NIIGATA MACHINE TECHNO CO., LTD.
1300 Okayama, Higashi-ku, Niigata city, Niigata pref,
950-0821 Japan
Phone: +81-25-270-9011    Fax: +81-25-271-5827
http://www.n-mtec.com

NIIGATA MACHINE TECHNO USA, INC.
1501 Landmeier Road
Elk Grove Village, IL 60007
630-283-5880

NIIGATA MACHINE TECHNO (SHANGHAI) CO., LTD.
1F-1A, No. 2, 1245 Zhong Shan Road (West), Changning District,
Shanghai, 200051, China
Phone: +86-21-6115-6925   Fax: +86-21-6115-6926

The contents herein are subject to change without notice.
All non-metric values are converted from metric measurements.

NIIGATA MACHINE TECHNO CO., LTD.
Niigata, Japan
HEAVY DUTY BOXWAY STYLE MACHINE CONSTRUCTION

As Niigata’s tradition, guide ways are a combination of hardened and ground hand-scraped turcite ways that provide superior stability and vibration dampening characteristics as well as a long life. The cross section of the rectangular guide ways are thick and wide for maximum machine rigidity.

NIIGATA’S SOLUTION FOR EFFICIENT MACHINING OF COMPLICATED-FORM AND 3D CURVES COMPONENTS

Simultaneous 5-axis machining achieves improved cycle time and machined surface.

NIIGATA’S SOLUTION FOR PROCESS INTEGRATION

5-face machining achieves reduced number of setup and simplified fixtures for a significant reduced changeover time.

The Model HN-5X series is the result of NIIGATA’s constant research and development for profitable machining of various components. Key development criteria for the “HN-5X” series were: higher productivity and increased accuracies. NIIGATA, a world leader of horizontal machining centers, is proud to declare that the model HN-5X series, a new design achieving significant performance advances, will satisfy all requirements of your machining needs.

5-AXIS TRUNNION HORIZONTAL MACHINING CENTER WORLD CLASS PRODUCTIVITY — NIIGATA NEW MODEL HN-5X SERIES

LARGEST WORK
HEAVY DUTY
MACHINE RIGIDITY

HIGH RIGID, HEAVY DUTY
5-AXIS TRUNNION
HMCs Solution for
AIRCRAFT, AUTOMOBILE, POWER
GENERATOR, DIE & MOLD and
SEMICONDUCTOR.

— NIIGATA NEW MODEL HN-5X SERIES

5-AXIS TRUNNION HORIZONTAL MACHINING CENTER

HIGH RIGID, HEAVY DUTY
5-AXIS TRUNNION
HMCs Solution for
AIRCRAFT, AUTOMOBILE, POWER
GENERATOR, DIE & MOLD and
SEMICONDUCTOR.

5-axis

LARGEST WORK
HEAVY DUTY
MACHINE RIGIDITY

HN50E-5X

TRAVEL
X-axis 800mm (31.5”)
Y-axis 930mm (36.6”)
Z-axis 830mm (32.7”)

Max Workpiece Swing Diameter
750mm (29.5”)
Height 700mm (27.6”)
Weight 600kg (1320 lbs)

HN63E-5X

TRAVEL
X-axis 900mm (35.4”)
Y-axis 930mm (36.8”)
Z-axis 830mm (32.7”)

Max Workpiece Swing Diameter
950mm (37.4”)
Height 800mm (31.5”)
Weight 1000kg (2200 lbs)

The Model HN-5X series is the result of NIIGATA’s constant research and development for profitable machining of various components. Key development criteria for the “HN-5X” series were: higher productivity and increased accuracies. NIIGATA, a world leader of horizontal machining centers, is proud to declare that the model HN-5X series, a new design achieving significant performance advances, will satisfy all requirements of your machining needs.
DESIGNED AND BUILT FOR ACCURACY, HEAVY DUTY METAL CUTTING

NEWLY ENGINEERED MACHINE RIGIDITY
Niigata’s reputation for superior machine rigidity and excellent cutting capability is widely accepted in the market place. All major components, such as the spindle, bed and column have been engineered to maximize metal cutting efficiency. Solid and well-balanced components satisfy wide variety of production needs.

SUPERIOR FEATURES OVER THE 3-AXIS AND 4-AXIS MACHINES
- Efficient Machining
  Complicated-form components such as Impellers and Turbine blade.
  3D curved components such as dies and molds.
- Improved machining accuracy
  Better cutting conditions.
  Superior accuracy.
- Process integration
  Reduced number of setup.
  Simplified fixtures.

3-AXIS AND 4-AXIS MACHINES
- Niigata’s unique design: Bifurcated Bell-shaped Column

5-AXIS MACHINES
- Niigata’s OWN DESIGN HEAVY DUTY 5 AXIS TRUNNION TABLE
  Both ends supported by High Load Type Roller BRG and Double-Lead Worm Gear system to achieve heavy duty machining capability.

SCALE FEEDBACK SYSTEM AS STANDARD
HN-5X series is equipped with optical scale feedback system (on X, Y, Z axes) and inductive scale feedback system (on A, B axes) as standard. This feature provides consistent long life dynamic machine accuracy.

SIMULTANEOUS 5-AXIS MACHINING ACCURACY RESULTS (HNS0E-5X)
ALUMINIUM CONE one cutting (End Milling)
Roundness: 0.0054mm (0.00021”)
Tolerance: 0.020mm (0.000787”)
Material: A5052 (Alminium)
Processing Dia.: Φ150 (5.91”)
V= 300m/min (984 SFM)
F= 640mm/min (25 ipm)
t = 0.1mm/min (0.004”)

Niigata’s unique design: Bifurcated Bell-shaped Column
OUTSTANDING CHIP REMOVAL PROVES
SUBSTANTIAL MACHINE RIGIDITY

HIGH TORQUE HEAVY DUTY SPINDLE

The spindle head stock is mono-cast (single piece) castings to achieve heavy and powerful milling capability and greater accuracy than bolt-together type spindle heads. This high performance spindle, power, and torque complements the extremely rigid machine frame.

A variety of high performance spindles are also available such as 8000min⁻¹ (rpm) High Power Spec. 12000min⁻¹ (rpm) High Speed Spec. to meet your production needs.

POWERFUL GEARED SPINDLE

Full 26kW (35HP) cuts are achieved through an advanced two(2) range head stock. With only three(3) rotating components, maximum power is transmitted simply and efficiently to the cutting tool.

SPINDLE SPEED AND TORQUE DIAGRAM

6000min⁻¹ 'SPINDLE (Standard)'

EXAMPLE OF MACHINING PERFORMANCE (HN50E-5X)

Milling

Y-axis Height $H=200$ mm (7.87”)

Material : S48C

Tool : $\Phi 160-8T$

Cutting Volume : 518 cm³/min (31.6 inch³/min)

Cutting Depth : 6 mm (0.236”)

Feedrate : 720 mm/min (28.3 ipm)

Spindle Speed : 300 min⁻¹ (300 rpm)

Surface Speed : 150 m/min (492 SFM)

Spindle Load : 901 N·m (665 ft.lbs)

Power : 26 kW (35 HP)

Drilling

Y-axis Height $H=550$ mm (21.65”)

Material : S48C

Tool : $\Phi 29$ drill (1.14”)

Cutting Volume : 105 cm³/min (6.4 inch³/min)

Tool length : 240 mm (9.44”)

Spindle Load : 44 %

Spindle Speed : 1592 min⁻¹ (1592 rpm)

Surface Speed : 145 m/min (475 SFM)

Niigata HN-Series Referenced Supply Industries

Power generation as well as aircraft industries in the field of "Turbine Blades" machining is key industry. Niigata’s heavy duty box way style horizontal machining centers have been well accepted and have been improving the capability of these industries world wide.
EXCELLENT ACCESSIBILITY TO THE WORK ZONE
Large sliding operator door allows easy and safe access to the machining area.

PALLET CHANGER
The APC is capable of indexing every 90 degree with foot pedal, so that multiple workpiece can be easily mounted on each position.

NEW GENERATION OPERATION PANEL WITH 15”COLOR LCD
HN-5X series is equipped with NEW generation operation panel with 15” color LCD as standard. The control panel is strategically located at the most convenient position and the operator can easily monitor the workpiece and machining operations, while utilizing the control functions.

SAFE AND CONVENIENT SETUP OF TOOLING
The tool magazine is on the side of the machine, outside the chip enclosure, and away from the cutting area. This design permits easy accessibility for tool inspection and replacement. Jog rotation of the tool magazine during automatic cycles facilitates tool inspection and changeover to maximize utilization. The load/unload station is located at a comfortable height for operator safety and ease.

SAFE AND CONVENIENT SETUP OF TOOLING
The tool magazine is on the side of the machine, outside the chip enclosure, and away from the cutting area. This design permits easy accessibility for tool inspection and replacement. Jog rotation of the tool magazine during automatic cycles facilitates tool inspection and changeover to maximize utilization. The load/unload station is located at a comfortable height for operator safety and ease.

HIGH RELIABILITY AND EASE OF MAINTENANCE

QUICK AND EASY 5-AXIS COMPENSATION FUNCTION
Probe and a true sphere search the center of A, B-axis rotation. Compensate for gap of A, B-axis rotation center. Maintain high accuracy over long periods.

FAST AND RELIABLE TOOL CHANGE SYSTEM
Tool magazine is driven by a servo motor for fast and reliable indexing. An electric servo motor positions the tool loader, insuring fast, smooth motion during a tool change. The tool inspection and loading/unloading during automatic operation are standard features. The tool magazine and the changer are free standing and are covered with a full enclosure. The ATC system is field expandable.

EXCELLENT CHIP REMOVAL
Roof type X axis cover and slanted Z axis cover make chips drop into large coil augers equipped on column both sides and X axis base. Those augers remove chips outside the machine.

DESIGN DETAILS FOCUSED ON OPERATOR FRIENDLINESS

HIGH RELIABILITY AND EASE OF MAINTENANCE

QUICK AND EASY 5-AXIS COMPENSATION FUNCTION
Probe and a true sphere search the center of A, B-axis rotation. Compensate for gap of A, B-axis rotation center. Maintain high accuracy over long periods.

FAST AND RELIABLE TOOL CHANGE SYSTEM
Tool magazine is driven by a servo motor for fast and reliable indexing. An electric servo motor positions the tool loader, insuring fast, smooth motion during a tool change. The tool inspection and loading/unloading during automatic operation are standard features. The tool magazine and the changer are free standing and are covered with a full enclosure. The ATC system is field expandable.

EXCELLENT CHIP REMOVAL
Roof type X axis cover and slanted Z axis cover make chips drop into large coil augers equipped on column both sides and X axis base. Those augers remove chips outside the machine.
MACHINE DIMENSIONS

HN63E-5X

Axis Travels

Maximum Workpiece Envelope

HN63E-5X General View

Standard Pallet Top Surface

Unit : mm(inch)

Coolant tank (excluding tank) (Type 380L)
WIDE RANGE OF OPTIONS TO ANSWER YOUR INDIVIDUAL MACHINING REQUIREMENTS

NIGATA HN-SERIES MODULAR DESIGN CONCEPT
FIELD EXPANDABLE ATC MAGAZINE

EXAMPLE OF AUTO TOOL CHANGE SYSTEM (Chain Type)

OPTIONAL FEATURES
- Multiple Pallet Magazine
- Carousel Type APC System
- Lift-up External Conveyor and Coolant Tank
- Linear Pallet Magazine System with Niigata ICC System Controller

MACHINE SPECIFICATIONS

STANDARD EQUIPMENT
- 6000min-1 (rpm) 26kW Two Geared Spindle
- Scale Feedback System X, Y, Z, A, B axes
- Shuttle Type Two Pallets Automatic Pallet Changer (2APC)
- Idle Self Rotation on 2APC System
- Two Pallets with Tap and Holes as per Niigata Standard Configuration
- Automatic Tool Change with 62 Tool capacity (ATC)
- Spindle Cooling Unit Controlled by a Thermal Sensor in the Machine Base
- Full Enclosure-Type Splash and Chip Guarding System with LED Work Light (SPG)
- Front and Rear Spiral Chip Augers
- Built into the Machine Bed
- Rigid Tapping
- Manual Pulse Generator with XYZ2AB axes
- Spindle Speed / Load Meter with Override on NC Control Display
- Flood Coolant System
- Coolant Tank
- Work Completion and Emergency Stop
- Automatic Power Off Device
- Door Interlock for 2APC, SPG, ATC and Electrical Cabinet
- Self Diagnostics Function
- 2APC Program Number Search (with 2APC)
- Renishaw A,B-axis compensation function with probing function
- Fanuc CNC System with 15” Color LCD Display
- One set of Machine and Fanuc Manuals (1 printed, and 1CD)
- Installation Parts

OPTIONAL FEATURES
- ATC MAGAZINE (Field Expandable)
  - 48 Tools Magazine
  - 128 Tools Magazine
  - 175 Tools Magazine (88+88 Tools)
  - 255 Tools Magazine (128+128 Tools)
- Matrix Style ATC System
- Cnc-Style Twin Pallets Automatic Pallet Changer (2APC)
- Linear Pallet Magazine (LPM) System with Niigata Intelligent Cell Controller (ICC)
- Extra Pallet
- T-slotted Pallet (Restriction of Max Load on the Pallet may Apply)

COOLANT SYSTEM
- Shower Coolant system
- Coolant Low Level Sensing Device
- Oversized Coolant Tank
- Spindle Cooling Unit
- Coolant Tank
- Chip Breakage Detector System

CUTTING MONITORING FUNCTION
- Advanced Unmanned Monitoring System: Niigata NM24 Monitor Ace

CHIP REMOVAL
- Lift-Up External Conveyor Hinge Pan Type
- Chip Lift-Up External Conveyor with Chip Bucket Caster and Handles

GENERAL
- 31/2” 230 mm
- 36” x 36” 914 mm x 914 mm
- 36” x 914 mm 914 mm x 914 mm
- 48” x 48” 1219 mm x 1219 mm
- 48” x 914 mm 914 mm x 1219 mm
- 48” x 24” 1219 mm x 610 mm
- 48” x 610 mm 610 mm x 1219 mm
- 60” x 60” 1524 mm x 1524 mm
- 60” x 1219 mm 1219 mm x 1524 mm
- 60” x 610 mm 610 mm x 1524 mm
- 60” x 1524 mm 1524 mm x 610 mm
- 96” x 96” 2438 mm x 2438 mm
- 96” x 2438 mm 2438 mm x 2438 mm

Figures in [ ] install the optional features.