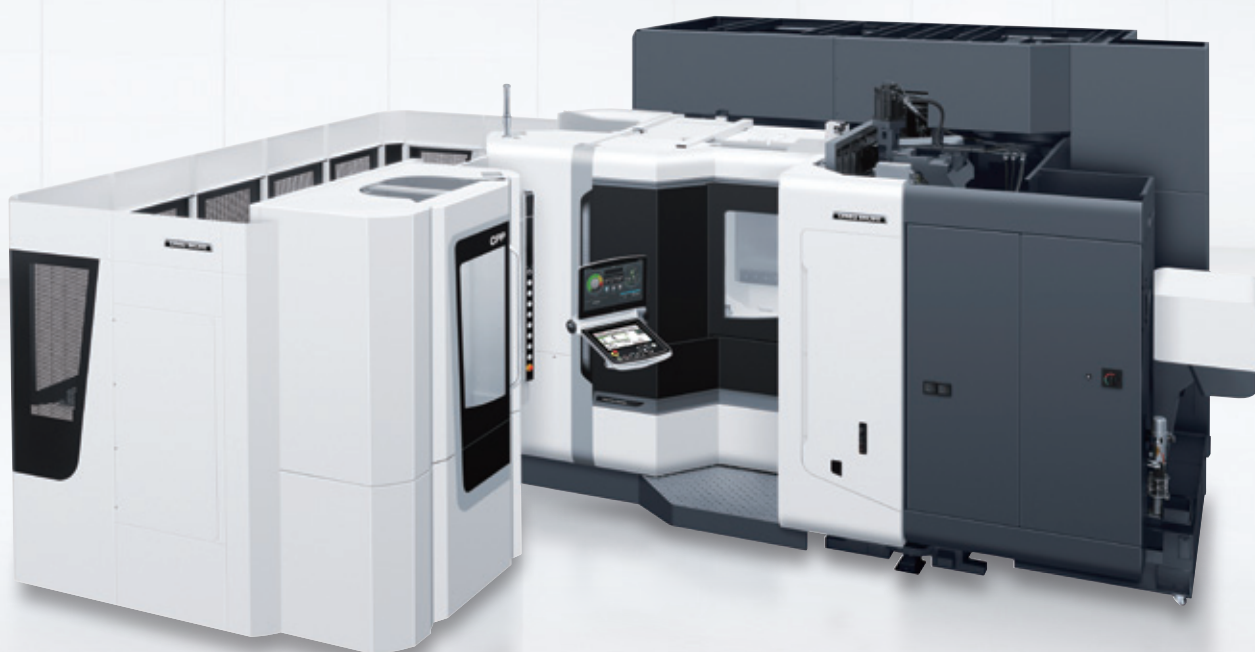


Carrier Pallet Pool System

CPP SYSTEM



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.



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.

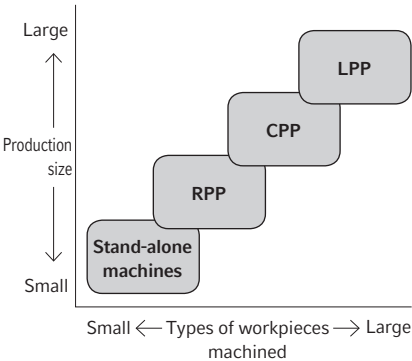
Reduced personnel costs
Since the system allows long-term automatic operation, you can reduce personnel costs, for example by conducting unmanned operation at night.

Reduction in setup time
By placing multiple fixtures on the pallets in advance, no setup is needed when you receive repeat orders.

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



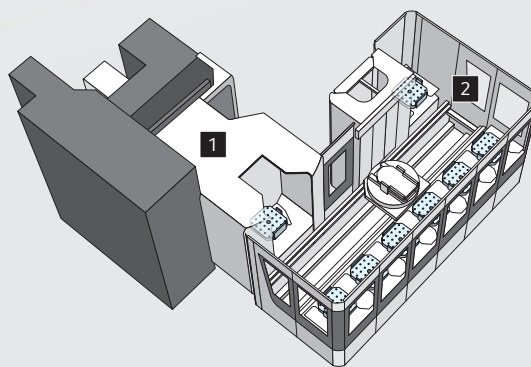
RPP: Round Pallet Pool CPP: Carrier Pallet Pool LPP: Linear Pallet Pool

Key points when selecting a system

	RPP	CPP	LPP
Number of machines	1 unit	Up to 4 units	Up to 8 units
Number of workpiece setup stations	1 station	Up to 2 stations	Up to 5 stations
Number of pallet stations	4 stations	Up to 29 stations	Up to 99 stations
Number of pallet shelves	1 level	1 level	2 levels

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.

No. 40 taper

Machine (e.g. NHX Series)	NHX 4000	NHX 5000
Pallet size	<input type="checkbox"/> 400 mm (15.7 in.)	<input type="checkbox"/> 500 mm (19.7 in.)

No. 50 taper

Machine (e.g. NHX Series)	NHX 5500	NHX 6300	NHX 8000	NHX 10000
Pallet size	<input type="checkbox"/> 500 mm (19.7 in.)	<input type="checkbox"/> 630 mm (24.8 in.)	<input type="checkbox"/> 800 mm (31.5 in.)	<input type="checkbox"/> 1,000 mm (39.4 in.)

Please select pallet pool specifications.

Machine installation arrangement: Right angle arrangement

CPP specifications	6CPP	8CPP	10CPP	12CPP
Number of pallets	6	8	10	12
Number of machines	1			

Machine installation arrangement: Straight line arrangement

CPP specifications	5CPP	7CPP	9CPP	11CPP
Number of pallets	5	7	9	11
Number of machines	1			

03

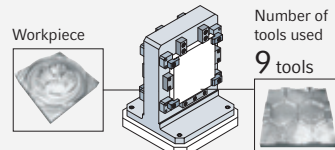
Total 41 variations for the NHX Series models

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 (3,960,000 sec.) / month

● When machining 2 kinds of workpieces at the same time.
Material <JIS>: A5052 (Aluminum)

JIS: Japanese Industrial Standard

Items compared	Stand-alone machines <NHX 5000> (with 2-station APC)	CPP (12CPP)
Number of machine operating days / month A	22 days	24 days
Machine operating time (manned + unmanned) B	10 hours (8 hours + 2 hours)	20 hours (8 hours + 12 hours)
Machine operating rate C	0.85	0.85
Actual operating time / day B × C = D	8.5 hours	17 hours
Actual operating time / month D × A = E	187 hours	408 hours
Number of machines required to run 1,100 hours / month (total)	6 machines	12CPP (1 machine) × 3 sets
Comparison of equipment costs	100%	70%
Number of operators required	3	2
Comparison of personnel costs	100%	67%

- Operability
- System Components

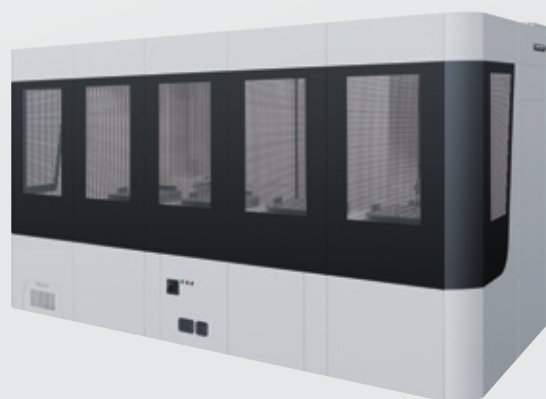
CPP SYSTEM

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)

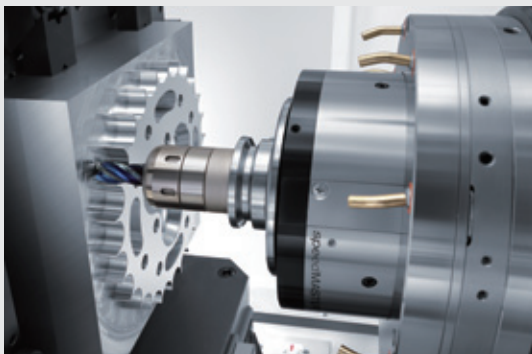
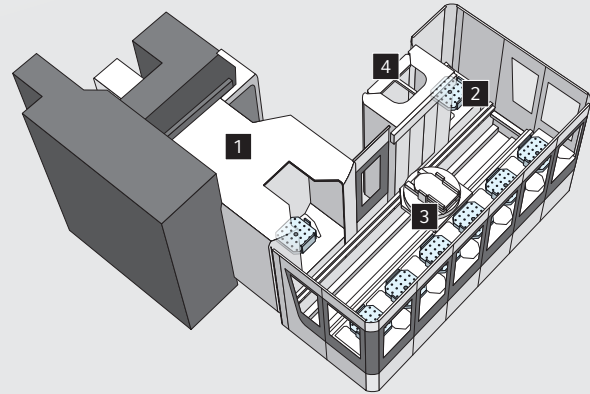
Handy controller



CPP SYSTEM

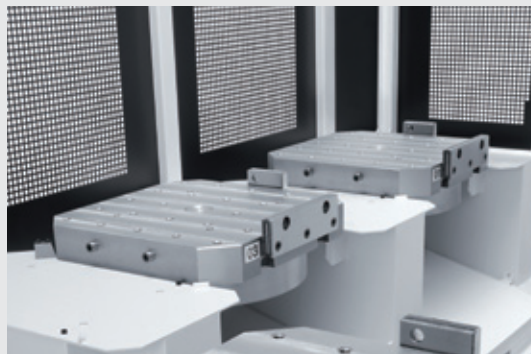
System Components for Highest Reliability

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



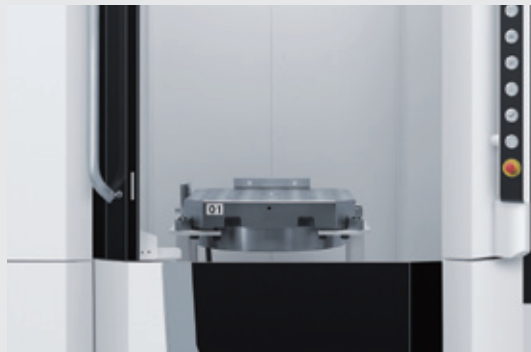
Pallet racks

- + 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

CPP SYSTEM

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.



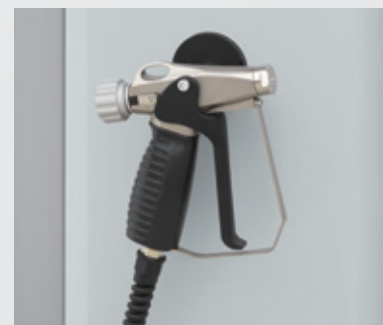
Setup station



Machining table

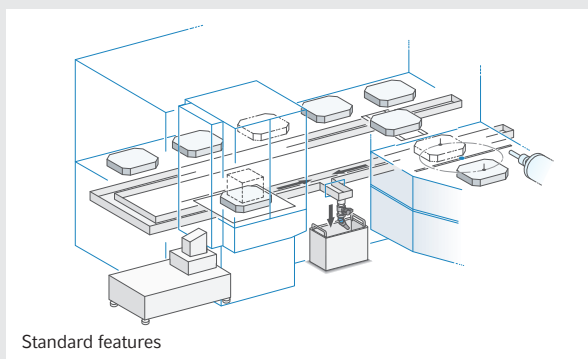
Coolant gun (option)

Use the high-pressure coolant gun to flush the chips from the machine and fixtures.



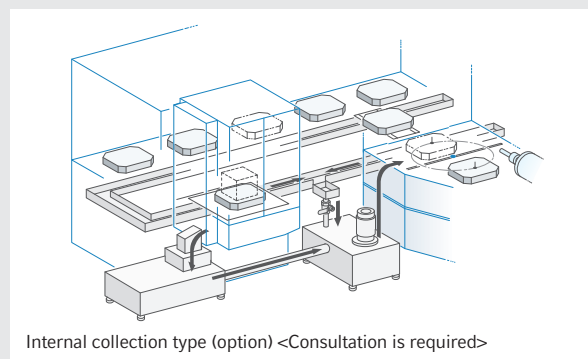
Coolant collection unit

The coolant collection unit installed around the CPP system.



Standard features

- Collection of coolant from the gutter inside the CPP must be arranged by the customer.



Internal collection type (option) <Consultation is required>

- This will be available as customized specifications.
- Coolant from inside the workpiece setup station is collected in the chip bucket.

Tool ID (option) <Consultation is required>

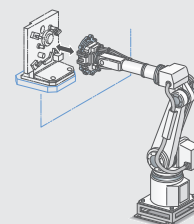
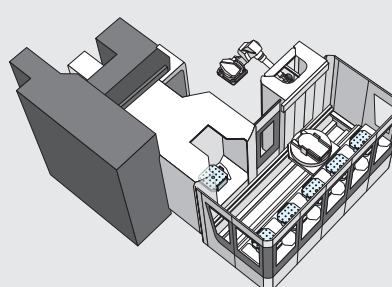
This system calls tool data, and automatically processes registered information to improve ease of setup.



- * A separate tool presetter is required
- When using this, both MCC-LPS III and MCC-TMS are required.

Robot (option) <Consultation is required>

The robot automates workpiece handling.

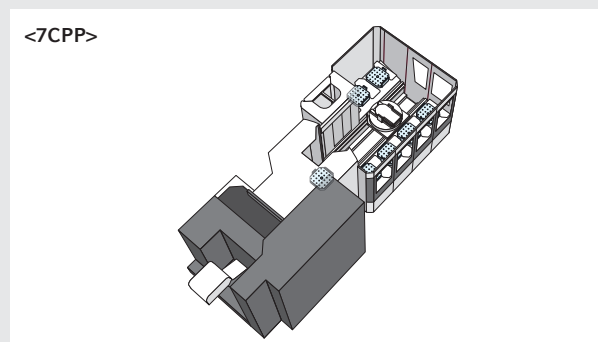
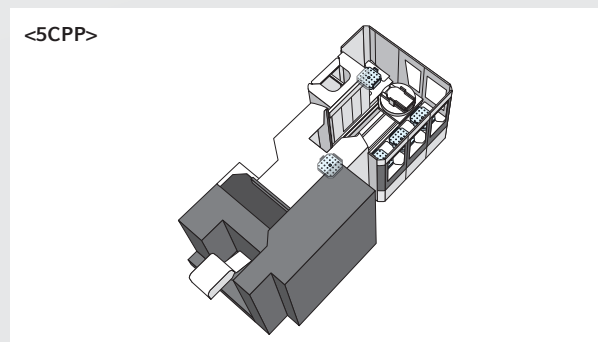


For mass production workpieces, this improves work efficiency by automatically attaching/removing unusually shaped or heavy workpieces.

System component specifications

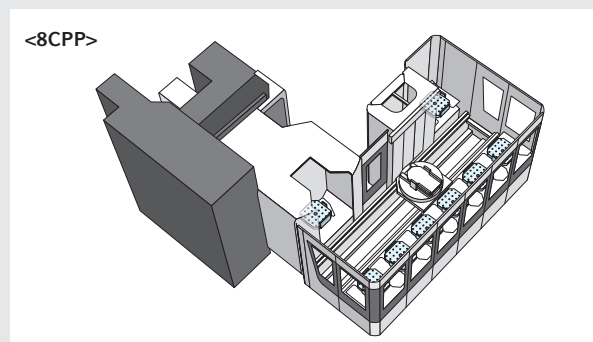
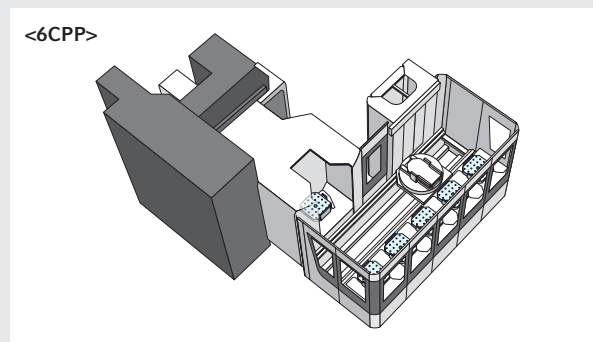
Straight line arrangement

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.



	NHX 4000-CPP	NHX 5000-CPP NHX 5500-CPP	NHX 6300-CPP	NHX 8000-CPP	NHX 10000-CPP
Machine and pallet specifications					
Applicable machining centers	NHX 4000	NHX 5000 NHX 5500	NHX 6300	NHX 8000	NHX 10000
Number of pallets controlled	Right angle arrangement: 6, 8, 10, 12 Straight line arrangement: 5, 7, 9, 11				Right angle arrangement: 6
Carrier travel specifications					
Speed (with / without pallet) m/min (fpm)	52 / 42 (170.6 / 137.8)	48 / 38 (157.5 / 124.7)	42 / 28 (137.8 / 91.9)	35 / 25 (114.8 / 82.0)	35 (114.8)
Workpiece transfer specifications					
Speed (with / without pallet) m/min (fpm)	50 / 40 (164.1 / 131.2)	45 / 35 (147.6 / 114.8)	40 / 25 (131.2 / 82.0)	35 / 25 (114.8 / 82.0)	12 / 8.5 (39.4 / 27.89)
Carrier hoist specifications					
Drive system	Hydraulic cylinder				Servo motor
Carrier turn specifications					
Drive system	General-purpose CAD motor				—
Turn speed min ⁻¹	7.34	6.73	4.63	3.7	—
Workpiece setup station specifications					
Setup system	45° indexing turn table system				Fixed



<Precautions for Machine Relocation>

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