



A World Leader of Horizontal Machining Centers



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NIIGATA UNMANNED SYSTEM



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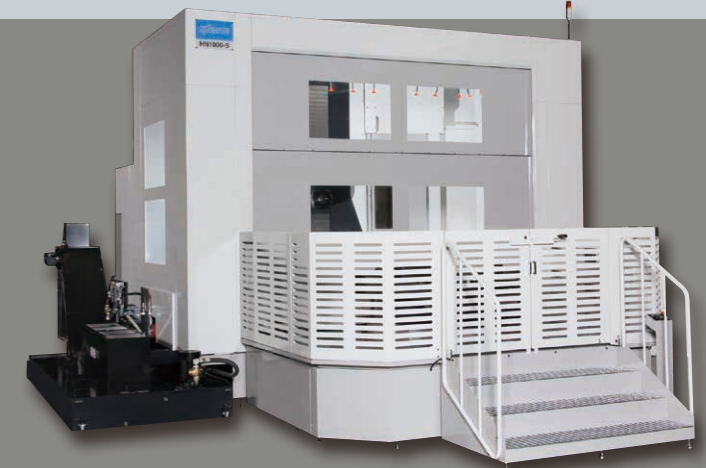
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HN-S

HN800-S / HN1000-S / HN1250-S / HN1600-S

UNRIVALED PERFORMANCE — HEAVY DUTY HIGH PRODUCTION TYPE
HORIZONTAL MACHINING CENTER



NIIGATA MACHINE TECHNO CO., LTD.

Niigata, Japan

NIIGATA'S TECHNICAL INNOVATION LEADS TO A NEW GENERATION WORLD CLASS PRODUCTIVITY — NIIGATA MODEL S

The model S is the result of NIIGATA's constant research and development for profitable machining of large components. Key development criteria for "S" series were: larger capacity, higher productivity, and reduction of cutting and non-cutting time.

NIIGATA, a world leader of horizontal machining centers, is proud to declare that the model S, a new design achieving significant performance advances, is built to support your production needs.

LARGEST WORK ENVELOPE IN ITS CLASS

Niigata is known for large envelopes in each model. Consider the travel and workpiece size below.

Many parts, which previously required one size larger machine, now will fit on this Niigata workhorse.

The upgraded capacity offers superior price/performance and quicker ROI.

HN800-S

TRAVEL	X axis	1530mm (60.2")
	Y axis	1230mm (48.4")
	Z axis	1020mm (40.2")

Max Workpiece Swing Diameter
1750mm (68.9")

Max Workpiece Height
1400mm (55.1")

HN1000-S

TRAVEL	X axis	2030mm (79.9")
	Y axis	1650mm (65.0")
	Z axis	1200mm (47.2")

Max Workpiece Swing Diameter
2300mm (90.6")

Max Workpiece Height
1850mm (72.8")

HN1250-S

TRAVEL	X axis	2200mm (86.6")
	Y axis	1800mm (70.8")
	Z axis	1200mm (47.2")

Max Workpiece Swing Diameter
2300mm (90.6")

Max Workpiece Height
2000mm (78.7")

HN1600-S

TRAVEL	X axis	3050mm (120.1")
	Y axis	2200mm (86.6")
	Z axis	1420mm (55.9")

Max Workpiece Swing Diameter
3200mm (126")

Max Workpiece Height
3000mm (118.1")



NEW

LARGEST WORK ZONE

HIGH PRODUCTIVITY

HIGH SPEED

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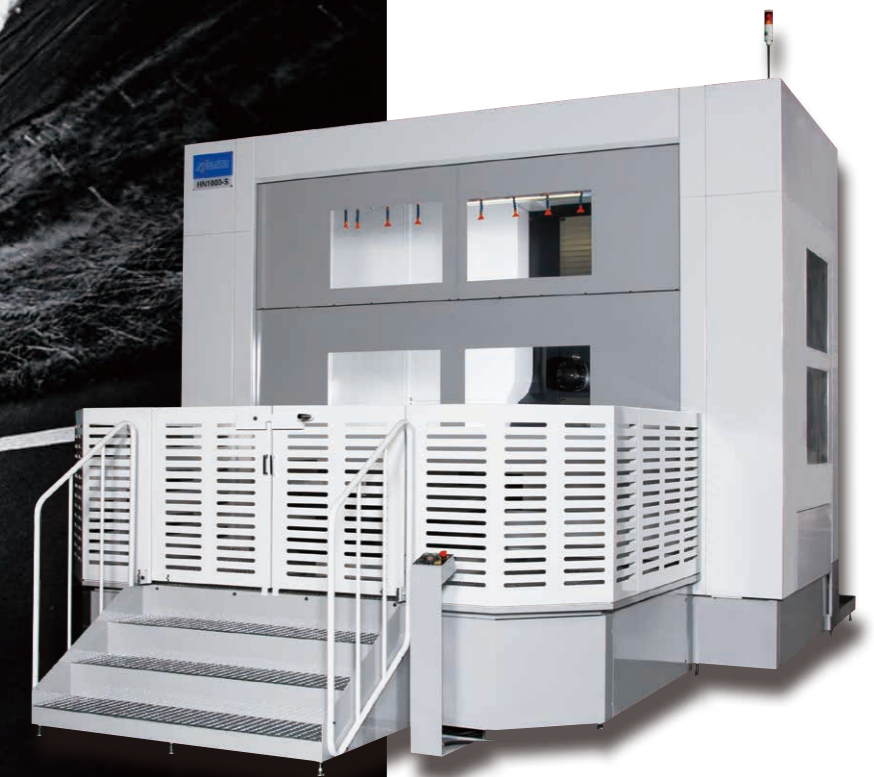
NIIGATA'S SOLUTION FOR EFFICIENT MACHINING OF LARGE/HEAVY COMPONENTS

New S-series employs ultra rigid roller guide system on X and Z axes and hardened and ground box way system on Y axis which maintain Niigata's tradition, maximum machine rigidity and the capability of heavy duty machining. Rapaid machine movement is reliably achieved in these large size horizontal machining centers. The best of both world comes true.

HIGH OUTPUT SOLUTION

High horse power and torque allow you to take full advantage of the rigid machine frame.

All Niigata models are highly reputed in the market for greater capability of heavy duty, high out-put machining.



PROFITABLE MACHINING OF LARGE COMPONENTS UNRIVALED PRODUCTIVITY — NIIGATA HN-S SERIES



- ✓ **LARGEST WORK ZONE**
- ✓ **HIGH PRODUCTIVITY**
- ✓ **HIGH SPEED**

FLEXIBILITY, PRODUCTIVITY AND ACCURACY LEADS TO HIGH PRODUCTION MACHINING

Until knowing capability of new S-Series from Niigata, materializing the capability of new S-Series from Niigata made the industry enjoy flexibility, productivity, and accuracy. The new S-Series with the ability to handle largest part envelope in its class will truly give you a machine with flexibility.

With a faster speed traverse rate in longer axes strokes your provided the capability to reduce your cutting and non-cutting times.

Niigata's tradition, highly reputed heavy duty machining capability has succeeded without any compromise. Niigata focused and emphasized the speed in the machining of larger components. The heavy duty machining capability and the high productivity comes true from NIIGATA.

More parts, less machining time and the need for fewer machines adds up to a faster return on your investment and more profits for your company.

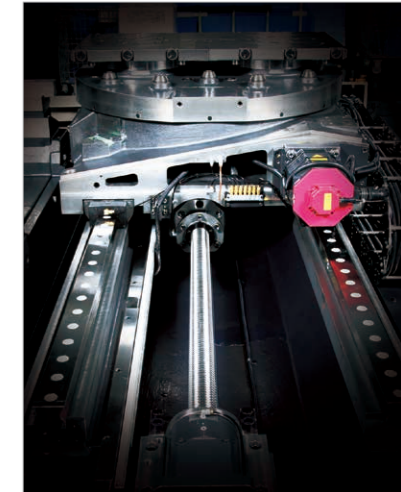
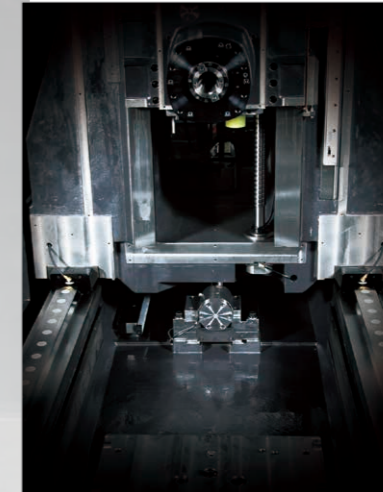
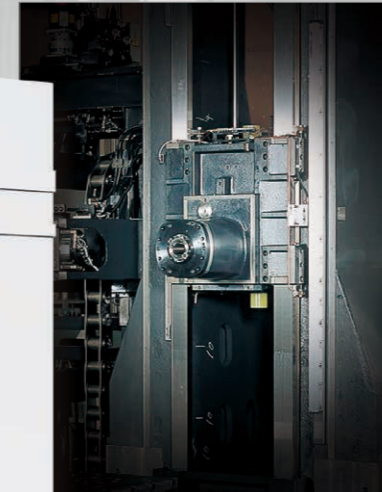
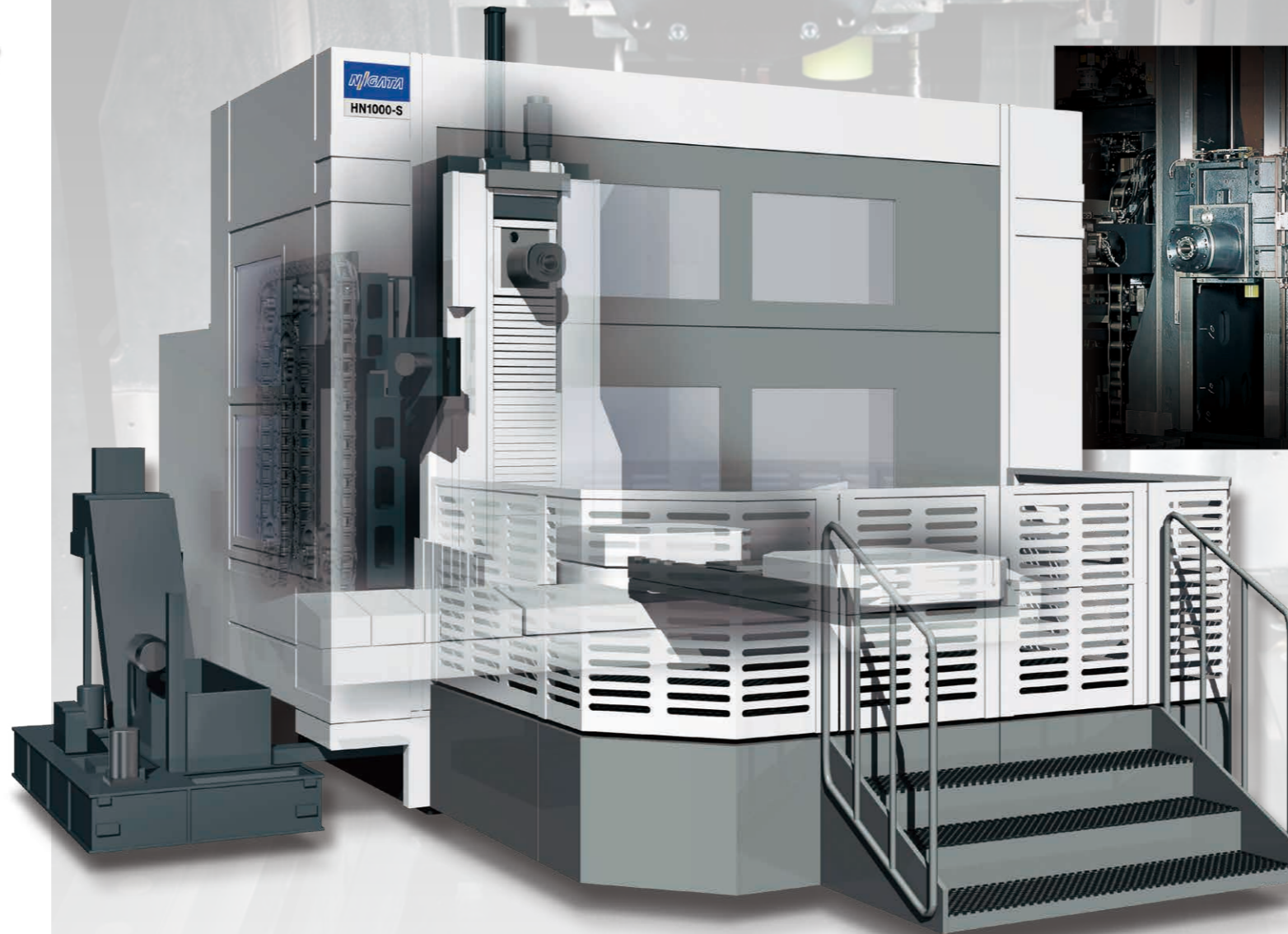
The new "NIIGATA HN-S Series" is the new world leader for the metalworking industries.

SOLID, WELL ENGINEERED COMPONENTS ACHIEVE ENHANCED PRODUCTIVITY

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, column and wing base of new HN-S Series, have been engineered to maximize metal cutting efficiency.



Niigata's unique design:
Bifurcated Bell-shaped Column



NIIGATA'S UNIQUE DESIGN "HYBRID STYLE" GUIDEWAY SYSTEM

Building on a century of machine design and innovation, Niigata is proud to be recognized as a world leader and specialist in horizontal Machining Centers. Niigata continues to innovate with the introduction of the new S-series hybrid construction guideway system.

Niigata's unique design hybrid guideway system employs ultra-rigid large roller guide system in the X & Z axes. There is no sacrifice of capability on heavy machining applications. The Y axis employs our traditional hardened and ground box way system, providing vibration dampening at the spindle tool point in a wide variety of machining applications. This improves the accuracy of the workpiece and tool life as well.

HIGH SPEED

Rapid traverse

HN800-S	50 m/min (1968 ipm)
HN1000-S	41 m/min (1614 ipm)
HN1250-S	41 m/min (1614 ipm)
HN1600-S	30 m/min (1181 ipm)

STURDY TABLE DESIGN SUPPORT HEAVIER LOAD CAPACITY

The pallet clamping system adopts a stable clamping plate that provides super stability of the pallet during heavy duty machining. Pallets are located with precision accuracy by cone-shaped tapered pins. the precision cone positioning system insures long-term accuracy and reliability.



HN800-S	: 2500kg (5500 lbs)
HN1000-S	: 3500kg (7700 lbs)
	/ Option 5000kg (11000 lbs)*1
HN1250-S	: 3500kg (7700 lbs)
	/ Option 5000kg (11000 lbs)*1
HN1600-S	: 8000kg (17600 lbs)*1
	/ Option 10000kg (22000 lbs)*1
	/ Option 14000kg (30800 lbs)*2

*1: Available with NC table only
*2: Available with NC table and shuttle APC

OUTSTANDING CHIP REMOVAL PROVES SUBSTANTIAL MACHINE RIGIDITY

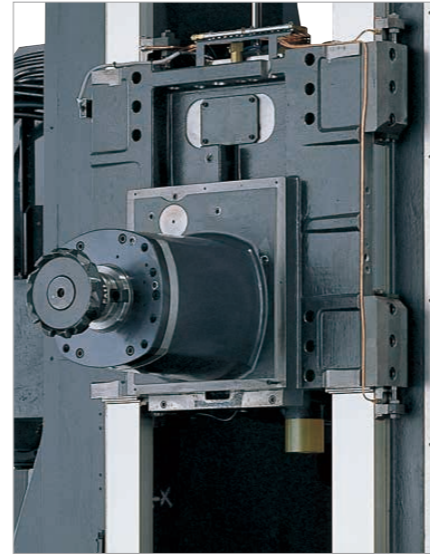


HIGH TORQUE HEAVY DUTY SPINDLE

	6000 min⁻¹ (rpm) Standard
POWER	37 kW (50 HP)
TORQUE	1200 N·m (886 ft.lbs)

The rugged and reliable spindle employs wide-spaced, super precision tapered roller and angular contact bearings with a 110 mm (4.33") diameter (ID). The spindle head stock is mono-cast (single piece) castings to achieve heavy and powerful milling capability. Greater accuracy is achieved versus

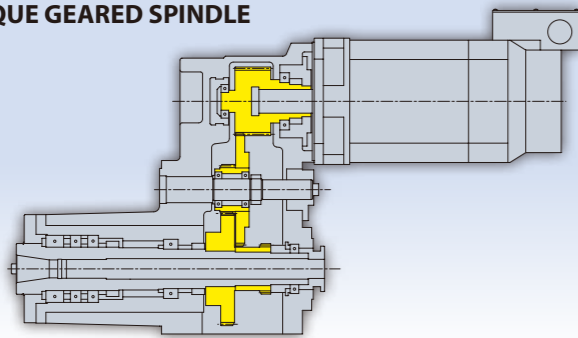
typical bolt together type spindle heads. This high performance spindle, power and torque complements the extremely rigid machine frame. Super High Torque also available for efficient machining of difficult materials such as Titanium inconel Hastelloy etc.



HIGH TORQUE GEARED SPINDLE

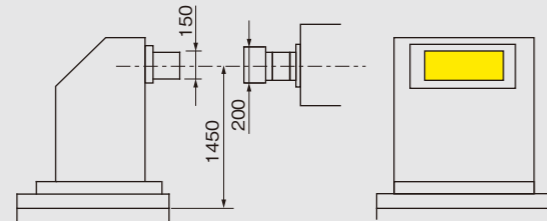
Full 37kW (50HP) cuts are achieved through an advanced (2) range head stock. With only (3) rotating components. Maximum power is transmitted simply and efficiently to the cutting tool.

HIGH TORQUE GEARED SPINDLE



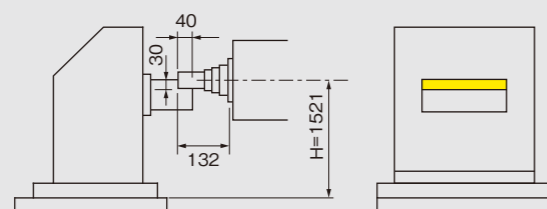
EXAMPLE OF HN1000-S's MACHINING PERFORMANCE

•Milling Cutter



- Material: S48 C (Steel)
- Tool: $\phi 200$ -10 T Milling Cutter
- Depth of Cut: 5 mm (0.197")
- Cutting Width: 150 mm (5.9")
- Spindle Speed: 250 min⁻¹ (250 rpm)
- Feed Rate: 875 mm/min

•End Milling



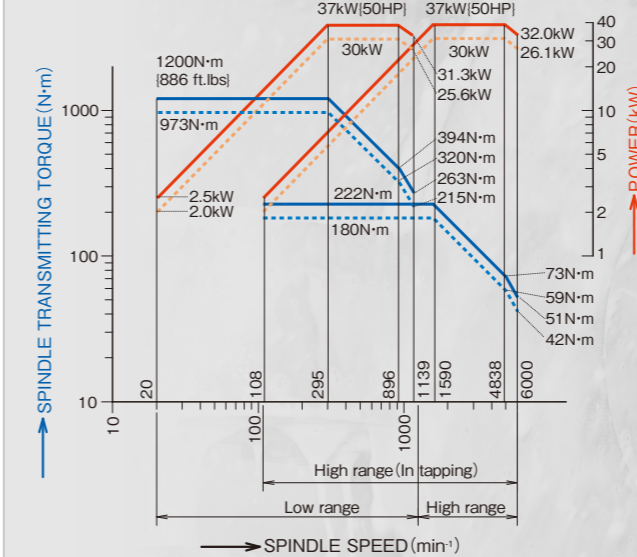
- Material: S48 C (Steel)
- Tool: $\phi 63$ -T4
- Spindle Speed: 707 min⁻¹ (707 rpm)
- Feed Rate: 565 mm/min
- Spindle Load: 77%

VARIETY OF HIGH PERFORMANCE SPINDLES

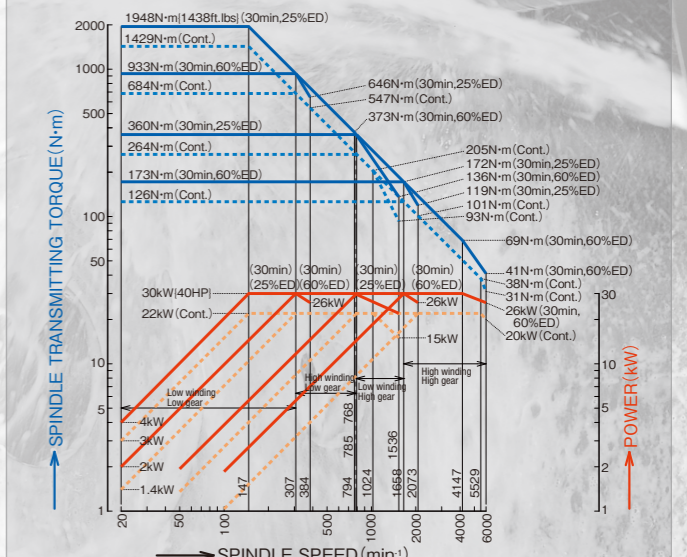
The spindle performance is a key features of the capability of the machine. The spindle provides Speed, Power, and Accuracy for a full range of cutting conditions. The Niigata high performance spindle power and torque complement the extremely rigid machine frame structure.

	① 6000 min ⁻¹ (rpm) Standard	② 6000 min ⁻¹ (rpm) Super High Torque Spec. (Option)	③ 6000 min ⁻¹ (rpm) Super High Power Spec. (Option)	④ 15000 min ⁻¹ (rpm) High Power Spec. (Option)
POWER	37 kW (50 HP)	30 kW (40 HP)	45 kW (60 HP)	45 kW (60 HP)
TORQUE	1200 N·m (886 ft.lbs)	1948 N·m (1438 ft.lbs)	1400 N·m (1033 ft.lbs)	400 N·m (295 ft.lbs)

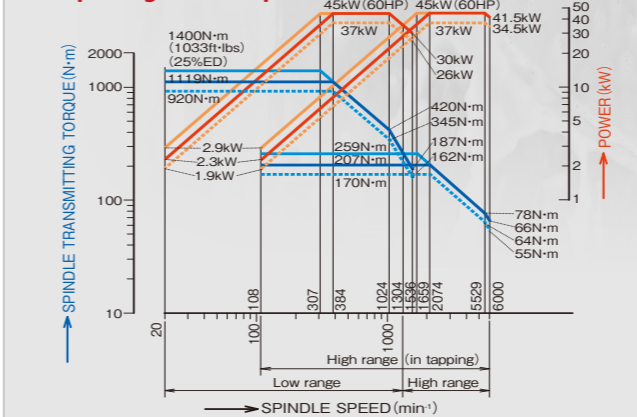
① SPINDLE SPEED AND TORQUE DIAGRAM Standard



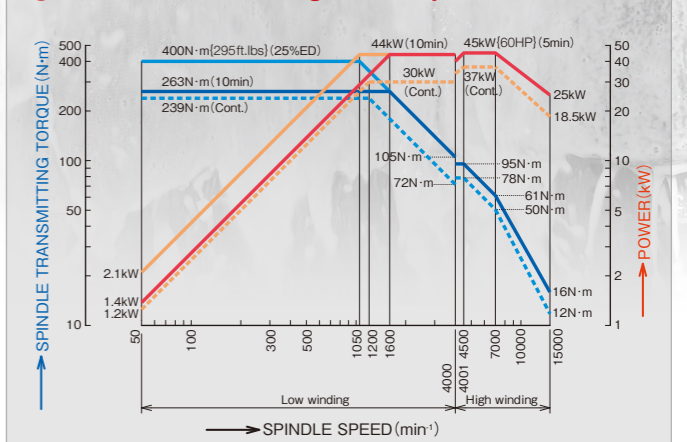
② SPINDLE SPEED AND TORQUE DIAGRAM Super High Torque Spec.



③ SPINDLE SPEED AND TORQUE DIAGRAM Super High Power spec.



④ 15000 min⁻¹ SPINDLE High Power Spec.



DESIGN DETAILS FOCUSED ON OPERATOR FRIENDLINESS



EXCELLENT ACCESSIBILITY TO THE WORK ZONE

Large sliding operator door allows easy and safe access to the machining area. A slanted ceiling of the enclosure minimizes coolant dripping on the operator.

WORK SETUP IS SAFE AND EASY

The reliable rotary type pallet changer system accommodates large fixtures and workpieces. Niigata's solution is the walk-around platform, which allows easy set-up and operator safety.

CENTRALIZED OPERATOR CONSOLE

The control panel is strategically located at the most convenient position so the operator can easily monitor the workpiece and machining operations, while utilizing the control functions.

Hand held manual pulse generator is compact and light for operator-friendly handling.

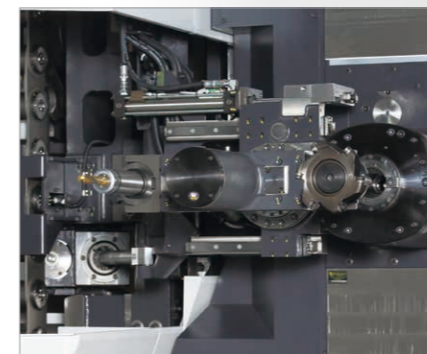
SAFE AND CONVENIENT SET-UP OF TOOLING

The tool magazine is on the side of the machine, outside the chip enclosure, and isolated 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 & EASY INSPECTION

Machine maintenance items such as lubrication control units and other devices are all located together at the rear of the machine for quick and easy inspection.

OIL-AIR LUBRICATION SYSTEM

This system automatically assures constant lubrication to the spindle bearings to prevent premature failure (versus grease packed bearings which require periodic repacking).

FAST AND RELIABLE TOOL CHANGE SYSTEM

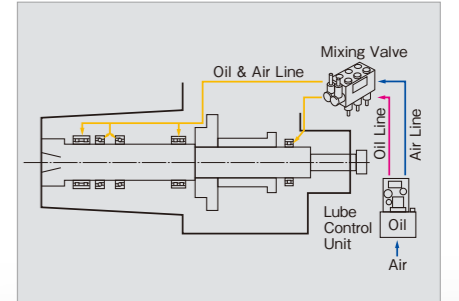
Tool magazine is driven by a servo motor for fast and reliable indexing. An electric servo motor positions the tool loader, insuring fast, smooth motion during a tool change. The tool inspection and loading/unloading during automatic operation are available and are standard features. The tool magazine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

EXCELLENT CHIP REMOVAL

Independent Z axis telescopic slide way covers and a chip scraper between the Z ways forces the chips to drop into the large coil chip augers. Roof-shaped telescopic covers protect the X axis ways. These features provide effective chip evacuation from the inside of the machining area.

THE FULLY ENCLOSED SPLASH GUARD

Total enclosure contains all fluids and chips in machine area. Operator comfort and safety are NIIGATA's continual theme.



WIDE RANGE OF OPTIONS TO ANSWER YOUR INDIVIDUAL MACHINING REQUIREMENTS

STANDARD EQUIPMENT

- 6000min⁻¹(rpm) 37kW (50HP) Two Geared Spindle
- Rotary Type Twin Pallets Automatic Pallet Changer with Safety Walk-around Platform (2APC)
- Two Pallets with threaded holes as Per Niigata Standard Configuration
- Automatic Tool Changer with 62 Tool Capacity (ATC)
- 1 Degree Indexing Table with Curvic Coupling (NC Table Only on HN1600-S)
- Scale Feedback System XYZ axes (Available as an Option on HN800-S)
- Spindle Cooling Unit Controlled by a Thermal Sensor in the Machine Base
- Full Enclosure-Type Splash and Chip Guarding System with LED Light (SPG)
- Front and Rear Spiral Chip Augers Built into the Machine Bed and column both sides
- Rigid Tapping
- Manual Pulse Generator with the XYZ axes Position Display
- Spindle Speed/Load Meter with Override on NC Control Display
- Flood Coolant System
- Coolant Tank
- Work Completion and Emergency Lamp
- Automatic Power Off Device
- Door Interlock (at 2APC, SPG, ATC and Electrical Cabinet)
- Self Diagnostics Function
- 2APC Program Number Search Function (with 2APC)
- Fanuc CNC System with 15" Color LCD
- One set of Machine and Fanuc Manuals (1 Printed, and 1 CD)
- Installation Parts

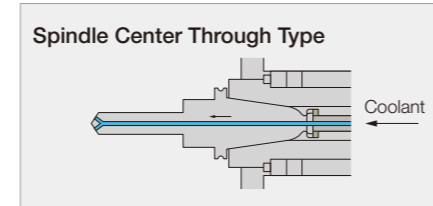
OPTIONAL FEATURES

- ATC MAGAZINE (Field Expandable)**
- 88 Tools Magazine
 - 128 Tools Magazine
 - 175 Tools Magazine (88 + 88 Tools)
 - 255 Tools Magazine (128 + 128 Tools)
 - Matrix Style ATC System (126/178/230 Tools)
 - Max Tool Weight 35kg (77lbs) Capability
- TABLES**
- 0.001°(NC Table) / 4th Axis Continuous
 - 5 Axis Application (Table on Table)
 - Max Load Capacity on the Pallet (Require Purchase NC Table)
 - 5000kg (11000lbs) on HN1000-S and HN1250-S
 - 10000kg (22000lbs) on HN1600-S
 - Idle Self Rotation on 2APC System (Available on HN800-S Only)
- PALLET and PALLET CHANGER SYSTEM**
- Carousel Type Multiple Pallet Changer 6/8/10/12 APC System (Only 6 APC with HN1000-S / Not Available on HN1600-S at All)
 - 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**
- Spindle Center Through Coolant Device
 - Overhead Shower Coolant System
 - Shower Coolant and Airblow System
 - Coolant Washing Gun
 - Oversized Coolant Tank
 - Coolant Low Level Sensing Device
- CHIP REMOVAL**
- Lift-Up External Conveyor Hinge-Pan Type
 - Lift-Up External Conveyor with Filtration System
 - Chip Bucket with Caster and Handles

- CUTTING MONITORING FUNCTION**
- Advanced Unmanned Monitoring System: Niigata NM24 Monitor Ace
 - Spindle Probing System
 - Table Probing System
 - Tool Breakage Detector System LS-Z Type
 - Four Face Part Program Control Function
- SPINDLE**
- BIG PLUS Spindle
 - HSK Spindle
 - BAR Spindle - W axis (see P12 - P13)
- AXIS EXTENSION**
- Y axis 2540mm (100.0") on HN1600-S BAR
 - Y axis 2690mm (105.9") on HN1600-S

OPTIONAL FEATURES

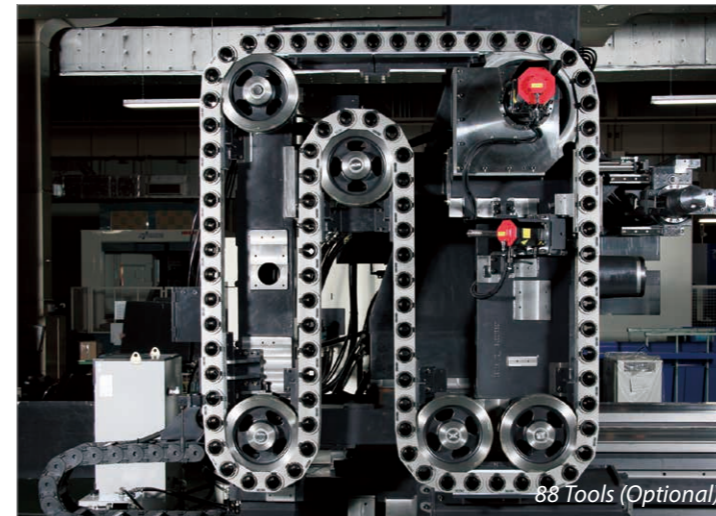
HIGH PRESSURE COOLANT THROUGH SPINDLE



LIFT-UP EXTERNAL CONVEYOR AND COOLANT TANK



NIIGATA HN-SERIES MODULAR DESIGN CONCEPT FIELD EXPANDABLE ATC MAGAZINE



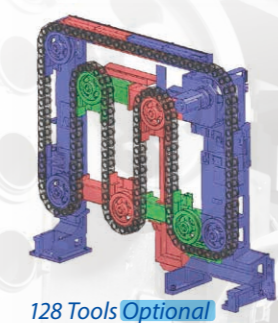
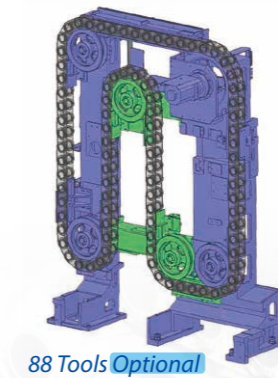
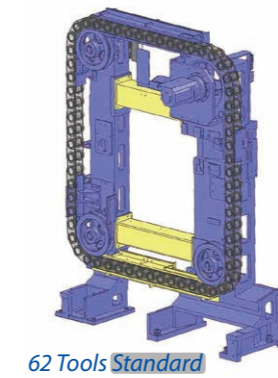
MATRIX TYPE AUTOMATIC TOOL CHANGE SYSTEM



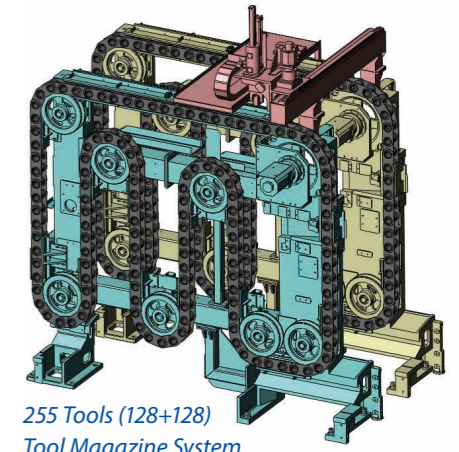
LINEAR PALLET MAGAZINE SYSTEM WITH NIIGATA ICC SYSTEM CONTROLLER



MULTIPLE PALLET MAGAZINE Carousel Type APC System

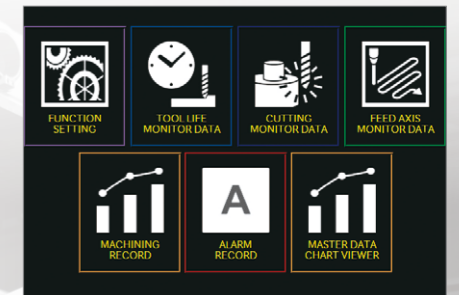


EXAMPLE OF AUTO TOOL CHANGE SYSTEM (Chain Type)



ADVANCED UNMANNED MONITORING SYSTEM NIIGATA NM24 MONITOR ACE

Menu Screen



KEY FEATURES

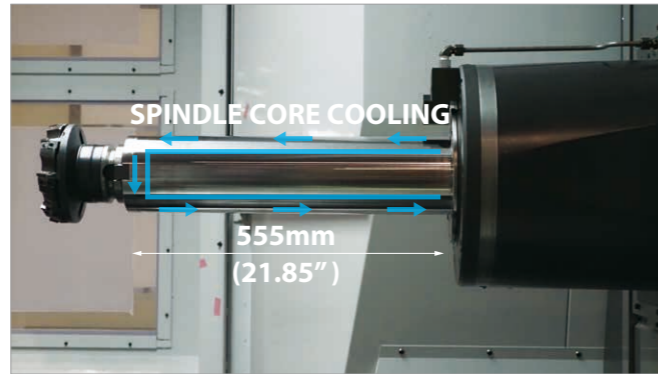
- Display on Machine Operational Screen: All Main Features Shown on Machine Operational Screen (Fanuc CNC Control)
- Cutting Monitor: Max Spindle Load / Feed Axis Load / Adaptive Control / FN Adaptive Control
- Tool Management: Tool Life Monitor / Spare Tool Function / Tool Number Conversion
- Automatic Continuous Machining: Spare Tool Conversion / Pallet Skip
- Operations Record Display: Machining Record / Alarm Record / Tool Life

THE HORIZONTAL BAR CENTER MODEL: HN-S BAR SERIES BASED ON NIIGATA'S HEAVY DUTY, HYBRID STYLE, HIGH PRODUCTION HORIZONTAL MACHINING CENTER



BAR/QUILL CAPABILITY ON HORIZONTAL MACHINING CENTER

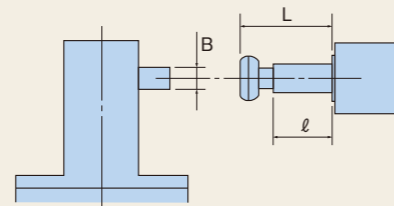
Niigata's model: HN-S Series machining centers, always known for rugged, high speed, reliable performance, can be equipped with a BAR/QUILL style spindle with spindle core cooling system. The BAR versions bring long-sought improvements in performance and accuracy to the work traditionally done by horizontal boring mills.



EXAMPLE OF NIIGATA BAR CENTER'S MACHINING PERFORMANCE (Medium Carbon Steel S45C)

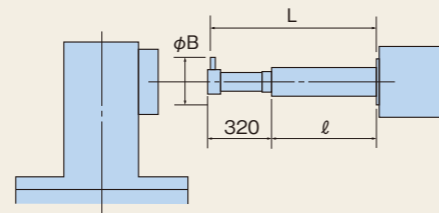
Face Mill

W axis extension	l	55mm {2.2inches}	220mm {8.7inches}
Cutting position from spindle surface	L	160mm {6.3inches}	325mm {12.8inches}
Cutting volume		691cm ³ /min {42cu.inch}	605cm ³ /min {37cu.inch}
Tool diameter		160mm {6.3inches}	160mm {6.3inches}
Width of cut	B	120mm {4.7inches}	120mm {4.7inches}
Depth of cut		8mm {0.32inches}	7mm {0.28inches}
Spindle speed		330min ⁻¹	300min ⁻¹
Feed rate		720mm/min {28.3ipm}	720mm/min {28.3ipm}

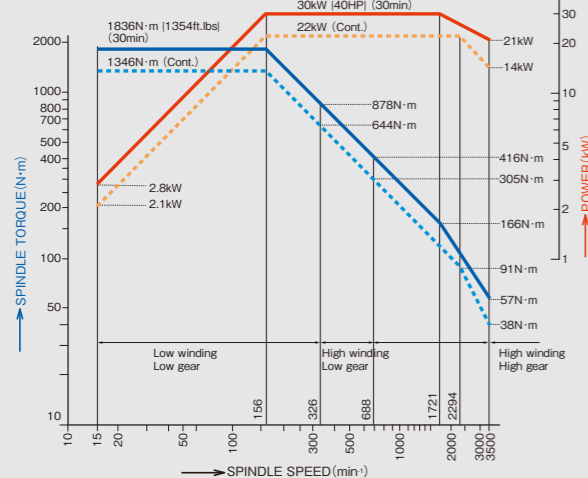


Boring

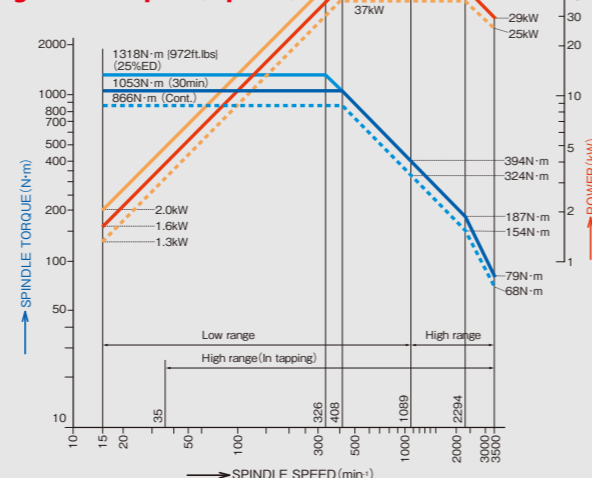
W axis extension	l	365mm {14.4inches}	535mm {21inches}
Cutting position from spindle surface	L	685mm {27inches}	855mm {33.7inches}
Cutting volume		272cm ³ /min {17cu.inch}	188cm ³ /min {12cu.inch}
Bore diameter	B	240mm {9.4inches}	228mm {9.0inches}
Depth of cut		7mm {0.28inches}	6mm {0.24inches}
Spindle speed		150min ⁻¹	168min ⁻¹
Feed rate		53mm/min {2.1ipm}	45mm/min {1.8ipm}



3500min⁻¹ (rpm) Standard



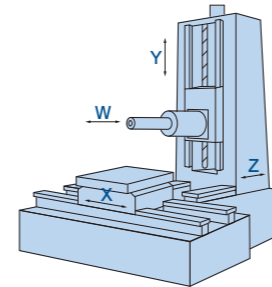
3500min⁻¹ (rpm) High Power Spec. (Option)



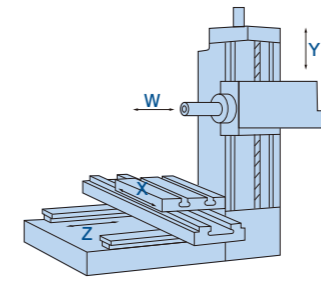
SUPERIOR FEATURES OVER THE TRADITIONAL BORING MILLS

- RIGID SPINDLE SNOOT**
Reduces the need to extend the quill to reach the part; provides a high radial load capability for heavy milling cuts.
- CENTER-MOUNTED SPINDLE**
Eliminates the column twist of side-mounted spindle.
- COLUMN FEED**
Superior accuracy and rigidity vs. table-fed machines, with compound slides (stacked X and Z axes).
- FASTER TRAVERSE AND FEED SPEEDS**
Higher productivity, more parts per shift, faster ROI vs. horizontal boring mills.
- ERGONOMICALLY SUPERIOR**
A full enclosure is standard, along with automatic tool changer and pallet changer to maximize the performance and productivity of your operation.
- TRUE COOLANT THRU THE SPINDLE**
 - Better cutting conditions.
 - Longer tool life.
 - Superior chip removal.
 - Not available from some competitors.
 - Special tool holders are not required.

NIIGATA BAR MACHINE

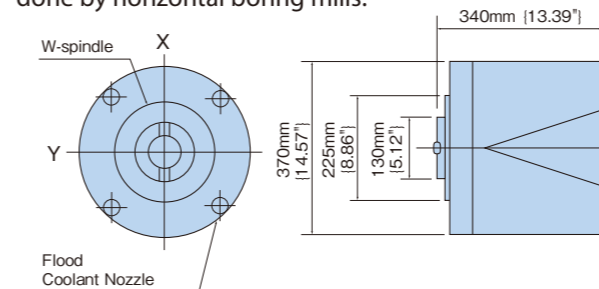


TYPICAL BORING MILL



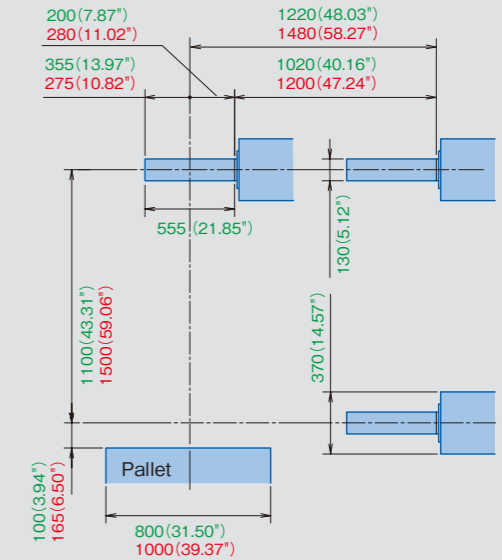
RIGID / HEAD STOCK DESIGN

The BAR versions bring long-sought after improvements in performance and accuracy to the work traditionally done by horizontal boring mills.



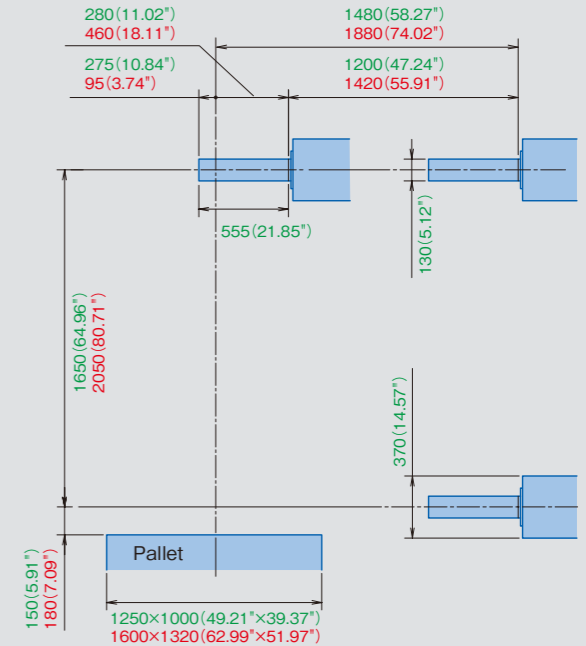
SPINDLE DISTANCES

■ : HN800-S BAR
■ : HN1000-S BAR
Unit:mm (inch)



SPINDLE DISTANCES

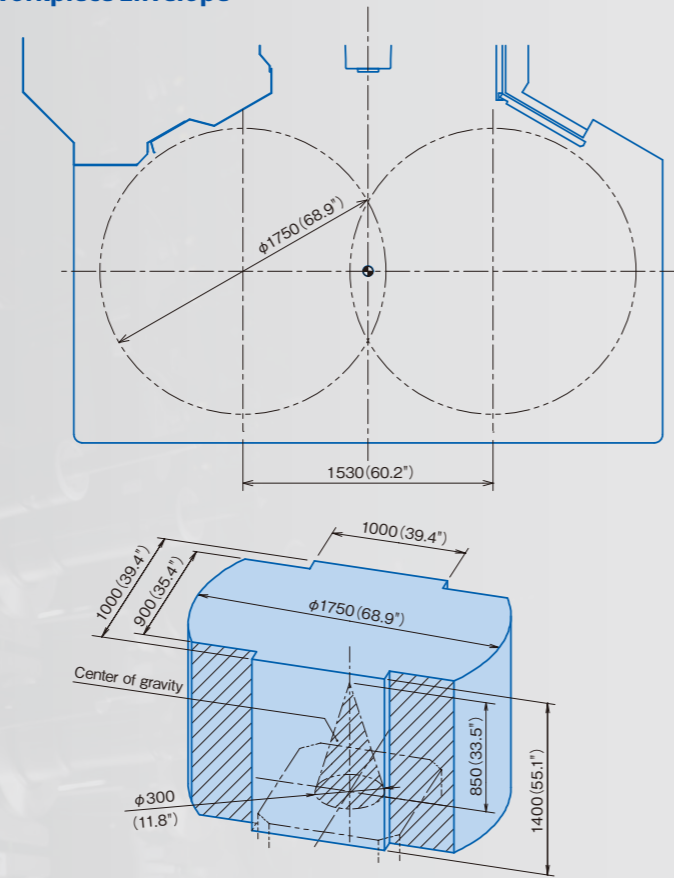
■ : HN1250-S BAR
■ : HN1600-S BAR
Unit:mm (inch)



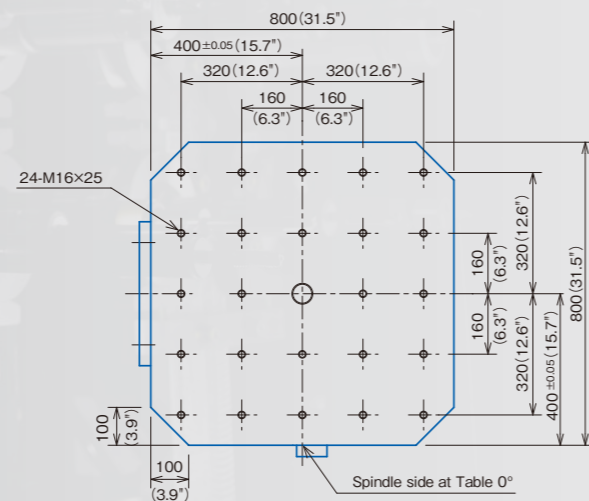
LARGEST WORK ENVELOPE IN ITS CLASS

φ1750mm (68.9") SWING DIAMETER INSIDE MACHINE

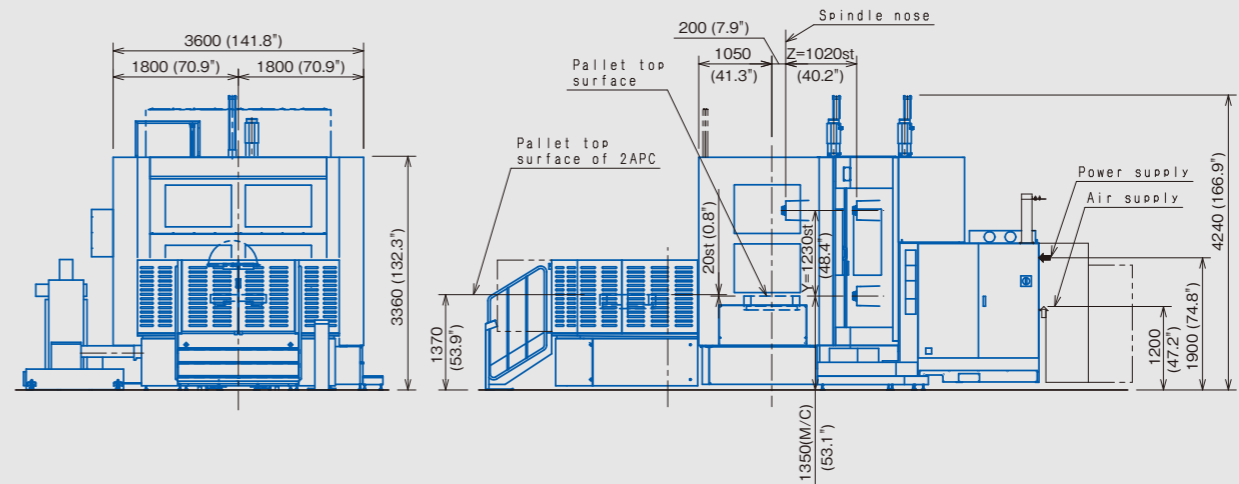
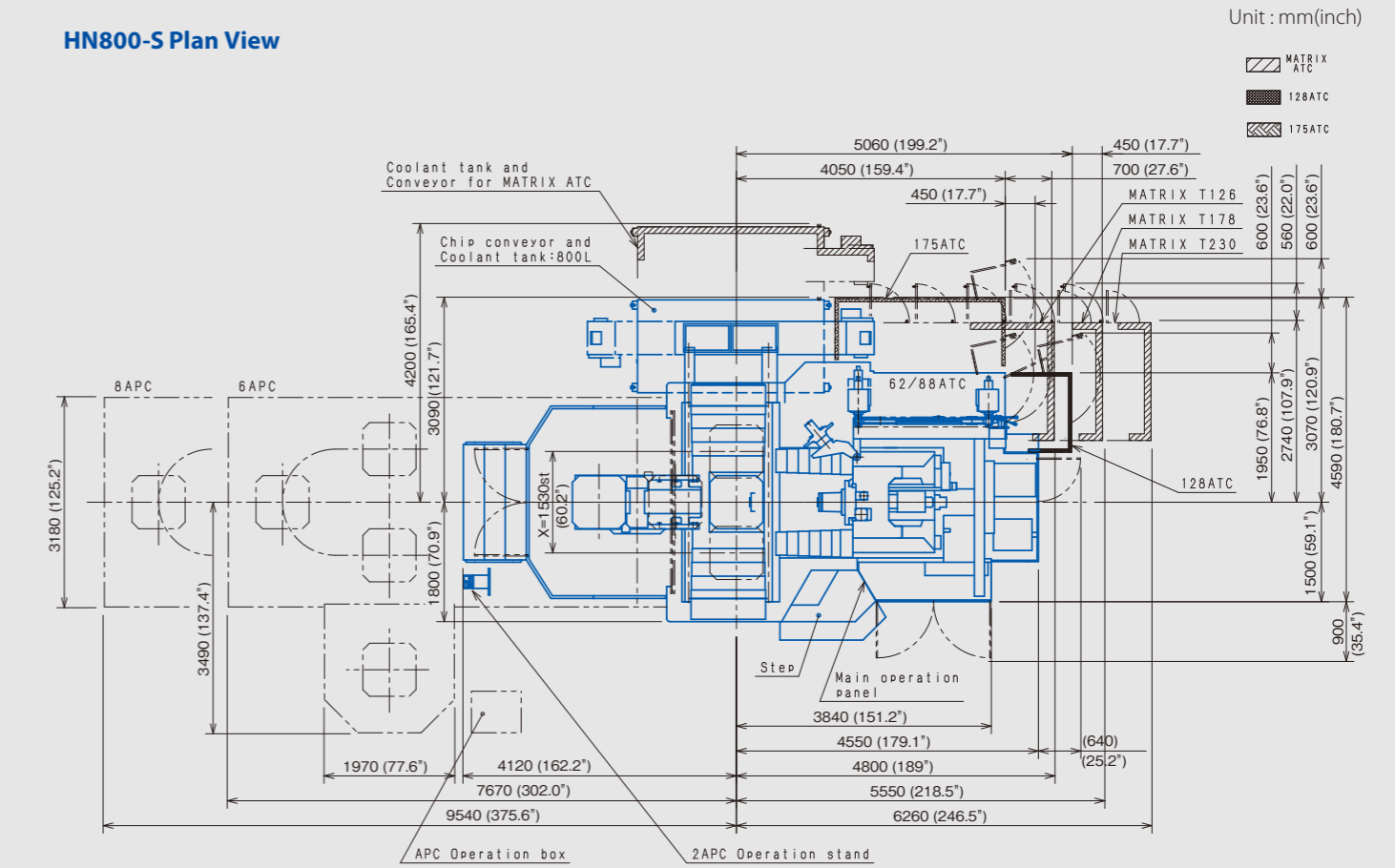
Maximum Workpiece Envelope



Standard Pallet Top Surface



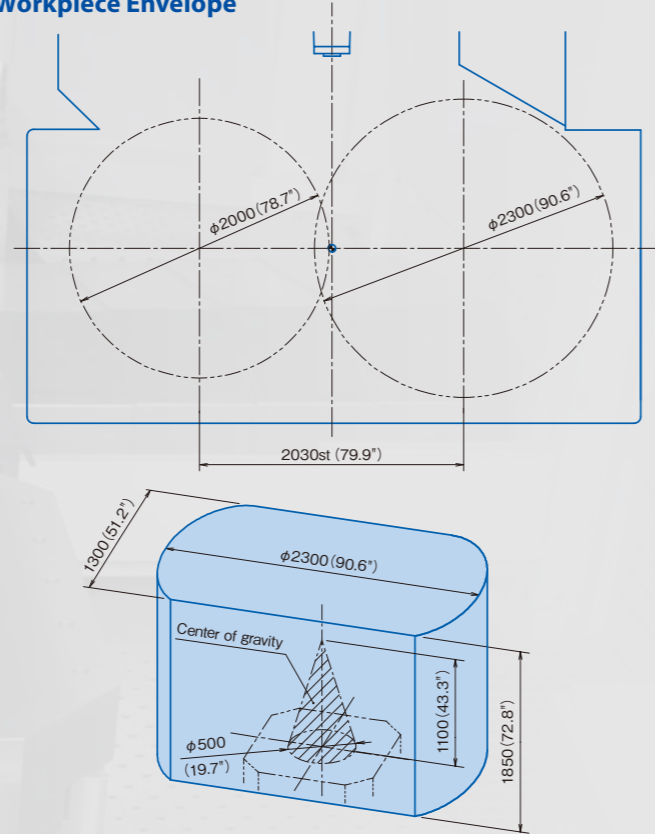
HN800-S Plan View



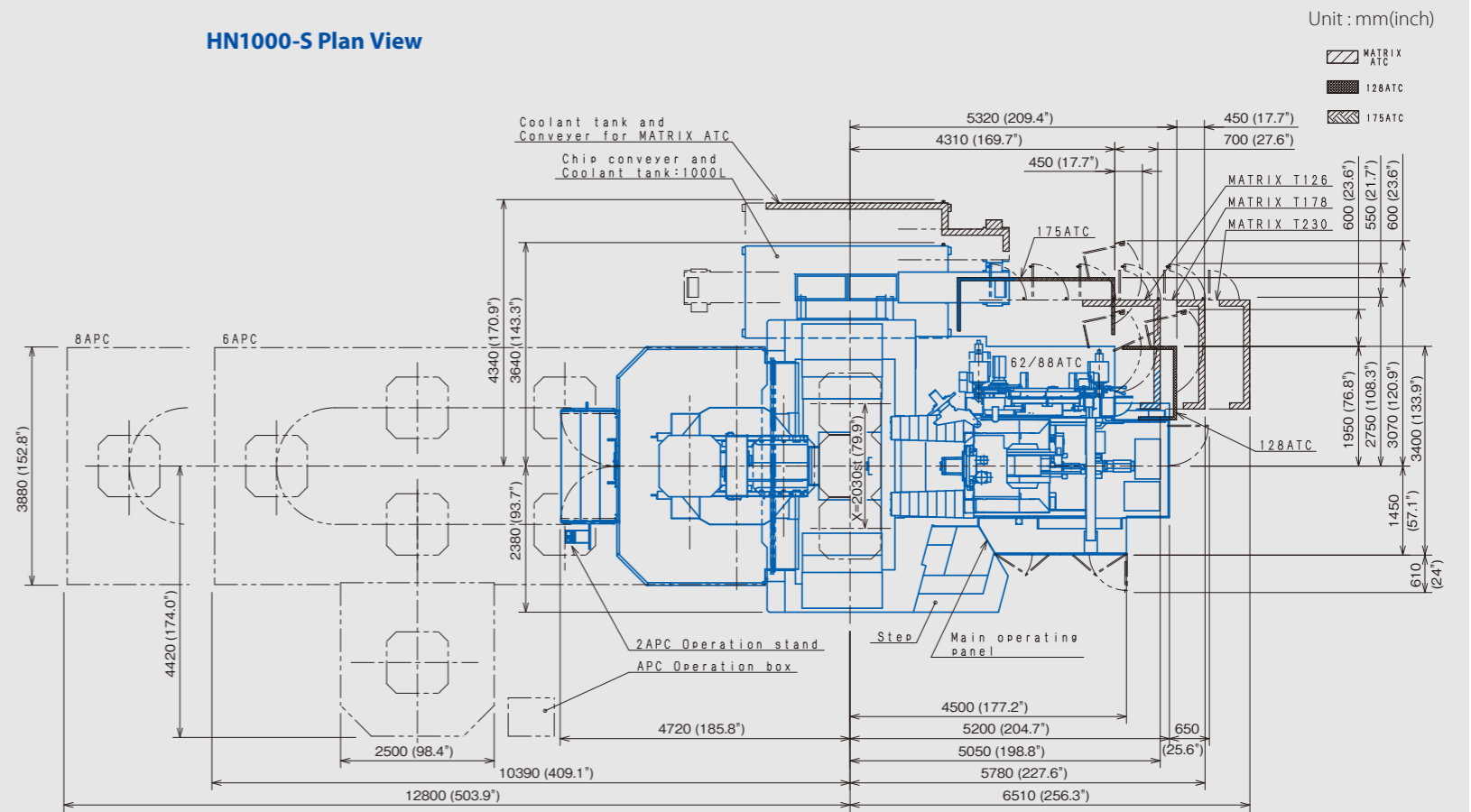
LARGEST WORK ENVELOPE IN ITS CLASS

φ2300mm (90.6") SWING DIAMETER INSIDE MACHINE

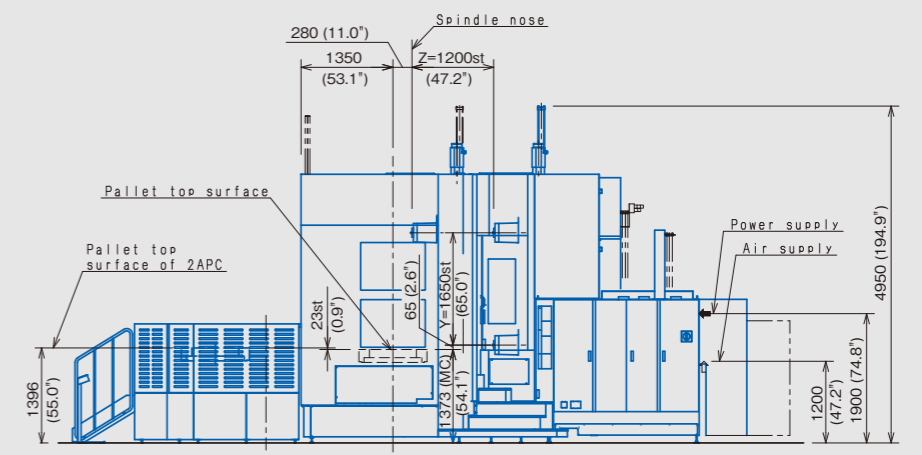
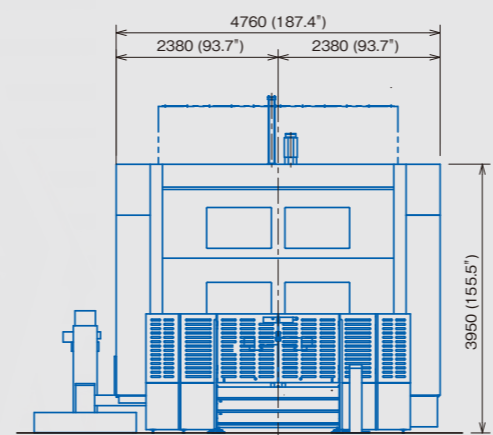
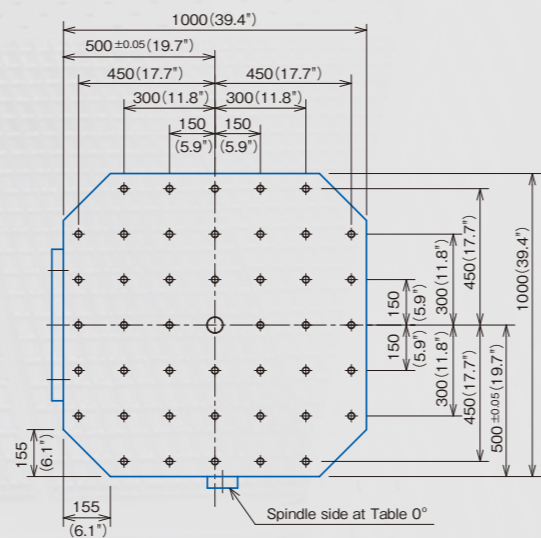
Maximum Workpiece Envelope



HN1000-S Plan View



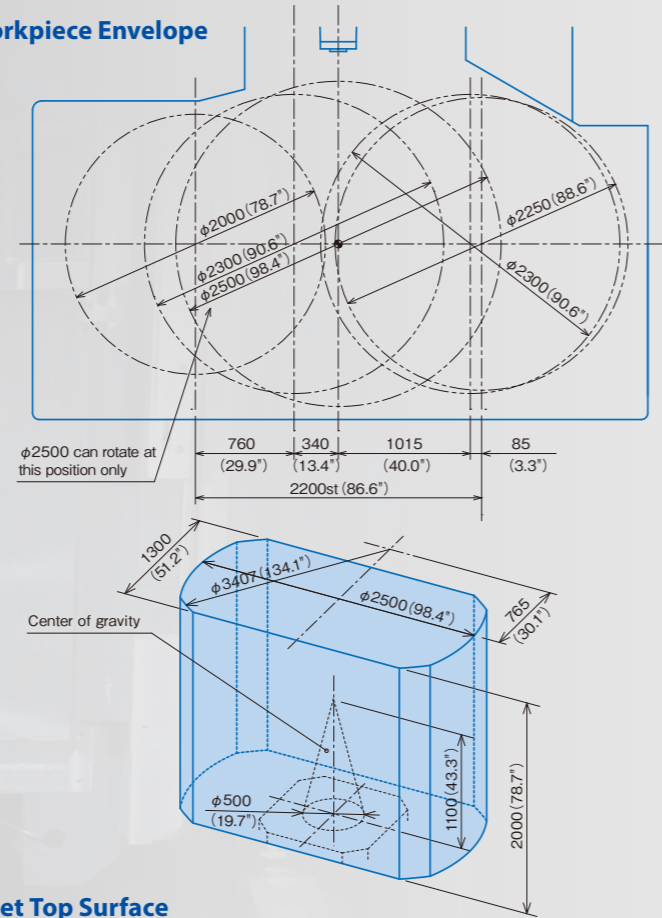
Standard Pallet Top Surface



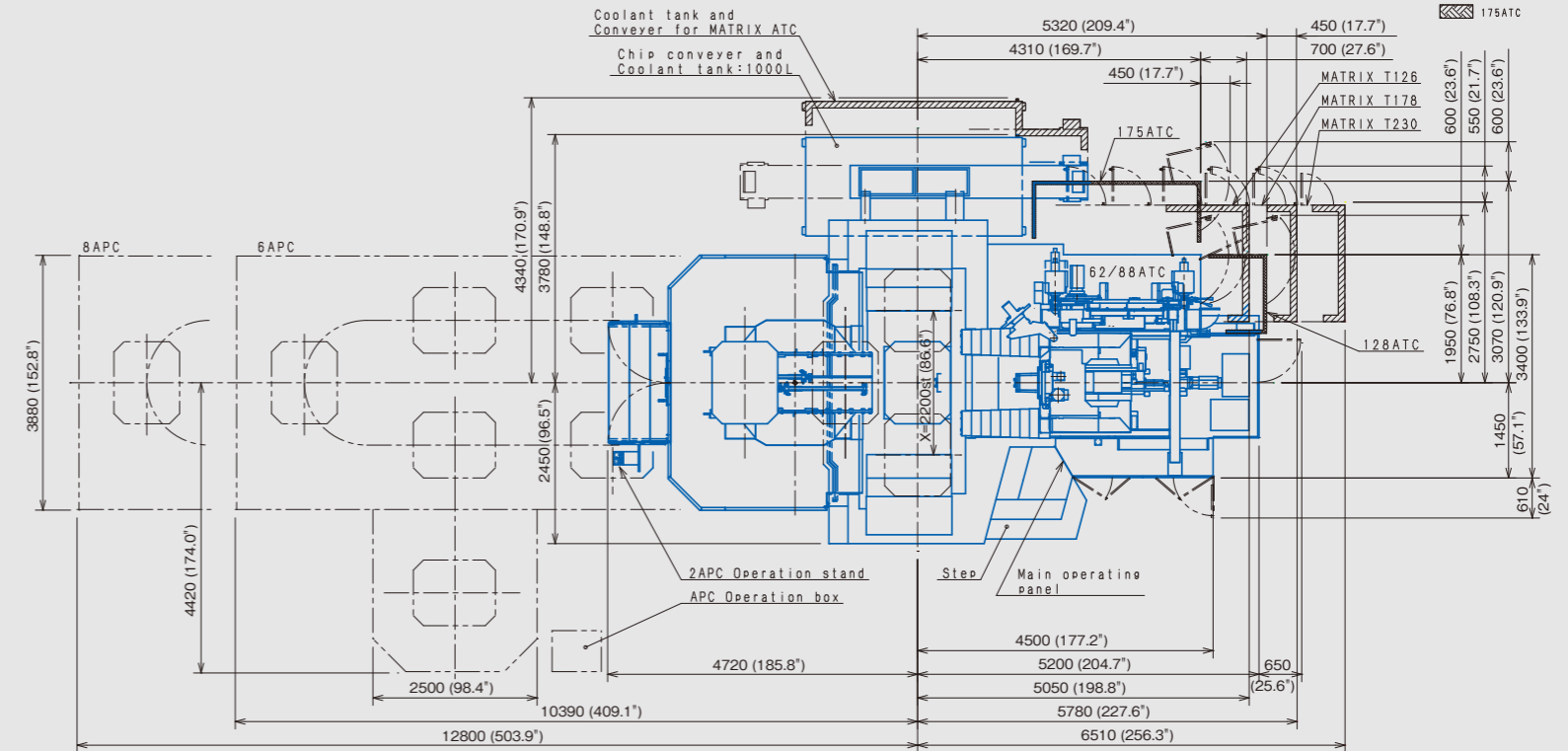
LARGEST WORK ENVELOPE IN ITS CLASS

φ2500mm (98.4") SWING DIAMETER INSIDE MACHINE

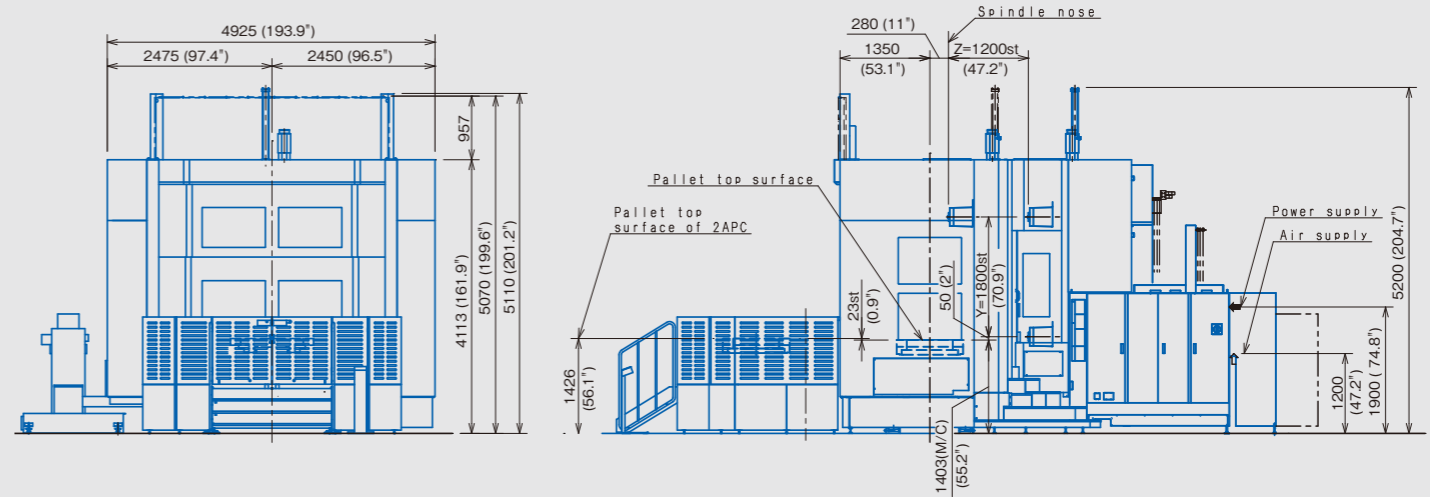
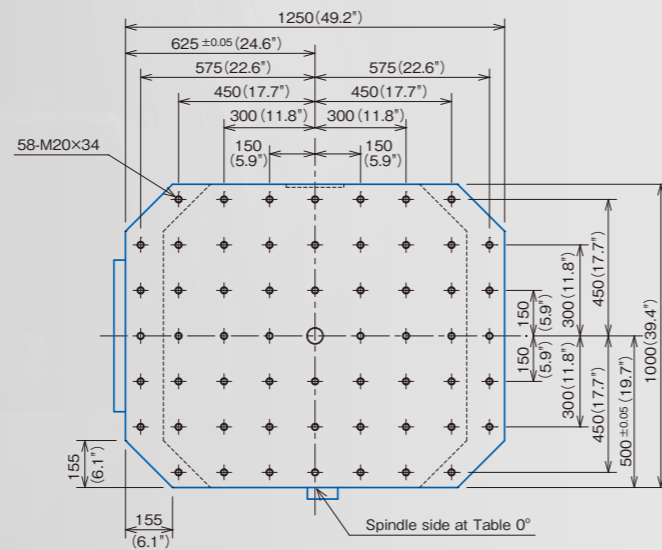
Maximum Workpiece Envelope



HN1250-S Plan View



Standard Pallet Top Surface

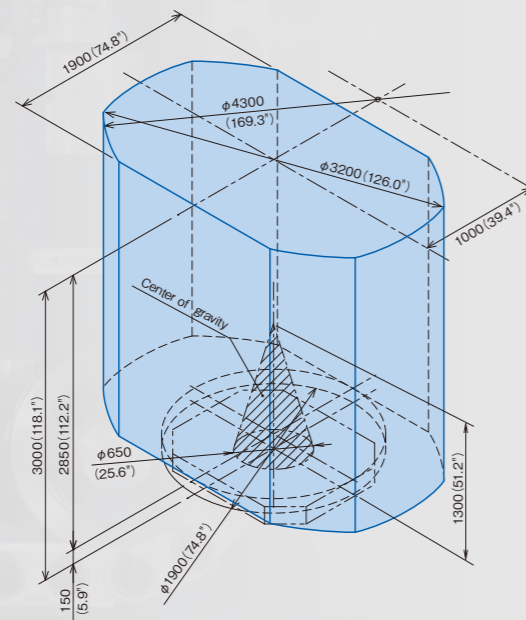
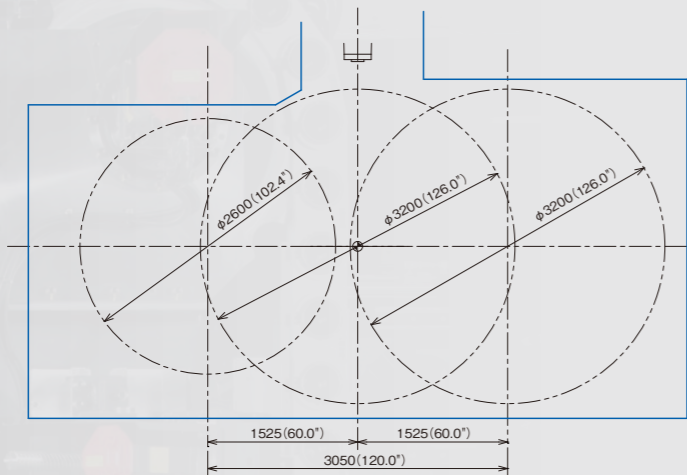


LARGEST WORK ENVELOPE IN ITS CLASS

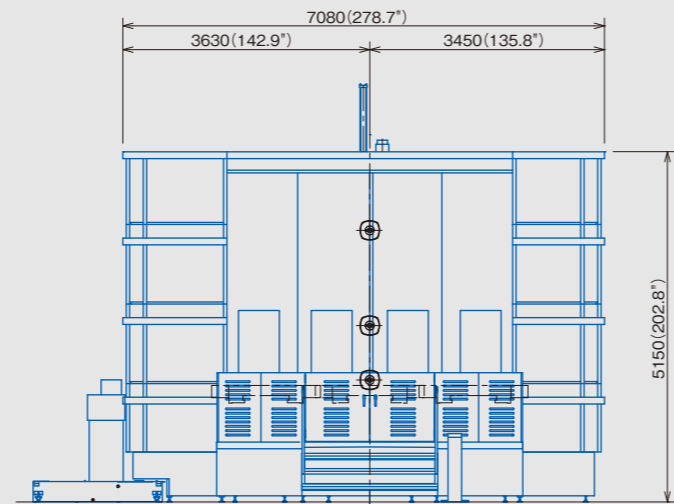
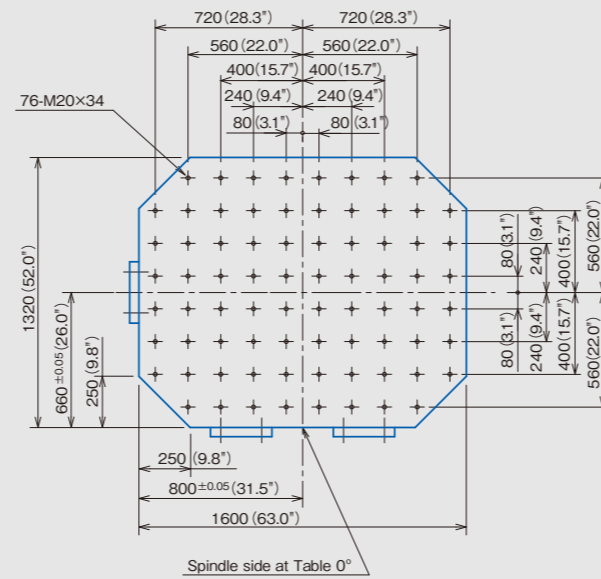
φ3200mm (126.0") SWING DIAMETER INSIDE MACHINE

Unit : mm(inch)

Maximum Workpiece Envelope



Standard Pallet Top Surface



HN1600-S Plan View

