Nidec Machine Tool Corporation

October 15, 2026

Nidec Machine Tool Launches New Mass-Production Internal Gear Grinding Machine "ZI35A" Compatible with Large Internal Gears up to 350 mm Outer Diameter

— Achieving High-Precision and High-Efficiency Mass Production for Robot Reducers and Large Automotive Ring Gears —

Nidec Machine Tool Corporation has developed the "ZI35A," a new mass-production internal gear grinding machine designed for high-speed, high-precision processing of internal gears up to 350 mm in maximum outer diameter, responding to the growing demand for high precision in large ring gears (internal gears) used in industrial robots, automobiles, and other applications.

Based on the existing "ZI25A" *1model—which features a world-first machining system patented by Nidec—the ZI35A enhances capacity for larger gear diameters. Furthermore, it newly incorporates a standard "Table Axis Tuning Function" developed to stabilize machining accuracy. In addition to automation such as automatic workpiece*2 loading and unloading, usability has been significantly improved through redesigned control panels and interactive software.

The ZI35A expands the machining range for large internal gears while contributing to higher efficiency, automation, and labor savings on production floors.

At JIMTOF2026, the company will demonstrate automatic grinding wheel arbor changing using a collaborative robot, proposing next-generation gear processing solutions.

Internal Gear Grinding Machine「ZI35A」

High-efficiency grinding using a barrel-shaped threaded grinding wheel (Generating grinding process)

Key Features

1. High-Precision, High-Efficiency Machining of Large Internal Gears

1. **Expansion of Maximum Outer Diameter to 350 mm**

   The machine accommodates gear outer diameters up to 350 mm and modules from 1 to 4. Expanding the outer diameter by 100 mm compared to the existing model (ZI25A) enables processing of large ring gears used in robot reducers, automobiles, and other machinery.

2. **High-Rigidity Structure for Increased Load Mass**
   A large, high-rigidity table axis capable of supporting a maximum load mass of 200 kg has been adopted. It achieves stable, high-precision machining even under high-speed rotation, with a maximum table rotational speed of 3,500 min^{-1} and a maximum grinding wheel spindle speed of 15,000 min^{-1}. Furthermore, automated transfer of gears weighing up to 20 kg is supported, capable of mass production.

3. **High-Precision, High-Efficiency Processing via Proprietary Generating Grinding Technology**
   In addition to generating grinding that precisely synchronizes the grinding wheel spindle and table axis, the machine utilizes a patented barrel-shaped threaded grinding wheel whose diameter continuously decreases from the center toward both ends. Setting a large axis crossing angle of 20 to 35 degrees between the grinding wheel spindle and workpiece axis increases sliding velocity (grinding speed), achieving highly efficient machining.

4. **Simplified Precision Control of Grinding Wheels and Dressers**[*3]
   Dressing (re-shaping) can be performed without removing the grinding wheel from the machine. In addition to the standard dressing gear method, an optional dedicated (rotary) dressing device can be mounted. Increasing the maximum dresser spindle speed to 6,000 min^{-1} (approximately double the conventional rate), combined with high mechanical rigidity, improves dressing precision and extends tool life, facilitating easier precision control of grinding wheels and dressers.

5. **Thermal Displacement Compensation Device (Optional) Supporting Long Continuous Operation**
   A touch-probe thermal displacement compensation device that measures fixture outer diameters is available as an option. By measuring the fixture outer diameter prior to machining and compensating the center distance between the grinding wheel and gear, changes in BBD (Between Balls Diameter)[*4] during extended continuous operation are suppressed, enabling consistent machining accuracy.

2. Enhanced Operability and Maintainability

1. **Newly Developed "Table Axis Tuning Function" Included as Standard**
   A newly developed "Table Axis Tuning Function" that automatically optimizes table axis servo parameters is included as standard equipment. Servo parameters that adapt to changes in inertia (moment of inertia) caused by fixture or workpiece changes can be easily optimized to expert levels, suppressing issues such as table axis oscillation and degraded machining accuracy.

2. **Improved Usability through Refreshed Control Panels and Interactive Software**
   A large 21.5-inch LCD screen expands the display area for interactive software. Operator visibility and operability are substantially improved through active use of softkeys, continuous display of dressing status, and automatic gear meshing using AE sensors[*5]. Furthermore, visualizing coolant tank conditions and temperature data for the grinding wheel and table spindles on-screen helps operators accurately monitor operating status and enhances maintainability.

Main Specifications

Item	ZI35A
Max. Workpiece Outer Diameter	φ350 mm
Machinable Module	1–4 (Module 5 available depending on conditions)
Max. Grinding Wheel Spindle Speed	15,000 min^{-1}
Max. Table Speed	3,500 min^{-1}
Max. Table Load Mass	200kg
NC Control Unit	FANUC Series 31i-B5 Plus（7 axes / OPT 8 axes）
Machine Installation Dimensions (Standard)	W 5,510 × D 5,450 × H 3,300 mm
Machine Mass	Approx. 15,000 kg

Notes:

*1 **ZI25A:** The successor to the first-generation ZI20A, inheriting the grinding technology described in section 1-(3).

*2 **Workpiece:** The object to be machined (gear).

*3 **Dressing / Dress:** The operation or process of conditioning the grinding wheel surface to restore cutting sharpness and profile. The tool or device used is called a dresser.

*4 **BBD (Between Balls Diameter):** A measurement method where two balls are placed in diametrically opposed tooth spaces of a gear to measure the distance between them. It is an index used to evaluate tooth thickness and gear machining accuracy.

*5 **AE Sensor:** A sensor that detects minute elastic waves (Acoustic Emission) generated upon contact between the grinding wheel and the workpiece or dresser.

Contact Information

Nidec Machine Tool Corporation:
https://www.nidec.com/en/products/machine-tools/inquiry/request/contact_form/