

Nidec

All for dreams

CYLINDRICAL GRINDING MACHINE

R SERIES



NIDEC MACHINE TOOL CORPORATION

www.nidec.com/en/nidec-machinetool/

R Series: Outstanding Functionality with Highest Technology

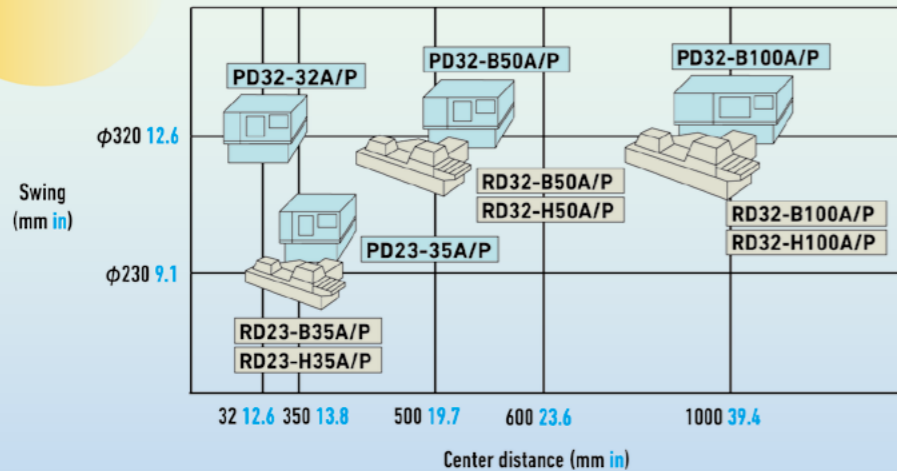
CYLINDRICAL GRINDING MACHINE

R SERIES General purpose models
RD23/RD32

NIDEC MACHINE TOOL CORPORATION utilizes the world's highest-level technologies. Fueled by successful experience with aircraft, ocean vessels, and power systems, we provide machine tools satisfying customers by identifying future needs and applying our cutting-edge technologies.



Wide selection lineup



Note: **R series** General purpose models **P series** Mass-production models

We have led the industry as the pioneer of cylindrical grinding machines with automatic programming functions and advanced CNC controls. We have realized high accuracy and high efficiency in grinding operation through advanced mechanical structures and unique control technologies. We listen to customer requirements and develop solutions that meet even future needs.

Feature 1

Excellent high-accuracy grinding and stable quality

- High-rigidity ball bearing wheel spindle
- Equipped with static/dynamic pressure hybrid bearing with low heat generation and high vibration absorption effect (optional)
- Excellent thermal and dimensional stability

Feature 2

A highly efficient machining mechanism

- Linear roller guides and high-rigidity ball bearings for high speed stability
- Wheel-spindle-stock mounted longitudinal locator as standard equipment (general-purpose locator)

Feature 3

Simple programming reduces operator workload

- Easy data entry programming feature so that grinding operation can start in minutes

Feature 4

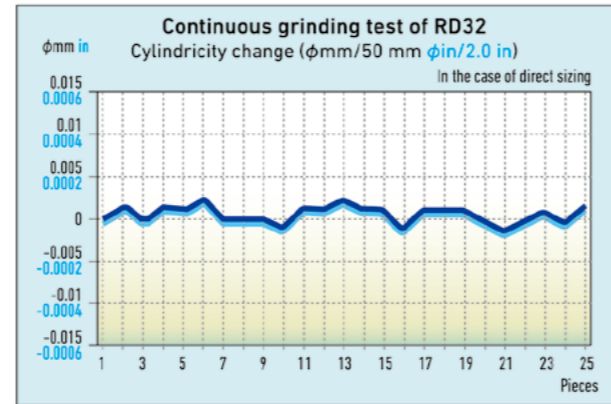
Ease of Use With Solid Safety

- Color LCD display with enhanced visibility and various indication functions
- Multi-type, multi-step machine memory
- Triple safety checks

ACCURATE AND STABLE GRINDING

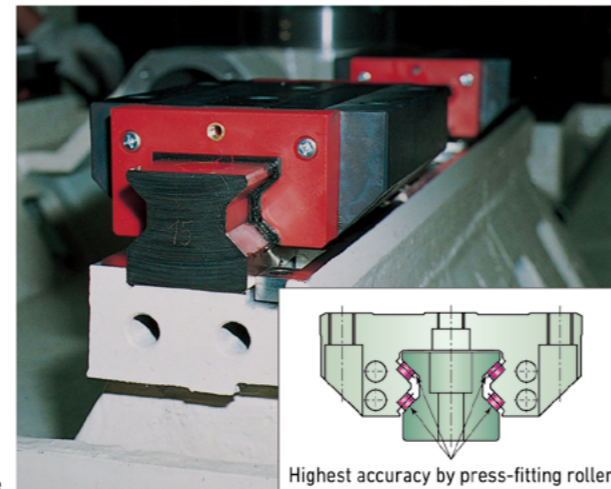
Stable grinding

Through enhanced accuracy and rigidity of mechanical structures including main spindle and feed axes and implementation of minimum command unit of $\phi 0.1 \mu\text{m}$ 0.00004 in , high-accuracy grinding is realized. Repetitive grinding accuracy is as stable as cylindricity change of $3 \mu\text{m}/50 \text{ mm}$ $0.0001 \text{ in}/2.0 \text{ in}$ (RD23/RD32) one hour after cold start.



Ultra-precise positioning accuracy through high-rigidity linear roller guide

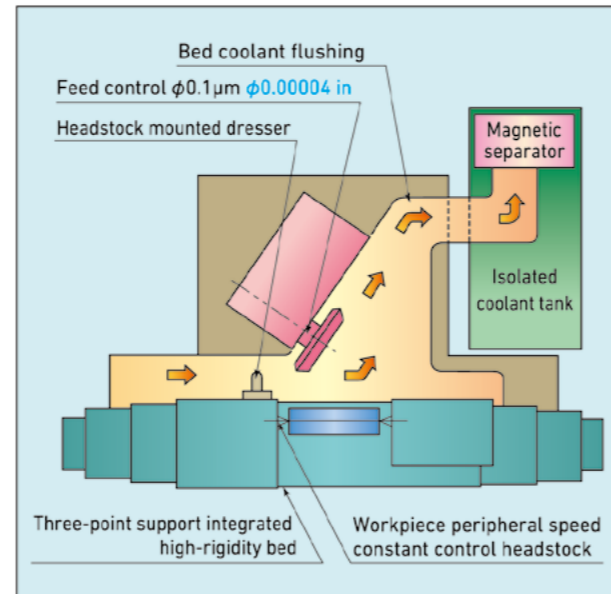
High-rigidity, pre-loaded linear roller guides are employed on the wheel spindle stock feed and table feed axes (RD23 and RD32). These designs provide precise positioning, enhancing the profile grinding accuracy.



Linear roller guide

Superior countermeasures for thermal deformation

- **Isolated placement of tanks**
Hydraulic, lubricating, and coolant tanks are isolated from the machine main body.
- **Prevention of rapid variation in bed temperature**
Immediately after startup of the machine, the coolant flows continuously through the bed, preventing variation in grinding accuracy.
- **Dresser mounted to headstock**
The headstock-mounted dresser minimizes even the smallest effect of thermal deformation. Cylindrical variation is minimal even in a long grinding operation.



A HIGHLY EFFICIENT MACHINING MECHANISM

Designed to enhance efficiency

- **Reduction of non-grinding time through high-speed feed via roller guides (RD23/RD32: 20 m/min 65.6 fpm)**
Adoption of high-rigidity linear roller guides has increased the speed of high-speed feed of wheel spindle and table spindle feed to 20 m/min (65.6 fpm).
- **High-rigidity ball bearings**
Provides a large wheel spindle retaining force.
- **Single stroke grinding using wide grinding wheel**
This enables a dramatic reduction of setup and grinding times.

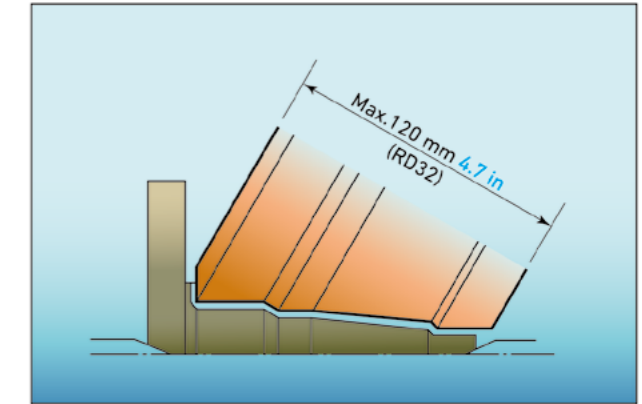
Grinding wheel width

Model	Standard	Maximum
RD23	50 mm 2.0 in	75 mm 3.0 in
RD32	75 mm 3.0 in	120 mm 4.7 in

- **Adoption of high-output motors**
Heavy-duty grinding with reserve power

Grinding wheel motor

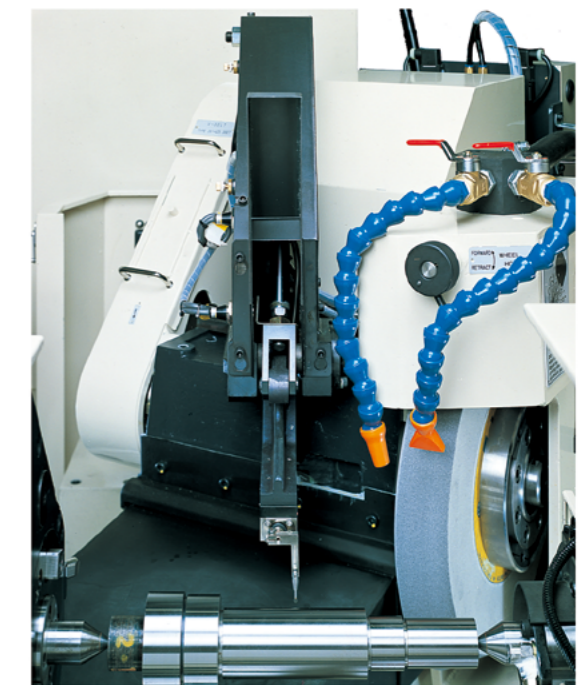
Model	Standard	Maximum
RD23	3.7 kW 5.0 HP	5.5 kW 7.4 HP
RD32	5.5 kW 7.4 HP	7.5 kW 10.1 HP



Plunge grinding with formed wheel

Designed to reduce non-productive time

- **Reduction of NC time**
NC processing time has been shortened by 15% as compared to the previous models.
- **Simple screen design for fast data input**
By simplifying data input operation, part setup input is reduced by 35% compared to the previous models.
- **Facilitation of setup changeover process**
 - Setup changeover can be done with one wrench.
 - One-touch structure has reduced the grinding wheel change time
 - Change-over time: approx. 10 min.
- **Standard equipment of longitudinal positioning device (general-purpose locator)**
The longitudinal locator is standard equipment, and automatically adjusts the measuring location of a workpiece along the spindle direction and diameter. The wheel-spindle-stock mounted locator does not require movement or adjustment when the length or diameter of a workpiece is changed, thereby facilitating the setup process and enabling measurement. This eliminates a complex time consuming setup procedure.

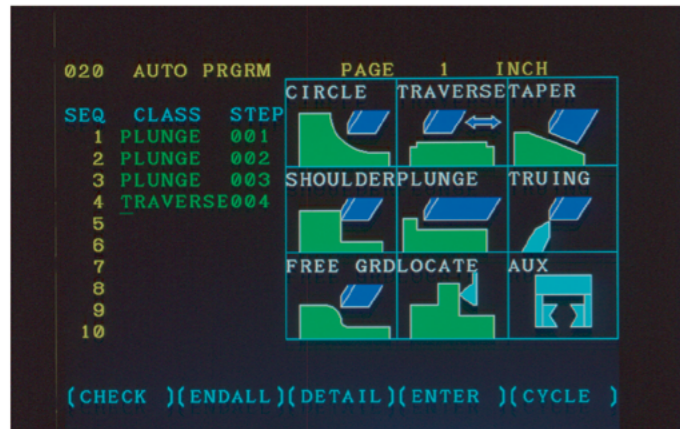


Wheel-spindle-stock mounted longitudinal locator

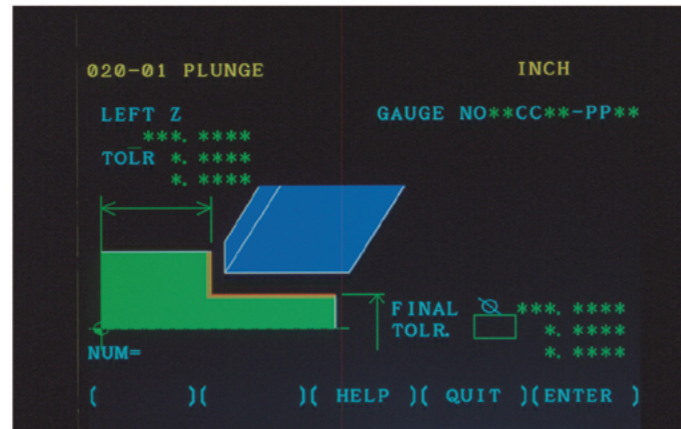
SIMPLE PROGRAMMING SOFTWARE REDUCES OPERATOR WORK

Easy input work through conversational graphical software

- The color programming screen shows various grinding and dressing patterns graphically, facilitating definition of workpiece shape.
- Input operations adopt a conversational method, allowing data entry with minimum key operations.
Direct input of dimensions shown on a drawing makes the operation especially easy. The dimension tolerance can be in either tolerance width (e.g. +0.000/-0.011) or JIS tolerance class (e.g. h5).
- Input operations and confirmation can be visually done in a conversational manner, reducing input mistakes.



Display example of various grinding patterns



Display example of direct input of dimensions

Input items for each grinding cycle

- **Easy input work by entering two items at minimum**
- **Immediate modification of grinding conditions is possible**
Modifying the grinding conditions and changing the order of grinding, etc., can be done immediately on the screen.
- **Nose R compensation**
In the case of radius grinding and taper grinding with grinding wheel edge R, the deviation of grinding can be compensated by R compensation.
- **Manual process overriding is also possible**
Automatic grinding process can be interrupted, and high-accuracy grinding process can be inserted.

Grinding Cycle	Operational Chart	Minimum Required Input
Plunge		<ol style="list-style-type: none"> 1. Finish dia.: $\phi 50 \text{ mm } \phi 2.0 \text{ in}$ 2. Length to left side end of grinding: Z
Traverse		<ol style="list-style-type: none"> 1. Finish dia.: $\phi 50 \text{ mm } \phi 2.0 \text{ in}$ 2. Length to left side end of grinding: Z 3. Grinding stroke: 100 mm 3.9 in
Taper		<ol style="list-style-type: none"> 1. Left side finish dia.: $\phi 100 \text{ mm } \phi 3.9 \text{ in}$ 2. Right side finish dia.: $\phi 50 \text{ mm } \phi 2.0 \text{ in}$ 3. Length to left side end of grinding: Z 4. Grinding stroke: 100mm
Circular arc		<ol style="list-style-type: none"> 1. Corner x $\phi 100 \text{ mm } \phi 3.9 \text{ in}$ 2. Corner Z 3. Corner radius (R) R < 0 \square R R > 0 \square R

Shoulder grinding is also possible.

EXCELLENT PERFORMANCE AND SOLID SAFETY

Color LCD display with enhanced visibility

The standard color LCD display provides enhanced visibility.

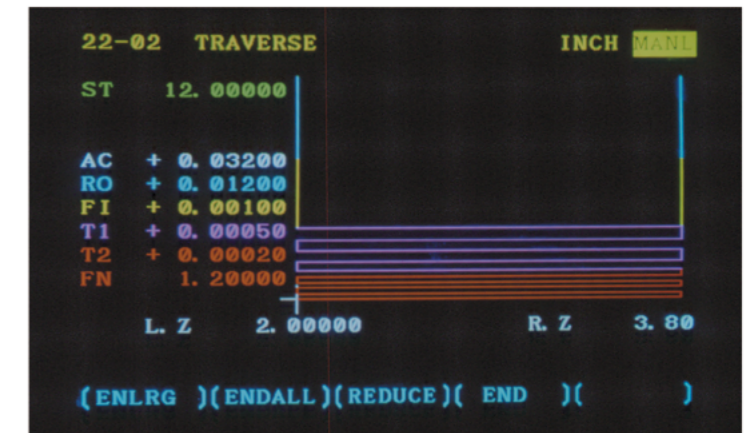


Operator's control panel

Graphic function display

The following various functions are graphically displayed to enhance visibility and ensure steady operations.

- Path check
- Grinding wheel trajectory
- Machining area indications
- Help



Display example of grinding wheel trajectory

Triple checking functions to ensure safety

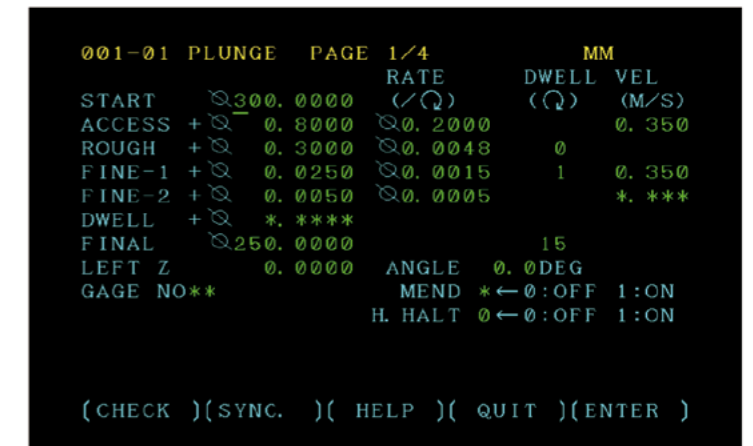
The safety is ensured by triple checks: automatic program check, grinding path check, and wheel motor overload detection, which assures operations of peace of mind.

Multi-type multi-step machine memory

The number of types of workpieces x number of grinding steps that can be registered totals 100 steps. For example, a maximum of 100 steps can be registered for one workpiece, and a maximum of 25 types of workpieces with 4-step grinding for each can be registered. If flash memory card is used, hundreds of steps can be supported. (One card is equipped as standard for the backup.)

Multi-task functions

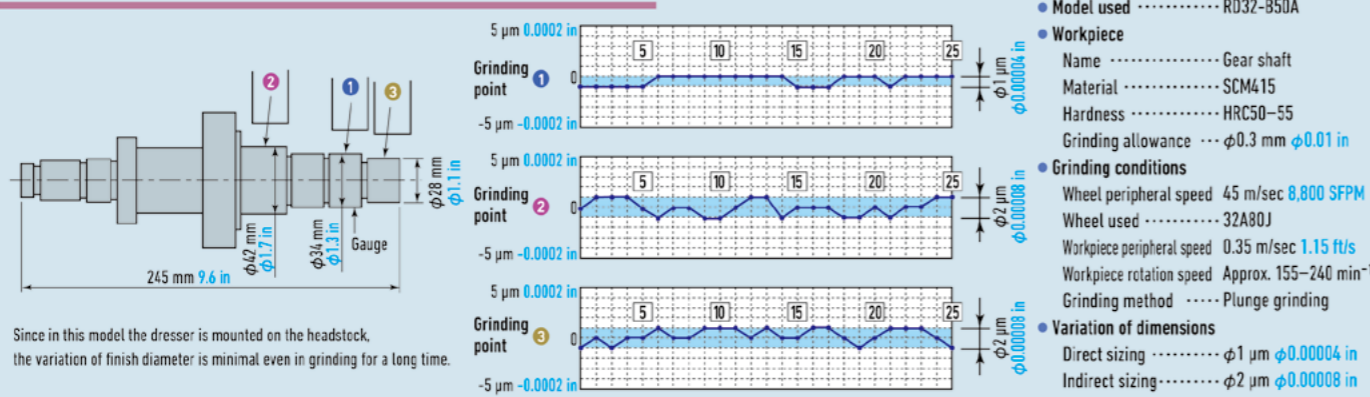
During grinding operation, the machining data of the next workpiece can be edited on the screen.



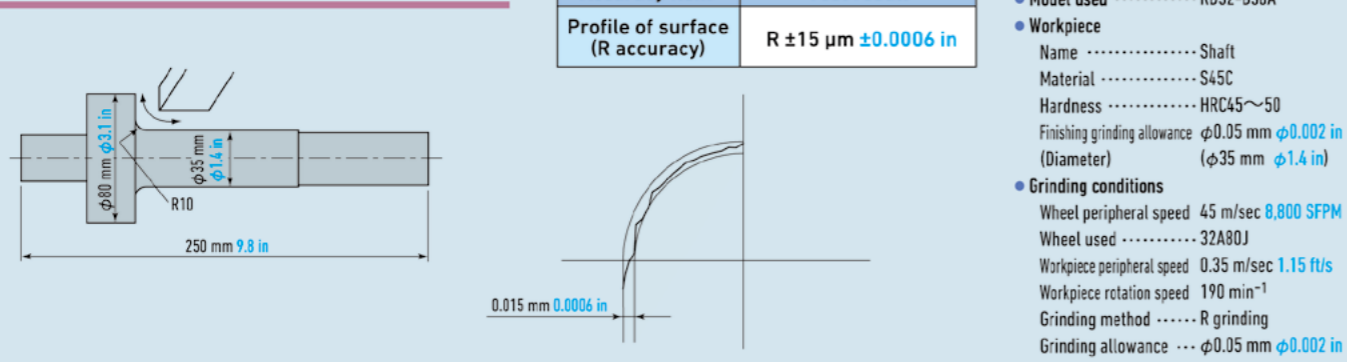
Display example of grinding program check

GRINDING DATA

Variation of diameter in plunge continuous grinding



R grinding by simultaneous 2-axis control



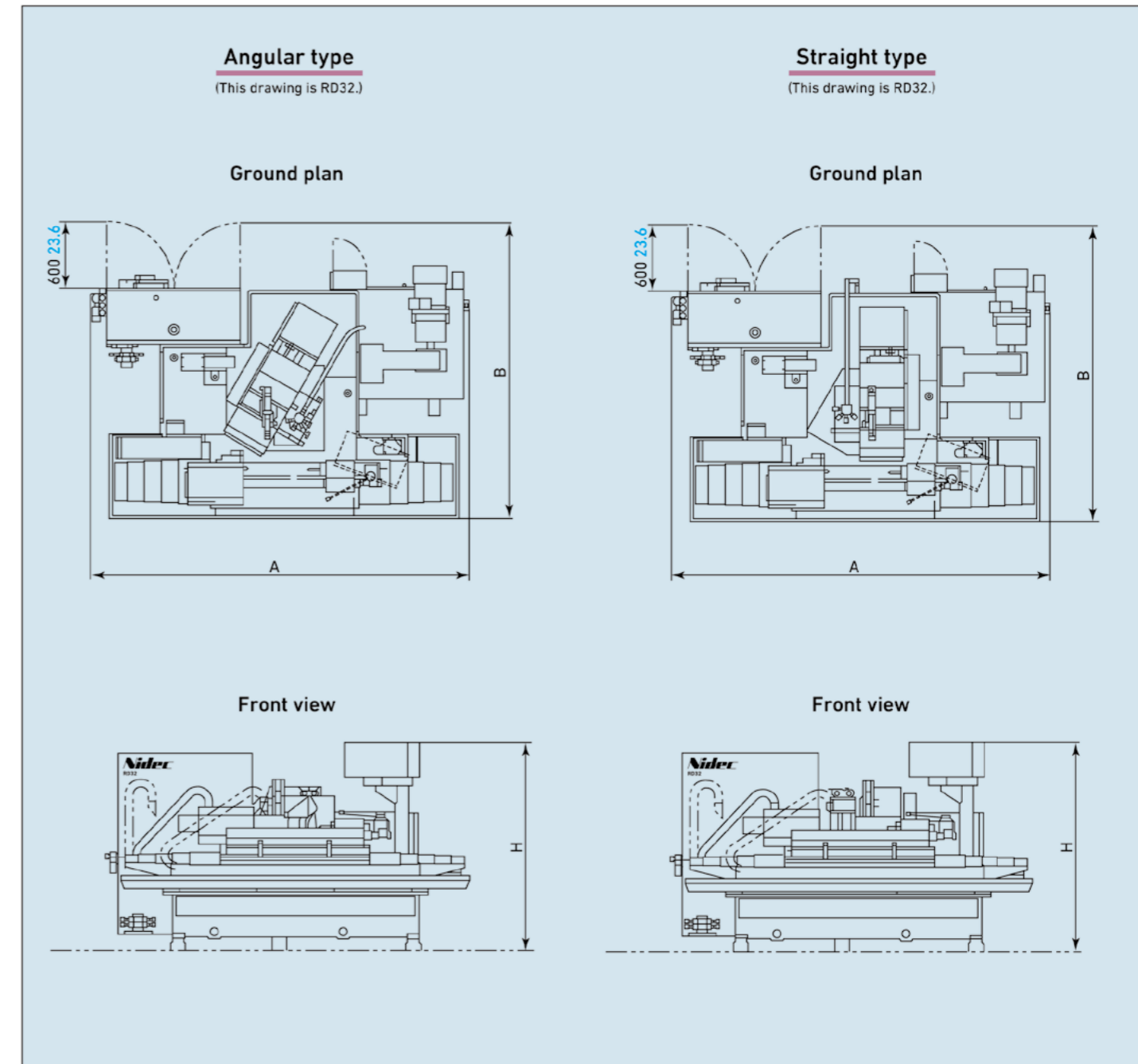
MAIN SPECIFICATIONS

Item	Model	RD23	RD32
Work capacity	Wheel slide type	Angular/straight	
	Swing	mm in	$\phi 230$ $\phi 9.1$
	Center distance	mm in	350 13.8
	Max. workpiece dia.	mm in	$\phi 150$ $\phi 5.9$
Max. mass of workpiece	kg lb	80 176	150 331
Wheel	External dia.	mm in	$\phi 405$ $\phi 15.9$ ($\phi 455$ $\phi 17.9$)
	Internal dia. x width	mm in	$\phi 127$ $\phi 5.0 \times 50$ 2.0 (75 3.0)
	Peripheral speed	m/s SFPM	45 8,800 (60 11,800)
Wheel spindle stock (X axis)	Rapid traverse	m/min fpm	$\phi 20$ $\phi 65.6$
	Feed rate	mm/min ipm	$\phi 0.001$ $\phi 0.00004$ - $\phi 20,000$ $\phi 787.4$
	Command unit	μ in	$\phi 0.1$ $\phi 0.000004$
Table (Z axis)	Rapid traverse	m/min fpm	20 65.6
	Feed rate	mm/min ipm	$\phi 0.001$ $\phi 0.00004$ - $\phi 20,000$ $\phi 787.4$
	Command unit	μ in	0.1 0.000004
Headstock	Work spindle speed	min ⁻¹	8-800
	Number of speeds		Infinitely variable
	Center taper		MT No.4
Tailstock	Stroke	mm in	150 5.9 (including 35 1.4 normal stroke)
	Clamping method		Spring
	Horizontal feed method		Manual lever
	Center taper		MT No.4
Taper fine adjustable amount	mm in	± 0.125 ± 0.005	± 0.125 ± 0.005
Dresser		Single point dresser holder	Single point dresser holder
Motor	Wheel (continuous rating)	kW HP	3.7 5.0 (5.5 7.4)
	Main (continuous rating)	kW HP	1.6 2.1
Power source capacity	kVA	12[B] 17[H]	16[B] 26[H]
Workpiece center height	mm in	1,000 39.4	1,105 43.5
Mass of machine	kg lb	3,000 6,620	4,500 9,920

Note: Options shown in parenthesis ().
[B]: High rigid ball bearing type [H]: Hydrostatic bearing type

MACHINE DIMENSIONS

Unit: mm in



Angular type

RD23					
Wheel bearings	Machine model	Center distance	Width: A	Depth: B	Height: H
Hydrostatic	RD23-H35A	350 13.8	2,598 102.3	2,968 116.9	1,715 67.5
High rigid ball	RD23-B35A				

RD32					
Wheel bearings	Machine model	Center distance	Width: A	Depth: B	Height: H
Hydrostatic	RD32-H50A	500 19.7	3,403 134.0	2,865 112.8	1,875 73.8
	RD32-H100A	1,000 39.4	4,570 179.9		
High rigid ball	RD32-B50A	500 19.7	3,403 134.0	2,675 105.3	
	RD32-B100A	1,000 39.4	4,570 179.9		

Note: Dimensions are subject to change without notice.
In case of hydrostatic bearing, the depth becomes about 1,000 mm 39.4 in longer.

Straight type

RD23					
Wheel bearings	Machine model	Center distance	Width: A	Depth: B	Height: H
Hydrostatic	RD23-H35A	350 13.8	2,598 102.3	2,968 116.9	1,715 67.5
High rigid ball	RD23-B35A				

RD32					
Wheel bearings	Machine model	Center distance	Width: A	Depth: B	Height: H
Hydrostatic	RD32-H50A	500 19.7	3,403 134.0	2,865 112.8	1,875 73.8
	RD32-H100A	1,000 39.4	4,570 179.9		
High rigid ball	RD32-B50A	500 19.7	3,403 134.0	2,675 105.3	
	RD32-B100A	1,000 39.4	4,570 179.9		

● STANDARD EQUIPMENT

- Wheel spindle
- High-precision ball bearing or high-precision static pressure bearing
- Dead center headstock
- Tailstock (manual, lever type)
- Infinitely variable speed spindle drive
- Workpiece taper fine adjustment mechanism
- Single point diamond nib holder (headstock mounted)
- Automatic dressing compensation
- Wheel spindle stock emergency return LS
- Wheel-spindle-stock mounted longitudinal locator (general-purpose locator)
- 45 m/s 8,800 SFPM wheel guarding
- Wheel flange
- Coolant nozzle for grinding wheel
- Balancing arbor
- Wheel flange lifter
- Work light
- Center for headstock
- Center for tailstock
- Single point diamond nib
- Grinding wheel (standard product)
- Standard tools
- Main operation panel with color LCD
- Shock sensor for collision avoidance
- Contact detector for high-speed wheel feeding
- Spindle motor overload detector
- Monitoring program
- Memory battery backup
- 100-step grinding cycle memory
- Plunge grinding cycle
- Traverse grinding cycle
- Radius grinding cycle (concave and convex)
- Taper grinding cycle
- Free form grinding cycle
- Shoulder grinding cycle
- Standard dress cycle
- Programmable multi-step dress cycle
- Longitudinal positioning cycle
- Manual process overriding
- Magnetic coolant separator
- Open-type splash cover
- Fixed-type front cover
- Coolant flushing on bed
- Multi-task
- Manual pulse generator
- Automatic programming
- Software counter
- Ethernet interface (RJ-45)
- Flash memory card

● OPTIONAL EQUIPMENT

The optional items shown in red are to replace the corresponding standard equipment.

Tooling

- Temporary workpiece holder
- **Wide wheel specifications**
- **Narrow wheel specifications**
- **Expanded wheel diameter specifications**
- **Special center**
- **Live center**
- One-touch driver
- Hydraulic spring type chuck (for dead center headstock)
- **Three-jaw scroll chuck (for live and live & dead headstocks)**
- Manual mandrel
- Collet chuck
- Pin driver
- Hydraulic mandrel
- Spindle positioning device
- Automatic center lubrication
- Spare single-point diamond nib
- Spare diamond roll
- Spare wheel flange

Automatization & Productivity

- Automated tailstock
- Automatic center lubrication
- **Manual door**
- **Automatic door**
- Automatic sizing gauge
- Multi-step sizing gauge
- **Table-mounted longitudinal locator**
- Tower lamp (three-column type: error, completed, in-operation)

- Air pressure sensor
- Air blow
- Quality check counter
- Minimum wheel diameter check
- Sub-control panel (startup and return)

Auto Loader

- Gantry-type auto-loader
- Bed mounted two-gripper auto-loader
- Interface for loader
- Safety guarding for loader
- Loading robot
- Workpiece turn-over device
- Workpiece reverser
- Constant delivery unit
- Pallet changer
- Loader/unloader pallet
- Flat conveyer
- Lift & carry conveyer
- Pallet-type conveyer

General-purpose

- **Live headstock**
- **Live/dead headstock**
- **Tailstock with automatic center distance adjustment**
- **Long-stroke tailstock**

High-Precision/Special Grinding

- Steady rest
- Hydraulic rest

- **CBN wheel specifications**
- **Rotary dresser**
- **Two-head nib holder**
- Variable wheel speed (inverter)
- Wheel speed change
- Automatic sizing gauge (high-precision type)
- Width sizing gauge
- **Magnet/paper coolant separator**
- **Coolant temperature controller**
- **Larger capacity coolant system**
- **Medium pressure coolant unit**
- Warming-up timer

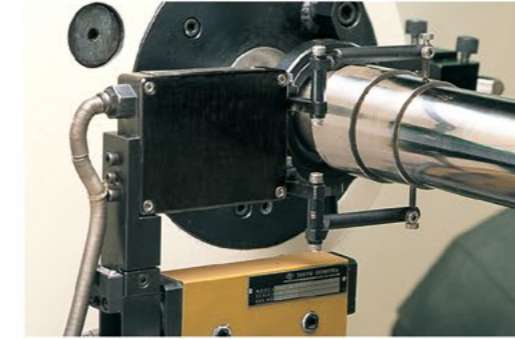
Safety & Clean

- Jib crane for wheel change
- Cycle-time-over indication (alarm lamp)
- Safety shutter for wheel intervention avoidance
- Workpiece clamp detection
- Automatic power shut-off
- Full enclosure cover
- Door interlock
- Mist collector
- Balancing stand

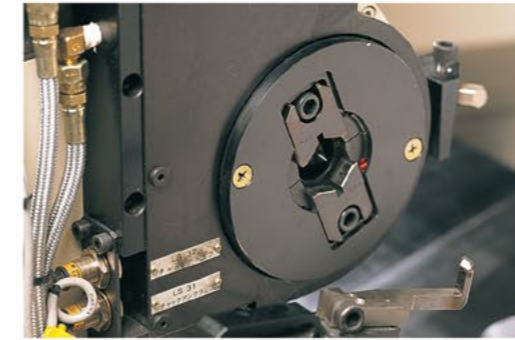
Others

- Coolant flushing
- Accumulation timer
- Watt-hour meter
- RS232C communication function

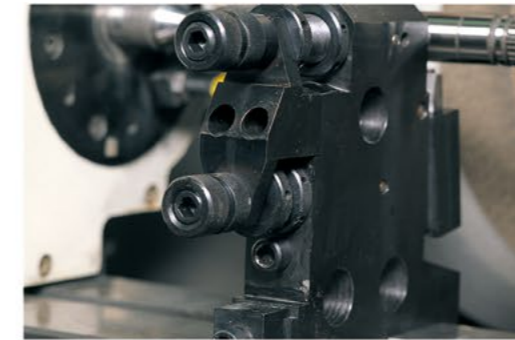
● OPTIONS



Automatic sizing gauge



Hydraulic spring type chuck



Steady rest



Gantry type two-gripper traveling auto-loader



Bed-mounted two-gripper auto-loader

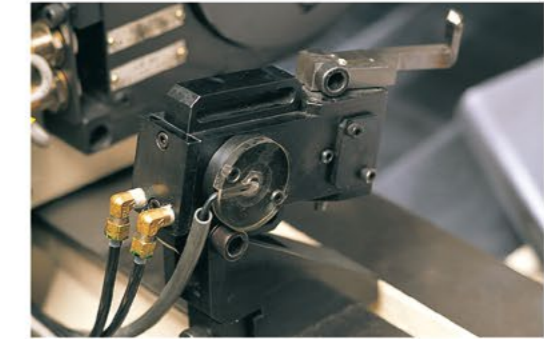


Table-mounted longitudinal locator



Temporary workpiece holder



Jib crane for wheel change



Two-head type single-point dresser holder



Magnet/paper coolant separator



Inquiry

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Machine specifications such as dimensions etc., are fixed using SI units including the metric system.
In case data are shown in other units in blue, such as inches, pounds and gallons etc. they are for reference only and the formal data
in black supersedes any equivalent data given in blue when fractions caused by conversion become an issue.
Specifications are subject to change without prior notice.
The export of this product is subject to Japanese Governmental approval.