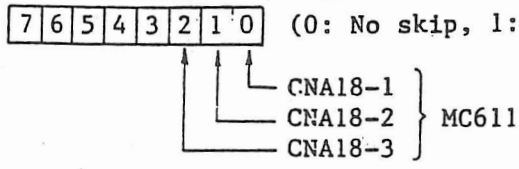
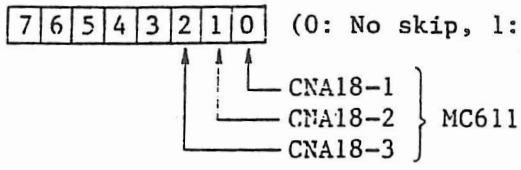
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K58	Type of T-code macroprogram appointment call.		M.E	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.
	-	0-3	Next block	Setting: 0 = M90 P□□□□; 1 = G65 P□□□□; 2 = G66 P□□□□; 3 = G66.1 P□□□□ Note: Valid only when bit 3 of K105 is "1".
K59	Type of second auxiliary function macroprogram appointment call.		M.E	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.
	-	0-3	Next block	Setting: 0 = M90 P□□□□; 1 = G65 P□□□□; 2 = G66 P□□□□; 3 = G66.1 P□□□□ Note: Valid only when bit 4 of K105 is "1".
K60	Fixed value		-	
	-	4	-	
K61 ⌇ K63	Fixed value		-	
	-	1	-	
K64	Fixed value		-	
	-	2	-	

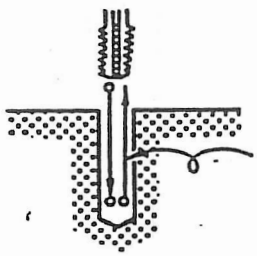
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K65 ~ K67	Fixed value		-	
	-	1	-	
K68	Spindle-encoder gear ratio		M.E	
	Bit	Binary 2 digits	Immediate	
K69	G31.1 skip conditions		E	 Select whether or not a skip signal is to be generated under the G31.1 command.
	Bit	Binary 2 digits	After movement stop	
K70	G31.2 skip conditions		E	 Select whether or not a skip signal is to be generated under the G31.2 command.
	Bit	Binary 2 digits	After movement stop	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K71	G31.3 skip conditions		E	 Select whether or not a skip signal is to be generated under the G31.3 command.
	Bit	Binary 2 digits	After movement stop	
K72				Invalid
K73	G4 skip conditions		E	 Select whether or not a skip signal is to be generated under the G4 command.
	Bit	Binary 2 digits	After movement stop	
K74 ~ K89				Invalid

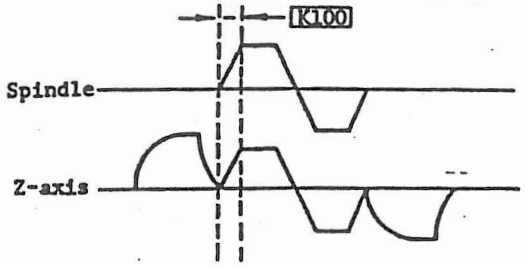
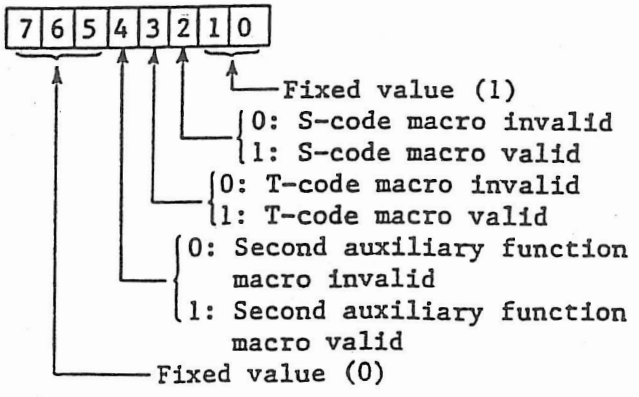
Classification	Machine	Display title	PARAMETER – MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K90	Return override during full-synchro tapping.		M.E	The overriding value for return from the hole bottom during a full-synchronous tapping cycle.
	1%	0–999	After movement stop	 Programmed feedrate x $\frac{\boxed{K90}}{100}$ Note: This parameter is valid only when bit 6 of F94 is "1".
K91 ~ K94				Invalid

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K95	-		M.E	7 6 5 4 3 2 1 0 Setting of constant circumferential speed for rapid feed 0: Valid 1: Invalid Fixed value (0) Tool position compensation during T-command execution 0: Not performed 1: Performed Coordinate system update during handle pulse interrupt 0: Not performed 1: Performed Fixed value (0) Acceleration/deceleration time constant for handle pulse feed 0: Time constant for cutting feed 1: No time constant Software limits of G30 execution 0: Invalid 1: Valid Inposition check 0: Invalid 1: Valid
	Bit	Binary 2 digits	At movement stop	
K96 ~ K99				Invalid

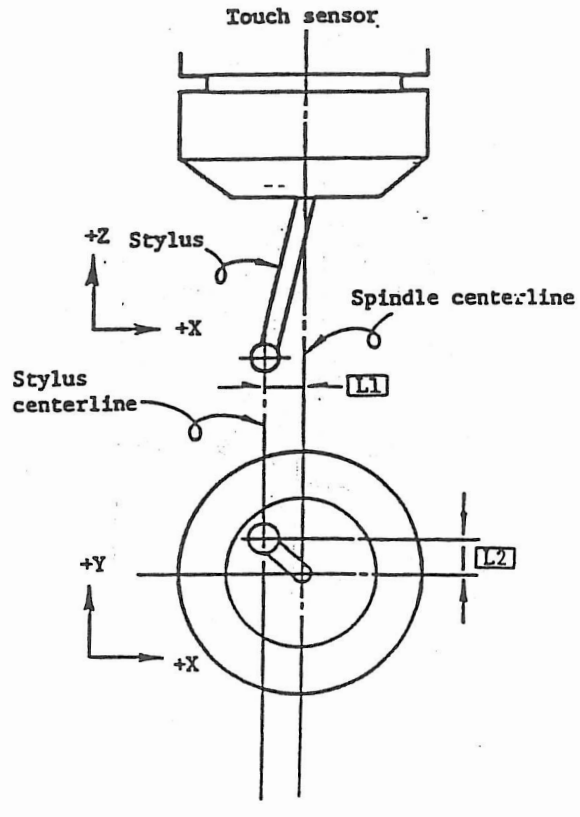
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K100	Acceleration/ deceleration time constant for full-synchro tap.		M.E	Time constant for linear acceleration/ deceleration of the spindle and Z-axis during a full-synchronous tapping cycle. 
	1 msec	0-1500	After movement stop	
K101 ⟨ K102				Invalid
K103 ⟨ K104				This parameter is automatically set within the system. Setting prohibited
K105	-		M.E	
	Bit	Binary 2 digits	Power on	

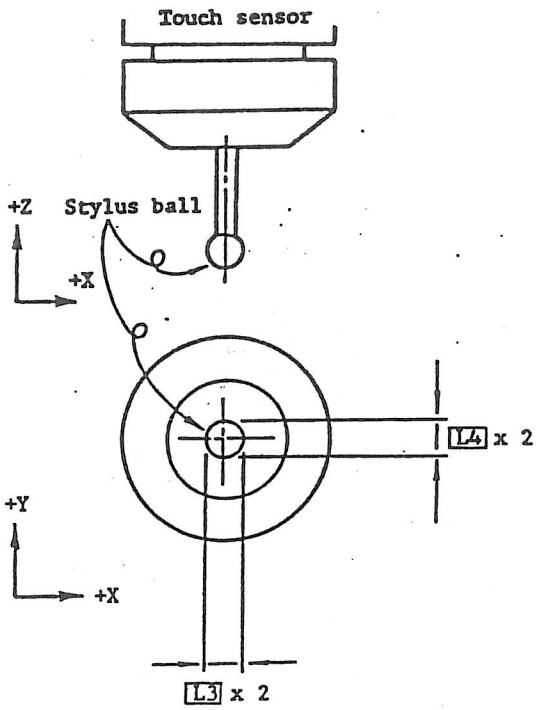
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 2

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
K106	-		M.E	7 6 5 4 3 2 1 0 Execution conditions for user macroprogram interrupt. 0: Edge triggering (Performed just once when the interrupt signal is ON) 1: Status triggering (Repeatedly performed while the interrupt signal is ON) Start timing for user macroprogram interrupt 0: The block under execution is aborted and then the interrupt occurs immediately. 1: Interrupt occurs after completion of the block being executed. Fixed value (0) Fixed value (1) 0: Actual machine 1: Simulation stand
	Bit	Binary 2 digits	Power on	
K107 ⟨ K108				Invalid

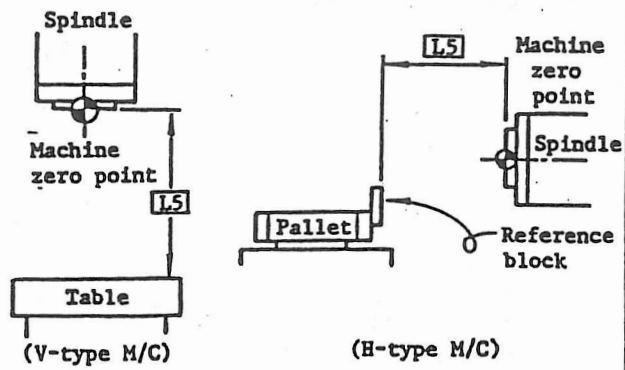
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L1	Stylus eccentricity of touch sensor (X-component).		M	The eccentricity of the stylus of the touch sensor with respect to the center of the spindle.  Note: These data are automatically set when calibration measurement is performed on the MMS unit.
	0.0001 mm 0.00001 inch	0 - ±99999999	Power on	
L2	Stylus eccentricity of touch sensor (Y-component).			
	0.0001 mm 0.00001 inch	0 - ±99999999	Power on	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L3	Radius of stylus ball of touch sensor (X-component).			The true radius value of the stylus ball of the touch sensor.  Note: These data are automatically set when calibration measurement is performed on the MMS unit.
	0.0001 mm 0.00001 inch	0 - ±99999999	Power on	
L4	Radius of stylus ball of touch sensor (Y-component).			
	0.0001 mm 0.00001 inch	0 - ±99999999	Power on	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L5	Z-axis stroke for tip position memory.		M.E	The distance from the spindle endface to the table surface (or the reference block on the pallet) existing when the Z-axis is in the machine zero-point position.
	0.0001 mm 0.00001 inch	0 - ±99999999	Immediate	
L6	Tool-breakage judgment distance (For TBR).		M	The tool displacement by which the tool is judged to be a broken one as a result of execution of the tool breakage detection function. If (registered tool length data) - (tool length data that has been measured during the detecting operation) ≧ L6, then the tool is judged broken.
	0.0001 mm 0.00001 inch	0 - ±99999999	Immediate	
L7	Tool breakage restoration mode for TBR.		M	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. 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.
	-	1-3	Immediate	

Classification	Machine	Display title	PARAMETER – MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L8	Skipping stroke limit for MMS.		M	The maximum skipping movement distance existing while measurement with the MMS unit is under way. If no touch sensors have come into contact with the work, an alarm message appears even when this skipping distance is reached.
	0.0001 mm 0.00001 inch	0 – 99999999	Immediate	
L9 ⟨ L18				Invalid
L19	Number of tools in tool magazine.		M.E	The total number of tools that can be accommodated in a tool magazine. If your machine has a drum changer, set the maximum number of tools in all drums.
	1 piece	1–960	Power on	
L20	Drum changing specifications (Valid/Invalid)		M.E	The presence/absence of drum changing specifications and the total number of drums used. 0–1: Drum changing specifications invalid 2–4: Drum quantity (Drum changing specifications valid)
	–	0–4	Power on	
L21 ⟨ L27				Invalid
L28	Number of spindle gear ranges		M.E	Number of spindle gear ranges
	1 range	0–8	Immediate	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L29 ⟩ L36				Invalid
L37	Minimum indexing angle of index unit		M	The minimum angle of indexing with the index unit using an M-code or a B-code command. Note: This parameter is invalid under NC rotary table specifications.
	1°	0-180	Power on	
L38	Indexing M/B code for index unit		M	The code that is output during execution of the index unit. 0-1: B code (0: CW rotation 1: Two-way rotation) 2-9999: M code (Expressed in output M-code number) Note 1: This parameter is invalid under NC rotary table specifications. Note 2: Only when this parameter is "1", can the rotational direction be selected with the index unit.
	-	0-9999	Power on	
L39	Mode selection for index unit execution		M	The conditions for execution of the index unit. If an attempt is made to execute the index unit immediately before the start of machining for each tool sequence (or at the end of the process): 0: The index unit is not executed if the particular rotation angle is the same as that previously set the last time the index unit was executed. 1: The index unit is executed unconditionally.
	-	0.1	Power on	
L40				Invalid

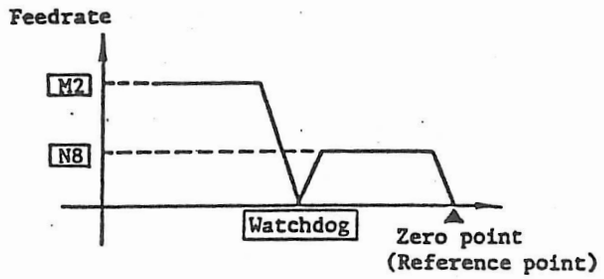
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L41	Simultaneous operation of index unit with ATC		M	The parameter for selecting whether or not the next ATC (automatic tool change) is to be performed during execution of the index unit. 0: ATC performed after execution of the index unit. 1: The index unit and ATC executed at the same time.
	-	0-1	Power on	
L42 ~ L45		--	-	Invalid
L46	Maximum number of pallets		M	The presence/absence of a pallet changer unit and the maximum number of pallets. 0-1: Pallet changer absent 2-255: Pallet changer present (This value indicates the maximum number of pallets available) The pallet changer unit cannot be used when this parameter is "0" or "1".
	-	0-255	Power on	
L47	Ready/not ready for next pallet change		M	The parameter used to select whether or not the pallet changer unit is designed so that the next pallet can be set and ready for change. 0: Next pallet not ready for change 1: Next pallet ready for change The next pallet can be set with the pallet changer unit when this parameter is "0" or "1".
	0	0.1	Power on	
L48				Invalid

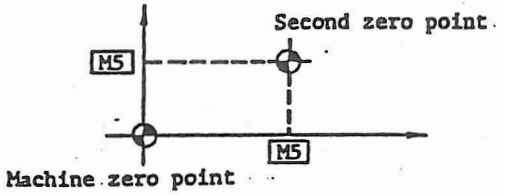
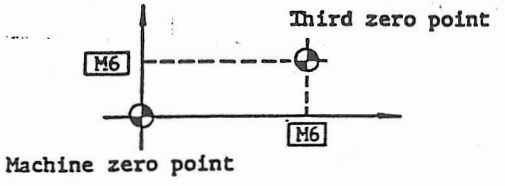
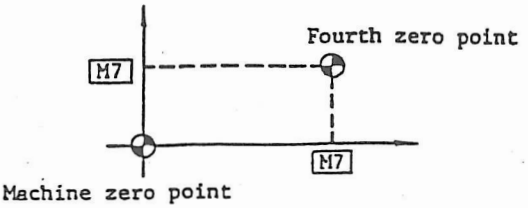
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 3

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
L49	Simultaneous operation of pallet changer unit with ATC		M	The parameter for selecting whether or not the next ATC (automatic tool change) is to be performed during execution of the pallet changer unit. 0: ATC performed after execution of the pallet changer unit. 1: The pallet changer unit and ATC executed at the same time.
	-	0.1	Power on	
L50 ⌇ L54				Invalid
L55	Spindle loadmeter selection		M.E	Of the spindle loadmeters being displayed on the POSITION COMMAND display, one that corresponds to the spindle type can be selected using this parameter. 0: FR-SF 1: FR-SE
	-	0.1	Power on	
L56 ⌇ L108				Invalid

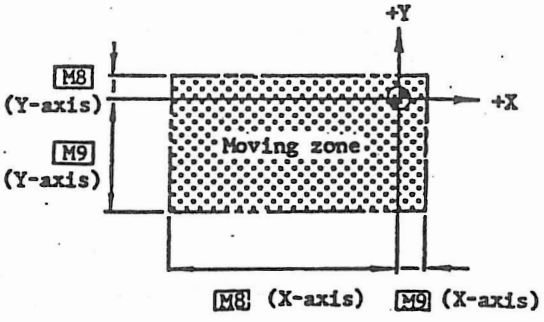
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 4

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
M1	Rapid feedrate		M.E	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. Note: Initial zero-point return is performed at the feedrate set using the [M2] parameter.
	1 mm/min (1 deg/min)	1-120000	After movement stop	
M2	Feedrate for initial zero-point return.		M.E	The feedrate for moving each axis during initial zero-point return (reference-point return) which follows the power-on action. 
	1 mm/min (1 deg/min)	1-120000	After movement stop	
M3	Cutting feedrate limit		M.E	The limit of cutting feedrate during automatic operation. Even if a feedrate higher than this parameter setting is specified, the latter governs.
	1 mm/min (1 deg/min)	1-120000	After movement stop	
M4	Fixed value		-	
	-	0	-	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 4

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
M5	Second zero-point coordinating value.		M.E	The machine coordinating values of the point to which each axis is to move back under the G30 command (second zero-point return).
	1 mm/min (1 deg/min)	±99999999	After movement stop	
M6	Third zero-point coordinating value.		M.E	The machine coordinating values of the point to which each axis is to move back under the G30P3 command (third zero-point return).
	1 mm/min (1 deg/min)	±99999999	After movement stop	
M7	Fourth zero-point coordinating value.		M.E	The machine coordinating values of the point to which each axis is to move back under the G30P4 command (fourth zero-point return).
	1 mm/min (1 deg/min)	±99999999	After movement stop	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 4

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
M8	Maximum software limit specified by manufacture (+ direction).		M.E	The maximum moving zone permissible under the machine specifications. Set the machine coordinate values. (Example)  If the machine is about to overstep the moving zone, it comes to an alarm stop. Note: This parameter is invalid when M8 = M9.
	0.001 mm (0.001°)	±99999999	After movement stop	
M9--	Minimum software limit specified by manufacture (- direction).		M.E	
	0.001 mm (0.001°)	±99999999	After movement stop	
M10	Fixed value		-	
	-	10	-	
M11	Address name of axis		M.E	Set the address name of each axis using a decimal ASCII code number.
	-	0-255	Power on	

	X-axis	Y-axis	Z-axis	4th axis	5th axis	6th axis
Address name	X	Y	Z	A	B	C
Set value	88	89	90	65	66	67

Fixed value

M12			Invalid

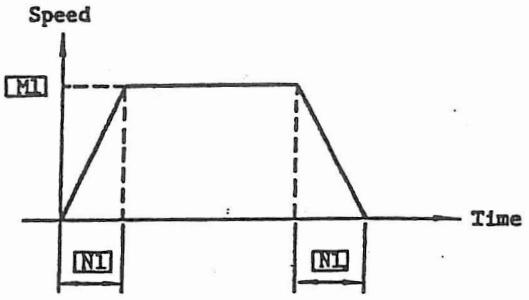
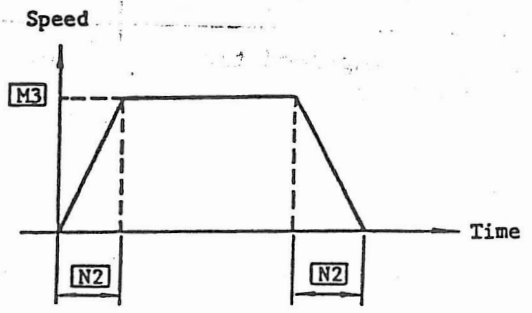
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 4

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
M13	-		M.E	7 6 5 4 3 2 1 0 Units of output from MUP to servo amplifier 0: Millimeter 1: Inch Direction of machine zero-point return 0: (+) direction 1: (−) direction Error correction during servo-off 0: Invalid 1: Valid Type of axis 0: Linear 1: Rotational Rotational direction of servo amplifier (When (+) direction is selected) 0: CW 1: CCW If axis is removed 0: Alarm 1: No alarm
	Bit	Binary 2 digits	Power on	
M14	-		M.E	7 6 5 4 3 2 1 0 Position counter during servo-off 0: Valid 1: Invalid 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
	Bit	Binary 2 digits	Power on	

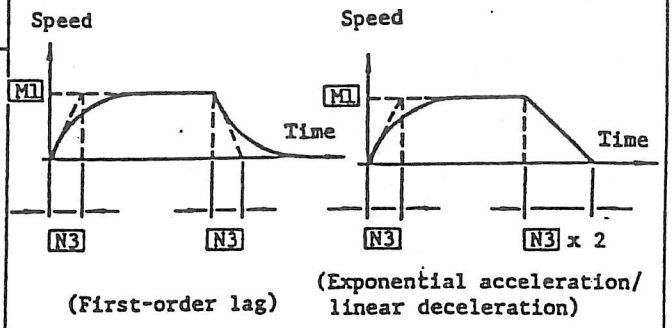
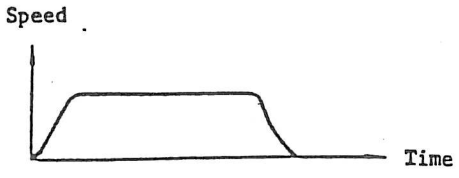
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 4

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
M15	-		M.E	7 6 5 4 3 2 1 0 — 0: Invalid 1: Valid Linear acceleration/deceleration First-order lag Second-order lag Exponentail acceleration/linear deceleration Rapid-feed acceleration/deceleration type Linear acceleration/deceleration First-order lag Second-order lag Exponentail acceleration/linear deceleration Cutting-feed acceleration/deceleration type Note: Time constants for each type of acceleration/deceleration must be set using parameters [N1] through [N6].
	Bit	Binary 2 digits	Power on	
M16	-		M.E	7 6 5 4 3 2 1 0 Deceleration time constant (For rapid-feed exponential acceleration/linear deceleration) 0: Parameter [N3] 1: Parameter [N3] x 2 Type of stroke-end stop 00: Linear deceleration 10: Position-loop stepped stop 01: Speed-loop stepped stop 11: Position-loop stepped stop
	Bit	Binary 2 digits	Power on	

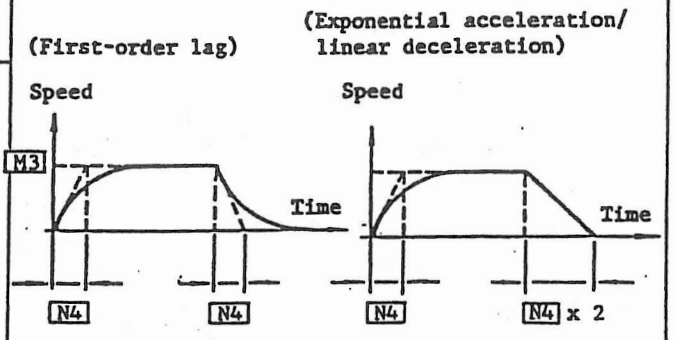
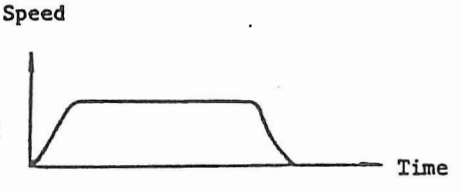
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 5

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
N1	Rapid-feed time constant (Linear acceleration/ deceleration).		M.E	Time constant for linear control during rapid-feed acceleration/deceleration.  Note: This parameter is valid only when bit 0 of M15 is "1".
	1 msec	4-1800	Power on	
N2	Cutting-feed time constant (Linear acceleration/ deceleration).		M.E	Time constant for linear control during cutting-feed acceleration/deceleration.  Note: This parameter is valid only when bit 4 of M15 is "1".
	1 msec	4-1800	Power on	

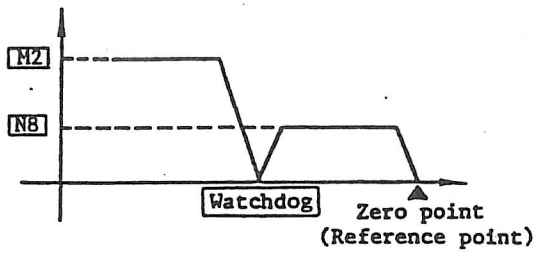
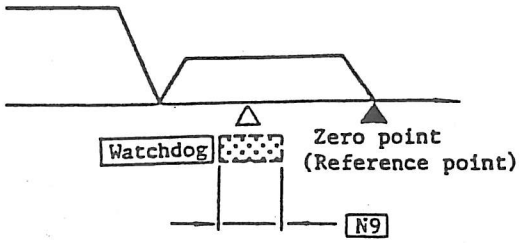
Classification	Machine	Display title	PARAMETER – MACHINE CONSTANT NO. 5

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
N3	Rapid-feed time constant (First-order lag)		M.E	First-order lag for rapid-feed acceleration/deceleration.  Note 1: For the first-order lag, also see the description of N4 . Note 2: This parameter is valid only when either bit 1, 2, or 3 of M15 is "1".
	1 msec	4–5000	Power on	
N4	Cutting-feed time constant		M.E	Second-order lag for cutting-feed acceleration/deceleration. The settings of parameters N3 and N4 that work together to make the second-order lag occur.  Note 1: Setting conditions: N4 0.3 x N3 Note 2: This parameter is valid only when either bit 3 of M15 is "1".
	1 msec	4–5000	Power on	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 5

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
N5	Cutting-feed time constant (First-order lag)		M.E	First-order lag for cutting-feed acceleration/deceleration.
	1 msec	4-5000	Power on	 Note 1: For the second-order lag, also see the description of N6. Note 2: This parameter is valid only when either bit 5, 6, or 7 of M15 is "1".
N6	Cutting-feed time constant (Second-order lag)		M.E	Second-order lag for cutting-feed acceleration/deceleration. The settings of parameters N5 and N6 work together to make the second-order lag occur.
	1 msec	4-5000	Power on	 Note 1: Setting conditions: N6 < 0.3 x N5 Note 2: This parameter is valid only when bit 7 of M15 is "1".

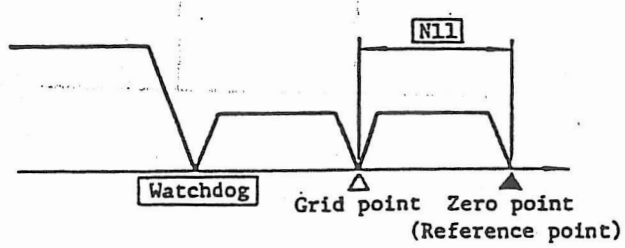
Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 5

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
N7	OT time		M.E	During external deceleration, the position loop is disconnected for the time interval set using this parameter and, as a result, the speed becomes zero.
	1 msec	1-32767	Power on	
N8	Creeping speed during initial zero-point return		M.E	The feedrate at which each axis is moved back to a reference point (initial zero-point return following the power-on action) after the zero-point watchdog LS (limit switch) has turned on. 
	1 mm/min (1 deg/min)	1-60000	After movement stop	
N9	Amount of grid ignorance during initial zero-point return		M.E	The spacing at which the grid point is ignored during reference point return (initial zero-point return following the power-on action) after the zero-point watchdog LS (limit switch) is turned off. With this parameter, dispersion in position deviations from the zero point can be minimized.  Note: The amount of grid ignorance must not exceed 1 grid.
	0.001 mm (0.001°)	-32768 - 32767	Power on	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 5

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
N10	Grid spacing		M.E	The grid spacing depends on the number of pulses per detector revolution.
	400 Pulses/rev	12-100	Power on	Note: For the 6X resolver, the setting becomes 60 if an absolute-value detection function is provided.
N11	Zero-point shift amount		M.E	The distance from the grid point to the actual zero point that exists during reference-point return (initial zero-point return following the power-on action).
	0.001 mm (0.001°)	0-65535	Power on	
N12	Rapid-feed backlash		M.E	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).
	0.0005 mm 0.00005 inch (0.0005°)	±9999	Power on	Note: Setting conditions: N12 < H13
N13	Cutting-feed backlash		M.E	The backlash amount to be corrected after the axis movement direction has been reversed in either the cutting-feed (G01) mode or manual mode.
	0.0005 mm 0.00005 inch (0.0005°)	±9999	Power on	Note: Setting conditions: N12 < H13

Detector	Setting
3000 Pulses/rev	12
5000 Pulses/rev	20
25000 Pulses/rev	100
6X resolver	10



Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 5

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
N14	Position loop gain of servo motor during full-synchro tapping		M.E	The position loop gain of the servo motor during operation of a full-synchronous tap.
	0.25 rad/sec	0-4000	Power on	
N15	Servo motor gear teeth quantity		M.E	The number of servo motor gear teeth that mesh with the machine motor gears. (In order that the gear ratios become the same, set the minimum integral-number value given by fractionalization of [N15] and [Q1] settings. Note: This parameter corresponds to the parameter PC1 in MR-S.
	-	1-32767	After movement stop	
N16				Invalid

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 6

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
Q1	Machine motor gear teeth quantity		M.E	The number of machine motor gear teeth that mesh with the servo motor gears. (In order that the gear ratios become the same, set the minimum integral-number value given by fractionalization of [N15] and [Q1] settings.) Note: This parameter corresponds to the parameter PC2 in MR-S.
	-	1-32767	After movement stop	
Q2	Position loop gain of servo motor		M.E	The position loop gain of the servo motor for each axis. Note: This parameter corresponds to the parameter PGN in MR-S.
	0.25 rad/S	0-65535	After movement stop	
Q3				Invalid
Q4	Speed loop gain of servo motor		M.E	The speed loop gain of the servo motor for each axis. A larger setting of this parameter gives better response, but increases vibration or noise levels. Note: This parameter corresponds to the parameter VG1 in MR-S.
	-	0-65535	After movement stop	
Q5				Invalid
Q6	Servo-motor speed loop lag compensation		M.E	The speed loop lag compensation ratio. (No lag compensation is provided if this parameter is set to 10,000; the gain decreases if this parameter is set below 9,000.) Note 1: This parameter is valid only when bit 0 of parameter [R14] is "1". Note 2: This parameter corresponds to the parameter VIL in MR-S.
	-	9000 - 10000	After movement stop	

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 6

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
Q7	Servo-motor speed loop lead compensation		M.E	Speed loop lead compensation frequency. Usually, this parameter is fixed at the value of 682. Note: This parameter corresponds to the parameter VIA in MR-S.
	-	163-16384	After movement stop	
Q8	Servo-motor current loop lead compensation 1		M.E	Internal compensation of current loop Type of motor / Setting HA40, HA80 / 2048 HA100, HA200, HA300, HA43, HA83 / 1024 Note: This parameter corresponds to the parameter IQA in MR-S.
	-	1-7680	After movement stop	
Q9	Servo-motor current loop lead compensation 2		M.E	Internal compensation of current loop Usually, this parameter is fixed at the value of 2048. Note: This parameter corresponds to the parameter IDA in MR-S.
	-	1-7680	After movement stop	
Q10	Servo-motor current loop proportional gain 1		M.E	Internal compensation of current loop Type of motor / Setting HA40, HA80 / 512 HA100, HA200, HA300, HA43, HA83 / 256 Note: This parameter corresponds to the parameter IQG in MR-S.
	-	100-5000	After movement stop	

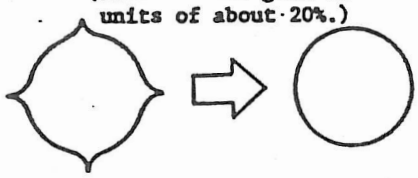
Classification	Machine	Display title	PARAMETER – MACHINE CONSTANT NO. 6

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
Q11	Servo-motor current loop proportional gain 2		M.E	Internal compensation of current loop Usually, this parameter is fixed at the value of 512. Note: This parameter corresponds to the parameter IDG in MR-S.
	–	1–2560	After movement stop	
Q12	Servo motor current limit value (+)		M.E	Multiply the peak ampere value (plus side) to be limited, by a value listed in the table below. (Setting conditions: Peak current < maximum current)
	–	1–1364	After movement stop	Note: This parameter corresponds to the parameter ILP in MR-S.
Q13	Servo motor current limit value (–)		M.E	Multiply the peak ampere value (minus side) to be limited, by a value listed in the table below. (Setting conditions: Peak current < maximum current)
	–	-1 – -1364	After movement stop	Note: This parameter corresponds to the parameter ILN in MR-S.

Type of motor	Max. current	Multiplying factor
HA40 HA43	22A	62.0
HA80 HA83	40A	34.1
HA100	60A	22.7
HA200	80A	17.0
HA300	120A	11.3

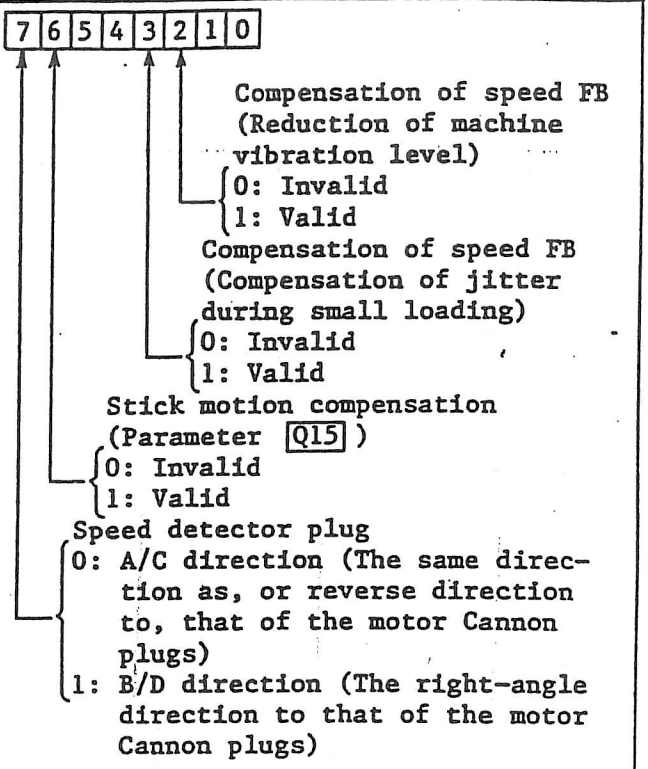
Type of motor	Max. current	Multiplying factor
HA40 HA43	22A	62.0
HA80 HA83	40A	34.1
HA100	60A	22.7
HA200	80A	17.0
HA300	120A	11.3

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 6

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
Q14				Invalid
Q15	Servo-motor stick motion compensation gain		M.E	This parameter is used to compensate for protrusions that may occur during arc cutting when the quadrant changes.
	1%	0-100	After movement stop	(Increase the gain in units of about 20%.)  Note 1: This parameter is valid only when bit 6 of parameter [R1] is "1". Note 2: This parameter corresponds to the parameter TGN in MR-S.
Q16				Invalid

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 7

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
R1	-		M.E	
	Bit	Binary 2 digits	Power on	



Note: This parameter corresponds to the parameter STY (high-order) in MR-S.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 7

Address	Name: Unit	Name: Setting range	Type of program: Conditions	Description
R2	-		M.E	01 21 01 00
	Bit	Binary 2 digits	Power on	7 6 5 4 3 2 1 0

Connect to card	Speed detector connection		Position detector connection	
	Bit 0	Bit 1	Bit 2	Bit 3
RF01	0	0	0	0
RF31,33	1	0	1	0
RF35	0	1	0	1

Type of servo loop
0: Semi-closed loop MOST CASES
1: Closed loop (Including ball-screw end detection)

Position feedback polarity
0: Positive polarity
1: Negative polarity

Absolute-value detection function
0: Invalid
1: Valid

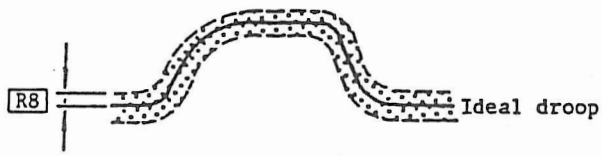
Note: This parameter corresponds to the parameter STY (low-order) in MR-S.

R3	Pitch of ball screw		M.E	Set the pitch (lead) of the ball screws for each axis.
	1 mm	1-360	Power on	Note: This parameter corresponds to the parameter PIT in MR-S.
R4	Servo-motor movement increments		M.E	Using the following table, set the appropriate value for the position detector being used
	-	1-1000	Power on	

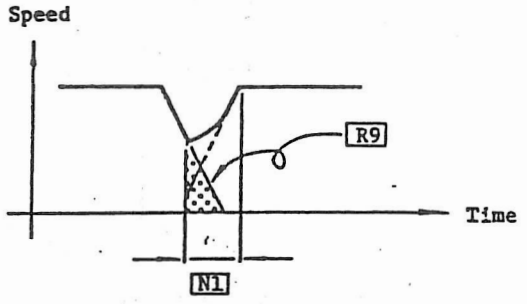
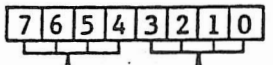
Position detector	Setting
Encoder 3000 P/r	12
Encoder 5000 P/r	20
Encoder 25000 P/r	100
Resolver 6X	60
Linear scale	$\frac{\text{PIT} \times 1}{\text{Scale resolution}(\mu)}$

Note: This parameter corresponds to the parameter RNG in MR-S.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 7

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
R5	Overheating alarm time constant for servo motor REGERATIVE BRAKING		M.E	Time constant used to detect overheating of regenerative resistor
	0.1 sec	51-18000	Power on	External regenerative resistor / Setting: Provided 3010; Not provided (Standard) 4680 Note: This parameter corresponds to the parameter ORT in MR-S.
R6	Overload time constant for servo motor		M.E	Time constant used to detect an overloaded condition of the servo motor.
	0.1 sec	1-18000	Power on	Note: This parameter corresponds to the parameter OLT in MR-S.
R7	Servo-motor overload detection level		M.E	Motor overload detection level
	1%	1-500	Power on	Note: This parameter corresponds to the parameter OLL in MR-S.
R8	Maximum error tolerance of servo motor (Servo ON)		M.E	The range of errors permissible during the servo ON state. Set the maximum deviation from an ideal droop (load is small for the particular command).
	0.0005 mm 0.00005 inch (0.0005°)	1-32767	Power on	 Note: This parameter corresponds to the parameter OD1 in MR-S.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 7

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
R9	In-position width of servo motor (AXIS)		M.E	The remaining distance of the present block existing at the start of execution of the next block.
	0.0005 mm 0.00005 inch (0.0005°)	0-32767	Power on	 Note: This parameter corresponds to the parameter ZRZ in MR-S.
R10	Model name of detector		M.E	 Set the position detector model name using the table below. Set the speed detector (mounted on the counterload side of the motor) using the table below.
	Bit	Binary 2 digits	Power on	

Detector model name	Setting
Encoder 3000 P/r	0000
Encoder 5000 P/r	0001
Encoder 5000 P/r + Absolute value	1001
Encoder 25000 P/r	0010
Encoder 25000 P/r + Absolute value	1010
Resolver 6X	0011
Linear scale	0100

Note: This parameter corresponds to the parameter MTY (high-order) in MR-S.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 7

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
R11	Model name of servo motor		M.E	7 6 5 4 3 2 1 0 Set the servo motor model name using the table below.
	Bit	Binary 2 digits	Power on	

Motor model name	Setting
HA33	10001111
HA40	00000000
HA43	10000000
HA80	00000001
HA83	10000001
HA100	00000010
HA200	00000011
HA300	00000100

Note: This parameter corresponds to the parameter MTY (low-order) in MR-S.

R12	Maximum error tolerance of servo motor (Servo OFF)		M.E	The range of errors permissible during the servo OFF state. Note 1: Excessive error is not detected if 0 is set. Note 2: This parameter corresponds to the parameter OD2 in MR-S.
	0.0005 mm 0.00005 inch (0.0005°)	0-32767	Power on	
R13	Special function 1 of servo motor		M.E	7 6 5 4 3 2 1 0 INDUCTOSYN + A/D converter 0: Unused 1: Used Zero-point returning direction (If "Used" has been selected above) 0: + direction 1: - direction
	Bit	Binary 2 digits	After movement stop	Note: This parameter corresponds to the parameter SSF (high-order) in MR-S.

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 7

Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
R14	Special function 2 of servo motor		M.E	7 6 5 4 3 2 1 0 └ Speed loop lag compensation (Parameter Q61) 0: Invalid 1: Valid └ If "Valid" has been selected for closed loop 0: Response improvement 1: No response improvement Note: This parameter corresponds to the parameter SSF (low-order) in MR-S.
	Bit	Binary 2 digits	After movement stop	
R15 ⟩ R16				Invalid

Classification	Machine	Display title	PARAMETER - MACHINE CONSTANT NO. 8

— Address	Name		Type of program	Description
	Unit	Setting range	Conditions	
S1				Invalid
S2	Servo current loop compensation		M.E	Note: This parameter corresponds to the parameter SP4 in MR-S.
	-	0.10	Power on	
S3	Unbalanced servo torque compensation ELECTRICAL COUNTERWEIGHT		M.E	This parameter is used to set the differences in load torque between the plus and minus directions of axis movement if such differences actually occur. Note: This parameter corresponds to the parameter SP5 in MR-S.
	1%	0-65536	Power on	
S4 ∫ S16				Invalid