NHX 5500 2nd Generation
NHX 6300 2nd Generation

High-Precision, High-Speed Horizontal Machining Center
The NHX 5500 2nd Generation and NHX 6300 2nd Generation are horizontal machining centers with a high rigidity construction designed exclusively for No. 50 taper spindles. The models are equipped with a diverse range of functions and suited to a wide variety of machining in many different fields including automotive and construction machinery. The model mounting the powerful and high-performance spindle powerMASTER and super-high rigidity bed suited for heavy duty cutting has evolved with higher cutting capabilities than that of the existing machine. An ideal machine has been achieved by a design with great attention down to the detail including the exterior.
Figures in inches were converted from metric measurements.
NHX 5500 2nd Generation / NHX 6300 2nd Generation

**Highest Rigidity and Accuracy**

The NHX 5500 2nd Generation and NHX 6300 2nd Generation achieve the highest rigidity and accuracy expected of horizontal machining centers. The ergonomically designed cover leads to outstanding operability and beautiful form. The models are equipped with the cutting-edge operation system, CELOS, which flexibly handles any conceivable scene in production processes.

### High speed
- Rapid traverse rate <X, Y and Z axes>: 60 m/min (2,362.2 ipm)
- Cutting feedrate <X, Y and Z axes>: 60 m/min (2,362.2 ipm)*

### High rigidity
- Thick, high-rigidity bed
- The 3-point support structure ensures a stable machine installation
- Machining with shorter tools

### High-precision equipment
- High-resolution full closed loop control (Scale feedback)
- Draw-back function for through-spindle coolant

### CELOS
- Consistent administration, documentation and visualization of order, process and machine data
- Extension of functions possible by adding applications, and high compatibility with existing information infrastructure and software

### Power-saving
- Function for energy-saving and visualization of the effect

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* When using high-precision control (look-ahead control)

CELOS: Control Efficiency Lead Operation System
NHX 5500 2nd Generation / NHX 6300 2nd Generation

No. 50 Taper Machine (HSK-A100*)
Best Suited for Mass Production of Large Workpieces

- Pallet size:
  - NHX 5500 // 500 × 500 mm (19.7 × 19.7 in.)
  - NHX 6300 // 630 × 630 mm (24.8 × 24.8 in.)

- Max. weight per station:
  - NHX 5500 // 1,000 kg (2,200 lb.)
  - NHX 6300 // 1,500 kg (3,300 lb.)

* Available as an option. The standard is BT50.

NHX 5500
Unbeatable cutting performance, speed and accuracy

<table>
<thead>
<tr>
<th>Machine Specifications</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel X / Y / Z-axis</td>
<td>800 / 800 / 880 (31.5 / 31.5 / 34.6)</td>
<td>1,050 / 900 / 1,030 (41.3 / 35.4 / 40.6)</td>
</tr>
<tr>
<td>Max. workpiece height</td>
<td>1,100 (43.3)*</td>
<td>1,300 (51.1)</td>
</tr>
<tr>
<td>Max. workpiece swing diameter</td>
<td>800 (31.4)</td>
<td>1,050 (41.3)</td>
</tr>
<tr>
<td>Pallet loading capacity</td>
<td>1,000 (2,200)</td>
<td>1,500 (3,300)</td>
</tr>
<tr>
<td>Floor space width x depth</td>
<td>3,365 × 5,465 (132.5 × 215.2)</td>
<td>3,930 × 5,917 (154.7 × 233.0)</td>
</tr>
</tbody>
</table>

* LPP specifications: either 1,000 mm (39.3 in.) or 1,100 mm (43.3 in.) can be selected

LPP: Linear Pallet Pool
Max. tool diameter: 320 mm (12.5 in.)<br>without adjacent tools

NHX 6300
Highest rigidity with a robust bed and powerful table / pallet clamping force.
A robust bed is an essential machine structure for stable and high-quality machining. The NHX 5500 2nd Generation and NHX 6300 2nd Generation exclusively designed for a No. 50 taper spindle (HSK-A100*) have high-quality beds with a thicker wall and higher rigidity to minimize vibration generated during machining. What’s more, the models come standard with the high-rigidity spindle powerMASTER with overwhelmingly powerful cutting capabilities to achieve stable heavy-duty cutting.

* Available as an option. The standard is BT50.

1 High-rigidity bed
   + The X-axis guideways with a step difference made high-rigidity bed possible
   + Thicker wall thickness than that of the existing machine to improve rigidity

2 3-point support structure
   + 3-point support machine structure for easy horizontal adjustment drastically reduces installation time
   + Not affected by ground conditions or gradual changes
3. **Spindle structure with higher rigidity**
   - The powerMASTER that achieves overwhelmingly powerful cutting performance as standard
   - Spindle bearings lined up in four rows

4. **Machining with shorter tools**
   - Distance between the spindle end face and the center of the pallet set to 50 mm (2.0 in.)
   - "Half that of the conventional machine" (NHX 6300)

5. **High-rigidity roller guides**
   - Roller type with large contact areas with the rail surfaces to achieve high rigidity
The NHX 5500 2nd Generation and NHX 6300 2nd Generation models are equipped with everything required for stable high-precision machining. In addition to perfect spindle cooling, a highly reliable SmartSCALE (Magnescale) with extreme accuracy is employed on all axes as standard to ensure the best positioning accuracy for a long period of time.

**Perfect Equipment for Ultimate Machining Accuracy**

Full closed loop control (Scale feedback) as standard on all axes (SmartSCALE)

**Simple non-contact structure**
- Saves space bearingless compact design
- Can be mounted in proximity to workpieces, enabling easy installation of multiple scales on one axis

**High resolution of 0.01 µm**
- Newly developed algorithm employed to improve the high-performance arithmetic processing circuit

**No air purge necessary thanks to the sealing structure with a protection degree of IP67**
- The magnetic scale and the detection device surfaces completely covered with a metal cover for even higher durability against coolant and chips
Draw-back function for through-spindle coolant

Any remaining coolant in the spindle is drawn back into the tank when the coolant flow is stopped, which minimizes the residue to ensure stable machining accuracy.

- Prevent coolant from adhering to the spindle taper during ATC
- Prevent mounting errors and rust caused by chips
- Prevent coolant from entering the magazine

This function is included in the through-spindle coolant specification.

Coolant chiller (separate type) <option>

Increased coolant temperature causes thermal displacement in the fixtures and workpiece, affecting the machining accuracy of the workpiece. Use this unit to prevent the cutting 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 or a high-pressure coolant system, please be sure to consult our sales representative.

- Machining with required accuracy of less than 20 µm
- High-precision machining that requires a large amount of high-pressure coolant
- Machining that requires oil-based coolant

We cannot guarantee that this unit will completely control the coolant temperature. It is designed to help prevent oil temperature increases.
The high-performance spindle powerMASTER with DMG MORI’s cutting-edge technologies and know-how. The powerMASTER with overwhelmingly high-power achieves a torque of up to 807 N·m (595.2 ft·lbf) as standard, and delivers superb performance especially in heavy-duty cutting that requires rigidity.

The spindle offers varieties of specifications including the high-speed <16,000 min⁻¹> as an option.

### Outstanding Machining Capability

**High-power Spindle powerMASTER**

The high-performance spindle powerMASTER with DMG MORI’s cutting-edge technologies and know-how. The powerMASTER with overwhelmingly high-power achieves a torque of up to 807 N·m (595.2 ft·lbf) as standard, and delivers superb performance especially in heavy-duty cutting that requires rigidity.

The spindle offers varieties of specifications including the high-speed <16,000 min⁻¹> as an option.

#### No. 50 taper spindle
- Type of tool shank: BT50, CAT50, DIN50, HSK-A100
- Spindle variations

<table>
<thead>
<tr>
<th>NHX 5500 / NHX 6300</th>
<th>Max. spindle speed</th>
<th>Output</th>
<th>Max. spindle torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>12,000 min⁻¹</td>
<td>55 / 30 kW (75 / 40 HP) &lt;15%ED / cont&gt;</td>
<td>807 N·m (595.2 ft·lbf) &lt;10%ED&gt;</td>
</tr>
<tr>
<td>High speed</td>
<td>16,000 min⁻¹</td>
<td>37 / 26 kW (50 / 34.7 HP) &lt;25%ED / cont&gt;</td>
<td>528 N·m (389.4 ft·lbf) &lt;10%ED&gt;</td>
</tr>
<tr>
<td>High torque*</td>
<td>8,000 min⁻¹</td>
<td>55 / 45 kW (75 / 60 HP) &lt;25%ED / cont&gt;</td>
<td>1,413 N·m (1,042.2 ft·lbf) &lt;10%ED&gt;</td>
</tr>
</tbody>
</table>

* NHX 6300 only.
**Sophisticated spindle labyrinth structure**
- The labyrinth structure has been enhanced, taking into account frequent use of high-pressure coolant
- Prevent coolant entry and improve spindle durability

**Spindle with point-symmetric structure**
- Fixing bolts and pipes to supply coolant and cooling oil to the spindle are arranged symmetrically relative to the center of the spindle, enabling the machine to achieve high-precision machining without being affected by thermal displacement

**Two-face contact specification (option)**
- Coming into contact with both spindle taper and spindle nose, a tool achieves greater flexural rigidity and longer useful life

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**World’s Best Spindle Technology**

**powerMASTER**
- No. 50 taper spindle achieves overwhelming heavy-duty cutting
- High-speed machining with the maximum spindle speed of 16,000 min⁻¹ (option)
- Thermal expansion compensation by Spindle Growth Sensor <SGS> (option)
- Advanced spindle labyrinth structure prevents coolant from entering the spindle

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**Spindle: 3-year warranty**

- The standard warranty period varies depending on the region. For details, please consult our sales representative.
NHX 5500 2nd Generation / NHX 6300 2nd Generation

Outstanding Standard Specification
Fully Ready for Automation

The models come standard with hydraulic / pneumatic interfaces, which used to be options, to facilitate the performance of hydraulic / pneumatic fixtures. This can fully accommodate system automation and greatly improve customers’ productivity.

The standard rotary table uses a high-speed rotary axis drive system DDM (Direct Drive Motor) that achieves zero backlash.

NHX 5500: 500 × 500 mm (19.7 × 19.7 in.)
NHX 6300: 630 × 630 mm (24.8 × 24.8 in.)

Direct Drive Motor

Until now, gears have been used to transmit the drive power to the rotary axes, but this drive system had a negative effect on drive speed and precision. By transmitting the drive power to the rotary axes directly without using gears, DDM offers outstanding transmission efficiency and high-speed feed. DDM also achieves zero backlash for highest accuracy.

+ High-speed rotation (B-axis max. rotational speed: 100 min⁻¹)
+ High-precision indexing
+ Less maintenance
+ Longer product life

DDM: Direct Drive Motor
Optimal acceleration / deceleration for each workpiece

Servo Sense for Workpiece (Z-axis, B-axis)

Drastically decrease overall cycle time by automatically finding the optimal acceleration / deceleration for each pallet (Z-axis and B-axis). The auto servo tuning function allows for efficient and smooth acceleration / deceleration, as well as ensuring stable positioning and higher machining accuracy.

- Optimized acceleration / deceleration for reduction of machining time
- Improved positioning accuracy
- Reduced machine vibration

Example: Reduction in the B-axis indexing time

Increase acceleration according to workpiece mass and reduce positioning and machining time

Comparison of 180 degree indexing time (NHX 6300): Workpiece mass 500 kg (1,100 lb.)

<table>
<thead>
<tr>
<th>B-axis rotational speed (min⁻¹)</th>
<th>Time (sec.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function off</td>
<td>Indexing completed</td>
</tr>
<tr>
<td>Hydraulic supply</td>
<td></td>
</tr>
<tr>
<td>Compressed air supply</td>
<td></td>
</tr>
<tr>
<td>Function on</td>
<td>Reduced by 40%</td>
</tr>
<tr>
<td>Hydraulic supply</td>
<td></td>
</tr>
<tr>
<td>Compressed air supply</td>
<td></td>
</tr>
</tbody>
</table>

Hydraulic / pneumatic interfaces essential for automation equipped as standard

Easy automation integration with standard hydraulic and pneumatic interface.

Pallet through specification

Easily transfer the pallets between the setup station and the work area and avoid external hoses and couplers.

Hydraulic / pneumatic fixtures

Offer optimal hydraulic / pneumatic fixtures based on our extensive experience and machining know-how.

- Automatic workpiece clamping / unclamping by hydraulic pressure
- Pallet through type
- Hydraulic / pneumatic pressure can be supplied from above (option)

Supply of hydraulic / pneumatic pressure from above (option)

Supplying from above the machine allows more ports to be added as needed by your fixture. Suitable for machining that requires high-pressure coolant and a number of ports. Capable of clamping and unclamping workpieces inside the machine to achieve flexible machining.

- The hydraulic / pneumatic interfaces make it possible to supply hydraulic / pneumatic pressure to the table of the APC-equipped machines

Hydraulic / pneumatic interfaces essential for automation equipped as standard

+ The data above is an example of a past test result. The results on the catalog may not be achieved according to workpieces or environmental conditions at the time of measurement.
**NHX 5500 2nd Generation / NHX 6300 2nd Generation**

**Variety of Magazines**

The smooth, high-speed indexing, ring type magazine [60-tool specification] is offered as standard. Three types of magazines [ring type, chain type, and rack type] are available with a max. tool storage capacity of up to 330, so the customers can choose the one that best suits their production needs.

- Tool storage capacity <ring-type / chain-type / rack-type>:
  - 60 tools / 100, 120 tools / 180, 240, 330 tools.
- Max. tool length: 550 mm (21.6 in.) <NHX 5500> / 630 mm (24.8 in.) <NHX 6300>
- Max. tool mass: 30 kg (66 lb.)
- Max. tool diameter: 320 mm (12.5 in.) <without adjacent tools> / 110 mm (4.3 in.) <with adjacent tools>

- Chain-type magazines (100- or 120-tool capacity) incorporate a pot tilting mechanism and the tool capacity includes one tool at the spindle side.
- Rack-type magazines (180-, 240-, or 330-tool capacity) incorporate a pot transfer mechanism and the tool capacity includes one tool at the spindle side.
- The maximum tool diameter is limited to 230 mm (9.0 in.) or less when using the spindle at 10,000 min⁻¹ or higher.

**Reliable tool change**

The ATC arm equipped with a holding lever for securing a tool tightly holds a long and heavy tool, offering reliable tool change.

<table>
<thead>
<tr>
<th>Cut-to-cut (chip-to-chip)*</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. &lt;ISO&gt; sec.</td>
<td>10.0</td>
<td>10.2</td>
</tr>
<tr>
<td>Min. &lt;ISO&gt; sec.</td>
<td>4.4</td>
<td>4.7</td>
</tr>
<tr>
<td>&lt;MAS&gt; sec.</td>
<td>4.4</td>
<td>4.8</td>
</tr>
<tr>
<td>Tool-to-tool sec.</td>
<td>1.97</td>
<td>2.05</td>
</tr>
</tbody>
</table>

* Ring type: 60 tools
* Cut-to-cut (chip-to-chip): The time differences are caused by the different conditions [travel distances, etc.] for each standard.
* Depending on the arrangement of tools in the magazine, the cut-to-cut (chip-to-chip) time may be longer.

**A maximum tool length exceeding the pallet size**

On the NHX 5500 2nd Generation the maximum tool length is greater than the pallet size, and on the NHX 6300 2nd Generation it is the same as the pallet size. So deep hole boring up to the maximum tool length is now possible without reversing the table. It also contributes to reducing cutting time and achieving high-precision machining.

- Max. tool length: 550 mm (21.6 in.) <NHX 5500> / 630 mm (24.8 in.) <NHX 6300>

* Depending on condition, machining may not always be possible.
Cutting-edge Chip Disposal Solution

Don’t let the chip evacuation be your biggest hurdle. DMG MORI conducted an in-depth study to design the most effective chip disposal system. Inside the machine, for example, coolant is sprayed not only from the ceiling but from the lower part of the machine, allowing the machine to prevent chip accumulation more reliably than conventional machines. Customized to different cutting conditions, it offers an optimized solution to multiple scenarios.

Zero sludge coolant tank

Multiple coolant nozzles are arranged to stir coolant and efficiently collect fine casting sludge with a highly accurate cyclone filter.

- Reduce cleaning work of the coolant tank dramatically
- Prevent clogging of pipes / coolant nozzles and pump breakage
- Expand coolant life

Coolant nozzle
Inlet filter pump
Cyclone filter
Stirring nozzle coolant pump
Clean coolant tank (from cyclone filter)
Through-spindle coolant pump

Not compatible with oil-based coolant.

Click here to watch the video of the zero sludge coolant tank.
**Through-spindle coolant system (option)**

+ Coolant to be supplied to the tip through the holes of the spindle and tool
+ Effective for chip removal, cooling of machining points and extension of tool life

<table>
<thead>
<tr>
<th>Unit on coolant tank</th>
<th>Separate type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge pressure MPa (psi)</td>
<td>1.5 / 7.0 [217.5 / 1,015] / 7.0 [1,015]</td>
</tr>
<tr>
<td>Installation space (width × depth) mm (in.)</td>
<td>Not necessary / 780 × 1,190 [30.7 × 46.9]</td>
</tr>
<tr>
<td>Water-soluble coolant</td>
<td>●</td>
</tr>
<tr>
<td>Oil-based coolant</td>
<td>○</td>
</tr>
<tr>
<td>Coolant filtration accuracy µm</td>
<td>20</td>
</tr>
</tbody>
</table>

*Oil-based coolant may not be filtered appropriately depending on its viscosity. In such cases it is advisable to select the high-pressure coolant unit (special option), which uses a ceramic backwashing filter in the filtration system instead of a regular cyclone filter. For details, please consult our sales representative.

**Mist collector**

Powerful vacuum sucks out dust and oil mist that accumulate inside the machine.

**Chip conveyor outside machine (rear discharge, drum filter type)**

+ Regardless of shapes or materials, any types of chips including long / short chips can be transferred using one conveyor
+ Suitable for discharging various types of chips
+ Tank capacity: 1,025 L [270.6 gal.] <NHX 5500> / 1,200 L [316.8 gal.] <NHX 6300>
+ Depth of tank: 400 mm [15.7 in.]

<table>
<thead>
<tr>
<th>Workpiece material</th>
<th>Steel</th>
<th>Cast iron</th>
<th>Aluminum / non-ferrous metal</th>
</tr>
</thead>
</table>

**Chip disposal groove (setup station)**

The optimized APC cover shape facilitates chip disposal. It also prevents chip accumulation in the cover gaps and other areas where chips tend to accumulate.

**Chip size guidelines**

Powdery: minute particles / Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ø 40 mm (ø 1.6 in.) or less / Long: over 50 mm (2.0 in.)
Pursuit of Usability

The NHX Series is designed with the priority on operability. The models have larger windows to improve visibility and take an ingenious approach to every part of the machine to enhance workability with a completely workability-oriented concept. What’s more, equipment including the hydraulic & pneumatic units are located together at a easy-to-access location to ensure easy maintainability.
1 **CELOS / ERGOline Touch**

Improved access to the spindle and workpieces thanks to the touch screen operation panel with a turning mechanism.

+ Swivel angle: 120° (NHX 5500)  
  135° (NHX 6300)

2 **Setup station**

With excellent access to the table and a wide door opening, setup operations such as fixture adjustment can be done smoothly.

+ Distance to the center of the pallet:  
  520 mm (20.5 in.) <NHX 5500>  
  600 mm (23.6 in.) <NHX 6300>
+ Distance from floor surface to pallet surface:  
  1,200 mm (47.2 in.) <NHX 5500>  
  1,250 mm (49.2 in.) <NHX 6300>
+ Door opening:  
  815 mm (32.1 in.) <NHX 5500>  
  1,064 mm (41.9 in.) <NHX 6300>

3 **Access to the machining chamber**

The machine offers improved accessibility from the operation door to the spindle.

+ Distance from the spindle center to the right side wall:  
  308 mm (12.1 in.) <NHX 5500>  
  270 mm (10.6 in.) <NHX 6300>
+ Distance below the door opening (from the top of the step):  
  956 mm (37.6 in.) <NHX 5500>  
  949 mm (37.4 in.) <NHX 6300>

4 **Centralized layout of devices**

Peripherals requiring periodic maintenance are located in one place, which contributes to improving operators’ work efficiency.

5 **Replacement of spindle unit**

By changing the spindle unit to a cartridge, which even includes the rear bearings, we have dramatically reduced replacement time.

6 **Display of Manuals**

As well as viewing operation manuals on the CELOS screen, you can perform full-text search with keyword and jump to links in the same way as you do on a PC. This is particularly convenient when searching for information during maintenance.

CELOS: Control Efficiency Lead Operation System
Flexible Automation Solutions

DMG MORI provides number of proven automation solutions for our customer diverse production requirements. We have installed automation systems around the world. With the advanced know-how we provide our customers with modular of fully customized solutions best suited for your floor.

1  RPP system (Round Pallet Pool System)
This system features outstanding space savings and setup capabilities, and can hold more pallets per unit area than any other pallet pool system. (NHX 5500 only)

2  CPP system (Carrier Pallet Pool System)
With its simple construction provided in predefined packages, this system is easy to introduce. For the system configuration, the customer can select from 8 packages to provide the optimum specifications for their needs.
Simple Control System

PALLET MANAGER*

* MAPPS V function, available to RPP and CPP only.

Easy check of pallet status on CELOS

+ Displays the entire system layout in an easy-to-see manner
+ Able to check the latest pallet status and shorten setup time
+ Able to transfer pallets by drag and drop of the pallet icon on the screen

Tool check to prevent troubles in advance

+ Automatically identifies and displays tools that are not suitable for machining by central tool management
+ Prevents machining failure and troubles caused by tool breakage
+ Improves productivity by minimizing problem-caused rework

MCC-LPSIII (Linear Pallet Pool Control System)

+ Easy operation / management of the pallet transfer system
+ Machining programs can be managed and automatically downloaded
+ Able to flexibly change production priority in response to urgent requests

MCC-TMS (The Tool Management System)

+ Improves the system operating rate through highly efficient, centralized tool management
+ Compatible with ID tags
+ Compatible with tool presetter interface

MCC-LPS

Ⅲ

(MCC-LPS III Linear Pallet Pool Control System)

+ Easy operation / management of the pallet transfer system
+ Machining programs can be managed and automatically downloaded
+ Able to flexibly change production priority in response to urgent requests

LPP system [Linear Pallet Pool System]*

This system can be equipped with multi-level pallet racks, providing a high level of automation. The system construction can also be customized however you wish, achieving the optimum productivity and operation rate.

* Max. workpiece height: either 1,000 mm (39.3 in.) or 1,100 mm (43.3 in.) can be selected -NHX 5500-
* For details, please consult our sales representative.

MAPPS: Mori Advanced Programming Production System
CELOS: Control Efficiency Lead Operation System
One Stop Service for Various Needs
DMG MORI Qualified Products

The DMG MORI Qualified Products (DMQP) program is designed to certify peripherals that meet DMG MORI standards in quality, performance and maintainability. DMG MORI collaborates with our partners in the world and provides customers with peripherals required for their machining. We take care of the arrangement from selection to installation to support best-quality machining. DMG MORI helps customers improve productivity by offering the total solutions including quality peripherals as well as machine tools.

- Offer peripheral equipment optimal for each customer at one stop
- Provide support including connection and setup of machines and peripheral equipment
- Achieve efficient connections with optimal interfaces

NHX 5500 2nd Generation / NHX 6300 2nd Generation

- Offer peripheral equipment optimal for each customer at one stop
- Provide support including connection and setup of machines and peripheral equipment
- Achieve efficient connections with optimal interfaces

● The options above are examples. For details, please consult our sales representative.

DMQP: DMG MORI Qualified Products
Robot

Oil skimmer

Air compressor

In-machine measuring system (workpiece)

Tool presetter

Tool balance measuring system

Shrink fit system

Coolant filtration filter

Air dryer

Air compressor

Electrical cabinet chiller

Oil skimmer

Tool
DMG MORI Technology Cycles

Technology Cycles (option) are total solutions that achieve complex machining easily in a short time. They enable every operator to easily perform high-quality machining, setups and measurement with general-purpose machine tools and standard tools / fixtures, which used to be done with specialized machines, programs and tools.

- The availability of the functions differ depending on the machine. For details, please consult our sales representative.
- The above is an image picture.
Interpolation turning

Easy programming of interpolation turning

DMG MORI gearMILL

Integrating gear cutting into milling

MVC (Machine Vibration Control)

Selects optimum conditions for preventing chatter

ATC (Application Tuning Cycle)

Easy setting of optimum feed according to the machining operation

MPC (Machine Protection Control)

Minimizing load to the spindle when interference occurs

Efficient Production Package (High-speed canned cycle)

Easy inputting of various machining patterns
From the Idea to the Finished Product

DMG MORI’s cutting-edge operation system, CELOS, enables consistent management, documentation and visualization of orders, processes and machine data. CELOS can be extended with apps and is also compatible with your company’s existing infrastructures and programs.

CELOS APPs facilitate quick and easy operation: three examples »»

**JOB MANAGER**
Systematic planning, administration and preparation of work orders

- Machine related creation and configuration of new work orders
- Structured storage of all production related data and documents
- Easy visualization of job information on drawings, models, tools, fixtures, etc.

**JOB ASSISTANT**
Process-defined orders

- Menu guided set-up of the machine and conversational processing of production orders
- Reliable error prevention thanks to windows-based assistance instructions with a mandatory acknowledgement function

**CAD-CAM VIEW**
Visualize workpieces and improve program data

- Direct remote access to external CAD / CAM workstations
- Central master data as basis for component viewing
- Immediate change options for machining steps, NC programs and CAM strategies, directly in the CNC system
APP menu:
Central access to all available applications

ERGO
line
operation panel with 21.5-inch multi-touch screen and NC unit from FANUC

STANDARD
Standard user interfaces for all new high technology machines from DMG MORI

CONSISTENT
Consistent administration, documentation and visualization of order, process and machine data

COMPATIBLE
Compatible with PPS and ERP systems
Can be networked with CAD / CAM products
Open to trendsetting CELOS APP extensions

PPS: Production Planning and Scheduling System
ERP: Enterprise Resource Planning
The CELOS plays a central role in promoting IoT technologies at shop floor. For example, the CELOS application visualizes machining status of machines connected online and operating conditions of a whole shop floor, and clarifies production issues to contribute to drastically improving productivity.

**Example of use of DMG MORI Messenger**

**Operation rate report for higher rate**
- The operation rate report displays real-time data collected from machines in a graph by information, such as machine status; operation rate; alarm history and cycle time.
- Contribute to boosting productivity by visualizing waste
- Calculate the cost of each workpiece by grasping the machining time
- Level the operation rates of machines to reduce lopsided overtime work of operators

**Higher operation rate with the alarm**
- The alarm history report displays alarms which have occurred in a specified period by the alarm number. The alarms are automatically sorted by frequency, which helps operators clarify a main reason of each machine stop. So the operation rate of machines can be improved by the problem solving.
- Contribute to boosting productivity by visualizing causes of machine stop

To check operating status via the Internet, it is required to use a VPN or the like to ensure a secure connection to the LAN.
Condition Analyzer <Consultation is required>

- Record various machine data with various sensors attached to a machine, and detect machine and machining problems at an early stage
- Handle problems using sensor information to minimize machine downtime at the time of trouble

Machine status monitoring

Various machine data generated by sensors can be easily checked on the CELOS.

- Spindle*
  - Vibration
  - Bearing temperature
- Coolant*
  - Temperature
  - Level
  - Pressure
  - Flow rate
- Oil chiller
  - Inlet temp.
  - Outlet temp.
  - Machine temp.
  - Room temp.
- Electric power
  - Machine total
  - Coolant pump inverter

* Option
* For details, please consult our sales representative.

ADAMOS - The Bridge towards IoT-based Manufacturing Digitization Connects the World

Offer an open platform

The DMG MORI group co-founded ADAMOS to further facilitate IoT technologies and digitization at shop floor. ADAMOS offers an open platform that can bring the IoT technologies to customers in the world.

In the manufacturing industry, not only machines, but everything in an entire factory will be connected via network to achieve highest productivity ever.

We provide customers across the world with the best solutions that integrate the DMG MORI’s cutting-edge production / machining technologies honed for long years with the ADAMOS’s open platform and know-how on information technology.
NHX 5500 2nd Generation / NHX 6300 2nd Generation

High-Performance Operation System
MAPPS V

MAPPS V is a high-performance, smart operation system mounted on CELOS. It enables operators to easily control machine operation with touch operation.

The 6-window display provides access to a variety of information at the same time »»

The screen combinations can be freely customized »»

MAPPS: Mori Advanced Programming Production System
CELOS: Control Efficiency Lead Operation System

Lower Touch Panel Screen Layout
1. Individual function operation area: Displays function buttons at all times regardless of the operation mode.
2. Operation mode selection area: Displays mode selection buttons at all times.
3. Status display area: Displays the override status.
5. Mode-by-mode operation area: Displays buttons related to axis feed, zero return or automatic operation over multiple pages. The available buttons will change depending on the mode selected.
6. In-machine display area: Displays the machine model view.
DMG MORI developed the new energy-saving function GREENmode to achieve sustainable development.

The function reduces power consumption by approximately 40%* compared to the conventional machine by using efficient machining programs to minimize unnecessary stand-by power.

* The effect indicated above may not be achieved depending on the machines, cutting conditions, environmental conditions at measurement.

+ Improve cutting conditions to reduce machining time by bringing the best out of machine tools and tools
+ Reduce unnecessary power consumption during stand-by time by shutting off power of the spindle, chip conveyor and coolant pump at a time of machine stop
+ Visualize power consumption and CO₂ emission amount

**GREENmode**

**GREEN monitoring**
+ Visualize power consumption and CO₂ emission amount on the CELOS operation screen

**GREEN device**
+ High-brightness LED light
+ Accumulator pressure-keeping hydraulic pump

**GREEN idle reduction**
+ Shut off the power of the servo motor, spindle and coolant pump at a time of machine stop
+ Turn off the operation panel screen when a machine is not in operation for a certain time

**GREEN control**
+ Reduce machining power by energy-saving pecking cycles
+ Quicken standard M codes
+ Simultaneous acceleration / deceleration of the spindle and feed axes
+ Inverter-controlled coolant supply

CELOS: Control Efficiency Lead Operation System
NHX 5500 2nd Generation / NHX 6300 2nd Generation

Machine Size

NHX 5500

Front view

<table>
<thead>
<tr>
<th>Tool storage capacity</th>
<th>Ring type: 60</th>
<th>Chain-type: 100, 120</th>
<th>Rack-type: 180</th>
<th>Rack-type: 240</th>
<th>Rack-type: 330</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height × width × depth</td>
<td>3,200 × 3,365 × 5,465 (126.0 × 132.5 × 215.2)</td>
<td>3,260 × 3,470 × 5,962 (128.3 × 136.6 × 234.7)</td>
<td>3,300 × 4,203 × 5,465 (129.9 × 165.5 × 215.2)</td>
<td>3,300 × 4,203 × 5,723 (129.9 × 165.5 × 225.3)</td>
<td>3,300 × 4,203 × 6,803 (129.9 × 165.5 × 267.8)</td>
</tr>
</tbody>
</table>

NHX 6300

Front view

<table>
<thead>
<tr>
<th>Tool storage capacity</th>
<th>Ring type: 60</th>
<th>Chain-type: 100, 120</th>
<th>Rack-type: 180</th>
<th>Rack-type: 240</th>
<th>Rack-type: 330</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height × width × depth</td>
<td>3,300 × 3,930 × 5,917 (129.9 × 154.7 × 233.0)</td>
<td>3,260 × 3,672 × 6,419 (128.3 × 144.6 × 252.7)</td>
<td>3,300 × 4,405 × 5,917 (129.9 × 173.4 × 233.0)</td>
<td>3,300 × 4,405 × 6,135 (129.9 × 173.4 × 241.5)</td>
<td>3,300 × 4,405 × 7,215 (129.9 × 173.4 × 284.1)</td>
</tr>
</tbody>
</table>

● The diagrams show the 60-tool specification.
## Machine Specifications

<table>
<thead>
<tr>
<th></th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-axis travel</td>
<td>mm (in.)</td>
<td>800 [31.5]</td>
</tr>
<tr>
<td>Y-axis travel</td>
<td>mm (in.)</td>
<td>800 [31.5]</td>
</tr>
<tr>
<td>Z-axis travel</td>
<td>mm (in.)</td>
<td>880 [34.6]</td>
</tr>
<tr>
<td>Distance from pallet</td>
<td>mm (in.)</td>
<td>70—950 [3.9—35.4]</td>
</tr>
<tr>
<td>center to spindle</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pallet</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet working surface</td>
<td>mm (in.)</td>
<td>500 × 500 [19.7 × 19.7]</td>
</tr>
<tr>
<td>Pallet loading capacity</td>
<td>kg (lb.)</td>
<td>1,080 [2,200]</td>
</tr>
<tr>
<td>Max. workpiece swing</td>
<td>mm (in.)</td>
<td>800 [31.4]</td>
</tr>
<tr>
<td>diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. workpiece height</td>
<td>mm (in.)</td>
<td>1,180 [41.3]*</td>
</tr>
<tr>
<td><strong>Spindle</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. spindle speed</td>
<td>min⁻¹</td>
<td>12,000</td>
</tr>
<tr>
<td></td>
<td>16,000 &lt;high speed&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8,000 &lt;high torque&gt;</td>
<td></td>
</tr>
<tr>
<td><strong>Feedrate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid traverse rate</td>
<td>m/min (ipm)</td>
<td>X, Y, Z: 60,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0—2,362.2</td>
</tr>
<tr>
<td>Cutting feedrate</td>
<td>m/min (ipm)</td>
<td>X, Y, Z: 0—60,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(when using high-precision control &lt;look-ahead control&gt;)</td>
</tr>
<tr>
<td><strong>ATC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of tool shank</td>
<td></td>
<td>BT50*; CAT50, DIN50, HSK-A100</td>
</tr>
<tr>
<td>Tool storage capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. tool diameter</td>
<td>mm (in.)</td>
<td>110 [4.3]</td>
</tr>
<tr>
<td>(with adjacent tools)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. tool diameter</td>
<td>mm (in.)</td>
<td>320 [12.5]</td>
</tr>
<tr>
<td>(without adjacent tools)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. tool length</td>
<td>mm (in.)</td>
<td>550 [21.6]</td>
</tr>
<tr>
<td>Max. tool mass</td>
<td>kg (lb.)</td>
<td>30 (66)</td>
</tr>
<tr>
<td>Tool changing time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool-to-tool &lt;MAS&gt;</td>
<td>s</td>
<td>1.97</td>
</tr>
<tr>
<td>Cut-to-cut &lt;chip-to-chip&gt;</td>
<td>ISO 10791-9</td>
<td>4.4: 60 tools &lt;ring-type&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JIS B6336-9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 tools &lt;ring-type&gt;: 10.0 / 4.4 [max. / min.]</td>
</tr>
<tr>
<td><strong>APC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of pallets</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Pallet changing time**</td>
<td>s</td>
<td>15.0</td>
</tr>
</tbody>
</table>

ISO: International Organization for Standardization   JIS: Japanese Industrial Standard

*1 LPP specifications: either 1,000 mm (39.3 in.) or 1,100 mm (43.3 in.) can be selected.
*2 When the two-face contact specification is selected, two-face contact tools and non-two-face contact tools cannot be used together.
*3 When equipped with the auto-coupler, time taken to shut off / supply hydraulic pressure to the fixture is not included.

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.

Please use a two-face contact tool when cutting at 15,000 min⁻¹ or higher.

Max. tool diameter: the maximum tool diameter is limited to 230 mm (9.0 in.) or less when using the spindle at 10,000 min⁻¹ or higher.

Tool changing time: the time differences are caused by the different conditions (travel distances, etc.) for each standard.

For details, please check the Detailed Specifications.

The information in this catalog is valid as of July 2018.

LPP: Linear Pallet Pool
# Machine Specifications

<table>
<thead>
<tr>
<th>Motor</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spindle drive motor &lt;15%ED / cont&gt;</td>
<td>12,000 min⁻¹ kW (HP)</td>
<td>55 / 30 [75 / 40]</td>
</tr>
<tr>
<td></td>
<td>16,000 min⁻¹ &lt;high speed&gt; kW (HP)</td>
<td>37 / 26 [50 / 34.7] &lt;25%ED / cont&gt;</td>
</tr>
<tr>
<td></td>
<td>8,000 min⁻¹ &lt;high torque&gt; kW (HP)</td>
<td>55 / 45 [75 / 60] &lt;25%ED / cont&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machine size</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine height &lt;from floor&gt; mm (in.)</td>
<td>3,200 [126.0]</td>
<td>3,300 [129.9]</td>
</tr>
<tr>
<td>Floor space &lt;width X depth&gt; mm (in.)</td>
<td>3,365 X 5,465 [132.5 X 215.2]</td>
<td>3,930 X 5,917 [154.7 X 233.0]</td>
</tr>
<tr>
<td>Mass of machine &lt;including coolant tank&gt; kg (lb.)</td>
<td>14,590 [32,098]</td>
<td>18,750 [41,250]</td>
</tr>
</tbody>
</table>

| Control unit | FANUC | F31B |

*For details, please check the Detailed Specifications.*
*The information in this catalog is valid as of July 2018.*
## Standard & Optional Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spindle</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of tool shank</td>
<td>BT50(*)</td>
<td>● ●</td>
</tr>
<tr>
<td></td>
<td>CAT50</td>
<td>○ ○</td>
</tr>
<tr>
<td></td>
<td>DIN50</td>
<td>○ ○</td>
</tr>
<tr>
<td></td>
<td>HSK-A100</td>
<td>○ ○</td>
</tr>
<tr>
<td>12,000 min⁻¹: 55 / 30 kW (75 / 40 HP) &lt;15%ED / cont&gt;</td>
<td>● ●</td>
<td>● ●</td>
</tr>
<tr>
<td>16,000 min⁻¹: 37 / 26 kW (50 / 34.7 HP) &lt;25%ED / cont&gt; (high speed)</td>
<td>○ ○</td>
<td>○ ○</td>
</tr>
<tr>
<td>8,000 min⁻¹: 55 / 45 kW (75 / 60 HP) &lt;25%ED / cont&gt; (high torque)</td>
<td>—</td>
<td>○</td>
</tr>
<tr>
<td><strong>Magazine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool storage capacity</td>
<td>60 tools (ring type)</td>
<td>● ●</td>
</tr>
<tr>
<td></td>
<td>100 tools (chain-type)</td>
<td>○ ○</td>
</tr>
<tr>
<td></td>
<td>120 tools (chain-type)</td>
<td>○ ○</td>
</tr>
<tr>
<td></td>
<td>180 tools (rack-type)</td>
<td>○ ○</td>
</tr>
<tr>
<td></td>
<td>240 tools (rack-type)</td>
<td>○ ○</td>
</tr>
<tr>
<td></td>
<td>330 tools (rack-type)</td>
<td>○ ○</td>
</tr>
<tr>
<td><strong>Coolant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coolant system</td>
<td>● ●</td>
<td>● ●</td>
</tr>
<tr>
<td>Shower coolant</td>
<td>● ●</td>
<td>● ●</td>
</tr>
<tr>
<td>Coolant gun</td>
<td>Setup station side</td>
<td>● ●</td>
</tr>
<tr>
<td></td>
<td>Setup station side and machining side</td>
<td>○ ○</td>
</tr>
<tr>
<td>Through-spindle coolant / air (switching specifications)</td>
<td>○ ○</td>
<td>○ ○</td>
</tr>
<tr>
<td>Through-spindle coolant system (unit on coolant tank)[*2] center through</td>
<td>1.5 MPa (217.5 psi) «water-soluble»</td>
<td>● ●</td>
</tr>
<tr>
<td></td>
<td>7.0 MPa (1,015 psi) «water-soluble»</td>
<td>○ ○</td>
</tr>
<tr>
<td>Through-spindle coolant system (separate type)[*3] center through</td>
<td>7.0 MPa (1,015 psi)</td>
<td>○  ○</td>
</tr>
<tr>
<td>Through-spindle coolant system (unit on coolant tank)[*4] side through</td>
<td>1.5 MPa (217.5 psi) «water-soluble»</td>
<td>○  ○</td>
</tr>
<tr>
<td></td>
<td>7.0 MPa (1,015 psi) «water-soluble»</td>
<td>○  ○</td>
</tr>
<tr>
<td>Through-spindle coolant system (separate type)[*3] side through</td>
<td>7.0 MPa (1,015 psi)</td>
<td>○  ○</td>
</tr>
</tbody>
</table>

---

1. When the two-face contact specification is selected, a two-face contact tool and other tools cannot be used together.
2. When using oil-based coolant, consult our sales representative.
3. DMQP (DMG MORI Qualified Products)

---

Flammable coolant such as oil-based coolant has a high risk of ignition, and will cause fire or machine breakage if ignited. If you have to use a flammable coolant for any reason, please be sure to consult our sales representative.
Standard & Optional Features

NHX 5500 2nd Generation / NHX 6300 2nd Generation

## Coolant

<table>
<thead>
<tr>
<th>Description</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant chiller (separate type)</td>
<td>○*4</td>
<td>○*4</td>
</tr>
<tr>
<td>For standard coolant system</td>
<td>○*4</td>
<td>○*4</td>
</tr>
<tr>
<td>For through-spindle coolant system</td>
<td>○*4</td>
<td>○*4</td>
</tr>
<tr>
<td>Mist collector HVS-220 Including stand*6</td>
<td>○*4</td>
<td>○*4</td>
</tr>
<tr>
<td>Mist collector HVS-300 Including stand*6</td>
<td>○*4</td>
<td>○*4</td>
</tr>
<tr>
<td>Mist collector AFS-1600*6 Including stand</td>
<td>○*4</td>
<td>○*4</td>
</tr>
</tbody>
</table>

## Chip disposal

<table>
<thead>
<tr>
<th>Description</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip conveyor Rear discharge, drum filter type</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

## Measurement

<table>
<thead>
<tr>
<th>Description</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-machine measuring system (table)*7</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Touch sensor</td>
<td>(M)</td>
<td>○</td>
</tr>
<tr>
<td>Touch sensor</td>
<td>(R)</td>
<td>○</td>
</tr>
<tr>
<td>Touch sensor + tool setter function (tool length + diameter) (M)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Touch sensor + tool setter function (tool length + diameter) (R)</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

## Improved accuracy

<table>
<thead>
<tr>
<th>Description</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full closed loop control (Scale feedback)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Oil chiller</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

## Other

<table>
<thead>
<tr>
<th>Description</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal lamp 4 colors (LED type: red, yellow, green, blue)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Manual pulse generator (separate type)</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

---

* DMQP (DMG MORI Qualified Products)
* Cannot be used in Europe.
* Not compatible with oil-based coolant. If using oil-based coolant, select the HVS-220 or HVS-300.
* The specifications vary depending on the manufacturers. (M: made by Magnescale, R: made by RENISHAW)
* Equipped with the spindle for which the spindle bearing uses a high wear resistance ceramic ball. So the energization type touch sensor cannot be used.
* DMQP: Please see Page 24 for details.
* For details, please check the Detailed Specifications.
* The information in this catalog is valid as of July 2018.
* Specifications, accessories, safety device and function are available upon request.
* Some options are not available in particular regions. For details, please consult our sales representative.

---

Flammable coolant such as oil-based coolant has a high risk of ignition, and will cause fire or machine breakage if ignited.
If you have to use a flammable coolant for any reason, please be sure to consult our sales representative.
<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 or its distributor representative. DMG MORI 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 and its distributor representative shall have no obligation to re-enable such Equipment.

DMG MORI 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.

DMG MORI 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 and its distributor representative shall have no obligation to re-enable such Equipment.

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