AS-200/200L

NAKAMURA-TOME PRECISION INDUSTRY CO., LTD.

https://www.nakamura-tome.co.jp

Netsuno 15, Hakusan, Ishikawa, 920-2195 Japan
Phone : +81 76 273 8100 Fax : +81 76 273 4312
E-mail : nt-jpn@nakamura-tome.co.jp

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NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

World Leader in
Cost Performance!

Innovative
Technology
～ Creating new values ～

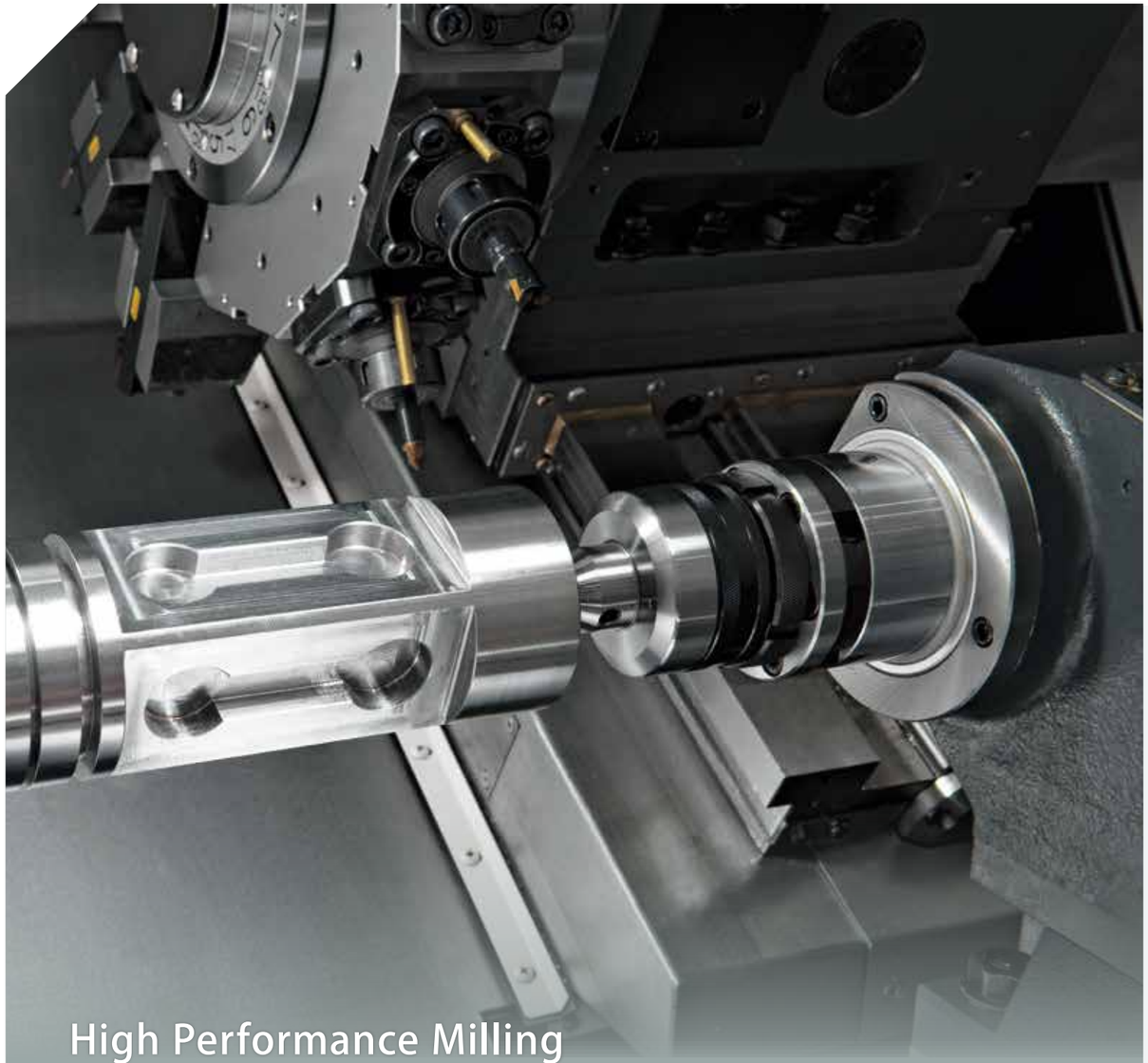
AS-200
AS-200L

This compact single-Turret machine with an 8-inch chuck and high cutting capabilities, can handle a wide range of applications from turning to milling.
This multitasking machine is simple, easy to use, and cost-effective.

- Space-saving multitasking machine with Y-axis & Milling function(standard)
- With Y-axis! Stroke: 82mm(±41mm)
  With Milling function: 5.5/3.7kW, spindle speed: 6,000min^{-1}
- X-axis: 24m/min, Z-axis: 36m/min, Y-axis: 6m/min
- Turret: Dodecagonal drum turret(max.24 stations) or 15 stations
- Number of milling tool (Dodecagonal drum turret): 12
  Number of milling tool (15 stations turret): 15
- Floor space 1,655mm×1,665mm(AS-200)
  2,716mm×1,805mm（AS-200L）

AS-200

AS-200L



High Performance Milling and Y-axis

Powerful milling drive, high-speed high-accuracy C-axis and 82mm-stroke Y-axis ensure production of finished parts, abolishing secondary operations, such as deburring, milling and drilling, as well as eliminating re-positioning fixtures.

Highest Machining Capabilities in its Class

AS-200

Turning

- Machined diameter 72mm
- Depth 4mm
- Feed 0.35mm/rev
- Cutting Speed 180m/min
- Spindle Speed 796min^{-1}

Milling

- Tool diameter 16mm
- Depth 5mm
- Feed 0.2mm/rev
- Cutting Speed 200m/min
- Spindle Speed 4,000min^{-1}

Drilling

- Tool diameter 50mm
- Feed 0.12mm/rev
- Cutting Speed 150m/min
- Spindle Speed 955min^{-1}

Turning and Milling with full power!

AS-200L

Turning

- Machined diameter 72mm
- Depth 4mm
- Feed 0.32mm/rev
- Cutting Speed 180m/min
- Spindle Speed 796min^{-1}

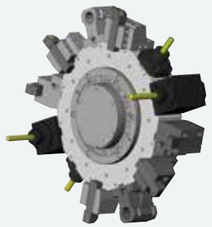
Milling

- Tool diameter 16mm
- Depth 5mm
- Feed 0.2mm/rev
- Cutting Speed 200m/min
- Spindle Speed 4,000min^{-1}

Turning

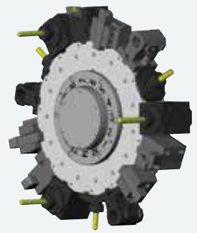
- Machined diameter 72mm
- Depth 3mm
- Feed 0.35mm/rev
- Cutting Speed 180m/min
- Spindle Speed 1,146min^{-1}

Stable Accuracy Ensured
AS-200



12 / 24 stations turret

Turret type : Dodecagonal
Number of tools : 24
Number of indexing pos. : 24
Number of milling stations: 12
Milling spindle speed : 6,000min^{-1}
O.D. turning tools : 20/25mm
I.D. Boring : dia.32mm
Collet diameter of driven tools : φ1-16mm
Tool swing diameter : 620mm
Max. turning diameter : 290mm



15 stations turret

Turret type : 15-station turret
Number of tools : 15
Number of indexing pos. : 15
Number of milling stations : 15
Milling spindle speed : 6,000min^{-1}
O.D. turning tools : 20/25mm
I.D. Boring : dia.32mm
Collet diameter of driven tools : φ1-16mm
Tool swing diameter : 615mm
Max. turning diameter : 280mm

■ L-spindle

Standard

Bar capacity	φ 65mm
Spindle motor	15/11kW 4,500min^{-1}

Option

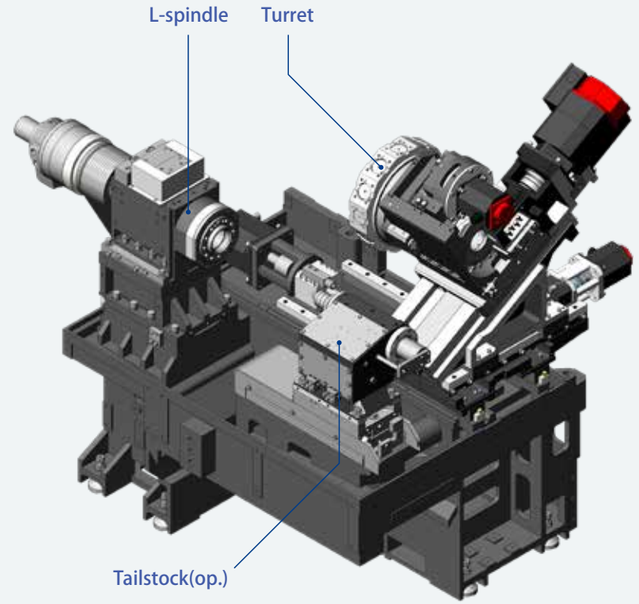
Bar capacity	φ 71mm

Option

Spindle motor	15/11kW (High torque) 4,500min^{-1}

Option

Spindle motor	15/11kW (High torque) 3,000min^{-1}

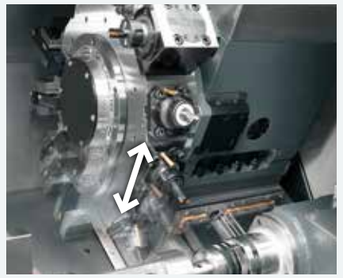


■ Tailstock

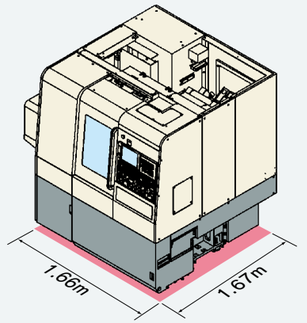
Option

Driving system	Manual
Quill taper	MT-4(Rotating center)
Quill diameter	φ 70mm
Quill stroke	80mm

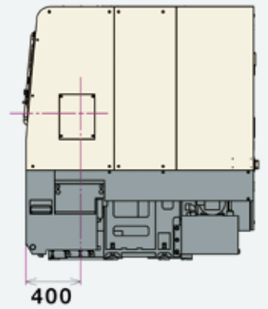
Y-axis slide travel
± 41mm



Compact!
The smallest floor space in its class



Operator Friendly,
Front distance to-spindle 400mm



Larger window ensures better visibility

Eco-friendly: Energy Saving Functions

1. Hyd. and Lub. pump motor stop except during auto operation.
2. Servo power off except during auto operation
3. Power control box cooling fan stops except during auto operation.
4. Motor fan stops except during auto operation
5. Energy saving mode for each axes acc. / dec.
6. Standard chip conveyor intermittent timer.(op.)
7. Work light off function
8. LCD back light off function
9. Inverter type Hyd. Pump unit (op.)

Stable Accuracy Ensured
AS-200L

■ L-spindle

Standard

Bar capacity	φ 65mm
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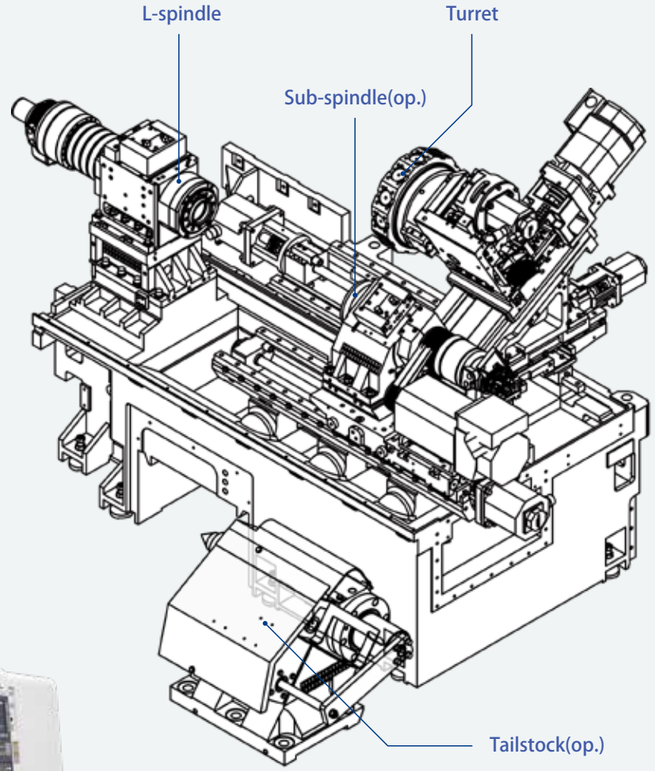


■ Sub-spindle

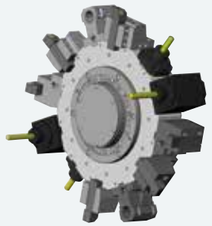
Option

Bar capacity	φ 42mm
Spindle motor	7.5/5.5kW 6,000min^{-1}

■ Tailstock

Option

Driving system	Manual
Quill taper	MT-4(Rotating center)
Quill diameter	φ 80mm
Quill stroke	80mm



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Turret type : Dodecagonal
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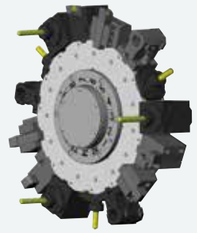
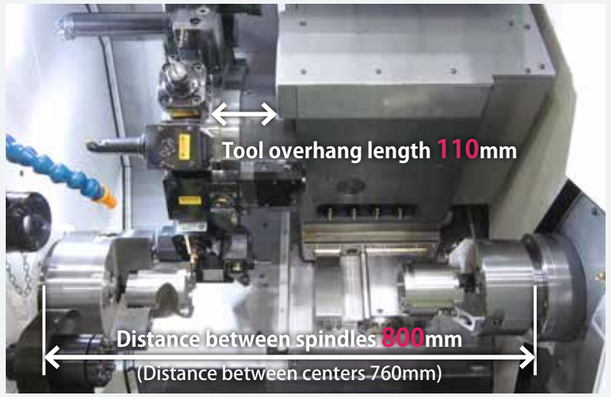


15 stations turret

Turret type : 15-station turret
Number of tools : 15
Number of indexing pos. : 15
Number of milling stations : 15
Milling spindle speed : 6,000min^{-1}
O.D. turning tools : 20/25mm
I.D. Boring : dia.32mm
Collet diameter of driven tools : φ1-16mm
Tool swing diameter : 615mm
Max. turning diameter : 280mm

Y-axis slide travel
± 41mm



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5. Energy saving mode for each axes acc. / dec.
6. Standard chip conveyor intermittent timer.(op.)
7. Work light off function
8. LCD back light off function
9. Inverter type Hyd. Pump unit (op.)

Full Operator Support : User-Friendly and Highly Reliable

Jig-less!
Setup-less!
Skill-less!

This essential function for multitasking machines is standard.

Main Features

Standard
NT Work Navigator
Airbag (Overload detection)
Advanced NT NURSE
NT Smart Sign
Digital Chuck Interlock

Option
NT Manual Guide i (LUCK-BEI II)

Digital Chuck Interlock

Set the Chuck Open and Close detection position easily.
The chuck open/close position is set on the NT SmartX screen.
Setup time and machining cycle time are reduced.

Airbag (Overload detection)

Compared to other machines, Nakamura-Tome machine will not break after the slightest collision. The "Airbag Function" minimizes the damage that may occur during a collision.

If a machine collision occurs, there is good reason to be assured: Airbag !

Barrier? Even with barrier function, machine collisions may occur

When the machine collision occurs, there is no reason to panic.

The Airbag (Overload detection) of the machine tool greatly reduces the impact of a collision, and protects the machine.

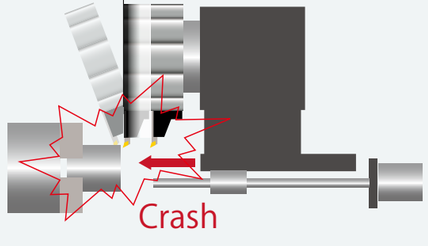
Without Airbag

Machines will not stop immediately. The slide continues to move even after a collision.

With Airbag

Retraction within 0.001 sec

Crash !
Within 1 millisecond after the crash, servo motor-feeding direction is reversed and the machine stops in EMG mode.



▲Video

* This feature does not mean zero impact

NT Work Navigator

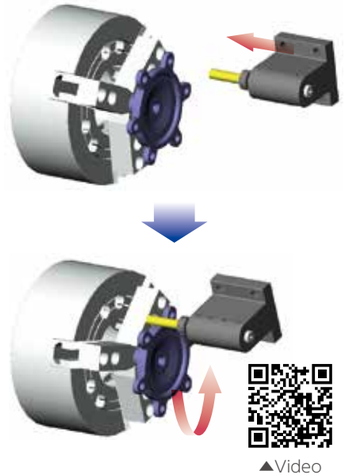
X Y Z C B (op. NC Tail stock)

Advanced NT Work Navigator !

A new upgrade makes it possible to navigate with the X and Y-axes. Many parts with irregular outer surfaces, requiring coordinate recognition with X or Y-Axis, become within the range of NT Work Navigator.

No fixtures required

Machining parts with non-round shapes, such as forgings or castings require that the raw part coordinates be recognized by the CNC control.
In order to achieve this without requiring extra cost or additional options, the NT Navigator is used.
It works just by touching the part with a simple inexpensive probe (mostly round bar mounted on a tool holder) and using the torque control feature of the servo-motor, which is to record required coordinates in the CNC. The NT Navigator is a cost cutting feature in multitasking machines, eliminating the need for positioning fixtures and special clamping devices.



▲Video

Featuring Functions to Make Efficient Programs, Faster

Advanced NT NURSE

※Depending on machine specifications, some functions are not available.

All-in-one software!

NT Nurse is software that provides the operator with user-friendly support for operation, programming and production on the machine. Among vital features are phase recognition (a must for multitasking), direct chucking to prevent positioning error during transfer, and perfect synchronization of the left and right hand spindles.

Among other features, are the load monitor for detecting tool wear and tool breakage, tool life management, operation condition monitoring, in addition to many other features to simplify programming, set up, operation and production, all offered in one single package.

Useful functions

Menu Screen

Tool Counter

Tool Life

Energy Saving

Operation Condition of each Tool

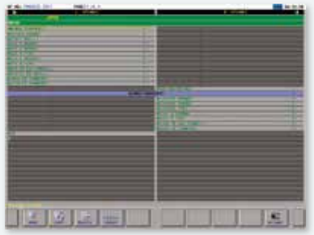
NT NURSE Call Button

Operation Message

Quick Offset

NT Manual Guide i (LUCK-BEI II) — Option

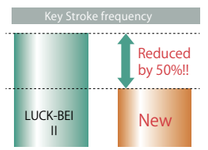
This programming guidance system can generate NC programs (ISO/EIA G-code programs) with ease. Processes created in conversational mode can be cut, copied or moved ensuring flexibility. Additionally, several cycles such as part-transfer cycle, requiring waiting M-codes, are readily made with the "NC program editing support function". The "NC program simulation function" can be used to check created programs by tool-path simulation or solid-model animation.


▲Process Editing Function
NT Manual Guide i automatically recognizes each process and lists all processes. An operator can easily change and optimize the program by moving processes, copying processes or adding waiting-functions.

▲Fixed-form sentence function
NT Manual Guide i contains more than 300 types of fixed form sentences. An operator can select these fixed form sentences for the program from a menu screen.

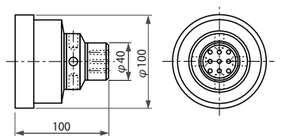
▲Simulation
Accurate simulation of turning and milling operations using a 3D solid model.

By introducing the “automatic cutting condition setting function”, the number of key strokes required to make a program was reduced by 50% reduced, compared with the previous NT-Manual guide version.



Automatic Cutting-Condition Setting Function

By setting the material type and required surface roughness, cutting conditions are automatically generated. These can be also changed depending on customers' experiences.



By selecting the material, cutting conditions are automatically input.

By setting the surface roughness, machining conditions are automatically input

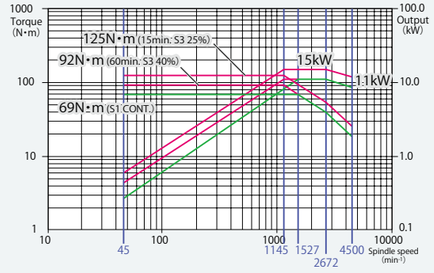
Cutting conditions. End mill

Torque / Output Chart

L-spindle motor 15/11kW

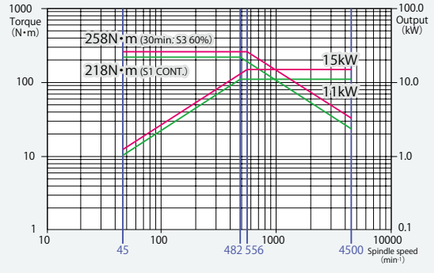
Standard

Max Rotational Speed : 4,500min^{-1}



Option　High torque specification

Max Rotational Speed : 4,500min^{-1}

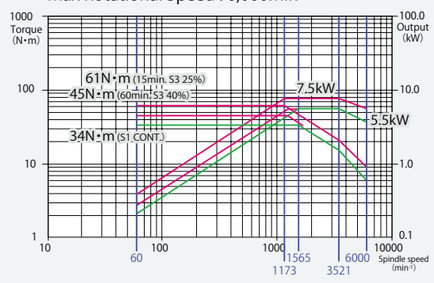


Option　High torque specification

Max Rotational Speed : 3,000min^{-1}

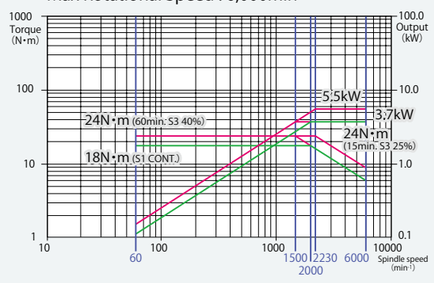
R-spindle motor (AS-200L)　Option

Max Rotational Speed : 6,000min^{-1}



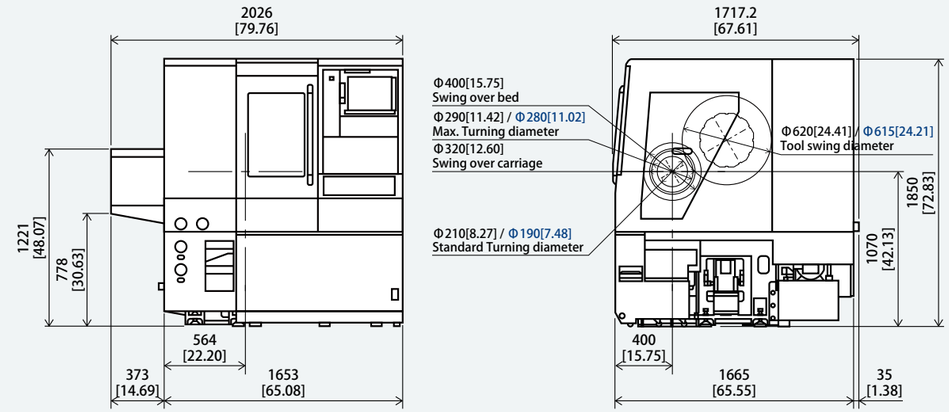
Milling motor　Standard

Max Rotational Speed : 6,000min^{-1}



Machine Dimensions

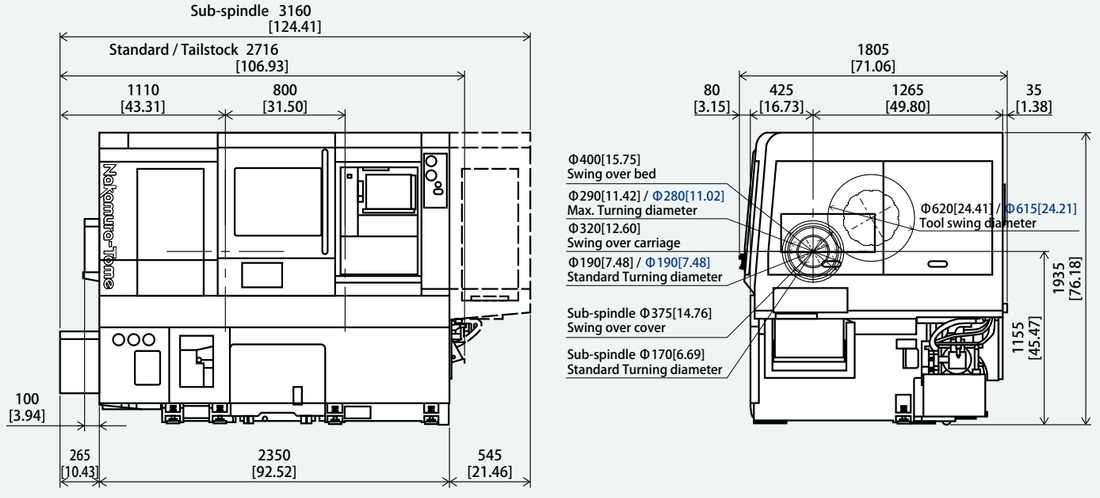
AS-200



*The dimensions given here may change depending on machine specifications.

12st/15st　mm[inch]

AS-200L



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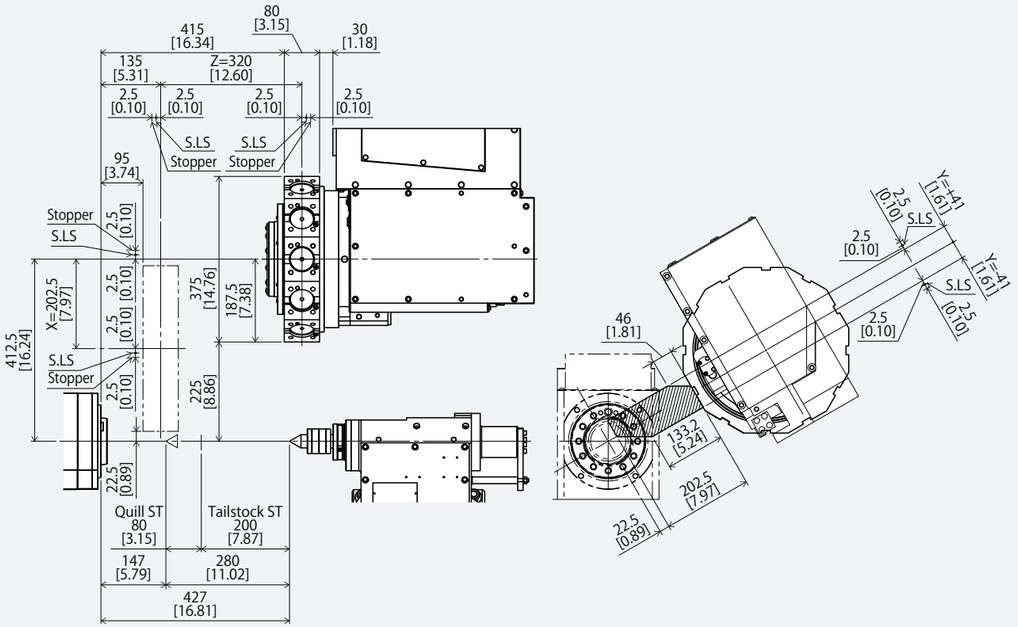
12st/15st　mm[inch]

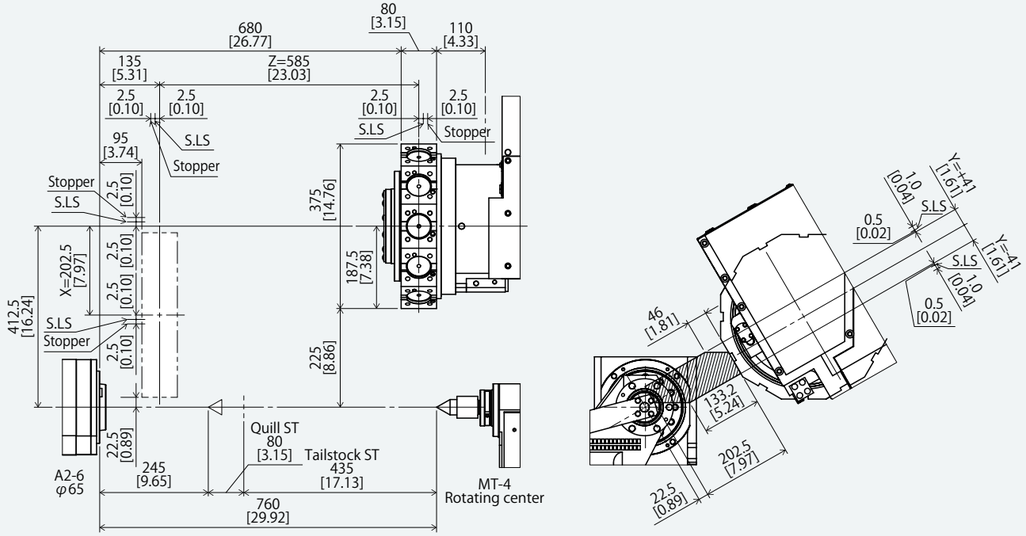
AS-200

Standard / Tailstock Specifications

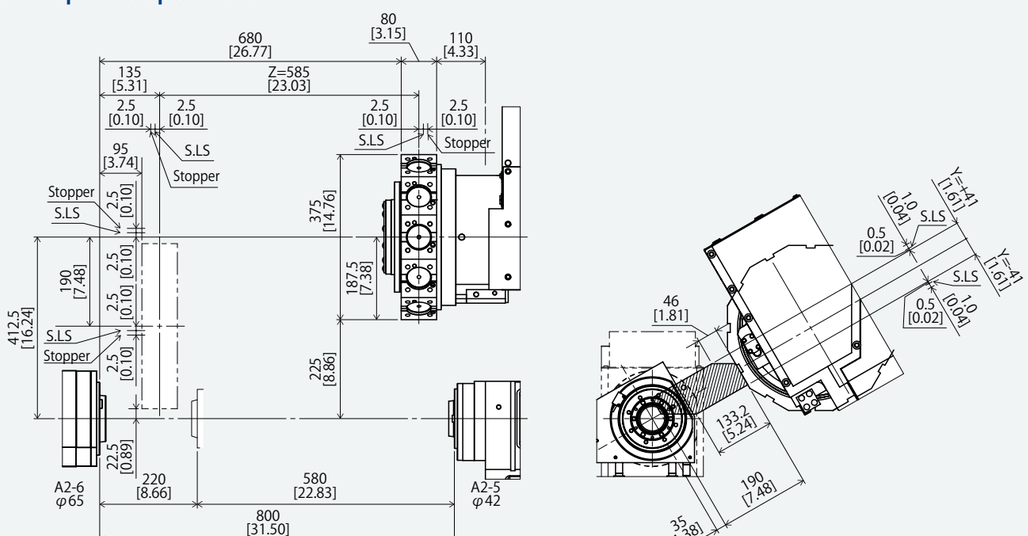


AS-200L

Standard / Tailstock Specification

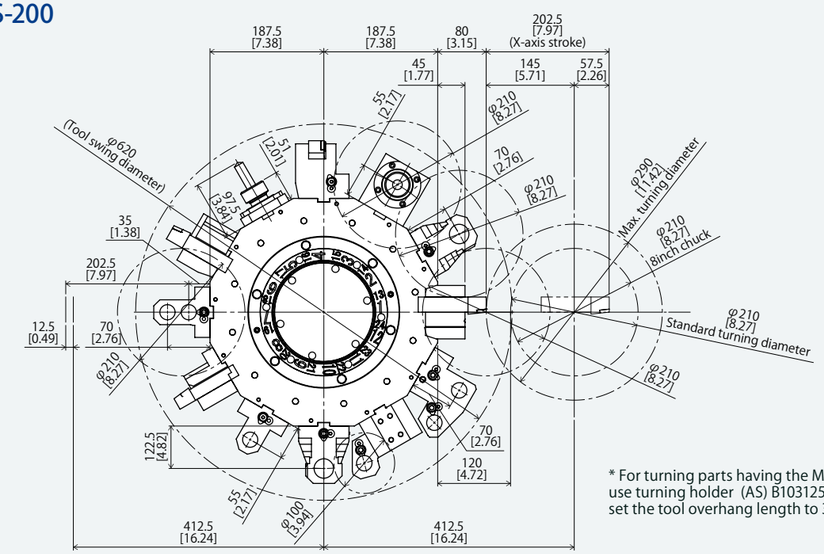


Sub-Spindle Specifications



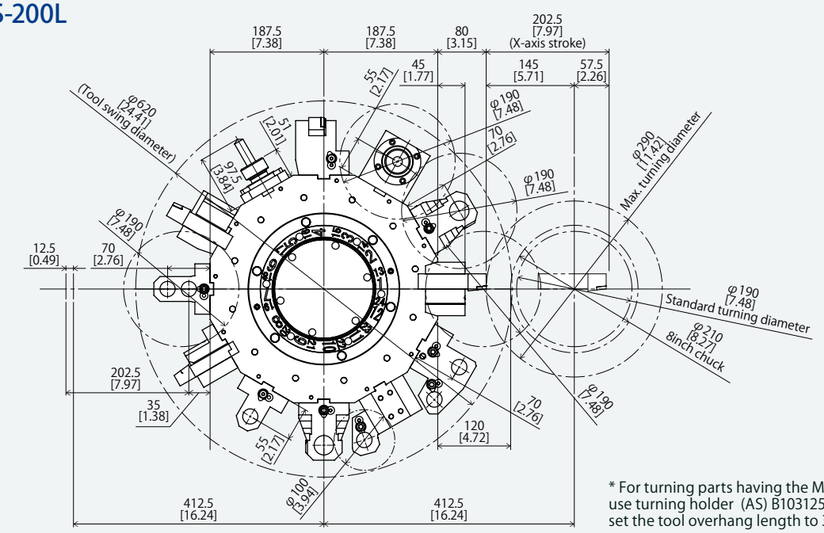
Tool Interference

AS-200



* For turning parts having the Max. Turning Diameter, use turning holder (AS) B1031251-01[B1032251-01] and set the tool overhang length to 35 mm.

AS-200L



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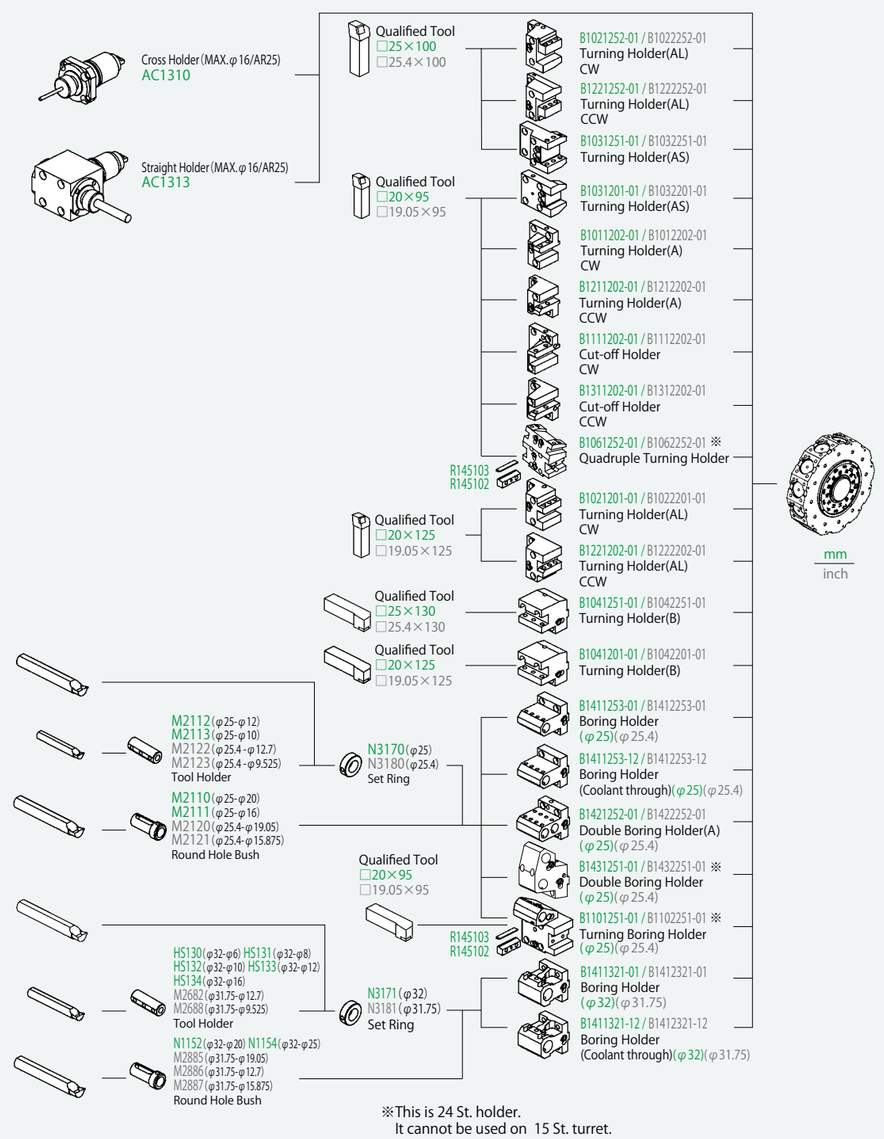
Tooling System



※This is 24 St. holder.
It cannot be used on 15 St. turret.

AS-200

■ Capacity		12/24 stations turret	15 stations turret
Max swing bed		400mm	
Max. turning diameter		290mm	280mm
Distance between centers	Tailstock	427mm	
Max. turning length		300mm	
Bar capacity		65mm / 71mm (op.)	
Chuck size		8"	
■ Axis travel / Rapid feed			
X-Axis slide travel / X-Axis rapid feed rate		202.5mm / 24m/min	212.5mm / 24m/min
Z-Axis slide travel / Z-Axis rapid feed rate		320mm / 36m/min	
Y-Axis slide travel / Y-Axis rapid feed rate		±41mm / 6m/min	
■ Main spindle			
Spindle speed		4,500min^{-1} / 3,000min^{-1}(op.)	
Spindle speed range		Stepless	
Spindle nose		A2-6	
Hole through spindle		80mm	
I.D. of front bearing		110mm	
Hole through draw tube		66mm / 72mm（op.）	
■ Turret			
Type of turret head		Dodecagonal drum turret	15 stations turret
Number of Tool stations		12 (Max.24)	15
Number of Indexing positions		24	15
Tool size (square shank)		□20mm, □25mm	
Tool size (round shank)		φ32mm	
■ Milling			
Rotary system		Individual rotation	
Milling spindle speed		6,000min^{-1}	
Spindle speed range		Stepless	
Number of milling stations		12	15
Tool size		Straight holder φ1mm ～φ16mm Cross holder φ1mm ～φ16mm	
■ Tailstock (op.)			
Driving System		Manual	
Quill diameter		φ70mm	
Quill taper		MT-4 (Rotating center)	
Quill stroke		80mm	
Travel		200mm	
■ Drive motor			
Main spindle	Standard	15/11kW 125/69N·m 4,500min^{-1}	
	Option	15/11kW(High torque) 258/218N·m 4,500min^{-1}	
	Option	15/11kW(High torque) 151/83N·m 3,000min^{-1}	
Sub spindle（op.）		-	
Milling		5.5/3.7kW	
■ General			
Machine height		1,852mm	
Floor space(L × W)		1,655mm ×1,665mm	
Machine weight		4,500kg	
Power supply		19.8kVA	

■ Items		
Control Type	Nakamura-Tome FANUC(0i-TF)	
■ Controlled axes		
Controlled axes	Standard	4 axes
Simultaneously Controlled axes	Standard	4 axes(X, Z, C, Y axis)
■ Input command		
Least input increment	0.001mm/0.0001inch（X in diameter), 0.001°	
Least command increment	Standard	X：0.0005mm / Z,Y：0.001mm / C：0.001°
Max. programmable dimension	±999999.999mm / ±39370.0787in , ±999999.999°	
Absolute/ Incremental programming	Standard	X, Z, Y, C / U, W, V, H
Decimal input	Standard	
Inch / Metric conversion	G20 / G21	
Programmable data input	G10	
■ Feed function		
Cutting feed	feed/min X, Z： 1～8000mm/min, 0.01～314inch/min (1～4800mm/min, 0.01～188inch/min) Y： 1～6000mm/min, 0.01～236inch/min (1～4800mm/min, 0.01～188inch/min) C： 1～4800° /min feed / rev 0.0001～500.0000mm/rev 0.000001～9.999999inch/rev) The maximum cutting feed rate is the value in AI contour control mode. In normal operation, It is enabled with G316 command. The values in parentheses are normal values.	
Dwell	G04	
Feed per minute / Feed per revolution	G98 / G99	
Thread cutting	G32F designation	
Thread cutting retract	Standard	
Continuous thread cutting	Standard	
Handle feed	Manual pulse generator 0.001/0.01/0.1mm(per pulse)	
Automatic acceleration / decelaration	Standard	
Linear accel./ decel. after cutting feed interpolation	Standard	
Rapid feed override	Low/25/50/100% (can be set from 0~100 in 10% intervals on NT Setting screen)	
Cutting feedrate override	0～150%, 10%(each 10%)	
AI contouring control I	G5.1	
Spindle override	50%～120% Set every 10%	

■ Program memory		
Part program storage length/ Number of registerable programs	512Kbyte Total 1280m	400
Parts program editing	delete, insert, change	
Program number search	Standard	
Sequence number search	Standard	
Address search	Standard	
Program storage memory	Battery backup	
Background editing	Standard	
DNC operation through memory card	Standard（Not including memory card）	
Extended part program editing	Standard	
■ Operation and display		
Operation panel : Display	15-inch color LCD	
Operation panel : Keyboard	Separate type MDI unit (QWERTY keys)	
■ Programming assist functions		
Circular interpolation R programming	Standard	
Direct drawing dimension programming or Chamfering/Corner R	Standard	
Canned cycles	G90, G92, G94	
Multiple repetitive canned cycles	G70 ～ G76	
Multiple repetitive canned cycles II	G71, G72	
Canned cycles for drilling	G80 ～ G89	
Sub program	Standard	
Custom macro	Standard (common variables #100 - #149, #500 - #549)	
Additional customer macro variables	Standard (After addition, #100 - #199, #500 - #999)	
Abnormal load detection function	Standard	
NT Work Navigator	Standard(not including contact bar)	
NT NURSE	Standard	
■ Machine support functions		
Rigid tapping	Standard	
Spindle orientation	Standard	
■ ECO functions		
Servo motor power off	Standard(Switch on Power Saving Mode in NT Setting screen)	
Control of motor output during acceleration and deceleration	Standard(Switch on Power Saving Mode in NT Setting screen)	
G code for servo motor energy-saving during acceleration and deceleration	G356/G357	
Automatic light off	Standard(Switch on Power Saving Mode in NT Setting screen)	
Automatic monitor off	Standard(Switch on Power Saving Mode in NT Setting screen)	

● Safety quality specifications

Various interlocks, such as safety fences, auto extinguisher devices, and other safety-related equipment may be required. These have to be selected during the configuration of the machine.

① Safety devices include electromagnetic door lock, chuck interlock, hydraulic pressure switch, air pressure switch, short circuit breaker and quill interlock. (Door interlock and chuck interlock are standard equipment.)

② In the case of automation, various safety fences may be required, such as work stocker safety fences, robot safety fences, ...etc.

During the configuration of machine specifications, please discuss these requirements with the Nakamura-Tome machine sales representative.

● Precautions on the use of cutting fluids and lubricating oils

◦ Some types of cutting fluids (coolant) are harmful to machine components, causing damages such as peeling of paint, cracking of resin, expanding of rubber, corrosion and rust build up on aluminum and copper.
To avoid causing damage to the machine, never use synthetic coolants, or any coolants containing chlorine. In addition, never use coolants and lubricating oils which contain organic solvents such as butane, pentane, hexane and octane.

AS-200L

■ Capacity

		12/24 stations turret	15 stations turret
Max swing bed		400mm	
Max. turning diameter		290mm	280mm
Distance between centers	Tailstock	760mm	
Distance between spindles	Sub spindle	800mm	
Max. turning length		570mm	
Bar capacity		65mm / 71mm (op.)	
Chuck size		8"	

■ Axis travel / Rapid feed

X-Axis slide travel / X-Axis rapid feed rate	202.5mm (Sub spindle:190mm) / 24m/min	212.5mm (Sub spindle:200mm) / 24m/min
Z-Axis slide travel / Z-Axis rapid feed rate	585mm / 36m/min	
Y-Axis slide travel / Y-Axis rapid feed rate	±41mm / 6m/min	

■ Main spindle

Spindle speed	4,500min^{-1} / 3,000min^{-1}(op.)
Spindle speed range	Stepless
Spindle nose	A2-6
Hole through spindle	80mm
I.D. of front bearing	110mm
Hole through draw tube	66mm / 72mm（op.）

■ Turret

Type of turret head	Dodecagonal drum turret	15 stations turret
Number of Tool stations	12 (Max.24)	15
Number of Indexing positions	24	15
Tool size (square shank)	□20mm, □25mm	
Tool size (round shank)	φ32mm	

■ Milling

Rotary system	Individual rotation	
Milling spindle speed	6,000min^{-1}	
Spindle speed range	Stepless	
Number of milling stations	12	15
Tool size	Straight holder φ1mm ～φ16mm Cross holder φ1mm ～φ16mm	

■ Tailstock (op.)

Driving System	Manual
Quill diameter	φ80mm
Quill taper	MT-4 (Rotating center)
Quill stroke	80mm
Travel	435mm

■ Sub spindle（op.）

Spindle speed	6,000min^{-1}
Spindle speed range	Stepless
Spindle nose	A2-5
Hole through spindle	56mm
I.D. of front bearing	80mm
Hole through draw tube	43mm

■ Drive motor

Main spindle	Standard	15/11kW 125/69N·m 4,500min^{-1}
	Option	15/11kW(High torque) 258/218N·m 4,500min^{-1}
	Option	15/11kW(High torque) 151/83N·m 3,000min^{-1}
Sub spindle（op.）		7.5/5.5kW
Milling		5.5/3.7kW

■ General

Machine height	1,935mm
Floor space(L × W)	2,716mm ×1,805mm (Standard)
	3,160mm ×1,805mm (Sub spindle)
Machine weight	5,500kg
Power supply	19.8kVA（Standard） 23kVA(Sub spindle)

■ Items

Control Type	Nakamura-Tome FANUC(0i-TF)

■ Controlled axes

Controlled axes	Standard	4 axes
	Sub spindle	6 axes
Simultaneously Controlled axes	Standard	4 axes(X, Z, C, Y axis)
	Sub-spindle	4 axes(X, Z, C(C2), Y, B axis)

■ Input command

Least input increment	0.001mm/0.0001inch（X in diameter), 0.001°	
Least command increment	Standard	X：0.0005mm / Z,Y：0.001mm / C：0.001°
	Sub-spindle	X：0.0005mm / Z,Y：0.001mm / C：0.001° / B：0.001mm
Max. programmable dimension	±999999.999mm / ±39370.0787in , ±999999.999°	
Absolute/ Incremental programming	Standard	X, Z, Y, C / U, W, V, H
	Sub-spindle	X, Z, Y, C, B(absolute only for B) / U, W, V, H
Decimal input	Standard	
Inch / Metric conversion	G20 / G21	
Programmable data input	G10	

■ Feed function

Cutting feed	feed/min X, Z： 1～8000mm/min, 0.01～314inch/min (1～4800mm/min, 0.01～188inch/min) Y： 1～6000mm/min, 0.01～236inch/min (1～4800mm/min, 0.01～188inch/min) C： 1～4800° /min B(op.)： 1～8000mm/min, 0.01～314inch/min (1～4800mm/min, 0.01～188inch/min) feed / rev 0.0001～500.0000mm/rev 0.000001～9.999999inch/rev) The maximum cutting feed rate is the value in AI contour control mode. In normal operation, It is enabled with G316 command. The values in parentheses are normal values.
Dwell	G04
Feed per minute / Feed per revolution	G98 / G99
Thread cutting	G32F designation
Thread cutting retract	Standard
Continuous thread cutting	Standard
Handle feed	Manual pulse generator 0.001/0.01/0.1mm(per pulse)
Automatic acceleration / decelaration	Standard
Linear accel./ decel. after cutting feed interpolation	Standard
Rapid feed override	Low/25/50/100% (can be set from 0~100 in 10% intervals on NT Setting screen)
Cutting feedrate override	0～150%, 10%(each 10%)
AI contouring control I	G5.1
Spindle override	50%～120% Set every 10%

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■ Program memory

Part program storage length/ Number of registerable programs	512Kbyte Total 1280m	400
	1Mbyte Total 2560m(Sub-spindle)	800
Parts program editing	delete, insert, change	
Program number search	Standard	
Sequence number search	Standard	
Address search	Standard	
Program storage memory	Battery backup	
Background editing	Standard	
DNC operation through memory card	Standard（Not including memory card）	
Extended part program editing	Standard	

■ Operation and display

Operation panel : Display	15-inch color LCD
Operation panel : Keyboard	Separate type MDI unit (QWERTY keys)

■ Programming assist functions

Circular interpolation R programming	Standard
Direct drawing dimension programming or Chamfering/Corner R	Standard
Canned cycles	G90, G92, G94
Multiple repetitive canned cycles	G70 ～ G76
Multiple repetitive canned cycles II	G71, G72
Canned cycles for drilling	G80 ～ G89
Sub program	Standard
Custom macro	Standard (common variables #100 - #149, #500 - #549)
Additional customer macro variables	Standard (After addition, #100 - #199, #500 - #999)
Abnormal load detection function	Standard
NT Work Navigator	Standard(not including contact bar)
NT NURSE	Standard

■ Machine support functions

Rigid tapping	Standard
Spindle synchronised control	Option (Sub-spindle)
C axis synchronised control	Option (Sub-spindle)
Spindle orientation	Standard

■ ECO functions

Servo motor power off	Standard(Switch on Power Saving Mode in NT Setting screen)
Control of motor output during acceleration and deceleration	Standard(Switch on Power Saving Mode in NT Setting screen)
G code for servo motor energy-saving during acceleration and deceleration	G356/G357
Automatic light off	Standard(Switch on Power Saving Mode in NT Setting screen)
Automatic monitor off	Standard(Switch on Power Saving Mode in NT Setting screen)

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