www.dmgmori.com

DMG MORI

Vertical CNC Lathe

NVL1350

NVL1350

Vertical CNC Lathe

NVL1350

ORC®
Octagonal Ram Construction

A high-precision large vertical lathe that answers the growing demand for both turning and milling of large-diameter workpieces.

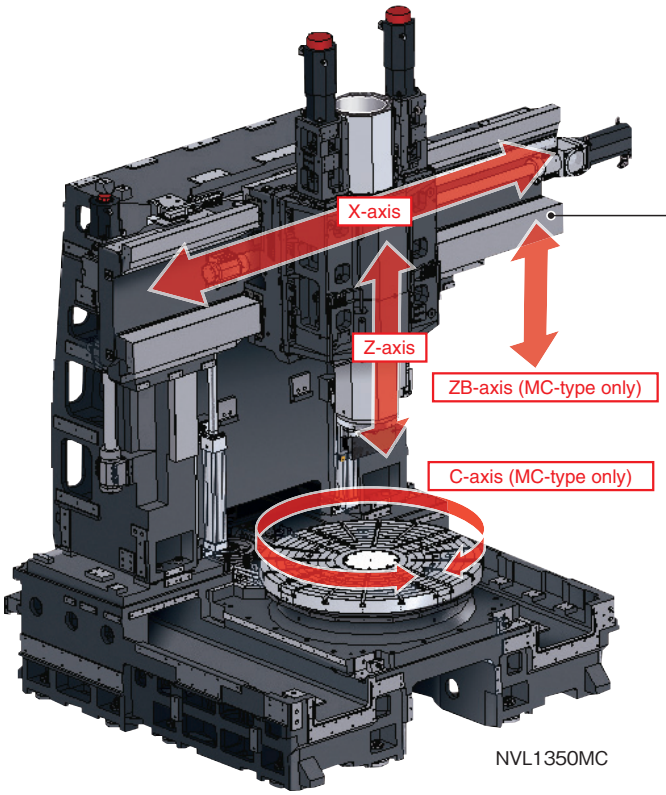
The NVL1350, a large vertical lathe designed for machining large-diameter, difficult-to-cut materials, was developed in response to the demand from the aircraft, shipbuilding and energy-related industries. While providing a maximum turning O.D. of 1,600 mm (62.9 in.) and maximum table loading capacity of 8,000 kg (17,600 lb.), the NVL1350 maintains a compact footprint, achieving greater productivity.

NVL1350MC

ORC: Octagonal Ram Construction
ORC: Except for NVL1350T.

Main features

Basic structure



NVL1350MC

Slideways

Slideways are used for all axes. This improves damping capacity during cutting and contributes to longer tool life.

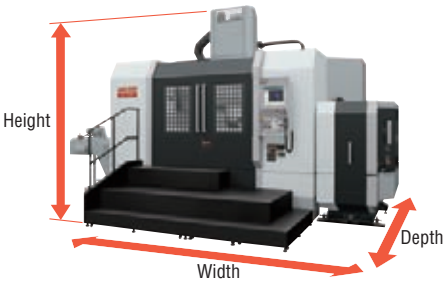
Travel

	NVL1350T	NVL1350MC
X-axis	1,400 mm (55.1 in.)	2,050 mm (80.7 in.)
Z-axis	560 mm (22.0 in.)	800 mm (31.5 in.)
ZB-axis		500 mm (19.7 in.)

Rapid traverse rate

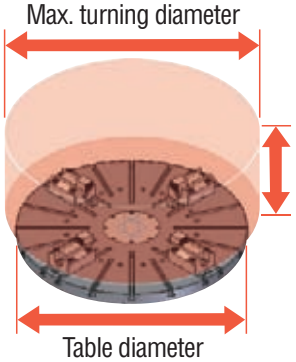
	NVL1350T	NVL1350MC
X-axis	16 m/min (629.9 ipm)	16 m/min (629.9 ipm)
Z-axis	12 m/min (472.4 ipm)	12 m/min (472.4 ipm)
ZB-axis		0.5 m/min (19.7 ipm)

Machine size



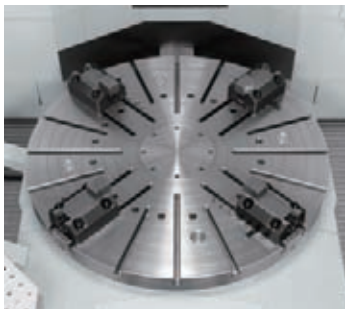
Item	Width	Depth <including external steps>	Height
NVL1350T	4,235 mm (166.7 in.)	5,528 mm (217.6 in.)	3,710 mm (146.1 in.)
NVL1350MC	6,718 mm (264.5 in.)	5,292 mm (208.3 in.)	4,680 mm (184.3 in.)

Workpiece size



Item	Max. turning diameter	Max. workpiece height	Table diameter
NVL1350T	1,600 mm (62.9 in.)	500 mm (19.6 in.)	1,350 mm (53.1 in.)
NVL1350MC		1,100 mm (43.3 in.)	

Spindle



Max. spindle speed

400 min^{-1}

Spindle torque <30 min>

20,000 N·m
(14,751.2 ft·lbf)

Table loading capacity

8,000 kg
(17,600 lb.)

Hydraulic chuck specifications, Boring mill jaws OP

NVL1350MC

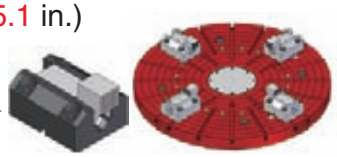
In addition to the boring mill jaw specifications, hydraulic chuck specifications are also available.

3-jaw hydraulic chuck

Max. chuck size

ϕ 1,400 mm (ϕ 55.1 in.)

Boring mill jaws



Rotary tool spindle

NVL1350MC

Suitable for many different types of machining.

Max. rotary tool spindle speed

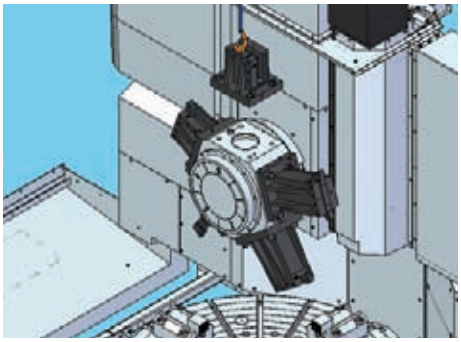
3,000 min^{-1} 6,000 min^{-1} <High speed> OP

Max. rotary tool spindle torque

525 N·m (387.2 ft·lbf) 600 N·m <High torque> OP (442.5 ft·lbf)

Turret

NVL1350T



A holder mounting surface of the turret is at the top position when holders are exchanged. Holders can be installed using a crane.

Number of tool stations

5 tools

Turret indexing time

2.3 sec. <1-station>

Coupling diameter

360 mm (14.2 in.)

Turret clamping force

177 kN (39,789 lbf)

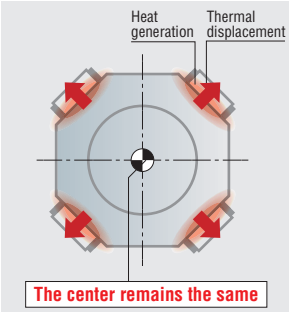
ORC

ORC® Octagonal Ram Construction

Original technology

Octagonal Ram Construction

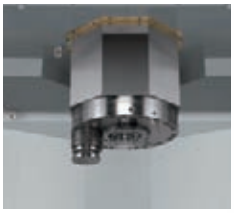
With the symmetry of an octagonal shape, thermal displacement is controlled and stable straightness is ensured even at high speeds. It offers stable, high-precision machining.

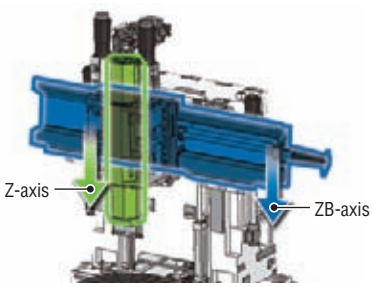


The center remains the same

The slideways, which are located diagonally from each other, offset each other's thermal displacement, because their distortion in response to heat is symmetrical.

With the distance between opposite sides of 380 mm (15.0 in.), the machine realized a high-precision feed mechanism. The cross rail that moves up and down allows positioning at any five points on the ZB-axis. This prevents decrease in rigidity caused by ram overhang.





● NVL1350MC only

Main features

ATC

NVL1350MC

Turning tool

BT50 two-face contact+Auxiliary clamp

Milling tool

BT50

With a double arm ATC, non-cutting time is reduced.

Cut-to-cut (chip-to-chip)

Turning tool → Turning tool	Milling tool → Milling tool	Turning tool ↔ Milling tool
18 sec.	14 sec.	38 sec.

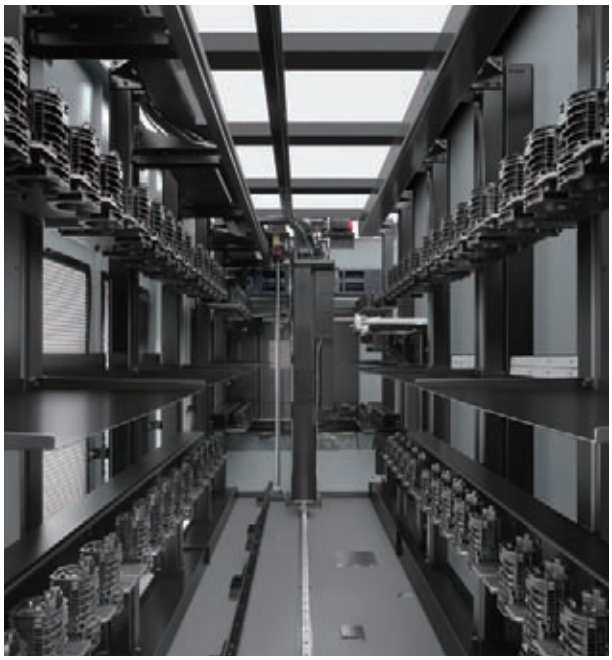
Tool-to-Tool

Turning tool → Turning tool	Milling tool → Milling tool	Turning tool ↔ Milling tool
8 sec.	4 sec.	28 sec.

● The time for Turning tool → Milling tool includes rid attaching time.

Magazine

NVL1350MC



Rack-type magazine: 80 tools

A turning tool and milling tool can be stored in one magazine. A magazine capable of storing up to 80 tools is available as an option. The magazine can also store tools with a diameter and length that can handle large-diameter workpieces.

Tool storage capacity

24 tools
40 tools OP
80 tools <rack-type> OP

Max. tool diameter

300 mm (11.8 in.)
<without adjacent tools>

Max. tool length

500 mm (19.6 in.)

APC OP

NVL1350MC

It uses a 2-station shuttle-type APC, which reduces setup time and maximizes the operating rate.

Pallet loading capacity

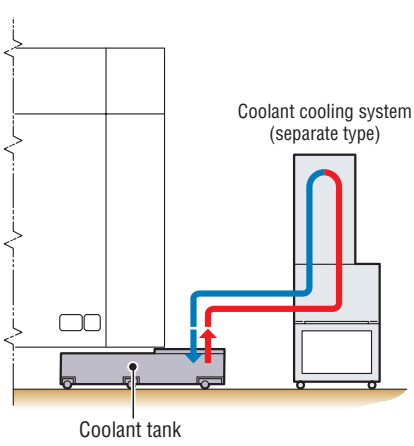
4,000 kg (8,800 lb.)

High-precision equipment

Coolant cooling system (separate type) OP

Raised coolant temperature causes thermal displacement in the fixtures and workpiece, affecting the machining accuracy of the workpiece. Use this unit to prevent the coolant from heating up. When using oil-based coolant, the coolant temperature can become extremely high even with the standard coolant pump, so please be sure to select this unit.

When using oil-based coolant, please be sure to consult with our sales 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.

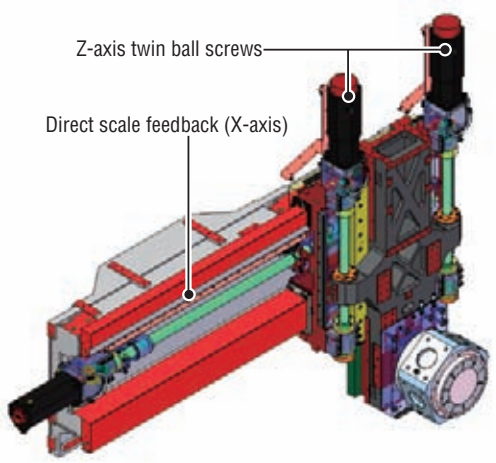
Positioning accuracy

Direct scale feedback (X-axis)

The X-axis scale is used as standard to improve machining accuracy. Feed box cooling blocks the heat generated by the servo motor.

Z-axis twin ball screws

To improve accuracy, positioning is controlled by the servo motor with twin ball screws.



Improved convenience

Improved convenience

For the NVL1350, we have installed features throughout the machine to improve operability based on the complete operator-centered concept.

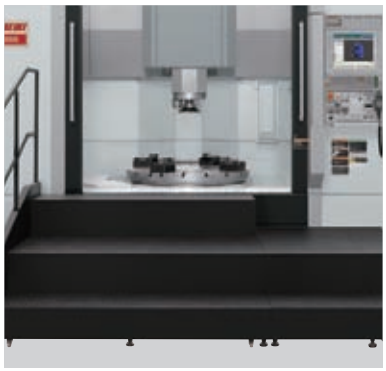
NVL1350MC

Door opening

NVL1350T 1,760 mm (69.3 in.)

NVL1350MC 1,920 mm (75.6 in.)

External steps



Since the top of the external steps, the work platform and the rail cover have the same height, the height difference between the inside and outside of the machine have been eliminated, ensuring safe and efficient operations.

Holder change

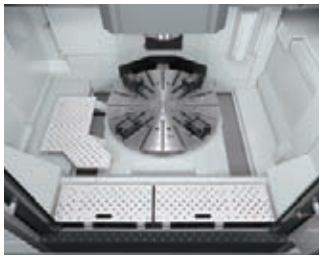
NVL1350MC

The ceiling part of the front door also opens, allowing easy loading and unloading using a crane. A tool attached to a holder can be automatically stored in the magazine just by pressing the button.

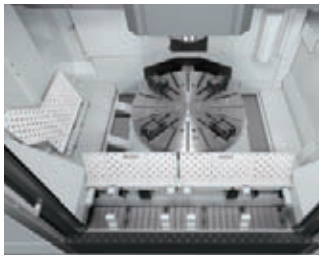
Work platform

NVL1350MC

The work platform is installed to facilitate setup, measurement and other operations inside the machine.



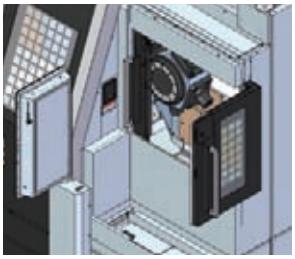
During operation



In upright position

The internal chip conveyor is designed for easy cleaning and maintenance.

Setup area



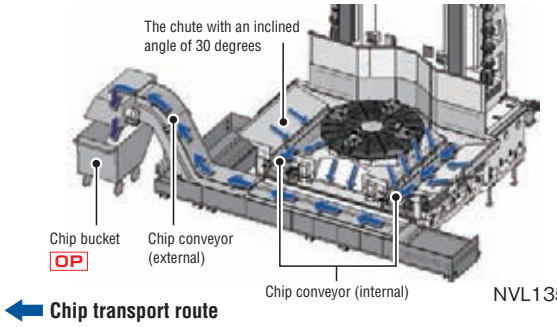
NVL1350T

The door opens to the left and right. The wide door opening enables you to replace multiple inserts at a time.

Peripheral equipment

Chip disposal

Chip conveyors are placed on both sides of the table and outside of the machine as standard, providing excellent chip disposal.



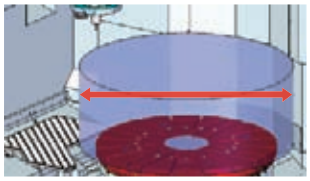
NVL1350MC

NVL1350MC Specifications	Workpiece material and chip size ○: Suitable ×: Not suitable						
	Steel			Cast iron	Aluminum/non-ferrous metal		
	Long	Short	Powdery	Short	Long	Short	Powdery
Hinge type	○	○	×	×	○	×	×
Scraper type OP	×	○	○	○	×	×	×
Hinge type+scraper type+ drum filter type OP	○	○	○	○	○	○	○

- Chip size guidelines
  Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ϕ 40 mm (ϕ 1.6 in.) or less
  Long: bigger than the above
- The options table below the general options when using coolant. Changes may be necessary if you are not using coolant, or depending on the amount of coolant, compatibility with machines, or the specifications required.
- Please select a chip conveyor to suit the shape of your chips. When using special or difficult-to-cut material (chip hardness HRC45 or higher), please consult with our sales representative.
- Chip conveyors are available in various types for handling chips of different shape and material. For details, please consult with our sales representative.

In-machine workpiece measuring system OP

The in-machine measuring system can measure the diameter of a maximumsized workpiece.



Max. turning diameter

NVL1350MC

1,600 mm
(62.9 in.)

Automatic in-machine tool presetter

Perform tool measurement more efficiently, thereby improving setup.

- Optional features for NVL1350T.

Reduction in environmental burden

Power-saving function

Power consumption is reduced while operating the machine efficiently.

Automatic machine light function

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

Automatic sleep function

If the keyboard is not touched after 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.

LED lighting

LED with high luminous efficiency offers a high light output at a low wattage, contributing to reducing electricity use.

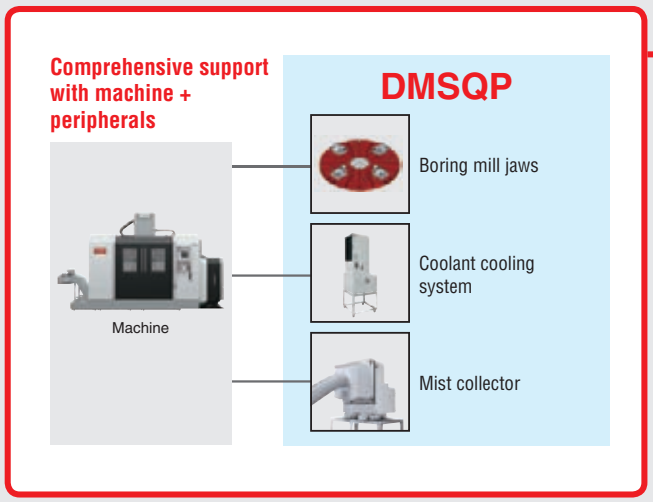
DMSQP (DMG Mori Seiki Qualified Products) OP

Selected peripherals with superior quality, performance and maintainability.

The DMSQP program is designed to certify peripherals that meet DMG MORI SEIKI standards in quality, performance and maintainability. DMSQP provides customers with even greater peace of mind.

Comprehensive support with machine + peripherals

DMG MORI SEIKI provides comprehensive support, from proposal to delivery and maintenance, for high-quality peripherals that offer superior performance and maintainability.



DMG MORI SEIKI Service Center

Advantages of DMSQP

- Qualified peripherals are arranged by DMG MORI SEIKI
- Two-year warranty, the same as machines
  (Parts relating to machine breakdown will be guaranteed free for 2 years from the date of installation, and labor costs to repair will be free for 1 year)
- Toll-free phone support is available 24 hours a day, 365 days a year (Japan only)

Examples of qualified products (NVL1350)

☐ **Coolant cooling system**
It cools down coolant to offer better cutting performance and minimize thermal displacement in the workpiece.

☐ **Mist collector**
It removes mist, smoke, etc. generated inside the machine.

☐ **Chip bucket**
Chips discharged from the chip conveyor are collected into this bucket.

☐ **Refrigerating type air dryer**
This unit removes moisture contained in the compressed air supplied by the compressor, preventing moisture-related problems in the pneumatic equipment.

☐ **Tool wagon**

☐ **Tool cabinet**

☐ **Boring mill jaws**

● For more details on DMSQP items, please contact your sales representative.

MAPPS Ⅳ

A New High-Performance Operating System
for CNC Lathes

A new high-performance operating system that pursues ease of use, and combines the best hardware in the industry with the advanced application/network systems.

- **Outstanding operability thanks to upgraded hardware**
- **New functions for easier setup and maintenance**
- **Various types of monitoring, including internal monitoring, are possible on the screen (option)**
- **In the event of trouble, DMG MORI SEIKI's remote maintenance service solves it smoothly (MORI-NET Global Edition Advance <option>)**

Outstanding operability

USB port / Memory card slot

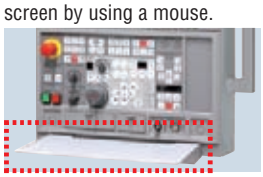
These can be used for inputting/outputting data such as NC programs and diagram data.

Keyboard

A PC-type keyboard is used as standard, making key input easy. A keyboard with a conventional key layout is also available as an option.

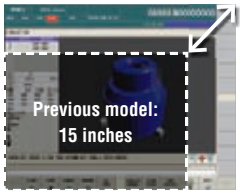
Mouse tray (detachable) OP

The mouse tray and USB port are useful in performing 3D cutting simulations in the CAM software or conversational function. You can smoothly and accurately turn the object on the screen by using a mouse.



19-inch large screen

A wide-angle, long-life, high-resolution TFT display is used. The industry's largest 19-inch display with bright, easy-to-see colors. Brightness adjustment is possible.



MAPPS Ⅳ:
19 inches

Vertical soft-keys

Vertical soft-keys are arranged on the left and right sides of the screen. The vertical soft-keys can be used as option buttons or shortcut keys to which you can assign your desired screens and functions, allowing you to quickly display the screen you want.

Advanced hardware

Reduction of drawing time

Shorter drawing time was achieved thanks to increased CPU performance.

MAPPS Ⅲ
57 sec.

MAPPS Ⅳ
42 sec.

Approx.
Reduced by 27%

Main specifications

Main memory	3 GB
User area	Standard: 6 GB Option: 20 GB
Interface	·USB 2.0 3 ports (Screen side: 1, Bottom and back of operation panel: each 1)
	·LAN 2 ports (1000BASE-T)
	·RS-232-C port
	·Memory card slot
Soft-keys	Left/right 12 keys Bottom 12 keys

MAPPS: Mori Advanced Programming Production System

Improved ease of setup

File display and Memo function

Data necessary for setups such as operating instructions, drawing data and text data can be viewed on MAPPS. Text data is editable.

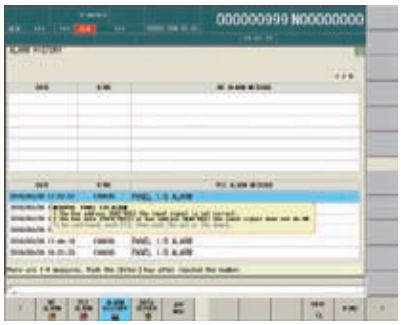
Viewable file types

- PDF ・TXT (Editable)
- Any file that can be displayed with Internet Explorer is available

Improved ease of maintenance

Alarm help function

When an alarm occurs, MAPPS identifies the cause of the trouble and provides solutions.



Improved work efficiency

Fixed-point in-machine camera

OP Consultation is required

Images taken by cameras installed inside/outside the machine can be viewed on the programming screen. This function is useful for maintenance.

Examples of camera locations

- Inside machine (to check machining)
- Tool magazine (to check cutting tools)
- Chip bucket (to check chip accumulation)

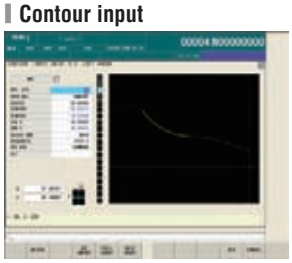
Conversational automatic programming

This function allows users to create programs simply by following the guidance on the screen.
Much of the programming process has been simplified due to the minimal key entry required for even the most complex shapes.

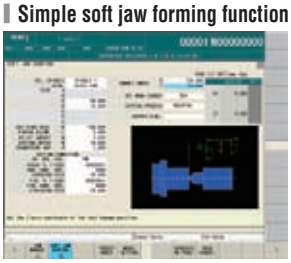
Machining menu

List display function

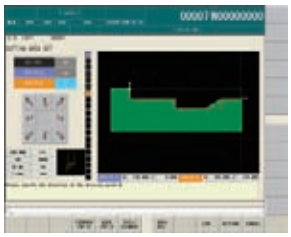
Contour input



Simple soft jaw forming function



Relief machining OP



DXF import function OP

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 Ⅳ operating systems.

- The photo shown may differ from actual machine.
- Information about the screen is current as of August 2012.

Machine specifications

Item			NVL1350T	NVL1350MC
Capacity	Table diameter	mm (in.)	1,350 (53.1)	
	Max. swing of workpiece	mm (in.)	1,600 (62.9)	
	Max. turning diameter	mm (in.)	1,600 (62.9)	
	Max. workpiece height	mm (in.)	500 (19.6)	1,100 (43.3)
	Max. turning height (Max. turning height may be restricted depending on the tool holders mounted on the adjacent stations)	mm (in.)	240 (9.4)	1,100 (43.3)
Travel	X-axis travel	mm (in.)	1,400 (55.1)	2,050 (80.7)
	Z-axis travel	mm (in.)	560 (22.0)	800 (31.5)
	ZB-axis travel	mm (in.)	—	500 (19.7)
Spindle <table>	Max. spindle speed	min^{-1}	400	
	Number of spindle speed ranges		2	
	Table loading capacity	kg (lb.)	8,000 (17,600)	
	Min. spindle indexing angle		—	0.001°
	Spindle bearing inner diameter	mm (in.)	560 (22.0)	
Turret	Number of tool stations		5	—
	Shank height for square tool	mm (in.)	32 (1¼)	—
	Shank diameter for boring bar	mm (in.)	50 (2)	—
	Turret indexing time	s	2.3	—
	Max. rotary tool spindle speed	min^{-1}	—	3,000 [6,000]
	Number of spindle speed ranges (rotary tool)		—	1
	Type of spindle taper hole (rotary tool)		—	No. 50
	Spindle bearing inner diameter (rotary tool)	mm (in.)	—	100 (3.9)
Feedrate	Rapid traverse rate	mm/min (ipm)	X: 16,000 (629.9) Z: 12,000 (472.4)	X: 16,000 (629.9) Z: 12,000 (472.4) ZB: 500 (19.7)
	Jog feedrate	mm/min (ipm)	X, Z: 0—5,000 (0–197.0) <20 steps>	X, Z: 0—5,000 (0—197.0) <20 steps> ZB: 0—500 (19.7)
ATC	Type of tool shank		—	BT50
	Type of retention knob		—	DMG MORI SEIKI 90°
	Tool storage capacity		—	24 [40] [80]
	Max. tool diameter <with adjacent tools>	mm (in.)	—	145 (5.7)
	Max. tool diameter <without adjacent tools>	mm (in.)	—	300 (11.8)
	Max. tool length	mm (in.)	—	500 (19.6)
	Max. tool mass	kg (lb.)	—	50 (110)
	Method of tool selection		—	Fixed address, shorter route access
	Tool changing time <tool-to-tool> {rotary tool}	s	—	4
	Tool changing time <tool-to-tool> {turning tool}	s	—	8
Motor	Spindle drive motor <30 min/cont>	kW (HP)	37/30 (50/40) [55/45 (75/60)]	
	Rotary tool spindle drive motor <10 min/cont>	kW (HP)	—	22/15 (30/20) [30/25 (40/33.3) <30 min/cont> {6,000 min^{-1}}]
	Feed motor	kW (HP)	X: 6.0 (8) Z: 9.0 (12)×2	X: 6.0 (8) Z: 9.0 (12)×2 ZB: 3.0 (4)×2
	Coolant pump motor	kW (HP)	0.72/1.2 (0.96/1.6)	
Power sources <standard>	Electrical power supply <cont>	I94275A02 kVA	68.1	87.3
	Compressed air supply	MPa (psi), L/min (gpm)	0.5 (72.5), 30 (7.9) <ANR>	0.5 (72.5), 600 (158.4) <ANR>
Tank capacity	Coolant tank capacity	L (gal.)	570 (150.5)	930 (245.5)
Machine size	Machine height	mm (in.)	3,710 (146.1)	4,680 (184.3)
	Floor space <including chip conveyor>	mm (in.)	4,235×5,528 (166.7×217.6) {4,235×4,270 (166.7×168.1) <not including external steps>}	6,718×5,292 (264.5×208.3) {6,718×3,962 (264.5×156.0) <not including external steps>}
	Mass of machine	kg (lb.)	25,000 (55,000)	31,000 (68,200)

[ ] Option

NVL1350T (110628)
NVL1350MC (110628)

- 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 ℃ (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.
- When the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required.
- Compressed air supply: please be sure to supply clean compressed air <air pressure: 0.7 MPa (101.5 psi), pressure dew point: 10 ℃ (50 °F) or below>.
- A criterion capacity to select a compressor is 90 L/min (23.8 gpm) per 0.75 kW (1 HP). However, this figure may differ depending on the type of compressors and options attached. For details, please check the compressor specifications.
- The information in this catalog is valid as of August 2012.

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2-year warranty, twice the peace of mind.

For machines delivered outside of Japan, parts relating to machine breakdown will be guaranteed free for 2 years from the date of installation, and labor costs to repair will be free for 1 year. Please contact our sales representative for details.

<Precautions for Machine Relocation>

EXPORTATION: All contracts are subject to export permit by the Government of Japan. Customer shall comply with the laws and regulations of the exporting country governing the exportation or re-exportation of the Equipment, including but not limited to the Export Administration Regulations. The Equipment is subject to export restrictions imposed by Japan and other exporting countries and the Customer will not export or permit the export of the Equipment anywhere outside the exporting country without proper government authorization. To prevent the illegal diversion of the Equipment to individuals or nations that threaten international security, it may include a "Relocation Machine Security Function" that automatically disables the Equipment if it is moved following installation. If the Equipment is so-disabled, it can only be re-enabled by contacting DMG MORI SEIKI or its distributor representative. DMG MORI SEIKI and its distributor representative may refuse to re-enable the Equipment if it determines that doing so would be an unauthorized export of technology or otherwise violates applicable export restrictions. DMG MORI SEIKI and its distributor representative shall have no obligation to re-enable such Equipment. DMG MORI SEIKI and its distributor representative shall have no liability (including for lost profits or business interruption or under the limited service warranty included herein) as a result of the Equipment being disabled.

- If you have any questions regarding the content, contact our sales representative.
- The information in this catalog is valid as of October 2013. Designs and specifications are subject to changes without notice.
- The machines shown in the catalog may differ from the actual machines. The location and the size of the nameplates may also differ from the actual machines, or the nameplates may not be attached to some machines.
- DMG MORI SEIKI is not responsible for differences between the information in the catalog and the actual machine.

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