MORI SEIKI
THE MACHINE TOOL COMPANY

NZ-S1500

CNC Lathe

2-Turret Shaft Lathe

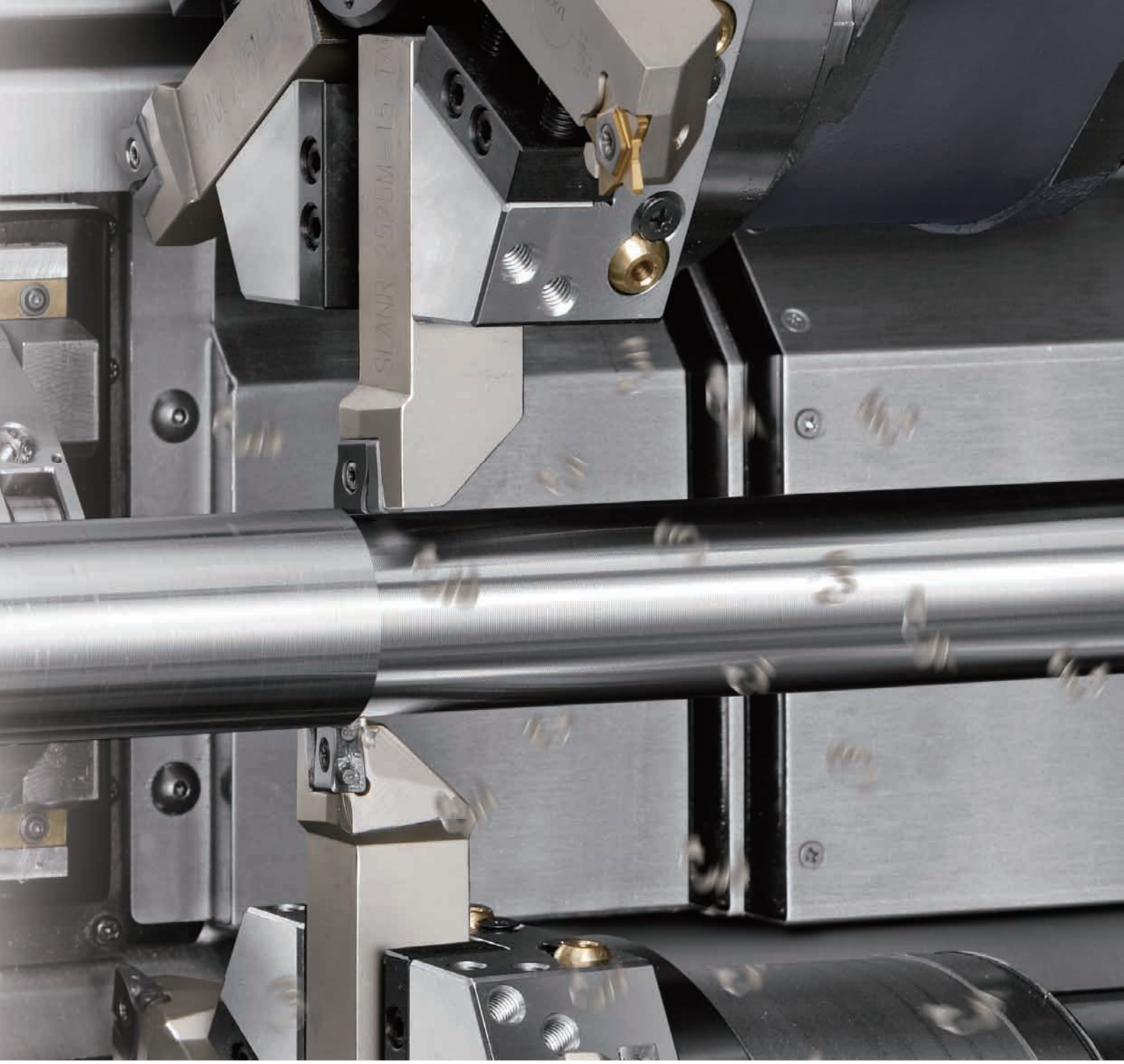
NZ-S1500

Professional machine for small diameter shaft machining

MORI SEIKI has produced a new lathe which completely satisfies the demands from the field of mass production machining. The optimal machine travel, spindle output, and feed thrust force for small diameter shaft workpieces have been set. We have eliminated waste and achieved unrivalled efficiency. We have also made the body smaller to save space. This improves visibility in factories, and increases the productivity per unit area. The optimal lathe for machining small diameter shafts is the NZ-S1500.

● The photo shows the NZ-S1500/500

● The photo shows the NZ-S1500/1000
● The photo shows the machine outfitted with options.
● Actual nameplate layout may differ from photo.



NZ-S1500/500
NZ-S1500/1000

2-Turret Shaft Lathe

● Figures in inches were converted from metric measurements.

The smallest size in its class

The height of the NZ-S1500 is significantly lower than the previous model, to improve visibility in factories. It has a reduced width and depth, and occupies less floor space, increasing the productivity per unit area. Not only is it compact, but it also has a symmetrical body and adequate heat prevention measures.

- The photo shows the NZ-S1500/500
- The photo shows the machine outfitted with options.
- Actual nameplate layout, etc may differ from the photo.

Comparison of body size <NZ-S1500/500>

Floor space

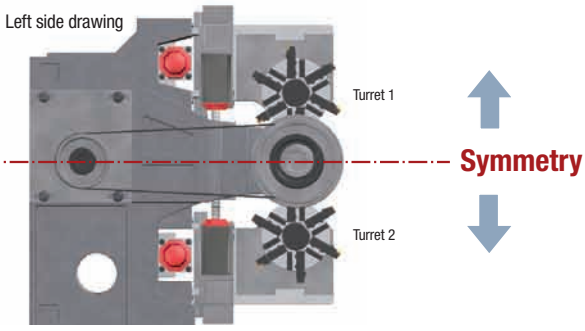
Approx. 2.8 m^2 (30.1 ft^2)

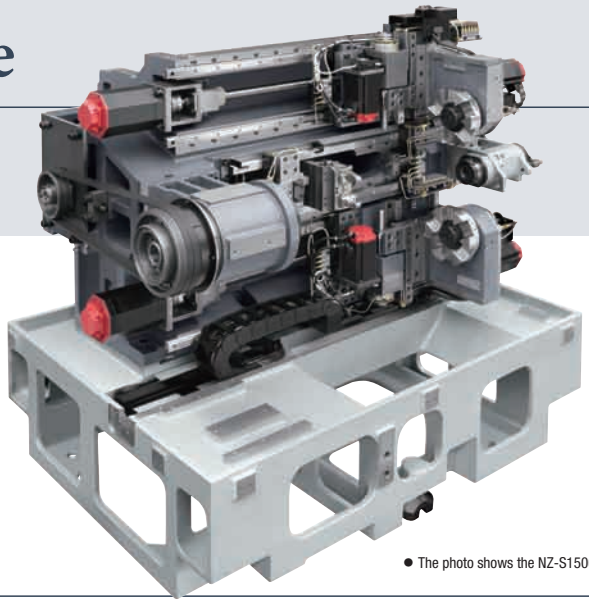
Volume ratio compared with previous model

31.5%

Symmetrical structure

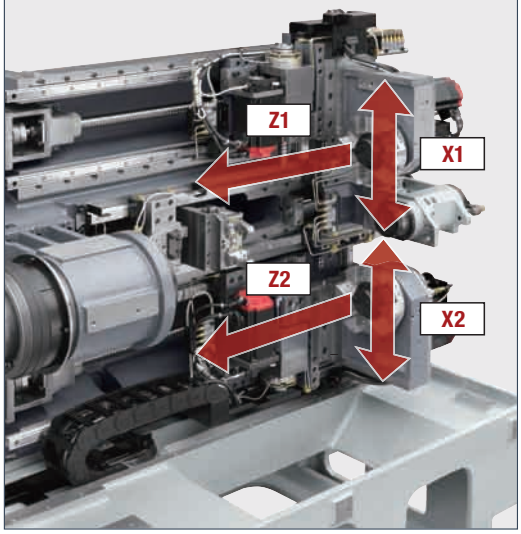
It has a symmetrical structure, with the headstock in the center, dispersing heat evenly and controlling thermal displacement, to increase accuracy during continuous machining.



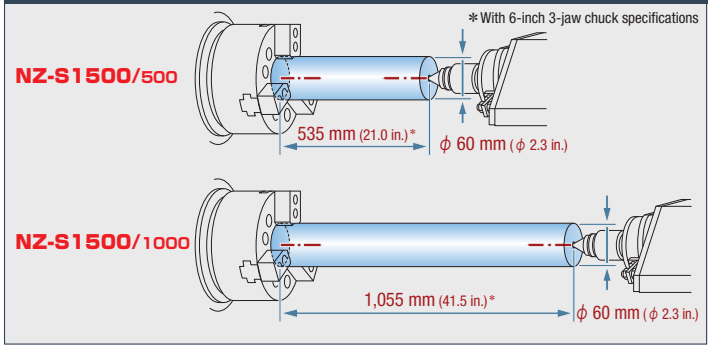


● The photo shows the NZ-S1500/500

Axis travel



Workpiece size



		X-axis (X1, X2)	Z-axis (Z1, Z2)
Travel	mm (in.)	60 (2.4)	NZ-S1500/500: 580 (22.8)
			NZ-S1500/1000: 1,100 (43.3)
Acceleration	G (m/s^2)	0.5 (4.9)	0.7 (6.9)
Rapid traverse rate	mm/min (ipm)	20,000 (787.4)	NZ-S1500/500: 30,000 (1,181.1)
			NZ-S1500/1000: 36,000 (1,417.3)

Optimal performance with no waste

Until now, there have been few machines designed specifically for machining small diameter shaft workpieces. Machining was done on machines with excessive spindle output and travel, resulting in a loss of accuracy and efficiency. The NZ-S1500 is equipped with the best spindle, turret and tailstock for small diameter shaft workpieces. It gives optimal performance with no waste, and machines accurately and efficiently.

Spindle

Spindle variations

1 2 3 4 5 6

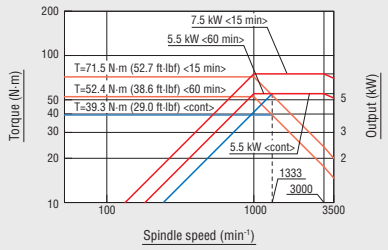
For small diameter ◄——► For large diameter

In addition to the standard model, there is a model with a high output in the high-speed range, and a model with high torque, to give our customers a range to suit their needs.

Max. spindle speed: 3,500 min^{-1}

1 High output in the high-speed range (option)

7.5/5.5/5.5 kW (10/7.5/7.5 HP) <15 min/60 min/cont>



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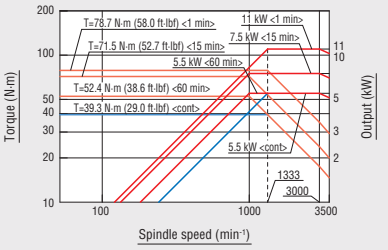
2 High output in the high-speed range (option)

11/7.5/5.5/5.5 kW (15/10/7.5/7.5 HP) <1 min/15 min/60 min/cont>



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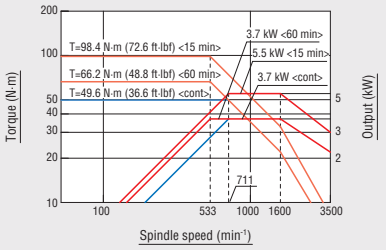
3 Standard

5.5/3.7/3.7 kW (7.5/5/5 HP) <15 min/60 min/cont>



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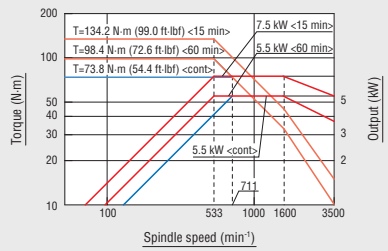
4 High torque (option)

7.5/5.5/5.5 kW (10/7.5/7.5 HP) <15 min/60 min/cont>



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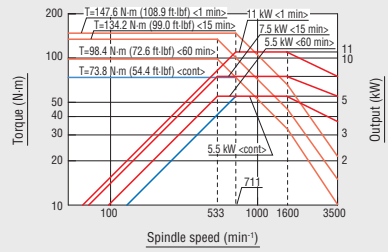
5 High torque (option)

11/7.5/5.5/5.5 kW (15/10/7.5/7.5 HP) <1 min/15 min/60 min/cont>



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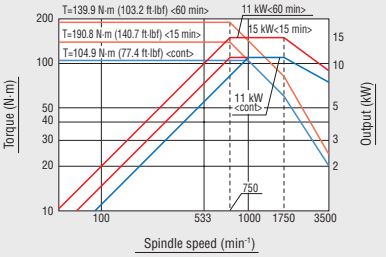
6 High torque (option)

15/11/11 kW (20/15/15 HP) <15 min/60 min/cont>



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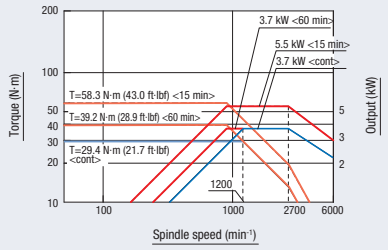
● Will be available for the NZ-S1500/500 from July 2007.

Max. spindle speed: 6,000 min^{-1} <ϕ 43 mm (1.7 in.) through-spindle hole diameter specifications> (option)

1 5.5/3.7/3.7 kW (7.5/5/5 HP) <15 min/60 min/cont>



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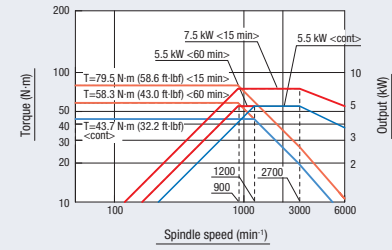
2 7.5/5.5/5.5 kW (10/7.5/7.5 HP) <15 min/60 min/cont>



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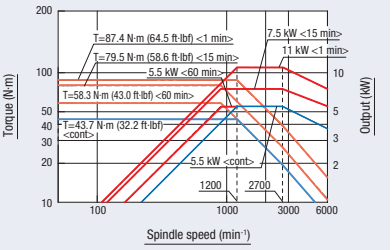
3 11/7.5/5.5/5.5 kW (15/10/7.5/7.5 HP) <1 min/15 min/60 min/cont>



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Turret

Two compact and high rigid turrets are installed. A turret with milling specifications is also available to meet a range of needs.

Capto C3 (option)

Turret indexing time

1 station 0.18 sec.

Milling specification (option)

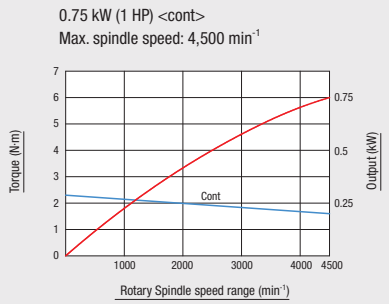
Turret 2

Milling holders can be mounted in a maximum of 3 places.

Max. rotary tool spindle speed

4,500 min^{-1}

Rotary tool spindle speed-torque/output diagram



Tailstock

A handle rotary type (standard) tailstock has been used, to secure longer workpieces to ensure stable machining.

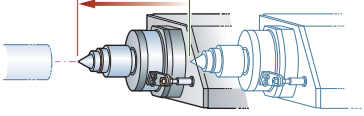
● The rotating center with options.

Handle

Tailstock travel

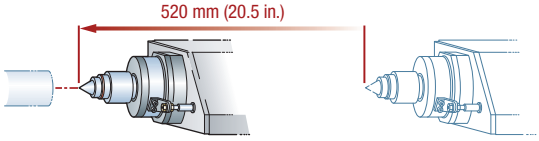
NZ-S1500/500

200 mm (7.9 in.)
370 mm (14.6 in.) <option>



NZ-S1500/1000

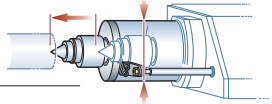
520 mm (20.5 in.)



Tailstock spindle travel

NZ-S1500/500
NZ-S1500/1000

70 mm (2.8 in.)
120 mm (4.7 in.) <option>



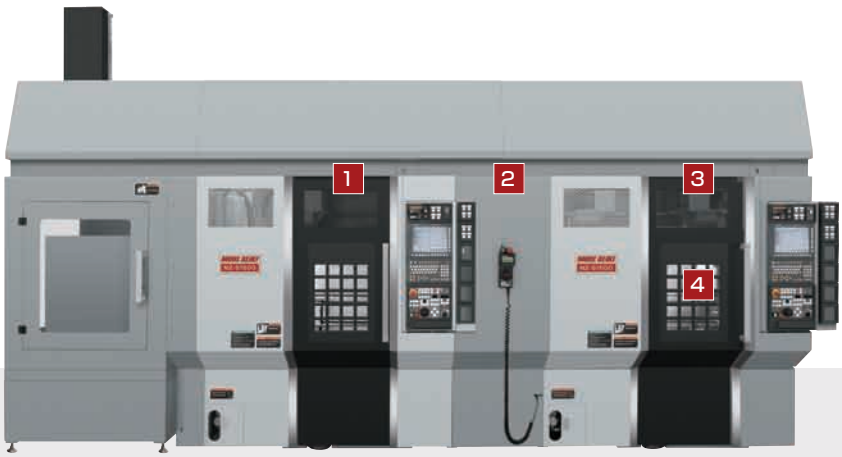
Tailstock diameter

NZ-S1500/500
NZ-S1500/1000

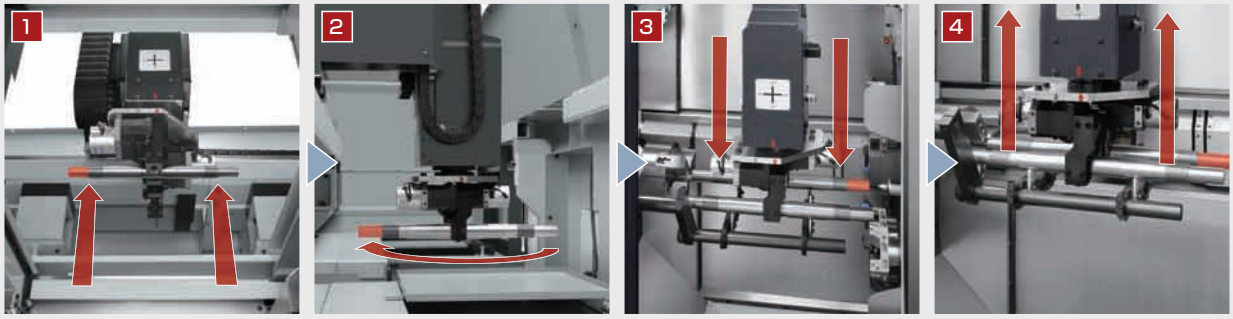
ϕ 85 mm (3.3 in.) <Live center MT4>
ϕ 85 mm (3.3 in.) <Built-in center MT3> <option>
ϕ 110 mm (4.3 in.) <Built-in center MT4> <option>

Loader <Consultation is required>

A new type of loader with a rotary hand function has been developed. It is possible to reverse the workpiece without using a turnover unit when transferring from process 1 to process 2, which dramatically reduces idle time.



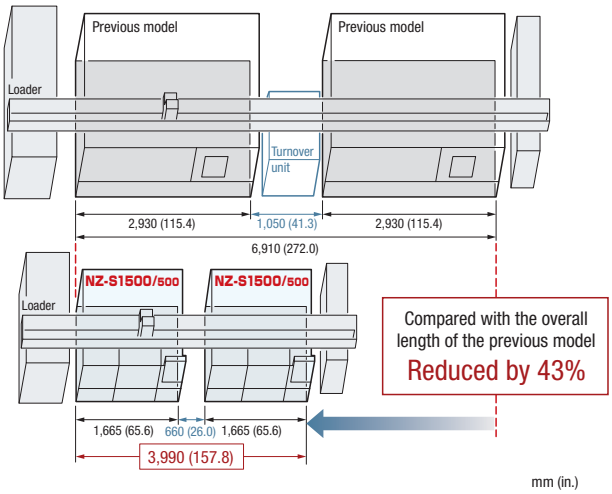
● The photo shows the NZ-S1500/500 ● The photo shows the machine outfitted with options. ● Actual nameplate layout, etc may differ from the photo.



Unloading | Reverse and transfer | Loading | Unloading

Comparison of connection space

A high-speed loader which does not need a turnover unit has been used, so that it takes up less space. It uses only 50% of the connection space required by the previous model.

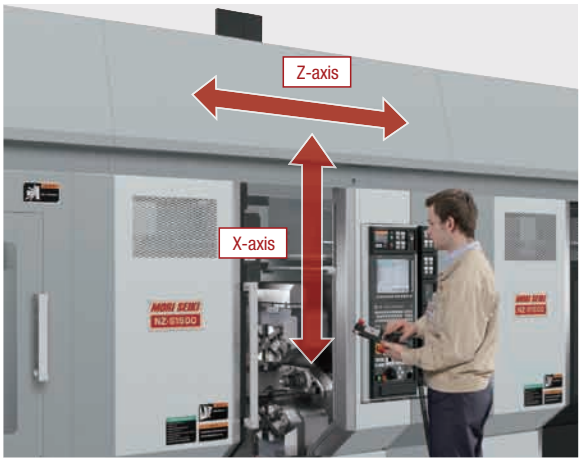


mm (in.)

Max. travel speed

X-axis
180 m/min (590.6 fpm)

Z-axis
200 m/min (656.2 fpm)



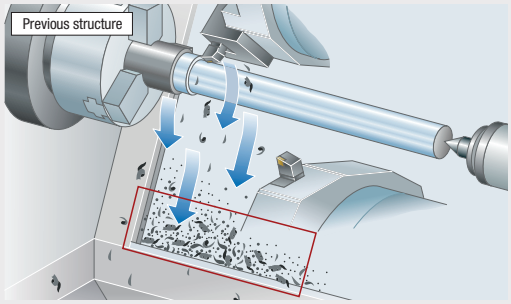
● The photo shows the NZ-S1500/500

Chip disposal

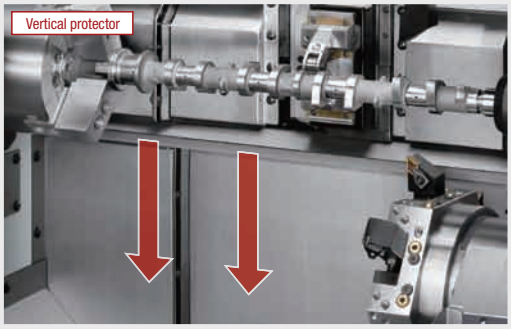
We have considered ways of disposing of chips from all angles, and succeeded in producing a highly efficient discharge. As the guideway is completely covered, chips are prevented from entering the unit or accumulating, improving the reliability of the machine.

Vertical protector

In the previous model, the X-axis guideway was exposed, making it easy for chips to enter. The NZ-S1500 uses a single, highly reliable protector which does not clog. The X-axis guideway is completely covered, so chips cannot penetrate.



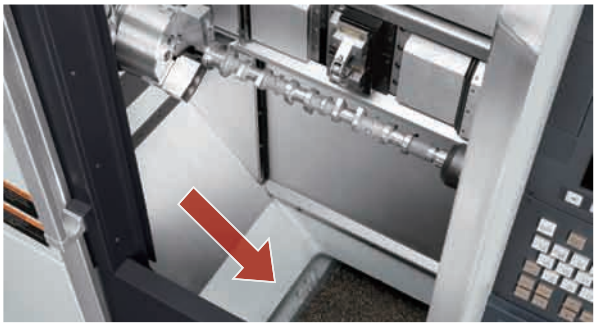
The diagonal structure causes accumulation of chips.



Chips fall straight down because of the force of gravity, giving a highly efficient discharge.

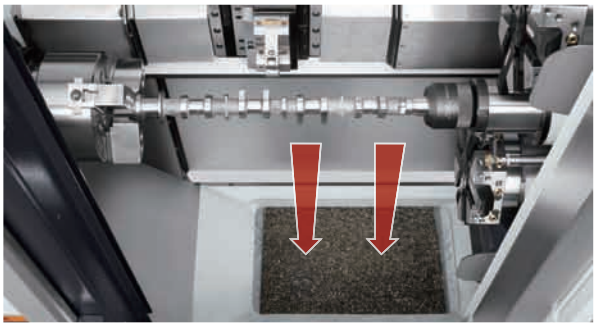
Slanted cover

The cover is set at an angle of 45 degrees, so that scattered chips fall quickly into the chip pan.



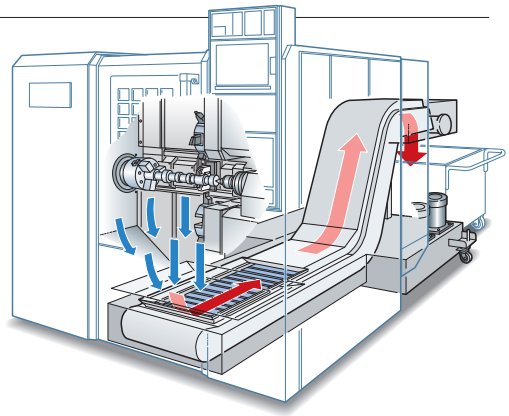
Chip pan

A chip pan is set directly below the machining area. Chips fall straight into the pan, preventing them from accumulating.



Chip conveyor outside machine (option)

We have prepared several chip conveyor options for different chip shapes and material. Please choose the one which best suits your type of machining.



● Please select a chip conveyor to suit the shape of your chips. When machining special or difficult-to-cut material (cutting hardness HRC 45 or higher), please consult with your Mori Seiki representative.

Table of external chip conveyor options

Available specifications	Workpiece material and chip size ◎: Optimum ○: Possible ×: Not available						
	Steel			Cast metal	Aluminum・Non-ferrous metal		
	Long	Short	Powdery	Short	Long	Short	Powdery
Hinge type+ drum filter Consultation is required	◎	◎	○	○	◎	◎	○
Hinge type	◎	○	○	×	○	×	×
Scraper type	×	○	○	○	×	×	×
Scraper type + drum filter Consultation is required	×	○ (Please use a steel filter.)	○	○	×	◎	○
Magnet scraper type	×	○	○	◎	×	×	×
Magnet scraper type + drum filter Consultation is required	×	○ (Please use a steel filter.)	○	○	×	○ (Effective for ferrous alloys.)	○ (Effective for ferrous alloys.)
Spiral type Consultation is required	×	○	×	○	×	○	×

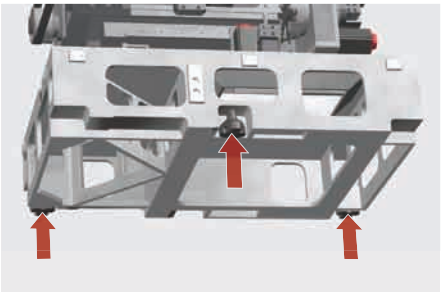
● Approximate chip size
Short: chips shorter than 50 mm (2.0 in.), blocks of chips shorter than ϕ 40 mm (ϕ 1.6 in.).
Long: chips longer than those indicated above.

Operability, Maintenance

Mori Seiki has introduced a range of innovations to improve operability, with the aim of providing our customers with the greatest peace of mind. We have also designed products which make daily inspection and maintenance smooth and quick.

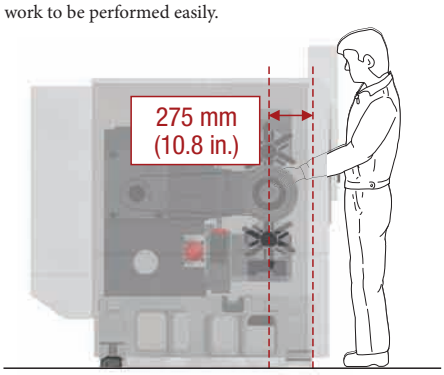
Three-point support system

The three-point support system makes it easy to perform horizontal adjustments, dramatically reducing installation time.



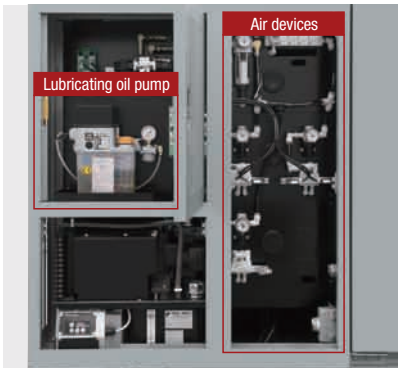
Accessibility

Accessibility to the workpiece is good, allowing setup work to be performed easily.



Daily maintenance & inspection

To reduce the time for maintenance and inspection, equipment which requires frequent inspection is placed behind the machine.



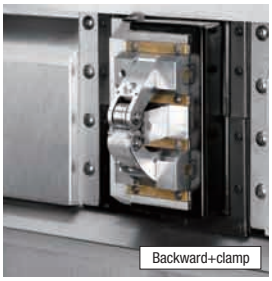
Operating panel

A 10.4 inch LCD has been used. Also, buttons have been arranged with ease of operation in mind.

Peripheral equipment (option)

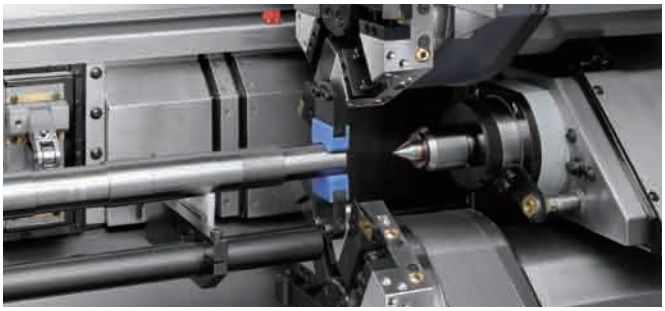
Hydraulic steady rest

This is installed on the Z-axis guideway to reduce vibration and bending in workpieces.



Turret-mounted workpiece retractor

Device for pulling workpieces out of the chuck.

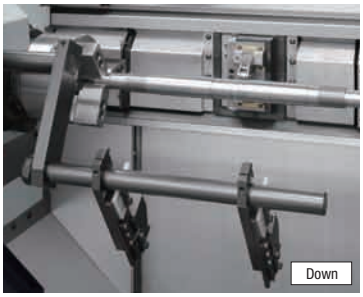


● The photo shows a gantry loader.

Workpiece rest on the chuck side

The workpiece is temporarily stocked before and after machining, so that it can be smoothly transferred to the next process

● With workpiece ejector function

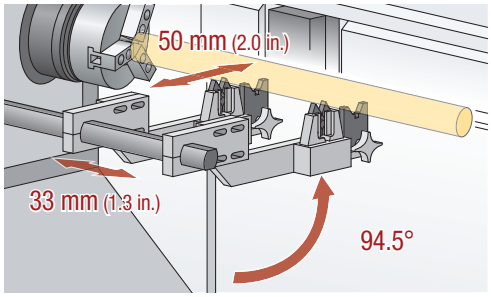


● The photo shows a gantry loader.

● Without workpiece ejector function

High-speed workpiece rest on the chuck side (3 sec./1 cycle) <Consultation is required>

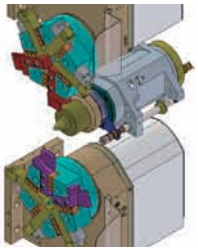
Transfers workpieces to the next process quickly.
<for workpiece diameter ϕ25 mm (1.0 in.) or smaller>



Oil mist collector <HVS-100>

This device enables the forced removal of oil mist from inside the machine.

Crack shaft machining specifications

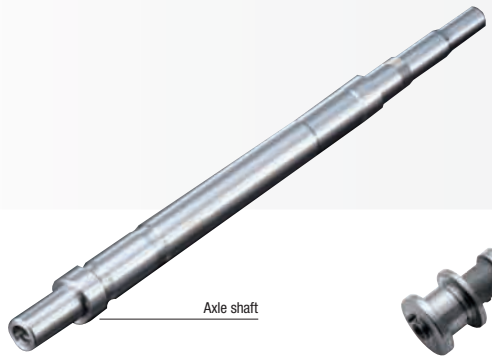


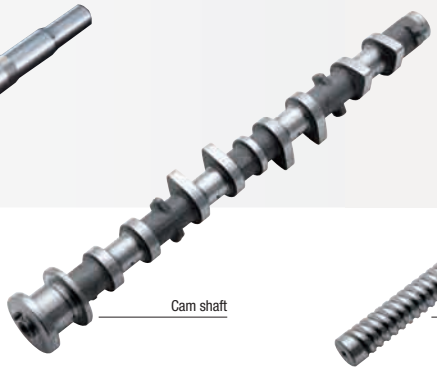
Travel	X-axis travel	63 mm (2.5 in.)
	Z-axis travel	580 mm (22.8 in.)
Turret <1, 2>	Turret type	5-station
	Number of tool stations	5 Tools
	Shank height for square tool	25 mm (1.0 in.)
Spindle 1	Chuck used	8 inch
	Motors	11/7.5/5.5 kW (15/10/7.5 HP) <1 min/30 min/cont> [15/11/11 kW (20/15/15 HP) <30 min/60 min/cont>]

[ ] Option

Machining ability

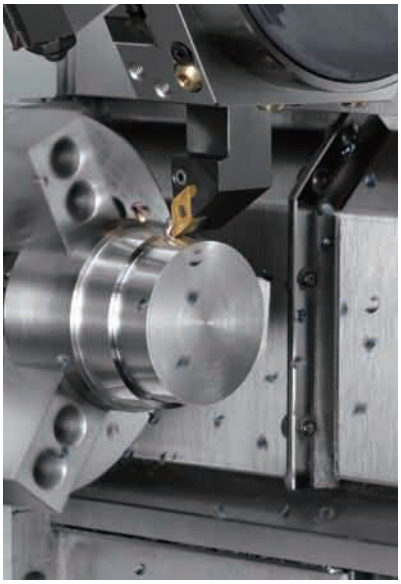
The NZ-S1500 is equipped with superior turrets which specialize in machining of small-diameter shaft workpieces and offer various machining methods. It boasts excellent machining ability over a wide range.


Axle shaft


Cam shaft


Ball screw

Turning performance <NZ-S1500/500>



O.D. cutting <depth of cut>

4 mm (0.16 in.)

Cutting speed	m/min (fpm)	120 (393.7)
Feedrate	mm/rev (ipr)	0.3 (0.012)
Workpiece size	mm (in.)	ϕ 60×80 (ϕ 2.4×3.1)
Spindle output	kW (HP)	5.5/3.7/3.7 (7.5/5/5) <15 min/60 min/cont> Standard

Material<JIS>: S45C (carbon steel)

O.D. grooving <cutting width>

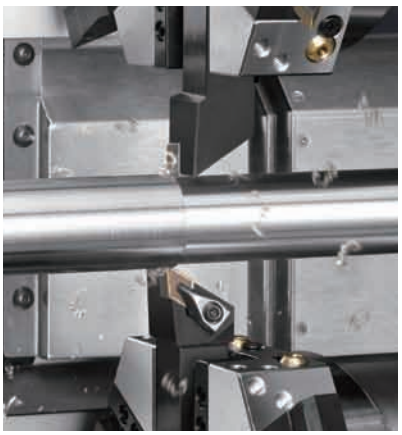
Turret 1	Turret 2
5 mm (0.20 in.)	**6 mm (0.24 in.)**

Cutting speed	m/min (fpm)	100 (328.1)
Feedrate	mm/rev (ipr)	0.1 (0.004)
Workpiece size	mm (in.)	ϕ 60×80 (ϕ 2.4×3.1)
Spindle output	kW (HP)	5.5/3.7/3.7 (7.5/5/5) <15 min/60 min/cont> Standard

Material<JIS>: S45C (carbon steel)

Balanced turning

Balanced cutting, in which turret 1 and 2 are controlled simultaneously, stops the turrets from vibrating. It is best for O.D. machining of long, thin workpieces.



Milling capacity <NZ-S1500/500>

Drill <material removal rate>

3.9 mL/min (0.24 in.^{3}/min)

Tool	mm (in.)	ϕ 9.5 (ϕ 0.37)
Rotary tool spindle speed	min^{-1}	1,100
Cutting speed	m/min (fpm)	33 (108.3)
Feedrate	mm/min (ipm)	55 (2.2)

Material<JIS>: S45C (carbon steel)

End mill <material removal rate>

3.2 mL/min (0.20 in.^{3}/min)

Tool	mm (in.)	ϕ 10 (ϕ 0.4) <2 blades>
Rotary tool spindle speed	min^{-1}	636
Cutting speed	m/min (fpm)	22 (72.2 fpm)
Feedrate	mm/min (ipm)	64 (2.5)

Material<JIS>: S45C (carbon steel)

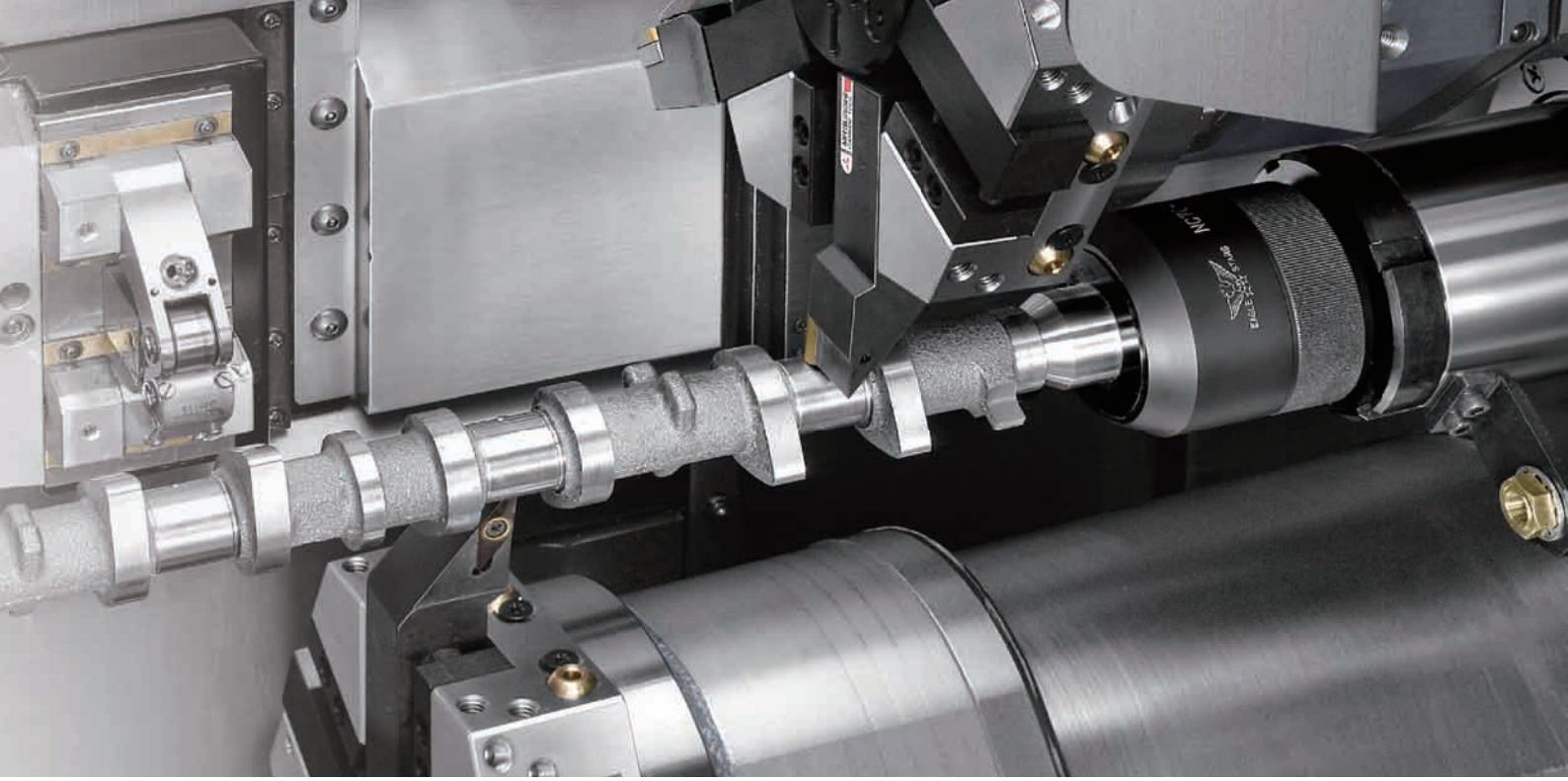
Tap <tool> (synchronized tapping)

M6×P1.0

Prepared-hole diameter	mm (in.)	ϕ 5.1 (ϕ 0.20)
Rotary tool spindle speed	min^{-1}	530

Material<JIS>: S45C (carbon steel)

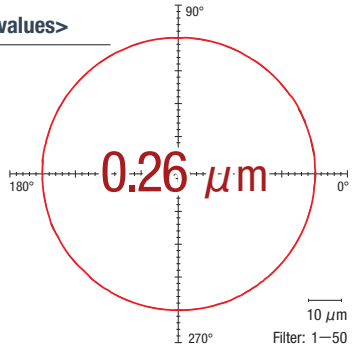
● JIS: Japanese Industrial Standard



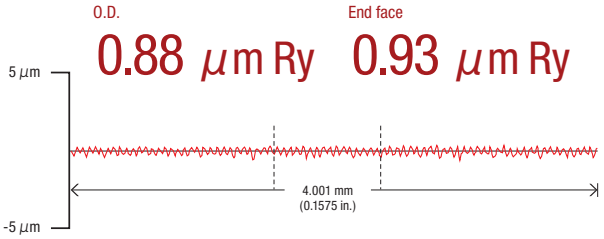
Precision <NZ-S1500/500>

Roundness <Actual values>

- Tool
  : Diamond tool
- Material
  : Brass
- O.D.
  : ϕ 50 mm (ϕ 2.0 in.)
- Spindle speed
  : 2,500 min^{-1}
- Feedrate
  : 0.1 mm/rev (0.004 ipr)



Surface roughness <Actual values>

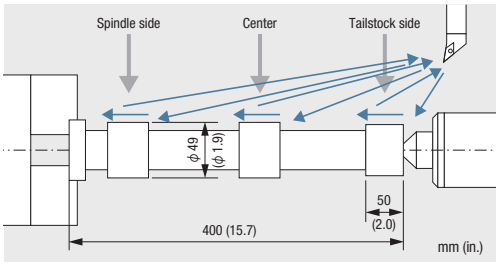


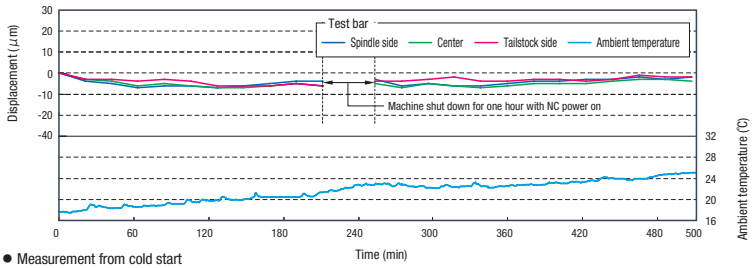
Change during continuous machining <Actual values>

Amount of displacement (diameter value)

Spindle side	Center	Tailstock side
7 μm	7 μm	6 μm

Workpiece	mm (in.)	ϕ 49 (ϕ 1.9) Brass
Spindle speed	min^{-1}	2,500
Cutting allowance	mm (in.)	0.05 (0.001)
Feedrate	mm/rev (ipr)	0.1 (0.004)





● Measurement from cold start

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

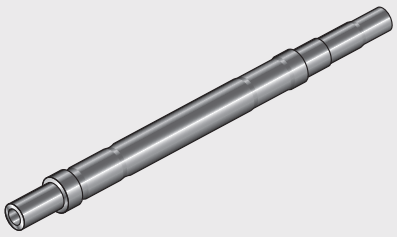
Productivity

The most important factor for customers installing the machine is how much the machining time, productivity, and sales can be improved. Here we demonstrate the high productivity of the NZ-S1500 by comparing its machining performance and accuracy with the previous model.

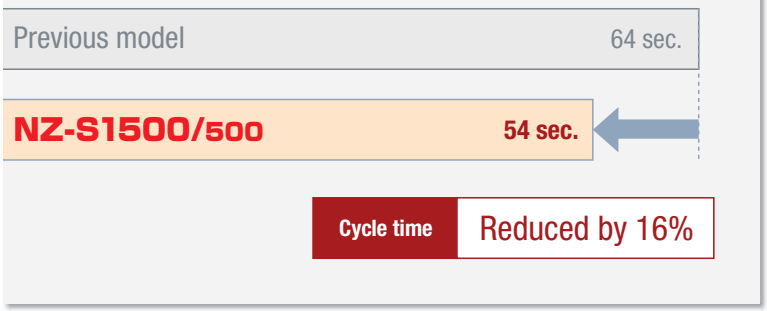
Comparison

Workpiece

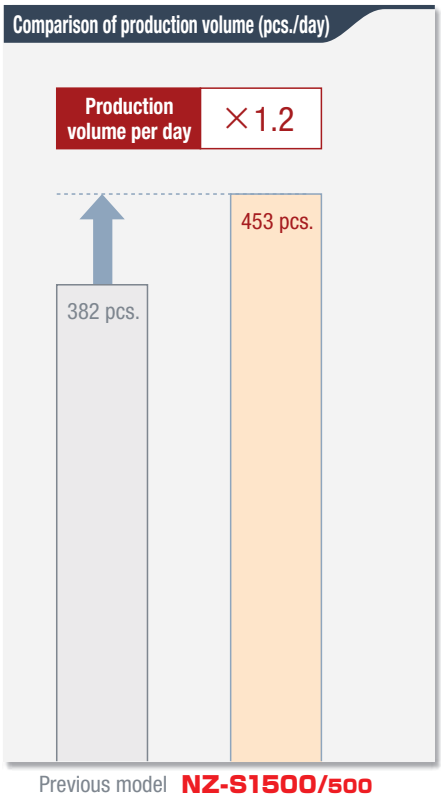
Shaft



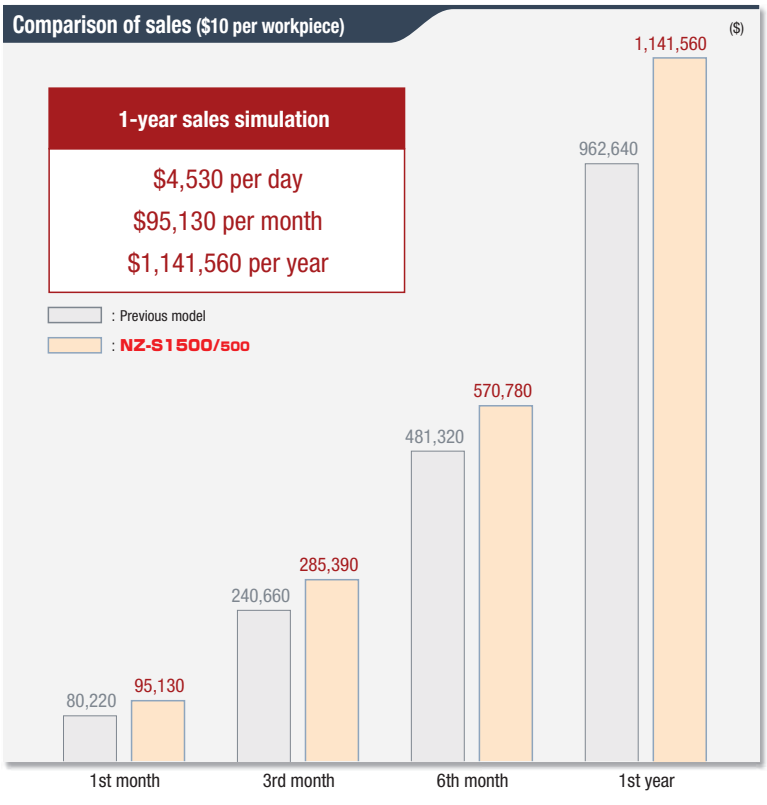
Cycle time comparison



Comparison of production volume (pcs./day)



Comparison of sales ($10 per workpiece)



Running time (one day)
8 hours×85%=3,600 sec.×8×0.85=24,480 sec.

Production volume (pcs./day)
24,480 sec.÷Cycle time (sec.)

Number of days operating in 1 year
21 days×12 months=252 days

Standard & Optional features

● Standard features ○ Option ☆ Consultation is required

■ Spindle

3,500 min^{-1}: 5.5/3.7/3.7 kW (7.5/5/5 HP) <15 min/60 min/cont>		●
3,500 min^{-1}: 7.5/5.5/5.5 kW (10/7.5/7.5 HP) <15 min/60 min/cont> High output in the high-speed range		○
3,500 min^{-1}: 7.5/5.5/5.5 kW (10/7.5/7.5 HP) <15 min/60 min/cont> High torque		○
3,500 min^{-1}: 11/7.5/5.5/5.5 kW (15/10/7.5/7.5 HP) <1 min/15 min/60 min/cont> High output in the high-speed range		○
3,500 min^{-1}: 11/7.5/5.5/5.5 kW (15/10/7.5/7.5 HP) <1 min/15 min/60 min/cont> High torque		○
3,500 min^{-1}:15/11/11 kW (20/15/15 HP) <15 min/60 min/cont> High torque		○
6,000 min^{-1}: 5.5/3.7/3.7 kW (7.5/5/5 HP) <15 min/60 min/cont>		○
6,000 min^{-1}: 7.5/5.5/5.5 kW (10/7.5/7.5 HP) <15 min/60 min/cont>		○
6,000 min^{-1}: 11/7.5/5.5/5.5 kW (15/10/7.5/7.5 HP) <1 min/15 min/60 min/cont>		○

■ Turret

Hex. head bolt screw type	Turret 1, Turret 2	●
Turret 2 milling function		○
6-station Turret (Capto C3)	Turret 1, Turret 2	○
5-station bolt-tightened type	Turret 1, Turret 2	○

■ Workpiece holding device

Hydraulic chuck (solid)	6-inch	○
	8-inch	○
Hydraulic chuck (hollow)	6-inch	○
	8-inch	○
Draw-down hydraulic chuck	6-inch	☆
	8-inch	☆
Center compensation hydraulic chuck	6-inch	○
	8-inch	○
Collet chuck	SAD	☆
Driving center		☆
Hydraulic steady rest (manual · automatic)	Automatic centering type (SLU-1Z) <Roller arm width: 24 mm (0.9in.)> ϕ 4–64 mm (ϕ 0.16–2.5 in.)	○
	Automatic centering type <roller arm width: 16 mm (0.6 in.)> ϕ 15–32 mm (ϕ 0.6–1.3 in.)	○
Chuck high/low pressure system		○

■ Tailstock, tailstock spindle

Tailstock axis travel check		●
Tailstock axis travel check (4 positions) or (2 positions)		○
Tailstock spindle travel	120 mm (4.7 in.)	○
Tailstock high/low pressure system		○
Tailstock		●
Programmable tailstock <servo motor driven>		○
Tailstock spindle	Live center MT4 (center is not included)	●
	Built-in center MT3 (including center)	○
	Built-in center MT4 (including center)	○

■ Coolant

Coolant system	325/520 W (50/60 Hz)	●
Coolant unit high pressure	635/1,040 W (50/60 Hz)	○
Oil skimmer		○
Coolant float switch		○
Coolant flow switch		☆

■ Automatic operation support

Workpiece rest	Fixed type <spindle side> + V receiver <Turret 2>	○
Workpiece rest (chuck side)	No workpiece ejection function <rotary in-out type/V receiver attached to Turret 2>	○
	With workpiece ejector function (turning in-out/cross motion. Workpiece ejection is manual attachment/detachment & fully automatic)	○
High-speed workpiece rest (chuck side)	In-out type (with workpiece ejector, manual attachment/detachment & fully automatic)	☆

■ Automatic operation support

Parts catcher	Front ejector type	☆
Workpiece unloading conveyor	Front left (or right) transfer type	☆
Workpiece remover (turret side)		○
Loader specification cover	Ceiling shutter, Traveling section cover	☆
Loader hand variation	Shaft hand	☆
Bar feeder interface		☆

■ Measurement

In-machine workpiece measuring system	Sensor (wired)	○
Automatic in-machine tool presetter	In-out type (ϕ 65 mm workpieces can be measured without unclamping.) •In some conditions there will be interference with the steady rest	○

■ Chip disposal

Chip conveyor operation panel (attached to the chip conveyor side)		○
Chip conveyor overload slip detection		○
Chip conveyor <For right disposal specifications, the height of the machine must be raised by at least 230 mm (9.1 in.)>	Rear disposal, hinge type	○
	Rear disposal, magnet scraper type	○
	Rear disposal, scraper type	○
	Rear disposal, scraper type + drum filter	☆
	Rear disposal, spiral type	☆
	Rear disposal, magnet scraper type + drum filter	☆
	Right disposal, hinge type	○
	Right disposal, magnet scraper type	☆
	Right disposal, scraper type	☆
	Right disposal, scraper type + drum filter	☆
	Right disposal, spiral type	☆
	Right disposal, magnet scraper type + drum filter	☆
Air blow	Chuck	○
	Tool tip	○
	Tailstock spindle	○
Air purge	Spindle	○
Coolant gun		○
Air gun interface		○
Oil mist collector	HVS-100	○
	Interface (duct only)	○
Dust collector	Interface (duct only)	☆
Shower coolant + coolant in upper part of chuck		○

■ 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 ・Overtravel: Software *Featured only when optional chuck/cylinder is selected.		●
Earth leakage breaker		○
Danger sensing device interface (recommended when oil-based coolant is used or during unmanned operation)		○
Raised machine height	100 mm (3.9 in.)	○
	200 mm (7.9 in.)	☆
	300 mm (11.8 in.)	☆
Dry anchor		○
Air pressure lower limit detection switch		●

■ Others

Chuck foot switch	1 foot switch	●
	2 foot switches	○
Automatic door		○
See-through cover		○
With hydraulic unit micro-separator		○
Signal tower	3 stages (red, white, green)	○

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

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.

2-year warranty, twice the peace of mind.

For machines installed after April 1, 2007, we will supply parts for repairs at no cost for a period of 2 years. Please contact your Mori Seiki sales representative for details.

2 years Guaranteed peace of mind

● For overseas customers, service parts are supplied for free for 2 years, and service for 1 year.

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

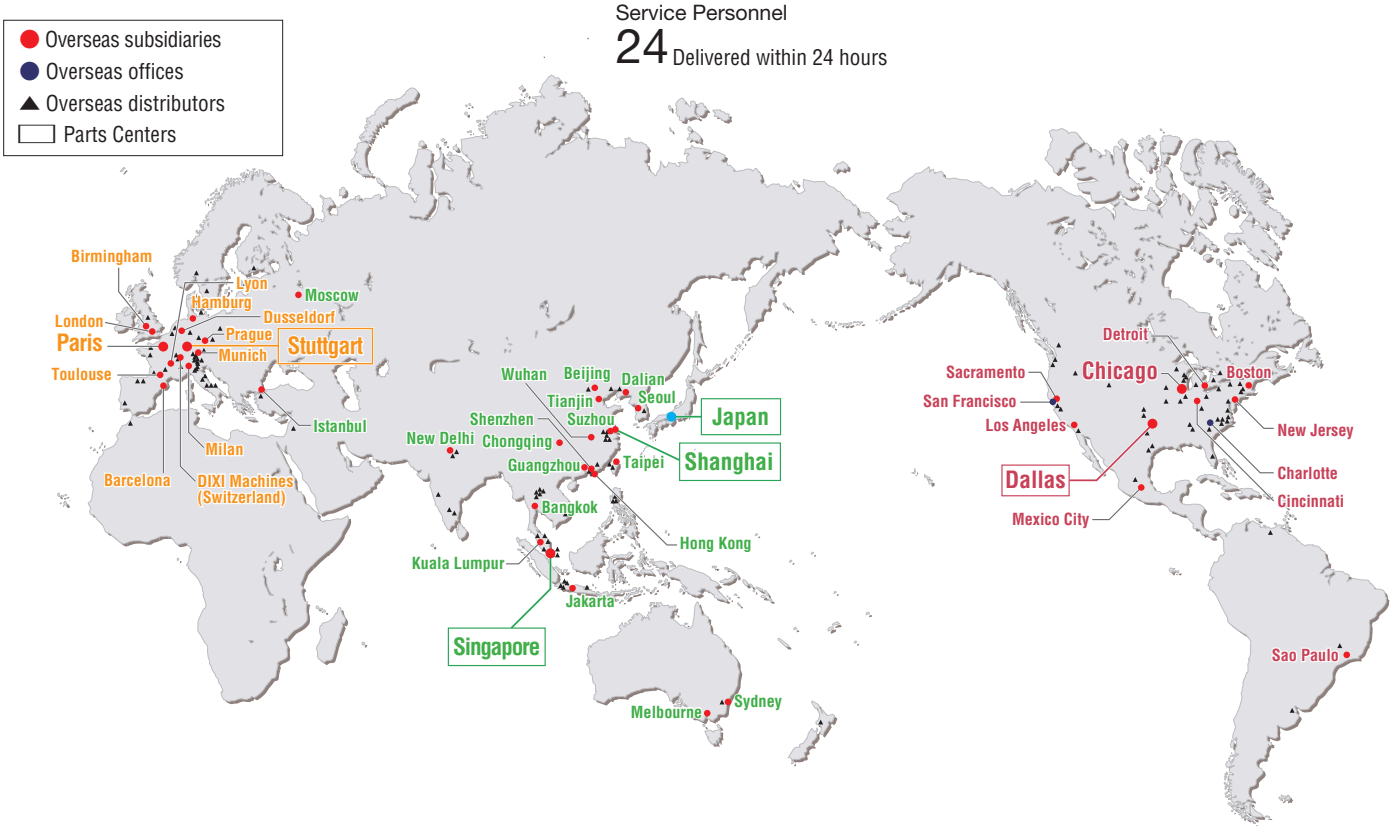
At the Iga and Chiba Service Centers, we have the following systems to respond to inquiries from overseas Technical Centers.

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.



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.

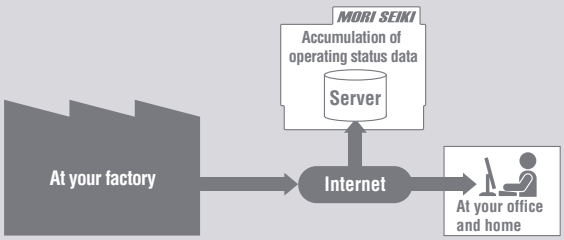
Applications

Proposals for upgrading systems and high-efficiency machining.

MORI-NET Global Edition

OP

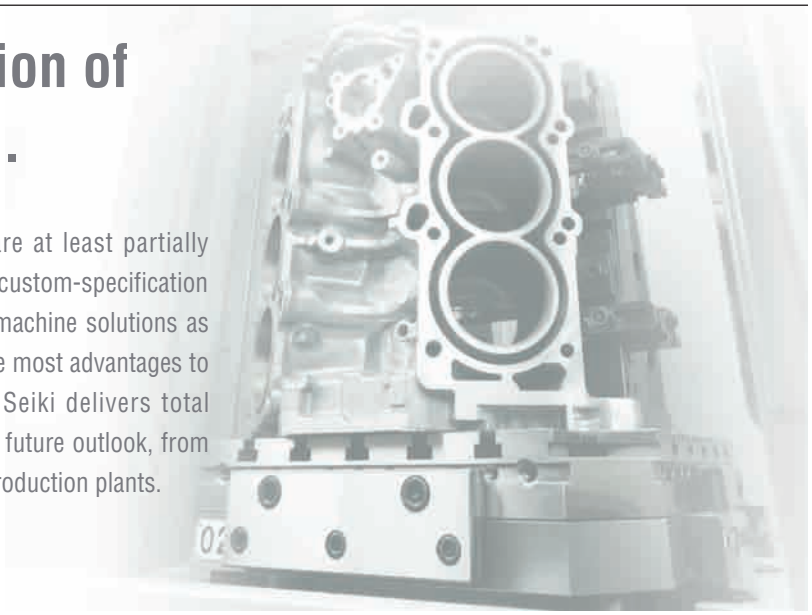
Remote monitoring of your machines over the Internet.
With this service it is possible to build remote management systems for machine tools having great speed and cost performance.



- 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.

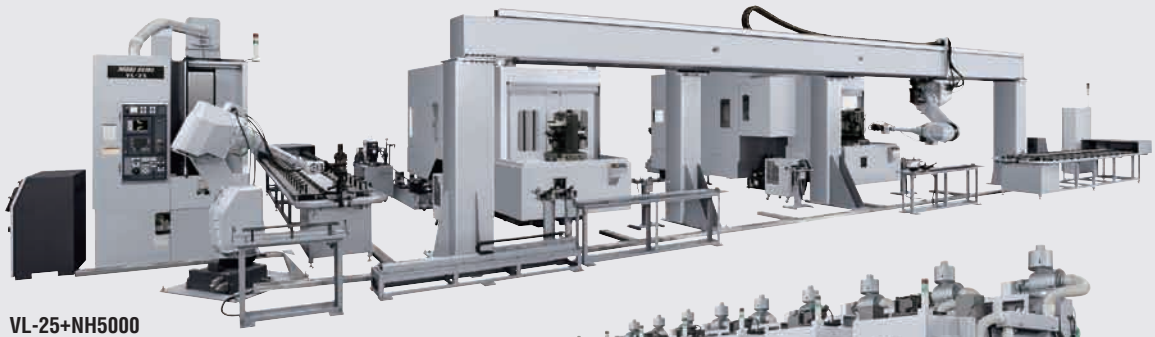
Low initial investment and running cost

Total support for construction of a high-productivity system.

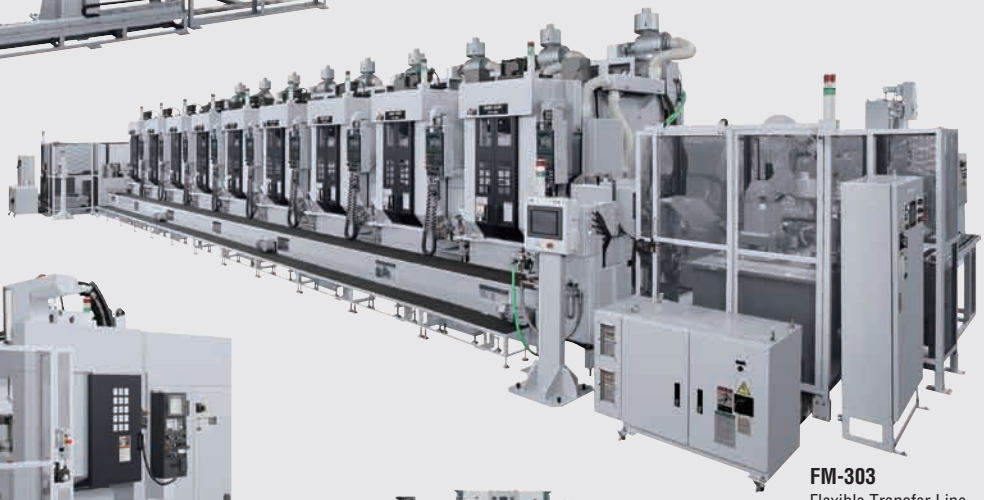


More than half of the machines delivered by Mori Seiki are at least partially customized. The Engineering Department approaches such custom-specification machines under the motto of “There are as many optimized machine solutions as there are workpieces,” working to create systems that bring the most 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

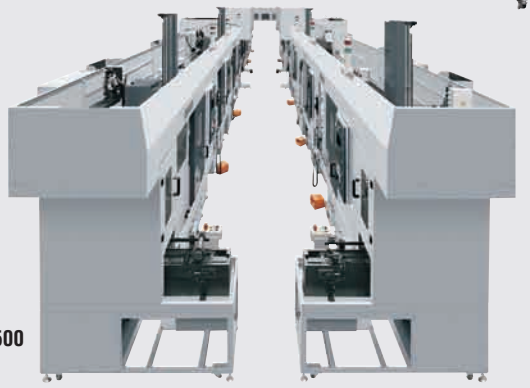


VL-25+NH5000
Robot specifications



FM-303
Flexible Transfer Line
(9 unit series)

SuperMILLER 400
Robot specifications



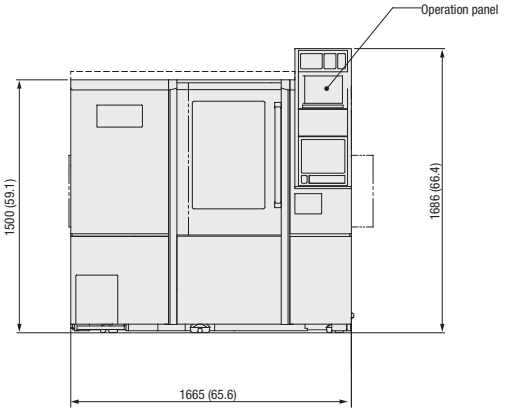
ULTIMILL V3000+CL1500
Gantry-type loader system

Installation diagram

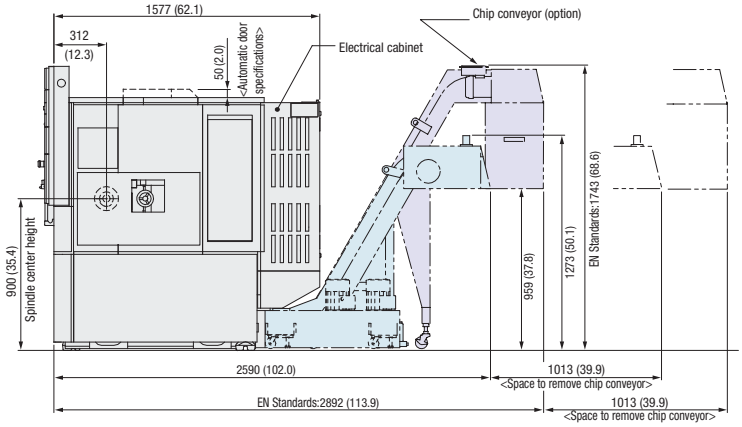
mm (in.)

NZ-S1500/500

Front view



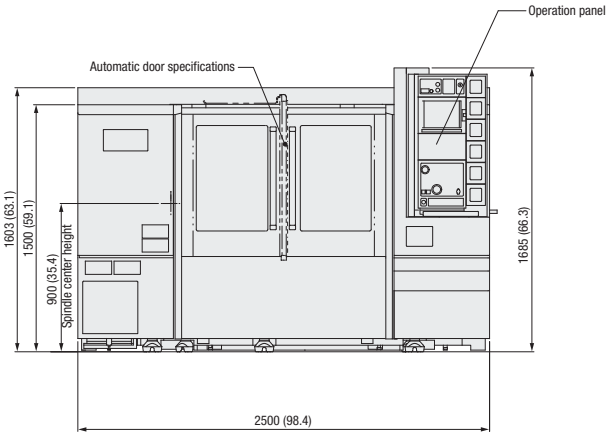
Side view



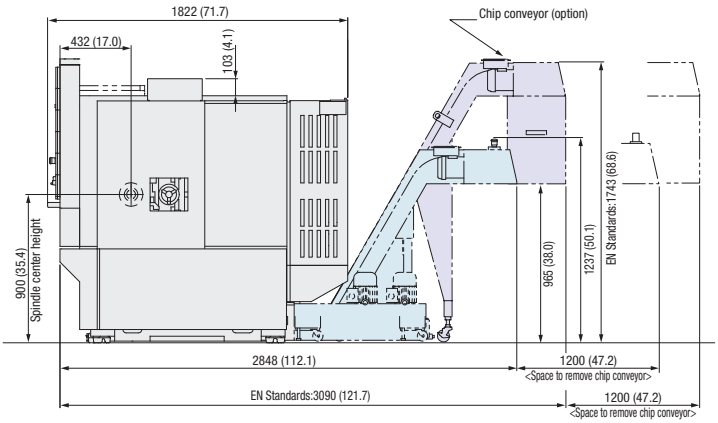
Not compatible with EN Standards:Q50924A02
EN Standards:Q50965A02

NZ-S1500/1000

Front view



Side view

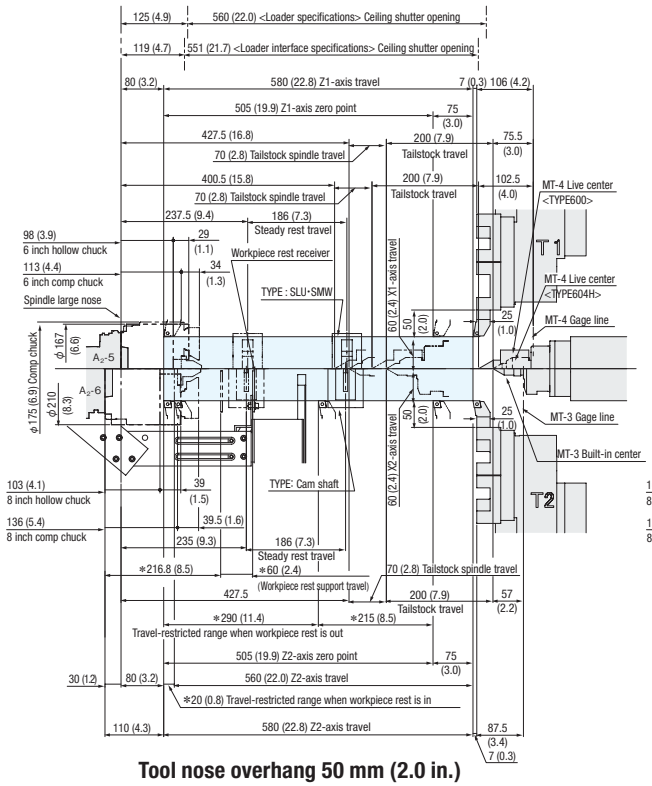


Not compatible with EN Standards:Q50894A02
EN Standards:Q50967A01

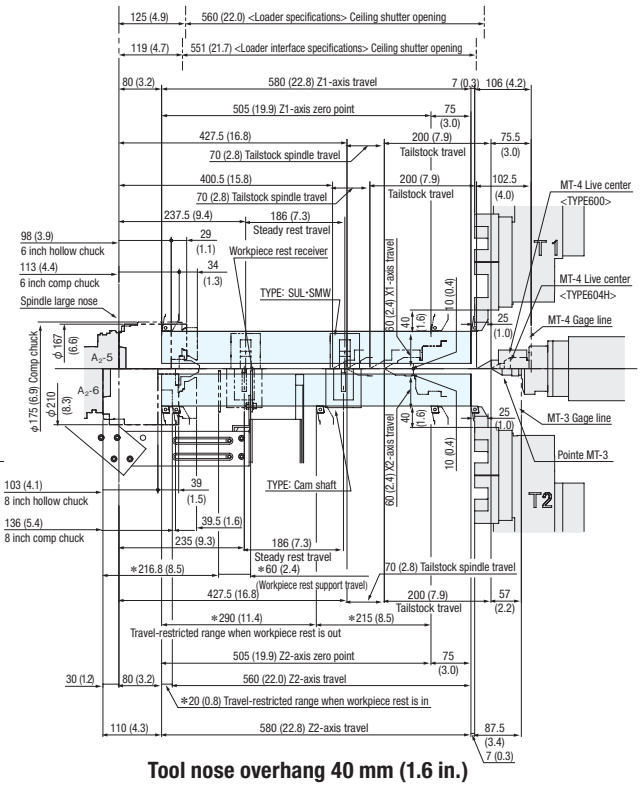
Axis travel diagram

mm (in.)

NZ-S1500/500



Tool nose overhang 50 mm (2.0 in.)

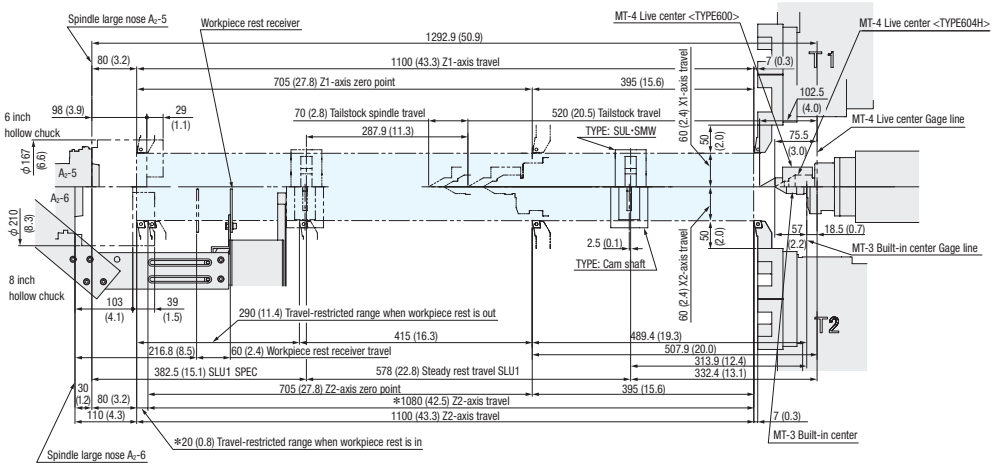


Tool nose overhang 40 mm (1.6 in.)

∗ When using a workpiece rest (without workpiece ejector)

Q52685A03

NZ-S1500/1000



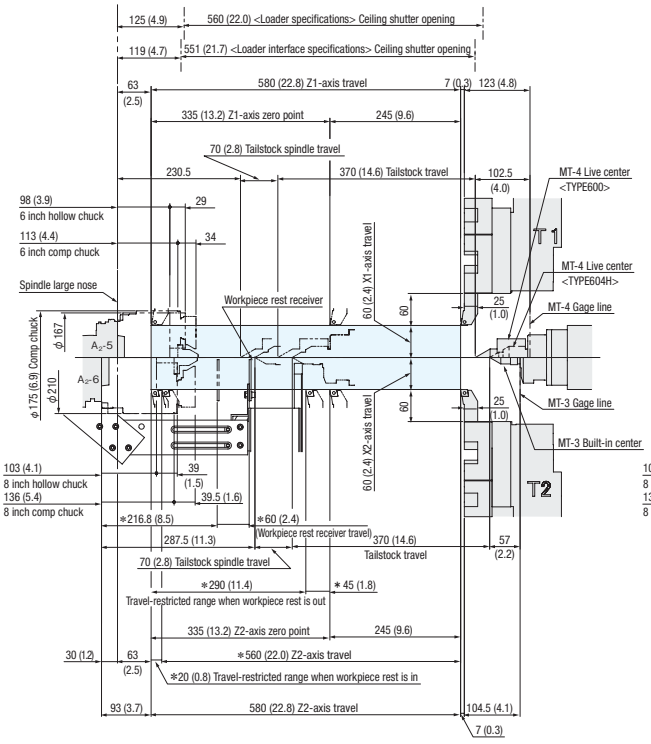
∗ When using a workpiece rest (without workpiece ejector)

Q52686A02

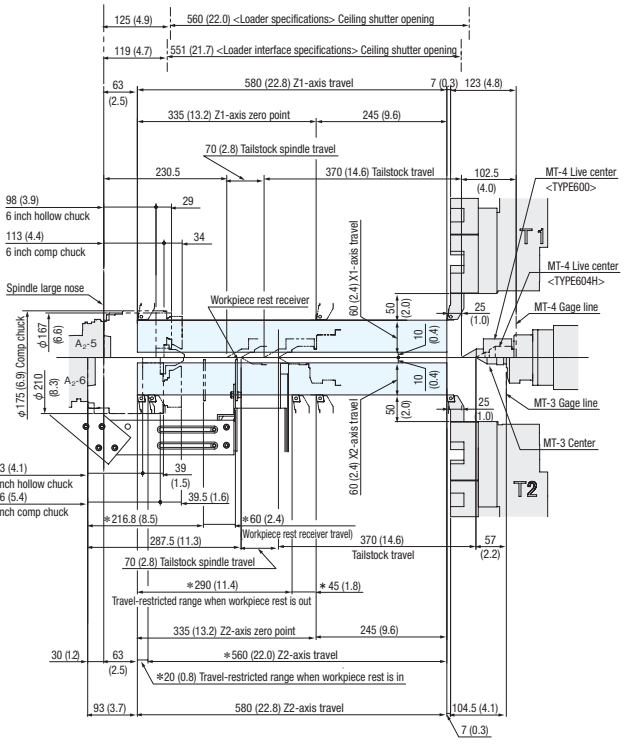
Axis travel diagram

mm (in.)

NZ-S1500/500 <370 mm (14.6 in.) tailstock travel specifications>



Tool nose overhang 60 mm (2.4 in.)



Tool nose overhang 50 mm (2.0 in.)

∗ When using a workpiece rest (without workpiece ejector)

Q52731A02

Numerical control unit specifications

MSC-700, MSC-701

(MSC-701: needs to be selected for machines with the Mori Seiki loader specifications or for machines with the milling function.)

● Standard ○ Option

■ Controlled axes

Controlled axes	Head 1: X, Z	●
	Head 2: X, Z	●
Simultaneously controlled axes	Head 1: X, Z	●
	Head 2: X, Z	●
Least input increment	0.001 mm (0.0001 in.)	●
Least command increment	0.001 mm (0.0001 in.)	●
Max. command value	±999,999.999 mm (±9,999.9999 in.)	●
Inch/Metric conversion		●
Machine lock		●
Chamfering ON/OFF		●
Backlash compensation	±9,999 pulses	●
Rapid traverse/cutting feed backlash compensation		●
Stored pitch error compensation		●
Abnormal load detection		●
Cutting feedrate		●
Stroke check before movement		○
Chuck and tailstock barrier		○

■ Operation

Automatic operation (memory)		●
Dry run		●
Single block		●
Jog feedrate	0 – 1,250 mm/min (0 – 49.2 ipm) <15 steps>	●
Manual zero return		●
Manual pulse handle feed	1 unit per control system: ×1, ×10, ×100	●
Sequence number collation and stop		○
Program restart		○
Manual handle feed interruption		○

■ Interpolation functions

Positioning	Linear interpolation type positioning is possible	●
Zero return		●
Zero return check		●
2nd zero return		●
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		○
3rd and 4th zero return		○
Floating zero return <MSC-701 only>		○

■ Feed functions

Rapid traverse rate override	F0, 25, 100% (3 steps)	●
Feed per minute		●
Feed per revolution		●
Constant tangential velocity control		●
Cutting feedrate clamp		●
Automatic acceleration/deceleration	Linear type: Rapid traverse Cutting feed: Exponential function type	●
Feedrate override	0 – 150% (10% increments)	●
Override cancel		●

■ Program input

Optional block skip	1 block	●
Max. command value	±8 digits	●
Program number	4-digit O code	●
Sequence number	5-digit N code	●
Absolute/Incremental programming		●
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		●
Sub-program call	Up to 4 nestings	●
Single repetitive cycle		●
Multiple repetitive cycle		●
Multiple repetitive cycle Ⅱ	Pocket cutting, zigzag thread cutting	●
Circular interpolation by radius programming		●
F15 format		●

■ Miscellaneous function/Spindle speed function

Miscellaneous function	3-digit M code	●
Auxiliary function lock		●
Multiple miscellaneous function commands	3 commands (this function is standard for the specified M codes)	●
Spindle speed functions	5-digit S code	●
Constant surface speed control		●
Spindle speed override	50 – 120% (10% increments)	●
Spindle 1 orientation (without lock)		○

■ Tool function/Tool offset function

Tool functions	4-digit T code	●
Number of tool offsets	32 sets	●
Tool position offset		●

■ Tool function/Tool offset function

Tool nose radius offset		●
Tool geometry offset/Tool wear offset		●
Tool offset measurement direct data input		●
Number of tool offsets 64 sets		○
Number of tool offsets 99 sets		○
Number of tool offsets 200 sets		○

■ Editing

Part program storage	Total 320 m (128 kB)	●
Number of stored programs	63 programs	●
Background editing		●
Expanded tape editing		●
Total program storage 320 m (128 kB) + number of stored programs: 250		○
Total program storage 640 m (256 kB) + number of stored programs: 500		○
Total program storage 1,280 m (512 kB) + number of stored programs: 1,000		○
Total program storage 2,560 m (1 MB) + number of stored programs: 1,000		○
Total program storage 5,120 m (2 MB) + number of stored programs: 1,000		○
Playback		○
Machining time stamp <only for MSC-701>		○

■ 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/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	●

■ Data Input/Output

Memory card input/output		●
External workpiece number search (#1 - #15)		○

I95022A03

Machine specifications

Item				NZ-S1500/500	NZ-S1500/1000
Capacity	Swing over bed		mm (in.)	285 (11.2)	
	Swing over cross slide		mm (in.)	285 (11.2)	
	Max. turning diameter		mm (in.)	120 (4.7)	
	Standard turning diameter		mm (in.)	20–60 (0.7–2.3)	
	Max. turning length		mm (in.)	535 (21.0)	1,055 (41.5)
	Bar work capacity [hollow cylinder]		mm (in.)	33 (1.2) [51 (2.0)]	
Travel	X-axis travel		mm (in.)	60 (2.4)	
	Z-axis travel		mm (in.)	580 (22.8)	1,100 (43.3)
Spindle 1	Max. spindle speed		min^{-1}	3,500 [6,000]	
	Type of spindle nose			JIS A2-5 [JIS A2-6]	
	Through spindle hole diameter		mm (in.)	43 (1.7) [61 (2.4)]	
	Spindle bearing inner diameter		mm (in.)	80 (3.1) [100 (3.9)]	
	Chuck used			6 [8]	
Turret 1	Type of turret			6-station [5-station] [Capto]	
	Number of tool stations			6 [5]	
	Shank height for square tool		mm (in.)	25 (1.0)	
	Turret indexing time		sec.	0.18	
Turret 2	Type of turret			6-station [5-station] [Capto]	
	Number of tool stations			6 [5]	
	Shank height for square tool		mm (in.)	25 (1.0)	
	Turret indexing time		sec.	0.18	
	Rotary tool spindle speed		min^{-1}	[4,500]	
Feedrate	Rapid traverse rate (X1, X2-axis)		mm/min (ipm)	20,000 (787.4)	
	Rapid traverse rate (Z1, Z2-axis)		mm/min (ipm)	30,000 (1,181.1)	36,000 (1,417.3)
	Jog feedrate		mm/min (ipm)	X1, X2, Z1, Z2: 0–5,000 (0–196.9)	
Tailstock	Tailstock travel		mm (in.)	200 (7.9) [370 (14.6)]	520 (20.5)
	Tailstock spindle diameter		mm (in.)	85 (3.3) [110 (4.3)]	
	Taper hole of tailstock spindle			MT4 (live center) [MT3, MT4 Built-in center]	
	Tailstock spindle travel		mm (in.)	70 (2.8) [120 (4.7)]	
Motors	Spindle 1 drive motor <15 min/60 min/cont>	3,500 min^{-1}	kW (HP)	5.5/3.7/3.7 (7.5/5/5) [7.5/5.5/5.5 (10/7.5/7.5)] [11/7.5/5.5/5.5 (15/10/7.5/7.5) <1 min/15 min/60 min/cont>] [15/11/11 (20/15/15)]	
		6,000 min^{-1}	kW (HP)	[5.5/3.7/3.7 (7.5/5/5)] [7.5/5.5/5.5 (10/7.5/7.5)] [11/7.5/5.5/5.5 (15/10/7.5/7.5) <1 min/15 min/60 min/cont>]	
	Rotary tool spindle drive motor		kW (HP)	[0.75]	
	Feed motor		kW (HP)	X1, X2 : 0.75 Z1, Z2 : 1.2	
	Coolant pump motor <50/60 Hz>		kW (HP)	0.325/0.52 (0.4/0.7)	
Power sources	Power supply <continuous rating>		kVA	14.3 [5.5/3.7 (7.5/5) kW], 16.5 [11/7.5 (15/10) kW], 16.5 [7.5/5.5 (10/7.5) kW], 22.4 [15/11 (20/15) kW]	
	Compressed air supply port		MPa, L/min	– <A compressed air supply may be required, depending on the options and peripheral equipment. >	
Tank capacity	Coolant tank capacity		L (gal.)	200 (52.8)	
Machine size	Machine height <except operation panel>		mm (in.)	1,500 (59.1)	1,603 (63.1)
	Floor space <width×depth>		mm (in.)	1,665×1,670 (65.6×65.7)	2,500×1,822 (98.4×71.7)
	Mass of machine		kg (lb.)	3,000 (6,600)	5,200 (11,440)

[ ] Option

- 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.

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- If you have any questions regarding the content, contact your nearest Mori Seiki dealer or Technical Center.
- The information in this catalog is valid as of August 2007. Design and specifications subject to change without notice.
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