Basic Machine

J-A00544*   NHX5000_M730BM

Table

J-002065   Full 4th axis rotary table

Minimum pallet indexing angle is changed to 0.001°
from the standard 1°.

Pallet/ APC

J-002005   Pallet edge locator   (2off)

Fix one each of large and small edge locators to the
edge of a pallet.   In the workpiece mounting
operation, the edge locators serve as contact points
that make it easier to position the workpiece on the
pallet.

Magazine

J-000290   Tool storage capacity 120 tools (7/24 Taper #40,
Retention knob: DIN40 or Special
(Center-Through), chain type)

Providing a chain type 120-tool magazine. A tool
holder with DIN40 grip or retention knob can be used.
* Tool storage capacity: 120
* Max. tool diameter:
  - With adjacent tools: φ70
* Max. tool length: 550 mm
* Tool changing time (Tool to tool): 0.9 sec.

Coolant

J-001944   Coolant gun for setup station side

This coolant gun allows you to remove chips
accumulating inside the setup station and the
machining chamber, as well as to clean up chips
adhering to pallets, workpieces, and fixtures.

J-001918   Through-spindle coolant system (separate type)
            I/F (center through, 7.0 MPa)

            This is the I/F for mounting the high pressure coolant
            system manufactured by OGURA CLUTCH CO.,
            LTD. (separate type).
            The coolant path to the tool tip is a center through
            type.
            When the coolant is not supplied, it vacuums the
            coolant left in the tool and pipes, preventing the liquid
            leakage out of the discharge hole.
            The followings are included with the specifications:
            -Changing to the spindle with through-spindle coolant
            specifications.
            -Machine-side piping for the coolant system.
            -Electrical parts for the coolant system.
            -Pumps

            *The high pressure coolant unit (separate type) is not
            included.*

Measurement

J-001955   In-machine measuring system (table) touch sensor
            (METROL)

            Mounting the touch sensor manufactured by Metrol
            makes it possible to measure tool length and detect
            tool breakage.
            During machining, the touch sensor is stored under
            the special cover to prevent it from being covered with
            chips.
            Chips or coolant on the receiver can be removed by
            air blow.
            ・Tool length measurement
            ・Inductive signal type
            ・Touch sensor measuring surface: ϕ 20 mm
            T25H-02-02 (METROL)

Improved accuracy

J-000310   Oil cooler specification (spindle cooling)

            It cools down the spindle motors and bearings
            according to the machine body temperature rise. This
            oil cooler is synchronized with temperature of the
            machine body, so it is less subject to room
            temperature change and stable the thermal
            displacement of the spindle (Z-axis) compared with
            the standard type fan cooler. This specification must
            be selected in the high-speed (20000 min-1)
            specifications.

Other (Machine Option)

J-000855   Signal tower 3 layers (Red, yellow, green)
             LED type (front upper side)

             This signal tower informs the operator of the
             machine's status with lights and a buzzer.
             Red: When an alarm occurs a buzzer sounds and the
             signal tower light comes on.
             Yellow: When the program end is executed, a buzzer
             sounds and the signal tower light comes on.
             Green: During NC operation, the signal tower light
             comes on. (The buzzer does not sound.)
             PATLITE

J-001226   Rotary window

             The rotary window is fixed inside the window at the
             machining side door.
             Glass disc of the rotary window rotates by air drive to
             remove coolant adhering inside of the window with
             centrifugal force.
             -Air drive system
             -Outer diameter: 239 mm
             -Thickness: 40 mm
             RE-V2-T (Pioneer Machine Tool)

NC Option

J-009150   Data server (excluding memory card)

             This can transfer the NC data and perform DNC
             operation by using the FTP. Data can be transferred
             by putting the device such as NC memory, CF card or
             host into the device A and the device B [the type of
             OS] Windows NT4.0 or above /2000/XP [Home
             edition (invalid)]···FTP software is required
             separately. [Professional (valid)] ···FTP software IIS
             is standard. ※ For XP, use Professional
             Edition.(DOS/UNIX can be selected.)

J-009193   Part program storage length 512 KB (1,280 m) in total
             + Registerable programs 1,000 in total

             The storage capacity can be increased to 512 KB,
             and up to 1,000 programs can be registered.

J-009310   High-speed and high-precision function I
             (AI contour control)

             The high-speed, high-accuracy control, to be used for
             running the machining program in which free-form
             curve is approximated with small segments at high
             speed and high accuracy, is effective for improving
             machining speeds in die/mold machining.
             There are two types; type I and type II. These two
             types differ in approximating processing performance
             of small segments and restrictions in programming.
             Comparing them using the small segment processing
             length performance, type II provides two times higher
             performance than type I.

J-008450   Installation of high-speed skip terminal

             The skip function operates based on a high-speed
             skip signal (connected directly to the NC; not via the
             PMC) instead of an ordinary skip signal.
             We will prepare 4 high-speed skips and terminal
             blocks.
             Delay and error of the skip signal input is 0-2 msec at
             the NC side (not considering those at the PMC side).
             This high-speed skip signal input function keeps this
             value to 0.1 msec or less, thus allowing high-precision
             measurement.

J-009148   Custom macro common variables 600 in total
             (#100-#199, #500-#999)

             These specifications increase the number of custom
             macro common variables.

J-009154   Additional workpiece coordinate systems 48 sets

             When the standard 6 sets of workpiece coordinate
             systems (G54 - G59) are not sufficient, up to 48 sets
             of workpiece coordinate systems can be added.

Special constructions services

SK001   Transformer

SK005   Renishaw OMP400 optical Inspection probe system
           with Inspection Plus software

SK006   Tooling package, up to a gross value of

UK0011   High Pressure (70 Bar*) Coolant Unit with twin cartridge
           filtration system (*only for tool / holder with Max. 2mm
           orifice - over 2mm will result in a reduction of pressure)

Basic machine

The specifications below apply to a basic machine without additional options.
Specifications in square brackets [ ] are values or features for a machine with additional options.

Travel

X-axis travel <longitudinal of movement of saddle>	mm (in.)	730 (28.74)
Y-axis travel <vertical movement of spindle head>	mm (in.)	730 (28.74)
Z-axis travel <cross movement of pallet>	mm (in.)	880 (34.65)
Distance from pallet surface to spindle center	mm (in.)	80 – 810 (3.15 – 31.89)
Distance from pallet center to spindle gage plane	mm (in.)	70 – 950 (2.76 – 37.40)

Pallet

Height from floor to pallet surface	mm (in.)	1,200 (47.24)
Pallet working surface	mm (in.)	500 x 500 (19.69 x 19.69)
Pallet loading capacity	kg (lb.)	500 (1,100) [700 (1,540)]
Maximum workpiece swing diameter	mm (in.)	800 (31.50)
Maximum workpiece height	mm (in.)	1,000 (39.37)
Pallet surface configuration <tap size x holes, pitch>		M16 (1/2-13 UNC) x 24, 100 mm (3.94 in.)
Minimum pallet Indexing angle	deg	1 [0.001 <full indexing table>]
Pallet indexing time <including clamping and unclamping time> <90 deg>	sec	1.49 [1.60] <1 degrees indexing table>

Spindle

Maximum spindle speed	min⁻¹	12,000 [12,000]
Maximum spindle speed <HSC option>	min⁻¹	20,000
Number of spindle speed ranges		1
Type of spindle taper hole		No. 40
Spindle bearing inner diameter	mm (in.)	80 (3.15)

Feedrate

Rapid traverse rate:		
- X-axis	mm/min (ipm)	60,000 (2,362.20)
- Y-axis	mm/min (ipm)	60,000 (2,362.20)
- Z-axis	mm/min (ipm)	60,000 (2,362.20)
Cutting feedrate <with high precision control>	mm/min (ipm)	0 - 60,000 (0 – 2,362.20)
Jog feedrate	mm/min (ipm)	0 - 5,000 (0 – 196.85) <20-step>

ATC

Type of tool shank		BT40 [CAT40] [DIN40] [HSK-A63] [KM-50] [Capto C5]
Type of retention knob		MORI SEIKI 90 deg type [45 deg <MAS-I>] [60 deg <MAS-II>] [DIN] [Special <center through>]
Tool storage capacity:		
- Ring-type	tools	40 [60]
- Chain-type	tools	[120]
- Rack-type	tools	[180] [240]
Maximum tool diameter <with adjacent tools>	mm (in.)	70 (2.76)
Maximum tool diameter <without adjacent tools>:		
- Ring-type	mm (in.)	170 (6.69)
- Chain-type, rack-type	mm (in.)	[140 (5.51)]
Maximum tool length	mm (in.)	550 (21.65)
Maximum tool mass	kg (lb.)	12 (26.40)
Maximum tool mass moment <From spindle gauge line>	N·m (ft·lbf)	7.84 (5.78)
Method of tool selection		Technical memory random
Tool changing time <tool-to-tool>:	sec	0.9
Tool changing time <cut-to-cut> <MAS>	sec	3.3
Tool changing time <cut-to-cut> <ISO 10791-9, JIS B6336-9>:		
- 40-tool <ring-type>	sec	8.2 <Max>, 3.3 <Min>
- [60-tool <ring-type>]	sec	10.4 <Max>, 3.3 <Min>

APC

Number of pallets		2
Method of pallet change		Turn type
Pallet changing time	sec	9.0 [12.5 <pallet loading capacity 700 kg (1,540 lb.)>]

Motor

Spindle drive motor:

- 12,000 min^{-1} <10%ED/cont>	kW (HP)	15/11 (20.00/14.67)
- [8,000 min^{-1} <15%ED/cont>]	kW (HP)	30/18.5 (40.00/24.67)
- 20,000 min^{-1} <10 min/30 min/cont>	kW (HP)	18.5/15/11 (24.67/20.00/14.67)

Feed motor:

- X-axis	kW (HP)	3 (4.00)
- Y-axis	kW (HP)	3 (4.00)
- Z-axis	kW (HP)	3 (4.00)
- B-axis	kW (HP)	3 (4.00)
Coolant pump motor	kW (HP)	1.2 + 1.2 (1.60 + 1.60)

Power source

Power sources <cont>	kVA	31.3
Compressed air supply	MPa (psi), L/min (gpm)	0.5 (72.50), 420 (110.88)

Tank capacity

Coolant tank capacity <external chip conveyor specification>	L (gal.)	800 (211.20)

Machine Size

Machine height <from floor>	mm (in.)	2,833 (111.54)
Floor space <width x depth> <external chip conveyor specification>	mm (in.)	[3,098 x 4,854 (121.97 x 191.10)]
Mass of machine <with coolant tank>	kg (lb.)	11,100 (24,420)

NC Unit
CNC Unit M730BM

Controlled axis

Controlled axis	X, Y, Z, B
Simultaneously controllable axes	4 axes
Least input increment	0.001 mm (0.0001 in.)
Max commandable value	±99,999.999 mm (±9,999.9999 in.)
Inch/metric conversion	
Machine lock	
Overtravel	
Door interlock	
Load monitoring function C	Soft-key type

Operation

Dry run	
Single block	
Jog feed	0 - 5,000 mm/min (0 - 196.85 ipm) <20 steps>
Manual return to reference position	
Manual handle feed	Manual pulse generator: 1 unit x1, x10, x100 <per pulse>
Pulse handle feed	x1, x10, x100

Interpolation functions

Nano interpolation	
Positioning	
Uni-directional approach/unidirectional positioning	
Exact stop mode	
Tapping mode	
Cutting mode	
Exact stop	
Helical interpolation	Optional 2 axes and other 1 axis
Return to reference position	
Reference position return check	
Return from reference position	
Return to second reference position	

Feed functions

Rapid traverse rate	Max. 60,000 mm/min
Feed per minute/cutting feedrate	0 − 60,000 mm/min
	(0 − 2,362.2 ipm)
	<when using high-precision control {look-ahead control}>
Rapid traverse override	F0/1/10/25/100% <5 steps>
Feed per minute	
Constant tangential feedrate control	
Cutting feedrate clamp	
Automatic acceleration and deceleration	Liner type <rapid traverse>/ Exponential function type <cutting feed>
Feedrate override	
Feedrate override cancel	
Linear acceleration/deceleration after cutting feed interpolation	
High-precision control (look-ahead control)	

Program input

Optional block skip	
Max. command value	±8 digits
Program number	4 digits
Absolute/incremental command	
Decimal point programming	Electrical calculator type decimal point programming is changeable using parameter.
Diameter/radius programming	
Plane selection	
Rotary axis designation	
Rotary axis roll-over	
Coordinate system setting	
Automatic coordinate system setting	
work coordinate system	
Programmable data input	
Sub-program call	Up to 8 nestings
Drilling cycle	
Programmable mirror image	
Custom macro common variables <in total>	200 variables (#100 - #199, #500 - #599)

Miscellaneous function/spindle speed function

Miscellaneous function <M function>	M4-digit
Auxiliary function lock	
Spindle speed function <S function>	S5-digit
Spindle override	50 - 150% <10% increments>
Spindle orientation	
Synchronous tapping	

Tool function/Tool offset function

Tool function <T function>	T8-digit
Number of tool offsets	200 sets <A set is defined as radius and length combination. If radius and length offset data are set individually, the value indicates the number of data.>
Tool offset data memory C	D/H code, geometry and wear offset data
Tool length correction	
Tool radius offset	
Tool position offset	
MAPPS tool management system	

Mechanical accuracy compensation

Backlash compensation	±9,999,999 pulses
Rapid traverse/cutting feed backlash compensation	
Stored pitch error compensation	
Interpolation type pitch error compensation	

Editing function

Part program storage	125 KB <320 m (1,050 ft.)>
Number of stored programs	200 programs
Part program edit or program editing	
Program protect	
Background editing	
Undo/Redo function <MAPPS>	
Line number display <MAPPS>	

Setting and display

Status display	
Clock function	
Position read-out, position display	
Program comment display	48 characters
Parameter setting display	
Alarm display	
Alarm history display	
Operator's message history display	
Operation history display	
Running time display/No. of parts display	
Actual feedrate display	
Operating monitor screen	Load meter display etc.
Help function	
Self-diagnosis function	includes alarm display, I/O signal diagnosis, ladder diagram
Operation panel: Display section	10.4" color TFT

I/O functions and units

I/O interface	USB
50 MB Program storage area <for card DNC operation function, for data backup> <MAPPS>	Files up to 10 MB in size can be edited

Standard Equipment

Control unit

- Operating system <operation panel>: MAPPS IV

Pallet/Pallet changing system

- 2-station turn-type APC
- Form of pallet - tap <metric, inch>
- 1° indexing table

Spindle

- Spindle drive motor is 15/11 kW (20/15 HP) <10% ED/cont.> and max. spindle speed is 12,000 min^{-1}.
- Spindle drive motor is 18.5/15/11 kW (24.7/20/15 HP) <10 min/30 min/cont.> and max. spindle speed is 20,000 min^{-1}. <HSC option>
- Spindle cooling specifications - Fan cooler
- Spindle cooling specifications - Oil cooler <HSC option>
- Type of tool shank BT40
- Type of retention knob - MORI SEIKI 90°
- Tool storage capacity is 40 tools. <ring type>

Coolant

- Coolant system
- Shower coolant <used at the same time as spindle coolant>
- Coolant float switch <lower limit detection>

Chip disposal

- Chip conveyor <Rear discharge, drum filter type + cyclone filter>
- Air blow for tool tip <when the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required>

High accuracy positioning

- Direct scale feedback <X-axis, Y-axis, Z-axis>

Safety features

- Full cover
- Door interlock system: front door/ set up station door/ magazine door/ electrical cabinet door
  Mechanical lock: front door/ set up station door/ magazine door
- Low hydraulic pressure detecting switch
- Low air pressure detecting switch
- Residual pressure exhaust valve

Others

- Automatic power-off system
- LED worklight
- Pallet seating confirmation
- Leveling jack specification
- Hand tools
- One set of operation and programming manuals