

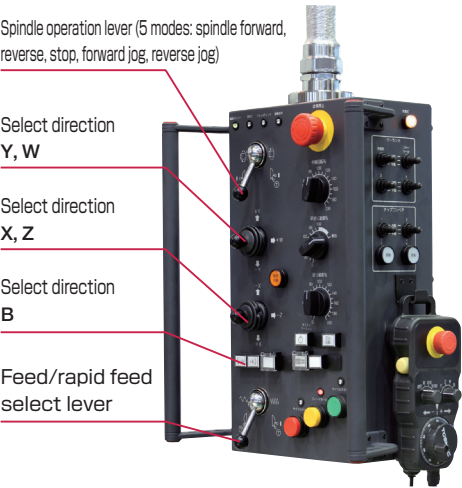
CNC System TOSNUC 999



User media (option set B)

Very useful device for managing long programs.

Pendant operation box



Manual operations relating to machine movements are separated from the NC operation unit and centrally arranged on the pendant operation box. Thus, combined NC and manual machining operations can be performed smoothly.

CNC System Specifications TOSNUC 999

Standard Specifications

●Controlled Axes	
Controlled axes	5 axes : X,Y,Z,W,B
Simultaneously controlled axes	
3 axes (X, Y, Z) for positioning (G00) and linear interpolation (G01)	
2 axes (any two axes excluding W- and B-axes) for circular interpolation (G02, G03)	

●Programmable Methods	
Programming resolution	Linear axis : 0.001 mm Rotating axis : 0.0001°
Maximum programmable dimension	Linear axis : ±99999.999mm Rotating axis : ±9999.999°
Data code	Automatic recognition of ISO/EIA code
	JIS B6311
	ISO 6983/1
	EIA RS-358-B EIA RS-244-B

Data format	Variable block with a decimal point word address format
Absolute/incremental programming	G90/G91
Decimal point input	Calculator type/Programming resolution type

●Interpolation	
Positioning	G00
Linear interpolation	G01
Circular interpolation	G02/G03: CW/CCW
●Feed	
Feedrate	F5-digit programming in mm/min
Dwell	G04 (0 ~ 999.99 sec)
Handwheel feed (portable)	
Linear axis : 0.001/0.01/0.1 mm (per division)	
Rotary axis : 0.0001/0.001/0.01° (per division)	
Continuous jog feed	
Rapid traverse rate override	0 ~ 100 % in 10 % increments
Feedrate override	0 ~ 200 % in 10 % increments
Override cancel	M48/M49

Automatic acceleration/deceleration	
Linear acceleration or deceleration is effected on rapid traverse rate and jog feedrate.	
Automatic acceleration/deceleration for feed G08/G09 G50/G51	
●Part Program Storage and Edit	
Program storage	150 m equivalent punched tape (To be reduced as per the attached functions.)
No. of registrable programs	128 (To be reduced as per the attached functions.)
Program edit	Various editing operations are possible for stored programs.

Background edit	
Program deletion, insertion and modification are possible in the background edit mode.	
Program name	\$ (or O) 8-digit programming (alphanumeric characters)
Program comment	No. of displayed characters max. 32 (max. 197 for input)

Control	in/out
Sequence number	N5-digit programming
Sequence number search	Bidirectional search is possible.
Program nesting list	
Fixture offset list	
T-code list	
Calendar timer	
Program creation date management, time display	

●Operation and Display	
Operation panel	
Display section: 10.4 inch color TFT liquid crystal display	
Operation section: Keyboard with membrane switches	
Customizing keys	
A series of key input operations (key pattern) can be registered. (6 types)	
A combination of screens can be registered. (4 types)	

Tool file	
Tool information such as tool offset and tool name can be batch-displayed and edited.	
Automatic operation Memory operation and DNC operation	
MDI operation Entry of multiple blocks and restart of an already executed block are possible.	
Manual numerical input command	
S.F manual setting Setting of S and F codes in manual mode.	
S.F auto setting	
Automatic setting of S and F codes in manual mode.	
Spindle drive motor load factor display	
Load imposed on spindle drive motor is displayed.	
Run hour display The NC working time is displayed.	
Program record A record of programs already executed is displayed. (Date of program execution, actual time, etc.)	

Customized display color tone	
Display gray scale of window frame, background and characters can be changed.	
●I/O functions and Devices	
RS232C interface port A	
Operation via external device, loading and dumping of programs and data are possible.	

●S, T and M Functions	
Spindle speed function	S5-digit programming
Spindle speed override	50 ~ 200 % (in 10 % increments)
Tool function	T4-digit programming
Miscellaneous function	M4-digit programming
●Tool Offset	
Tool length offset	G43/G44/(G49)
Tool offset	G45/G46/G47/G48
Cutter compensation C G40/G41/G42, point of intersection calculation	
No. of tool offsets 60 sets (tool length offset, cutter compensation)	

●Coordinate System	
Coordinate system setting	G92
Machine coordinate system positioning command	G73
Plane selection	G17/G18/G19
Fixture offset	G53/G57, 9 sets (This function cannot be used together with fixture offset 2.)
Fixture offset 2	G53/G54/G55/G56 3 sets

●Operation Support Function	
Single block A program can be executed block by block.	
Optional stop	
Optional block skip	
A block containing a “/” code at the head is ignored.	
Dry run	
Machine lock	
Auxiliary function lock	
Z-axis feed cancel	
Manual absolute ON/OFF	
All clear	
Reset	
Feed hold	
Cycle stop	

Program restart	Program restart, block restart
Sequence number collation and stop	
Manual interruption	
Handwheel feed interruption	
●Programming Support Function	
Circular interpolation by radius R designation	
Radius of a circle can be specified directly, using R code.	
Circle cutting Inner circle cutting: G12/G13, G22/G23	
Outer circle cutting: G222/G223	
Canned cycle	
G77 ~ G89, G98, G99, G100, G186	
Subprogram call G72 (Nesting of up to five levels is possible.)	
Macro programming	
Single call: G72	
Modal call 1: G74/G76	
Modal call 2: G75/G76	

Automatic corner override	
Inside corner automatic override and inside corner cutting speed change.	
Pattern cycle G109 ~ G119 (Drilling pattern)	
G121 ~ G132 (Milling pattern)	
Programming format check function Program format check	
Single block suppression	G990/G991
Feed hold suppression	G992/G993
Override suppression	G994/G995
Handwheel feed interruption suppression	G996/G997

●Mechanical Error Compensation	
Backlash compensation	
Pitch error compensation	
Pitch error gradient compensation	
Origin correction	
X-axis shift from table center is corrected.	
Unidirectional positioning	G60
Straightness compensation	
Non-linear type compensation control	
●Automatic Support Function	
Tool life management	
· Counting of tool working time	
· Tool wear coefficient function Tool life and workingtime are counted by multiplying a specified coefficient.	
· Spare tool selection	

●Machine Control Support Function	
Integrated PLC	TC200
Axis feed interlock	
●Safety and Maintenance	
Emergency stop	
Stored stroke limit	
Axis interference area setting and axis interference check	
G24/G25, G26/G27	
Self-diagnosis function	
Door interlock	

●Servo System	
Servo motor	AC servo motors
Position detectors	
Absolute encoders (All axes: Absolute position detection)	
Rotary scale (B-axis)	

Special Specifications (Options)	
Options - Set B	
(1) Helical interpolation G02/G03 (arc + linear)	
(2) Synchronous tapping M843, M844, M845	
(3) Part program storage	
300 m equivalent punched tape (No. of registrable programs: 256)	
(4) User media	
(USB port + compact flash slot)	
For loading and dumping of NC programs and tool offset data.	
(5) No. of fixture offsets	
99 sets (including the standard sets)	
(6) Random angle chamfering & corner R	
(7) Manual alignment function	
Including manual tool length/diameter measurement and coordinate conversion (G10/G11).	
(8) Teaching function	
Automatic program creation by MDI and manual operations.	
(9) W-axis offset function	
W-axis extended position is compensated with Z-axis fixture offset.	

Other Options	
●Controlled Axes	
(1) One additional controlled axis	
●Programming Methods	
(2) Inch/metric selection G70/G71	
●Interpolation	
(3) Hypothetical axis interpolation (i.e., interpolation with sine curve) G07	
(4) Cylindrical interpolation G67	
(5) Involute interpolation G105	
(6) Archimedes interpolation (Spiral interpolation) G102/G103	

●Feed	
(7) Synchronous thread-cutting	
(8) Per-revolution feed G95	
(9) Per-revolution dwell G05	
●Part Program Storage and Edit	
(10) Part program storage	
600 m equivalent punched tape (No. of registrable programs: 512)	
1,200 m equivalent punched tape (No. of registrable programs: 1024)	
3,000 m equivalent punched tape (No. of registrable programs: 1024)	
5,400 m equivalent punched tape (No. of registrable programs: 1024)	
7,800 m equivalent punched tape (No. of registrable programs: 1536)	
10,200 m equivalent punched tape (No. of registrable programs: 1536)	
(11) Mass memory	
Selection of 256 MB, 512 MB or 1 GB.	

●I/O Functions and Devices	
(12) Remote buffer operation (including port C connection)	
(13) High-speed LAN linkage	
File transfer by connecting CNC and LAN.	
●Tool Offset	
(14) No. of tool offsets	
No. of tool length offsets: 499 sets (including the standard sets)	
No. of cutter compensations: 499 sets (including the standard sets)	
(15) Three-dimensional tool compensation G30/G31	
●Operation Support Function	
(16) Foreground plotting function	
A tool locus of active program is plotted.	
(17) Additional number of optional block skips Max. 9	
●Programming Support Function	
(18) Programmable mirror image G62/G66	
(19) Programmable data input	
Updating of offsets by G58/G59.	
(20) Scaling G64/G65	
(21) Plane conversion G35 ~ G39	
(22) Three-dimensional coordinate conversion G14	
(23) Figure copy function G721/G722	
(24) Circle cutting compensation	
(25) Machining time estimate & NC plotting function	
Machining time estimate and tool path plotting for non-active program on the background.	
(26) Pattern cycle division into NC statements	
●Automatic Support Function	
(27) Faulty cut detection & feedrate regulation function	
Tool breakage and wear detection	
Feedrate regulation	
Note) Counting of tool working time and spare tool selection are included in the standard specifications.	
(28) Program check & used tool list creation	
Check of a program to be executed next and creation of a slated tool list.	
(29) Cutting start detection Used for spot facing, etc.	
●Safety and Maintenance	
(30) Memory lock	
●High-Accuracy Machining & Servo System	
(31) Shape recognition preview positioning control	
(32) NURBS interpolation	
●Cable	
(33) RS232C cable 10 m-long	