CPP SYSTEM

Simple and Sophisticated Package System

With its simple construction provided in predefined packages, this system is easy to introduce. For the system configuration, the customer can select the optimum specifications from 8 packages. CPP contributes to improving customers’ productivity.

CPP’s features

Among all the various systems which are available, the CPP system is the most suitable for multi-item, small to medium-lot production.

Characteristics of each system

<table>
<thead>
<tr>
<th>Large Production size</th>
<th>Small Production size</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPP</td>
<td>Stand-alone machines</td>
</tr>
<tr>
<td>CPP</td>
<td>LPP</td>
</tr>
</tbody>
</table>

Key points when selecting a system

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>RPP</th>
<th>CPP</th>
<th>LPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of machines</td>
<td>1 unit</td>
<td>Up to 4 units</td>
<td>Up to 8 units</td>
</tr>
<tr>
<td>Number of workpiece setup stations</td>
<td>1 station</td>
<td>Up to 2 stations</td>
<td>Up to 5 stations</td>
</tr>
<tr>
<td>Number of pallet stations</td>
<td>4 stations</td>
<td>Up to 29 stations</td>
<td>Up to 99 stations</td>
</tr>
<tr>
<td>Number of pallet shelves</td>
<td>1 level</td>
<td>1 level</td>
<td>2 levels</td>
</tr>
</tbody>
</table>

Easy to order

You can choose your system from a wide range of pre-set options to suit your type of production. This allows you to construct the system quickly.

Space-saving

It allows you to establish an efficient automation system in far less space than other automation systems.

Reduced personnel costs

Since the system allows long-term automatic operation, you can reduce personnel costs, for example by conducting unmanned operation at night.

Reduction in setup time

By placing multiple fixtures on the pallets in advance, no setup is needed when you receive repeat orders.
Easy to Select Your Best System

The package system consists of a combination of a machining center and one of the eight pallet pool specifications. With your choice of spindle taper, the number of pallets and the machine installation arrangement, the system optimal for your production is complete.

Please select your machine.

<table>
<thead>
<tr>
<th>No. 40 taper</th>
<th>NHX 4000</th>
<th>NHX 5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine (e.g. NHX Series)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet size</td>
<td>400 mm (15.7 in.)</td>
<td>500 mm (19.7 in.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. 50 taper</th>
<th>NHX 5500</th>
<th>NHX 6300</th>
<th>NHX 8000</th>
<th>NHX 10000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine (e.g. NHX Series)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallet size</td>
<td>500 mm (19.7 in.)</td>
<td>630 mm (24.8 in.)</td>
<td>800 mm (31.5 in.)</td>
<td>1,000 mm (39.4 in.)</td>
</tr>
</tbody>
</table>

Please select pallet pool specifications.

<table>
<thead>
<tr>
<th>CPP specifications</th>
<th>6CPP</th>
<th>8CPP</th>
<th>10CPP</th>
<th>12CPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pallets</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Number of machines</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPP specifications</th>
<th>5CPP</th>
<th>7CPP</th>
<th>9CPP</th>
<th>11CPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pallets</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>Number of machines</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total 41 variations for the NHX Series models

Comparison of operating rates and productivity

In order to help you understand the CPP’s features, we have conducted a simulation comparing operating ratios and productivity under the same production conditions.

Assumptions:
- We are making the comparison under the following operating conditions.
- Cycle time / 1 pcs. = 897 sec. × 4,414 pcs. = 1,100 hours (3,946,000 sec.) / month
- When machining 2 kinds of workpieces at the same time.
- Material <JIS>: A5052 (Aluminum)

### Stand-alone machines <NHX 5000> (with 2-station APC)

- Number of machine operating days / month: 22 days
- Machine operating time (manned + unmanned): 10 hours (8 hours + 2 hours)
- Machine operating rate: 0.85
- Actual operating time / day: 8.5 hours
- Actual operating time / month: 187 hours
- Number of machines required to run 1,100 hours / month (total): 6 machines
- Comparison of equipment costs: 100%
- Number of operators required: 3
- Comparison of personnel costs: 100%

### CPP (12CPP)

- Number of machine operating days / month: 24 days
- Machine operating time (manned + unmanned): 20 hours (8 hours + 12 hours)
- Machine operating rate: 0.85
- Actual operating time / day: 17 hours
- Actual operating time / month: 408 hours
- Number of machines required to run 1,100 hours / month (total): 12CPP (1 machine) × 3 sets
- Comparison of equipment costs: 100%
- Number of operators required: 70%
- Comparison of personnel costs: 67%
CPP SYSTEM

New Design with Beauty and Usability

The CPP system is designed in pursuit of usability, aiming at reduction of operators’ everyday burden. The system with a beautiful new design cover provides operators a joy of machine operation.

- Smoother door opening / closing to reduce operators' burden
- Improved visibility inside the CPP

Setups can be performed not only with the conventional handy controller, but with CELOS on the machine. The use of CELOS also allows for operation and management of both machine and CPP. CELOS featuring a large touch screen ensures hassle-free setup operations.

PALLET MANAGER

- Intuitive operation, just like a smartphone
- Shorter setup times

* This is a MAPPS V function and is applicable to the following models: NHX 4000 2nd Generation, NHX 5000 2nd Generation, NHX 5500 and NHX 6300. This function is not available on NHX 8000 and NHX 10000. (pallet operation is possible only with the handy controller)

CELLOS: Control Efficiency Lead Operation System
MAPPS: Mori Advanced Programming Production System
System Components for Highest Reliability

Each structure of the CPP consists of high-quality, durable components. You can select the ideal specifications for your production from the packages.

**Machine**
- Uses the NHX Series horizontal machining centers

**Pallet racks**
- The pallets are transferred using the random access method (number of pallets = number of pallet stations + number of machines)
- The open frame offers excellent visibility

**Transfer AGV (Automatic Guided Vehicle)**
- The pallet direct calling function calls pallets quickly
- The NC control achieves highly accurate positioning, high reliability and easy maintenance by ensuring smooth axis travel and transfer
- High-speed travel is possible by using a rack & pinion and a guide rail

**Workpiece setup station (WSS)**
- Manual pallet indexing is possible in 45° increments up to 360°, offering easier setup
- Hydraulic and pneumatic units for automatic fixture clamping *
- An air gun ** and a coolant gun can be installed (option)

* Consultation is required
A Wide Variety of Peripherals to Meet Your Needs

The combination of the high-performance system and the excellent peripheral equipment helps significantly improve operating efficiency and accuracy.

**Auto-coupler (option) <Consultation is required>**
Compressed air is supplied to the setup station. Hydraulic fluid is supplied to both the setup station and the machining table. High pressure can be used with the anti-rising mechanism.

**Coolant gun (option)**
Use the high-pressure coolant gun to flush the chips from the machine and fixtures.

**Coolant collection unit**
The coolant collection unit installed around the CPP system.

**Tool ID (option) <Consultation is required>**
This system calls tool data, and automatically processes registered information to improve ease of setup.

**Robot (option) <Consultation is required>**
The robot automates workpiece handling.

- A separate tool presetter is required
- When using this, both MCC-LPS III and MCC-TMS are required.
### System component specifications

**Straight line arrangement**
With these specifications, the machine is set up horizontally in relation to the pallet shelves.

**Right angle arrangement**
With these specifications, the machine is set up vertically in relation to the pallet shelves.

<table>
<thead>
<tr>
<th>Machine and pallet specifications</th>
<th>NHX 4000-CPP</th>
<th>NHX 5000-CPP</th>
<th>NHX 6300-CPP</th>
<th>NHX 8000-CPP</th>
<th>NHX 10000-CPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable machining centers</td>
<td>NHX 4000</td>
<td>NHX 5000</td>
<td>NHX 6300</td>
<td>NHX 8000</td>
<td>NHX 10000</td>
</tr>
<tr>
<td>Number of pallets controlled</td>
<td>Right angle arrangement: 6, 8, 10, 12</td>
<td>Straight line arrangement: 5, 7, 9, 11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrier travel specifications</td>
<td>Speed (with / without pallet) m/min (fpm)</td>
<td>52 / 42 (170.6 / 137.8)</td>
<td>48 / 38 (157.5 / 124.7)</td>
<td>42 / 28 (137.8 / 91.9)</td>
<td>35 / 25 (114.8 / 82.0)</td>
</tr>
<tr>
<td>Workpiece transfer specifications</td>
<td>Speed (with / without pallet) m/min (fpm)</td>
<td>50 / 40 (164.1 / 131.2)</td>
<td>45 / 35 (147.6 / 114.8)</td>
<td>40 / 25 (131.2 / 82.0)</td>
<td>35 / 25 (114.8 / 82.0)</td>
</tr>
<tr>
<td>Carrier hoist specifications</td>
<td>Drive system</td>
<td>Hydraulic cylinder</td>
<td>Servo motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrier turn specifications</td>
<td>Turn speed</td>
<td>7.34</td>
<td>6.73</td>
<td>4.63</td>
<td>3.7</td>
</tr>
<tr>
<td>Workpiece setup station specifications</td>
<td>Setup system</td>
<td>45° indexing turn table system</td>
<td>Fixed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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● For any functions not featured in the MAPPS system you are currently using, software updates are required. For details, please consult with our sales representative. (There will be a charge for the software update)

● Some functions are not supported by some models.

● The product names in this catalog are all trademarks or registered trademarks of the individual companies.

● If you have any questions regarding the content, contact our sales representative.

● The information in this catalog is valid as of December 2015. Designs and specifications are subject to changes without notice.

● DMG MORI is not responsible for differences between the information in the catalog and the actual machine.

<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 the 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.