SECTION 2   TABLES OF COMMAND CODES

1.   List of G Codes

Code	Group	Functions	Optional
G00 *3 G01 *3 G02 G03	1	Positioning Linear interpolation Circular interpolation-Helical cutting (CW) Circular interpolation-Helical cutting (CCW)	
G04 *2	2	Dwell	
G05 G06 G07 G08			
G09 *2	18	Exact stop	
G10 *1 G11	3	Cancel of G11 Parallel and rotation shift of coordinate system	○
G12 G13			
G14		Axis name designation/cancel	○
G15 G16 *2	4	Selection of work coordinate system (Modal) Selection of work coordinate system (One-shot)	○
G17 *3 G18 *2 G19 *2	5	Plane selection: XY Plane selection: ZX Plane selection: YZ	
G20 *2 G21 *2	15	Inch input confirmation Metric input confirmation	○
G22 *3 G23 *3	6	Programmable travel limit ON Programmable travel limit cancel	○
G24 G25 G26 G27 G28 G29			

*1   Has already been set when power supply is turned on.

*2   Effective in a specified block.

*3   May be set by an initial condition parameter.

(cont'd)

Code	Group	Functions	Optional
G30 *2	16	Positioning to home position	
G31 *2	17	Skip function	○
G32			
G33			
G34			
G35			
G36			
G37			
G38			
G40 *1	7	Cutter radius compensation cancel	
G41		Cutter radius compensation, left	
G42		Cutter Radius compensation, right	
G43 *1	8	Three dimensional compensation cancel	○
G44		Three dimensional compensation ON	
G45			
G46			
G47			
G48			
G49			
G50 *1	9	Enlargement and reduction of geometry cancel	○
G51		Enlargement and reduction of geometry ON	
G52			
G53 *3	10	Tool length offset cancel	
G54		Tool length offset, X-axis	
G55		Tool length offset, Y-axis	
G56 *3		Tool length offset, Y-axis	
G57		Tool length offset, 4th-axis	
G58		Tool length offset, 5th-axis	
G59		Tool length offset, 6th-axis	
G60	1	One-directional positioning	
G61	14	Exact stop mode	

*1 Has already been set when power supply is turned on.

*2 Effective in a specified block.

*3 May be set by an initial condition parameter.

(cont'd)

Code	Group	Functions	Optional
G62	19	Programmable mirror image function	○
G63			
G64 *1	14	Cutting mode	○
G65			
G66			
G67			
G68	24	Cancel of G68	○
G69		Setting of 3-D coordinate system conversion	
G70			
G71	11	Fixed cycle, Designation of return level for M53	
G72			
G73	11	Fixed cycle, High speed drilling cycle	
G74		Fixed cycle, Reverse tapping	
G75			
G76	11	Fixed cycle, Fine boring	
G77			
G78			
G79			
G80 *1	11	Fixed cycle, Mode cancel	
G81		Fixed cycle, Drill/spot boring	
G82		Fixed cycle, Drill/counter boring	
G83		Fixed cycle, Deep-hole drilling cycle	
G84		Fixed cycle, Tapping	
G85		Fixed cycle, Boring	
G86		Fixed cycle, Boring	
G87		Fixed cycle, Back boring	
G88			
G89	11	Fixed cycle, Boring	
G90 *3	12	Absolute dimensioning	
G91 *3		Incremental dimensioning	

*1 Has already been set when power supply is turned on.

*2 Effective in a specified block.

*3 May be set by an initial condition parameter.

(cont'd)

Code	Group	Functions	Optional
G92	20	Setting of work coordinate system	
G93			
G94 *3	13	Feed per min	
G95 *3		Feed per rev	
G96			
G97			
G98			
G99			
G172	0	3-D arc nearest path	
G173	0	3-D arc farthest path	
G174	77	Cylinder side-face machining OFF	
G175	77	Cylinder side-face machining ON	
G176	71	F-code and S-code ignore CANCEL	
G177	71	F-code and S-code ignore	
G178	0	Threading fixed cycle in the No. 1 axis direction in a plane	
G179	0	Threading fixed cycle in the No. 2 axis direction in a plane	
G180	64	Attachment rotation compensation CANCEL	
G181	64	Attachment rotation compensation facing FRONT	
G182	64	Attachment rotation compensation facing LEFT	
G183	64	Attachment rotation compensation facing REAR	
G184	64	Attachment rotation compensation facing RIGHT	
G185	64	Attachment rotation compensation facing DOWN	
G186	65	Tolerance control mode CANCEL	
G187	65	Tolerance control mode ON	
G188	69	No. 2 tool length offset CANCEL	
G189	69	No. 2 tool length offset ON	
G190	39	Constant G90 mode (absolute) processing	
G191	25	Manual shift amount CANCEL	
G192	67	Top face detection fixed cycle mode CANCEL	
G193	67	Top face detection fixed cycle mode ON	
G194	68	Fixed cycle mode with breakage detection CANCEL	
G195	68	Fixed cycle mode with breakage detection ON	
G196	26	Block call at each sub-program ON	
G197	26	Block call at each sub-program CANCEL	

(cont'd)

Code	Group	Functions	Optional
G198	70	Threading compound fixed cycle in the No. 1 axis direction in a plane	
G199	70	Threading compound fixed cycle in the No. 2 axis direction in a plane	
G256	78	3-D arc projection surface selection	
G274	10	Fixed cycle synchronous tapping reverse tapping cycle	○
G284	10	Fixed cycle synchronous tapping tapping cycle	○

*1 Has already been set when power supply is turned on.

*2 Effective in a specified block.

*3 May be set by an initial condition parameter.

2. List of Mnemonic Codes

Code	Group	Contents	Optional
NOEX	34	Specification of the sequence not executed	
CALL	27	Subprogram, Simple call	
RTS		Subprogram, End code	
MODIN		Subprogram, Call after positioning mode ON	
MODOUT		Subprogram, Call after positioning mode OFF	
GOTO	28	Branch command, Unconditional jump	
IF		Branch command, Conditional jump (6 kinds)	
RTMCR		Macro processing end code (used only in system)	
RTMDI		MDI processing end code (used only in system)	
OMIT	29	Coordinate calculation function, Omit	○
RSTRT		Coordinate calculation function, Restart	
LAA	30	Coordinate calculation function, Line at angle	○
ARC		Coordinate calculation function, Arc	
GRDX		Coordinate calculation function, Grid X	
GRDY		Coordinate calculation function, Grid Y	
DGRDX		Coordinate calculation function, Double grid X	
DGRDY		Coordinate calculation function, Double grid Y	
SQRX		Coordinate calculation function, Square X	
SQRY		Coordinate calculation function, Square Y	
BHC		Coordinate calculation function, Bolt hole circle	
FMILR	31	Area machining, Face milling (Rough)	○
FMILF		Area machining, Face milling (Finish)	
PMIL		Area machining, Pocket milling (Zigzag)	
PMILR		Area machining, Pocket milling (Spiral)	
RMILO		Area machining, Round milling (Out)	
RMILI		Area machining, Round milling (In)	
MSG	35	Message display	○
NMSG		Restoring original display	
NCYL	36	Fixed cycle, No cycle movement	
COPY	39	Copy, initial value of local coordinate system for parallel shift or rotation	○
COPYE		Copy end, Incremental value for parallel shift or rotation of local coordinate system	
CHFC		Arbitrary-angle chamfering	○
CHFR		Arbitrary-angle chamfering (rounding)	

3. List of M Codes

Code	Group	Function Element	Against Axis Movement	Modal/ One-shot	Remarks	Optional
M00	1	Program stop	After	one-shot		
M01		Optional stop	After	one-shot		
M02	18	End of program	After	one-shot		
M30		End of tape	After	one-shot		
M03	2	Spindle CW	At the same time	modal		
M04		Spindle CCW	At the same time	modal		
M05		Spindle stop	After	modal		
M19		Spindle orientation	After	modal		
M06	3	Vertical spindle tool change	After	one-shot		
M77		Horizontal spindle tool change	After	one-shot		
M07	8	Oil mist coolant ON	At the same time	modal		○
M08	10	Coolant pump ON	At the same time	modal		○
M09	24	Coolant system OFF (M07, 08, 12, 50, 51, 59, 120 OFF)	After	modal		○
M10	30	A-axis clamp	After	modal		○
M11		A-axis unclamp	After	modal		
M12	22	Chip air blow ON	At the same time	modal		○
M15	5	Rotary index table CW (4th-axis)	At the same time	modal		
M16		Rotary index table CCW (4th-axis)	At the same time	modal		
M17	7	Swivel head index CCW	At the same time	one-shot	Effective for only the first M73 - M76	
M20	31	B-axis clamp	After	modal		○
M21		B-axis unclamp	After	modal		(Except for MC-H)
M22	32	Y-axis clamp	After	modal		
M23		Y-axis unclamp	After	modal		
M24	33	Z-axis clamp	After	modal		
M25		Z-axis unclamp	After	modal		
M26	35	C-axis clamp	After	modal		○
M27		C-axis unclamp	After	modal		
M32	38	Splash guard door close	At the same time	modal		○
M33		Splash guard door open	At the same time	modal		

(cont'd)

Code	Group	Function Element	Against Axis Movement	Modal/ One-shot	Remarks	Optional
M40	11	High/middle-high/middle-low/low range	At the same time	modal	Spindle gears are automatically determined by RPM command.	
M41		High/middle-high/middle-low range	At the same time	modal		
M42		High/middle-high range	At the same time	modal		
M43		High range	At the same time	modal		
M44		AAC (F) next attachment clear	At the same time	one-shot	F: Floor type	○
M45		AAC (F) change preparation	At the same time	one-shot	T: Table type	
M46		AAC (F) no next attachment	At the same time	one-shot		
M47		AAC (T) no next attachment	At the same time	one-shot		
M48		AAC (T) next attachment clear	At the same time	one-shot		
M49		AAC (T) change preparation	At the same time	one-shot		
M50	23	Through-the-tool coolant, low pressure ON	At the same time	modal		○
M51		Through-the-tool coolant, high pressure ON	At the same time	modal		
M52	12	Return level in fixed cycle: upper limit	At the same time	one-shot		
M53	13	Return level in fixed cycle: specified level	At the same time	modal		
M54		Return level in fixed cycle: R level	At the same time	modal		
M57	34	W-axis clamp	After	modal		○
M58		W-axis unclamp	After	modal		
M59	25	Chip air blow ON	At the same time	modal		○
M60	4	Pallet change cycle	After	one-shot		○
M62		Vertical spindle tool change preparation	After	modal		○
M68		Vertical spindle tool clamp	After	modal		
M69		Vertical spindle tool unclamp	After	modal		
M63	21	No next tool in automatic tool change cycle	At the same time	one-shot		
M64		Next tool return cycle	At the same time	one-shot		
M65		ATC ready	At the same time	one-shot		

(cont'd)

Code	Group	Function Element	Against Axis Movement	Modal/One-shot	Remarks	Optional
M66	14	Continuous tool change between vertical and horizontal spindle (same tool)	At the same time	one-shot		
M67		Continuous tool change between vertical and horizontal spindle (different tool)	At the same time	one-shot		
M70	3	Manual tool change	After	one-shot		○
M71		Attachment manual tool change	After	one-shot		○
M72		Horizontal spindle tool change preparation	After	modal		
M78		Horizontal spindle tool clamp	After	modal		
M79		Horizontal spindle tool unclamp	After	modal		
M73	15	Swivel head, front position	After	one-shot		○
M74		Swivel head, left position	After	one-shot		
M75		Swivel head, back position	After	one-shot		
M76		Swivel head, right position	After	one-shot		
M81	27	Automatic W-axis positioning 1	After	one-shot		○
M82		Automatic W-axis positioning 2	After	one-shot		
M83		Automatic W-axis positioning 3	After	one-shot		
M84		Automatic W-axis positioning 4	After	one-shot		
M85		Automatic W-axis positioning 5	After	one-shot		
M87		Oil mist/Air blow ON	At the same time	one-shot	Effective for M90, 91 and 98	○
M88		Dust collector ON	At the same time	modal		○
M89		Dust collector OFF	At the same time	modal		
M90		Vertical spindle oil mist cycle mode ON	At the same time	modal		
M98		Horizontal spindle oil mist cycle mode ON	At the same time	modal		
M91		Tap-drill hole chip air blow cycle mode ON	At the same time	modal	Turned OFF by M09	○

(cont'd)

Code	Group	Function Element	Against Axis Movement	Modal/ One-shot	Remarks	Optional
M101	4	Pallet selection 1	After	one-shot		○
M102		Pallet selection 2	After	one-shot		
M103		Pallet selection 3	After	one-shot		
M104		Pallet selection 4	After	one-shot		
M105		Pallet selection 5	After	one-shot		
M106		Pallet selection 6	After	one-shot		
M107		Pallet selection 7	After	one-shot		
M108		Pallet selection 8	After	one-shot		
M109		Pallet selection 9	After	one-shot		
M110		Pallet selection 10	After	one-shot		
M111		Pallet selection 11	After	one-shot		
M112		Pallet selection 12	After	one-shot		
M115	6	5th axis-rotary table forward	At the same time	modal		○
M116		5th axis-rotary table reverse	At the same time	modal		
M118		Spindle orientation (reverse)	After	modal		
M119		Spindle orientation (reverse/forward)	After	modal		
M120		Shower coolant ON	At the same time	modal		○
M130	9	Spindle rotation condition for cutting feed OFF	At the same time	modal		
M131		Spindle rotation condition for cutting feed ON	At the same time	modal		
M132	37	Single block ineffective	At the same time	modal		
M133		Single block effective	At the same time	modal		
M134	16	Spindle speed override ineffective	At the same time	modal		
M135		Spindle speed override effective	At the same time	modal		
M136	17	Feedrate override ineffective	At the same time	modal		
M137		Feedrate override effective	At the same time	modal		
M138	36	Dry run ineffective	At the same time	modal		
M139		Dry run effective	At the same time	modal		
M140	39	Slide hold ineffective	At the same time	modal		
M141		Slide hold effective	At the same time	modal		

(cont'd)

Code	Group	Function Element	Against Axis Movement	Modal/ One-shot	Remarks	Optional
M142		Spindle overload detection ineffective	At the same time	modal		○
M143		Spindle overload detection effective	At the same time	modal		
M144	19	Touch sensor advance	After	modal		○
M145		Touch sensor retraction	After	modal		
M150	28	Coolant group specification- vertical spindle	At the same time	modal		○
M151		Coolant group specification- horizontal spindle	At the same time	modal		
M152		Coolant group specification- 3rd group	At the same time	modal		
M153		Coolant group specification- 4th group	At the same time	modal		
M154	20	Sensor air blow OFF	After	modal		○
M155		Sensor air blow ON	At the same time	modal		
M157		AAC (2 st.) no next tool	After	one-shot		○
M158		AAC (2 st.) next tool clear	After	one-shot		
M159		AAC (2 st.) attachment preparation	After	one-shot		
M160	4	Pallet loading command at PPC ON				○
M161		Pallet unloading command at PPC ON				
M163		Long tool-no next tool	At the same time	one-shot		○
M165		Long tool-tool change preparation	At the same time	one-shot	Safety cover specification for next tool	

(cont'd)

Code	Group	Function Element	Against Axis Movement	Modal/ One-shot	Remarks	Optional
M172	3	Long tool-tool change-command	After	one-shot		O
M166		ATC active tool return mode specification	At the same time	one-shot		O
M170	3	AAC (F) attachment change	After	one-shot	F: Floor type	
M171		AAC (T) attachment change	After	one-shot	T: Table type	O
M173		AAC (2 st.) attachment change command	After	one-shot		O
M176		Dust collection mode-sir blow	At the same time	one-shot		O
M178	4	Dust collection mode-ON	At the same time	modal		O
M179		Dust collection mode-OFF	At the same time	modal		
M177	3	Angular attachment tool change	After	one-shot	AT-ATC	O
M181	38	External M signal	At the same time	one-shot		O
M182		External M signal	At the same time	one-shot		
M183		External M signal	At the same time	one-shot		
M184		External M signal	At the same time	one-shot		
M185		External M signal	At the same time	one-shot		
M186		External M signal	At the same time	one-shot		O
M187		External M signal	At the same time	one-shot		
M188		External M signal	At the same time	one-shot		
M190		Automatic W-axis positioning 1	After	one-shot		O
M191		Automatic W-axis positioning 2	After	one-shot		
M192		Automatic W-axis positioning 3	After	one-shot		
M193		Automatic W-axis positioning 4	After	one-shot	For automatic W-axis positioning 10 points specification	
M194		Automatic W-axis positioning 5	After	one-shot		
M195		Automatic W-axis positioning 6	After	one-shot		
M196		Automatic W-axis positioning 7	After	one-shot		
M197		Automatic W-axis positioning 8	After	one-shot		
M198		Automatic W-axis positioning 9	After	one-shot		
M199		Automatic W-axis positioning 10	After	one-shot		

(cont'd)

Code	Group	Function Element	Against Axis Movement	Modal/One-shot	Remarks	Optional
M234	50	Synchronized tapping gear selection range command (gear determined according to available spindle speeds in each gear range)				
M235	50	Synchronized tapping gear selection range command (spindle speeds in the 1st gear range are covered by 2nd gear range)				
M236	50	Synchronized tapping gear selection range command (spindle speeds in the 1st and 2nd gear ranges are covered by 3rd gear range)				
M237	50	Synchronized tapping gear selection range command (entire speeds are covered by 4th gear range)				
M238	39	Soft override DISABLED				
M239	39	Soft override ENABLED				
M292	44	Threading fixed cycle chamfering ON				○
M293	44	Threading fixed cycle chamfering OFF				○
M294	43	Compound fixed cycle cutting pattern 1				○
M295	43	Compound fixed cycle cutting pattern 2				○
M296	43	Compound fixed cycle cutting pattern 3				○
M323	2	MC500/600H APC/ATC simultaneous operating M-code				
M326	51	Synchronized tapping torque monitoring DISABLED				
M327	51	Synchronized tapping torque monitoring ENABLED				
M331	56	6th axis rotary table FORWARD				
M332	56	6th axis rotary table REVERSE				
M396	49	Synchronized tapping 1-speed gear indexing				