

NL SERIES

CNC Lathe



Rigid and Precise CNC Lathe

NL SERIES



Rigid & Precise

A lathe which moves the world.



Ever since our first machine tool rolled off the production line in 1968, we here at Mori Seiki have continued to make CNC lathes that are praised by customers everywhere. Over those 35 years, we have released around 100 models. We can say with confidence that we believe every single one was an improvement on its predecessor. So Mori Seiki has been able to create a new generation of CNC lathes, a lathe that moves the world. By reviewing the structure of every feature, by confronting the problem of heat generation, by reflecting on a product which incorporates all the customers' many demands. Through uncompromising development, we have achieved previously unheard of levels of rigidity, accuracy and reliability. Our efforts have created our newest line, the NL Series. These new machines are high-rigidity, high-precision CNC lathes and set the new standard in "common sense" machining for a new age.

Innovative turret design	P.4—7
The ultimate in turning	P.8—9
Rigid base	P.10—11
Thermal isolation	P.12—13
Variations	P.14—15
Y-axis specifications	P.16
Digital tailstock	P.17
Distance between centers 2000 type, 3000 type	P.18—19
Machining power	P.20—21
Productivity	P.22—23
Maintenance	P.24—25
Convenience	P.26
Eco-friendly design	P.27
Peripheral equipment	P.28—31
MAPPSS III (a new high-performance operating system)	P.32—35
Turnkey systems	P.36—37
Service Network	P.38—39
Standard & optional features	P.40—46
Recommended specifications	P.47
Numerical control unit specifications (MSX-850 III)	P.48
Machine size	P.49
Machine specifications	P.50—55

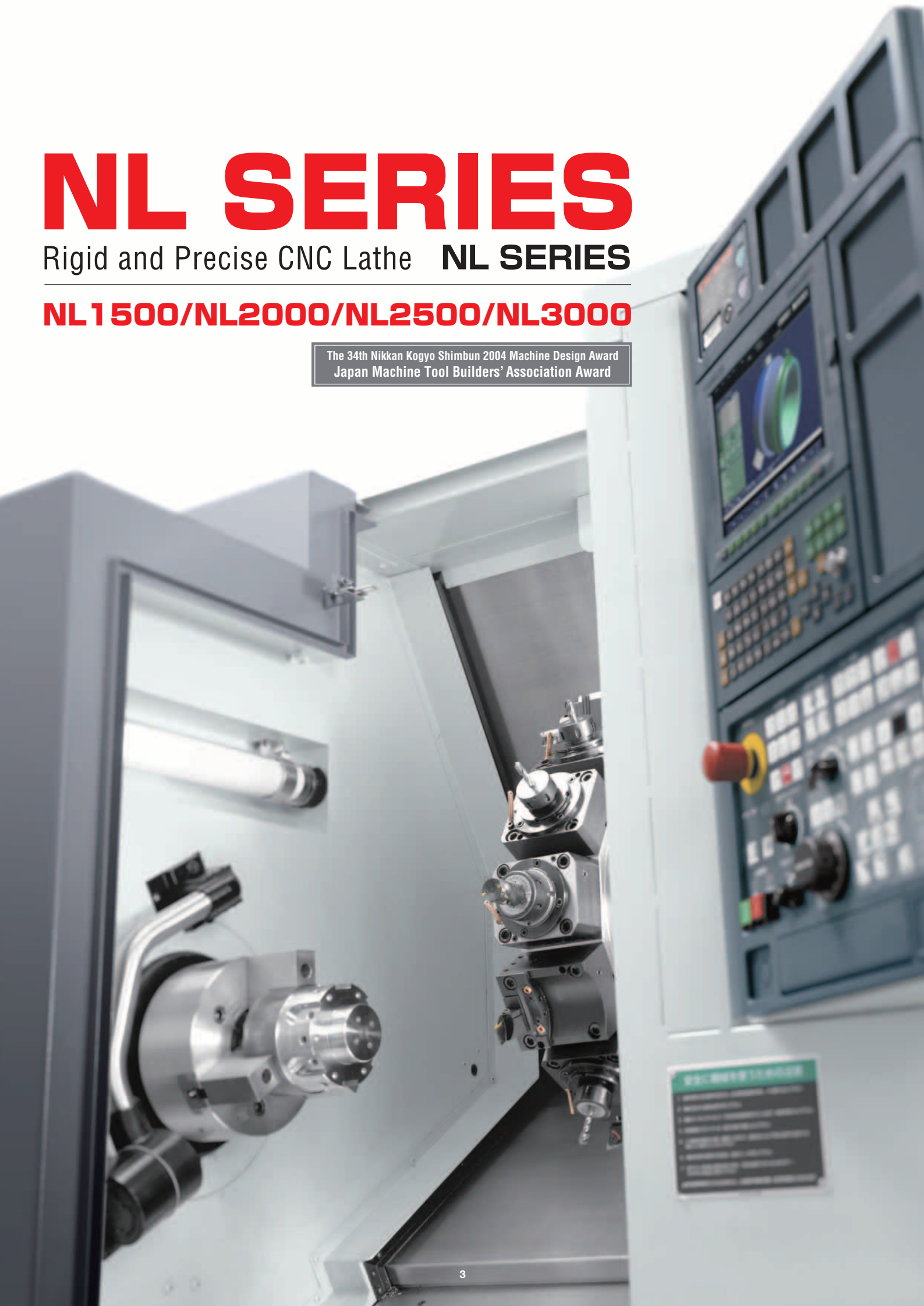
MAPPSS: Mori Advanced Programming Production System
 ● Figures in inches were converted from metric measurements.

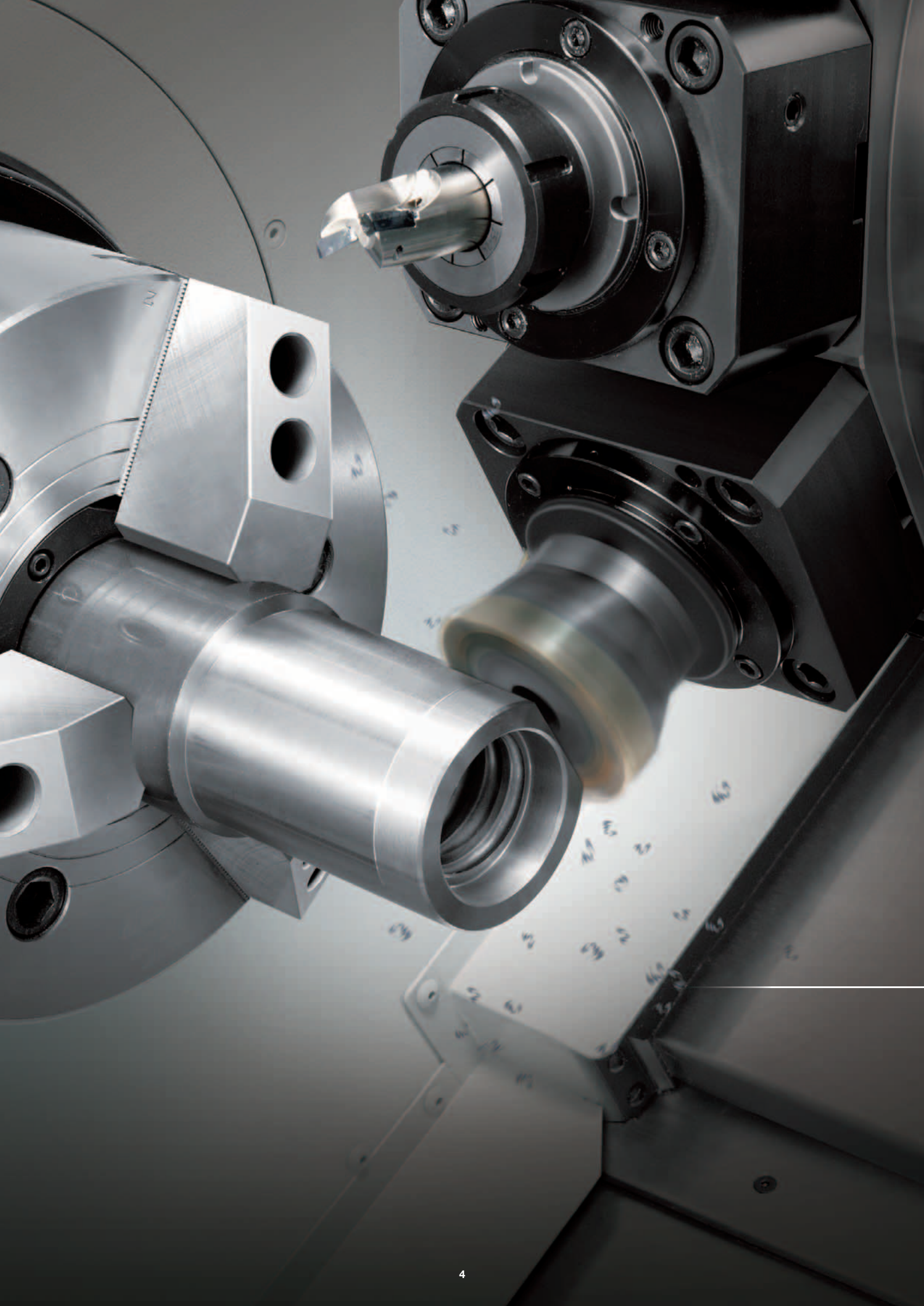
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Rigid and Precise CNC Lathe **NL SERIES**

NL1500/NL2000/NL2500/NL3000

The 34th Nikkan Kogyo Shimbun 2004 Machine Design Award
Japan Machine Tool Builders' Association Award







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Innovative turret design

BMT™

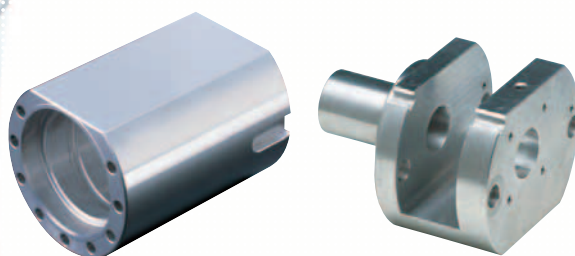
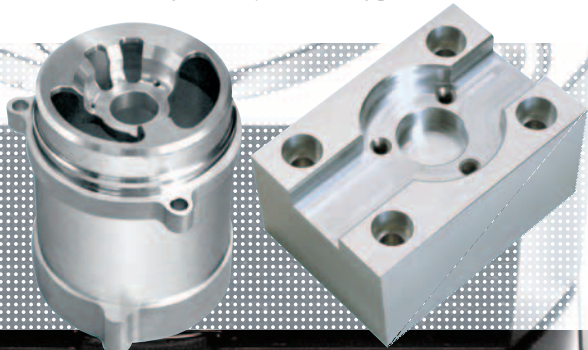
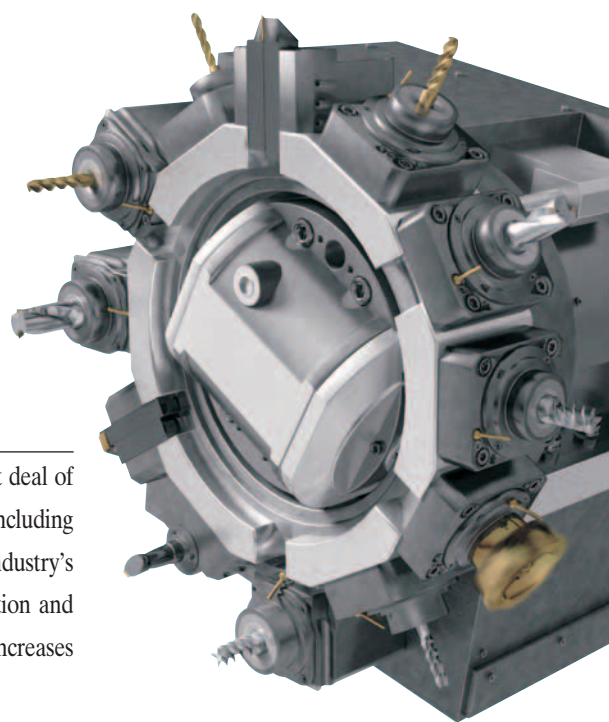


BMT™
Built-in Motor Turret

(Built-in Motor Turret)

The 2004 JSME Medal for New Technology
JSME: The Japan Society of Mechanical Engineers

The milling mechanism on conventional lathes generates a great deal of heat and vibration due to the large number of parts involved, including the motor and gear belt. The NL Series, however, features the industry's first BMT™. This revolutionary design minimizes heat generation and vibration while eliminating transmission losses. The new design increases both machining accuracy and cutting performance.



NL2500

Face mill

$\phi 80$ mm
($\phi 3.1$ in.)

Tapping capacity M20

The NL Series was designed to create a CNC lathe with true milling capability. For example, the NL2500 can accommodate face mills of up to $\phi 80$ mm ($\phi 3.1$ in.). NL Series machines boast milling performance approaching that of No. 40 taper machining centers.

《Actual size》

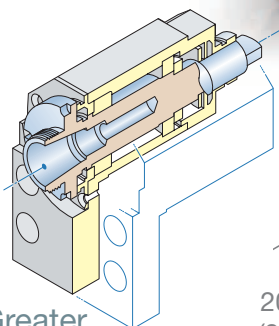
Extremely rigid turret

In order to enhance the milling function, it is essential to increase the rigidity of the rotary tool holders. The NL Series rotary tool holders have a broader grip compared to conventional lathes. By raising attachment precision we have vastly improved rigidity.

■ Comparison of rotary tool holder rigidity

With conventional lathes, chattering occurred when the depth of cut was increased. The NL Series, however, is equipped with rotary tool holders with improved rigidity, allowing deeper cutting than before.

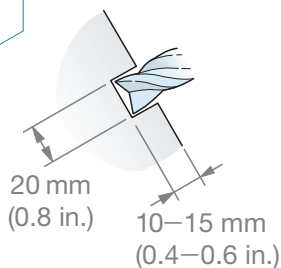
Previous model



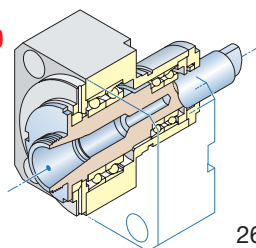
Rotary tool holder rigidity

180% Greater

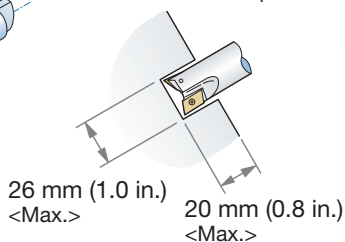
Tool diameter and depth of cut



NL2500



Tool diameter and depth of cut



Tool diameter

26 mm (1.0 in.) <Max.>

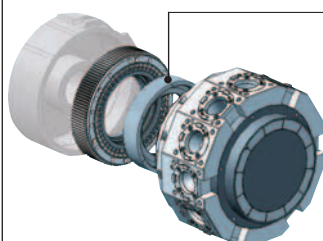
Depth of cut

20 mm (0.8 in.) <Max.>

• The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

■ Coupling diameter

Greater coupling diameter than before.



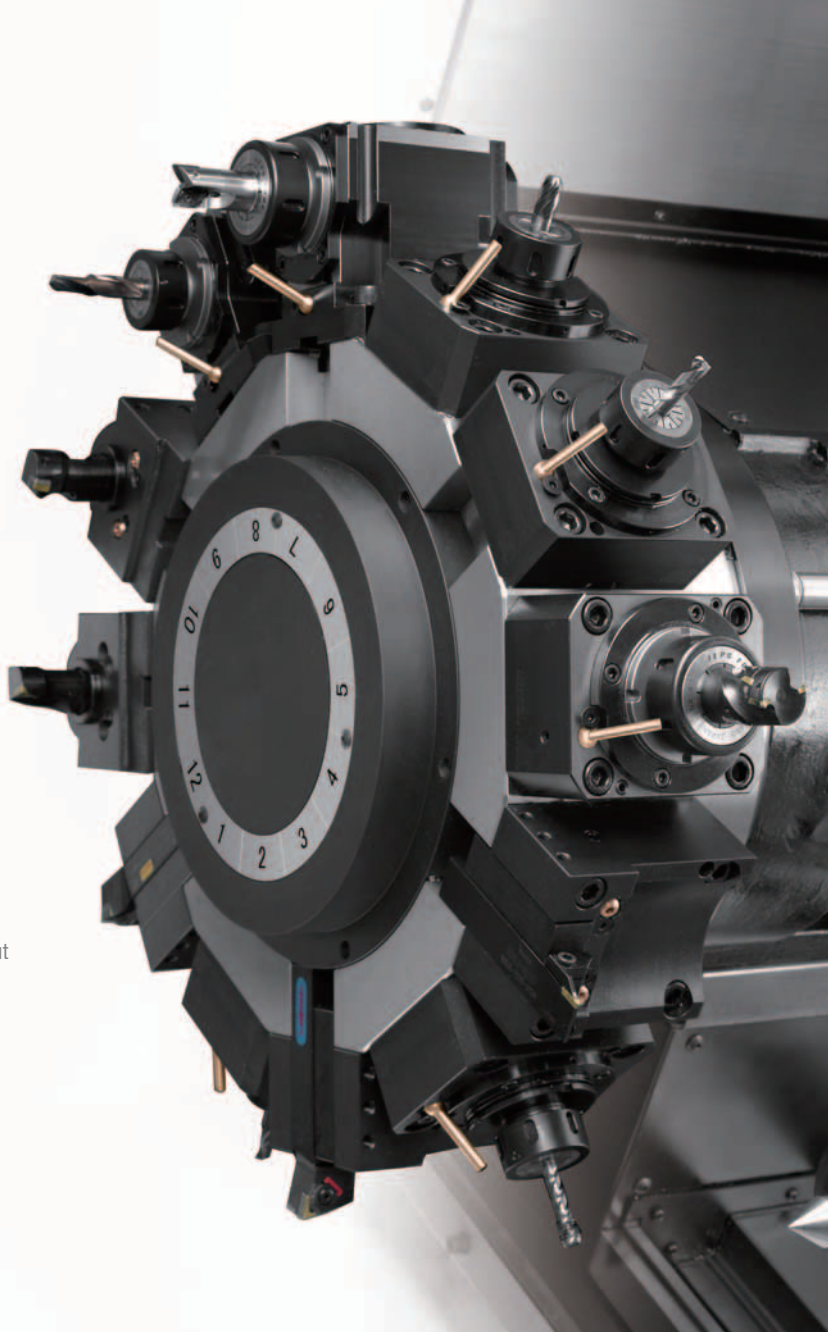
Previous model
210 mm
(8.3 in.)



NL2500
250 mm
(9.8 in.)

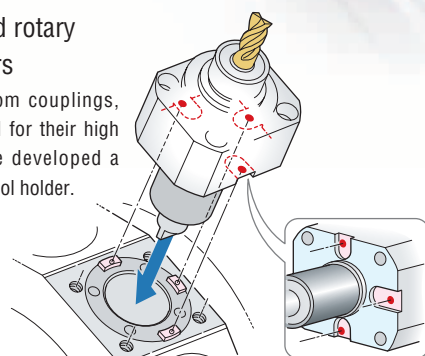
Coupling diameter

19% Greater

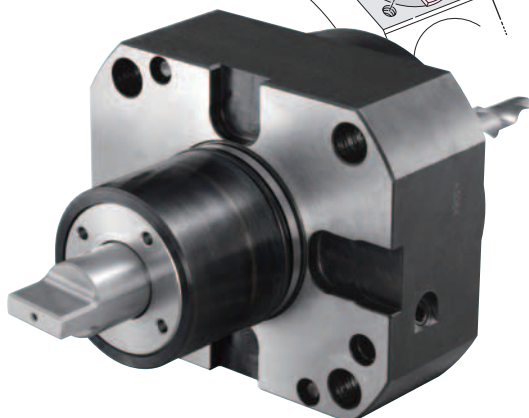


■ Super-rigid rotary tool holders

Taking a hint from couplings, which are praised for their high repeatability, we developed a very rigid rotary tool holder.



Positioning key
Strong gripping force is secured by the 3 positioning keys.





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■ High-performance rotary tool spindle

A DDS motor that has no gear belt is used for the rotary tool spindle, delivering high-speed, high-efficiency machining.

DDS: Direct Drive Spindle

Max. rotary tool spindle speed

Previous model	NL SERIES
4,000 min ⁻¹	6,000 min⁻¹
▶ 50% Greater	

Rotary tool spindle acceleration time

Previous model	NL2500
0→4,000 min ⁻¹	0→4,000 min ⁻¹
0.35 sec.	0.11 sec.
▶ Reduced approximately 70%	
	0→6,000 min ⁻¹
	0.23 sec.

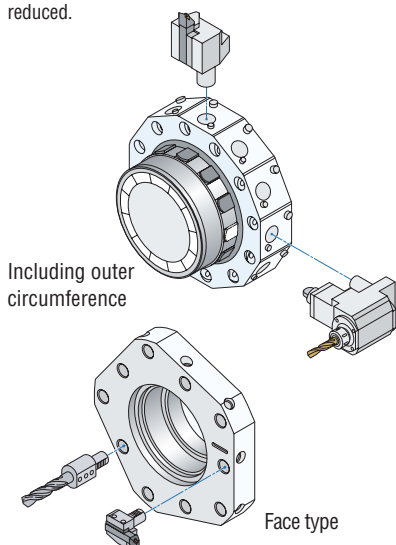
Maximum rotary tool spindle torque

NL1500	24 N·m (17.7 ft·lbf) <3 min>
NL2000	29 N·m (21.4 ft·lbf) <3 min>
NL2500 NL3000	40 N·m (29.5 ft·lbf) <3 min>
NL3000	54 N·m (39.8 ft·lbf) <10 min> [OP]

■ Turret variations

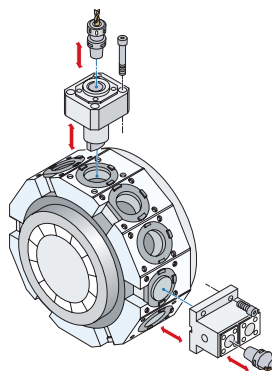
Quick-change type turret head (VDI) **[OP]**

Turret equipped with quick-change specifications for VDI tools. Tool attachment time is dramatically reduced.



Capto-compatible holder **[OP]**

The Coromant Capto modular tooling system, with much faster tool-changing time than conventional machines.



20-station turret head **[OP]** (NL1500, NL2000)

A 20-station turret for workpieces which require many machining processes, or for various types of workpieces.



10-station turret head (NL3000)

Equipped with the bolt-fastened type, 10-station turret from the NL3000.



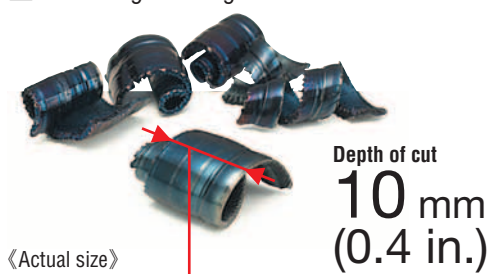
• The face type is only available for 2-axis turning specifications.

The ultimate in turning

Improved tool tip rigidity

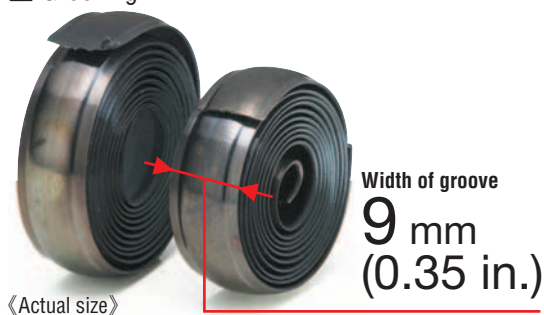
By increasing the rigidity between the spindle and tool tip, tool tip vibration has been minimized, achieving a high-quality cutting surface during turning. At the same time, tool tip vibration control also contributes to longer tool life.

■ O.D. rough cutting

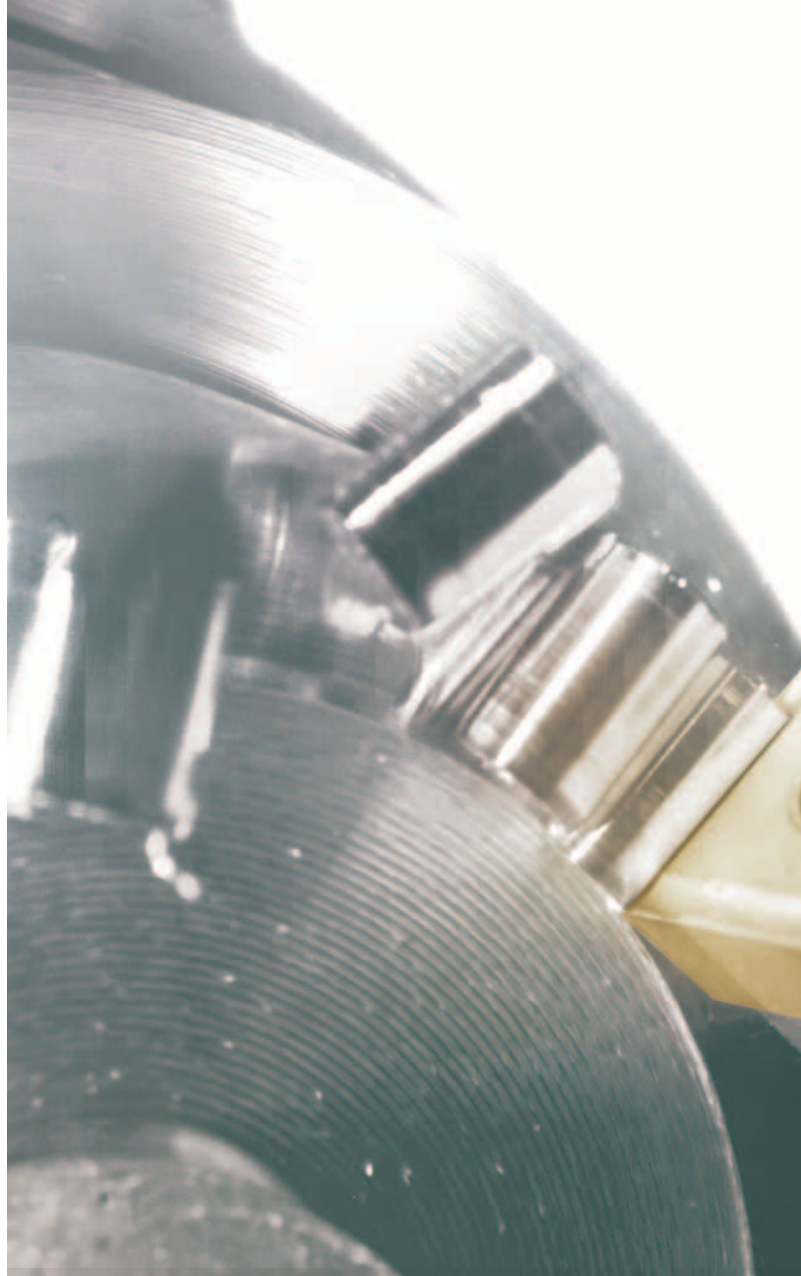


Machine type	NL3000Y/700
Tool	SANDVIK CNMM190616-PR4025
Material <JIS>	S45C (Carbon steel)
Cutting speed	220 m/min (721.8 fpm)
Feedrate	0.6 mm/rev (0.024 ipr)
Depth of cut	10 mm (0.4 in.)

■ Grooving



Machine type	NL2000MC/500
Tool	ISCAR GFN9 IC354
Material <JIS>	S45C (Carbon steel)
Cutting speed	190 m/min (623.4 fpm)
Feedrate	0.25 mm/rev (0.010 ipr)
Width of groove	9 mm (0.35 in.)





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Handles large-diameter workpieces

Although the NL Series machines remain rock solid during heavy-duty cutting, their design incorporates the largest through-spindle hole in its class < ϕ 91 mm (ϕ 3.6 in.) for NL2500>.

Bar work capacity

NL1500 ϕ 52 mm (ϕ 2.0 in.)
[ϕ 34 mm (ϕ 1.3 in.) <8,000 min⁻¹>]

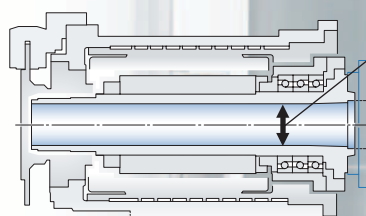
NL2000 ϕ 65 mm (ϕ 2.6 in.)

NL2500 ϕ 80 mm (ϕ 3.1 in.)

NL3000 ϕ 90 mm (ϕ 3.5 in.)

[] Option

• Depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.



Through-spindle hole diameter (headstock 1)

NL1500
61 mm (2.4 in.)
[43 mm (1.7 in.) <8,000 min⁻¹>]

NL2000
73 mm (2.9 in.)

NL2500
91 mm (3.6 in.)

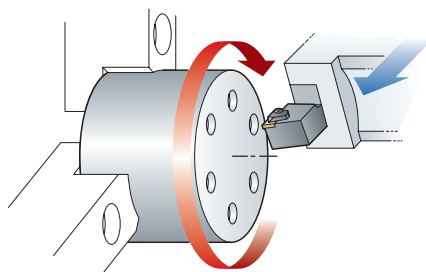
NL3000
105 mm (4.1 in.)

[] Option

Machine rigidity which shows in the cutting surface

End face finishing accuracy

Conventional machines create a pattern on material due to the amount of vibration the tool tip generates. If you do the same machining with the NL Series, the high machine rigidity shows in the cutting surface.

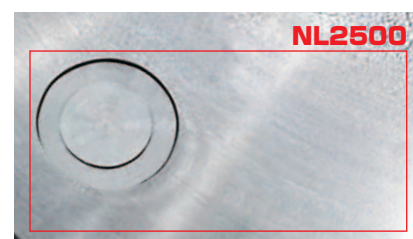


Tool	WTKNR2525M-16N
Inserts	TNMG160408-PF (4015)
Material <JIS>	S45C < ϕ 150×150 mm (ϕ 5.9×5.9 in.)>
Cutting speed	380 m/min (1,246.8 fpm)
Feedrate	0.12 mm/rev (0.005 ipr)
Depth of cut	0.1 mm (0.004 in.)

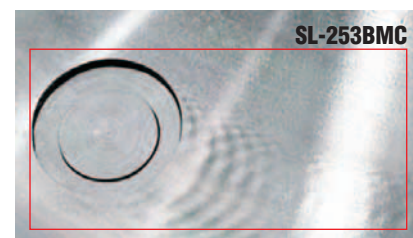
S45C: Carbon steel JIS: Japanese Industrial Standard

• The cutting test results indicated in this catalog are provided as examples.

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Patterns caused by small vibration during machining



Patterns caused by large vibration during machining

Rigid base

Ultra-high rigidity structure

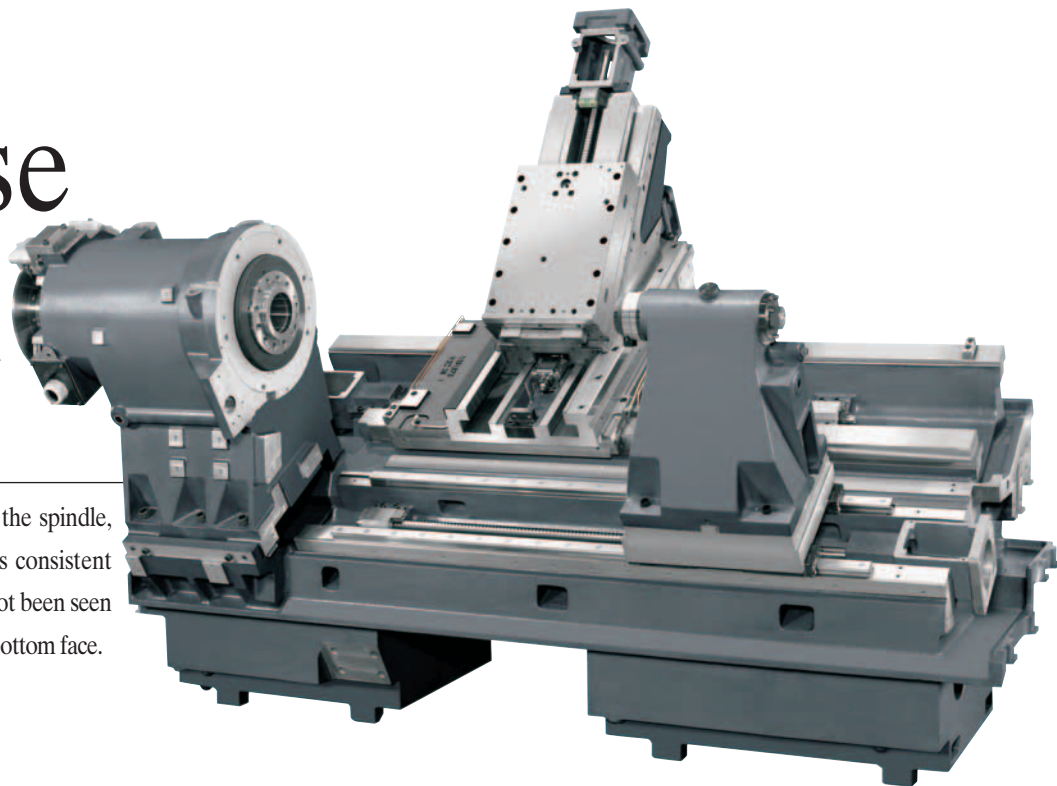
We have a new design for the basic structure: the spindle, saddle and tailstock. This new design ensures consistent rigidity. The result is a level of rigidity that has not been seen before, with increased stability due to the broad bottom face.

Torsionally rigid

100% Greater

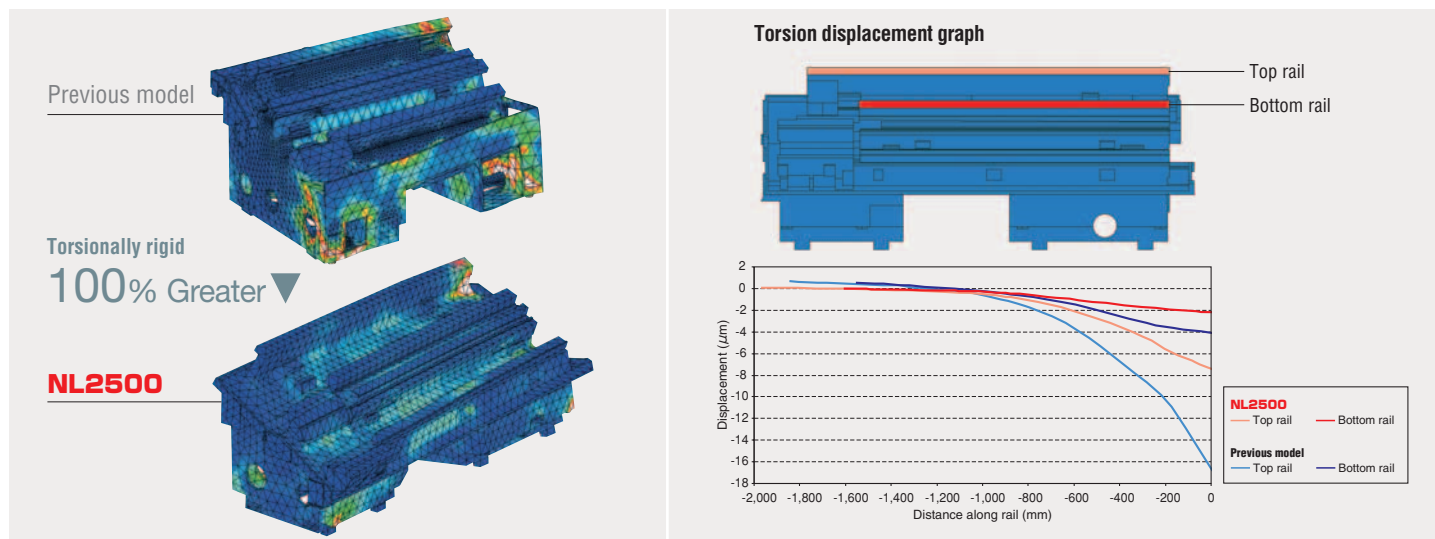
<comparison to conventional machines>

NL2500Y/700



■ Bed torsion rigidity

Dramatically better bed torsion rigidity compared to conventional machines has been achieved through static analysis.



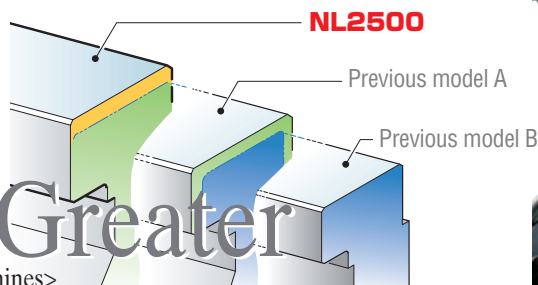
■ Broader guideways

The slideways are 30% wider than those of conventional machines and are the largest in the class. We have achieved an unknown level of stability not only in turning work but also in milling work.

Guideway
width

30% Greater

<comparison to conventional machines>

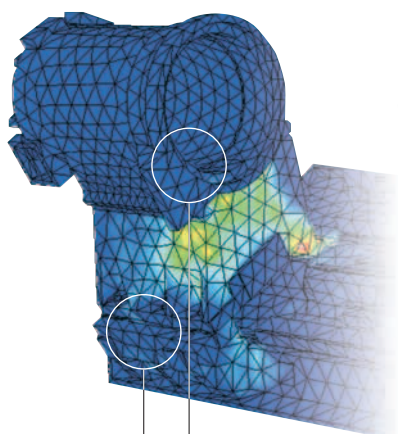




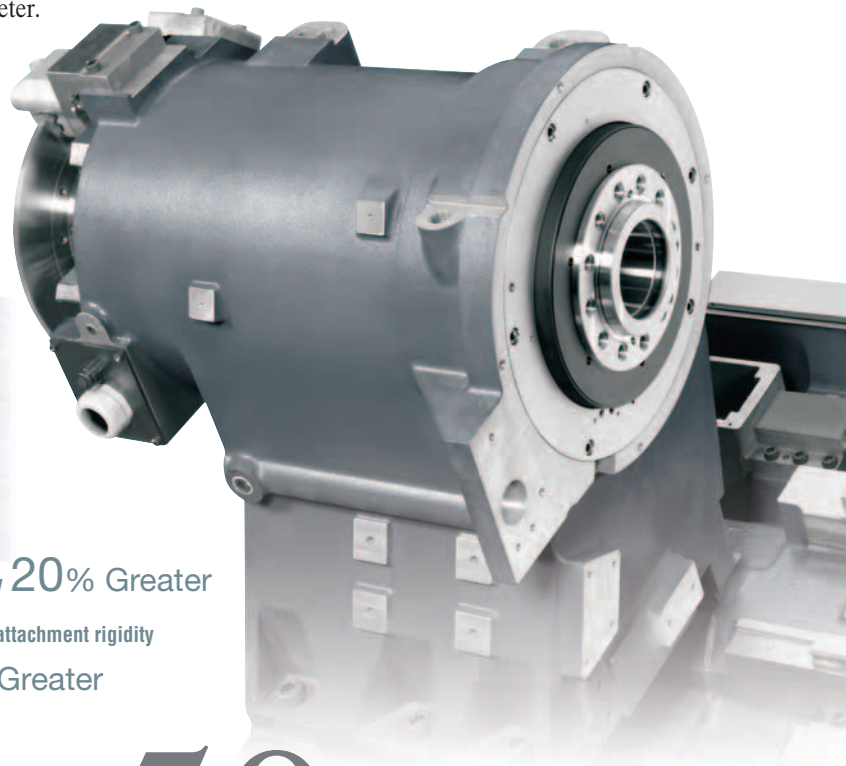
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Highly rigid spindle

The axis rigidity of the headstock and its mounting have been improved by changing the shape of the headstock and increasing the thickness of its parts. The diameter of the bearings has been increased. This allows better spindle rigidity while enlarging the through-hole diameter.



Axis rigidity **20% Greater**
Headstock attachment rigidity
30% Greater



Rigidity of the
spindle itself

50% Greater
<comparison to conventional machines>

■ Improved acceleration/deceleration time and torque specs

Raising the rigidity has endowed the NL Series with performance equal to that of spindle motors one class above.

Acceleration/deceleration time (when mounted with chuck)

Previous model

Spindle acceleration time
(0→4,000 min⁻¹)

4.9 sec. ► Reduced by
31%

Spindle deceleration time
(4,000 min⁻¹→0)

4.2 sec. ► Reduced by
14%

NL2500

Spindle acceleration time
(0→4,000 min⁻¹)

3.4 sec.

Spindle deceleration time
(4,000 min⁻¹→0)

3.6 sec.

Maximum spindle torque (standard)

NL1500

200 N·m (147.5 ft·lbf) <50%ED>

NL2000

349 N·m (257.4 ft·lbf) <50%ED>

NL2500

599 N·m (441.8 ft·lbf) <25%ED>

NL3000

1,025 N·m (756.0 ft·lbf) <30 min>

Thermal isolation

Designed to eliminate all heat

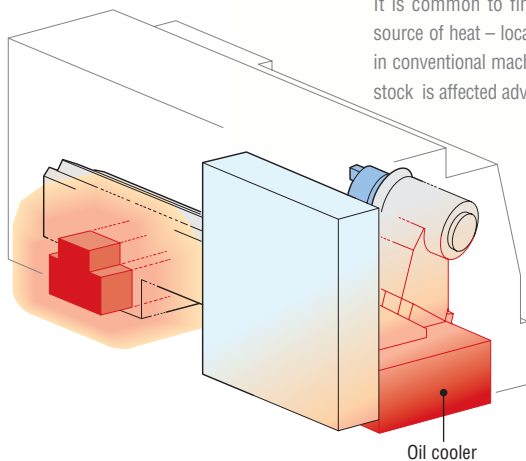
The most prominent feature of the NL Series is said to be the elimination of the adverse effects of heat. In order to raise the continuous machining precision of lathes, 95% of which is said to be taken up by cutting time, we at Mori Seiki have come up with the concept of total heat elimination.



Heat elimination layout

Previous model

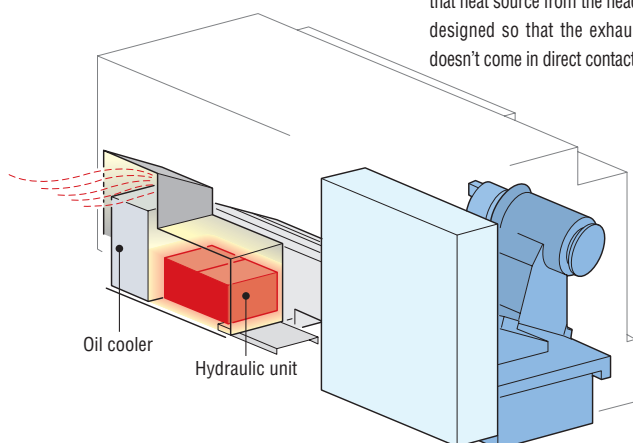
It is common to find the oil cooler – a major source of heat – located right next to the spindle in conventional machines. As a result, the headstock is affected adversely by that heat.



Large heat displacement

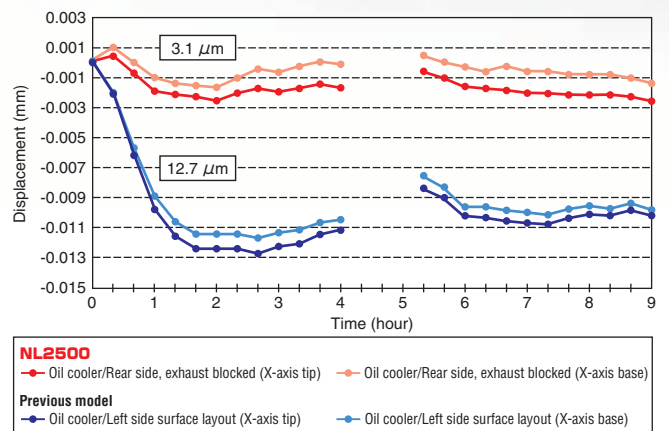
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Placing the oil cooler behind the machine removes that heat source from the headstock. The machine is designed so that the exhaust from the oil cooler doesn't come in direct contact with the machine.



Low heat displacement

Spindle thermal displacement



Fully-covered bed

Covering the bed with a cover makes it difficult for the heat from chips to be transmitted to the bed.





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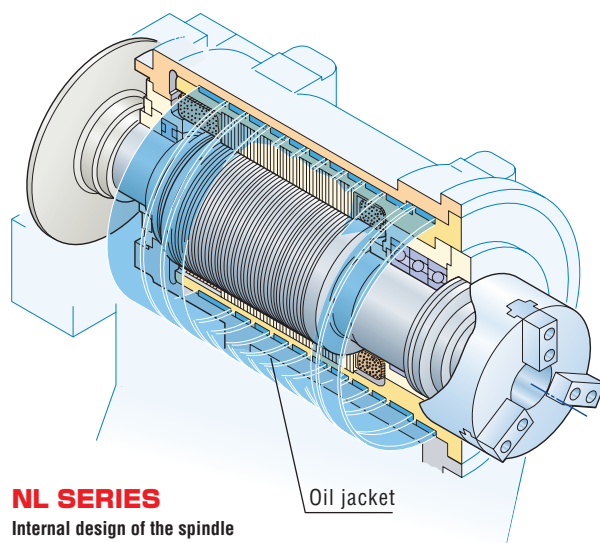
Spindle cooling

We have redesigned the spindle, which is the greatest source of heat, to employ a uniform-heat construction that maintains an equal temperature all around the spindle. The main spindle unit is protected from rises in temperature by the spiraling oil jacket located all the way to the back side.



Inverter-type oil cooler

An inverter-type oil cooler with very accurate temperature regulation has been used.



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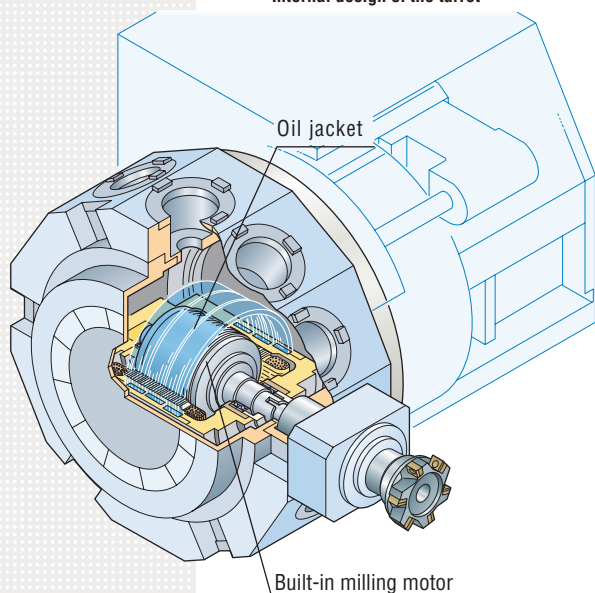
Internal design of the spindle

Oil jacket

Milling turret with a heat-suppressing design

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Internal design of the turret



Built-in milling motor

The industry's first BMT™ (Built-in Motor Turret) minimizes heat.

Previous model

Motor
+
Timing belt 1
+
Timing belt 2
+
Involute spline
+
Bevel gear
+
Keyed shaft

The transmission with all its gear, belts, and more, generates a substantial amount of heat and can adversely affect machining precision.

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Built-in milling motor
+
Keyed shaft

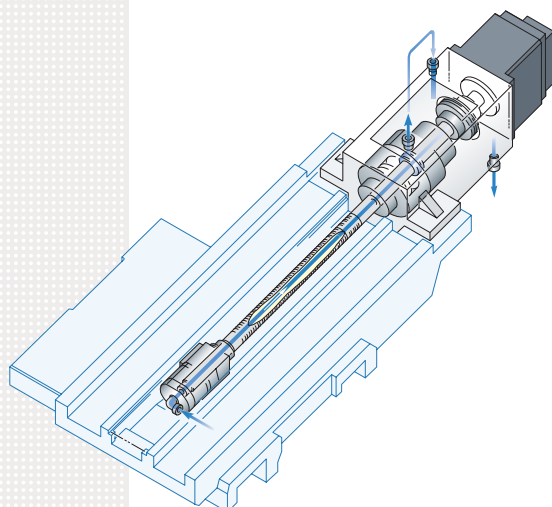
The built-in milling motor design has eliminated the transmission mechanism. Therefore, sources of heat are eliminated and jacket cooling is performed. This is only achieved with a built-in milling motor.

Rising turret
temperatures

1/10
or less

Ball screw shaft cooling (option)

As an option to increase machining accuracy even further, we have provided ball screw core cooling. (X-axis only)



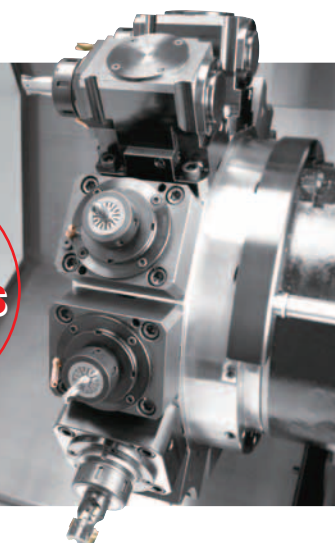


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Variations

We want everyone to use the new standard in CNC lathes. Mori Seiki's NL Series has machines in four classes for different workpiece sizes and six types to best match the level of the customer's machining and process integration. With a total of 36 variations, you are bound to find one right for you.

36
variations
in all



NL1500MC/500

NL1500

2-axis turning	MC	Y	S	SMC	SY
Distance between centers	↔500↔				
Standard chuck size <headstock 1/headstock 2>	⑥ inches / ⑥ inches				
Bar work capacity	52 mm (2.0 in.) [34 mm (1.3 in.) <8,000 min ⁻¹ >]				
Number of tool stations	12 [16] [20] tools				
Travel <X-/Z-axis>	260/590 mm (10.2/23.2 in.)				
Travel <Y-axis>	100 <±50> mm (3.9 <±2.0> in.)				

[] Option



NL2000SMC/500

NL2000

2-axis turning	MC	Y	S	SMC	SY
Distance between centers	↔500↔				
Standard chuck size <headstock 1/headstock 2>	⑧ inches / ⑥ inches				
Bar work capacity	65 mm (2.5 in.)				
Number of tool stations	12 [10] [16] [20] tools				
Travel <X-/Z-axis>	260/590 mm (10.2/23.2 in.)				
Travel <Y-axis>	100 <±50> mm (3.9 <±2.0> in.)				

[] Option

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity. ● The photo shows the machine equipped with options.

MC Turret with milling function



While milling with the spindle rotating, multi-axis turning is made possible by simultaneously controlling three axes, including the C-axis. This flexibly meets processing needs even when involving drilling processes or complex shapes.

Y Turret with Y-axis control



Controls tool center height in both the direction of the workpiece diameter (X-axis) and the direction of the axis (Z-axis). Achieves high-accuracy machining even with processes such as offset key grooving or drilling off-center holes, which are difficult for conventional turning centers.

S Headstock 2



A sub-spindle is mounted in the machine. When the first process completes, you can immediately transfer the workpiece to the sub-spindle, achieving continuous machining with both high speed and high precision.



NL2500MC/700



NL2500Y/1250

NL2500

2-axis turning	MC	Y	S	SMC	SY
Distance between centers	$\longleftrightarrow 700 \longleftrightarrow$ $\longleftrightarrow 1250 \longleftrightarrow$				
Standard chuck size <headstock 1/headstock 2>	$\textcircled{10}$ inches / $\textcircled{6}$ inches				
Bar work capacity	80 mm (3.1 in.)				
Number of tool stations	12 [10] tools				
Travel <X-/Z-axis>	260/795 mm (10.2/31.3 in.) <700 type> 260/1,345 mm (10.2/53.0 in.) <1250 type>				
Travel <Y-axis>	100 \pm 50 mm (3.9 \pm 2.0 in.)				

[] Option



NL3000Y/700



NL3000MC/1250

NL3000

2-axis turning	MC	Y
Distance between centers	$\longleftrightarrow 700 \longleftrightarrow$ $\longleftrightarrow 1250 \longleftrightarrow$ $\longleftrightarrow 2000 \longleftrightarrow$ $\longleftrightarrow 3000 \longleftrightarrow$	
Standard chuck size	$\textcircled{12}$ inches	
Bar work capacity	90 mm (3.5 in.)	
Number of tool stations	10 [12] tools	
Travel <X-/Z-axis>	280/820 mm (11.0/32.3 in.) <700 type> 280/1,370 mm (11.0/53.9 in.) <1250 type> 280/2,170 mm (11.0/85.4 in.) <2000 type> 280/3,170 mm (11.0/124.8 in.) <3000 type>	
Travel <Y-axis>	120 \pm 60 mm (4.7 \pm 2.4 in.)	

[] Option

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity. ● The photo shows the machine equipped with options.

Y-axis specifications **Y** **SY**

We also independently developed a powerful platform for maximizing performance in the Y-axis specifications. This has achieved rigidity between the spindle and the tool tip that exceeds that of conventional two-axis lathes.

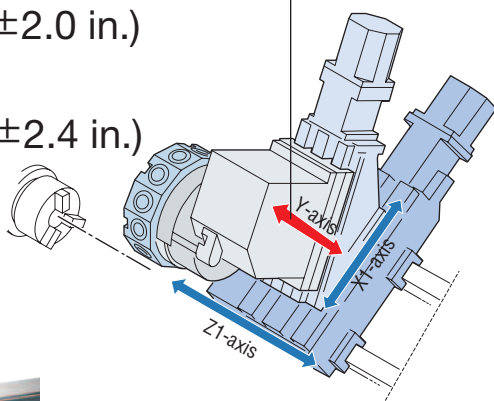
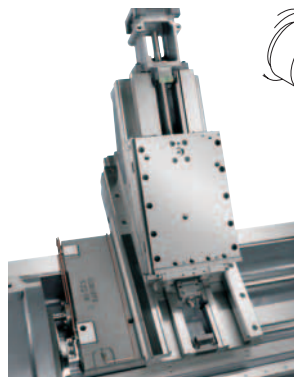
Y-axis travel

NL1500/NL2000/NL2500

±50 mm (±2.0 in.)

NL3000

±60 mm (±2.4 in.)

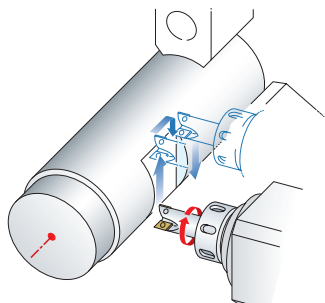


Linking the X-axis and a virtual axis creates the Y-axis movement. The axis unit has been downsized to lower machine height.

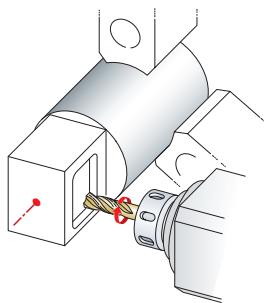


■ Bar machining with Y-axis control

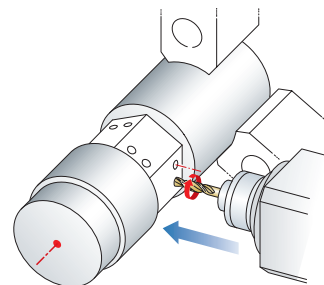
Side milling



Off-center grooving

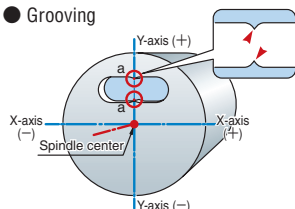


Off-center drilling

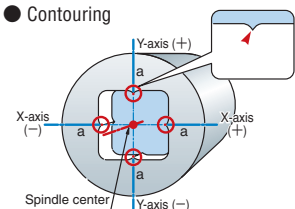


■ Comparison between polar coordinate interpolation and Y-axis control

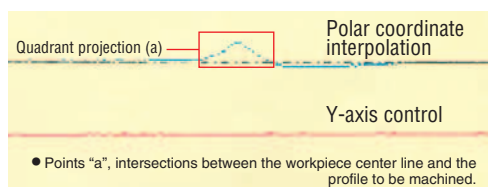
● Grooving



● Contouring



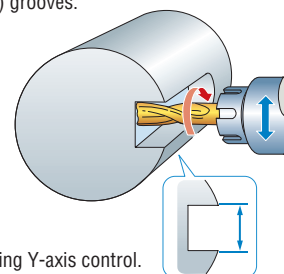
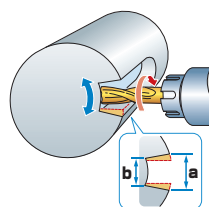
On a conventional turning center, polar coordinate interpolation is used for tool motion control during grooving and contouring, as illustrated in the left figure. In this control mode, however, the X-axis travel direction is reversed at points "a", the intersections between the workpiece center line and the profile to be machined. This reversal changes cutting conditions and subsequently effects profile accuracy. Machining with Y-axis control, on the other hand, is free of such changes and ensures a high level of profile accuracy.



■ Circumferential grooving on a turning center with Y-axis control

Milling without Y-axis control

It is hard to match the width of outer (a) and inner (b) grooves.



Milling on the NL Series

Groove width can be matched using Y-axis control.

Headstock 2

S

SMC

SY

Choose from S-type, which allows both-face continuous machining, SMC-type which offers consistent machining from turning to secondary machining and back face machining thanks to its combination of headstock 2 and rotary tools, and SY-type, which achieves superior multi-axis machining with the additional Y-axis.

Maximum headstock 2 torque

NL SERIES

77.8 N·m (57.4 ft·lbf) <25%ED>



Digital tailstock

2-axis turning

MC

Y

Not including NL3000/2000, NL3000/3000

The NL Series comes standard with a new feature – a highly rigid digital tailstock driven by a servo motor. This drastically reduces setup time. (New standard feature does not apply to S, SMC and SY types.)



■ Fewer steps requiring operation of the tailstock

The operator is freed from the hassle of having to lock the tailstock when changing to a workpiece of a different length, connecting it to the turret, etc.

■ Operating time reduced

With the conventional hydraulic system, changing the tailstock spindle settings was inconvenient, so there was a limit to how much operating time could be reduced. A digital tailstock with variable feed speed control allows separate speeds to be set for approach and engagement, reducing the operating time of the tailstock spindle by over 20%.

■ Variable pressure control using program instructions

With a hydraulic tailstock spindle, thrust is controlled indirectly using a hydraulic pressure meter, so if you use different machine models, you will get different thrusts even if the same pressure is set. With a digital tailstock, however, the thrust is measured directly, so the workpiece engagement is done accurately, raising machining precision.

■ Simple operation using MAPPS III

Approach position, retract position, re-chucking and more can be done simply and easily from the MAPPS III screen. Besides being able to handle a variety of different workpiece types, it can also work with M-code thrust selection as a standard feature.



Tailstock control screen

Setup time

Reduced by over **50%**

Tailstock spindle operating time

Reduced by over **20%**

■ More applications

With a servomotor for positioning, the digital tailstock has outstanding functionality. It can also be used for certain types of machining (e.g., drilling, boring) of the center of the workpiece end face.



Machining using the tailstock drill (option)

- The NL3000 with a distance between centers of 2000 type, 3000 type is equipped with a programmable tailstock (carriage direct-coupled) as standard.

Distance between centers 2000 type, 3000 type (NL3000)

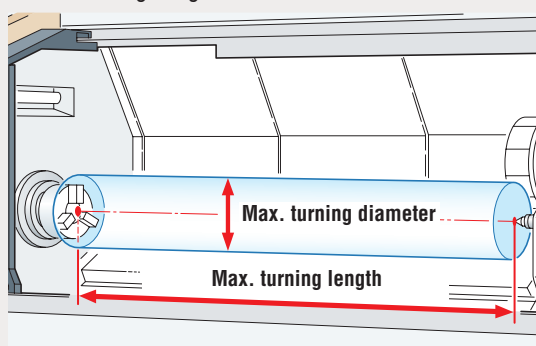


In order to machine long workpieces with high speed and high precision, we have added a high-rigidity bed and special functions and equipment for machining long workpieces. It is the definitive bar work machine, eliminating all compromise.



NL3000MC/3000

■ Machining range



Max. turning diameter

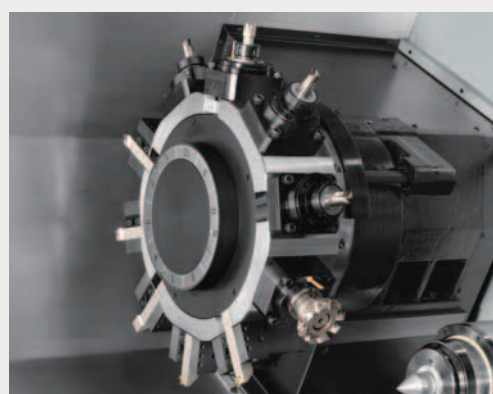
420 mm (16.5 in.)

Max. turning length

2,123 mm (83.5 in.) <NL3000/2000>

3,123 mm (122.9 in.) <NL3000/3000>

■ 10-station turret head

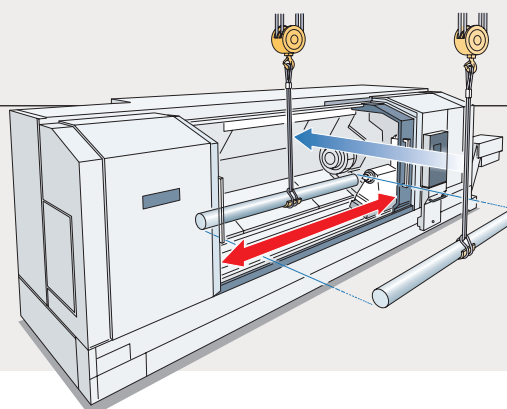


■ Wide door opening

To improve operability when using a crane, it is equipped with a wide door opening.

2,340 mm (92.1 in.) <NL3000/2000>

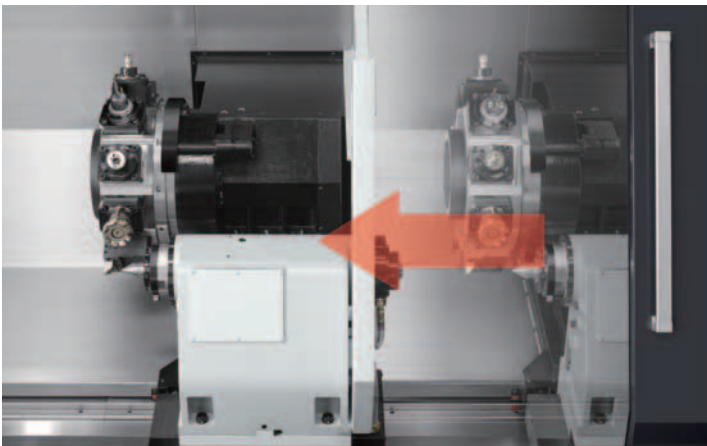
3,340 mm (131.5 in.) <NL3000/3000>



■ Tailstock (digital tailstock cannot be used)

Programmable tailstock (carriage direct-coupled)

The programmable tailstock, which can easily be to user-defined positions, allows shorter setup time, even for workpieces of different lengths.



By connecting the tailstock and turret by a pin, the Z-axis can drive the tailstock without using a servo motor.

Tailstock spindle travel

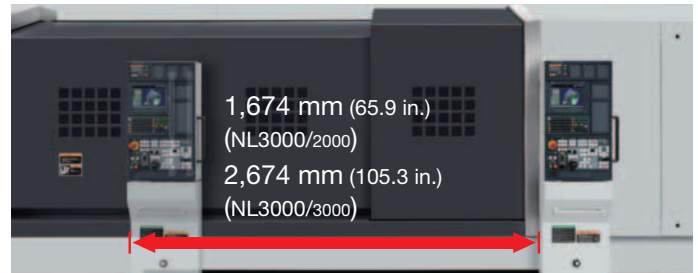


■ Operation panel that enhances operability



The easy-to-use operation panel swivels 90°. Improved visibility during operation.

0—90°



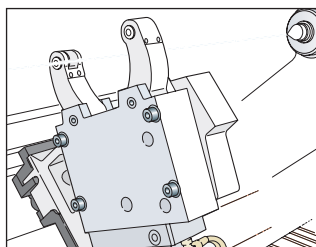
Depending on machining situation, the operator can slide the operation panel for ease and comfort.

■ Peripheral equipment



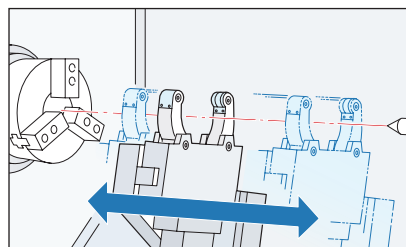
Chip conveyor

Hinge-type, right disposal specifications are standard.



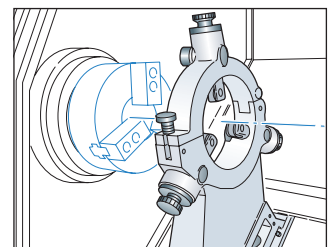
Hydraulic steady rest (bolt-tightening) OP

The hydraulic steady rest can be set up in less time and without any manual setting thanks to automatic centering.



Hydraulic steady rest (automatic) OP

We have made workpiece support automatic with hydraulics. The movement of the steady rest also has accurate position indexing thanks to NC control.



Steady rest OP

Bolts are tightened manually, supporting the workpiece.

Applicable workpiece diameter
20—240 mm (0.8—9.4 in.)
180—350 mm (7.1—13.7 in.)



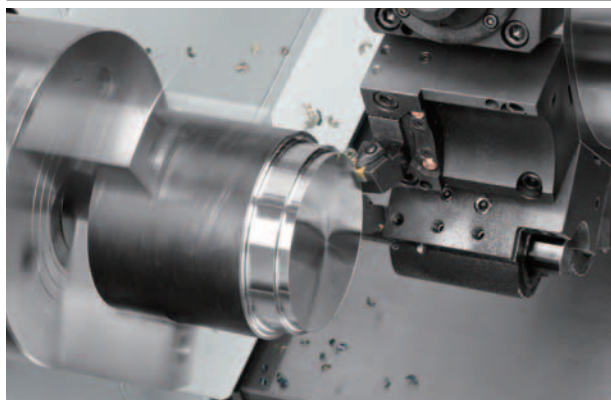
Rigid & Precise
NL SERIES

Machining power

By employing a super-rigid construction for the NL Series and equipping it with a BMT™ (Built-in Motor Turret), it is able to deliver cutting equal to that of machines one class above. This contributes to productivity.

Turning performance

Heavy-duty cutting <O.D.>



As you can see, wide cutting can be done in outer diameter heavy cutting.



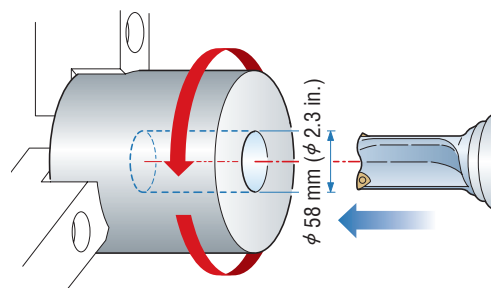
〈Actual size〉

Machine type	NL2500MC/700
Material <JIS>	S45C <φ 118×100 mm (φ 4.6×3.9 in.)>
Spindle speed	764 min ⁻¹
Depth of cut	10 mm (0.4 in.)
Cutting speed	120 m/min (393.7 fpm)
Feedrate	0.4 mm/rev (0.016 ipr)

Material removal rate

576.0 mL/min
(35.1 in³./min)

Throw-away drill



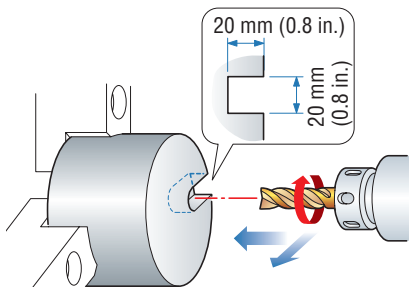
Material removal rate

435.2 mL/min (26.5 in³./min)

Machine type	NL2500MC/700
Material <JIS>	S45C <φ 118×50 mm (φ 4.6×2.0 in.)>
Spindle speed	549 min ⁻¹
Drill diameter	58 mm (2.3 in.)
Cutting speed	100 m/min (328.1 fpm)
Feedrate	0.3 mm/rev (0.012 in.)

Milling capacity (material <JIS>: S45C) φ 118×100 mm (φ 4.6×3.9 in.)

End mill <φ 20 mm (φ 0.8 in.) High-speed steel, 2 blades>

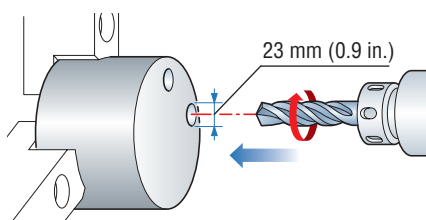


Material removal rate

25.6 mL/min (1.6 in³./min)

Machine type	NL2500MC/700
Rotary tool spindle speed	320 min ⁻¹
Depth of cut	20 mm (0.8 in.)
Cutting speed	20 m/min (65.6 fpm)
Feedrate	64 mm/min (2.5 ipm)

Drill <φ 23 mm (φ 0.9 in.) High-speed steel, 2 blades>

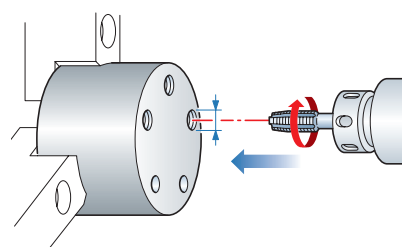


Material removal rate

43.0 mL/min (2.6 in³./min)

Machine type	NL2500MC/700
Rotary tool spindle speed	345 min ⁻¹
Cutting speed	25 m/min (82.0 fpm)
Feedrate	103.5 mm/min (4.1 ipm)

Tap



Tool

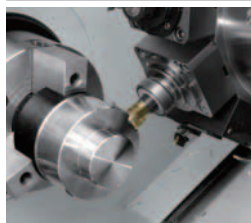
M20×P2.5

Machine type	NL2500MC/700
Rotary tool spindle speed	160 min ⁻¹
Cutting speed	10 m/min (32.8 fpm)
Feedrate	400 mm/min (15.7 ipm)

S45C: Carbon steel JIS: Japanese Industrial Standard
• The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Comparison of milling power (material <JIS>: S45C)

End mill



Machine type	
Previous model	NL2500MC/700
Depth of cut	
15 mm (0.6 in.)	20 mm (0.8 in.)
Material removal rate	
8.6 mL/min (0.5 in ³ /min)	38.4 mL/min (2.3 in ³ /min)

Drill

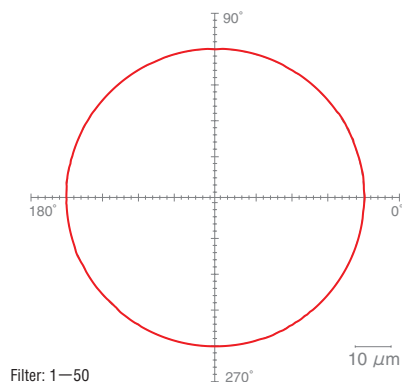


Machine type	
Previous model	NL2500MC/700
Drill diameter	
20 mm (0.8 in.)	24 mm (0.9 in.)
Material removal rate	
12.6 mL/min (0.8 in ³ /min)	45.1 mL/min (2.8 in ³ /min)

Machining power **Approx. 4 times**

- The maximum machining ability shown above is for short-term machining. S45C: Carbon steel JIS: Japanese Industrial Standard
- The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Roundness (turning)



Roundness

0.4 μm (actual result)

Machine type	NL2500MC/700
Tool	Diamond tool <nose radius 0.5 mm (0.020 in.)>
Material	Brass
Outer diameter	40 mm (1.6 in.)
Spindle speed	4,000 min ⁻¹
Feedrate	0.05 mm/rev (0.0020 ipr)

- The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Comparison of cutting time

6-inch chuck machine



	NL1500	Previous model A	Previous model B
Cutting time <sec.>	124	149	149
Non-cutting time <sec.>	21	26	25
Total time <sec.>	145	175	174

Total time comparison

Compared against previous model A
Reduced by **30 sec.**

Compared against previous model B
Reduced by **29 sec.**

8-inch chuck machine



	NL2000	Previous model C	Previous model D
Cutting time <sec.>	219	263	264
Milling time <sec.>	149	168	168
Non-cutting time <sec.>	40	42	45
Total time <sec.>	408	473	477

Total time comparison

Compared against previous model C
Reduced by **65 sec.**

Compared against previous model D
Reduced by **69 sec.**

10-inch chuck machine



	NL2500	Previous model E	Previous model F
Cutting time <sec.>	366	392	390
Non-cutting time <sec.>	24	28	32
Total time <sec.>	390	420	422

Total time comparison

Compared against previous model E
Reduced by **30 sec.**

Compared against previous model F
Reduced by **32 sec.**

12-inch chuck machine



	NL3000	Previous model G
Cutting time <sec.>	810	847
Non-cutting time <sec.>	31	40
Total time <sec.>	841	887

Total time comparison

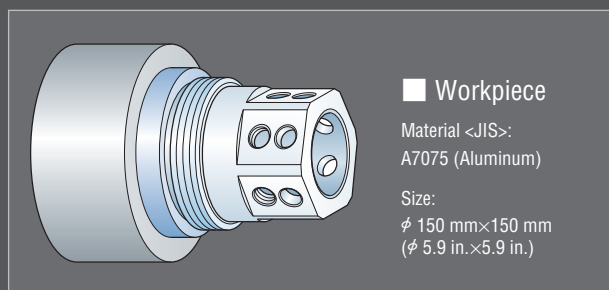
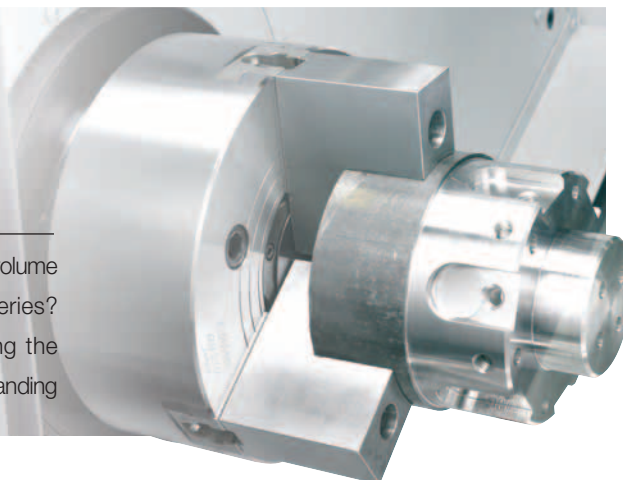
Compared against previous model G
Reduced by **46 sec.**



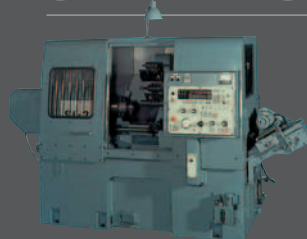
Rigid & Precise
NL SERIES

Productivity

What are the differences in machining time, production volume and sales between previous models and the NL Series?
We have included a machining simulation comparing the NL Series to previous models, so take a look at the outstanding productivity of the innovative NL Series for yourself.



SL-2+MV-40



SL-2 (manufacturing period: 1978–1987)

MV-40

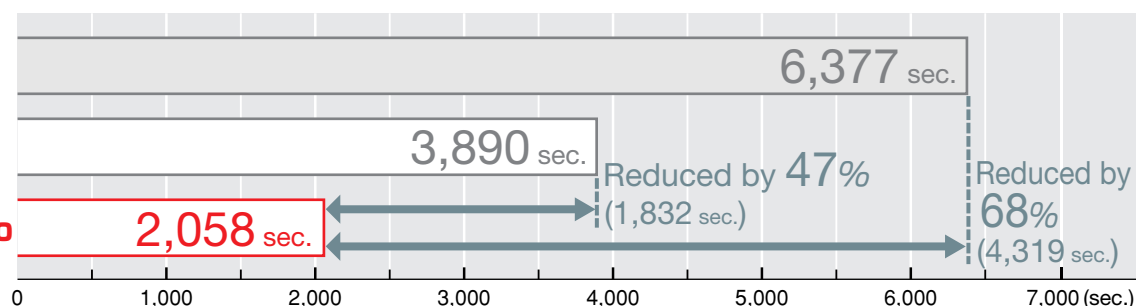
Cycle time comparison

Process		Cutting time <sec.>		
		SL-2+MV-40	SL-25MC	NL2500MC/700
1	I.D. bottom drilling	253	222	131
2	End face & O.D. rough cutting	805	523	366
3	Rough boring	114	69	46
4	End face & O.D. finishing	189	161	95
5	I.D. finishing	49	39	26
6	O.D. grooving	67	53	32
7	O.D. threading	207	106	60
8	Workpiece transfer	1,800	0	0
9	Face groove roughing	801	785	436
10	Face groove finishing	698	684	380
11	M12×P1.75 tap pre-drilling	202	198	66
12	M12×P1.75 tap bottom drilling	611	598	239
13	M12×P1.75 tapping	581	452	181
Total cutting time <sec.>		6,377	3,890	2,058

SL-2+MV-40

SL-25MC

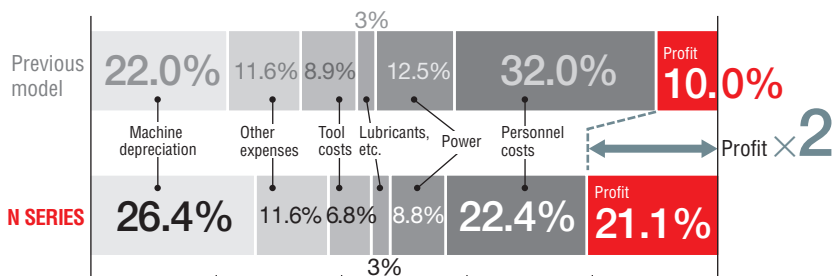
NL2500MC/700



JIS: Japanese Industrial Standard

N Series cost structure comparison

This is a comparison of costs between the N Series and conventional machines, assuming the same sales (i.e. production). Even if the price were set at 20% higher, the N Series, with its advantages of shorter machining time, the ability to control personnel costs, tool life and power consumption, allows you to double your profits.



SL-25MC



(manufacturing period: 1987—2000)

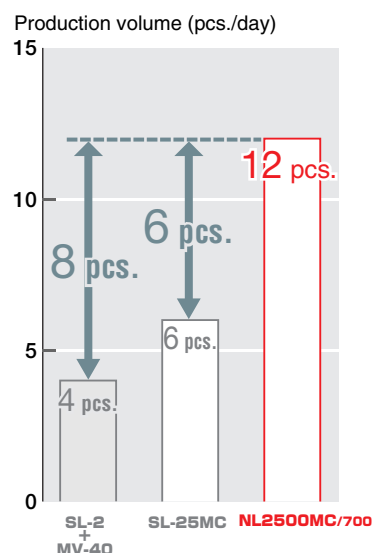
NL2500MC/700



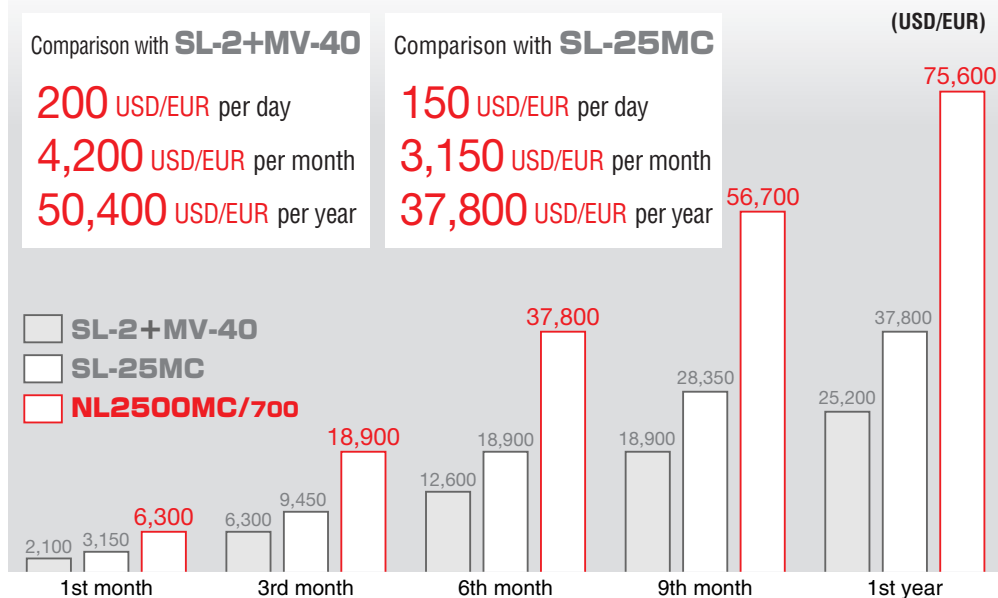
Comparison of production volume and sales (25 USD/EUR per workpiece)

Running time (one day) : 8 hours × 85% = 3,600 sec. × 8 × 0.85 = 24,480 sec.
 Number of days operating in 1 year : 21 days × 12 months = 252 days
 Production volume per day (pcs./day) : 24,480 sec. ÷ Cycle time (sec.)

Comparison of production volume



1-year sales simulation





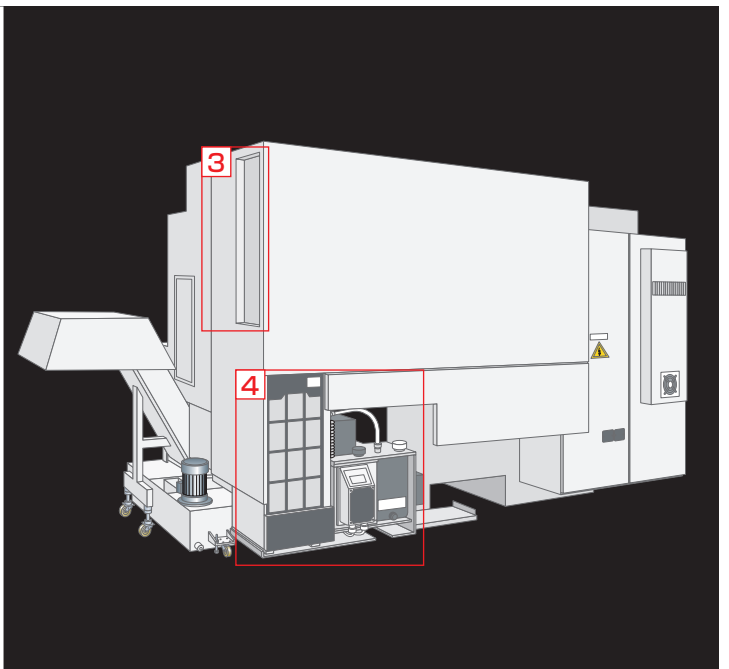
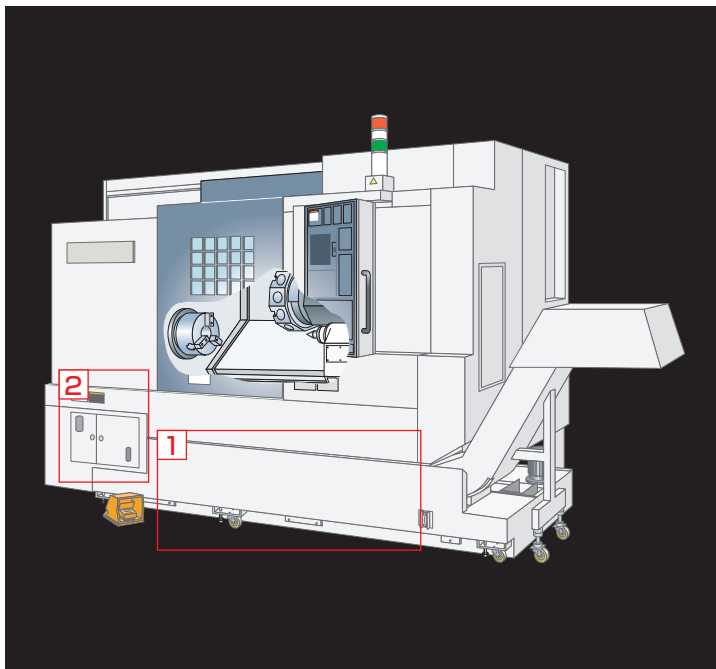
Rigid & Precise
NL SERIES

Maintenance

Minimizing machine down time. In our constant effort to become the most trusted machine tool company in the industry, we design Mori Seiki machines with maintenance and reliability in mind.



Improved maintainability



1 Pull out the coolant tank in front

With the new design, the coolant tank can be pulled out in front without having to pull out the chip conveyor. It can be pulled out easily and does not take up extra space in the back.



2 Lubricating oil (for sliding surfaces) tank

The supply hole for the lubricant tank for the box way is located in the front of the machine for easy refilling.



3 Layout of pneumatic equipment

The air equipment is located on the right side panel in order to facilitate maintenance.



4 Oil cooler, Hydraulic unit

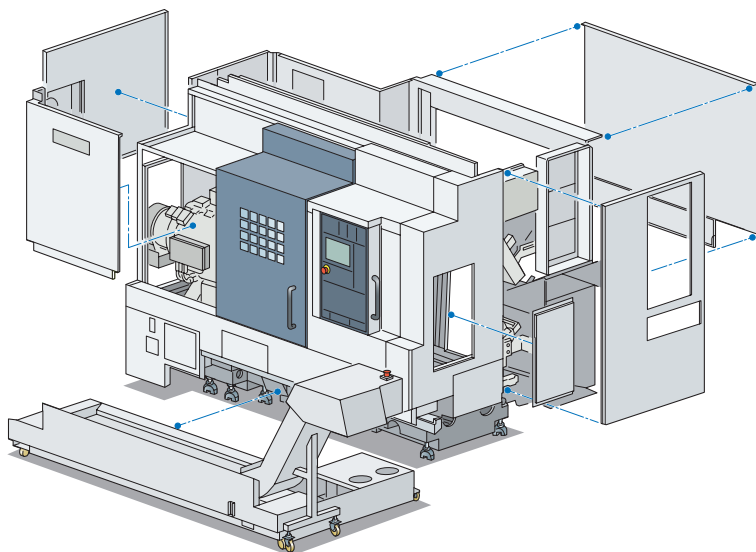
The oil cooler and hydraulic unit are placed together at the rear of the machine without a cover for easy access.



Reduced MTTR

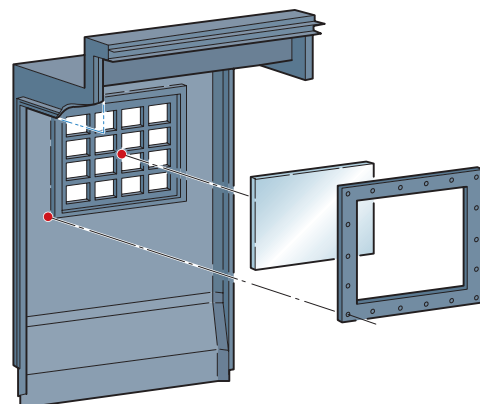
Machine cover design

We designed the machine covers so that maintenance locations are easily seen when they are removed, and the openings have been made wider to allow easier access.



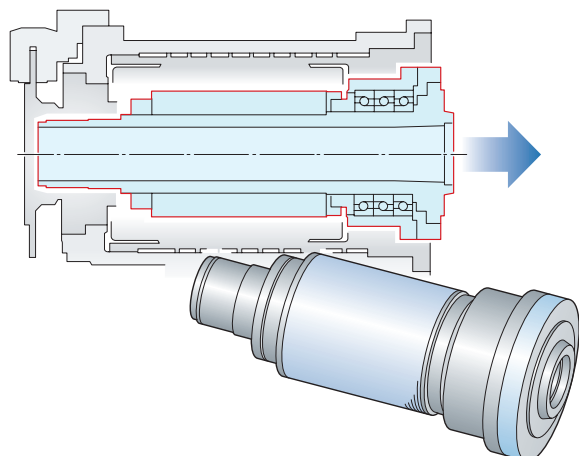
Replacing windows

Machine downtime is further reduced by using a door design that enables window replacement without having to remove the door.



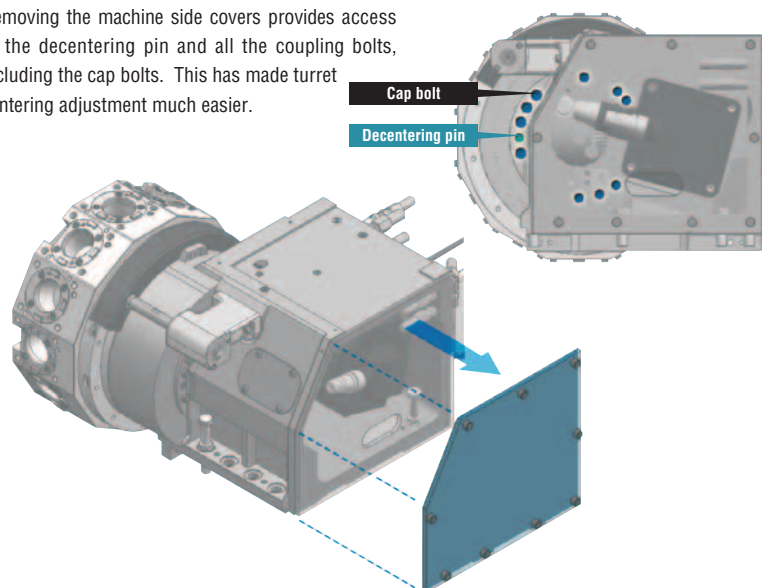
Spindle unit replacement

A spindle design with a separate rear bearing housing makes it possible to replace the spindle unit without having to remove the motor wiring. The time it takes to replace the spindle is dramatically shorter when compared with previous models.



Turret centering adjustment

Removing the machine side covers provides access to the decentering pin and all the coupling bolts, including the cap bolts. This has made turret centering adjustment much easier.





Rigid & Precise
NL SERIES

Convenience

The NL Series has been designed with the operator first and foremost in mind, with innovations included throughout the machines to increase convenience.



OP Option

Automatic door **OP**

Automatic doors to enhance automation, not only during normal operation but also when using a robot.



● Door opening may vary from the standard machine.

Broader field of vision

The new design includes a vertical front door and a window closer to the operator. The broader field of vision allows the operator to view the machine interior without having to stoop down. The distance between the operation panel and the machine interior has been shortened, thus reducing eye strain.



Adjustable operation panel

The easy-to-use operation panel swivels 90°. Improved visibility during operation.



NL Series operation panel

We have changed the layout of the buttons on the operation panel to improve setup. We've also used rotary buttons for those with most frequent use.



NL SERIES



Previous model



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NL SERIES

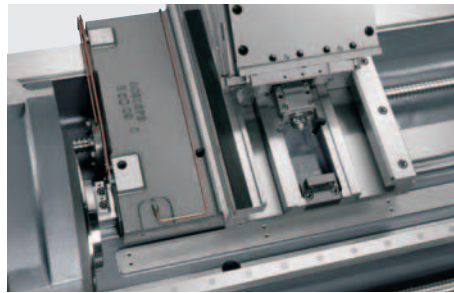
Eco-friendly design

Reducing the strain on the environment has become an important task facing companies today. NL Series have been designed with environmentally friendly functions to make this task easier. The new functions focus on reducing lubricant and electricity consumption. This focus fills customer needs at reduced costs.



Reduced consumption of lubricating oil

Energy savings



The amount of lubricant needed by the box way has been reduced, contributing to energy savings.

■ Comparison of amounts of lubricant needed

Less **50%**

Reduced consumption of electricity

Power savings



■ Automatic machine light function

If the operation panel is not touched for a certain amount of time, the interior light turns off. This saves energy and lengthens the life of the machine lights.

Energy-saving settings screen



■ Function to reduce power consumption during standby

The amount of electricity consumed in standby mode has been reduced.



■ Automatic sleep function

If the keyboard is not touched for a certain amount of time and NC operation is not being performed, power is cut off to the servo motor, the spindle, the coolant pump and the chip conveyor, thereby saving energy.



Peripheral equipment

Gantry-type loader system

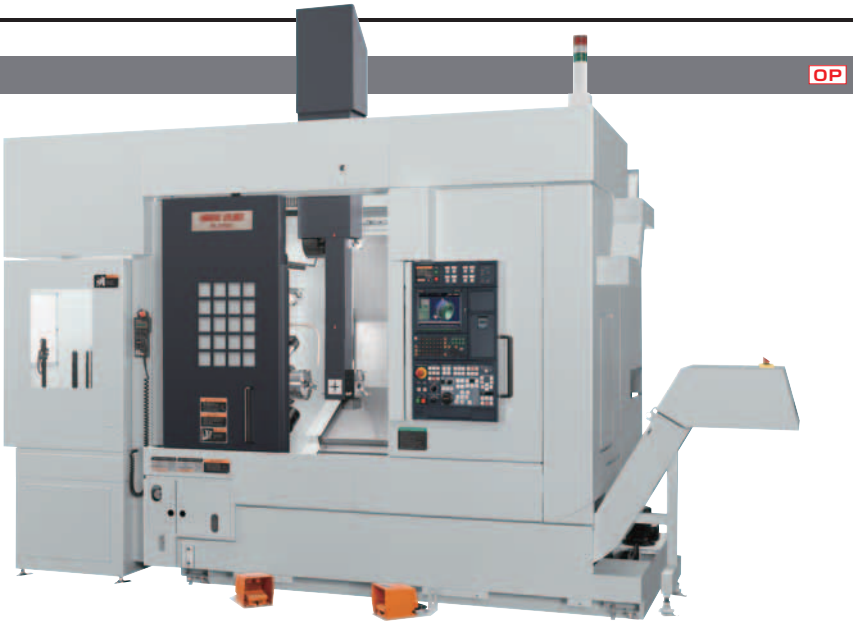
We have achieved completely automated start-to-finish machining using only one machine, from material supply to discharging the completed workpiece.

This is a high-speed mass production system that reduces non-cutting time.

Loader travel speed (travel)

NL1500/NL2000
200 m/min
 (656.2 fpm)

NL2500/NL3000
120 m/min
 (393.7 fpm)



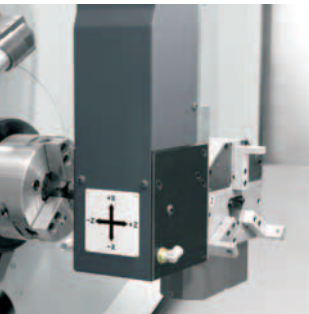
NL1500 with Gantry Loader

Item			NL1500/NL2000	NL2500	NL3000
Loader type			LG-05 <machine travel type>		LG-10 <machine travel type>
Gantry-type loader	Max. travel speed	X-axis <hand up/down>	180 m/min (590.6 fpm)		90 m/min (295.3 fpm)
		Z-axis <loader unit left/right>	200 m/min (656.2 fpm)		120 m/min (393.7 fpm)
Loader hand	Model		Parallel hands (Back end hands <please contact Mori Seiki>)		Parallel hands
	Max. transfer weight		5 kg (11 lb.)×2		10 kg (22 lb.)×2
	Applicable workpiece diameter		20—150 mm (0.8—5.9 in.)		30—200 mm (1.2—7.8 in.)
	Applicable workpiece length		10—120 mm (0.4—4.7 in.)		20—150 mm (0.8—5.9 in.)
Workstocker	Number of pallet tables		14 (20, 26 <please contact Mori Seiki>)		10 (20 <please contact Mori Seiki>)
	Max. workpiece weight		35 kg (77 lb.)/pallet		75 kg (165 lb.)/pallet
	Max. workpiece stacked height				470 mm (18.5 in.)
	Applicable workpiece diameter		20—150 mm (0.8—5.9 in.)		30—200 mm (1.2—7.8 in.)

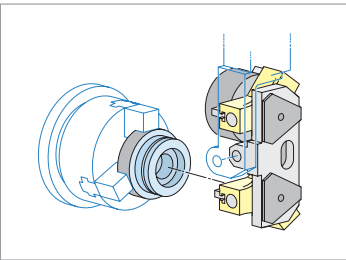
● Depending on the shape of the workpiece, it may not be possible to machine with standard specifications. For details contact Mori Seiki.

Loader hand

A close confirmation switch comes as a standard feature, thus improving the reliability of the work chucking.

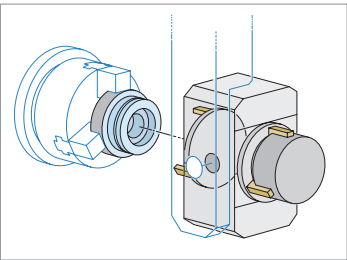


■ Parallel hands



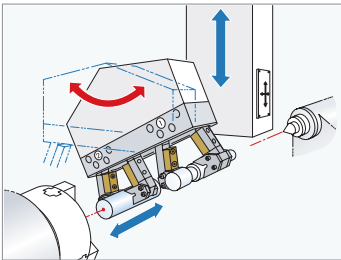
■ Back end hands

<please contact Mori Seiki>



■ Hand for shaft workpieces

<please contact Mori Seiki>

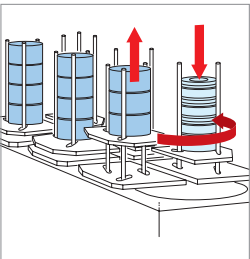


Workstocker

A ball caster wheel conveyor is used because it does not cause many chip problems.

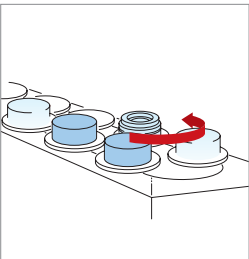


■ Rotary workstocker



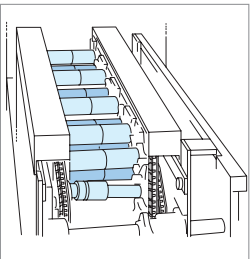
■ Flat workstocker

<please contact Mori Seiki>



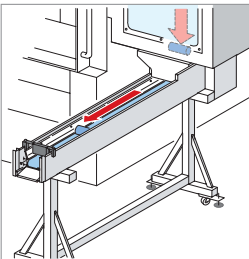
■ Workstocker for shaft workpieces

<please contact Mori Seiki>

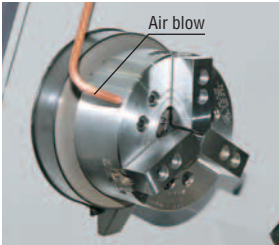


■ Belt conveyor

<please contact Mori Seiki>



Standard features

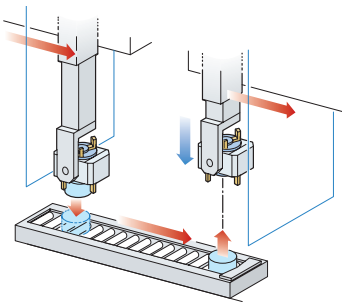


Air blow system, chuck (headstock 1)

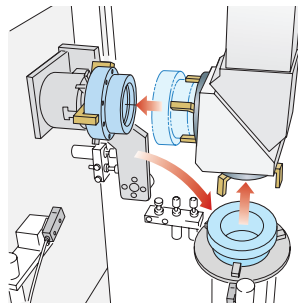
Others

- 14-station rotary workstocker (LG-05)/
10-station rotary workstocker (LG-10)
- Hand air-blow
- Automatic power-off system
- Spindle orientation
- Low air pressure detecting switch
- Work counter

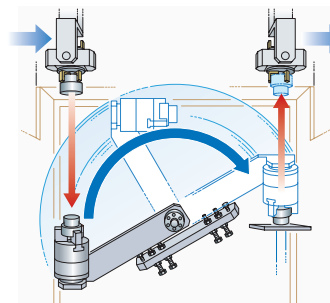
Optional features <please contact Mori Seiki>



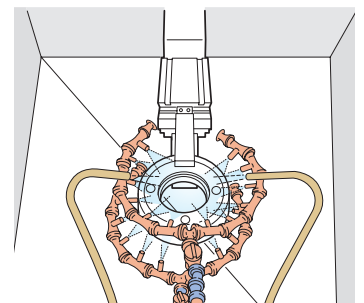
Transfer unit



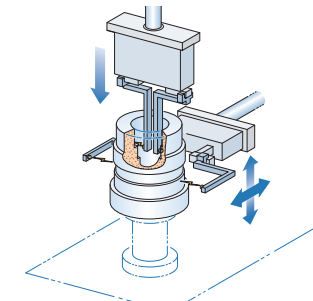
Turnover unit



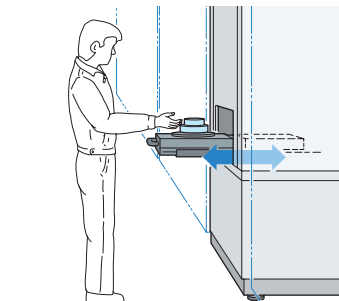
Transfer turnover unit



Washing unit



Measuring system



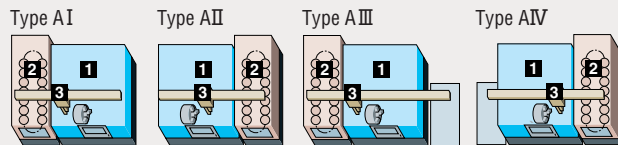
Quality inspection station

Others

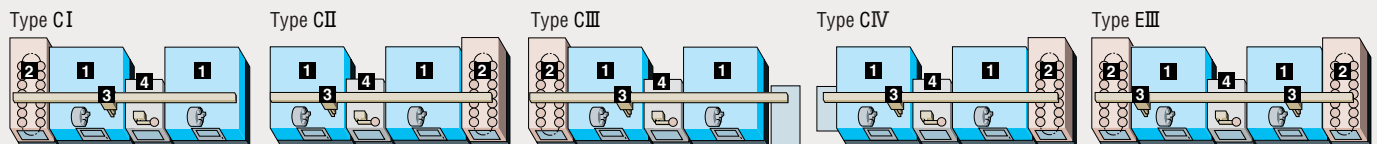
- Gantry-type loader for shaft workpieces
- Turret-mounted workpiece-pusher
- 20-station rotary workstocker/
26-station rotary workstocker (LG-05)
- Workpiece holding detector (chuck)
- External emergency stop button
- Quality check chute
- Center-guide specifications
(workpiece pallet)
- Hexagonal material specifications
(workpiece pallet)

System variations

Specifications



Order system (please contact Mori Seiki)



Units

1 Machine 2 Workstocker 3 Loader 4 Turnover unit

- Not applicable for hollow cylinder specifications: Type AI, Type AIII, Type CI, Type CIII, Type EIII

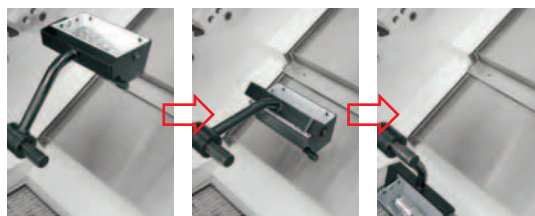
Peripheral equipment



Workpiece unloader* (built-in type)

OP

We have further developed the previous parts catcher so that it can now be customized more easily by the end user. Both spindles handle workpieces up to double the previous length.



■ Applicable workpiece diameter

NL SERIES

80 mm (3.1 in.)

■ Applicable workpiece length

NL SERIES

200 mm (7.8 in.)

■ Max. transfer weight

NL1500/NL2000/NL2500

3.0 kg (6.6 lb.)

NL3000

4.0 kg (8.8 lb.)



■ Workpiece bucket

The capacity of the bucket has been doubled for more convenient automation.

* Standard for S, SMC and SY types.
(Not including gantry loader specifications)



Bar feeder

NL2000

Bar feeder system

OP

Complete bar machining is possible on a single machine when coupled with a workpiece unloader. You won't need a work loader/unloader or turnover unit.

Bar work capacity

NL1500

φ 52 mm
(φ 2.0 in.)

NL2000

φ 65 mm
(φ 2.5 in.)

NL2500

φ 80 mm
(φ 3.1 in.)

NL3000

φ 90 mm
(φ 3.5 in.)

■ Recommended accessories for bar feeder specification

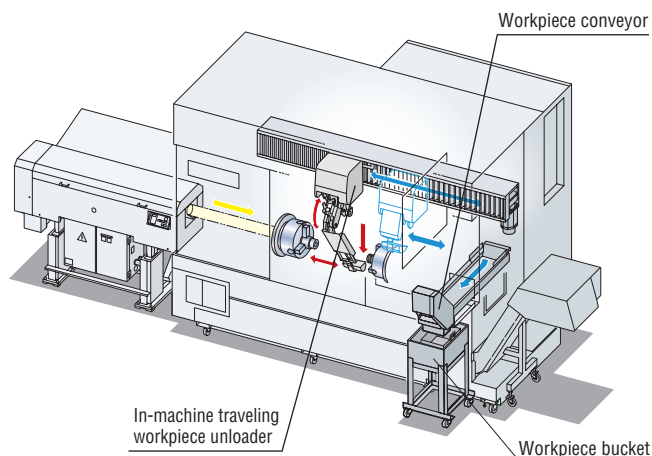
- Bar feeder
- Multi counter
- Signal tower
- Guide bushing
- Work stopper

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.

In-machine traveling workpiece unloader system

OP

Operate unmanned when equipped with the workpiece conveyor.
With the S-type, receive workpieces from either the No. 1 or No. 2 spindles.



In-machine traveling workpiece unloader

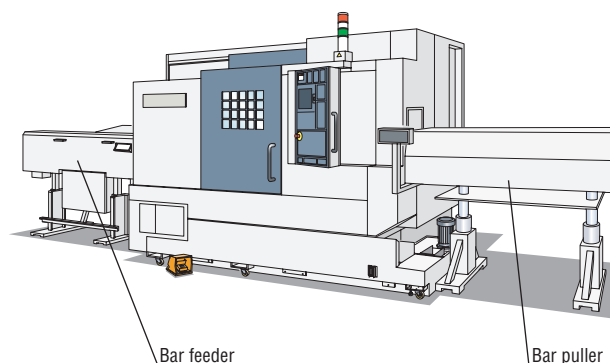
Workpiece conveyor

Workpiece bucket

Bar puller system

OP

Automatically discharge the machined piece from the No. 2 spindle, making it easier to automate machining of bar workpieces and making this system ideal for long workpieces that cannot be handled by a workpiece unloader.



Bar feeder

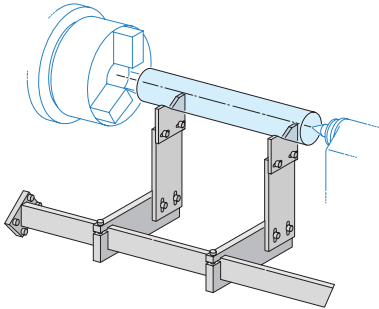
Bar puller

Workpiece rest

OP

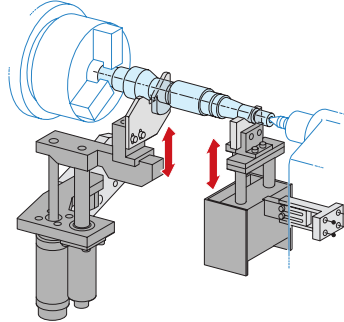
Fixed type

This temporary workpiece rest helps reliably carry out workpiece chucking in a short period.



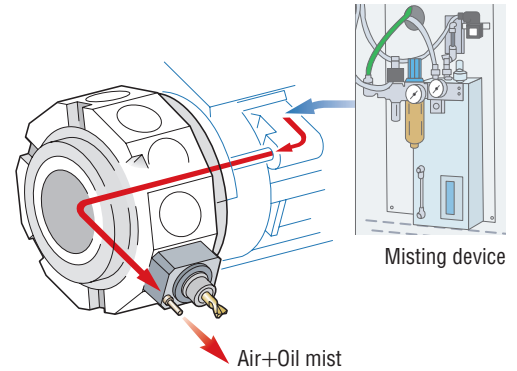
Withdrawal type

Interference and accumulation of chips during machining is prevented by withdrawing the workpiece retainer.



Semi-dry unit

OP



Manual type in-machine tool presetter

Perform tool measurement more efficiently, thereby improving setup.



Coolant cooling unit (separate type)

OP

The coolant temperature rises because of heat generated by machining. Circulating the coolant also raises the temperature. Increases in the oil temperature have a major effect on thermal displacement in the machine and the dimensional accuracy of the workpiece. This unit prevents the coolant from heating. **When using oil-based coolant**, the oil temperature can become extremely high even with the standard coolant pump, so we strongly recommend this unit.



When using oil-based coolant, please be sure to consult with your Mori Seiki representative.

- While this unit is not the only way to completely control the temperature of the coolant, it makes a major contribution to preventing increases in the oil temperature.

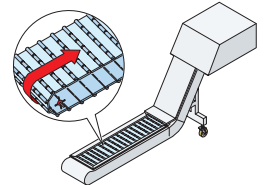
Chip conveyor

OP

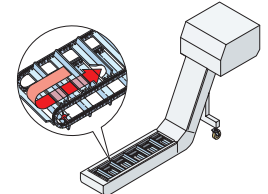
A chip conveyor that efficiently disposes of chips. Choose the specifications right for you.



Hinge type



Scraper type



- Hinge type chip conveyor comes standard on NL3000/2000, NL3000/3000.
- Chip conveyors are available in various types for handling chips of different shape and material. For details contact Mori Seiki.

Others

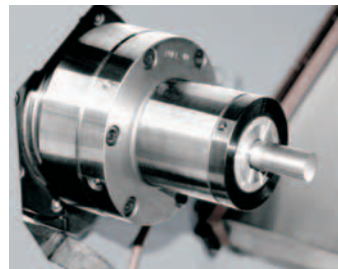
OP



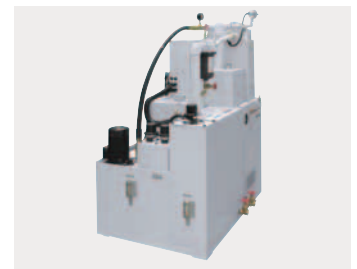
Oil mist collector



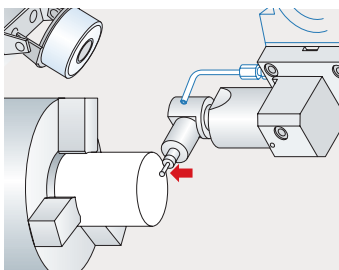
Oil skimmer



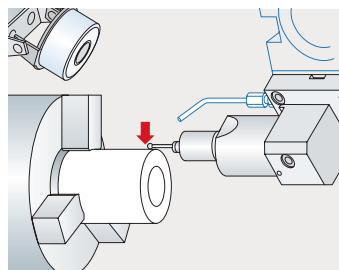
Collet chuck



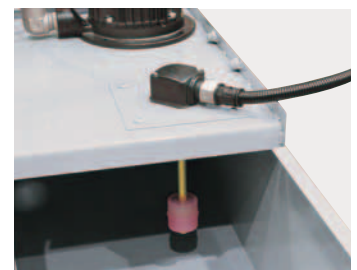
Super high-pressure coolant unit



In-machine workpiece measuring system



Hydraulic steady rest

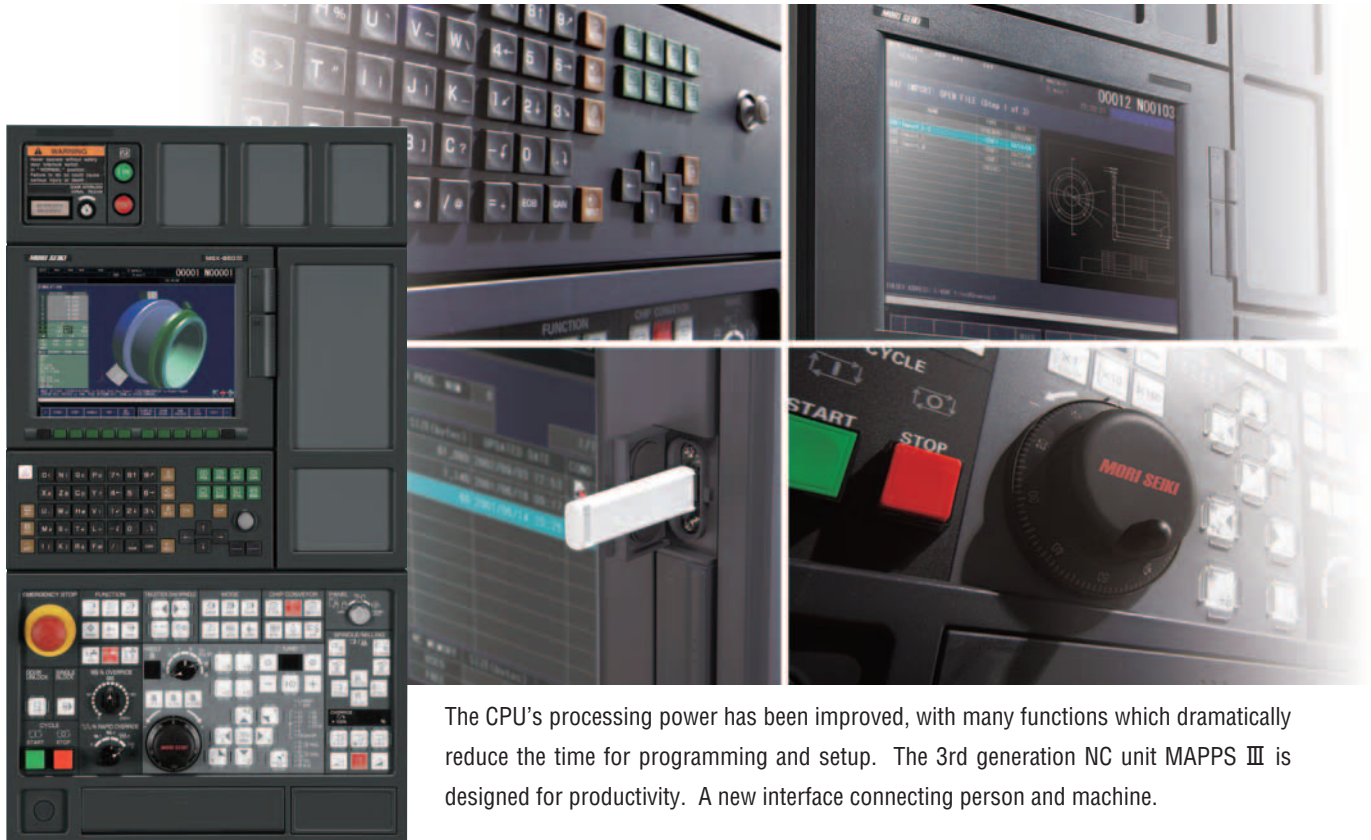


Coolant float switch

- The colors and configurations shown in the photographs or illustrations may differ from those of the actual product.

A New High-Performance Operating System

MAPPS III for CNC Lathes



10.4-inch operation panel

The CPU's processing power has been improved, with many functions which dramatically reduce the time for programming and setup. The 3rd generation NC unit MAPPS III is designed for productivity. A new interface connecting person and machine.

Improved hardware specs

Equipped with a USB interface

- Data can be transferred easily between the machine and your PC.
(For the USB memory, please use Mori Seiki specified products. We cannot guarantee correct operations with other peripheral equipment such as USB hard disks)

A large MAPPS user memory area*

- We have prepared an area which is separate from the NC memory, where programs can be stored in MAPPS.

Standard

50 MB

<tape memory length equivalent to
127,000 m (416,687 ft)>

500 MB OP

Card DNC operation

- Select the program needed from within the user memory area and use it for DNC operation for the NC unit.
(Macro programs such as GOTO, IF and WHILE cannot be used in DNC operating programs)
- Programs in the user memory area can be edited, copied, deleted and renamed.
(Programs up to 10 MB can be edited on the spot)

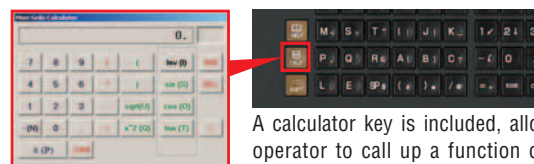
* Programs can be transferred between the user memory area and an external device such as an NC memory, an RS-232-C connection, a card interface or the MORI-SERVER.

Programs that call sub-programs stored in the user memory area using M98/G65 must be stored in the NC memory.

- Card DNC operation transfer speed: the maximum feed speed is 7 m/min for a program with 25-character blocks at a pitch of 1 mm.
(These are not absolute values, and feedrate may occasionally deteriorate)

● Please see the product catalog for details. ● The photo shown may differ from actual machine.
MAPPS: Mori Advanced Programming Production System

A handy calculator function



A calculator key is included, allowing the operator to call up a function calculator from any screen.

Network

MORI-SERVER Standard feature

A network-enabled data management system for high-speed transfer of data between computer and machine.

MORI-NET Global Edition OP

Mori Seiki's MORI-NET Global Edition is a customer support service using the Internet.

Faster creation of programs

Conversational automatic programming

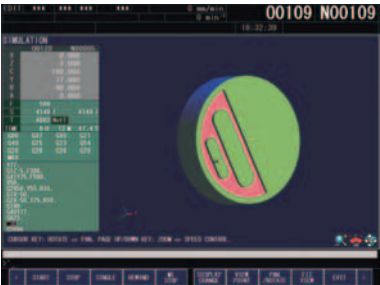
Machining menu

The milling function has been greatly enhanced. A drilling and milling menu equal to that of a machining center is included.

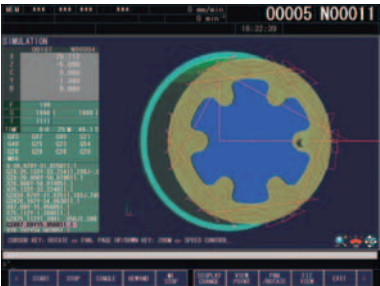


Main menu		Groove menu	
Machining patterns	7	Machining patterns	13
Screw menu		Turning hole menu	
Machining patterns	4	Machining patterns	3
Drilling menu		Milling operation menu	
Machining patterns	5	Machining patterns	6
Hole position patterns	10	Shape patterns	35
Hand-over menu		Supplemental process menu	
Machining patterns	2	Machining patterns	8

Island shapes, open pockets

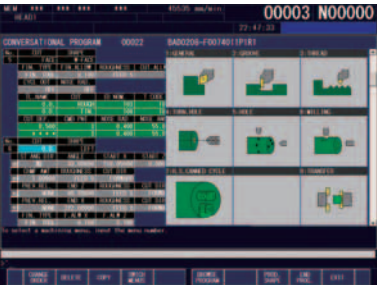


Up to 127 islands can be defined.

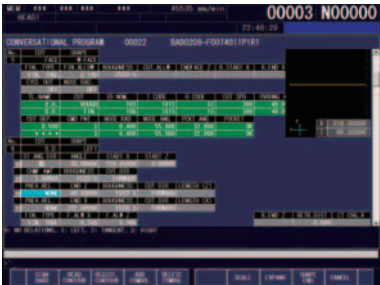


Definition of open areas eliminates tool paths with no machining allowance, making it possible to create optimum paths.

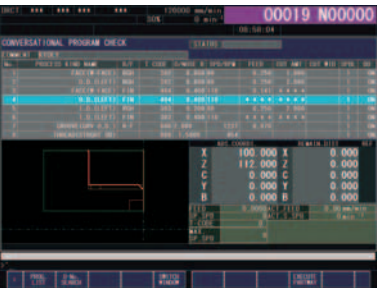
List display function



You can create conversational data without switching screens.



Conversational direct operation function and conversational direct drawing function



Conversational data entered based on the drawings can be used to perform a drawing check (direct drawing) and to carry out direct operation, all without creating an NC program. After entry of the conversational data, the data can immediately be used for operation, reducing the setup time.

Faster creation of programs

Program editing function

1 Creating programs G code editing function

Extended editing

A large number of sub-menus is available.

- Search • Replace • Top • End • Select • Copy • Cut • Paste
- Insert row • Insert sequence No.
- Edit two programs simultaneously (background editing)

Rapid registration

Full programs and portions of programs that are used frequently can be registered and later pasted into other programs with a single operation.



Register

Insert

Editing line number display, Undo/Redo function

This allows for mistakes to be corrected when creating a program.

- Displays line number being edited
- Edited line numbers are displayed in red
- Actions can be undone any number of times (up to 400 kB)
- Batch replaces can also be undone or redone in a single step

Comparison of editing times

We made a comparison of the time needed to copy, cut and paste 100 blocks, 1 block 5-word program.

Copy buffer
 Previous model: 4 kB
MAPPS III : 10 kB

	Copy	Cut
Previous model	7.5 sec.	11 sec.
MAPPS III	1.5 sec.	2.5 sec.

Help

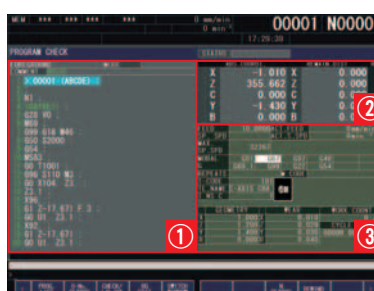
When you get stuck, the G code guidance and PLC message details function are useful.

2 Program check

Simultaneous 3-way split display

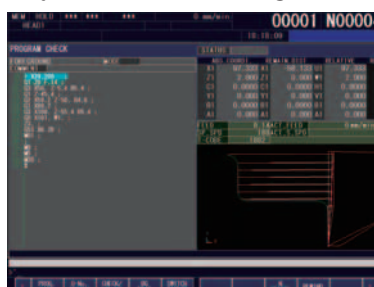
Three different screens can be displayed at once.

The screens can be switched easily using the soft keys.



- ① Program
- ② Coordinate display
- ③ Tool info

Synchronized drawing



Simulations which are synchronized with actual machining can be made in the program check screen.

3 Program management



Group management

Programs can be managed in groups for easier searching.

Status display

The status of the program - No Editing, Foreground and Background - is displayed.

Sorting

Data can be sorted according to different criteria.

- By number • By size • By comment

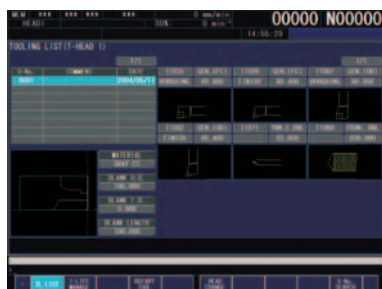
Custom display

Choose which information you want displayed.

- Size • Comment • Display/hide group

Faster setup

Tool list



Tools used by the selected program are displayed as a list along side simulated images of the workpiece shape, giving operators important data in a quick-to-grasp visual format.

Simple soft jaw forming function



The setup-saving function automatically handles everything from rough machining to finishing, simply by entering the required dimensions for soft jaw forming and the cutting conditions on the screen.

Current tool offset



Operators can display only the tools used in the current program. Work offsets can also be displayed.

Tool offset



The tool types and guidance drawings can be set for clear display. The settings can be adjusted to enter and display the tool shape and wear correction at the same time.

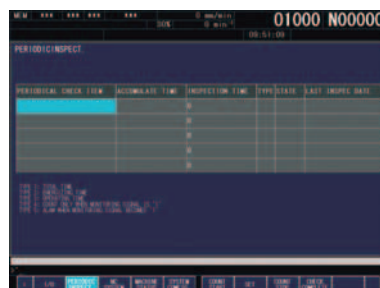
Minimizing machine down time

Limit switch guidance function



The status (on/off) of the limit switch can be checked, along with the layout diagram, without having to look at the strong electric diagram, shortening the time it takes to perform maintenance.

Regular maintenance function



The operator can enter and set the inspection items at will. Once a predetermined amount of time has passed, the screen automatically jumps to maintenance items that need attention.

MORI Automatic Programming System for Lathes

MORI-APL OP

Application systems which let you create machining programs easily on your PC.

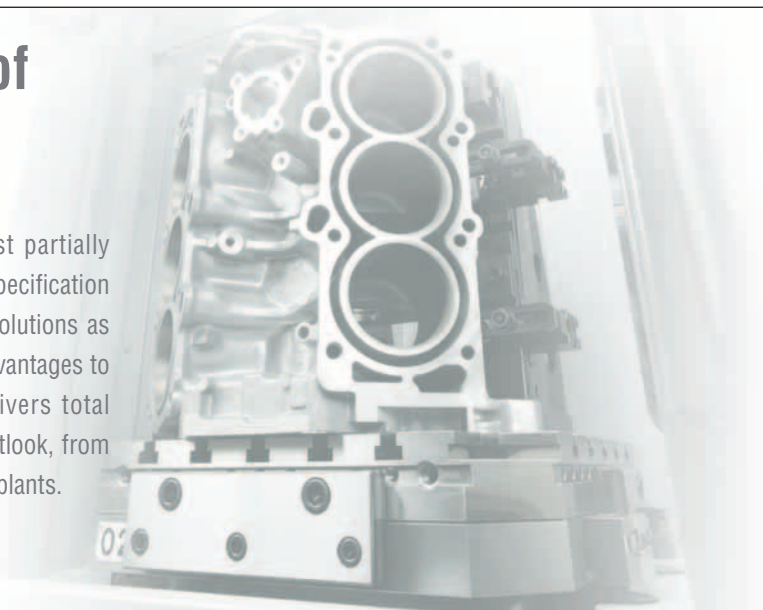
- Easy operation, simply by entering the product shapes while following the instructions on the screen.
- Its functions, data and operability are fully compatible with the conversational programming system of the MAPPS III operating systems.



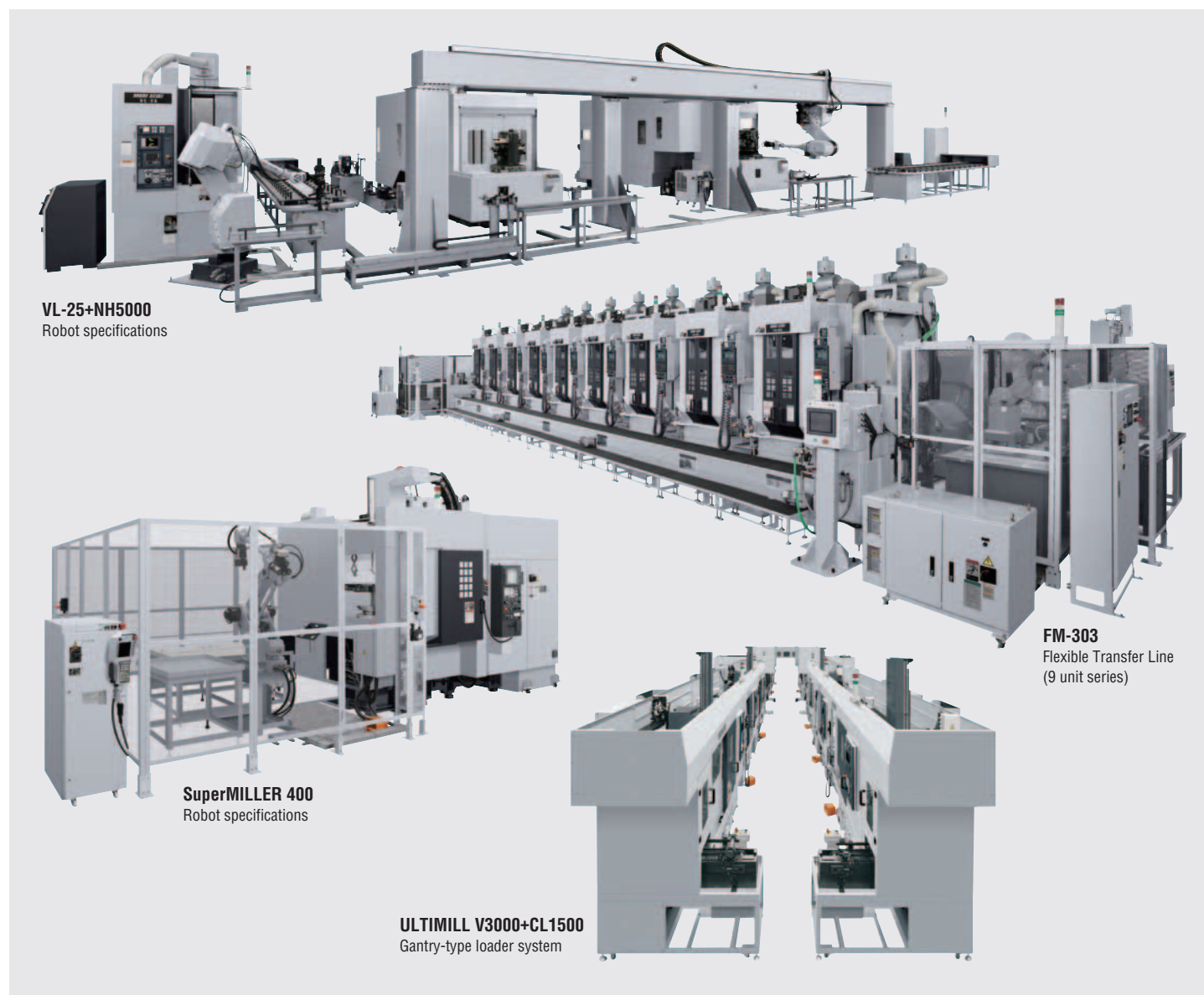
Turnkey systems

Total support for construction of a high-productivity system.

More than half of the machines delivered by Mori Seiki are at least partially customized. The Engineering Department approaches such custom-specification machines under the motto of “There are as many optimized machine solutions as there are workpieces,” working to create systems that bring the most advantages to your unique production needs (turnkey systems). Mori Seiki delivers total solutions by selecting the best line process that matches your future outlook, from simple design specifications to large projects covering entire production plants.

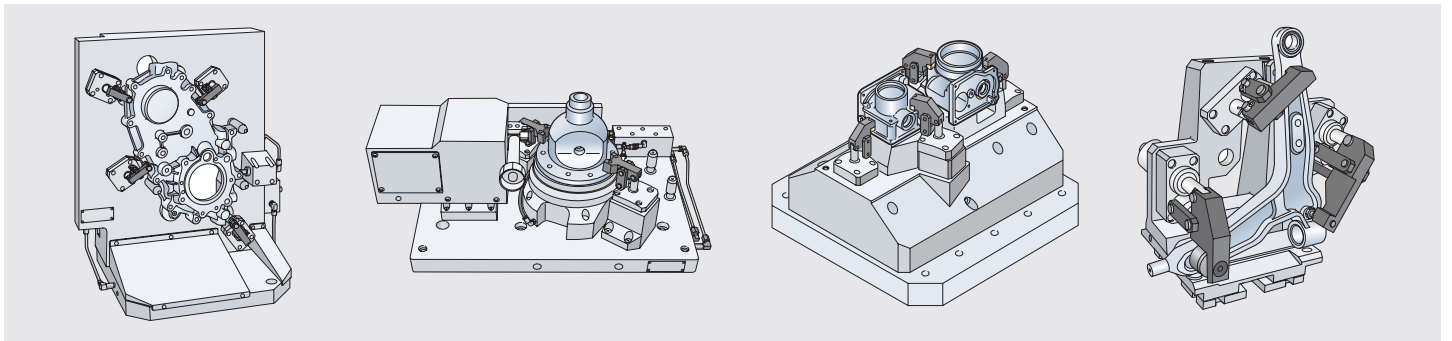


System examples

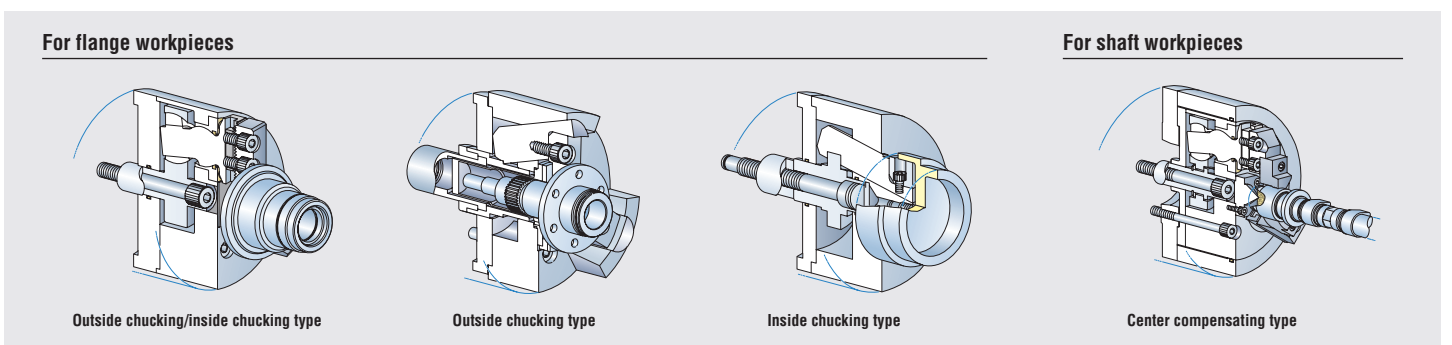




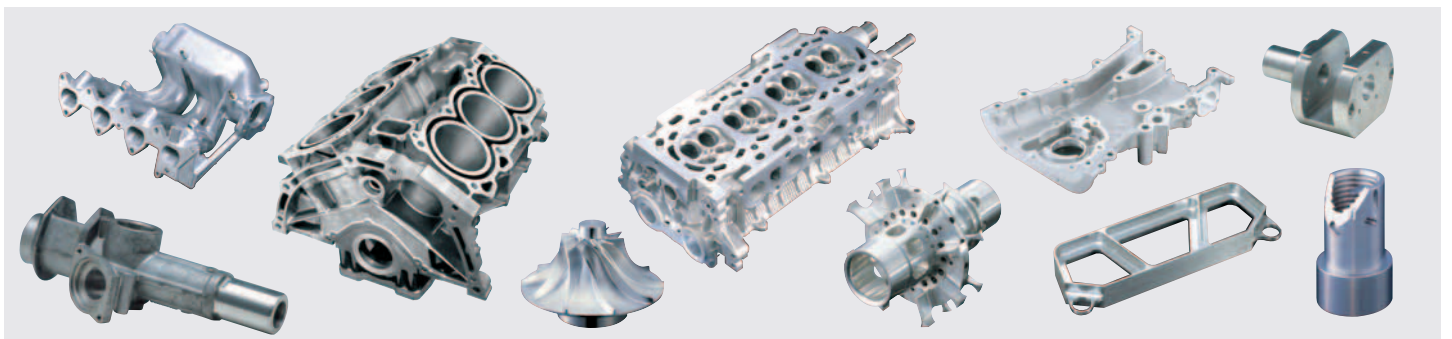
Fixture examples



Example of special chucks



Sample workpieces



Service network

World-Standard Quality & High-Reliability Network

Mori Seiki is a leading manufacturer of NC machine tools with a solid worldwide reputation and years of international experience. There are Mori Seiki bases in major cities on every continent, and all of them function as Technical and Service Centers which work closely with our customers. Our expert staff is always ready to help you. Constantly updated computer records allow us to find customer details immediately and give prompt international service.



Mori Seiki's global service

Overseas countries

46

Overseas distributors

143

Parts locations

Iga Campus
Dallas Technical Center
Stuttgart Technical Center
Singapore Technical Center
Shanghai Parts Center

Service systems

At the Iga and Chiba Service Centers, we have the following systems to respond to inquiries from overseas Technical Centers.

Service Center (Iga, Chiba)
24 hours **365** Operating 365 days a year

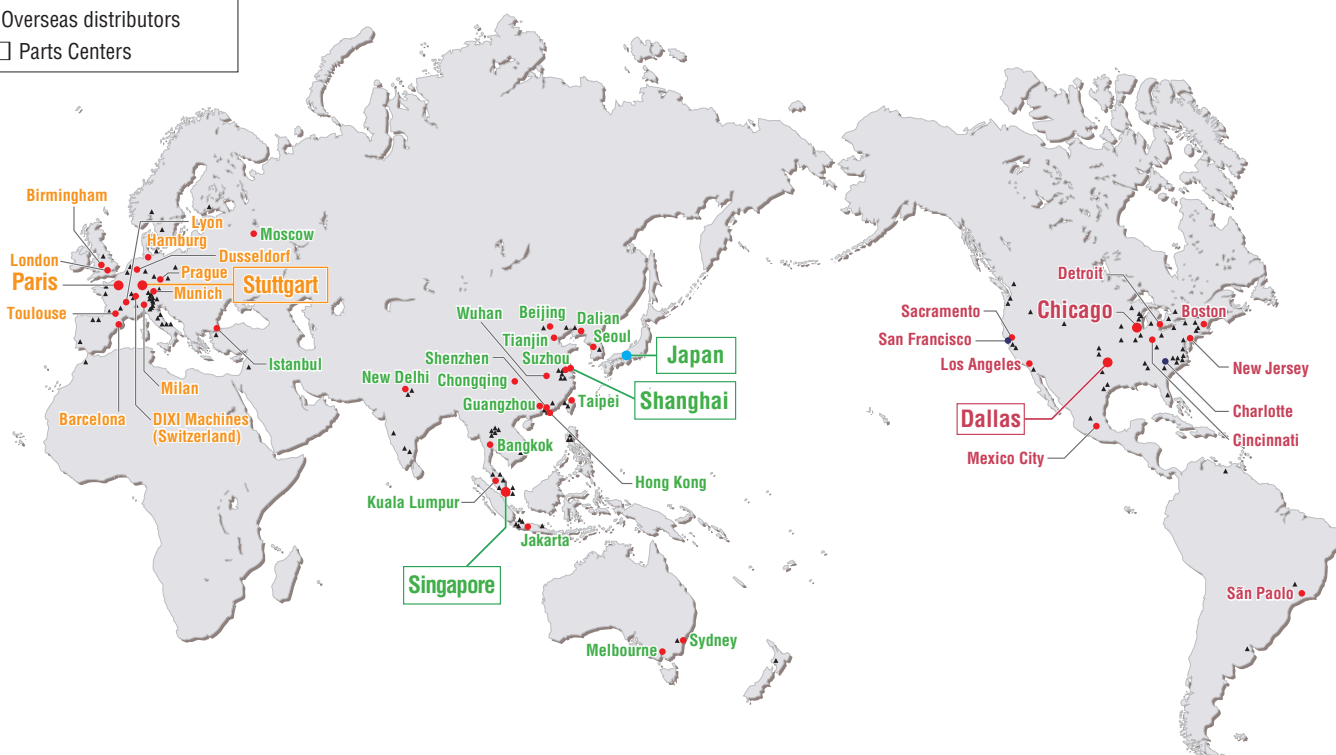
Parts Center
24 Shipped within 24 hours

Service Personnel
24 Delivered within 24 hours



Parts Center at the Stuttgart Technical Center.

- Overseas subsidiaries
- Overseas offices
- ▲ Overseas distributors
- Parts Centers



Parts supply



We have extensive parts bases in Iga, Dallas, Stuttgart, Singapore and Shanghai.

Service

Meticulous follow-up by experienced engineers.



Training



Technical seminars covering programming, maintenance, etc.

Applications

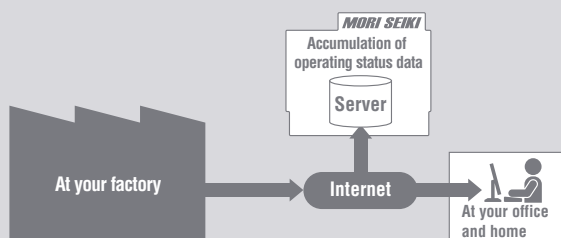
Proposals for upgrading systems and high-efficiency machining.



MORI-NET Global Edition

Remote monitoring of your machines over the Internet.

With this service it is possible to build remote management systems for machine tools having great speed and cost performance.



- This system allows you to see the operating status of your machine tools over the Internet from wherever you may be in the world.
- Regular e-mail notifications are sent to you directly with your machine operating status.

Low initial investment and running cost

Standard & optional features (NL1500/NL2000)

Spindle		NL1500						NL2000					
		2-axis turning	MC	Y	S	SMC	SY	2-axis turning	MC	Y	S	SMC	SY
Headstock 1	6,000 min ⁻¹ : 11/11/7.5 kW (15/15/10 HP) <50%ED/30 min/cont>	●	●	●	●	●	●	×	×	×	×	×	×
	6,000 min ⁻¹ : 15/15/11 kW (20/20/15 HP) <50%ED/30 min/cont>	○	○	○	○	○	○	×	×	×	×	×	×
	8,000 min ⁻¹ : 11/7.5 kW (15/10 HP) <25%ED/cont>*	○	○	○	○	○	○	×	×	×	×	×	×
	5,000 min ⁻¹ : 15/15/11 kW (20/20/15 HP) <50%ED/30 min/cont>	×	×	×	×	×	×	●	●	●	●	●	●
	5,000 min ⁻¹ : 18.5/18.5/15 kW (24.7/24.7/20 HP) <25%ED/50%ED/30 min/cont>	×	×	×	×	×	×	○	○	○	○	○	○
Headstock 2	6,000 min ⁻¹ : 11/7.5 kW (15/10 HP) <25%ED/cont>	×	×	×	●	●	●	×	×	×	●	●	●
	8,000 min ⁻¹ : 11/7.5 kW (15/10 HP) <25%ED/cont> (headstock 1 side is also 8,000 min ⁻¹)	×	×	×	○	○	○	×	×	×	×	×	×
	5,000 min ⁻¹ : 11/7.5 kW (15/10 HP) <25%ED/cont>	×	×	×	×	×	×	×	×	×	○	○	○

* Through-spindle hole diameter: 43 mm (1.7 in.).

Turret		2-axis turning	MC	Y	S	SMC	SY	2-axis turning	MC	Y	S	SMC	SY
12-station turret head, bolt-tightened		●	●	●	●	●	●	●	●	●	●	●	●
10-station turret head, bolt-tightened		×	×	×	×	×	×	○	○	○	○	○	○
12-station turret head, bolt-tightened	SL compatible	○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, bolt-tightened	SL compatible	×	×	×	×	×	×	○	○	○	○	○	○
20-station turret head, bolt-tightened	NZ compatible	○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, quick-change VDI	Including outer circumference	○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, quick-change VDI	Including outer circumference	×	×	×	×	×	×	○	○	○	○	○	○
16-station turret head, quick-change VDI	Including outer circumference*1	○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, quick-change VDI	Face type	○	×	×	×	×	×	○	×	×	×	×	×
10-station turret head, quick-change VDI	Face type	×	×	×	×	×	×	○	×	×	○*2	×	×
Max. rotary tool spindle speed	6,000 min ⁻¹ : 5.5/5.5/3.7 kW (7.5/7.5/5 HP) <3 min/5 min/cont>	×	●	●	×	●	●	×	●	●	×	●	●
Tool holders		●	●	●	●	●	●	●	●	●	●	●	●
Rotary tool holders		×	○	○	×	○	○	×	○	○	×	○	○
Capto-compatible holder		○	○	○	○	○	○	○	○	○	○	○	○
Overhang of O.D. cutting rotary tool	50 mm (2.0 in.)	×	●	●	×	●	●	×	●	●	×	●	●
	100 mm (3.9 in.)*3 <Y-axis travel is limited for the Y and SY types>	×	○	○	×	○	○	×	○	○	×	○	○

*1 Tools used: ϕ 30 mm (ϕ 1.2 in.) VDI holder (for ZT1000Y). *2 Headstock 1 only. *3 Does not apply when using 20-station turret specifications.

Workpiece holding device

Hydraulic chuck (headstock 1)	6 inches	○	○	○	○	○	○	×	×	×	×	×	×
	8 inches	○	○	○	○	○	○	○	○	○	○	○	○
	10 inches	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic chuck (headstock 2)	6 inches	×	×	×	○	○	○	×	×	×	○	○	○
	8 inches	×	×	×	○	○	○	×	×	×	○	○	○
Hydraulic steady rest (SLU-1Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLUA-1Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLU-2Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLUA-2Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
Hydraulic steady rest	Interface	○	○	○	×	×	×	○	○	○	×	×	×
Steady rest	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×

Tailstock/tailstock spindle

Tailstock spindle live center*1	MT-4	●	●	●	×	×	×	●	●	●	×	×	×
Tailstock spindle built-in center*2	MT-3	○	○	○	×	×	×	○	○	○	×	×	×
Drilling with the tailstock <only applicable for live center specification>		○	○	○	×	×	×	○	○	○	×	×	×
No tailstock		○	○	○	×	×	×	○	○	○	×	×	×
Headstock 2 tailstock		×	×	×	○	○	○	×	×	×	○	○	○

*1 The center is optional. *2 The center is standard.

Measurement

Manual type in-machine tool presetter (headstock 1)	Pivoting type	●	●	●	●	●	●	●	●	●	●	●	●
Manual type in-machine tool presetter (headstock 2)	Removable	×	×	×	●	●	●	×	×	×	●	●	●
Automatic in-machine tool presetter (headstock 1)	Pivoting type	○	○	○	○	○	○	○	○	○	○	○	○
In-machine workpiece measuring system (inner and outer diameter measurement) <certain workpiece shapes cannot be measured>		○	○	○	○	○	○	○	○	○	○	○	○
In-machine workpiece measuring system	Headstock 2	×	×	×	○	○	○	×	×	×	○	○	○

Improved accuracy

Direct scale feedback	X-axis	○	○	○	○	○	○	○	○	○	○	○	○
	Y-axis	×	×	○	×	×	○	×	×	○	×	×	○
	Z-axis	○	○	○	○	○	○	○	○	○	○	○	○

Coolant

Through-spindle coolant system	Headstock 1	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Headstock 2	×	×	×	☆	☆	☆	×	×	×	☆	☆	☆

●: Standard features ○: Option ☆: Please contact Mori Seiki ×: Not available

		NL1500						NL2000					
Chip disposal		2-axis turning	MC	Y	S	SMC	SY	2-axis turning	MC	Y	S	SMC	SY
Chip conveyor	Right disposal (hinge type)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (hinge type)	○	○	○	○	○	○	○	○	○	○	○	○
	Right disposal (scraper type)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (scraper type)	○	○	○	○	○	○	○	○	○	○	○	○
	Right disposal (magnet scraper type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Rear disposal (magnet scraper type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Right disposal (spiral type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Rear disposal (spiral type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Right disposal (hinge type+drum filter)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Right disposal (hinge type <for aluminum>)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (hinge type <for aluminum>)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Right disposal (interface)	●	●	●	●	●	●	●	●	●	●	●	●
	Rear disposal (interface)	○	○	○	○	○	○	○	○	○	○	○	○
Air blow system	Tool tip	○	○	○	○	○	○	○	○	○	○	○	○
	Chuck (headstock 1)	○	○	○	○	○	○	○	○	○	○	○	○
	Chuck (headstock 2)	×	×	×	●	●	●	×	×	×	●	●	●
	Tailstock spindle	○	○	○	×	×	×	○	○	○	×	×	×
Through-spindle air blow system	Headstock 1	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Headstock 2	×	×	×	●	●	●	×	×	×	●	●	●
Oil mist collector I/F (duct only)	φ 100 mm (φ 3.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○
	φ 125 mm (φ 4.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○
	φ 150 mm (φ 5.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○

Automatic operation support

Gantry-type loader	LG-05	○	○	○	○	○	○	○	○	○	○	○	○
Workstocker	14 stations	○	○	○	○	○	○	○	○	○	○	○	○
	20 stations	○	○	○	○	○	○	○	○	○	○	○	○
	26 stations	○	○	○	○	○	○	○	○	○	○	○	○
Workpiece unloader		○	○	○	●*1	●*1	●*1	○	○	○	●*1	●*1	●*1
	In-machine traveling type	○	○	○	○	○	○	○	○	○	○	○	○
Workpiece conveyor		○	○	○	○	○	○	○	○	○	○	○	○
Workpiece push-out equipment (headstock 2)		×	×	×	●	●	●	×	×	×	●	●	●
	Cylinder type	×	×	×	☆	☆	☆	×	×	×	○*2	○*2	○*2
Loader	Interface	○	○	○	○	○	○	○	○	○	○	○	○
Robot	Interface	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Bar feeder	Interface	○	○	○	○	○	○	○	○	○	○	○	○
Workpiece rest		○	○	○	○	○	○	○	○	○	○	○	○
Pull-out finger		○	○	○	○	○	○	○	○	○	○	○	○
Turret-mounted workpiece-pusher	φ 53 mm (φ 2.0 in.)	○	○	○	○	○	○	○	○	○	○	○	○
Guide bushing		○	○	○	○	○	○	○	○	○	○	○	○

*1 Not including gantry loader specifications. *2 For spindle through hole dia. 73 mm (2.9 in.) specifications only. Consultation is required for other specifications.

Safety features

Low air pressure detecting switch		×	×	×	●	●	●	×	×	×	●	●	●
Dry anchor		○	○	○	○	○	○	○	○	○	○	○	○
Raised machine height <not applicable when the right disposal type chip conveyor is selected>	100 mm (3.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○

- The details given above and the specifications are subject to change without notice.
- Specifications, accessories, safety device and function are available upon request.
- Some options are not available in particular regions. For details contact Mori Seiki.

Standard & optional features (NL2500)

Spindle		NL2500/700						NL2500/1250					
		2-axis turning	MC	Y	S	SMC	SY	2-axis turning	MC	Y	S	SMC	SY
Headstock 1	4,000 min ⁻¹ : 18.5/18.5/15 kW (24.7/24.7/20 HP) <25%ED/50%ED/cont>	●	●	●	●	●	●	●	●	●	●	●	●
	4,000 min ⁻¹ : 26/26/22 kW (34.7/34.7/30 HP) <10 min/30 min/cont>	○	○	○	○	○	○	○	○	○	○	○	○
Headstock 2	6,000 min ⁻¹ : 11/7.5 kW (15/10 HP) <25%ED/cont>	×	×	×	●	●	●	×	×	×	●	●	●
	5,000 min ⁻¹ : 11/7.5 kW (15/10 HP) <25%ED/cont>	×	×	×	○	○	○	×	×	×	○	○	○

Turret

12-station turret head, bolt-tightened		●	●	●	●	●	●	●	●	●	●	●	●
10-station turret head, bolt-tightened		○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, bolt-tightened	SL compatible	○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, bolt-tightened	SL compatible	○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, quick-change VDI	Including outer circumference	○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, quick-change VDI	Including outer circumference	○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, quick-change VDI	Face type	○	×	×	×	×	×	○	×	×	×	×	×
10-station turret head, quick-change VDI	Face type	○	×	×	○	×	×	○	×	×	○	×	×
Max. rotary tool spindle speed	6,000 min ⁻¹ : 5.5/5.5/3.7 kW (7.5/7.5/5 HP) <3 min/5 min/cont>	×	●	●	×	●	●	×	●	●	×	●	●
Tool holders		●	●	●	●	●	●	●	●	●	●	●	●
Rotary tool holders		×	○	○	×	○	○	×	○	○	×	○	○
Capto-compatible holder		○	○	○	○	○	○	○	○	○	○	○	○
Overhang of O.D. cutting rotary tool	50 mm (2.0 in.)	×	●	●	×	●	●	×	●	●	×	●	●
	100 mm (3.9 in.) <Y-axis travel is limited for the Y and SY types>	×	○	○	×	○	○	×	○	○	×	○	○

Workpiece holding device

Hydraulic chuck (headstock 1)	10 inches	○	○	○	○	○	○	○	○	○	○	○	○
	12 inches	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic chuck (headstock 2)	6 inches	×	×	×	○	○	○	×	×	×	○	○	○
	8 inches	×	×	×	○	○	○	×	×	×	○	○	○
Hydraulic steady rest (SLU-1Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
	Carriage direct-coupled (suspended from the saddle)	×	×	×	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLUA-1Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
	Carriage direct-coupled (suspended from the saddle)	×	×	×	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLU-2Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
	Carriage direct-coupled (suspended from the saddle)	×	×	×	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLUA-2Z)	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×
	Carriage direct-coupled (suspended from the saddle)	×	×	×	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLU-B3Z)	Bolt-tightening	×	×	×	×	×	×	○	○	○	×	×	×
	Carriage direct-coupled (suspended from the saddle)	×	×	×	×	×	×	○	○	○	×	×	×
Hydraulic steady rest (SLUA-B3Z)	Bolt-tightening	×	×	×	×	×	×	○	○	○	×	×	×
	Carriage direct-coupled (suspended from the saddle)	×	×	×	×	×	×	○	○	○	×	×	×
Hydraulic steady rest	Interface	○	○	○	×	×	×	○	○	○	×	×	×
Steady rest	Bolt-tightening	○	○	○	×	×	×	○	○	○	×	×	×

Tailstock/tailstock spindle

Tailstock spindle live center* ¹	MT-5	●	●	●	×	×	×	●	●	●	×	×	×
Tailstock spindle built-in center* ²	MT-3	○	○	○	×	×	×	×	×	×	×	×	×
	MT-4	○	○	○	×	×	×	○	○	○	×	×	×
Drilling with the tailstock <only applicable for live center specification>		○	○	○	×	×	×	○	○	○	×	×	×
No tailstock		○	○	○	×	×	×	○	○	○	×	×	×
Headstock 2 tailstock		×	×	×	○	○	○	×	×	×	○	○	○

*1 The center is optional. *2 The center is standard.

Measurement

Manual type in-machine tool presetter (headstock 1)	Pivoting type	●	●	●	●	●	●	●	●	●	●	●	●
Manual type in-machine tool presetter (headstock 2)	Removable	×	×	×	●	●	●	×	×	×	●	●	●
Automatic in-machine tool presetter (headstock 1)	Pivoting type	○	○	○	○	○	○	○	○	○	○	○	○
In-machine workpiece measuring system (inner and outer diameter measurement) <certain workpiece shapes cannot be measured>		○	○	○	○	○	○	○	○	○	○	○	○
In-machine workpiece measuring system	Headstock 2	×	×	×	○	○	○	×	×	×	○	○	○

●: Standard features ○: Option ☆: Please contact Mori Seiki ×: Not available

		NL2500/700						NL2500/1250					
Improved accuracy		2-axis turning	MC	Y	S	SMC	SY	2-axis turning	MC	Y	S	SMC	SY
Direct scale feedback	X-axis	○	○	○	○	○	○	○	○	○	○	○	○
	Y-axis	×	×	○	×	×	○	×	×	○	×	×	○
	Z-axis	○	○	○	○	○	○	○	○	○	○	○	○

Coolant

Through-spindle coolant system	Headstock 1	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Headstock 2	×	×	×	☆	☆	☆	×	×	×	☆	☆	☆

Chip disposal

Chip conveyor	Right disposal (hinge type)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (hinge type)	○	○	○	○	○	○	×	×	×	×	×	×
	Right disposal (scraper type)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (scraper type)	○	○	○	○	○	○	×	×	×	×	×	×
	Right disposal (magnet scraper type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Rear disposal (magnet scraper type)	☆	☆	☆	☆	☆	☆	×	×	×	×	×	×
	Right disposal (spiral type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Rear disposal (spiral type)	☆	☆	☆	☆	☆	☆	×	×	×	×	×	×
	Right disposal (hinge type+drum filter)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Right disposal (hinge type <for aluminum>)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (hinge type <for aluminum>)	☆	☆	☆	☆	☆	☆	×	×	×	×	×	×
	Right disposal (interface)	●	●	●	●	●	●	●	●	●	●	●	●
Air blow system	Rear disposal (interface)	○	○	○	○	○	○	×	×	×	×	×	×
	Tool tip	○	○	○	○	○	○	○	○	○	○	○	○
	Chuck (headstock 1)	○	○	○	○	○	○	○	○	○	○	○	○
	Chuck (headstock 2)	×	×	×	●	●	●	×	×	×	●	●	●
Through-spindle air blow system	Tailstock spindle	○	○	○	×	×	×	○	○	○	×	×	×
	Headstock 1	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Oil mist collector I/F (duct only)	Headstock 2	×	×	×	●	●	●	×	×	×	●	●	●
	φ 100 mm (φ 3.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○
	φ 125 mm (φ 4.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○
	φ 150 mm (φ 5.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○

Automatic operation support

Gantry-type loader	LG-10	○	○	○	○	○	○	○	○	○	○	○	○
Workstocker	10 stations	○	○	○	○	○	○	○	○	○	○	○	○
	20 stations	○	○	○	○	○	○	○	○	○	○	○	○
Workpiece unloader		○	○	○	●*	●*	●*	○	○	○	●*	●*	●*
	In-machine traveling type	○	○	○	○	○	○	×	×	×	×	×	×
Workpiece conveyor		○	○	○	○	○	○	☆	☆	☆	☆	☆	☆
Workpiece push-out equipment		×	×	×	●	●	●	×	×	×	●	●	●
	Cylinder type	×	×	×	○	○	○	×	×	×	○	○	○
Loader	Interface	○	○	○	○	○	○	○	○	○	○	○	○
Robot	Interface	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Bar feeder	Interface	○	○	○	○	○	○	○	○	○	○	○	○
Workpiece rest		○	○	○	○	○	○	○	○	○	○	○	○
Pull-out finger		○	○	○	○	○	○	○	○	○	○	○	○
Turret-mounted workpiece-pusher	φ 53 mm (φ 2.0 in.)	○	○	○	○	○	○	○	○	○	○	○	○
Guide bushing		○	○	○	○	○	○	○	○	○	○	○	○

* Not including gantry loader specifications.

Safety features

Low air pressure detecting switch		×	×	×	●	●	●	×	×	×	●	●	●
Dry anchor		○	○	○	○	○	○	○	○	○	○	○	○
Raised machine height <not applicable when the right disposal type chip conveyor is selected>	100 mm (3.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○

- The details given above and the specifications are subject to change without notice.
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- Some options are not available in particular regions. For details contact Mori Seiki.

Standard & optional features (NL3000)

		NL3000/700			NL3000/1250			NL3000/2000			NL3000/3000		
		2-axis turning	MC	Y	2-axis turning	MC	Y	2-axis turning	MC	Y	2-axis turning	MC	Y
Spindle	3,000 min ⁻¹ : 22/18.5 kW (30/24.7 HP) <30 min/cont>	●	●	●	●	●	●	●	●	●	●	●	●
	3,000 min ⁻¹ : 30/25 kW (40/33.3 HP) <30 min/cont>	○	○	○	○	○	○	○	○	○	○	○	○

Turret

12-station turret head, bolt-tightened		○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, bolt-tightened		●	●	●	●	●	●	●	●	●	●	●	●
12-station turret head, bolt-tightened	SL compatible	○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, bolt-tightened	SL compatible	○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, quick-change VDI	Including outer circumference	○	○	○	○	○	○	○	○	○	○	○	○
10-station turret head, quick-change VDI	Including outer circumference	○	○	○	○	○	○	○	○	○	○	○	○
12-station turret head, quick-change VDI	Face type	○	×	×	○	×	×	○	×	×	○	×	×
Max. rotary tool spindle speed	6,000 min ⁻¹ : 5.5/5.5/3.7 kW (7.5/7.5/5 HP) <3 min/5 min/cont>	×	●	●	×	●	●	×	●	●	×	●	●
Tool holders		●	●	●	●	●	●	●	●	●	●	●	●
Rotary tool holders		×	○	○	×	○	○	×	○	○	×	○	○
Capto-compatible holder		○	○	○	○	○	○	○	○	○	○	○	○
Overhang of O.D. cutting rotary tool	50 mm (2.0 in.)	×	●	●	×	●	●	×	●	●	×	●	●
	100 mm (3.9 in.) <Y-axis travel is limited for the Y and SY types>	×	○	○	×	○	○	×	×	×	×	×	×

Workpiece holding device

Hydraulic chuck	12 inches	○	○	○	○	○	○	○	○	○	○	○	○
	15 inches	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic steady rest (SLU-2Z)	Bolt-tightening	○	○	○	○	○	○	○	○	○	○	○	○
	Carriage direct-coupled (suspended from the saddle)	○	○	○	○	○	○	×	×	×	×	×	×
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLUA-2Z)	Bolt-tightening	○	○	○	○	○	○	○	○	○	○	○	○
	Carriage direct-coupled (suspended from the saddle)	○	○	○	○	○	○	×	×	×	×	×	×
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLU-3Z)	Bolt-tightening	×	×	×	×	×	×	○	○	○	○	○	○
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLUA-3Z)	Bolt-tightening	×	×	×	×	×	×	○	○	○	○	○	○
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLU-3.1Z)	Bolt-tightening	○	○	○	○	○	○	○	○	○	○	○	○
	Carriage direct-coupled (suspended from the saddle)	○	○	○	○	○	○	×	×	×	×	×	×
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLUA-3.1Z)	Bolt-tightening	○	○	○	○	○	○	○	○	○	○	○	○
	Carriage direct-coupled (suspended from the saddle)	○	○	○	○	○	○	×	×	×	×	×	×
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLU-3.2Z)	Bolt-tightening	×	×	×	×	×	×	○	○	○	○	○	○
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest (SLUB-4Z)	Bolt-tightening	×	×	×	×	×	×	○	○	○	○	○	○
	Programmable (rack & pinion)	×	×	×	×	×	×	○	○	○	○	○	○
Hydraulic steady rest	Interface	○	○	○	○	○	○	○	○	○	○	○	○
Steady rest	Bolt-tightening	○	○	○	○	○	○	○	○	○	○	○	○

Tailstock/tailstock spindle

Tailstock spindle live center* ¹	MT-5	●	●	●	●	●	●	×	×	×	×	×	×
Tailstock spindle built-in center* ²	MT-4	○	○	○	○	○	○	×	×	×	×	×	×
	MT-5	×	×	×	×	×	×	●	●	●	●	●	●
Programmable tailstock	Carriage direct-coupled	×	×	×	×	×	×	●	●	●	●	●	●
Drilling with the tailstock <only applicable for live center specification>		○	○	○	○	○	○	×	×	×	×	×	×
No tailstock		○	○	○	○	○	○	×	×	×	×	×	×

*1 The center is optional. *2 The center is standard.

Measurement

Manual type in-machine tool presetter	Pivoting type	●	●	●	●	●	●	●	●	●	●	●	●
Automatic in-machine tool presetter	Pivoting type	○	○	○	○	○	○	○	○	○	○	○	○
In-machine workpiece measuring system (inner and outer diameter measurement) <certain workpiece shapes cannot be measured>		○	○	○	○	○	○	○	○	○	○	○	○

●: Standard features ○: Option ☆: Please contact Mori Seiki ✕: Not available

		NL3000/700			NL3000/1250			NL3000/2000			NL3000/3000		
		2-axis turning	MC	Y	2-axis turning	MC	Y	2-axis turning	MC	Y	2-axis turning	MC	Y
Improved accuracy	X-axis	○	○	○	○	○	○	○	○	○	○	○	○
	Y-axis	✕	✕	○	✕	✕	○	✕	✕	○	✕	✕	○
	Z-axis	○	○	○	○	○	○	☆	☆	☆	☆	☆	☆

Coolant

Through-spindle coolant system	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
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Chip disposal

Chip conveyor	Right disposal (hinge type)	○	○	○	○	○	○	●	●	●	●	●	●
	Rear disposal (hinge type)	○	○	○	✕	✕	✕	✕	✕	✕	✕	✕	✕
	Right disposal (scraper type)	○	○	○	○	○	○	○	○	○	○	○	○
	Rear disposal (scraper type)	○	○	○	✕	✕	✕	✕	✕	✕	✕	✕	✕
	Right disposal (magnet scraper type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Rear disposal (magnet scraper type)	☆	☆	☆	✕	✕	✕	✕	✕	✕	✕	✕	✕
	Right disposal (spiral type)	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	Rear disposal (spiral type)	☆	☆	☆	✕	✕	✕	✕	✕	✕	✕	✕	✕
	Right disposal (hinge type+drum filter)	☆	☆	☆	☆	☆	☆	✕	✕	✕	✕	✕	✕
	Right disposal (hinge type <for aluminum>)	○	○	○	○	○	○	✕	✕	✕	✕	✕	✕
	Rear disposal (hinge type <for aluminum>)	☆	☆	☆	✕	✕	✕	✕	✕	✕	✕	✕	✕
	Right disposal (interface)	●	●	●	●	●	●	○	○	○	○	○	○
	Rear disposal (interface)	○	○	○	✕	✕	✕	✕	✕	✕	✕	✕	✕
Air blow system	Tool tip	○	○	○	○	○	○	○	○	○	○	○	○
	Chuck	○	○	○	○	○	○	○	○	○	○	○	○
	Tailstock spindle	○	○	○	○	○	○	○	○	○	○	○	○
Through-spindle air blow system		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Oil mist collector I/F (duct only)	φ 100 mm (φ 3.9 in.)	○	○	○	○	○	○	✕	✕	✕	✕	✕	✕
	φ 125 mm (φ 4.9 in.)	○	○	○	○	○	○	✕	✕	✕	✕	✕	✕
	φ 150 mm (φ 5.9 in.)	○	○	○	○	○	○	○	○	○	○	○	○
	φ 200 mm (φ 7.9 in.)	✕	✕	✕	✕	✕	✕	○	○	○	○	○	○

Automatic operation support

Gantry-type loader	LG-10	○	○	○	☆	☆	☆	✕	✕	✕	✕	✕	✕
Workstocker	10 stations	○	○	○	✕	✕	✕	✕	✕	✕	✕	✕	✕
	20 stations	○	○	○	✕	✕	✕	✕	✕	✕	✕	✕	✕
Workpiece unloader		○	○	○	○	○	○	✕	✕	✕	✕	✕	✕
	In-machine traveling type	☆	☆	☆	✕	✕	✕	✕	✕	✕	✕	✕	✕
Workpiece conveyor		○	○	○	☆	☆	☆	✕	✕	✕	✕	✕	✕
Loader	Interface	○*	○*	○*	✕	✕	✕	✕	✕	✕	✕	✕	✕
Robot	Interface	☆	☆	☆	☆	☆	☆	✕	✕	✕	✕	✕	✕
Bar feeder	Interface	○	○	○	○	○	○	✕	✕	✕	✕	✕	✕
Workpiece rest		○	○	○	○	○	○	☆	☆	☆	☆	☆	☆
Pull-out finger		○	○	○	○	○	○	☆	☆	☆	☆	☆	☆
Turret-mounted workpiece-pusher	φ 53 mm (φ 2.0 in.)	○	○	○	○	○	○	☆	☆	☆	☆	☆	☆
Guide bushing		○	○	○	○	○	○	☆	☆	☆	☆	☆	☆

* Not available for specifications with a cylinder cover.

Safety features

Dry anchor		○	○	○	○	○	○	○	○	○	○	○	○
Raised machine height <not applicable when the right disposal type chip conveyor is selected>	100 mm (3.9 in.)	○	○	○	○	○	○	✕	✕	✕	✕	✕	✕
Tailstock spindle travel check		✕	✕	✕	✕	✕	✕	○	○	○	○	○	○

- The details given above and the specifications are subject to change without notice.
- Specifications, accessories, safety device and function are available upon request.
- Some options are not available in particular regions. For details contact Mori Seiki.

Standard & optional features (common items to all models)

●: Standard features ○: Option ☆: Please contact Mori Seiki

Spindle

Spindle cooling system	Oil cooler (inverter type)	●
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Workpiece holding device

Collet chuck		○
Index chuck (electric)	Interface	☆
Soft jaws		○
Chuck high/low pressure system		○
Work stopper (in spindle)		○

Improved accuracy

Ball screw center cooling device	X-axis	○
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Coolant

Bed cover chip flush coolant device <standard feature when the rear disposal chip conveyor is selected>		○
Coolant system	325/520 W (50/60 Hz)	●
High-pressure coolant system	635/1,040 W (50/60 Hz)	○
	3.5 MPa (507.5 psi)	○
Super high-pressure coolant unit	7 MPa (1,015 psi)	○
	Interface	○
Semi-dry unit		○
Oil skimmer		○
	Optional when using water-soluble coolant	○
Coolant cooling unit (separate type)	Essential when using oil-based coolant (for details contact Mori Seiki)	○
Coolant float switch		○
Coolant flow switch		○

Chip disposal

Chuck top coolant		○
Coolant gun		○
Chip bucket		○
Oil mist collector		○

Operation support device/function

Total counter		○
Multi counter		☆
Work counter		○
Automatic door		○
Automatic power-off system		●

Automatic operation support

External M code	5	○
	10	○

Others

Signal tower	1 stage	○
	3 stages	○
Chuck foot switch	1 foot switch	●
	2 foot switches	○
Built-in worklight		●
Hand tools		●
Anti-dust specifications		☆

Safety features

Full cover		●
Impact resistant viewing window		●
Door interlock system (incl. mechanical lock)		●
Chuck jaw stroke end check*		●
Cylinder check valve*		●
Low hydraulic pressure detecting switch		●
Footswitch with lock device		●
Earth leakage breaker		○
Overtravel	Software	●
Danger sensing device interface (recommended when oil-based coolant is used or during unmanned operation)		○

* Featured only when optional chuck/cylinder is selected.

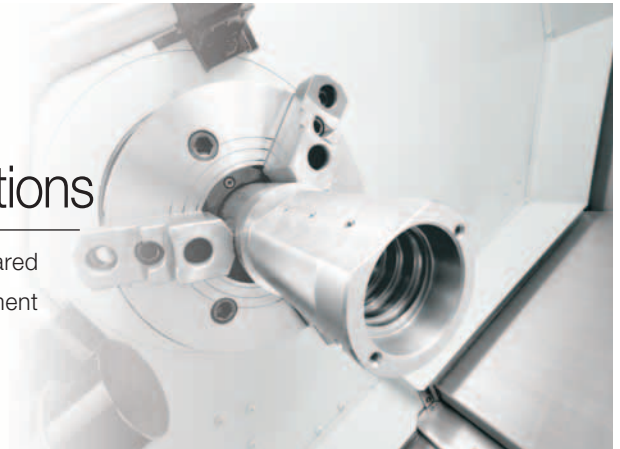
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- Some options are not available in particular regions. For details contact Mori Seiki.



Rigid & Precise
NL SERIES

Recommended specifications

For even more effective machining, we have prepared recommended specifications for peripheral equipment (options) for each customer's type of production. Please refer to this when selecting options.



Recommended specifications for bar material

Recommended specifications for promoting automation and efficiency for bar machining.

Recommended specifications 1

Bar feeder I/F
+
Workpiece unloader
+
Workpiece positioning holder (turret-mounted type)
+
Cut-off holder
+
Guide bushing

Recommended specifications 2

Bar feeder I/F
+
Cut-off holder
+
8 inch chuck specifications (headstock 2)
+
Guide bushing

● NL2000, NL2500 only.

Recommended specifications for setup support

Effective recommended specifications for reducing setup time.

Recommended specifications 1

Automatic door (with tape switch)
+
Signal tower (3-stage)

Recommended specifications 2

Workpiece rest
+
Tailstock air blow

Recommended specifications for ultra-high pressure coolant

Recommended specifications for efficient removal of chips from tool tip.

Recommended specifications

High-pressure coolant system <7 MPa (1,015 psi)>
+
Coolant cooling unit
+
Oil mist collector I/F

Recommended specifications for machining aluminum

Recommended specifications for stable chip disposal during aluminum machining.

Recommended specifications

Hinge type chip conveyor (for aluminum)
+
Shower coolant

Recommended specifications for machining long workpieces

Recommended specifications for long workpieces.

Recommended specifications 1

SMW Brace Anchor I/F (one)
+
Tailstock air blow

Recommended specifications 2

SMW Brace Anchor I/F (one)
+
Workpiece rest
+
Tailstock air blow

● For details contact Mori Seiki.

Numerical control unit specifications (MSX-850Ⅲ)

●: Standard ○: Option ✕: Not available

Controlled axes

Least input increment	0.001 mm (0.0001 in.)	●
Least command increment	0.001 mm (0.0001 in.)	●
Max. command value	±99,999.999 mm (±9,999.9999 in.)	●
Inch/metric conversion		●
Machine lock		●
Chuck and tailstock barrier	Only works in automatic operation	●
Chamfering on/off		●
Backlash compensation	±9,999 pulses	●
Rapid traverse/cutting feed backlash compensation		●
Stored pitch error compensation		●
Inclined angle offset	Memorized relative position compensation	●
Straightness offset		●
Programming resolution multiplied by 1/10	0.0001 mm (0.00001 in.) <however, the C-axis control is 0.001>	○

Operation

Sequence number collation and stop		●
Dry run		●
Single block		●
Jog feedrate	0—5,000 mm/min (0—197.0 ipm) <20 steps>	●
Manual zero return		●
Manual pulse handle feed	1 unit per control system: ×1, ×10, ×100	●
Program restart		○
Manual handle feed interruption		○

Interpolation functions

Positioning	linear interpolation type positioning is possible	●
Thread cutting/Synchronous feed		●
Multi-start thread cutting		●
Retract during thread cutting cycle		●
Continuous thread cutting		●
Variable lead thread cutting		●
High-speed skip		●
Multi-skip		●
Zero return		●
Zero return check		●
2nd zero return		●
3rd and 4th zero return		●

Feed functions

Rapid traverse rate override	F0/5/10/25/100%	●
Feed per minute		●
Feed per revolution		●
Constant tangential velocity control	Interpolation in cutting feed	●
Cutting feedrate clamp		●
Automatic acceleration/deceleration	Linear type (rapid traverse)/ Exponential function type (cutting feed)	●
Feedrate override	0—200% (10% increments)	●
Override cancel		●

Program input

Optional block skip	1 block	●
Max. command value	±8 digits	●
Program number	4 digits	●
Sequence number	5-digit N code	●
Decimal point programming/ Electrical calculator type decimal point programming	You can change the electrical calculator type decimal point programming by changing a parameter	●
Diameter/radius programming (X-axis)	Standard: diameter	●
Plane selection		●
Rotary axis designation		●
Rotary axis roll-over		●
Coordinate system setting		●
Automatic coordinate system setting		●
Work coordinate system		●
Chamfer, corner R		●
Programmable data input		●
Sub-program call	Up to 8 nestings	●
Custom macro	200 sets (# 100 to # 199, # 500 to # 599)	●
Interruption type custom macro		●
Single repetitive cycle		●
Multiple repetitive cycle		●
Multiple repetitive cycle II	Pocket cutting, zigzag thread cutting	●
Hole machining canned cycle		●
F15 format		●
Command angles of straight lines		●
Program number	8 digits	○
Addition of optional block skip	Soft key type (2—9)	○
Custom macro common variables <in total>	300 variables (# 100 to # 199, # 500 to # 699) 600 variables (# 100 to # 199, # 500 to # 999)	○
Automatic tool nose radius compensation		○
Groove width compensation		○
Manual coordinate system function		○
Tool geometry offset type I		○

Miscellaneous function/Spindle speed function

Miscellaneous function	4-digit M code	●
Auxiliary function lock		●
Multiple miscellaneous function commands	3 commands (this function is standard for the specified M codes)	●
Spindle speed function	5-digit S code	●
Constant surface speed control		●
Spindle speed override	50—150% (10% increments)	●
Spindle orientation (headstock 1)	Without lock function	●
Load monitoring function A		●
Spindle orientation (headstock 1)	With software lock	○
Synchronized tapping	Turning spindle	○

Tool function/Tool offset function

Tool function	4-digit T code	●
Number of tool offsets	80 sets	●
Tool position offset		●
Tool nose radius offset		●
Tool geometry offset/Tool wear offset		●
Tool life management	80 sets	●
7-digit tool offset data	Distance between centers 1250 type and 2000 type only	●
Tool offset measurement direct data input		●
Tool offset measurement direct data input B	In-machine tool presetter	●

Editing

Part program storage	320 m (1,050 ft) <128 kB>	●
Number of stored programs	200 programs	●
Background editing		●
Expanded tape editing function		●
Undo/Redo function		●
Line no. display function		●
Part program storage <in total>+	600 m (1,970 ft) <240 kB>+ 400 programs	○
Number of stored programs <in total>	1,280 m (4,200 ft) <512 kB>+ 1,000 programs	○
Part program storage <in total>+	2,560 m (8,400 ft) <1 MB>+ 1,000 programs	○
Number of stored programs <in total>	5,120 m (16,800 ft) <2 MB>+ 1,000 programs	○

Setting and display

Status display		●
Clock function		●
Actual position display		●
Program display	Program name: 48 characters	●
Parameter setting display		●
Self-diagnosis function		●
Alarm display		●
Alarm history display		●
Operator's message history display		●
Operation history display		●
Help function		●
Running time display/Number of parts display		●
Actual feedrate display		●
Display of actual spindle speed and T code		●
Operation panel: display section	10.4-inch TFT color LCD	●
Regular interval maintenance screen		●
Screen clear	It is possible to set on the screen of saving electric power	●

Data input/output

I/O interface	RS-232-C/PCMCIA (type I, II)	●
User memory area 50 MB (for card DNC operation function, for data backup)	Files up to 10 MB in size can be edited	●
Data server		○
External work number search	# 1—# 15	○
DNC operation with memory card		○
User memory area 500 MB (for card DNC operation function, for data backup)	Files up to 10 MB in size can be edited	○

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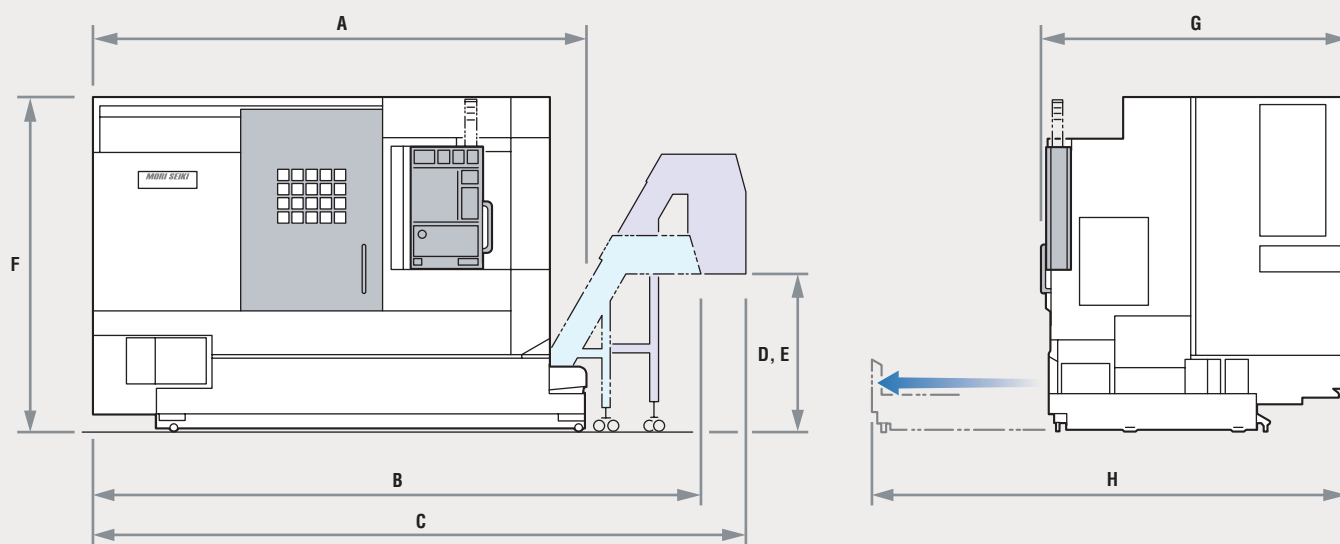
Application by type

	Item	2-axis turning	MC-type	Y-type	S-type	SMC-type	SY-type
Controlled axes	Controlled axes	X, Z, B, 4	●	X, Z, C, B, 5	●	X, Z, C, Y, B, 6	●
	Simultaneously controllable axes	X, Z	●	X, Z, C	●	X, Z, C	●
	Inclined axis control for arbitrary axis (Y-axis)	✕		✕	●	✕	●
Interpolation functions	Polar coordinate interpolation	✕	●	●	●	✕	●
	Cylindrical interpolation	✕	●	●	●	●	●
	Helical interpolation (circular interpolation+ linear interpolation <max. 2 axes>)	✕		○	●	✕	○
	Polygon cutting	✕		○	○	✕	○
Program input	Absolute (incremental) programming	X (U), Z (W)	●	X (U), Z (W), C (H)	●	X (U), Z (W), C (H), B	●
Miscellaneous function/ Spindle speed function	Spindle orientation (headstock 2) <without lock function>	✕	✕	✕	●	●	●
	Spindle orientation (headstock 2) <with software lock>	✕	✕	✕	○	○	○
	Spindle synchronized control	✕	✕	✕	●	●	●
	Multiple-spindle control	✕	●	●	●	●	●
	Synchronized tapping (with rotary tool spindle)	✕	●	●	✕	●	●
Tool function/ Tool offset function	Y-axis offset	✕	✕	●	✕	✕	●

Machine size

Front view

Side view



mm (in.)

Machine type		Width			Chip conveyor disposal height		Depth		Height F
		Machine only	Including chip conveyor	Including chip conveyor <EN Standards>	Standard	EN Standards	Machine only	Including space to remove coolant tank	
		A	B	C	D	E	G	H	
NL1500	Without sub-spindle	2,695 (106.1)	3,388 (133.4)	3,688 (145.2)	1,005 (39.6)		1,922 (75.7)	3,150 (124.0)	2,120 (83.5)
	With sub-spindle						2,000 (78.7)		
NL2000	Without sub-spindle						1,922 (75.7)		
	With sub-spindle						2,000 (78.7)		
NL2500/700	Without sub-spindle	3,100 (122.0)	3,805 (149.8)	4,105 (161.6)			1,922 (75.7)		
	With sub-spindle						2,000 (78.7)		
NL2500/1250		4,329 (170.4)	5,039 (198.4)	5,339 (210.2)	1,000 (39.4)		2,143 (84.4)	3,325 (130.9)	2,232 (87.9)
NL3000/700		3,410 (134.3)	4,092 (161.1)	4,392 (172.9)	1,055 (41.5)		2,089 (82.2)	3,432 (135.1)	2,270 (89.4)
NL3000/1250		4,522 (178.0)	5,184 (204.1)	5,484 (215.9)			2,291 (90.2)	3,464 (136.4)	
NL3000/2000		—	7,080 (278.7) <chip conveyors are standard>	7,417 (292.0) <chip conveyors are standard>	1,020 (40.2)	1,042 (41.0)	2,587 (101.9)	4,494 (176.9)	2,390 (94.1)
NL3000/3000		—	8,147 (320.7) <chip conveyors are standard>	8,484 (334.0) <chip conveyors are standard>					

Machine specifications (NL1500)

Item			NL1500/500	NL1500MC/500	NL1500Y/500	NL1500S/500	NL1500SMC/500	NL1500SY/500
Capacity	Swing over bed	mm (in.)	923.8 (36.4) <interference with front cover 579.8 (22.8)>					
	Swing over cross slide	mm (in.)	755 (29.7)					
	Max. turning diameter	mm (in.)	356 (14.0) [278 (10.9) <20-station turret head>]					
	Standard turning diameter	mm (in.)	260 (10.2) [192.6 (7.5) <20-station turret head>]					
	Max. turning length	mm (in.)	515 (20.2)					
	Bar work capacity	mm (in.)	52 (2.0) [34 (1.3) <8,000 min ⁻¹ >]					
Travel	X-axis travel	mm (in.)	260 (10.2)					
	Z-axis travel	mm (in.)	590 (23.2) [580 (22.8) <20-station turret head>]					
	Y-axis travel	mm (in.)	—		100 <±50> (3.9 <±2.0>)	—		100 <±50> (3.9 <±2.0>)
	Headstock 2 travel <B-axis>	mm (in.)	—			624 (24.6)		
Spindle	Max. spindle speed	min ⁻¹	6,000 [8,000]			Headstock 1, 2: 6,000 [8,000]		
	Type of spindle nose		JIS A ₂ -5			Headstock 1, 2: JIS A ₂ -5		
	Through-spindle hole diameter	mm (in.)	61 (2.4) [43 (1.7) <8,000 min ⁻¹ >]			Headstock 1: 61 (2.4) [43 (1.7) <8,000 min ⁻¹ > Headstock 2: 43 (1.7)		
	Min. spindle indexing angle		—		0.001°	—		0.001°
	Spindle bearing inner diameter	mm (in.)	100 (3.9) [85 (3.3) <8,000 min ⁻¹ >]			Headstock 1: 100 (3.9) [85 (3.3) <8,000 min ⁻¹ > Headstock 2: 85 (3.3)		
	Turret	Number of tool stations		12 [16] [20]				
Shank height for square tool		mm (in.)	20 (3/4)					
Shank diameter for boring bar		mm (in.)	Max. 40 (1 1/2) [32 (1 1/4) <double boring holder>]			Headstock 1: Max. 40 (1 1/2) [32 (1 1/4) <double boring holder> Headstock 2: Max. 32 (1 1/4)		
Tool shank diameter for rotary tool		mm (in.)	—		26 (1.0)	—		26 (1.0)
Turret indexing time		s	0.2 [0.25 <20-station turret head>]		0.25	0.2 [0.25 <20-station turret head>]		0.25
Max. rotary tool spindle speed		min ⁻¹	—		6,000	—		6,000
Feedrate	Rapid traverse rate	mm/min (ipm)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z, B: 30,000 (1,181.1) C: 400 min ⁻¹	X, Z, B: 30,000 (1,181.1) Y: 10,000 (393.7) C: 400 min ⁻¹	
Tailstock	Tailstock travel	mm (in.)	564 (22.2)			—		
	Tailstock spindle diameter	mm (in.)	80 (3.1)			—		
	Taper hole of tailstock spindle		Live center <MT4> [Built-in center <MT3>]			—		
Motor	Spindle drive motor	6,000 min ⁻¹ kW (HP)	11/11/7.5 (15/15/10) [15/15/11 (20/20/15)]			Headstock 1: 11/11/7.5 (15/15/10) [15/15/11 (20/20/15)] Headstock 2: 11/7.5 (15/10) <25%ED/cont>		
		8,000 min ⁻¹ kW (HP)	[11/7.5 (15/10) <25%ED/cont>]			Headstock 1, 2: [11/7.5 (15/10) <25%ED/cont>]		
	Rotary tool spindle drive motor <3 min/5 min/cont>	kW (HP)	—		5.5/5.5/3.7 (7.5/7.5/5)	—		5.5/5.5/3.7 (7.5/7.5/5)
	Feed motor	kW (HP)	X: 2.0 (2.7) Z: 3.5 (4.7)			X, Y: 2.0 (2.7) Z: 3.5 (4.7)	X, B: 2.0 (2.7) Z: 3.5 (4.7)	
Power sources	Electrical power supply <for the standard specifications>	kVA	18.8	23.3	27.2	27.3	27.2	31.6
	Compressed air supply	MPa (psi), L/min (gpm)	— (a compressed air supply may be needed, depending on options and peripheral equipment)			0.5 (72.5), 100 (26.4) <ANR>		
Tank capacity	Coolant tank capacity	L (gal.)	235 (62.0)					
Machine size	Machine height <from floor>	mm (in.)	2,120 (83.5)					
	Floor space <width×depth>	mm (in.)	2,695×1,922 (106.1×75.7)			2,695×2,000 (106.1×78.7)		
	Mass of machine	kg (lb.)	5,300 (11,660)	5,400 (11,880)	5,600 (12,320)	5,400 (11,880)	5,500 (12,100)	5,700 (12,540)

[] Option JIS: Japanese Industrial Standard

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.

● Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.

● ANR: ANR refers to a standard atmospheric state; i. e., temperature at 20 °C (68 °F), absolute pressure at 101.3 kPa (14.7 psi) and relative humidity at 65%.

● Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

194028A04

Machine specifications (NL2000)

Item			NL2000/500	NL2000MC/500	NL2000Y/500	NL2000S/500	NL2000SMC/500	NL2000SY/500
Capacity	Swing over bed	mm (in.)	923.8 (36.4) <interference with front cover 579.8 (22.8)>					
	Swing over cross slide	mm (in.)	755 (29.7)					
	Max. turning diameter	mm (in.)	356 (14.0) [278 (10.9) <20-station turret head>]					
	Standard turning diameter	mm (in.)	275 (10.8) [192.6 (7.5) <20-station turret head>]					
	Max. turning length	mm (in.)	510 (20.0)					
	Bar work capacity	mm (in.)	65 (2.5)					
Travel	X-axis travel	mm (in.)	260 (10.2)					
	Z-axis travel	mm (in.)	590 (23.2) [580 (22.8) <20-station turret head>]					
	Y-axis travel	mm (in.)	—		100 <±50> (3.9 <±2.0>)	—		100 <±50> (3.9 <±2.0>)
	Headstock 2 travel <B-axis>	mm (in.)	—			624 (24.6)		
Spindle	Max. spindle speed	min ⁻¹	5,000			Headstock 1: 5,000 Headstock 2: 6,000 [5,000]		
	Type of spindle nose		JIS A2-6			Headstock 1: JIS A2-6 Headstock 2: JIS A2-5 [JIS A2-6 <5,000 min ⁻¹ >]		
	Through-spindle hole diameter	mm (in.)	73 (2.9)			Headstock 1: 73 (2.9) Headstock 2: 43 (1.7) [73 (2.9) <5,000 min ⁻¹ >]		
	Min. spindle indexing angle		—	0.001°		—	0.001°	
	Spindle bearing inner diameter	mm (in.)	120 (4.7)			Headstock 1: 120 (4.7) Headstock 2: 85 (3.3) [120 (4.7) <5,000 min ⁻¹ >]		
	Number of tool stations		12 [10] [16] [20]					
Turret	Shank height for square tool	mm (in.)	25 (1)					
	Shank diameter for boring bar	mm (in.)	Max. 50 (2) [32 (1 ¹ / ₄) <double boring holder>]			Headstock 1: Max. 50 (2) [32 (1 ¹ / ₄) <double boring holder>] Headstock 2: Max. 32 (1 ¹ / ₄)		
	Tool shank diameter for rotary tool	mm (in.)	—	26 (1.0)		—	26 (1.0)	
	Turret indexing time	s	0.2 [0.25 <20-station turret head>]	0.25		0.2 [0.25 <20-station turret head>]	0.25	
	Max. rotary tool spindle speed	min ⁻¹	—	6,000		—	6,000	
	Feedrate	Rapid traverse rate mm/min (ipm)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z, B: 30,000 (1,181.1)	X, Z, B: 30,000 (1,181.1) C: 400 min ⁻¹	X, Z, B: 30,000 (1,181.1) Y: 10,000 (393.7) C: 400 min ⁻¹
Tailstock	Tailstock travel	mm (in.)	564 (22.2)			—		
	Tailstock spindle diameter	mm (in.)	80 (3.1)			—		
	Taper hole of tailstock spindle		Live center <MT4> [Built-in center <MT3>]			—		
Motor	Spindle drive motor <50%ED/30 min/cont>	kW (HP)	15/15/11 (20/20/15) [18.5/18.5/18.5/15 (24.7/24.7/24.7/20) <25%ED/50%ED/30 min/cont>]			Headstock 1: 15/15/11 (20/20/15) [18.5/18.5/18.5/15 (24.7/24.7/24.7/20) <25%ED/50%ED/30 min/cont>] Headstock 2: 11/7.5 (15/10) <25%ED/cont>		
	Rotary tool spindle drive motor <3 min/5 min/cont>	kW (HP)	—	5.5/5.5/3.7 (7.5/7.5/5)		—	5.5/5.5/3.7 (7.5/7.5/5)	
	Feed motor	kW (HP)	X: 2.0 (2.7) Z: 3.5 (4.7)		X, Y: 2.0 (2.7) Z: 3.5 (4.7)	X, B: 2.0 (2.7) Z: 3.5 (4.7)		X, Y, B: 2.0 (2.7) Z: 3.5 (4.7)
Power sources	Electrical power supply <for the standard specifications>	kVA	20.3	24.0	31.3	31.3		35.7
	Compressed air supply MPa (psi), L/min (gpm)		— (a compressed air supply may be needed, depending on options and peripheral equipment)			0.5 (72.5), 100 (26.4) <ANR>		
Tank capacity	Coolant tank capacity	L (gal.)	235 (62.0)					
Machine size	Machine height <from floor>	mm (in.)	2,120 (83.5)					
	Floor space <width×depth>	mm (in.)	2,695×1,922 (106.1×75.7)			2,695×2,000 (106.1×78.7)		
	Mass of machine	kg (lb.)	5,400 (11,880)	5,500 (12,100)	5,700 (12,540)	5,500 (12,100)	5,600 (12,320)	5,800 (12,760)

[] Option JIS: Japanese Industrial Standard

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.

● Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.

● ANR: ANR refers to a standard atmospheric state; i. e., temperature at 20 °C (68 °F), absolute pressure at 101.3 kPa (14.7 psi) and relative humidity at 65%.

● Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

194029A04

Machine specifications (NL2500/700)

Item			NL2500/700	NL2500MC/700	NL2500Y/700	NL2500S/700	NL2500SMC/700	NL2500SY/700
Capacity	Swing over bed	mm (in.)	923.8 (36.4) <interference with front cover 579.8 (22.8)>					
	Swing over cross slide	mm (in.)	755 (29.7)					
	Max. turning diameter	mm (in.)	356 (14.0)					
	Standard turning diameter	mm (in.)	275 (10.8)					
	Max. turning length	mm (in.)	705 (27.7)					
	Bar work capacity	mm (in.)	80 (3.1)					
Travel	X-axis travel	mm (in.)	260 (10.2)					
	Z-axis travel	mm (in.)	795 (31.3)					
	Y-axis travel	mm (in.)	—		100 <±50> (3.9 <±2.0>)	—		100 <±50> (3.9 <±2.0>)
	Headstock 2 travel <B-axis>	mm (in.)	—			734 (28.9)		
Spindle	Max. spindle speed	min ⁻¹	4,000			Headstock 1: 4,000 Headstock 2: 6,000 [5,000]		
	Type of spindle nose		JIS A2-8			Headstock 1: JIS A2-8 Headstock 2: JIS A2-5 [JIS A2-6 <5,000 min ⁻¹ >]		
	Through-spindle hole diameter	mm (in.)	91 (3.6)			Headstock 1: 91 (3.6) Headstock 2: 43 (1.7) [73 (2.9) <5,000 min ⁻¹ >]		
	Min. spindle indexing angle		—	0.001°		—	0.001°	
	Spindle bearing inner diameter	mm (in.)	140 (5.5)			Headstock 1: 140 (5.5) Headstock 2: 85 (3.3) [120 (4.7) <5,000 min ⁻¹ >]		
	Number of tool stations		12 [10]					
Turret	Shank height for square tool	mm (in.)	25 (1)					
	Shank diameter for boring bar	mm (in.)	Max. 50 (2) [32 (1 ¹ / ₄) <double boring holder>]			Headstock 1: Max. 50 (2) [32 (1 ¹ / ₄) <double boring holder>] Headstock 2: Max. 32 (1 ¹ / ₄)		
	Tool shank diameter for rotary tool	mm (in.)	—	26 (1.0)		—	26 (1.0)	
	Turret indexing time	s	0.2	0.25		0.2	0.25	
	Max. rotary tool spindle speed	min ⁻¹	—	6,000		—	6,000	
	Feedrate	Rapid traverse rate mm/min (ipm)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z, B: 30,000 (1,181.1)	X, Z, B: 30,000 (1,181.1) C: 400 min ⁻¹	X, Z, B: 30,000 (1,181.1) Y: 10,000 (393.7) C: 400 min ⁻¹
Tailstock	Tailstock travel	mm (in.)	734 (28.9)			—		
	Tailstock spindle diameter	mm (in.)	80 (3.1)			—		
	Taper hole of tailstock spindle		Live center <MT5> [Built-in center <MT3>] [Built-in center <MT4>]			—		
Motor	Spindle drive motor <25%ED/50%ED/cont>	kW (HP)	18.5/18.5/15 (24.7/24.7/20) [26/26/22 (34.7/34.7/30) <10 min/30 min/cont>]			Headstock 1: 18.5/18.5/15 (24.7/24.7/20) [26/26/22 (34.7/34.7/30) <10 min/30 min/cont>] Headstock 2: 11/7.5 (15/10) <25%ED/cont>		
	Rotary tool spindle drive motor <3 min/5 min/cont>	kW (HP)	—	5.5/5.5/3.7 (7.5/7.5/5)		—	5.5/5.5/3.7 (7.5/7.5/5)	
	Feed motor	kW (HP)	X, Z: 3.5 (4.7)		X, Z, Y: 3.5 (4.7)	X, Z: 3.5 (4.7) B: 2.0 (2.7)		X, Z, Y: 3.5 (4.7) B: 2.0 (2.7)
Power sources	Electrical power supply <for the standard specifications>	kVA	27.8	32.0	36.4	36.4		39.4
	Compressed air supply	MPa (psi), L/min (gpm)	— (a compressed air supply may be needed, depending on options and peripheral equipment)			0.5 (72.5), 100 (26.4) <ANR>		
Tank capacity	Coolant tank capacity	L (gal.)	246 (64.9)					
Machine size	Machine height <from floor>	mm (in.)	2,120 (83.5)					
	Floor space <width×depth>	mm (in.)	3,100×1,922 (122.0×75.7)			3,100×2,000 (122.0×78.7)		
	Mass of machine	kg (lb.)	5,800 (12,760)	5,900 (12,980)	6,100 (13,420)	5,900 (12,980)	6,000 (13,200)	6,200 (13,640)

[] Option JIS: Japanese Industrial Standard

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.

● Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.

● ANR: ANR refers to a standard atmospheric state; i. e., temperature at 20 °C (68 °F), absolute pressure at 101.3 kPa (14.7 psi) and relative humidity at 65%.

● Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

194030A04

Machine specifications (NL2500/1250)

Item			NL2500/1250	NL2500MC/1250	NL2500Y/1250	NL2500S/1250	NL2500SMC/1250	NL2500SY/1250
Capacity	Swing over bed	mm (in.)	923.8 (36.4) <interference with front cover 679.8 (26.8)>					
	Swing over cross slide	mm (in.)	755 (29.7)					
	Max. turning diameter	mm (in.)	356 (14.0)					
	Standard turning diameter	mm (in.)	275 (10.8)					
	Max. turning length	mm (in.)	1,298 (51.1)					
	Bar work capacity	mm (in.)	80 (3.1)					
Travel	X-axis travel	mm (in.)	260 (10.2)					
	Z-axis travel	mm (in.)	1,345 (53.0)					
	Y-axis travel	mm (in.)	—		100 <±50> (3.9 <±2.0>)	—		100 <±50> (3.9 <±2.0>)
	Headstock 2 travel <B-axis>	mm (in.)	—			1,284 (50.6)		
Spindle	Max. spindle speed	min ⁻¹	4,000			Headstock 1: 4,000 Headstock 2: 6,000 [5,000]		
	Type of spindle nose		JIS A ₂ -8			Headstock 1: JIS A ₂ -8 Headstock 2: JIS A ₂ -5 [JIS A ₂ -6 <5,000 min ⁻¹ >]		
	Through-spindle hole diameter	mm (in.)	91 (3.6)			Headstock 1: 91 (3.6) Headstock 2: 43 (1.7) [73 (2.9) <5,000 min ⁻¹ >]		
	Min. spindle indexing angle		—	0.001°		—	0.001°	
	Spindle bearing inner diameter	mm (in.)	140 (5.5)			Headstock 1: 140 (5.5) Headstock 2: 85 (3.3) [120 (4.7) <5,000 min ⁻¹ >]		
	Number of tool stations		12 [10]					
Turret	Shank height for square tool	mm (in.)	25 (1)					
	Shank diameter for boring bar	mm (in.)	Max. 50 (2) [32 (1 ¹ / ₄) <double boring holder>]			Headstock 1: Max. 50 (2) [32 (1 ¹ / ₄) <double boring holder>] Headstock 2: Max. 32 (1 ¹ / ₄)		
	Tool shank diameter for rotary tool	mm (in.)	—	26 (1.0)		—	26 (1.0)	
	Turret indexing time	s	0.2	0.25		0.2	0.25	
	Max. rotary tool spindle speed	min ⁻¹	—	6,000		—	6,000	
	Feedrate	Rapid traverse rate mm/min (ipm)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock: 7,000 (275.6) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) B: 20,000 (787.4)	X, Z: 30,000 (1,181.1) B: 20,000 (787.4) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) B: 20,000 (787.4) Y: 10,000 (393.7) C: 400 min ⁻¹
Tailstock	Tailstock travel	mm (in.)	1,284 (50.6)			—		
	Tailstock spindle diameter	mm (in.)	110 (4.3)			—		
	Taper hole of tailstock spindle		Live center <MT5> [Built-in center <MT4>]			—		
Motor	Spindle drive motor <25%ED/50%ED/cont>	kW (HP)	18.5/18.5/15 (24.7/24.7/20) [26/26/22 (34.7/34.7/30) <10 min/30 min/cont>]			Headstock 1: 18.5/18.5/15 (24.7/24.7/20) [26/26/22 (34.7/34.7/30) <10 min/30 min/cont>] Headstock 2: 11/7.5 (15/10) <25%ED/cont>		
	Rotary tool spindle drive motor <3 min/5 min/cont>	kW (HP)	—	5.5/5.5/3.7 (7.5/7.5/5)		—	5.5/5.5/3.7 (7.5/7.5/5)	
	Feed motor	kW (HP)	X, Z: 3.5 (4.7)		X, Z, Y: 3.5 (4.7)	X, Z: 3.5 (4.7) B: 2.0 (2.7)		X, Z: 3.5 (4.7) Y, B: 2.0 (2.7)
Power sources	Electrical power supply <for the standard specifications>	kVA	28.6	32.9	37.3	37.3		40.2
	Compressed air supply MPa (psi), L/min (gpm)		— (a compressed air supply may be needed, depending on options and peripheral equipment)			0.5 (72.5), 100 (26.4) <ANR>		
Tank capacity	Coolant tank capacity	L (gal.)	345 (91.1)					
Machine size	Machine height <from floor>	mm (in.)	2,232 (87.9)					
	Floor space <width×depth>	mm (in.)	4,329×2,143 (170.4×84.4)					
	Mass of machine	kg (lb.)	7,200 (15,840)	7,300 (16,060)	7,500 (16,500)	7,300 (16,060)	7,400 (16,280)	7,600 (16,720)

[] Option JIS: Japanese Industrial Standard

● Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.

● Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.

● ANR: ANR refers to a standard atmospheric state; i. e., temperature at 20 °C (68 °F), absolute pressure at 101.3 kPa (14.7 psi) and relative humidity at 65%.

● Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

I94030A04

Machine specifications (NL3000/700, NL3000/1250)

Item			NL3000/700	NL3000MC/700	NL3000Y/700	NL3000/1250	NL3000MC/1250	NL3000Y/1250
Capacity	Swing over bed	mm (in.)	995 (39.2) <interference with front cover 670 (26.4)>			995 (39.2) <interference with front cover 700 (27.6)>		
	Swing over cross slide	mm (in.)	825 (32.5)					
	Max. turning diameter	mm (in.)	420 (16.5)					
	Standard turning diameter	mm (in.)	310 (12.2)					
	Max. turning length	mm (in.)	713 (28.0)			1,260 (49.6)		
	Bar work capacity	mm (in.)	90 (3.5)					
Travel	X-axis travel	mm (in.)	280 (11.0) <210+70 (8.3+2.8)>					
	Z-axis travel	mm (in.)	820 (32.3)			1,370 (53.9)		
	Y-axis travel	mm (in.)	—		120 <±60> (4.7 <±2.4>)	—		120 <±60> (4.7 <±2.4>)
Spindle	Max. spindle speed	min ⁻¹	3,000					
	Type of spindle nose		JIS A ₂ -8					
	Through-spindle hole diameter	mm (in.)	105 (4.1)					
	Min. spindle indexing angle		—	0.001°		—	0.001°	
	Spindle bearing inner diameter	mm (in.)	160 (6.3)					
Turret	Number of tool stations		10 [12]					
	Shank height for square tool	mm (in.)	25 (1)					
	Shank diameter for boring bar	mm (in.)	Max. 50 (2)					
	Tool shank diameter for rotary tool	mm (in.)	—	26 (1.0)		—	26 (1.0)	
	Turret indexing time	s	0.3					
	Max. rotary tool spindle speed	min ⁻¹	—	6,000		—	6,000	
Feedrate	Rapid traverse rate	mm/min (ipm)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6)	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6) C: 300 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock: 7,000 (275.6) C: 300 min ⁻¹	X, Z: 30,000 (1,181.1) Tailstock: 7,000 (275.6)	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock: 7,000 (275.6) C: 300 min ⁻¹	
Tailstock	Tailstock travel	mm (in.)	734 (28.9)			1,284 (50.6)		
	Tailstock spindle diameter	mm (in.)	110 (4.3)					
	Taper hole of tailstock spindle		Live center <MT5> [Built-in center <MT4>]					
Motor	Spindle drive motor <30 min/cont>	kW (HP)	22/18.5 (30/24.7) [30/25 (40/33.3)]					
	Rotary tool spindle drive motor <3 min/5 min/cont>	kW (HP)	—	5.5/5.5/3.7 (7.5/7.5/5)		—	5.5/5.5/3.7 (7.5/7.5/5)	
	Feed motor	kW (HP)	X, Z: 3.5 (4.7)		X, Z, Y: 3.5 (4.7)	X, Z: 3.5 (4.7)		X, Z, Y: 3.5 (4.7)
Power sources	Electrical power supply <for the standard specifications>	kVA	33.1	38.7	40.3	33.1	38.7	40.3
	Compressed air supply	MPa (psi), L/min (gpm)	— (a compressed air supply may be needed, depending on options and peripheral equipment)					
Tank capacity	Coolant tank capacity	L (gal.)	300 (79.2)			370 (97.7)		
Machine size	Machine height <from floor>	mm (in.)	2,270 (89.4)			2,390 (94.1)		
	Floor space <width×depth>	mm (in.)	3,410×2,089 (134.3×82.2)			4,522×2,291 (178.0×90.2)		
	Mass of machine	kg (lb.)	6,000 (13,200)		6,500 (14,300)	7,600 (16,720)		8,100 (17,820)

[] Option JIS: Japanese Industrial Standard

194031A04

- Bar work capacity: depending on the chuck/cylinder used and its restrictions, it may not be possible to reach full bar work capacity.
- Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.
- Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

Machine specifications (NL3000/2000, NL3000/3000)

Item			NL3000/2000	NL3000MC/2000	NL3000Y/2000	NL3000/3000	NL3000MC/3000	NL3000Y/3000
Capacity	Swing over bed	mm (in.)	995 (39.2) <interference with front cover 963 (37.9)>					
	Swing over cross slide	mm (in.)	825 (32.5)					
	Max. turning diameter	mm (in.)	420 (16.5)					
	Standard turning diameter	mm (in.)	310 (12.2)					
	Max. turning length	mm (in.)	2,123 (83.5)			3,123 (122.9)		
	Bar work capacity	mm (in.)	90 (3.5)					
Travel	X-axis travel	mm (in.)	280 (11.0) <210+70 (8.3+2.8)>					
	Z-axis travel	mm (in.)	2,170 (85.4)			3,170 (124.8)		
	Y-axis travel	mm (in.)	—		120 <±60> (4.7 <±2.4>)	—		120 <±60> (4.7 <±2.4>)
Spindle	Max. spindle speed	min ⁻¹	3,000					
	Type of spindle nose		JIS A-8					
	Through-spindle hole diameter	mm (in.)	105 (4.1)					
	Min. spindle indexing angle		—	0.001°		—	0.001°	
	Spindle bearing inner diameter	mm (in.)	160 (6.3)					
Turret	Number of tool stations		10 [12]					
	Shank height for square tool	mm (in.)	25 (1)					
	Shank diameter for boring bar	mm (in.)	50 (2)					
	Turret indexing time	s	0.3					
	Max. rotary tool spindle speed	min ⁻¹	—	6,000		—	6,000	
Feedrate	Rapid traverse rate	mm/min (ipm)	X, Z: 30,000 (1,181.1)	X, Z: 30,000 (1,181.1) C: 300 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) C: 300 min ⁻¹	X, Z: 30,000 (1,181.1)	X, Z: 30,000 (1,181.1) C: 300 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) C: 300 min ⁻¹
Tailstock	Tailstock travel	mm (in.)	2,164 (85.2)			3,164 (124.6)		
	Tailstock spindle diameter	mm (in.)	150 (5.9)					
	Tailstock spindle travel	mm (in.)	150 (5.9)					
	Taper hole of tailstock spindle		Built-in center <MT5>					
Motor	Spindle drive motor <30 min/cont>	kW (HP)	22/18.5 (30/24.7) [30/25 (40/33.3)]					
	Rotary tool spindle drive motor <5 min/cont>	kW (HP)	—	5.5/3.7 (7.5/5)		—	5.5/3.7 (7.5/5)	
	Feed motor	kW (HP)	X: 3.5 (4.7) Z: 7.0 (9.3)		X, Y: 3.5 (4.7) Z: 7.0 (9.3)	X: 3.5 (4.7) Z: 7.0 (9.3)		X, Y: 3.5 (4.7) Z: 7.0 (9.3)
Power sources	Electrical power supply <for the standard specifications>	kVA	35.3	40.9	42.4	35.3	40.9	42.4
	Compressed air supply	MPa (psi), L/min (gpm)	— (a compressed air supply may be needed, depending on options and peripheral equipment)					
Tank capacity	Coolant tank capacity	L (gal.)	470 (124.1)			540 (142.6)		
Machine size	Machine height <from floor>	mm (in.)	2,390 (94.1)					
	Floor space <width×depth> (including chip conveyor)	mm (in.)	7,080×2,587 (278.7×101.9) <depth includes operation panel>			8,147×2,587 (320.7×101.9) <depth includes operation panel>		
	Mass of machine	kg (lb.)	11,500 (25,300)		12,000 (26,400)	13,500 (29,700)		14,000 (30,800)

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