

CITIZEN

Miyano



Preface

Dear Readers,

Citizen Machinery Europe GmbH has successfully been selling Swiss type lathes and fixed head automatic lathes of the brands Cincom and Miyano all over Germany and in large parts of Europe for many decades. With our 3 locations in Esslingen, Villingendorf and Neuss, we are always personally at your disposal and always in close vicinity throughout Germany to answer your questions regarding sales and other issues. In all service matters, we are there for you in whole of Europe.

Under the Cincom brand, we sell Swiss-type lathes which demonstrate their full power and performance when machining long workpieces and small diameters.

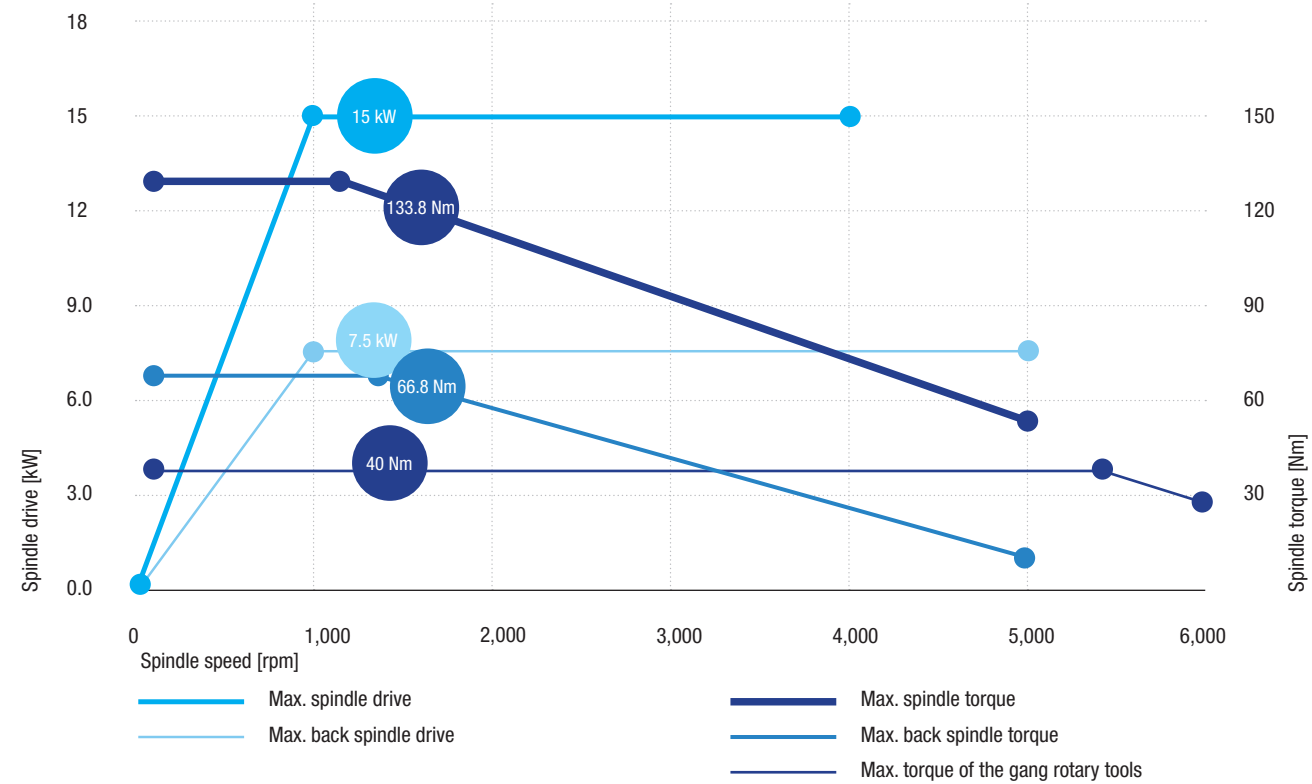
The Miyano brand measures up to all challenges when turning short workpieces in fixed-headstock applications. The machines distinguish themselves by high productivity, quality and precision and grant excellent results in diameter ranges of up to 80 mm.

Our path-breaking LFV Technology as well as laser integration have revolutionized the cutting process. We will continue to work hard on developing new innovations and provide optimum solutions to our customers. With future-oriented products, we look forward to stepping into the future together with you.

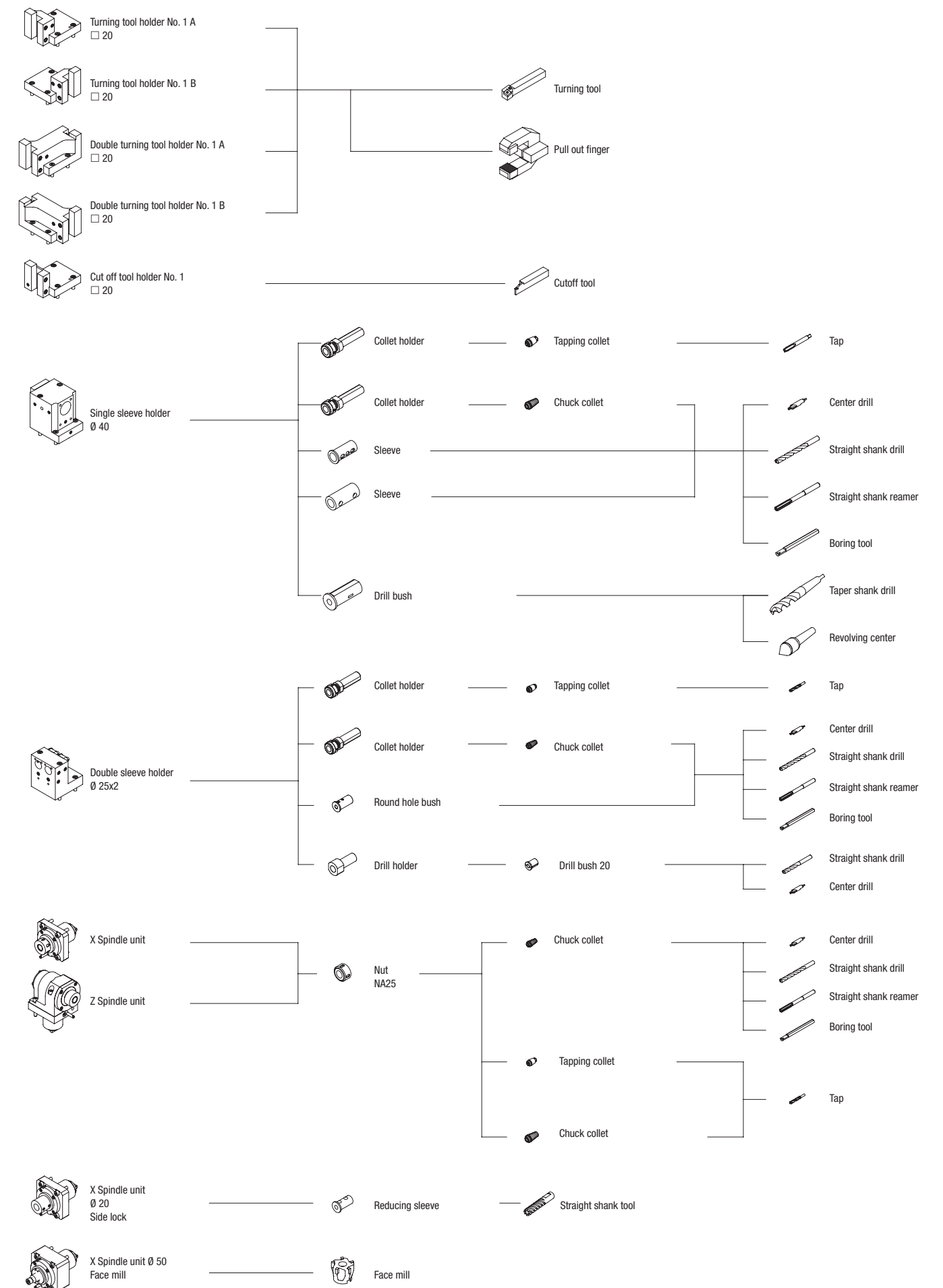


Markus Reissig
General Manager Citizen

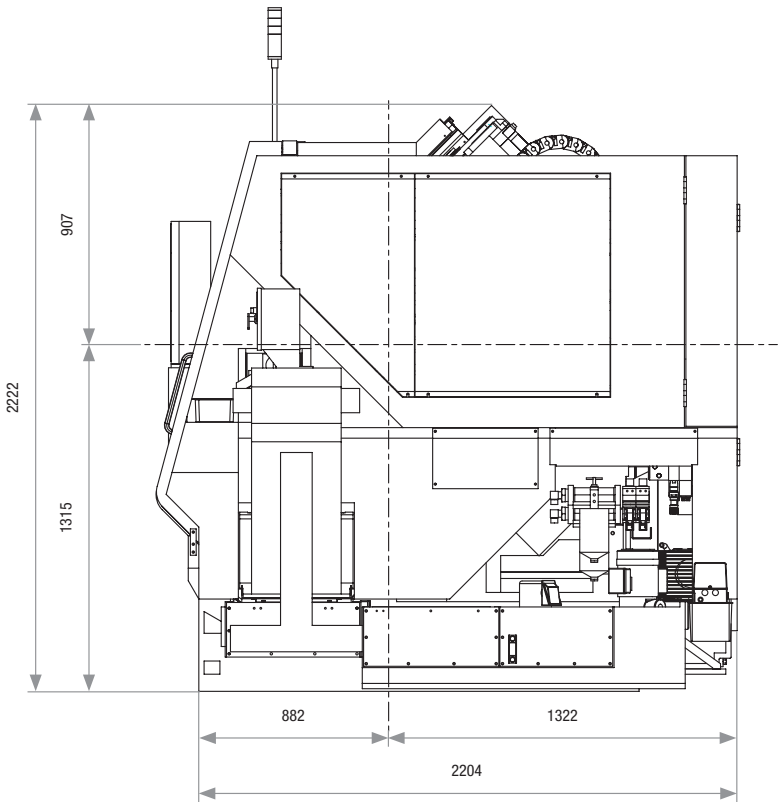
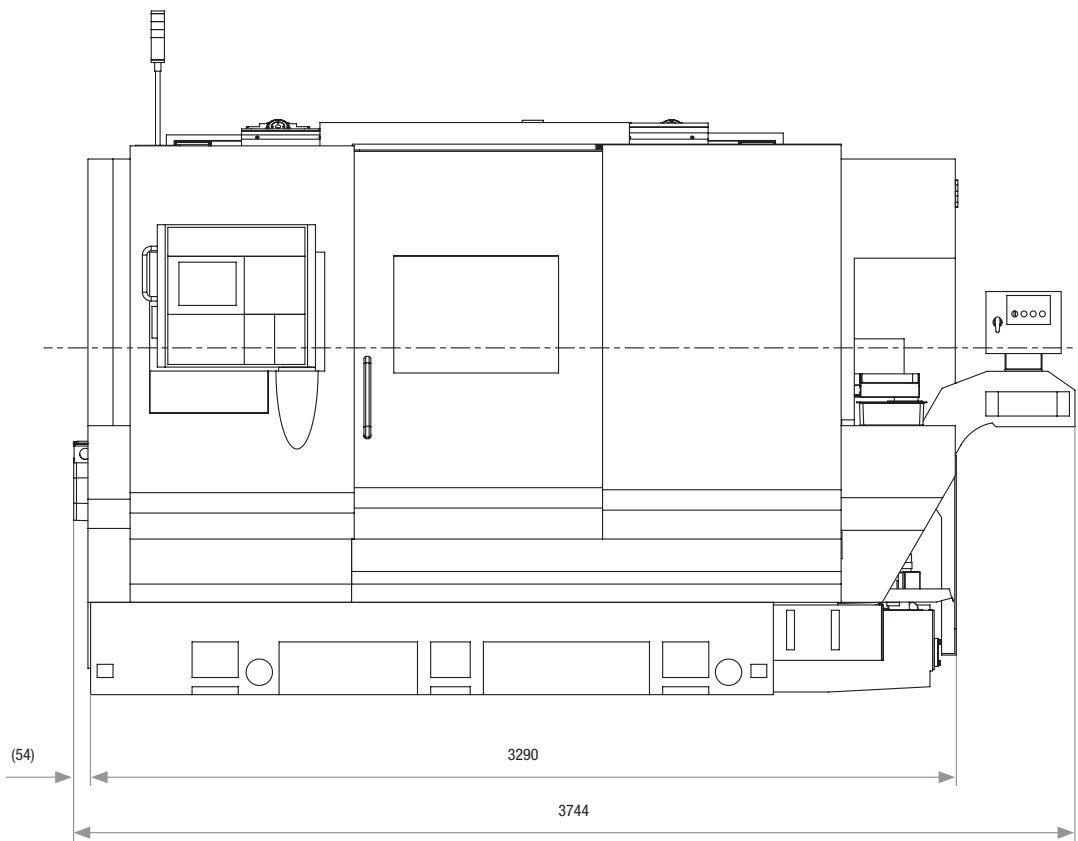
Performance diagram



Tooling System



Floor plan



Machine specification

Item		ABX-51SYY2	ABX-64SYY2
Machining capacity			
Maximum work length	SP1	125 mm	118 mm
Maximum work length	SP2	125 mm	125 mm
Maximum work diameter for bar chuck	SP1	Ø 51 mm	Ø 64 mm
Maximum work diameter for bar chuck	SP2	Ø 51 mm	Ø 51 mm
Maximum work diameter for power chuck	SP1	Ø 165 mm	—
Maximum work diameter for power chuck	SP2	Ø 165 mm	Ø 165 mm
Spindle			
Number of spindles		2	2
Spindle speed	SP1	50–5,000 rpm	40–4,000 rpm
	SP2	50–5,000 rpm	50–5,000 rpm
Inner diameter of draw tube	SP1	Ø 52 mm	Ø 65.5 mm
	SP2	Ø 52 mm	Ø 52 mm
Chucking system	SP1, SP2	Hydraulic cylinder	Hydraulic cylinder
Type of collet chuck	SP1	S collet system H-S22/ DIN177E	S collet system H-S26/ DIN185E
	SP2	S collet system H-S22/ DIN177E	S collet system H-S22/ DIN177E
Type of power chuck	SP1	6" Hydraulic chuck	6" Hydraulic chuck
	SP2	6" Hydraulic chuck	6" Hydraulic chuck
Turret			
Number of turrets		2	2
Turret stations	HD1, HD2, HD3	12 st.	12 st.
Tool shank size	HD1, HD2, HD3	□ 20 mm	□ 20 mm
I.D. tool hole size	HD1, HD2, HD3	Ø 25 mm/Ø 40 mm	Ø 25 mm/Ø 40 mm
Index time	HD1, HD2, HD3	0.25 s/1 Pos.	0.25 s/1 Pos.
Rapid traverse rate	HD1, X1	16 rpm	16 rpm
	HD1, Z1	30 rpm	30 rpm
	HD1, Y1	12 rpm	12 rpm
	HD2, X2	16 rpm	16 rpm
	HD2, Z2	30 rpm	30 rpm
	HD2, Y1	12 rpm	12 rpm
	SP2, Zs	30 rpm	30 rpm
Rotary tools (Option)			
Number of rotary tools	HD1, HD2, HD3	12 (max. 24)	12 (max. 24)
Maximum spindle speed		6,000 rpm	6,000 rpm
Machining capacity	Drilling	max. Ø 20 mm	max. Ø 20 mm
	Tapping	max. M14×2	max. M14×2
	End milling	max. Ø 16 mm	max. Ø 16 mm
Tank capacity			
Hydraulic tank capacity		10 l	10 l
Lubricating tank capacity		4 l	4 l
Coolant tank capacity		400 l	400 l
Machine dimensions			
Machine height		2,222 mm	2,222 mm
Floor space		3,290 × 2,204 mm	3,290 × 2,204 mm
Machine weight		10,600 kg	10,600 kg
Spindle motor	SP1	AC 11/15 kW	AC 11/15 kW
	SP2	AC 5.5/7.5 kW	AC 5.5/7.5 kW
Turning tool motor	HD1, 2, 3	AC 4.5 kW	AC 4.5 kW
Power supply			
Voltage		AC 200/220 V ± 10 %	AC 200/220 V ± 10 %
		50/60 Hz ± 1Hz	50/60 Hz ± 1Hz
Power consumption		48 kVA	48 kVA
Air supply		5 bar (5 kgf/cm ²)	5 bar (5 kgf/cm ²)
Fuse		150 A	150 A

BNE 51 MSY

With additional axis, for enhanced simultaneous machining.

The BNE series is renowned for its high rigidity, heavy cutting capability and outstanding precision. The MSY model extends the ability of the BNE series with the adoption of X3 axis on the back spindle (SP2) and synchronized / superimposed control for 3-tool simultaneous machining. Faster cycle times, outstanding easy-of-use and the ability to machine complex work pieces is the result.

Advantages

Maximum rigidity for high-accuracy machining.

Convenient operation.

Simultaneous machining with up to three tools at a time.

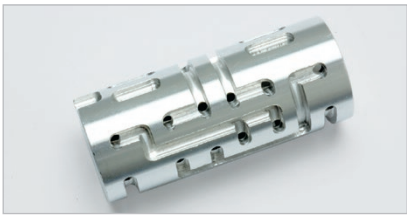
Optional for 65 mm available.

5.88 m²



Workpiece example

Name Sample part
Material Aluminium



Machining examples

Simultaneous machining of 3 tools

Simultaneous machining of 2 tools

1

2

3

4

5

6

7

1 SP1, turning & drilling
SP2, drilling

2 HD1-L, drilling
HD2-R, drilling

3 HD1-L, milling
HD2-R, milling

4 SP1, simultaneous turning
SP2, drilling

5 HD1-L, turning
HD2-R, turning

6 Left simultaneous machining
(HD1 turning, HD2 drilling)

7 Right simultaneous machining
(HD1 turning, HD2 drilling)

Standard

1

2

3

1 **Part catcher**

2 **HMI (Human Machine Interface) is adopted**
Graphics displayed for each item and screens that display all the necessary information in one place greatly improve operating convenience.

3 **Machining data screen**
All you have to do is input the machining length, chucking length and so on, and the escape and approach positions are automatically calculated. This is useful for collision prevention and shortening setup times.

Options

1

2

3

4

1 Barfeeder

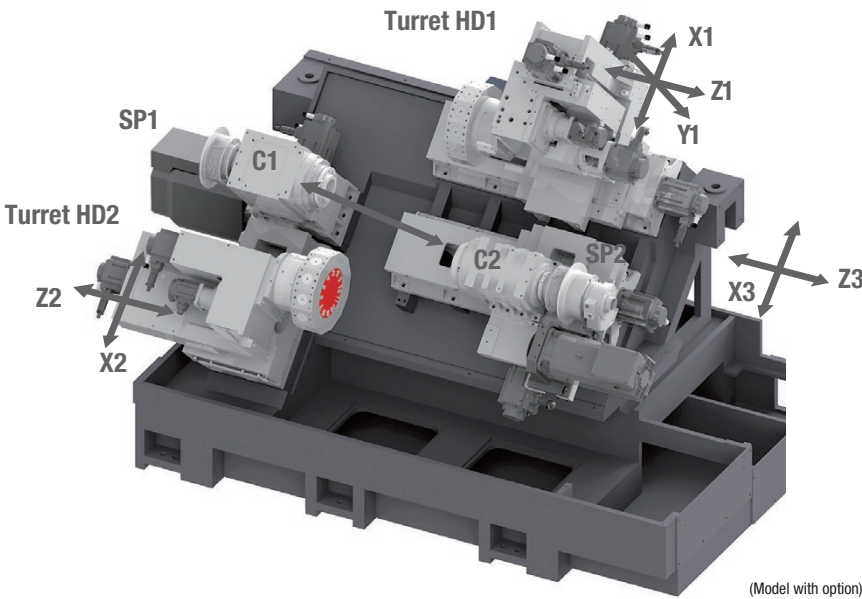
2 Revolving tools

3 Cut-off confirmation

4 Drill breakage detector

Kinematics

The basic construction of the machine, that is the combination of the highly rigid precision scraped square guideways and the heavy slanted bed cast in one piece, is the base to support high precision, heavy cutting and long tool life even in complex machining.



Working area

1

2

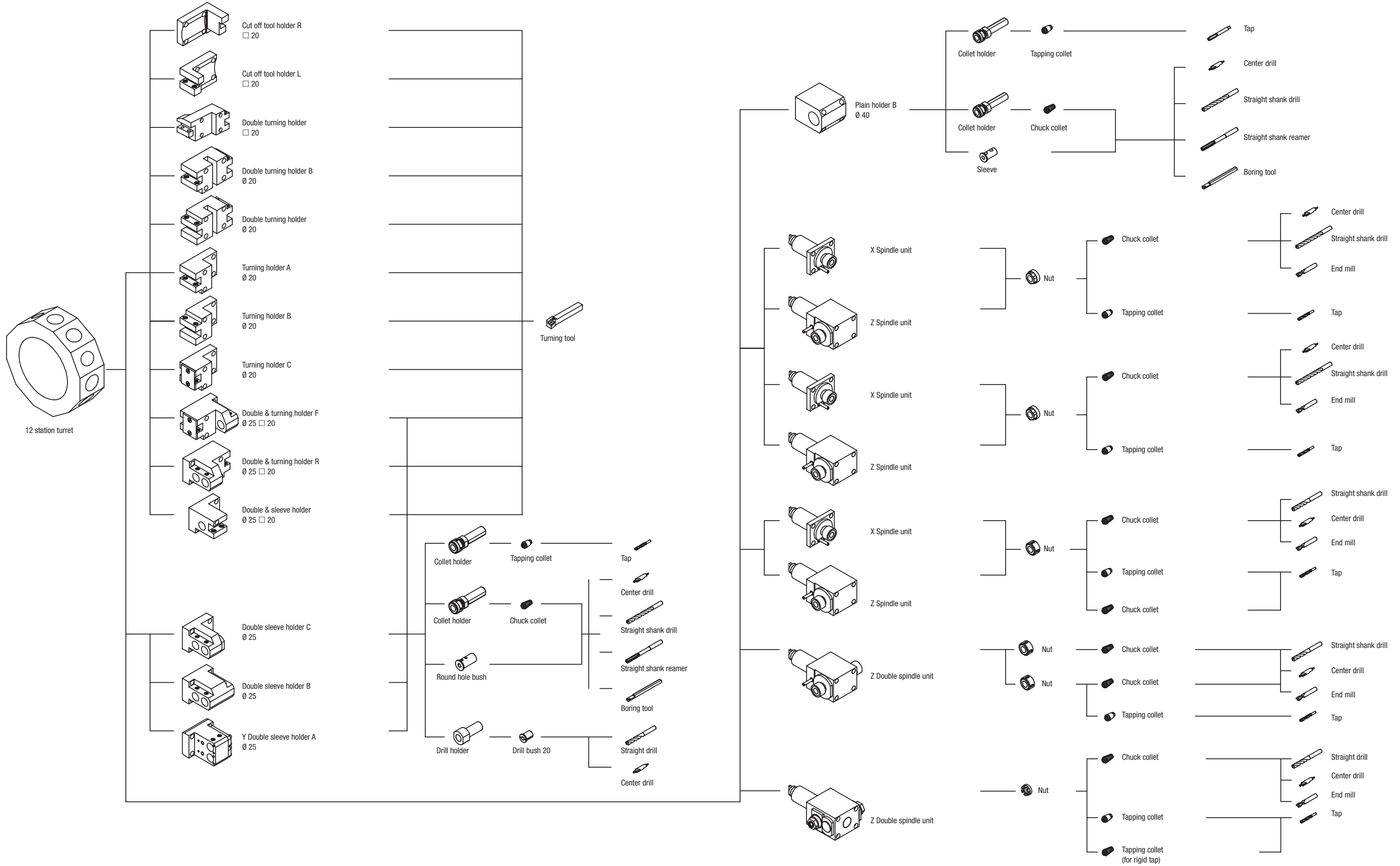
3

1 Examples of simultaneous machining with two tools

2 Examples of simultaneous machining with three tools

3 Turret

Tooling System



The graph displays the performance characteristics of the S1000 series spindle drive across a range of spindle speeds from 0 to 7,000 rpm. The left y-axis represents spindle drive power in kW (0.0 to 18), and the right y-axis represents spindle torque in Nm (0 to 150). Four data series are plotted: maximum spindle drive power, maximum spindle torque, maximum back spindle drive power, and maximum torque of the gang rotary tools. The maximum spindle drive power increases sharply from 0 kW at 0 rpm to 15 kW at 1,500 rpm and remains constant. The maximum spindle torque starts at 112.7 Nm at 0 rpm and decreases linearly to 22 Nm at 6,000 rpm. The maximum back spindle drive power increases from 0 kW at 0 rpm to 5.5 kW at 2,000 rpm and remains constant. The maximum torque of the gang rotary tools is constant at 40 Nm from 0 to 1,500 rpm and then decreases to 22 Nm at 6,000 rpm.

Spindle speed [rpm]	Max. spindle drive [kW]	Max. spindle torque [Nm]	Max. back spindle drive [kW]	Max. torque of the gang rotary tools [Nm]
0	0.0	112.7	0.0	40
1,500	15.0	112.7	5.5	40
2,000	15.0	105.0	5.5	40
5,000	15.0	60.0	5.5	22
6,000	15.0	22.0	5.5	22
7,000	15.0	-	5.5	-

Technical drawings of the S 1000 machine showing front and side views with dimensions.

Front View Dimensions:

- Overall width: 2725
- Left section width: 385
- Main body width: 1865
- Right section width: 475
- Base width: 883
- Height of the right section: 1020

Side View Dimensions:

- Overall depth: 2159
- Front panel depth: 215
- Main body depth: 1505
- Right section depth: 360
- Overall height: 2050
- Height of the main body: 1200
- Height of the top section: 725
- Top section width: 749

Item		BNE51MSY
Machining capacity		
Maximum work length		90 mm
Max. bar diameter	SP1	Ø 51 mm
	SP2	Ø 51 mm
Spindle		
Number of spindles		2
Spindle speed	SP1	5,000 rpm
	SP2	5,000 rpm
Spindle nose	SP1	A2-6
	SP2	A2-6
Draw tube dia.	SP1	Ø 52 mm
	SP2	Ø 52 mm
Collet chuck type	SP1	H-S22/ DIN177E
	SP2	H-S22/ DIN177E
Power chuck size and type	SP1	6" (Ø 169)
	SP2	6" (Ø 169)
Turret		
Number of turrets		2
Turret stations	HD1	12
	HD2	12
Shank size of square turning tool		□ 20 mm
Diameter of drill shank		Ø 25 mm
Rotary tool		
Number of rotary tools		Max.12+12
Type of rotary tools		Single clutch
Tool spindle speed range		
Feed rate		Max. 6,000 rpm
Rapid feed rate		
Rapid feed rate	X1 axis	18 m/min
	Z1 axis	20 m/min
	Y1 axis	12 m/min
	X2 axis	16.2 m/min
	Z2 axis	18 m/min
	X3 axis	18 m/min
	Z3 (B) axis	20 m/min
Slide stroke	X1 axis	195 mm
	Z1 axis	380 mm
	Y1 axis	80 (±40) mm
	X2 axis	195 mm
	Z axis	175 mm
	X3 axis	155 mm
	Z3 (B) axis	450 mm
Motors		
Spindle motor	SP1	11/15 kW
	SP2	5.5/7.5 kW
Motor for rotary tools		2.2 kW 20 Nm/4.0 kW 25 Nm (option)
Hydraulic motor		1.5 kW
Lubricating motor		0.023 kW
Coolant motor		0.25 kW
High pressure colant motor		0.8/1.36 kW (50/60 Hz)
Turret index motor		0.7 kW
Power supply		
Capacity		44 kVA
Voltage		AC 200/220 V
Air supply		5 bar
Fuse		125 A
Tank capacity		
Hydraulic oil tank capacity		18 l
Lubrication oil tank capacity		5 l
Coolant tank capacity		350 l
Machine dimensions		
Machine height		2,050 mm
Floor space		W 2,725 x D 2,159 mm
Machine weight		8,000 kg

NC unit	
Model	mitsubishi M730VS
Program commands, axes	HD1: X1, Z1, Y1,
	HD2: X2, Z2,
	SP1: C1,
	SP2: C2,
	SP2 Slide : X3, Z3
Auxiliary axes	HD1 rotary tool : C3
	HD1 rotary tool : C4
	HD1 Index
	T1
	HD2 Index
	T2
Axis control groups	3 groups
Input code	ISO
Command input system	Incremental and absolute
Tool offset data	200 pairs
Feed command system	Per rotation feed and per minute
Cutting feed rate and	Max.100%
Rapid feed override	
Zero return function	Manual zero return
On-machine program check function	Manual pulse generator
Program storage capacity	512KB (1,312.34 yd)
Input/Output interface	Compact flash card slot
Spindle C-axis function	0.001°
Display device	10.4" color LCD / MDI
Standard function	
Start position automatic return, Manual feed function	
Manual data input (MDI) function, Back up function	
Operation time display, Product counter display	
Cycle time check function, Automatic screen off function	
Optional block skip, Optional stop	
Constant surface speed control Cut off confirmation	
Corner chamfering / Radius function	
Tool nose R compensation function	
Arc radius specification, Thread cutting canned cycle	
Spindle synchronizing control function	
Rotary tool synchronous tapping function	
Spindle synchronizing control function, Custom macro	
Multiple canned cycles for turning, Canned cycle for drilling	
High speed program check function, Milling interpolation	
Helical interpolation function	
Preparation functions	
Start position automatic return, Waiting point automatic return	
Sub spindle retract return, Turret retract return	
Automatic cut-off machining function, Tool set function	
Spindle speed set function, Tool select function	
Chuck adjustment function, AUX Manual select function	
JOG operation function, Handle operation function	
Spindle speed simultaneous command for 3 spindle	
3 Sets of M code simultaneous command	
Control axis swap function, Arbitrary superimposition function	
Background editing, Function to superimpose 2 pairs of axes	
Editing support functions	
Calculator function, Code list display, Code insert, Coordinate calculation function,	
Format check	
Options	
Automatic power shut-off, Thermo revision, tool setter, Eco function RS232C	

BNE 42/51 S SY

For the demanding manufacturing of complex high-precision workpieces from bar stock.

The BNE series has especially been designed for today's ever more demanding production of complex high-precision workpieces from bar stock. Thanks to multi-tool simultaneous machining, also more complex shapes may be machined now in an ultrafast and economical way. On type "S", multiple tools may simultaneously be mounted in L & R spindle. Type "SY" with Y axis slide for the upper turret offers functions similar to a machining center and efficiently machines complex workpieces.

Advantages

Highly rigid precision scraped square slideways.

Powerful tools.

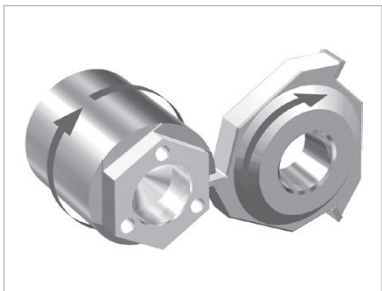
Convenient and simple operation.

Optional for 65 mm available.

5.81 m²



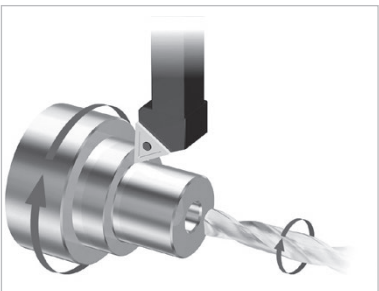
Machining examples



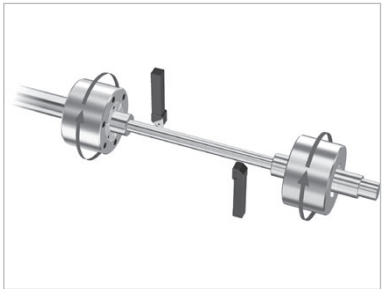
Polygon machining (Optional)
Synchronizing the revolving tool speed with the spindle speed at two times permits polygon machining, such as two-, four- and six-sided machining, with a polygon cutter.



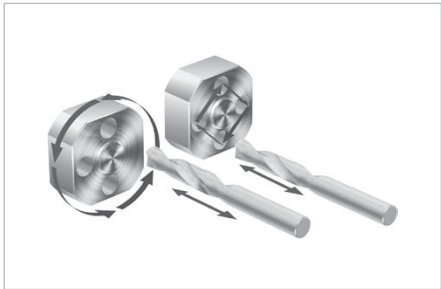
Large-diameter thread cutting using helical interpolation (Optional)
Large-diameter thread cutting can be done with a planetary tap using the helical interpolation function. (SY type)



Differential velocity cutting by revolving tools
In multiple cutting of inner and outer diameters, the optimum cutting speed can be obtained by controlling the revolving tool speed. A small-diameter drill is rotated in the forward direction to increase the relative speed between the drill and the workpiece, while a large-diameter drill is rotated in the reverse direction to decrease the relative speed.

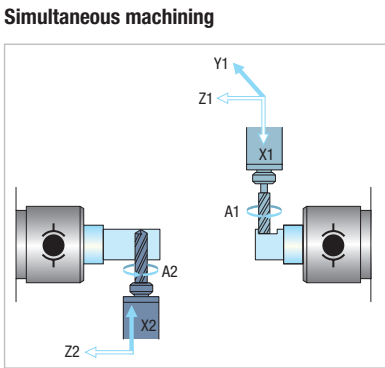
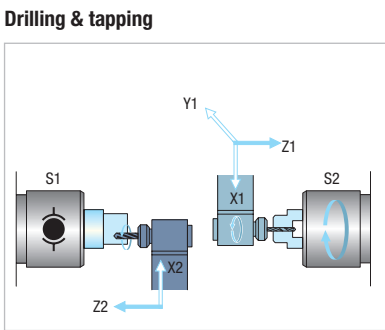
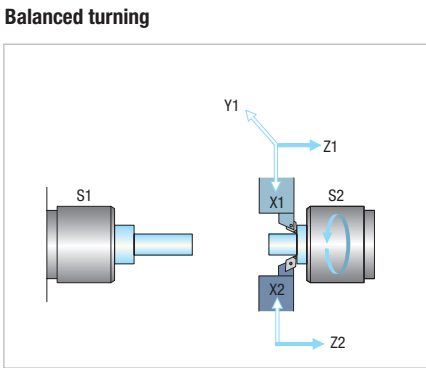
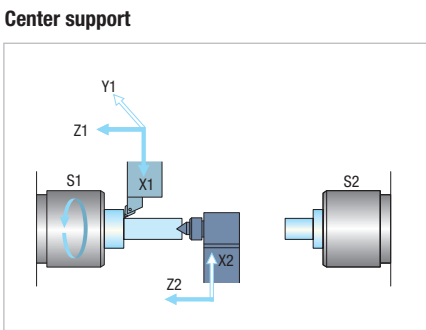
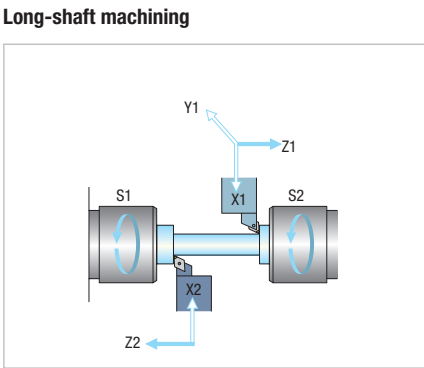
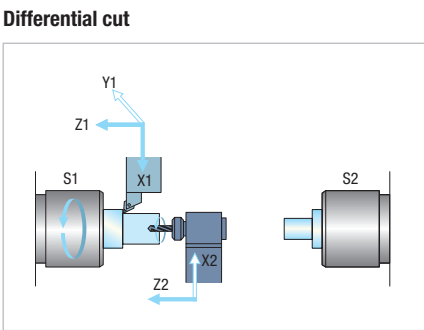


Long-shaft machining
The bar stock machined on the L spindle is pulled out by the R spindle and chucked in synchronization by the L and R spindles at the same time. Simultaneous machining is performed and then the workpiece is cut off. After that the machining at the R spindle side is performed and the finished product is pushed out of the R spindle by the next workpiece.

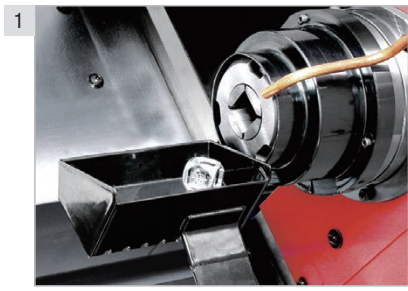


Efficient face drilling
In complex machining in the X-Y or Z-Y plane, using C axis control to index the drilling position takes a long time. Using the Y axis allows efficient drilling on the end face. (SY type)

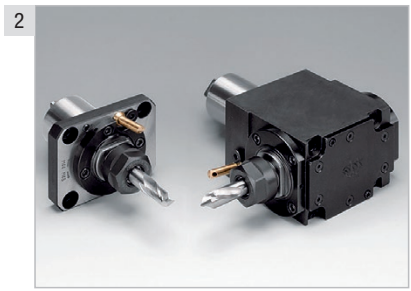
Machining patterns



Standard

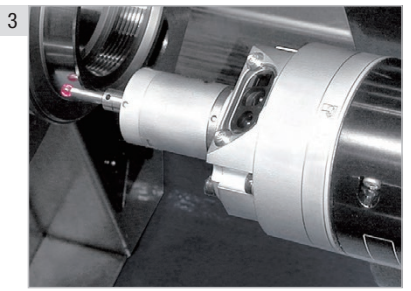


- 1 Part catcher
- 2 Revolving tool
- 3 Automatic measuring device
- 4 Tool setting
- 5 Maintenance



4 HD1 TOOL SETTING (GEOMETRY)

NO.	X1	Z1	MACHINE
001	-288.936	104.118	X1 -48.505
002	-327.169	80.800	Z1 37.965
003	-320.127	88.328	X2 -22.239
004	0.000	0.000	Z2 8.691
005	0.000	0.000	X3 -18.931
006	0.000	0.000	Z3 -23.854
007	0.000	0.000	Z5 -12.609
008	-350.000	127.046	
009	-314.028	84.104	
010	0.000	0.000	



5 MAINTENANCE

C1 ZERO POINT ADJUST MODE
C3 ZERO POINT ADJUST MODE
SPINDLE PHASE ADJUST MODE
HD1 RVT→TURRET MAINTENANCE MODE
HD2 RVT→TURRET MAINTENANCE MODE
HD3 RVT→TURRET MAINTENANCE MODE
CHECK OPERATING PANEL LAMP - TURN ON
THE ZERO POINT OF C-AXIS IS ADJUSTED.

Options



- 1 Barfeeder
- 2 Chip conveyor
- 3 Tool monitor: Allows you to monitor tool wear and breakage by checking the current state of the machining and status of the cutting tools in terms of numerical values based on the sampling data.

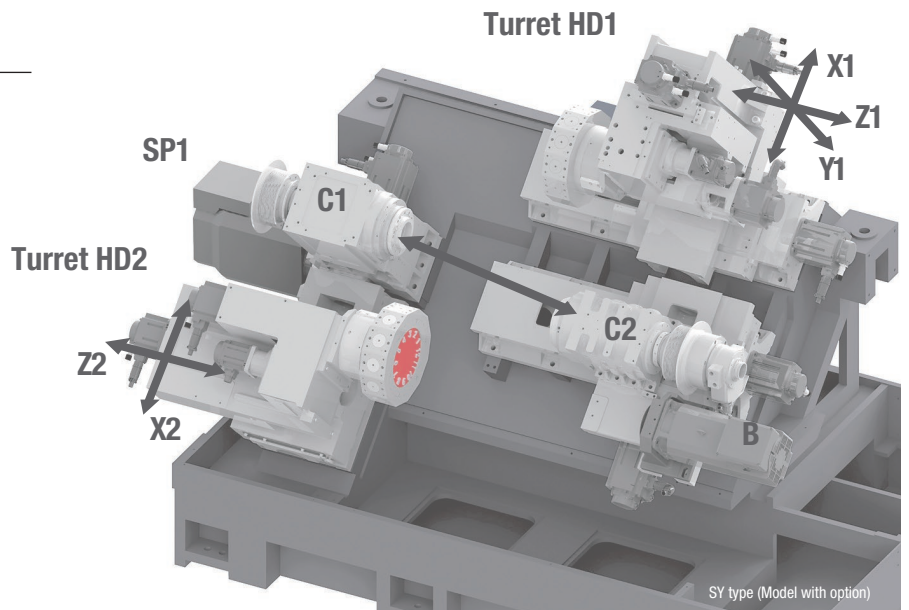


3 TOOL MONITOR MONITORING No.01

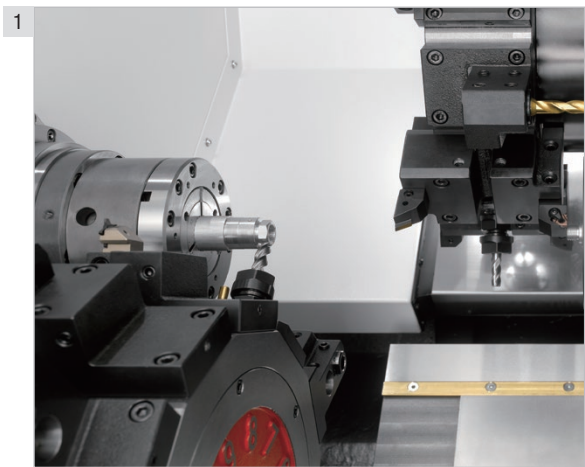
%	25	50	75	100	125	150	PEAK
X							
Z							
Y							
Z5							
C							
A							
S1							
S2							

Kinematics

The basic construction of the machine, that is the combination of the highly rigid precision scraped square guideways and the heavy slanted bed cast in one piece, is the base to support high precision, heavy cutting and long tool life even in complex machining.



Working area



1 SY: Y Axis on turret HD1

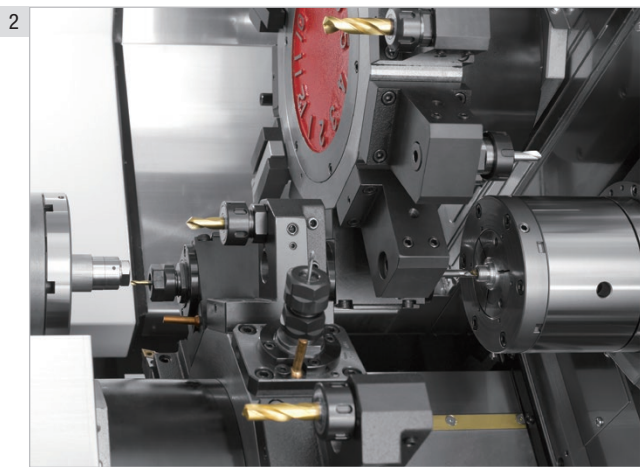
In addition to front / back integrated machining and multiple cutting achievable by the 2-spindle and 2-turret specification machines, the Y axis installed on turret HD1 (SY type) enables a greater variety of complex machining.

Ample tool stations

Installation of double tool holders on the 12-station turret allows two tools to be mounted at a single position, so you will never feel short of tools. (Common to S/SY types)

Powerful tool

Revolving tools featuring a power ful machining torque of 20 Nm and high rotational speeds of up to 6.000 rpm can be mounted at all positions (12 positions) with independent drive. (Common to S/SY types)



2 S: Two spindle capacities

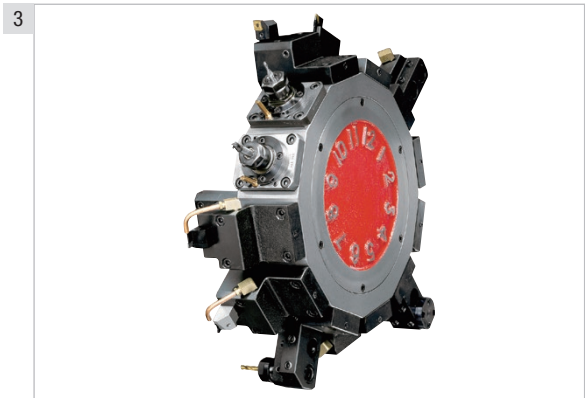
BNE 42/51 available in two versions S without Y axis and SY with Y axis to turret HD 1.

Revamped NC unit

The new 31i-B NC unit simplifies the operation panel with less push buttons and support screens including "Machining Data", "Start Conditions" and "Tool Monitor" (option) enable further improvements in productivity by faster set-ups.

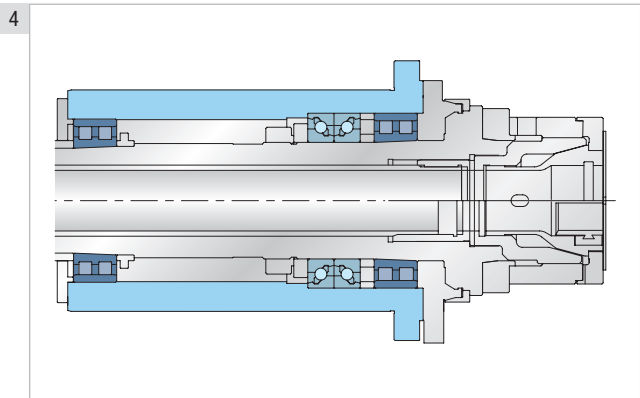
Newly designed covers

All the covers have been reviewed in detail and redesigned to improve ease of operation, including changing the splash guard to open inside the fixed cover.



3 Turret

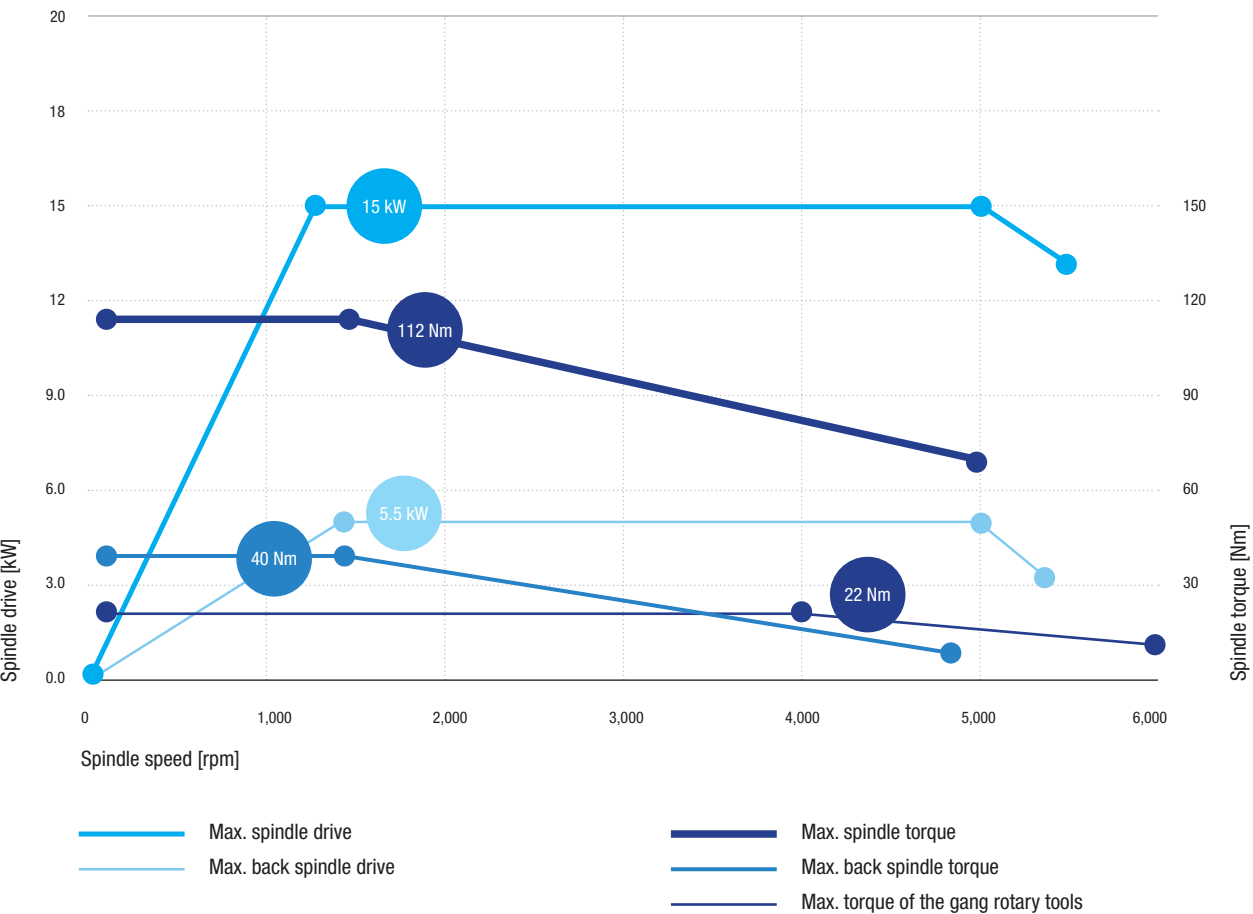
Indexing by a large-diameter curvic coupling, secure hydraulic turret clamping and rugged square guideways assure high precision and long life of the turret without compromise. This turret can accommodate revolving tools with a high machining torque of 20 Nm at all 12 positions. Our unique tool holder mounting method using two location pins makes it easy to mount and remove tool holders and ensures exceptionally high re-mounting accuracy.



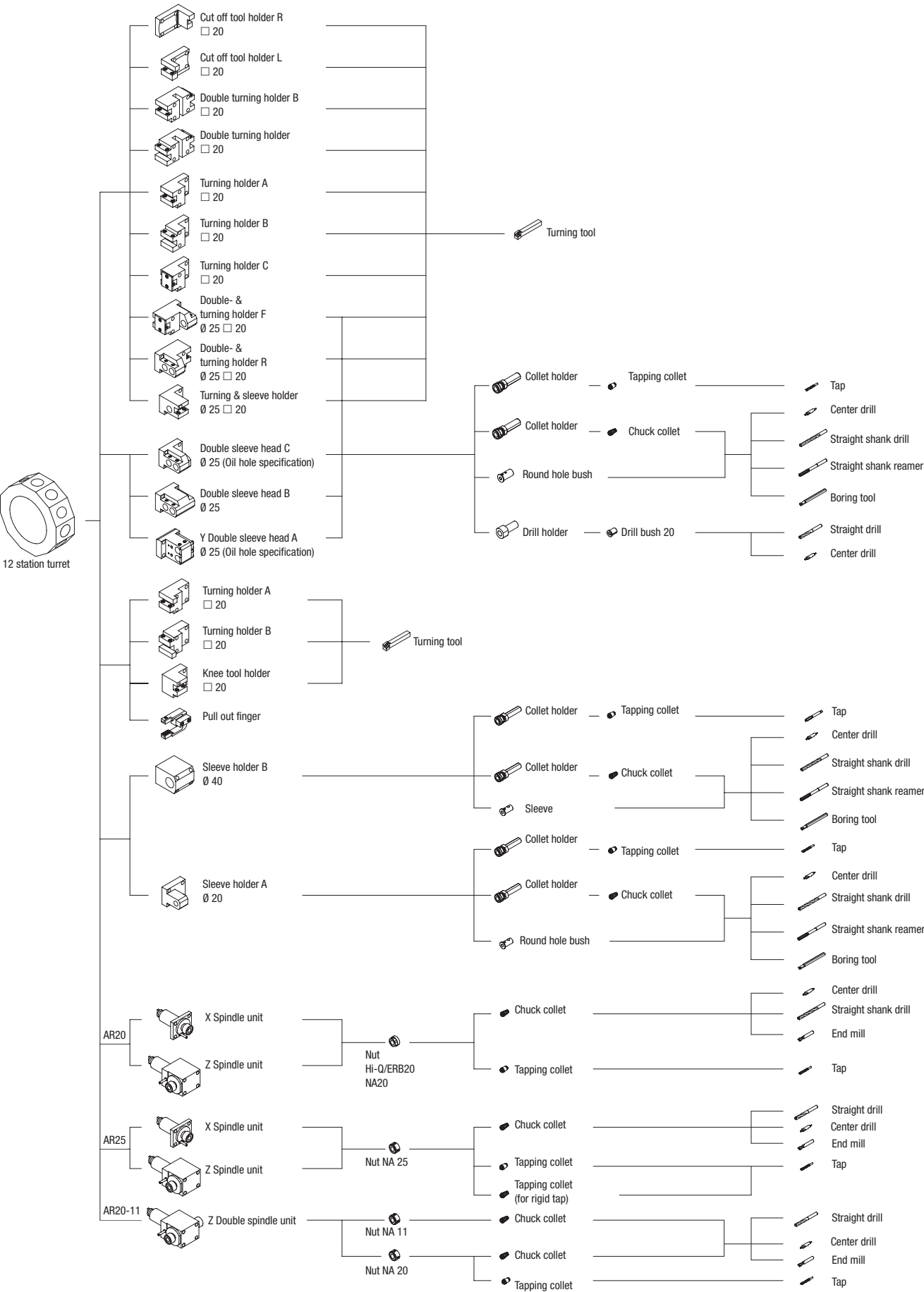
4 Spindle

The main spindle of the 51S / 51SY is supported by "ultra precision double-row cylindrical roller bearings" and "ultra precision angular contact ball bearings" at the front and by "ultra precision double-row cylindrical roller bearings" at the rear to suppress radial run-out and thermal displacement in the longitudinal direction as well as to provide high rigidity. This precision spindle is installed in a ground, high-precision quill type housing. This spindle structure maintains sufficient rigidity to allow powerful machining and ensures stable thermal displacement characteristics thanks to less heat generation. All spindles are manufactured in the dedicated in-house production line and undergo extended bench testing before being assembled into the machine to provide the stable machining accuracy for which Miyano is renowned.

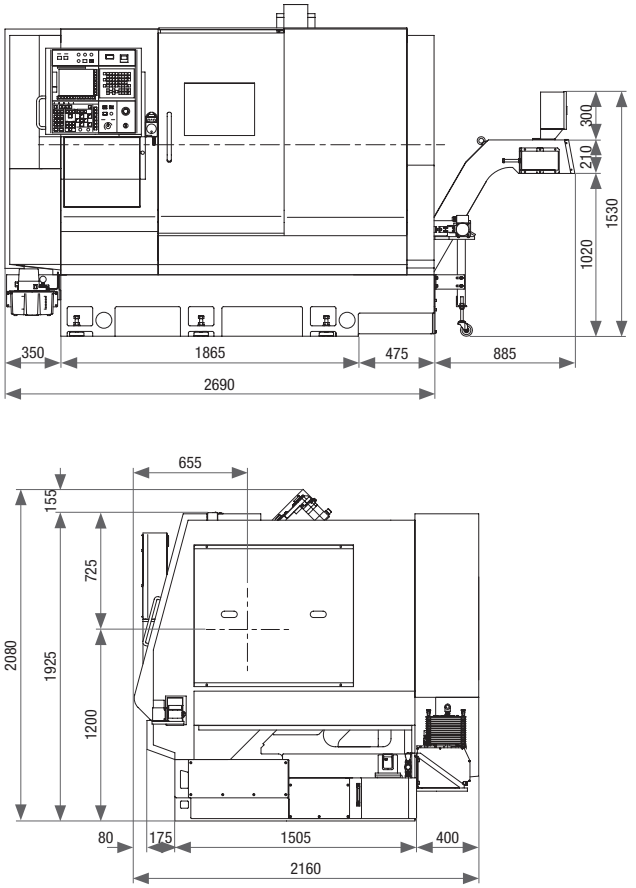
Performance diagram



Tooling System



Floor plan



Machine specification

Item	BNE42S6	BNE51S6	BNE51SY6
Machining capacity			
Maximum work length	90 mm	90 mm	90 mm
Maximum bar diameter	SP1 Ø 42 mm SP2 Ø 42 mm	Ø 51 mm Ø 42 mm	Ø 51 mm Ø 42 mm
Spindle			
Number of spindles	2	2	2
Spindle speed	SP1 6,000 rpm SP2 5,000 rpm	5,000 rpm 5,000 rpm	5,000 rpm 5,000 rpm
Spindle nose	SP1 A2-6 SP2 Flat	A2-6 Flat	A2-6 Flat
Draw tube dia.	SP1 Ø 43 mm SP2 Ø 43 mm	Ø 52 mm Ø 43 mm	Ø 52 mm Ø 43 mm
Collet chuck type	SP1 H-S22/ DIN177E SP2 H-S20/ DIN173E	H-S22/ DIN177E H-S20/ DIN173E	H-S22/ DIN177E H-S20/ DIN173E
Power chuck size and type	SP1 5" Hydraulic SP2 5" Hydraulic	6" Hydraulic 5" Hydraulic	6" Hydraulic 6" Hydraulic
Turret			
Number of turrets	2	2	2
Turret stations	HD1 12 HD2 12	12 12	12 12
Shank size of square turning tool	□ 20 mm	□ 20 mm	□ 20 mm
Diameter of drill shank	Ø 25 mm	Ø 25 mm	Ø 25 mm
Rotary tool			
Number of rotary tools	12+12	Max. 12+12	Max. 12+12
Type of rotary tools	Single clutch	Single clutch	Single clutch
Tool spindle speed range	Max. 6,000 rpm	Max. 6,000 rpm	Max. 6,000 rpm
Feed rate			
Rapid feed rate	X1 axis 18 m/min X2 axis 16.2 m/min Z1 axis 20 m/min Z2 axis 18 m/min Y1 axis 12 m/min B axis 20 m/min	18 m/min 16.2 m/min 20 m/min 18 m/min 12 m/min 20 m/min	18 m/min 16.2 m/min 20 m/min 18 m/min 12 m/min 20 m/min
Slide stroke	X1 axis 175 mm X2 axis 145 mm Z1 axis 380 mm Z2 axis 175 mm Y1 axis 175 mm B axis 450 mm	175 mm 145 mm 380 mm 175 mm 175 mm 450 mm	175 mm 145 mm 380 mm 175 mm ±40 mm 450 mm
Motors			
Spindle motors	SP1 11/15 kW SP2 3.7/5.5 kW	11/15 kW 3.7/5.5 kW	11/15 kW 3.7/5.5 kW
Motor for rotary tools	2.2 kW 20 Nm	2.2 kW 20 Nm	2.2 kW 20 Nm
Hydraulic motor	2.2 kW	2.2 kW	2.2 kW
Lubricating motor	0.023 kW	0.023 kW	0.023 kW
Coolant motor	0.25 kW x 2	0.25 kW x 2	0.25 kW x 2
High-pressure coolant motor	0.8/1.36 kW (50/60Hz)	0.8/1.36 kW (50/60Hz)	0.8/1.36 kW (50/60Hz)
Turret index motor	0.75 kW	0.75 kW	0.75 kW
Power supply			
Capacity	44 kVA	44 kVA	44 kVA
Voltage	AC 200/220 V	AC 200/220 V	AC 200/220 V
Air supply	5 bar	5 bar	5 bar
Fuse	125 A	125 A	125 A
Tank capacity			
Hydraulic oil tank capacity	18 l	18 l	18 l
Lubrication oil tank capacity	5 l	5 l	5 l
Coolant tank capacity	350 l	350 l	350 l
Machine dimensions			
Machine height	1,925 mm	1,925 mm	2,080 mm
Floor space	W 2,690 x D 2,160	W 2,690 x D 2,160	W 2,690 x D 2,160
Machine weight	7,800 kg	7,800 kg	7,800 kg
NC unit			
FS31i-B 2 system			
Axis control: HD1: X1, Z1, (Y1), C1, A1 / HD2: X2, Z2, C2, A2, B2; Minimum setting unit: 0.001 mm, 0.001°;			
Interpolation functions: G01, G02, G03; Threading: G32, G33, G92; Rapid feed override: 0-100%;			
Feed rate override: 0-150%; Feed rate per minute/Feed rate: G98/G99; Program storage capacity: Sum total for 2 systems: 64 kB (160 m); Spindle function: 4-digit S command; Support function: 3-digit M word; Constant surface speed control: G96; Tool function: Taabb (aa=Tool number and geometry, bb=Wear offset number) 32 pieces, 64 pieces (2 system).			
Automatic operation			
Automatic operation, MDI operation, Program number search, Block number search, Test run, Single block, Optional stop (M01), Jog feed, manual reference point return, Setup/display function, Machine alarm message display, Self diagnosis function, Preventive maintenance screen, Maintenance data screen, Help function, Current feed rate display, Current spindle speed display and T code, Display of all group directories, Servo setting screen, Spindle setting screen, Display of hardware & software system configuration.			
Data input-and-output function			
Memory card interface, USB memory interface,			
Others			
10.4 inch color monitor (LCD), Machine lock, Overrun, Stored stroke check, Chamfering ON/OFF, Backlash compensation, Synchronization / mixture control, Gs outline control, Spindle synchronous control, Superimposition control, Polar coordinate interpolation, Optional block skip, Absolute command, Incremental command, Decimal point input, Coordinate system setup, Single form fixed cycle, Circle radius R command, Programmable data input			
Options			
Cylindrical interpolation, Spindle rigid tapping, Rotary tool rigid tapping, Helical interpolation, polygon turning, Workpiece coordinate system, Inch/metric change, Tool nose radius compensation, Customer macro, Multiple repetitive cycles, Program storage capacity addition, Background editing, Run hour/Parts count display, Leader puncher interface, RS-232C port			

BND 51 SY

Perfectly suited for the precise machining of complex parts.

The BND bar machine is equipped with a back spindle on a Y-axis that can machine bar material up to Ø 51 mm. The structure of the machine offers precision scraped square slideways that provide the high rigidity and excellent vibration damping characteristics and a heavy 30° slanted bed as platform construction with intelligently arranged ribs ensuring good thermal stability and minimum dimensional changes over time. In other words: A comprehensive package designed for consistently high machining accuracy over long operating periods.

Advantages

Strong, highly rigid construction.

Wide range of complex machining with rotary tools.

NC custom menu: 'One-touch' functions for faster set-ups.

4.05 m²



Machining examples

1 End mill

2 Planetary tap (optional)

3 End mill

4 End mill

5 End mill

6 Polygon machining (optional)

1 End mill
2 Planetary tap (optional)

3 End mill
4 End mill

5 End mill
6 Polygon machining (optional)

Standard

1

2

3

4

1 Turret maintenance: Used to adjust the turret zero point.
2 Block skip: Used to set block skip 1 to block skip 9.
3 Part catcher
4 Part conveyor

Options

1

2

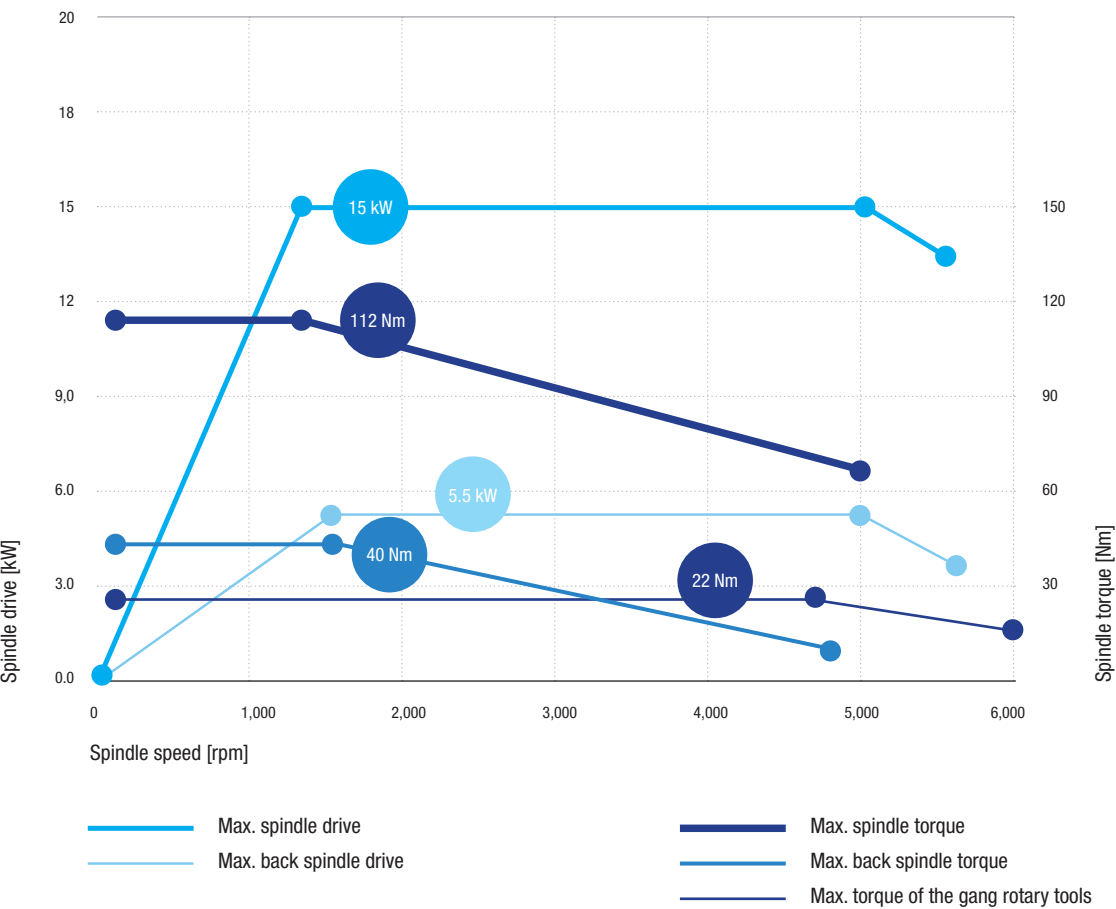
1 Option device: Used to select an auxiliary device such as a part catcher to be operated manually.
2 Chip conveyor

Working area

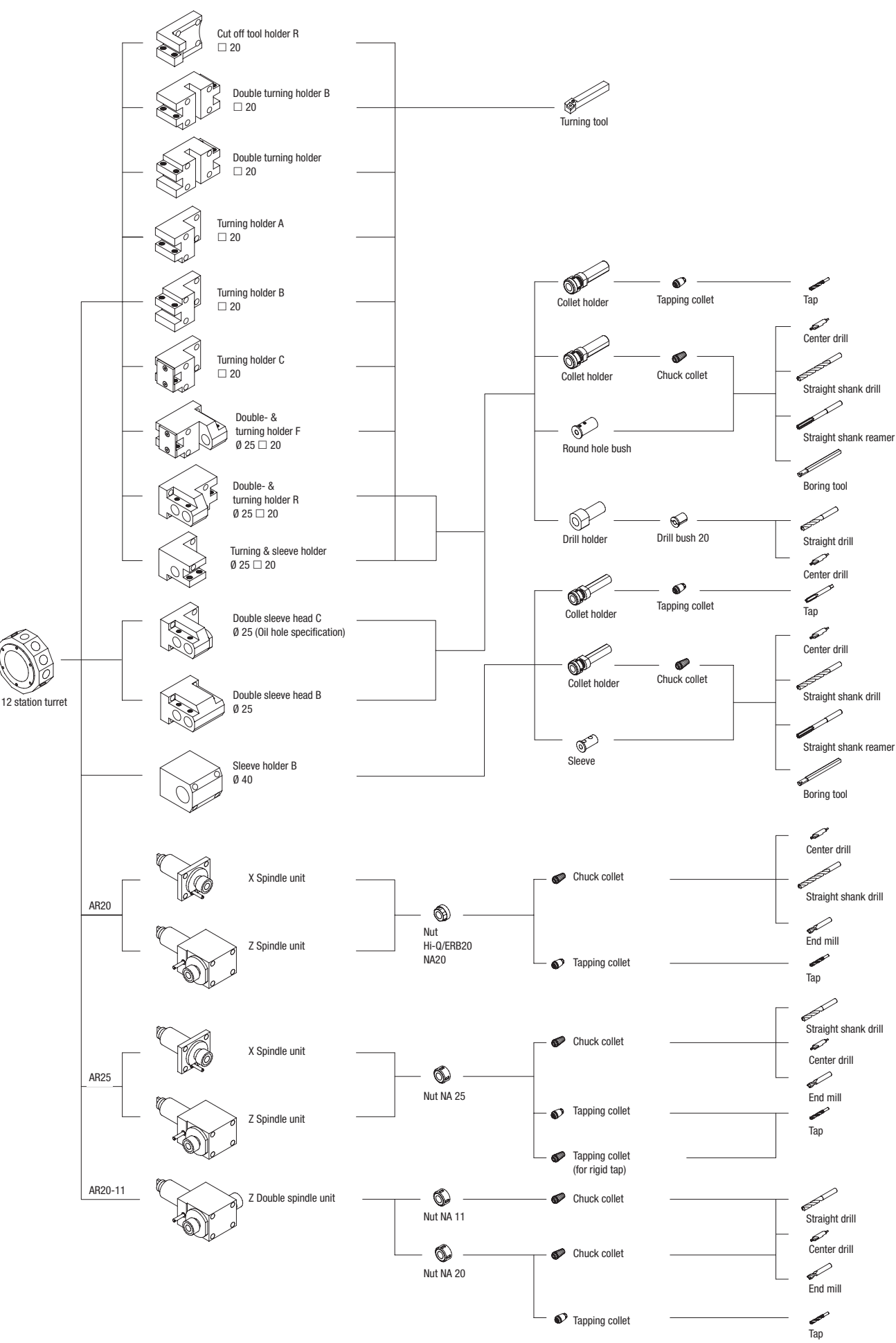
1 **Complex machining with Y axis control**
The combination of independently driven revolving tools that can be mounted at all positions on the turret with the Y axis and the subspindle realizes a high level of process integration in complex machining.

2 **Easy to use tooling system**
Double sleeve holders and double turning holders allow multiple tools to be mounted at a single position on the turret to maximize tooling flexibility.

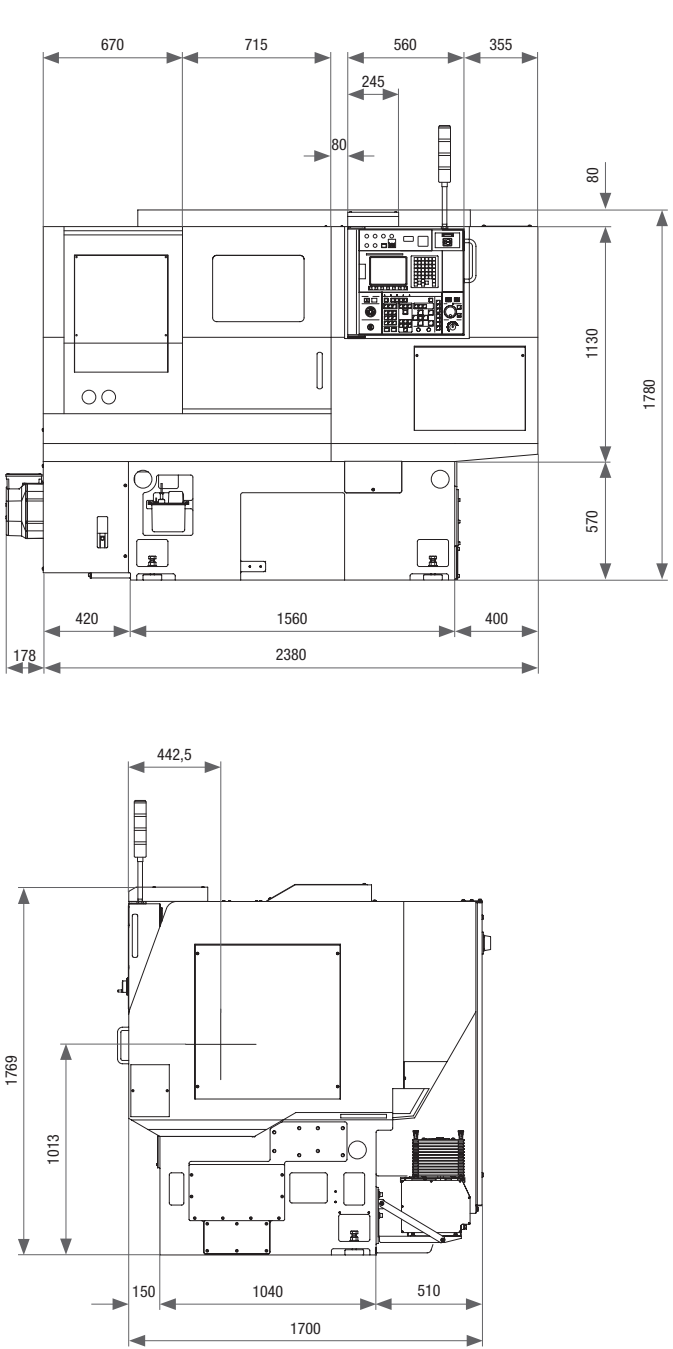
Performance diagram



Tooling System



Floor plan



Machine specification

Item	BND51SY2
Machining capacity	
Maximum work length	320 mm
Maximum bar diameter	Ø 51 mm
Maximum blank diameter	Chuck: Ø 210 mm
Spindle	
Number of spindles	2
Spindle speed	50–5,000 rpm
Draw tube dia.	SP1: Ø 52 mm SP2: Ø 26 mm
Power chuck type	Hydraulic
Collet chuck type	SP1: H-S22 Pads SP2: H-S16, S22 pads
Power chuck size and type	SP1: 6" Through hole type SP2: 5" Through hole type
Turret	
Number of turrets	1
Turret stations	12 st.
Shank size of square turning tool	□ 20 mm
Diameter of drill shank	Ø 25 mm
Turret index time	0.26 sec. per station
Feed rate	
Slide stroke	X axis: 175 mm Z axis: 435 mm
Y axis	75 mm
B axis	530 mm
Rapid feed rate	18 m/min
X axis	20 m/min
Y axis	12 m/min
B axis	18 m/min
Rotary tool	
Number of rotary tools	max. 12
Tool spindle speed range	60–6,000 rpm
Capacity	Drill: max. Ø 13 mm Tap (steel): max. M8 Tap (Al, brass): max. M8
Tank capacity	
Hydraulic oil tank capacity	18 l
Lubrication oil tank capacity	2 l
Coolant tank capacity	150 l
Machine dimensions	
Machine height	1,700 mm
Floor space	2,605 mm × 1,740 mm
Machine weight	4,500 kg
Motors	
Spindle motor	SP1: AC 11/15 kW SP2: AC 3.7/5.5 kW
Motor for rotary tools	AC 2.2 kW 20 Nm
Power supply	
Voltage	AC 200/220 V ± 10%
Capacity	37 kVA
Fuse	125 A
Air supply	5 bar (5 kgf/cm ²)
Others	
Splash guard interlock, Revolving tool drive unit, Pneumatic, Spindle brake No.1, High pressure coolant, Part Catcher, Part conveyor, Work ejector & inner high pressure coolant.	
NC Specifications	
FANUC Oi-TD	
Axis control: X, Z, Y, B, Cs; Simultaneous control axes: 4; Min. output unit: X=0.0005 mm, Z=0.001 mm / Y=0.001 mm, B=0.001 mm, Cs=0.001°; Interpolation functions: G00, G01, G02, G03, G04, G32, G33; Program storage capacity: 1 Mbyte (2560 m); Spindle function: 4-digit S command; Cutting feed rate: 3.4 digit F word (feed per revolution), 6-digit F word (feed per minute), direct programming; Feed rate override: 0–150% (in 10% increments); Rapid feed override: F0, 25, 50, 100%; Thread cutting: G32, G33, G92; Canned cycle: G90, G92, G94; Tool function T AAB (AA=Tool number & geometry, BB = Wear offset number); Direct input function of tool position: By measurement in MDI mode, data I/O, Memory card interface, USB memory interface, Automatic data backup; Automatic operation: 1 cycle/Automatic operation; Single block, Block delete, Machine lock, Optional block skip, Dry run, Feed hold	
Others	
8.4" color LCD/MDI. Program storage capacity addition: 800 pieces; Decimal point input; Manual pulse generator; Memory protect; AC digital servo motor: circle radius command R; Nose radius compensation; Constant surface speed control (G96); Background editing; Programmable data input (G10); Run hour/Parts count display; Multiple repetitive cycle (G70-G76); Rigid tap spindle; Polar coordinate interpolation; Custom macro B; Canned cycles for drilling; Tool life management, etc.	
NC Option	
Helical interpolation, Leader puncher interface, etc.	

BNJ 42 S 42/51 SY

Economical, efficient and powerful thanks to simultaneous machining.

Turret No. 2 now has 8 tool mounting stations instead of 6 on the previous machines, so the number of tools has been increased and also rotary tools may be mounted. The milling processes that were handled using turret No. 1 alone can now be shared with turret No. 2, making it possible so substantially shorten cycle times and deal with workpieces that require complex machining.

Advantages

Considerably improved operability.

Collision protection (rapid feed only).

Machining time shortened by simultaneous machining at left and right.

Combined Machining with the Y-axis.

Machining time shortened through superimposition machining.

Optional for 64 mm available.

4.05 m²



Workpiece example

Name Adjusting screw
Material Brass



Standard

1

2

NO.	X1	Z1	R	T	Y1
001	-223.020	98.626	0.000	0	0.000
002	-211.803	4.500	0.000	0	0.000
003	-260.000	81.291	0.000	0	0.000
004	-222.519	4.500	0.000	0	0.000
005	-200.415	4.500	0.000	0	0.000

機械座標

X1	X2	Z1	Z2
-0.004	-0.003	138.551	-0.002
-0.228			

JRG SELECT

3

T-MONITOR MONITORING No.06

%	25	50	75	100	125	150	PEAK
X	*****						102
Z	*						0
Y							
ZS							
C							
A							
S1	*****						98
S2							

- 1 Control configuration of the new models BNJ42/ BNJ51
- 2 Tool setting
- 3 Tool monitor

Options

1

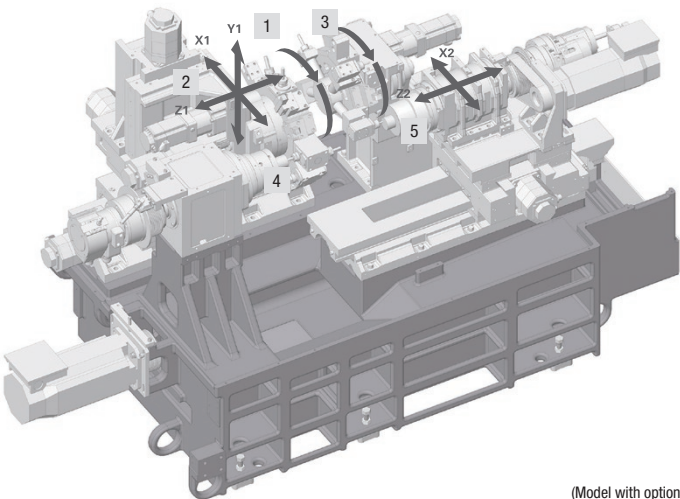
2

3

- 1 Part catcher
- 2 Part conveyor
- 3 Drill breakage detector

Kinematics

- 1 **Turret No. 1:** Turret type: 12 stations
Number of rotary tools: 12 (25 Nm)
- 2 **Y axis** (SY type only)
- 3 **Turret No. 2:** Turret type: 8 stations
Number of rotary tools: 4 (10 Nm)
- 4 **Spindle No. 1**
Spindle speed: 6000 rpm (BNJ42) / 5,000 rpm (BNJ51)
- 5 **Spindle No. 2**
Spindle speed: 5,000 rpm

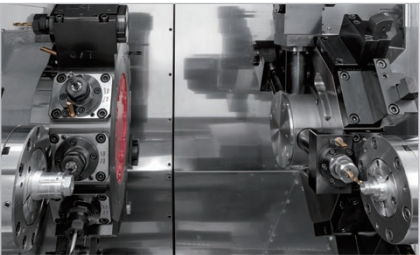


(Model with option)

Working area

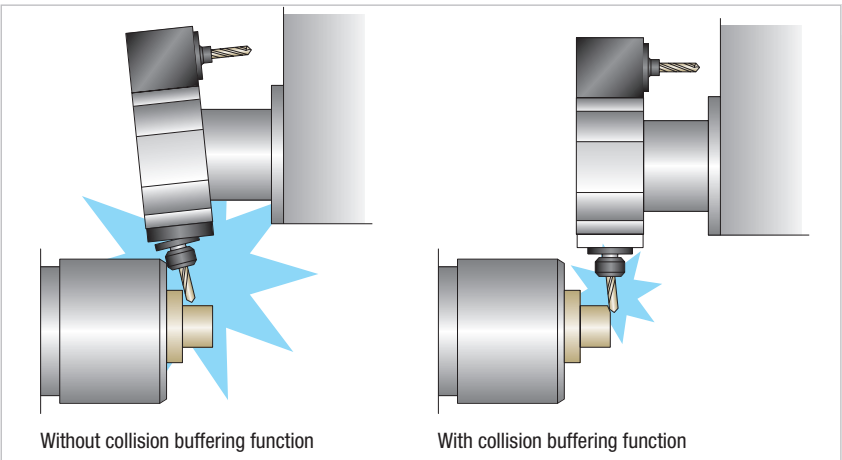
1 **Turret No. 1 accommodating higher-torque revolving tools**
Since a single drive mechanism is used to drive the revolving tools, they can be mounted at all stations. With a maximum torque of 25 Nm, they can handle heavy-duty cutting too.

Turret No. 2 accommodating revolving tools and with a bigger tool capacity
The number of tool mounting positions has increased from the six on existing machines to eight. The turret also now accepts double plain holders, greatly increasing the number of tools that can be mounted.

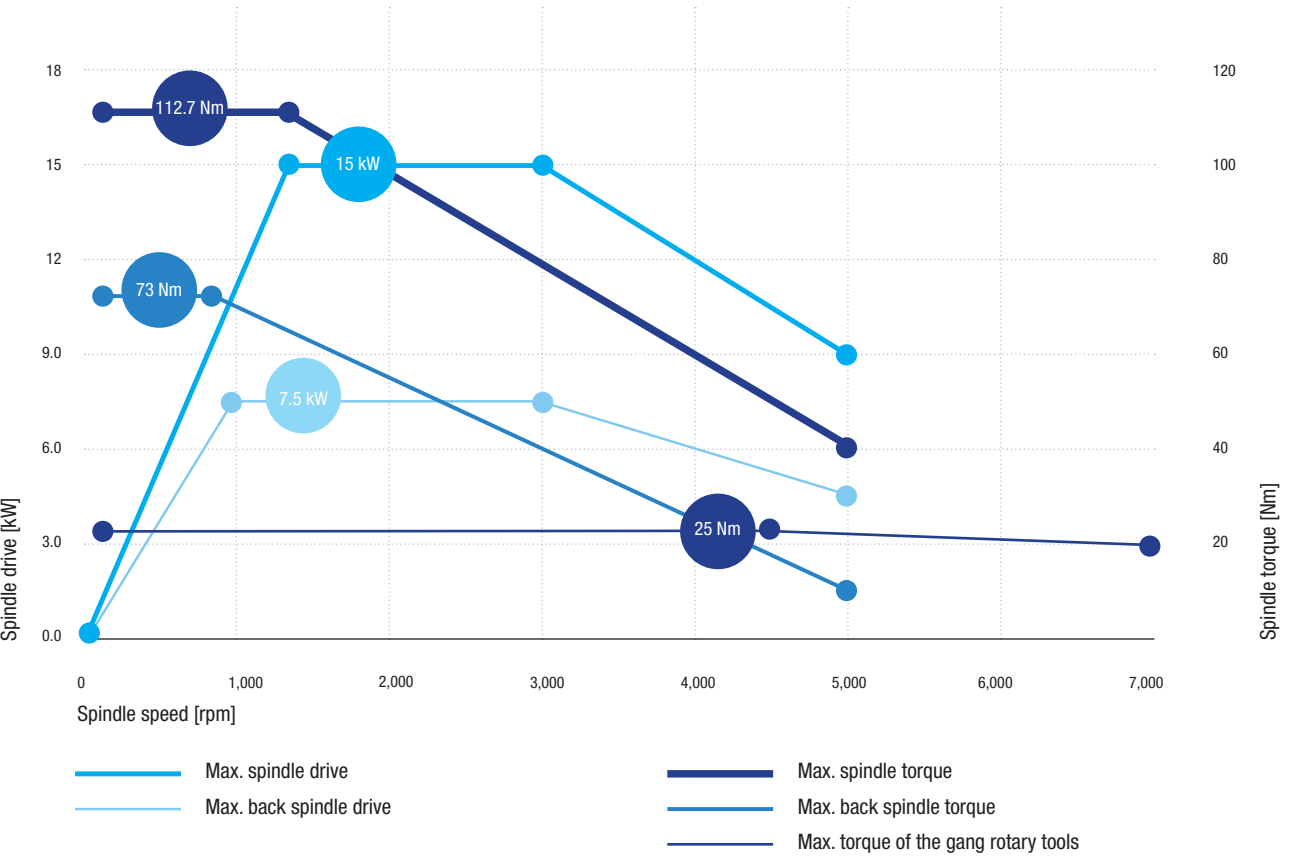


Machining time shortened by simultaneous machining at left and right

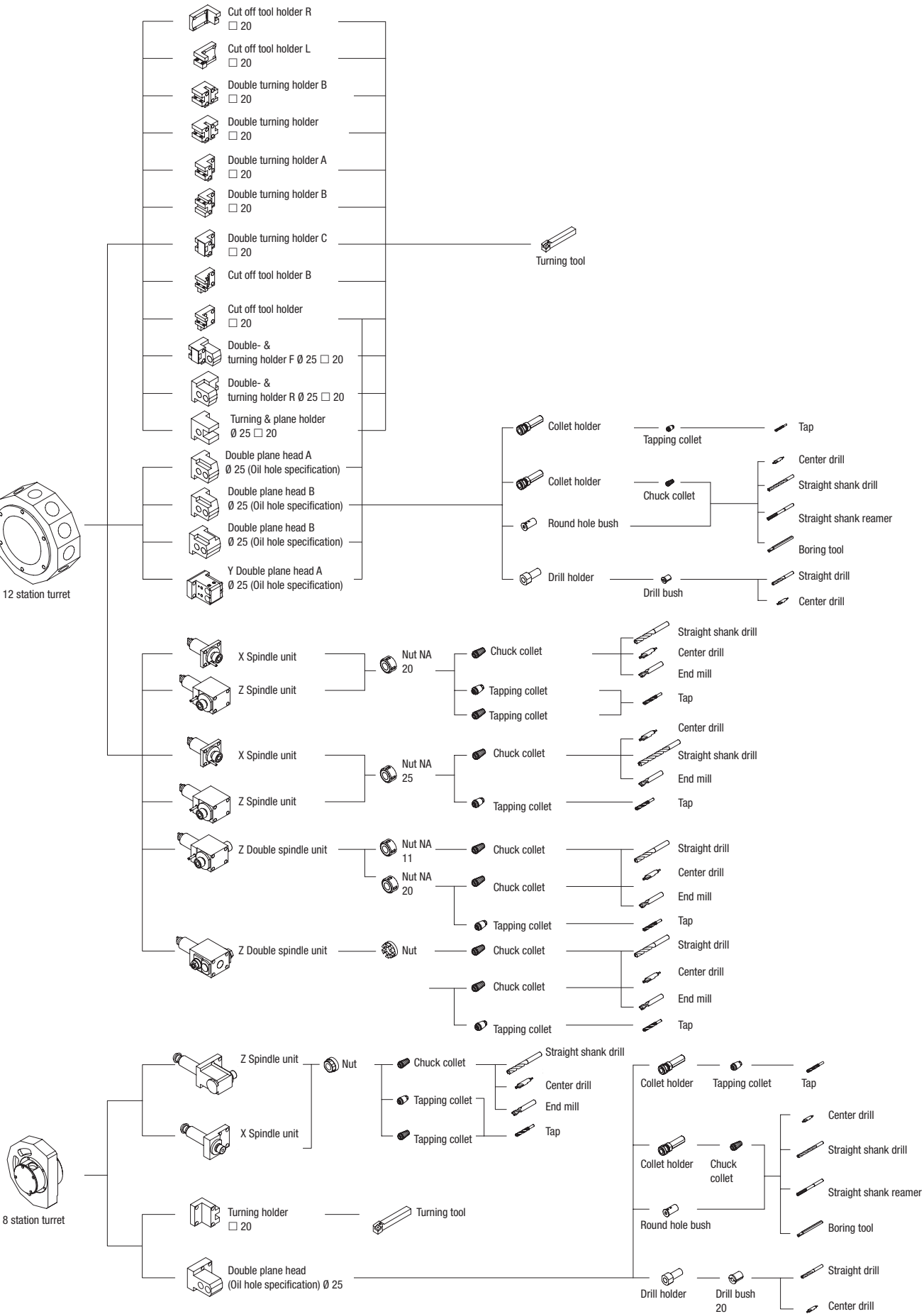
2 **Collision buffering (just rapid traverse operation)**
When interference is encountered in rapid traverse operation, the function decelerates and stops axis feed and generates retraction torque to retract the feed axis in the opposite direction to the collision direction, limiting damage to the machine.



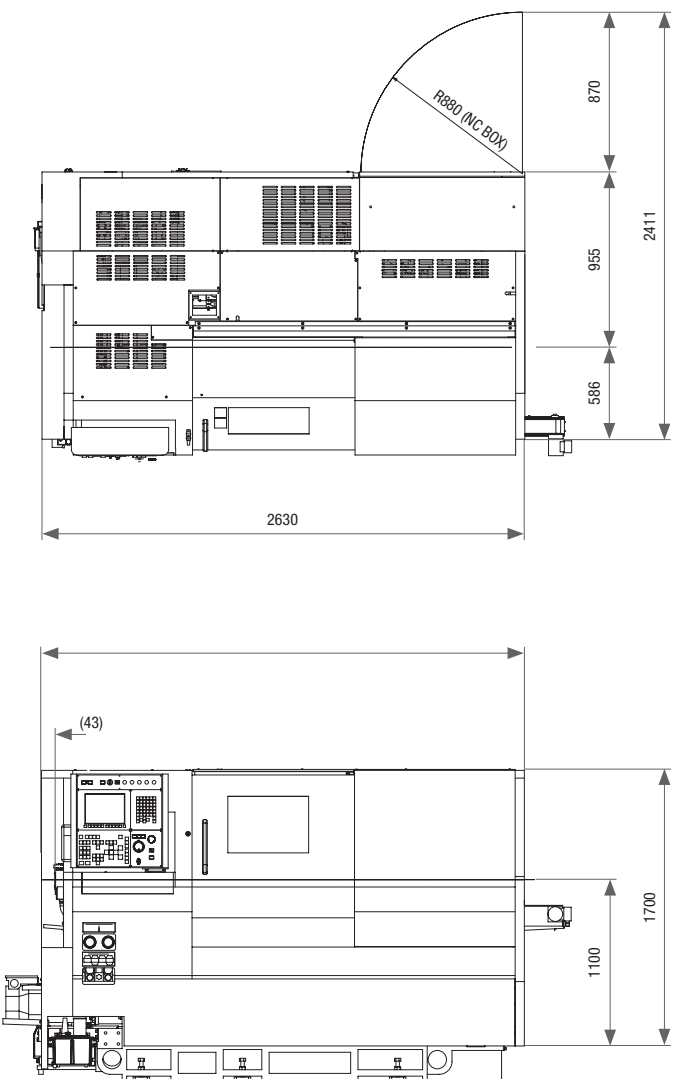
Performance diagram



Tooling System



Floor plan



Machine specification

Item		BNJ-42S6	BNJ-42SY6	BNJ-51SY6
Machining capacity				
Maximum machining length		100 mm		
Ø Standard machining	Spindle No. 1	Ø 42 mm	Ø 42 mm	Ø 51 mm
	Spindle No. 2	Ø 42 mm		
Chuck size	Spindle No. 1	5 "	5 "	6 "
	Spindle No. 2	5 "		
Spindle				
Number of spindles		2		
Spindle speed range	Spindle No. 1	6,000 rpm	6,000 rpm	5,000 rpm
	Spindle No. 2	5,000 rpm		
Inner diameter of draw tube	Spindle No. 1	Ø 43 mm	Ø 43 mm	Ø 52 mm
	Spindle No. 2	Ø 43 mm		
Chuck collet	Spindle No. 1	H-S22, DIN177E		
	Spindle No. 2	JPN, H-S16, DIN171E		
Power chuck (thru-hole chuck)	Spindle No. 1	5"	5"	6"
	Spindle No. 2	5"		
Turret				
Number of turrets		2		
Type of Turret	Turret No. 1	12-station turret		
	Turret No. 2	8-station turret		
Shank size of square turning tool		□ 20 mm.		
Diameter of drill shank		Ø 25 mm		
Rotary tools				
Number of rotary tools	Turret No. 1	Max. 12		
	Turret No. 2	Max. 4		
Type of rotary tools	Turret No. 1	Single clutch		
	Turret No. 2	Simultaneous drive in all positions		
Tool spindle speed range	Turret No. 1	6,000 rpm		
	Turret No. 2	3,000 rpm		
Machining capacity	Drill	Turret No. 1	Max. Ø 13 mm	
		Turret No. 2	Max. Ø 10 mm	
	Tap	Turret No. 1	Max. M12x1.75 (S45C-D)	
		Turret No. 2	Max. M6x1.0 (S45C-D)	
Slide stroke				
Turret slide stroke	X1 axis	165 mm		
	Z1 axis	246 mm		
Y1 axis	Y1 axis	—	80 (±40) mm	80 (±40) mm
	X2 axis	85 mm		
Spindle slide stroke	Z2 axis	590 mm		
	Feed rate			
Rapid feed rate	X1 axis	20 m/min		
	Z1 axis	20 m/min		
Y1 axis	Y1 axis	—	12 m/min	12 m/min
	X2 axis	20 m/min		
Z2 axis	Z2 axis	20 m/min		
Motors				
Spindle drive	Spindle No. 1 Cs	11/15 kW (15 min/cont.)		
	Spindle No. 2 Cs	5.5/7.5 kW (15 min/cont.)		
Rotary tool drive	Turret No. 1	2.2 kW		
	Turret No. 2	0.75 kW		
Slide		1.2 kW (X1, Z1, Y, X2, Z2)		
Hydraulic oil motor		2.2 kW		
Lubricating oil motor		0.004 kW		
Coolant pump		0.25 kW × 1, 0.18 kW × 1		
Turret index motor		0.75 kW		
Power supply				
Voltage		AC 200/220 ± 10% 50/60 Hz ± 1%		
Power consumption		33 KVA		
Air supply		5 bar		
Fuse		100 A		
Tank capacity				
Hydraulic oil tank capacity		18 l		
Lubrication oil tank capacity		4 l		
Coolant tank capacity		300 l		
Machine dimensions				
Machine height		1,700 mm		
Floor space		2,780×1,510 mm (without Chip conveyor)		
Machine weight		5,300 kg		
Others				
Splash guard interlock, Coolant & pneumatic unit, Machine light, Non-fuse breaker, SP2 Work ejector & inner high pressure coolant, Chuck close confirmation, Total & preset counter (Custom menu)				
NC specifications				
Control unit: FS 0i-TF; Simultaneously controlled axis Max.4: X1, Z1, Y1, Cs1, A1, A2 (Opt.) X2, Z2, Cs2; Min. input increment; 0.001 mm, 0.0001 inch, 0.001 deg; Min. output increment: X-axis: 0.0000 in, X axis: 20.001 mm, Y axis: 0.001 mm; total program storage capacity 1MB (2,560m tape length); Spindle function: speed programming via 4-digit S word/Constant cutting speed control (G96); Rapid traverse rate: X1, X2, Z1 axis: 20 m/min, Z2 axis: 20 m/min, Y1 axis: 12 m/min; Cutting feed rate: 3.4 digit F word (feed per revolution); Cutting feed rate override: 0 ~ 150% (in 10% increments); interpolation: G01, G02, G03; Thread cutting: G32, G92; Canned cycle: G90, G92, G94; Work coordinate setting: Automatic setting, 64 work coordinate systems can be set via tool position; Tool selection: by TAABB at the specified position for each turret tool wear compensation, selection by BB; Direct input of tool position by measurement in MDI mode; Input/Output interface: USB, PC card slot; Automatic operation: 1 cycle operation/continuous operation, Single block, Block delete, Machine lock, Dry run, Feed hold, Optional block skip				
NC standard functions				
10.4"color LCD, No. of registered programs: 800, Decimal point input Manual pulse generator, Memory protect, Polar coordinate interpolation Programmable data input (G10), C-axis control (SP1/SP2), Superimposed control A Chamfering/Corner R, Tool nose R compensation, Background editing, Synchronous mixed control, Operating time/ Parts No. display Multiple repetitive canned cycle (G70-G76), Continuous threading Canned cycle for drilling, Tool life management system, Variable-lead cutting Rigid tapping function (spindle & rotary tool), Circular interpolation, Custom macro, Handle retrace function, Polygon cutting, Synchronized function, Dual check safety Reference position setting, NC option Helical interpolation, RS-232C.				

BNA 42 GTJ

Even faster with consistently high precision.

Hand scraped slideways offering maximum stability and rigidity are used to achieve the renowned “Miyano accuracy“. These slideways excel at extraordinarily high rigidity as well as excellent damping characteristics thus contributing to powerful machining and extended tool life. The main components of the machine, like spindles and tool slides, are installed on the stable cast bed. The machine is designed in a way that mounting faces are not distorted by the effects of heat. Even if the units are subject to thermal expansion, they are all displaced in the same direction (perpendicular to their mounting faces). This minimizes relative deviations between the workpiece and cutting tools.

Advantages

Easy to use tooling system.

Simultaneous machining with 3 tools.

Maximum productivity hand in hand with very short cycle times.

The renowned “Miyano accuracy“.

Highly flexible tool configuration.

Excellent machining output and efficiency.

Cycle time shortened by superimposition control.

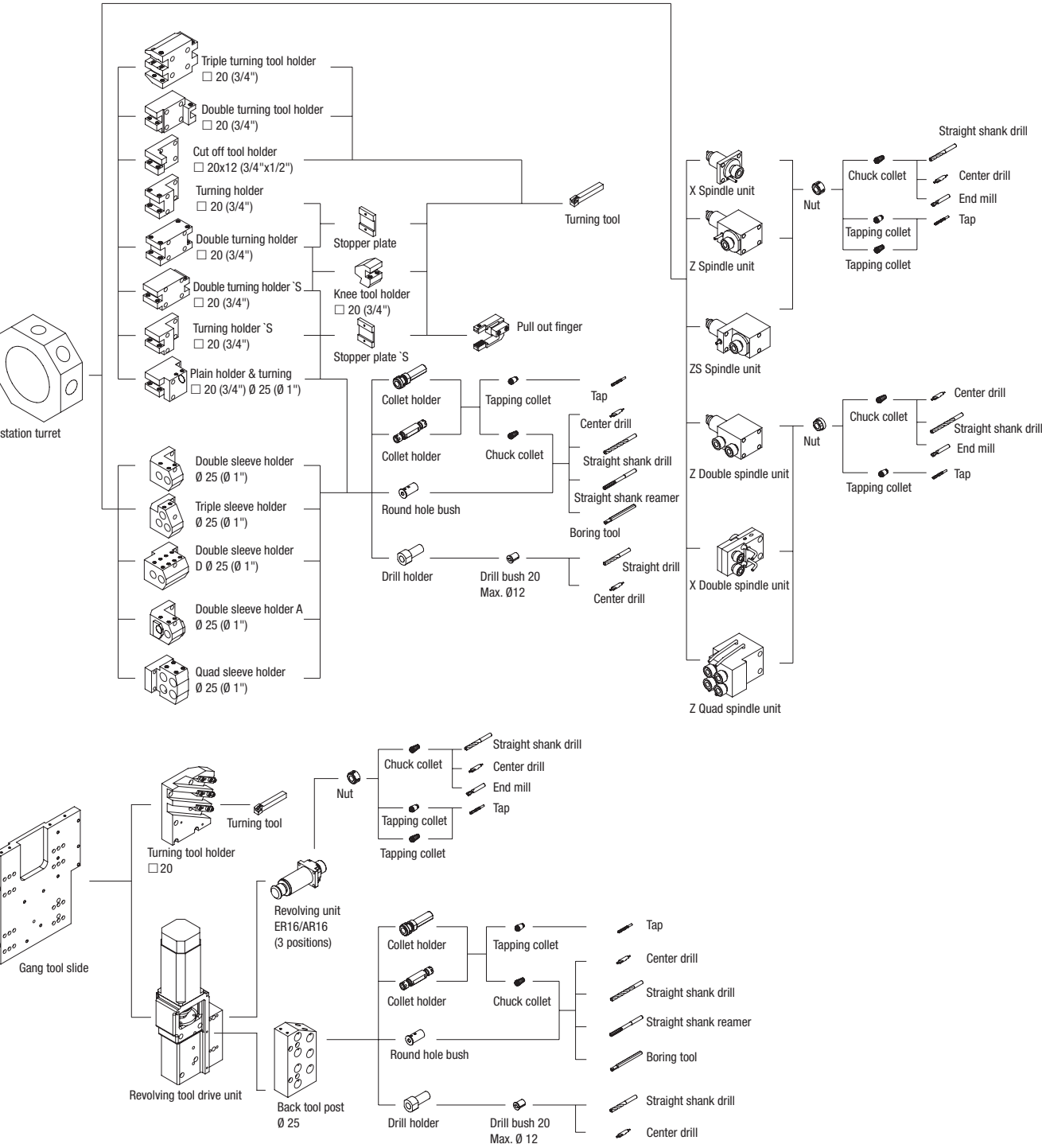
LFV Technology.



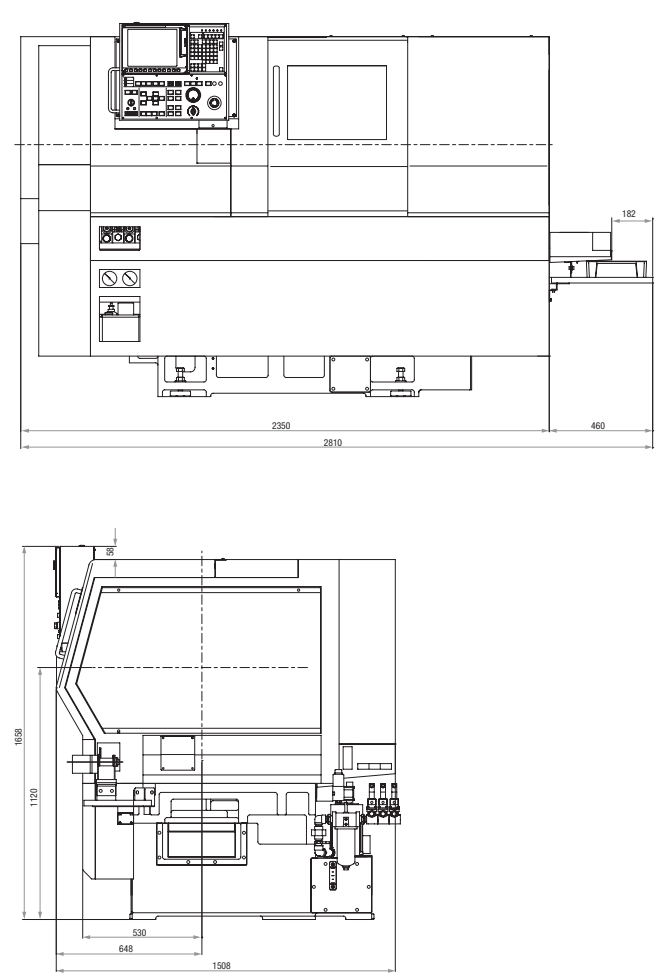
4.66 m²



Tooling System



Floor plan



Machine specification

Item		BNA-42GTY	
Machining capacity			
Maximum machining diameter for bar chuck	SP1	Ø 42 mm	
	SP2	Ø 34 mm	
Maximum machining length		110 mm	
Spindle			
Number of spindles		2	
Spindle speed range	SP1	6,000 rpm	
	SP2	5,000 rpm	
Minimum spindle positioning	SP1	0.001°	
	SP2	0.001°	
Turret			
Number of turrets		2	
Tool for SP1	Turning	3	
Drilling			
Rotary tool		3	
Tool for SP2	Turning		
Drilling		7	
Rotary tool			
Type of Turret		8 st.	
Rotary tool		8 (Op.)	
Max. number of tools		21 – 43	
Shank size of turning tool		Ø 20 mm	
Diameter of sleeve holder		Ø 25 mm	
Rotary tool chuck		AR16 (Ø 10 mm)	
Tool spindle speed range		6,000 rpm	
Slide stroke			
Traverse rate/Feed rate	Z1 axis	110 mm	30 m/min
	X1 axis	95 mm	24 m/min
	Y1 axis	260 mm	30 m/min
	Z2 axis	235 mm	20 m/min
	X2 axis	140 mm	20 m/min
	Y2 axis	70 mm	12 m/min
	Z3 axis	360 mm	20 m/min
	X3 axis	190 mm	12 m/min
Motors			
Spindle drive	SP1	7.5/11 kW	
	SP2	3.7/5.5 kW	
Rotary tool drive unit	Turret	1.0 kW	
Gang tool post		1.5 kW	
Tank capacity			
Hydraulic tank		7 l	
Lubricating tank		4 l	
Coolant tank		165 l	
Power supply			
Voltage		AC 200/220 V ± 10%	
Power consumption		28 KVA	
Fuse		100 A	
Air supply		7 bar	
Machine dimensions			
Machine height		1,680 mm	
Floor space (L x W)		2,350 × 1,490 mm	
Machine weight		3,740 kg	
NC specification			
Control model		MITSUBISHI M730VS	
Display device		10.4-inch color LCD	
Controllable axes			
Programmable axes		X1, Z1, Y1, C1 axis	
		X2, Z2, Y2, C2 axis	
		X3, Z3 axis	
Auxiliary axes		C3, C4, T1 axis	
Axis control groups		3 groups	
Input code		ISO	
Command input system		Incremental and absolute	
Feed command system		Feed per revolution and feed per minute	
Cutting feed rate and rapid feed override		Max.100 %	
Tool offset data		80 pairs	
Program storage capacity		320 m	
Standard accessories			
On machine program check function; Manual feed function; Manual Data input (MDI); Operation time display; Product counter display; Cycle time check function; Preparation functions; Start position automatic return; Automatic cut-off machining function; Tool set function; Spindle speed simultaneous command for 3 spindles; 3 Sets M code simultaneous command; Control axis swap function; Control axes superimposition function; Arbitrary superimposition function; Function to superimpose 2 pairs of axes; Background editing; Simultaneous program editing for two axis control groups; Editing support functions; Calculator function; Code list display; Coordinate calculation function; Spindle C axis function; Constant surface speed control;Cut off confirmation; Tool nose R compensation function; corner chamfering / rounding function; thread cutting canned cycle; Spindle synchronizing control function; Milling interpolation			
Option			
Helical interpolation; Spindle synchronous tapping function; Synchronous tapping function for rotary tools; Custom macro; Multiple canned cycle for turning; canned cycles for drilling; Inch / metric conversion			

BNA 42 DHY

The BNA series is a synonym for evolution and innovation.

The BNA-DHY distinguishes itself by a compact structure and numerous high-performance and accuracy features as well as 2 turrets and one Y-axis. All features for which Miyano has rightly been renowned by our demanding customers. This makes the BNA-DHY an extremely flexible machine.

Advantages

Compact design.

Numerous high-performance and precision features.

Two turrets with Y-axis.

More versatile tooling options.

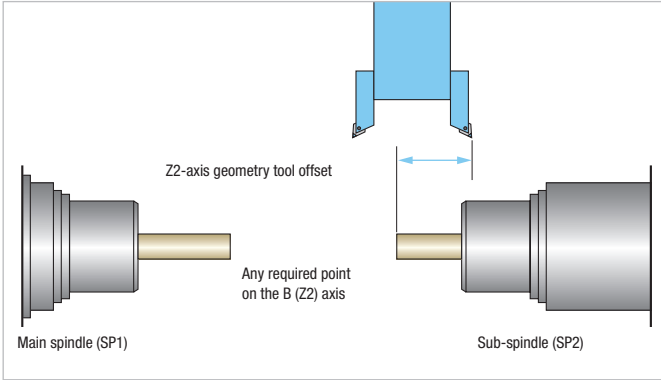
Cycle time shortened by superimposition control.

3.25 m²



Machining examples

Arbitrary point control by B (Z2) axis



The approach for secondary operation can be made at any required point on the B (Z2) axis, so there is no need to consider the position of the B (Z2) axis when setting the offset for tools that operate on the sub-spindle (SP2). Wasted motion is eliminated, and a smooth transition from primary to secondary operation can be made at turret index, helping to reduce cutting time.

Standard



Machining support screens

- 1 Automatic operation monitor (spindle / rotary tools)
- 2 Automatic operation monitor (axis)
- 3 Program handwheel (DHY only): In automatic operation, the program may be checked using the program handwheel.

1

AUTOMATIC RUNNING MONITOR (SP/ROT)

SPEED	ROTATION STATE
SP1 3000 rpm	FORWARD
SP2 0 rpm	SP BRAKE LOCK
RV1 0 rpm	REVERSE RIGID TAP

SP OVERRIDE (for AUTO MODE): 90%

SP1 SPEED ATTAINMENT LEVEL : 85.0%

SP2 SPEED ATTAINMENT LEVEL : 68.3%

2

AUTOMATIC RUNNING MONITOR (AXIS)

HD1	HD2
XZC	XZC

TORQUE LIMIT ---

SYNCHRONOUS CONTROL ---

COMPOSITE CONTROL ---

OVERLAPPING CONTROL ---

FEED OVERRIDE: 100%

3

PROGRAM

11 G71 U3.0 R1.0 ;

12 G72 P0.0 Q0.0 U0.0 W0.0 F0.3 ;

13 M00 ;

14 G1 Z40.0 F0.14 ;

15 G3 X20.0 Z20.0 R15.0 F0.1 ;

16 G2 Z25.0 F0.14 ;

17 M00 ;

18 X50.0 Y-1.0 ;

19 Z-1.0 ;

20 M03 S54.0 F0.8 ;

21 M0 X100.0 Y100.0 M09 ;

22 M1 ;

23 M2 ;

24 M2 C25.0MM DRILL ;

25 M03 ;

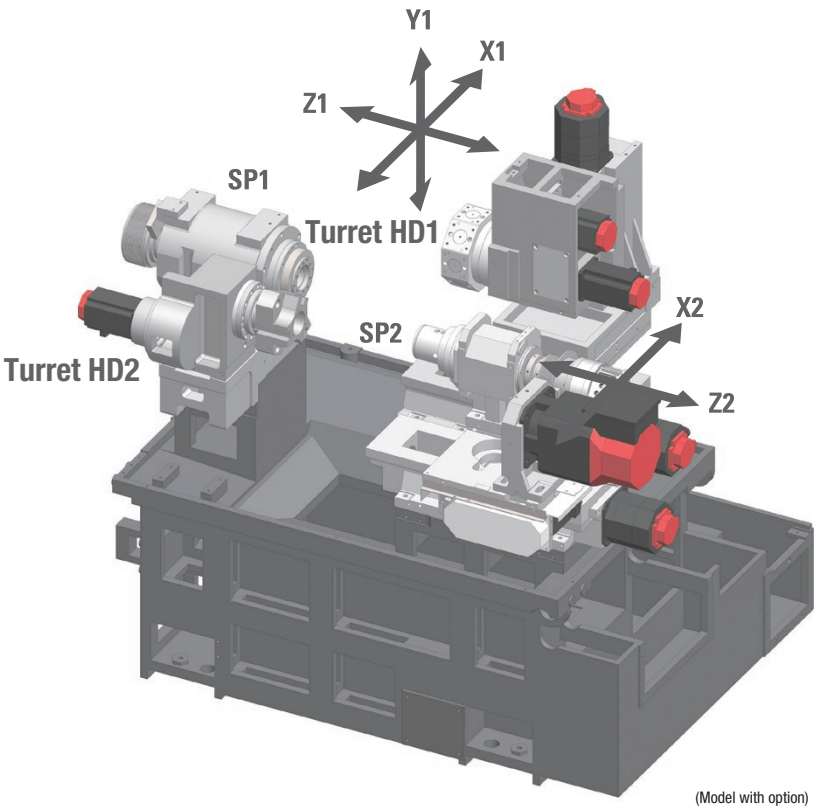
26 G99 G97 S50 S1200 P11.16202 ;

27 M0 X100.0 Y100.0 ;

28 M03 S1000 ;

Kinematics

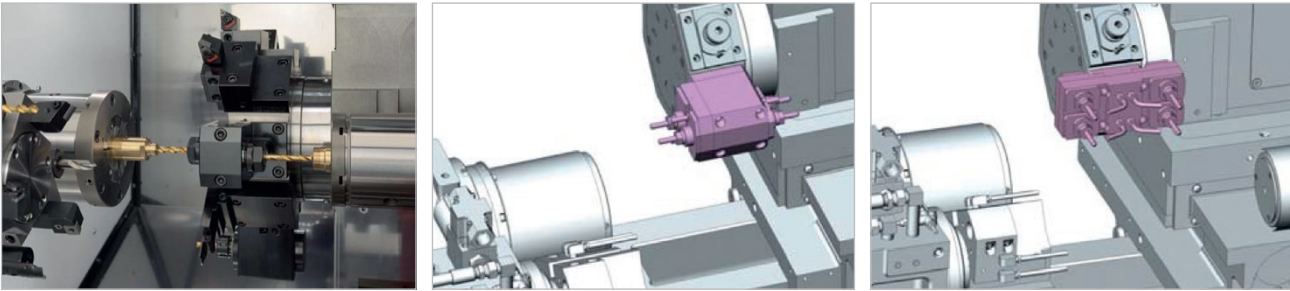
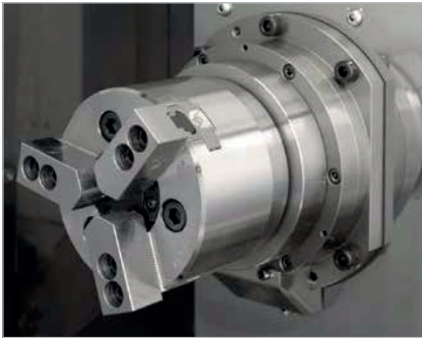
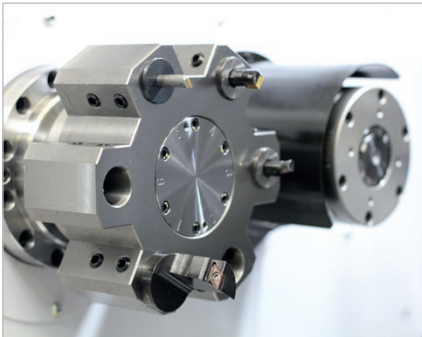
Highly rigid hand scraped slideways permit heavy-duty cutting. These slideways excel at extraordinarily high rigidity as well as excellent damping characteristics thus contributing to powerful machining and extended tool life.



(Model with option)

Working area

- 1 Combination from main turret with integrated Y axis (HD1) and compact additional turret with 6 stations (HD2)
- 2 Power chuck on back spindle
- 3 Optimized simultaneous machining at turret



Multiple tool stations for rotary tools

Options

1

2

3

4

5

1

Part catcher

2

Part conveyor

3

Chip conveyor

4

Barfeeder

5

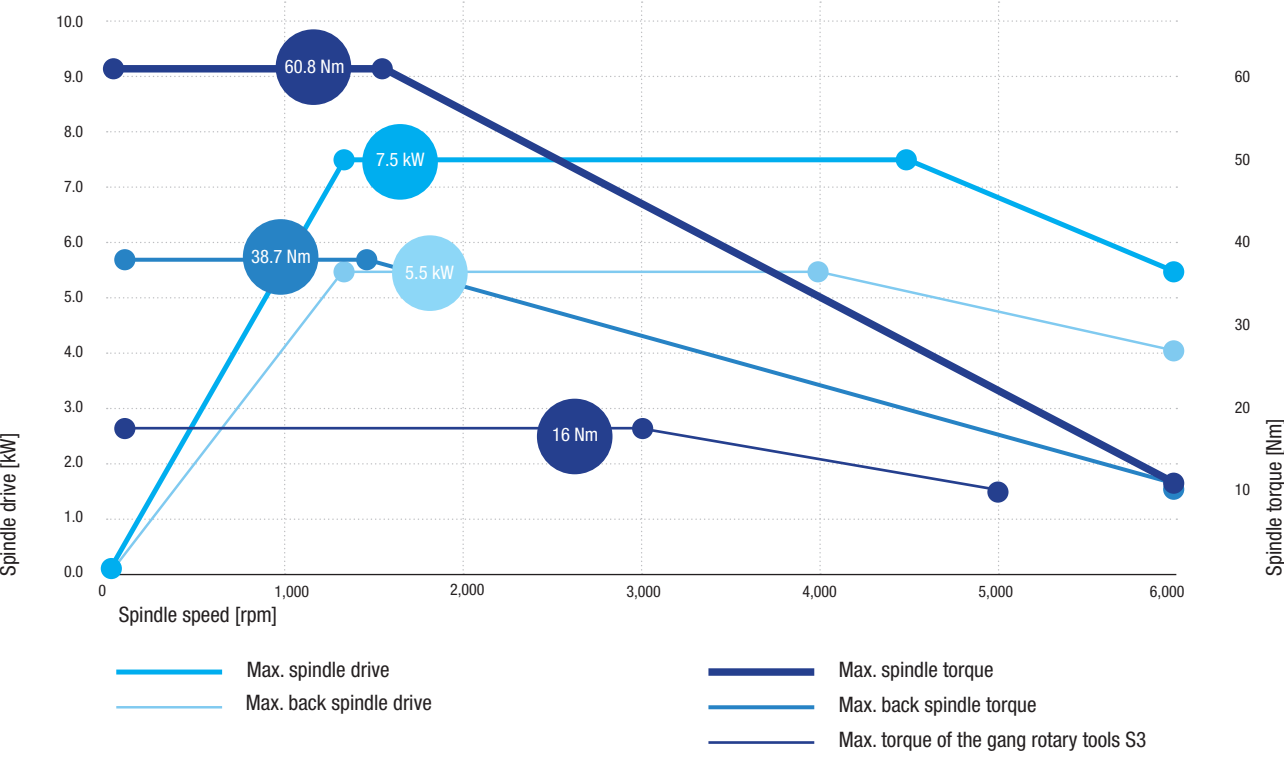
Tool monitor

5

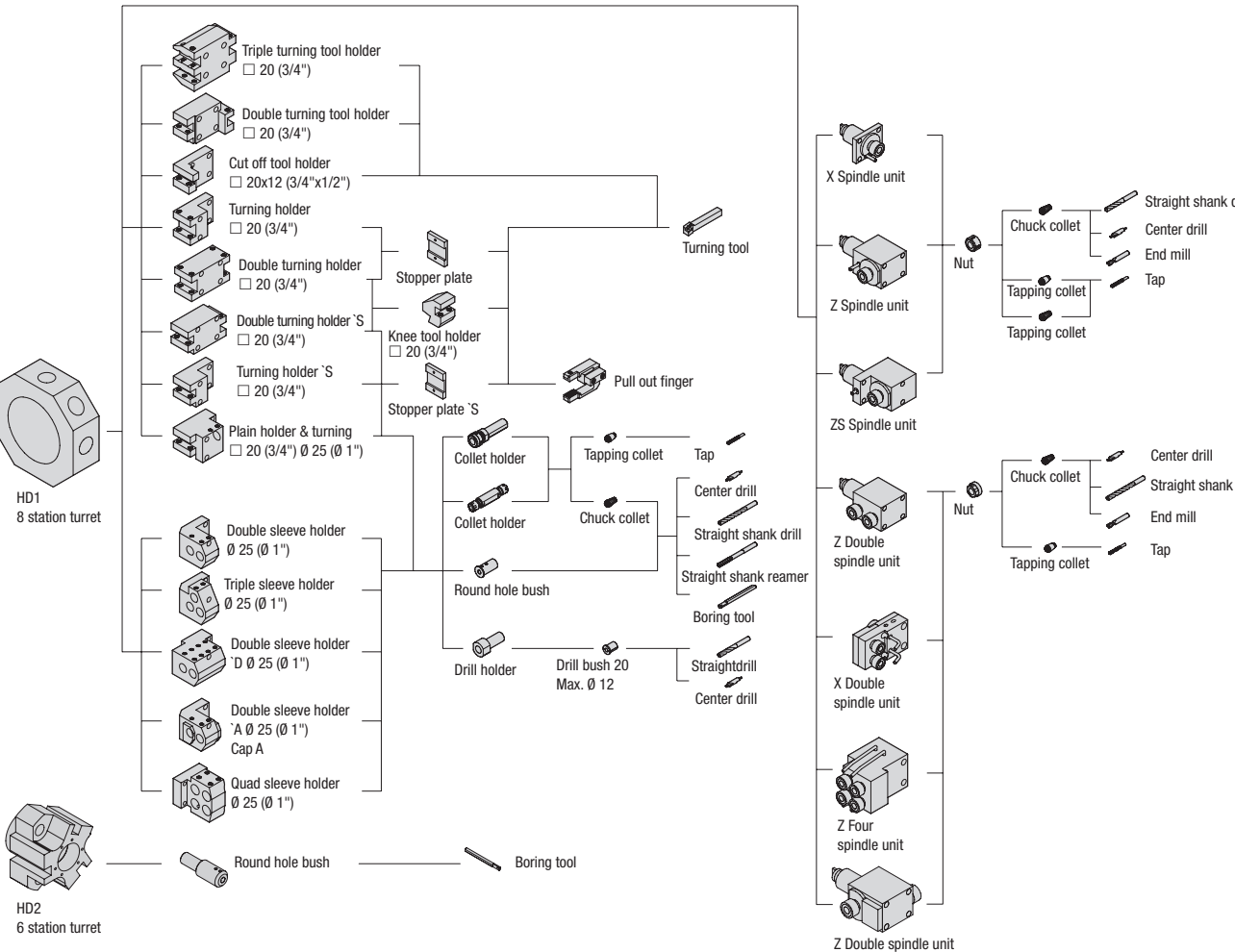
TOOL MONITOR MONITORING No. 01

%	25	50	75	100	125	150	PEAK
X	*****						100
Z	*****						103
Y	*****						
B	*****						
C	*****						
A	*****						
S1	*****						
S2 *	*****						5

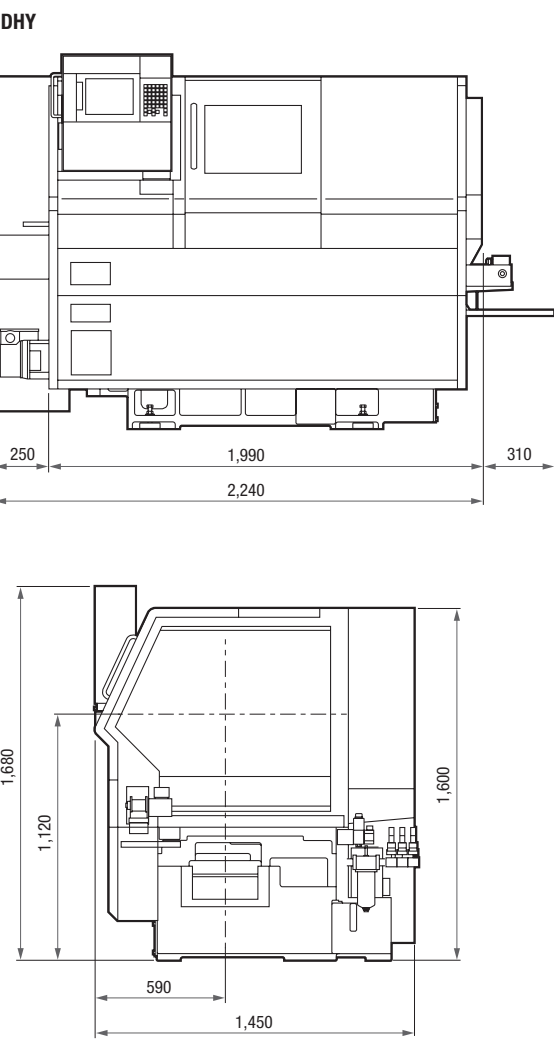
Performance diagram



Tooling System



Floor plan



Machine specification

Item	BNA-42DHY3
Max. machining diameter (main spindle)	Ø 42 mm
Max. machining diameter (back spindle)	Ø 42 mm
Maximum machining length	100 mm
Axis strokes	
X1 axis	140 mm
Z1 axis	235 mm
Y1 axis	70 (+/-35 mm)
X2 axis	140 mm
Z2 axis	360 mm
Spindle	
Number of spindles	2
Inner diameter of draw tube – spindle 1	Ø 43 mm
Inner diameter of draw tube – spindle 2	Ø 30 mm
Speed – spindle 1	60–6,000 rpm
Speed – spindle 2	50–5,000 rpm
Collet type – spindle 1 DIN collet	DIN collet Hainbuch
Collet type – spindle 2	DIN collet Hainbuch
C axis – spindle 1	0.001 °
Power chuck type	
Spindle 1	5" through-hole chuck
Spindle 2	4" through-hole chuck
C axis – spindle 2	0.001 °
Turret	
Number	2
Number of stations – turret 1	8
Number of stations – turret 2	6
Turning tool cross section	□ 20 mm
Sleeve diameter	Ø 25 mm
Rotary tools	
Number of rotary tools	max. 8
Rotary tool speed	50–5,000 rpm
Max. drilling diameter	Ø 10 mm
Max. front tapping diameter	M8 x 1.25
Rapid feed rate	
X1 axis	20 m/min
X2 axis	20 m/min
Y1 axis	12 m/min
X2 axis	12 m/min
Z2 axis	20 m/min
Motor Output	
Main spindle	5.5/7.5 kW
Back spindle	3.7/5.5 kW
Rotary tools	1.0/2.8 kW
Power supply	
Capacity	30 kVA
Air supply	5 bar
Electrical fuse	100 A
Weight	3,100 kg
Volume of tank	
Coolant tank	175 l
Hydraulic tank	7 l
Lubricating tank	2 l
NC Specification	
Control type	Fanuc Oi-TD
Screen	8.4 inch color liquid crystal display (LCD)
Controllable axes	X1, Z1 (BNA-C), -X1, Z1, Z2 (BNA-S), X1, Z1, Y, X2, Z2 (BNA-DHY)
Auxiliary axes	C3, T1
Input	ISO
Tool compensation	80 pairs
Memory capacity	1 Mbyte (2560 m)
Interpolation	G01, G02, G03
Thread cutting cycle	G32, G92
Fixed cycles	G90, G92, G94
Input/output interface	PC card
NC standard functions	
Corner chamfering / rounding function, tool nose R compensation, Constant cutting speed control (G70-G76), Synchronous tapping, Drilling cycle (G80-G86), Tool life monitoring,	

BNA 42 S

Space-saving design with improved functions and maximum precision. Sets the new standard in bar machining.

The BNA series combines high-tech functions and maximum precision in an extremely compact space-saving machine. The series includes the model BNA-S equipped with one back spindle (SP2) for back machining.

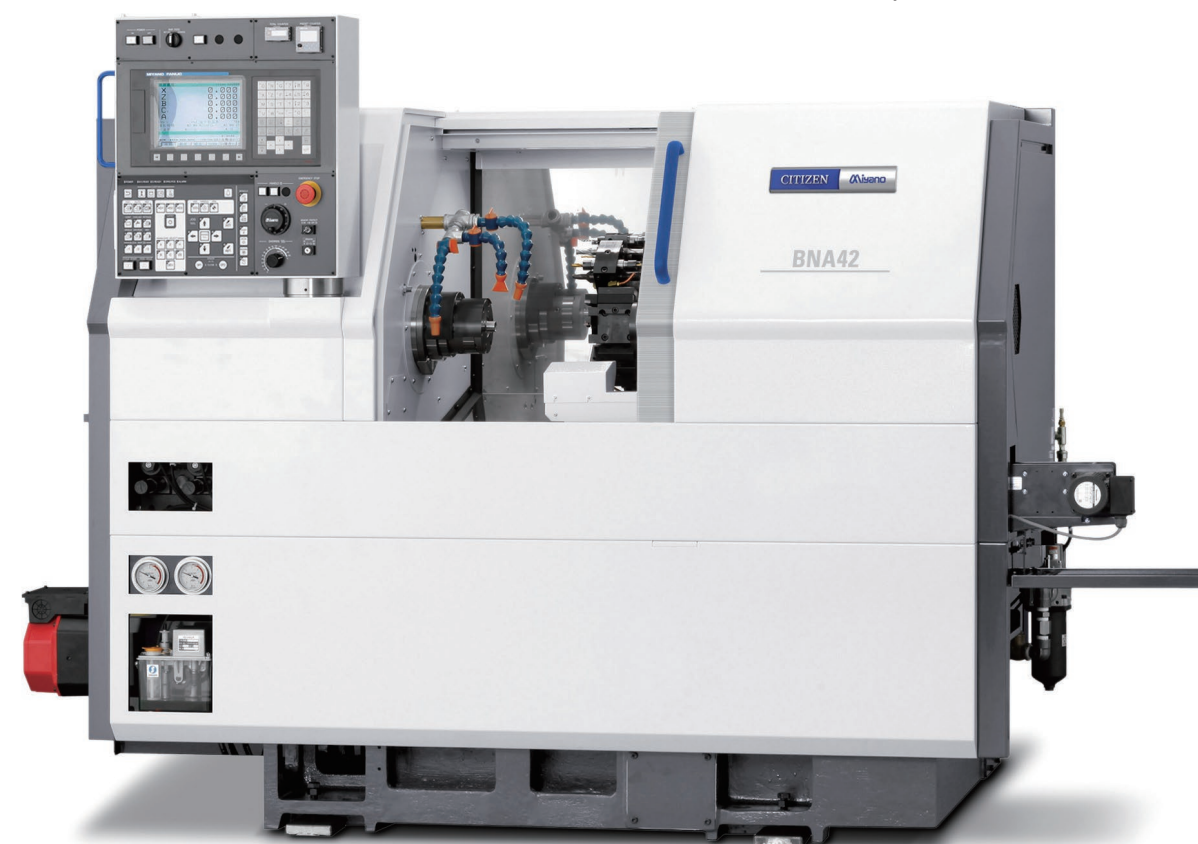
Advantages

Equipped with a back spindle for tapping the workpiece and for backside machining.

Due to several tool holders, numerous tools can be used.

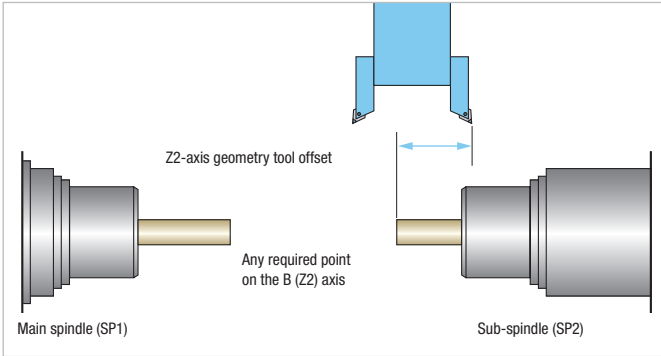
Flexible tool arrangement.

2.77 m²



Machining examples

Arbitrary point control by B (Z2) axis



The approach for secondary operation can be made at any required point on the B (Z2) axis, so there is no need to consider the position of the B (Z2) axis when setting the offset for tools that operate on the sub-spindle (SP2).
Wasted motion is eliminated, and a smooth transition from primary to secondary operation can be made at turret index, helping to reduce cutting time.

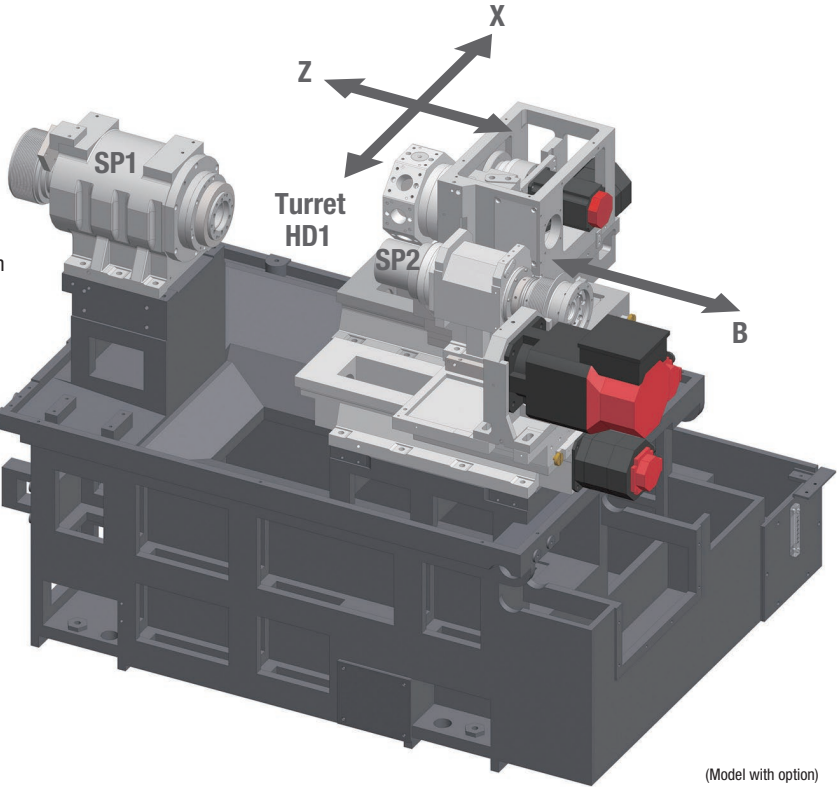
Machining program example

```
O1000;
G591;
G0 B-260.;
G01 B-290.43 F4000.;
M408;
M118;
G590;
•
N8 (CUT OFF) M91;
G28U0;
M291;
T0808M117;
G0G97Z0.S2900M403P11;
•
X23.0;
M290;
G506K0.05F500;
G99G1X-1.0;
G0X50.0M205;
•
G591: B-axis program registration start
B-axis forward
B-axis positioning
M408: M403 completion confirmation
M118: SP2 chuck close
G590: B-axis program registration end
•
M91: SP1 position coder selection
X-axis origin point return
M291: B-axis program execution start
Turret selection, M117: SP2 chuck open
Z-axis positioning,
M403SP1&2 Synchronous forward
Immediate completion
X-axis positioning
M290: B-axis program execution
completion confirmation
G506: B-axis incremental move
Cut off
M205: SP1&2 Synchronous stop
```

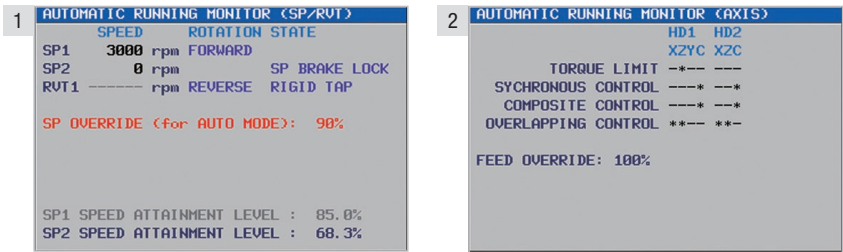
B (Z2) axis independent multiple block commands can make it possible for B (Z2) axis programs input in advance to run independently from the main program.
B (Z2) axis commands can contain maximum 10 blocks.

Kinematics

Stable, accurate and strong
The machine bed has a platform structure with traditional square, hand-scraped slidways for assured accuracy and long tool life. The unit mounting faces are not distorted by the effects of heat, and even if the units are subject to thermal expansion they are all displaced in the same direction (perpendicular to their mounting faces), minimizing relative deviations between the workpiece and cutting tools.



Standard

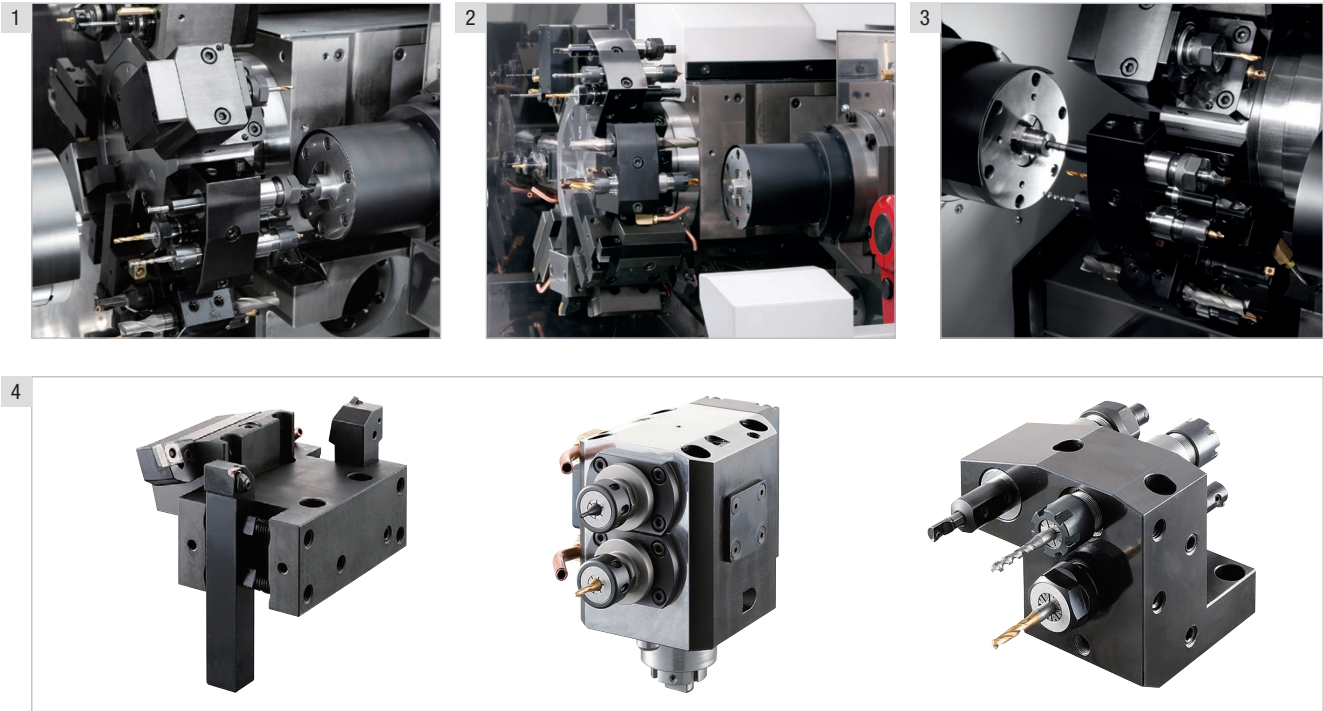
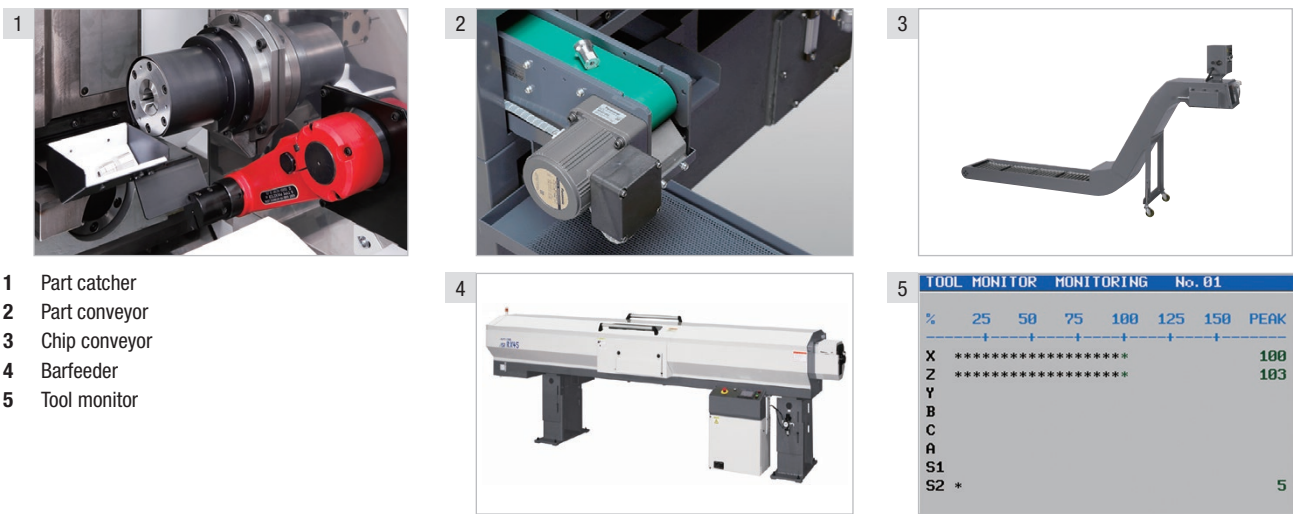


- Machining support screens**
- 1 Automatic operation monitor (spindle / rotary tools)
 - 2 Automatic operation monitor (axis)

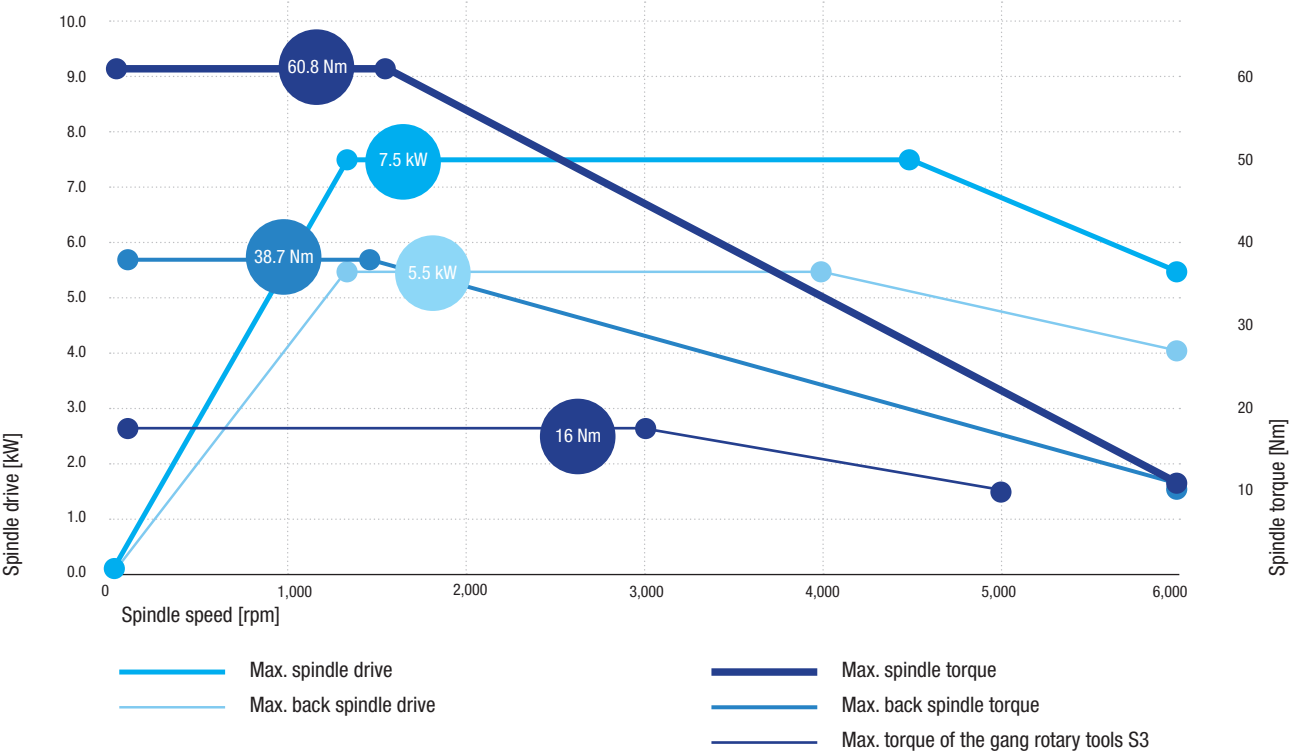
Working area

- 1 Back spindle for complete machining
- 2 The turret may be expanded to accommodate 16 stations.
- 3 The BNA-S disposes of two spindles and one turret
- 4 Easy to use tooling system

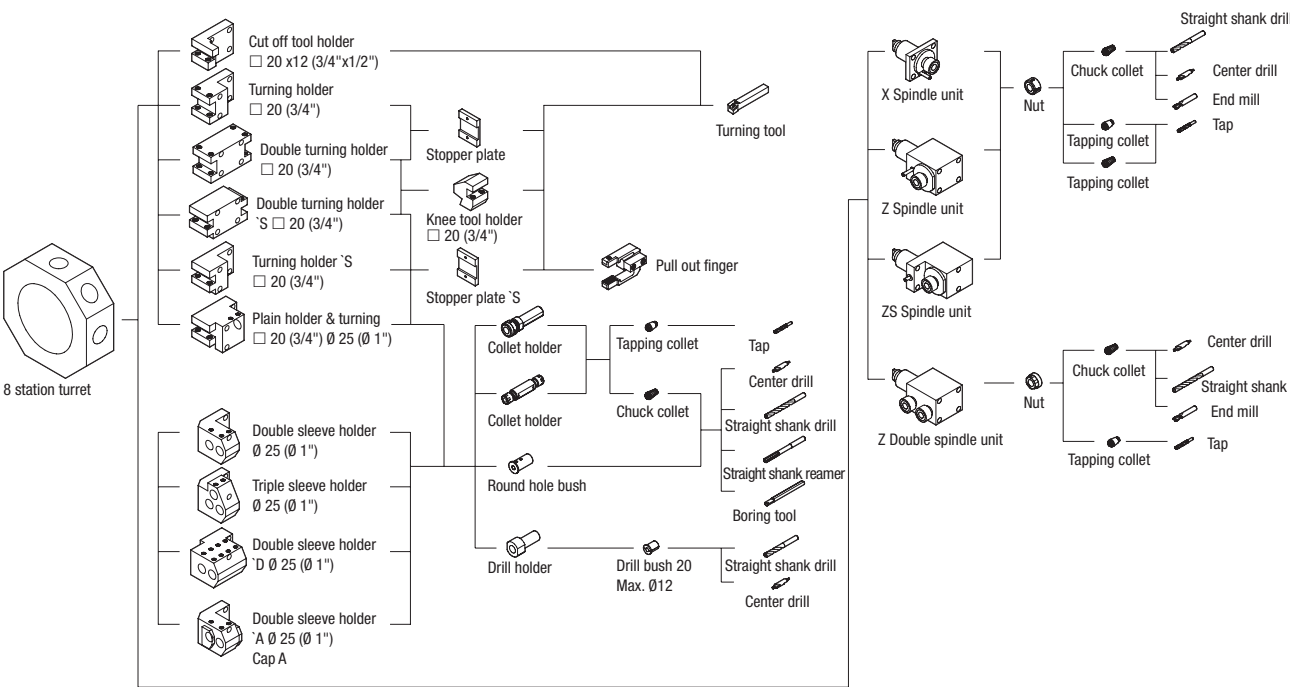
Options



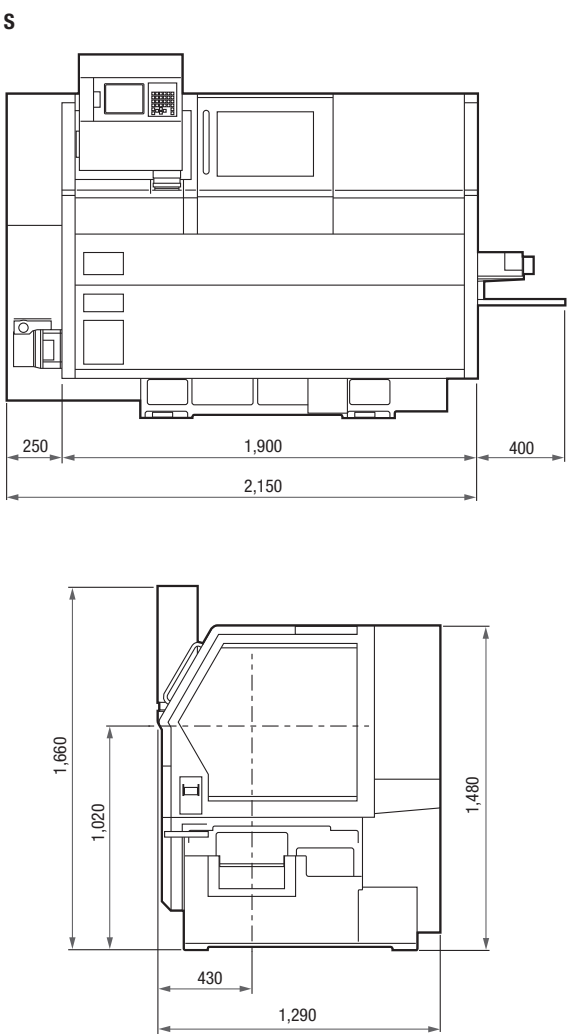
Performance diagram



Tooling System



Floor plan



Machine specification

Item	BNA-42S
Max. machining diameter (main spindle)	Ø 42 mm
Max. machining diameter (back spindle)	Ø 34 mm
Maximum machining length	100 mm
Axis strokes	
X1 axis	135 mm
Z1 axis	235 mm
B axis	310 mm
Spindle	
Number of spindles	2
Inner diameter of draw tube – spindle 1	Ø 43 mm
Inner diameter of draw tube – spindle 2	Ø 30 mm
Speed – spindle 1	6,000 rpm
Speed – spindle 2	5,000 rpm
Collet type – spindle 1	DIN collet
Collet type – spindle 2	DIN collet
C axis – spindle 1	0.001 °
C axis – spindle 2	0.001 °
Turret	
Number	1
Number of stations – turret 1	8
Turning tool cross section	□ 20 mm
Sleeve diameter	Ø 25 mm
Rotary tools	
Number of rotary tools	max. 8
Rotary tool speed	5,000 rpm
Max. drilling diameter	Ø 10 mm
Max. front tapping diameter	M8 x 1.25
Rapid feed rate	
X1 axis	20 m/min
X2 axis	20 m/min
B axis	20 m/min
Motor Output	
Main spindle	5.5/7.5 kW
Back spindle	3.7/5.5 kW
Rotary tools	1.0/2.8 kW
Weight	2,800 kg
Volume of tank	
Coolant tank	165 l
NC Specification	
Control type	Fanuc 0i-TD
Screen	8.4 inch color liquid crystal display (LCD)
Controllable axes	X1, Z1 (BNA-C), -X1, Z1, Z2 (BNA-S), X1, Z1, Y, X2, Z2 (BNA-DHY)
Auxiliary axes	C3, T1
Input	ISO
Tool compensation	80 pairs
Memory capacity	1 Mbyte (2560 m)
Interpolation	G01, G02, G03
Thread cutting cycle	G32, G92
Fixed cycles	G90, G92, G94
Input/output interface	PC card
NC standard functions	
Corner chamfering / rounding function, tool nose R compensation, Constant cutting speed control (G70-G76), Synchronous tapping, Drilling cycle (G80-G86), Tool life monitoring,	

BNA 42 MSY

Sets the new standard in bar machining.

We proudly introduce: Model BNA-42MSY – CNC turning center with 2 spindles and 1 turret. The turret features a Y axis and half-indexing, expanding the machining possibilities. The machine is equipped with the largest spindle motor in the series, enabling powerful cutting. The X2 axis at the back spindle allows for the simultaneous machining at the front and back of the workpiece. This model combines the advantages of a double turret machine and the lower purchase price of a machine with just one turret. The unique control improves productivity and cycle times.

Advantages

Maximum rigidity and stability for powerful cutting.

Cycle time shortened by superimposition control.

Substantial reduction in non-cutting time.

Easy to use tooling system.

Convenient operation.

3.46 m²

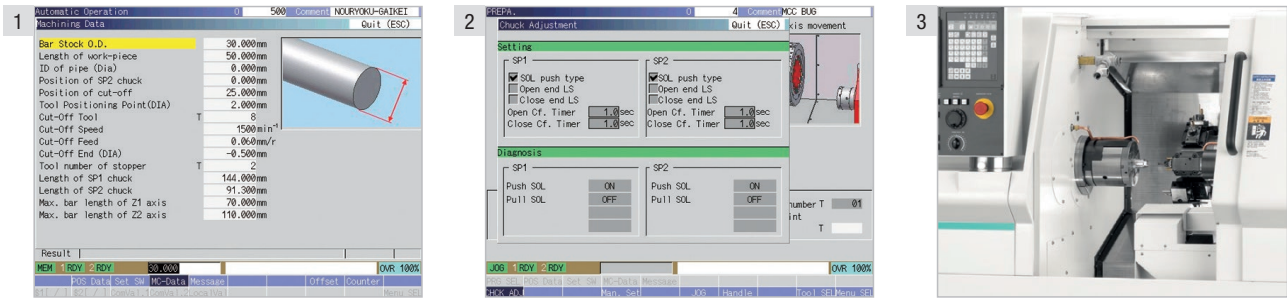


Workpiece example

Name Thread attachment
Material Steel



Standard



- 1 Machining data: All you have to do is enter machining length, chucking length etc. – the escape and approach positions are then automatically calculated in an instant. This effectively helps to avoid interference and shorten setup times.
- 2 HMI (Human Machine Interface) is adapted: Graphics displayed for each item and screens that display all necessary information in one place greatly improve operating convenience.
- 3 The BNA series is praised for its compactness and user-friendliness. The machine also offers a generous opening into the machining area from the top where the door extends beyond the spindle. In this way, coolant may not drop on the hands of the operator when the operation is temporarily interrupted to remove the finished parts close to the spindle.

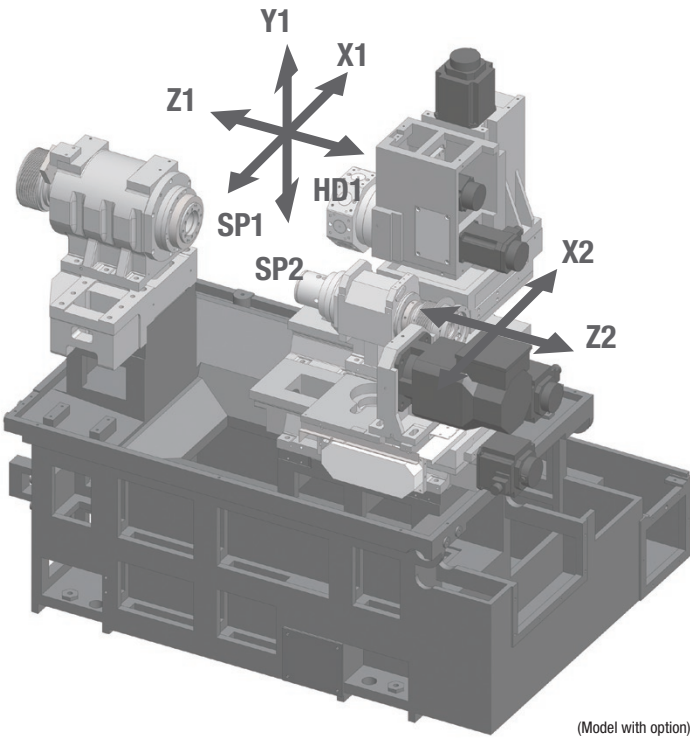
Options



- 1 Chip conveyor
- 2 Barfeeder

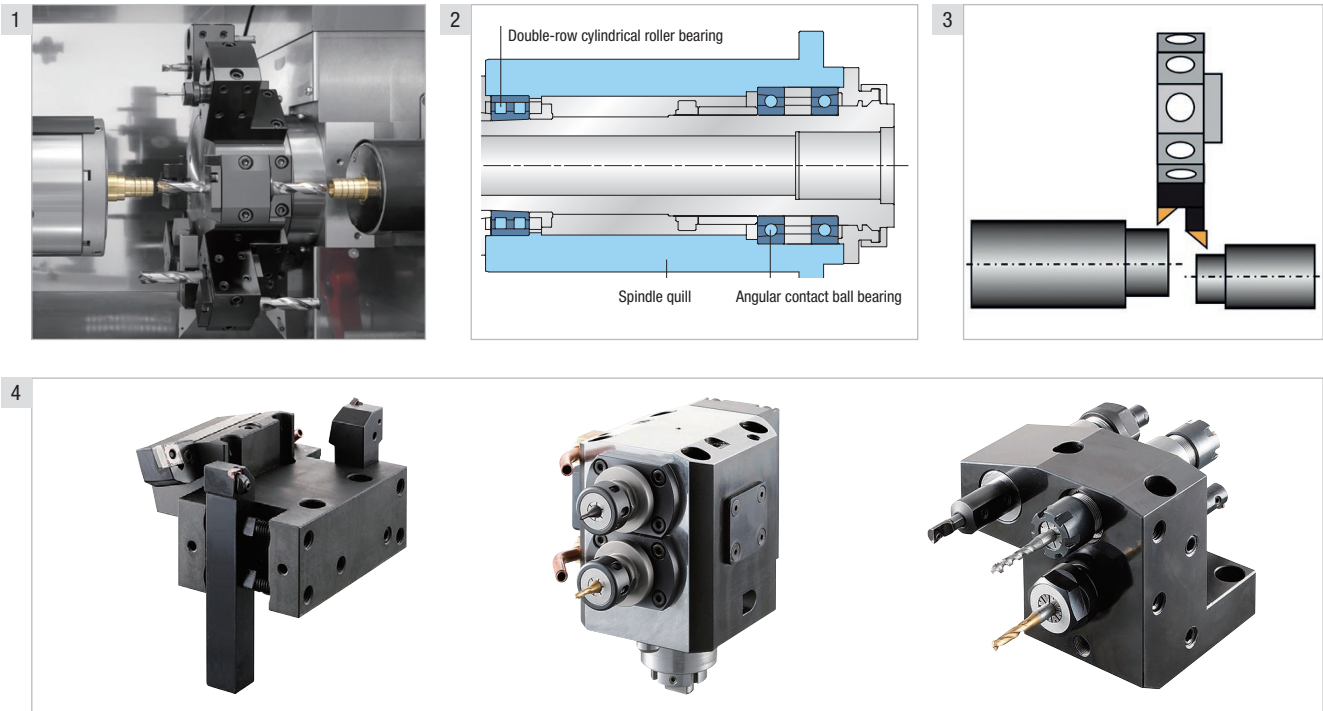
Kinematics

High-rigidity scraped slideways are used on all axes. These slideways with face contacts have exceptional rigidity and damping characteristics, achieve powerful cutting, and help to prolong cutting tool life.

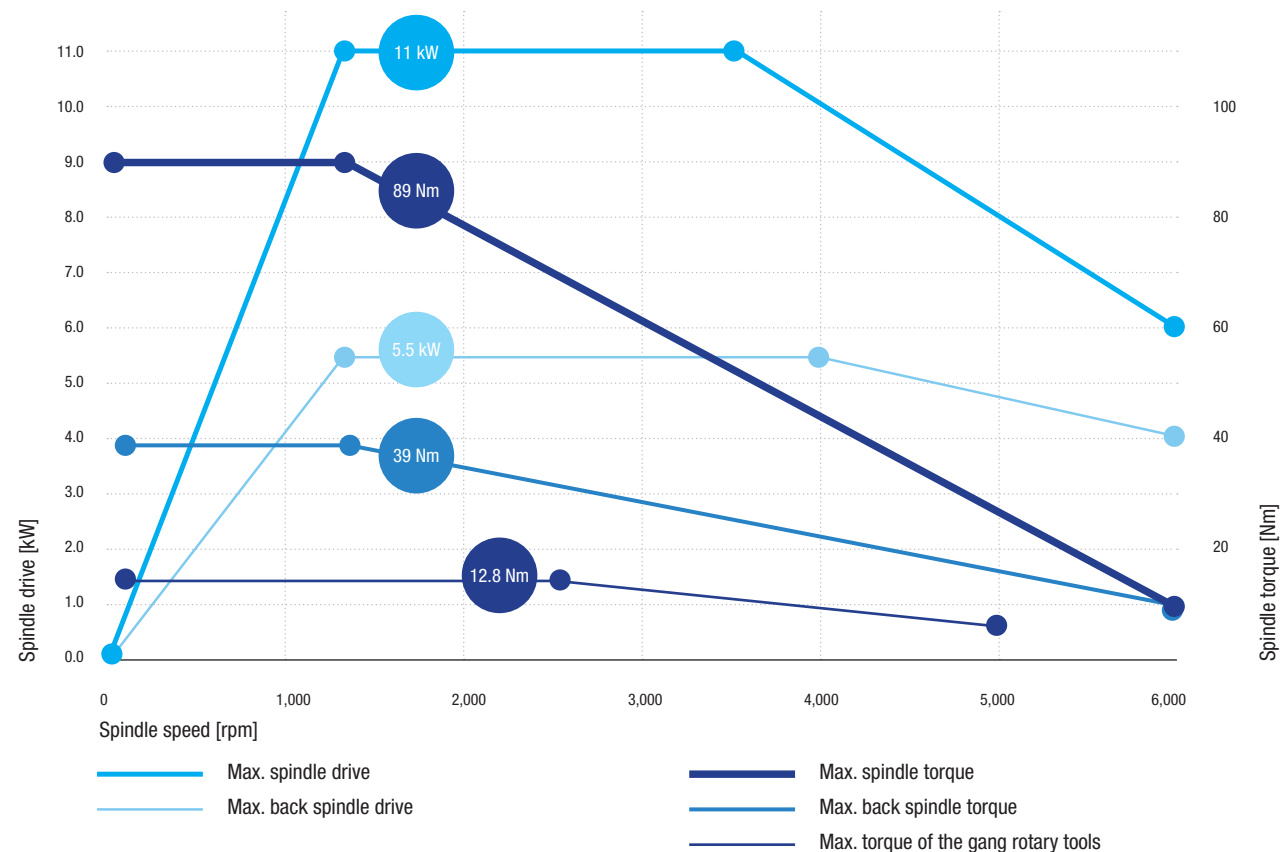


Working area

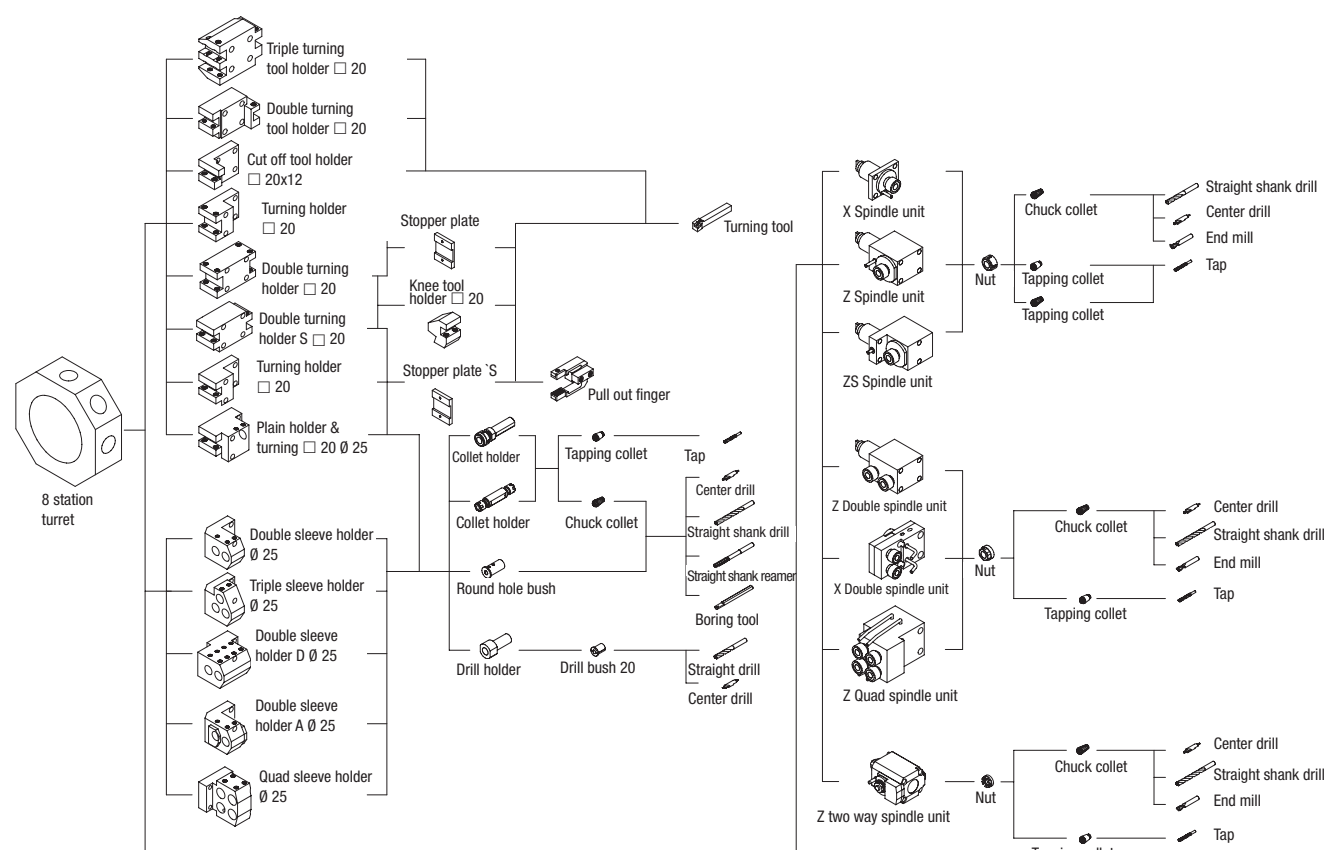
- 1 Superimposition control: A turret with X, Y and Z axis (HD1) and a back spindle with X and Z axis (SP2) open up the possibility of machining by superimposition control, where the back spindle synchronizes with the turret to machine a workpiece in the main spindle (SP1), a very effective way to shorten cycle time.
- 2 Cross section of spindle
- 3 Simultaneous machining with superimposition control: With its double spindle/one turret design, the BNA 42MSY2 is able to machine simultaneously by superimposition control which had not been possible with models BNS34 / 42S so far. This innovative feature significantly reduces cycle times. This innovation drastically shortens cycle times. The turret incorporates X, Y and Z axis and an X and Z axis at the back spindle (SP2) – a constellation for the efficient machining of complex shapes.
- 4 Easy to use tooling system



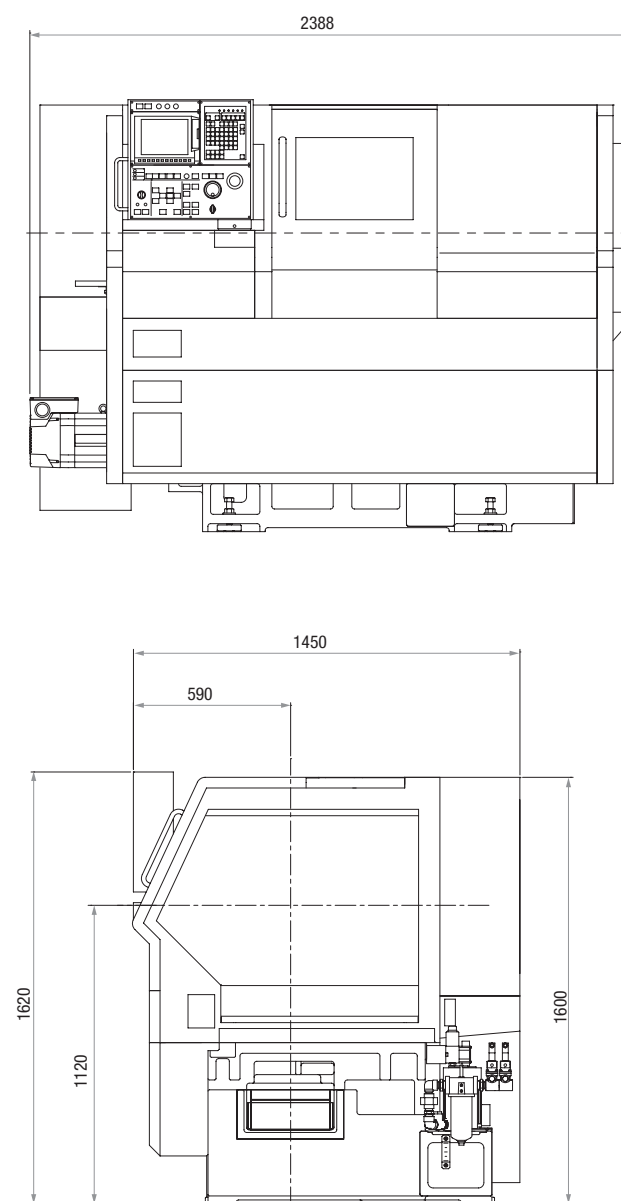
Performance diagram



Tooling System



Floor plan



Machine specification

Item	BNA-42MSY2	
Machining capacity		
Maximum machining length		100 mm
Max. machining diameter	SP1	Ø 42 mm
	SP2	Ø 34 mm
Axis strokes		
X1 axis		140 mm
Z1 axis		235 mm
Y1 axis		70 (+/-35 mm)
X2 axis		129 mm
Z2 axis		360 mm
Spindle		
Number of spindles		2
Spindle through-hole diameter		Ø 43 mm
Inner diameter of draw tube	SP1	Ø 43 mm
	SP2	Ø 30 mm
Speed	SP1	6,000 rpm
	SP2	5,000 rpm
Type of collet chuck	SP1	DIN collet
	SP2	DIN collet
C axis	SP1	0.001 °
	SP2	0.001 °
Turret		
Number		1
Number of stations		8
Turning tool cross section		□ 20 mm
Sleeve diameter		Ø 25 mm
Rotary tools		
Number of rotary tools		max. 8
Rotary tool speed		6,000 rpm
Max. drilling diameter		Ø 10 mm
Max. front tapping diameter		M8 x 1.25
Rapid feed rate		
X1 axis		20 m/min
X2 axis		20 m/min
Y1 axis		12 m/min
Y2 axis		12 m/min
Z2 axis		20 m/min
Motor Output		
Main spindle		7.5/11 kW
Back spindle		3.7/5.5 kW
Rotary tools		1.0 kW
Weight		3,000 kg
Volume of tank		
Coolant tank		165 l
NC Specification		
Control type	MITSUBISHI M730VS	
Screen	8.4 inch color liquid crystal display (LCD)	
Controllable axes	X1, Z1, Y1, C1, X2, Z2, C2 axis	
Auxiliary axes	C3, T1 axis	
Input	ISO	
Tool compensation	80 pairs	
Memory capacity	160 m	
Standard function		
Program check function using program wheel; MDI function; Cycle time display; Part counter; Automatic start position return; Automatic cut-off machining function; Tool set function; Superimposed function; special macros; Background program input; 2-line programming; Programming support functions; calculator function; M and G code display; Constant surface speed control; cut-off confirmation; Corner chamfering / rounding function; Tool nose R compensation; Thread chasing cycle; Synchronous thread cutting; Spindle synchronizing control function; custom macro; multiple cycle repetition; drilling cycle; milling interpolation		

BNA 42 SY/CY

Two BNA Series models with improved basic functions.

Type SY with improved performance as a bar-material processing machine.

Type CY may also be used as a chucker machine.

Advantages

Program storage capacity addition.

High-rigidity spindle.

SY: Front and back machining.

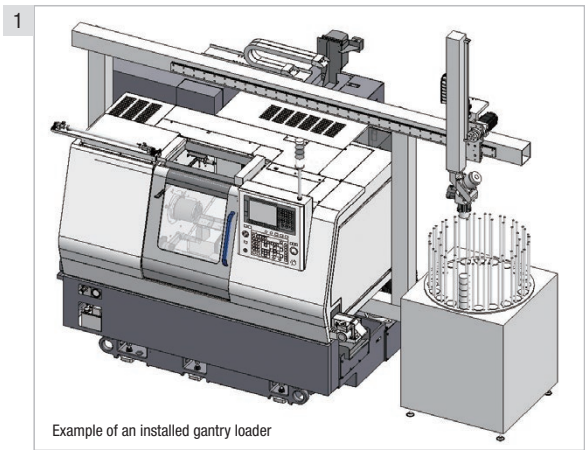
SY: Equipped with a 12 station turret and one Y axis.

SY: Short-term increase in rated power of the main spindle.

3.35 m²

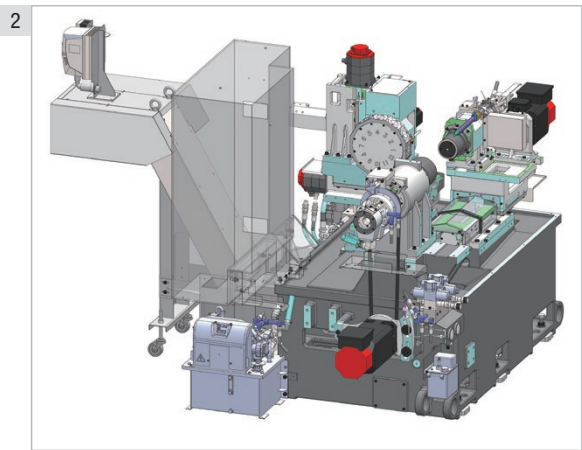


Standard



1 **CY – Gantry loader:** Foot mounts for the gantry loader are provided as standard. An automatic shutter that secures space for the loader hand to enter the machine (above the spindle) has been adopted. Installation of gantry loaders manufactured by third parties is now supported

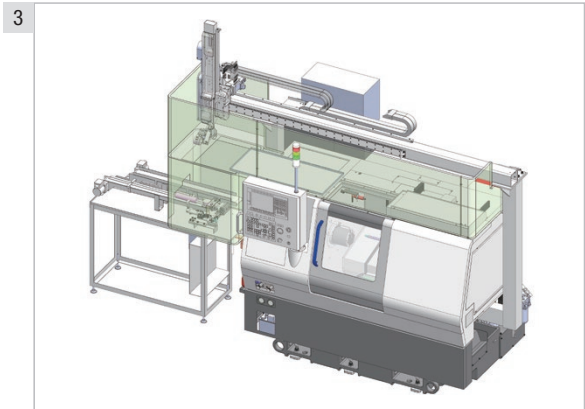
2 **SY – Foot mounts for the gantry loader**



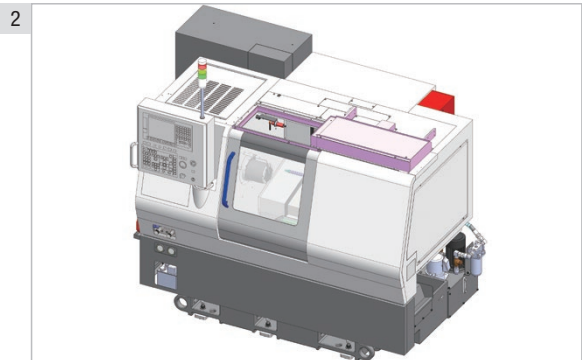
Further (SY only):

- Spindle synchronizing control function
- Rigid tapping function
- Superimposition control

Options

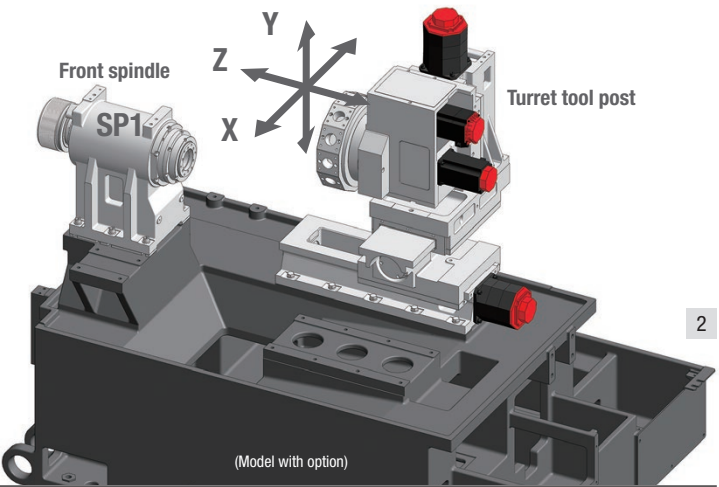
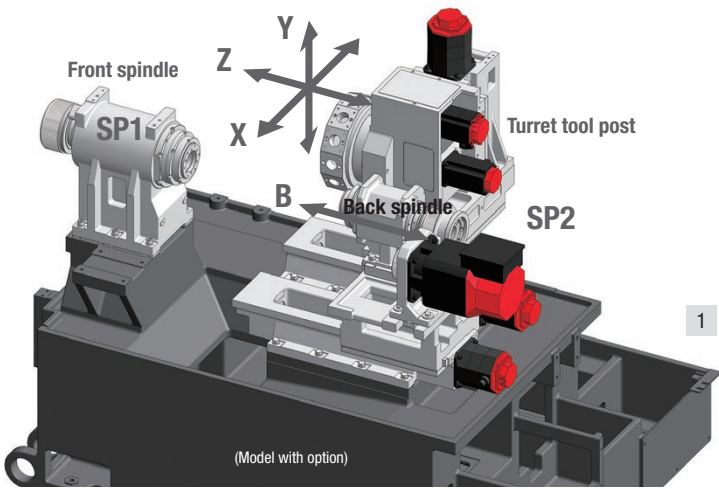


- 1 The chip conveyor allows for rear discharge in addition to the current side discharge. This increases the options for the installation method used.
- 2 Automatic shutter (SY)
- 3 Gantry loader
- 4 Barfeeder

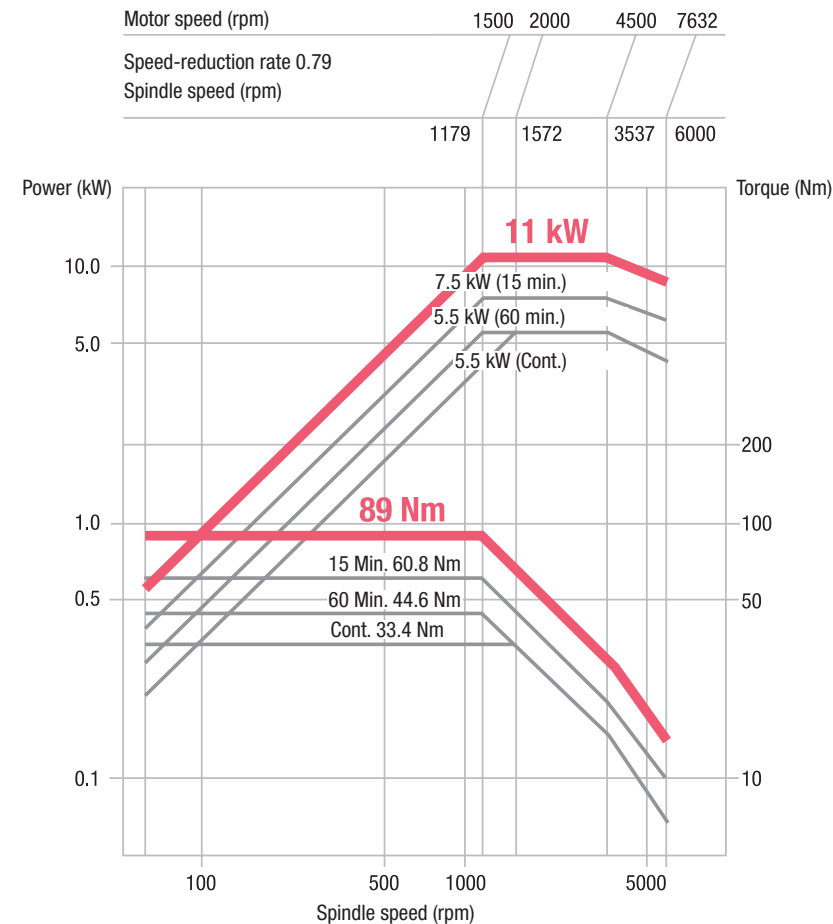


Kinematics

- 1 **SY:** The newly designed base increases the weight of the unit while also improving rigidity. Rectangular lapped slides have been adapted for all slides. The sliding contact between surfaces provides excellent rigidity and damping performance, as well as strong cutting performance, while also helping to extend the service life of cutting tools. Additionally, the Z-stroke travel distance has been increased to 50 mm to expand the range of machining available.
- 2 **CY:** The newly designed base increases the weight of the unit while also improving rigidity. Combining with a tailstock (option), enables use of long workpieces. Mounting eyes for the legs of the gantry loader are provided on the left and right side faces of the bed. You can select whether the chip conveyor discharges to the right or the rear.

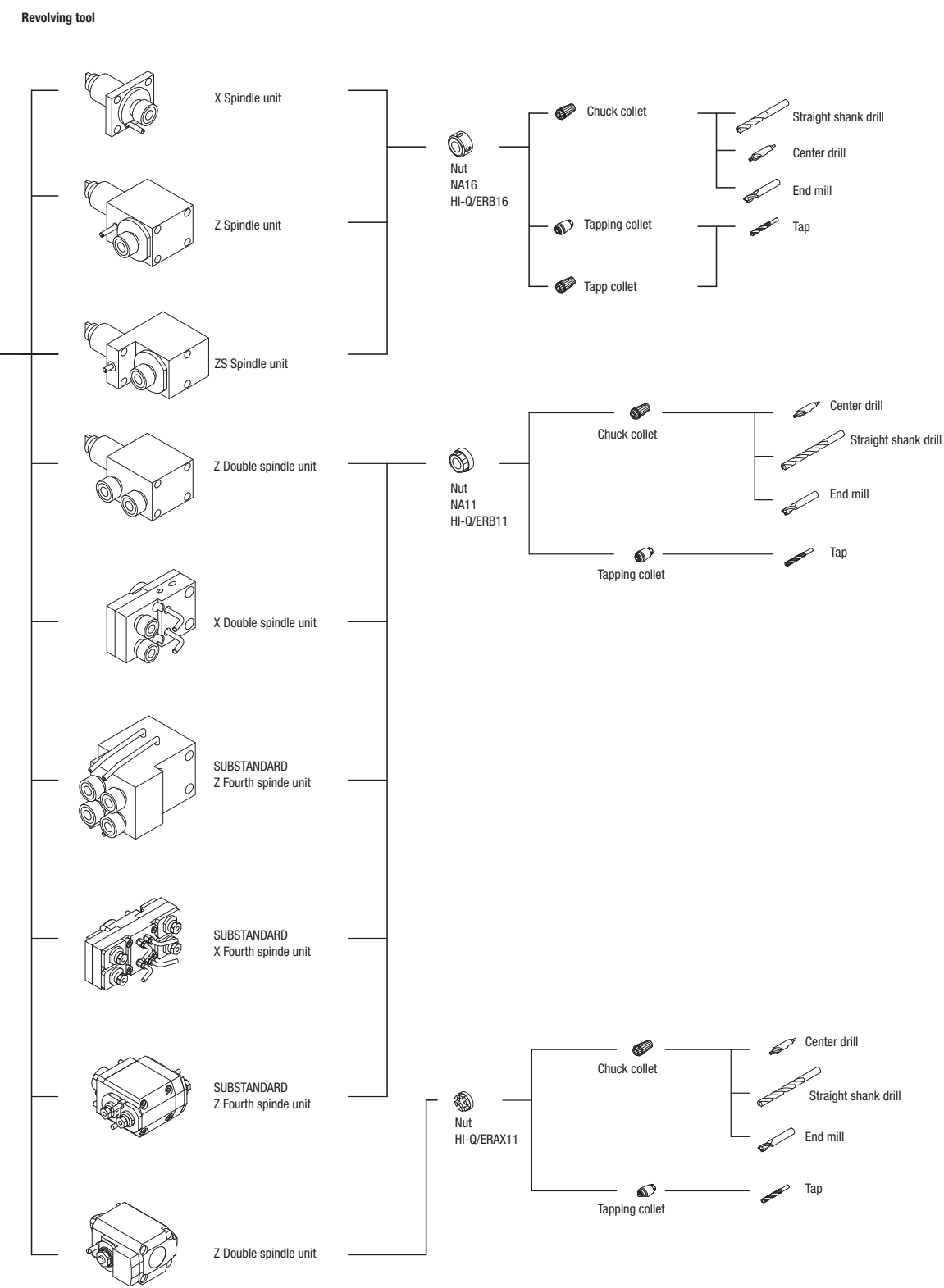
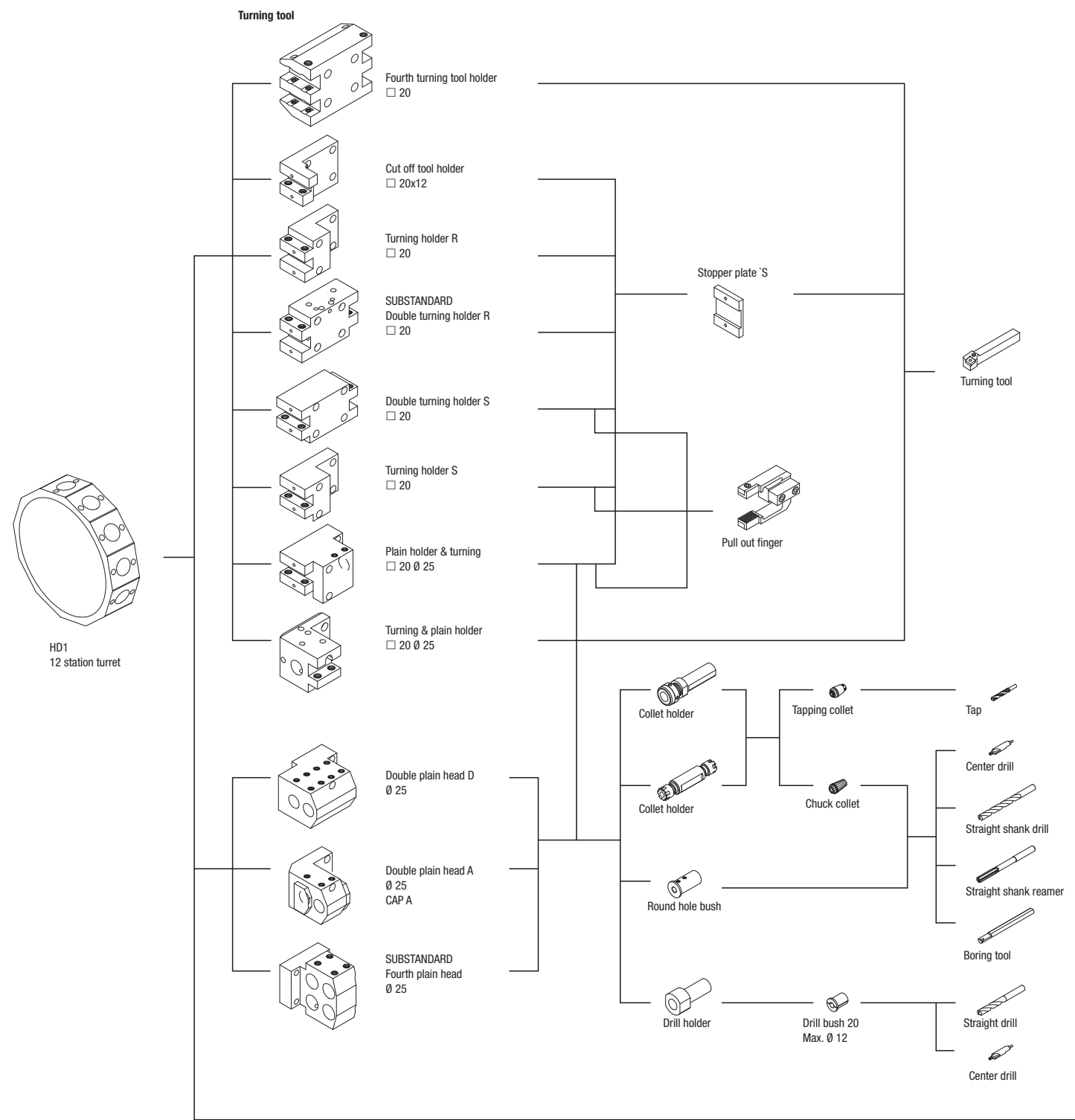


Performance diagram

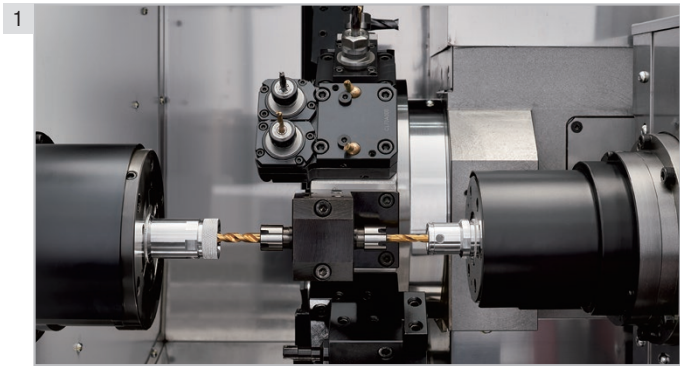


Short-term increase in rated power of the front spindle
Power is increased up to 11 kW during spindle acceleration and deceleration to help reduce the cycle time.

Tooling System

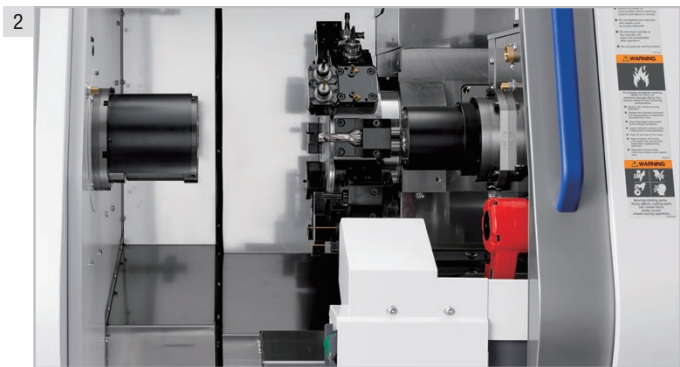


Working area



1 Simultaneous machining using both left and right-side spindles enables the turret tool post and front spindle to perform machining while the back spindle follows after to perform superimposed and similar types of machining, thereby further reducing the processing time.

(Image: SY type)



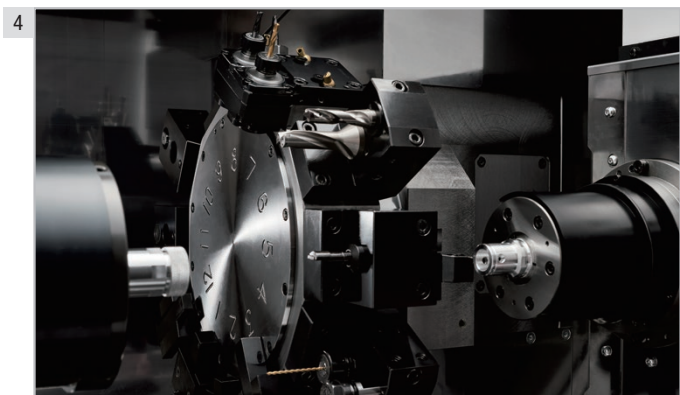
2 A surface plate structure, a tradition of the Miyano brand, has been carried over for the bed, an essential element for machining, while both size and weight have been increased in order to improve damping performance. Additionally, the coolant tank capacity has been increased to improve thermal stability. Rigidity of the entire turret tool post has been increased, and equipping with a Y axis enables the use of 12 stations. The number of installed tools has also been increased.

(Image: SY type)



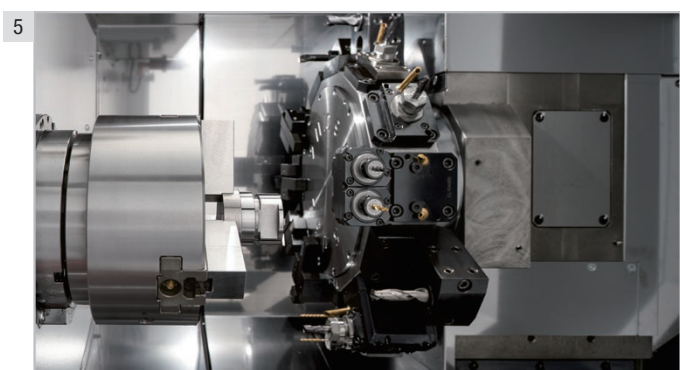
3 The cover has been completely redesigned to improve workability. The opening has been enlarged for easier access and provided with a large window to improve visibility. The port through which chips fall has been enlarged and the removal port has been moved closer to the outer edge of the cover to make it easier to clean away chips. These new NC units are standard-equipped with a dual-check safety function to improve safety and productivity.

(Image: CY type)



4 The SY type has a dual-spindle/single turret tool post mechanical configuration, and the base and turret rigidity has been increased to improve basic functions. The turret tool post has been equipped with a Y axis to expand the number of installed tools to 12 stations in order to provide the use of a rich assortment of tools, as well as simultaneous left/right machining for superimposed machining and similar processes. The tool holder and rotary tools are the same used for the current BNA Series and the program compatibility is also ensured.

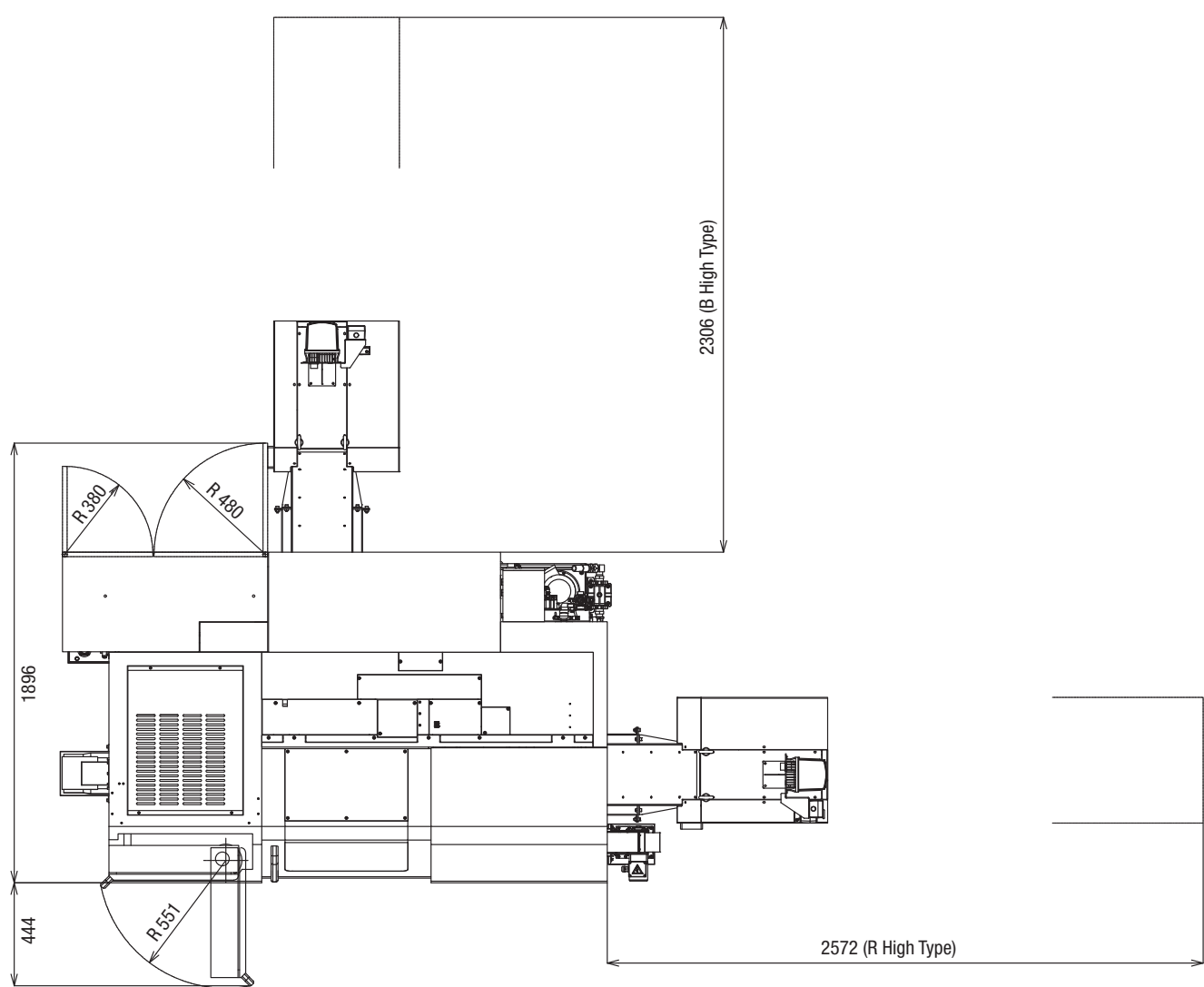
(Image: SY type)



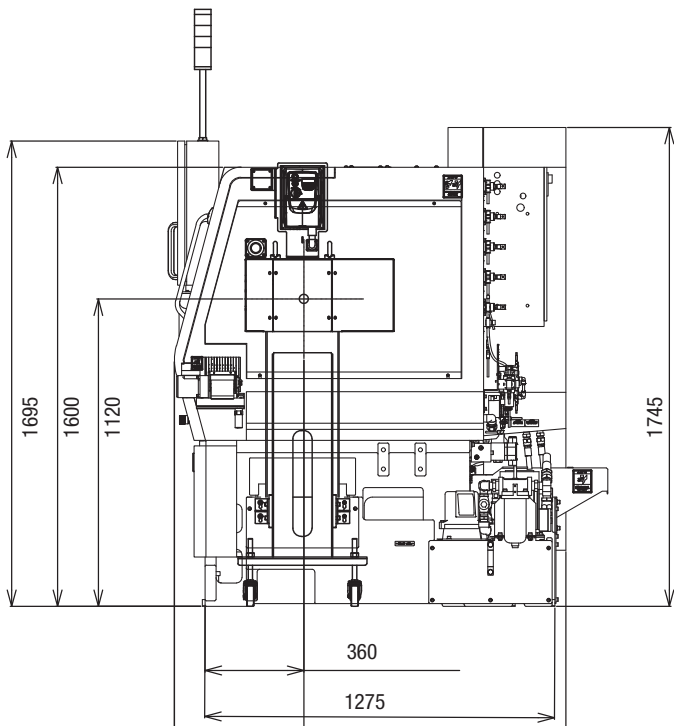
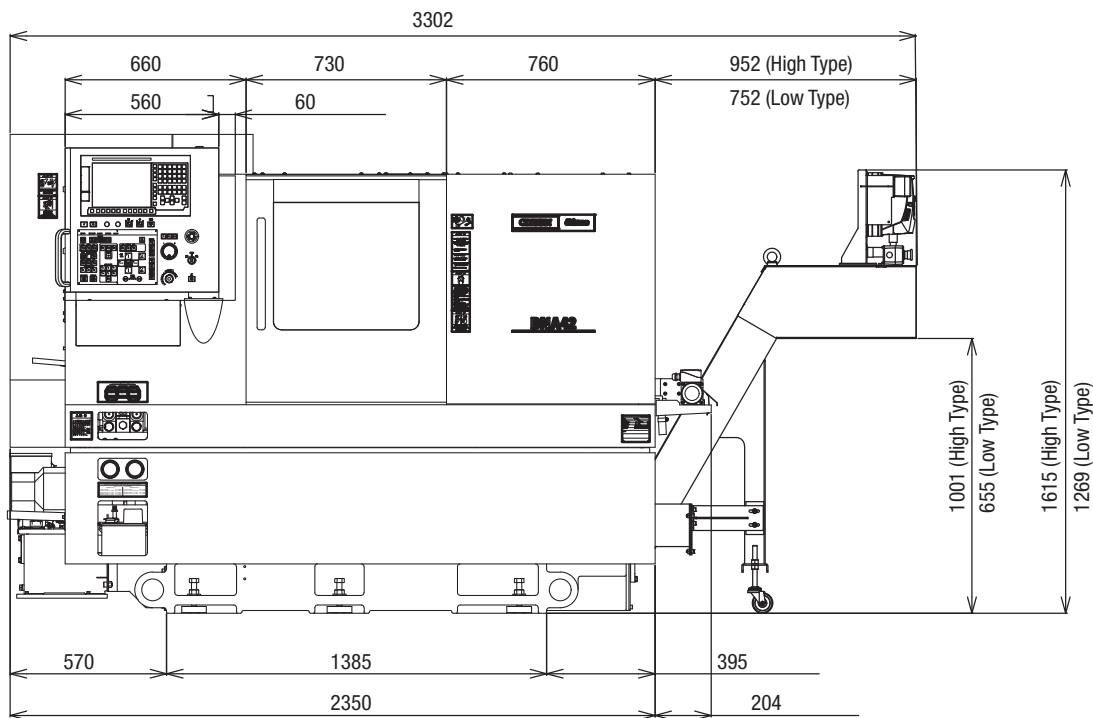
5 The CY type was developed under the concept of "Bar and Chucker". The simple structure of one spindle for one turret tool post can not only perform bar material machining, but you can also combine options such as power chucks or a chip conveyor with rear discharge together with supply/discharge units, such as a gantry loader manufactured by another company, in order to incorporate the CY type into a production line as a chucker machine.

(Image: CY type)

Floor plan



Floor plan



Machine specification

Item		BNA-42CY5	BNA-42SY5
Machining capacity			
Maximum machining length		200 mm	100 mm
Standard machining diameter (Chuck diameter)	SP1	Ø 42 mm	
	SP2	–	Ø 34 mm
Travel distance			
Turret slide stroke	X axis	140 mm	
	Z axis	285 mm	
	Y axis	70 (+/-35) mm	
Slide stroke, back spindle	B axis	–	360 mm
Spindles			
Number of spindles		1	2
Spindle speed	SP1	60–6,000 rpm	50–5,000 rpm
	SP2		
Draw tube through-hole diameter	SP1	Ø 43 mm	Ø 30 mm
	SP2		
Collet Chuck	SP1	Hardinge S20, DIN173E, Hainbuch	
	SP2	–	JPN, DIN171E, DIN173E
Power chuck type	SP1	5" and 6" hollow chucks	5" hollow chuck
	SP2	–	4" hollow chuck
Tool post			
Number of tool posts		1	
Type of tool post		12 st.	
Opposite side distance of tool post		300 mm	
Max. turning radius of tool post		Ø 505 mm	
Tool size		□ 20 mm	
Dimensions of tool post holes		Ø 25 mm	
Rotary tools			
Number of rotary tools		Max.12	
Type of rotary tool drive		Independent clutch drive	
Rotating speed of rotary tools		50–5,000 rpm	
Machining capacity	Drill Tap	Max. Ø 10 mm	
		Max. M6 x 1	
(Limited to spiral and point taps for M8 x 1.25)			
Max. M8 x 1.25 for BSBM			
Feed rate			
Rapid feed rate	X axis	20 m/min	
	Z axis	20 m/min	
	Y axis	12 m/min	
	B axis	–	20 m/min
Slide thrust	X axis	5 kN	
	Z axis	5 kN	
	Y axis	6.7 kN	
	B axis	–	5 kN
Tailstock	Max. travel distance	200 mm	
	Morse taper size	MT2	
	Max. slide thrust	4.3 kN (at 34 bar)	
	Min. slide thrust	0.57 kN (at 4.5 bar)	
	Drive method	Hydraulic	
Motors			
Spindle motor	SP1	5.5/7.5/11 kW	
	SP2	3.7/ 5.5 kW	
Motor for rotary tools		1.0/2.8 kW	
Coolant pump motor		0.25 kW	
High-pressure coolant motor		0.75/1.1 kW (60/50 Hz)	
Power supply			
Voltage		AC 200/220 +5%/-10%, 50/60 Hz ±1%	
Capacity		16 KVA	26 KVA
Air supply		5 bar	
Fuse capacity on facilities side		75 A	100 A
Tank capacity			
Hydraulic tank capacity		18 l	
Lubrication oil tank capacity		2 l	
Coolant tank capacity		225 l	
Machine dimensions			
Machine height		1,745 mm	
Required floor space		W 2,260 x D 1,433 mm	W 2,350 x D 1,433 mm
Machine weight		3,430 kg	3,880 kg

NC unit		BNA-42CY5	BNA-42SY5
Control unit		FS.0i-TF PLUS	
Control axis	HD1	X1, Z1, Y1, C1, E1 (turret)	X1, Z1, Y1, C1, E1 (turret), A1 (rotary tools); In superimposition mode: X1, Z1, Y1, C1, E1 (turret), A1 (rotary tools)
Absolute position encoder of the feed axis	HD2	– X, Z1, Y1	In superimposition mode: Z2, C2, X1, Z1, Y1, B
Min. set unit		0.001 mm / 0.001°	
Interpolation functions			
Positioner		G00	
Linear interpolation		G01	
Cylindrical interpolation		G02, G03 (multiple quadrants available)	
Dwell		G04	
Thread cutting		G32	
Multiple threading		G33	
Feed function			
Rapid feed override		0 – 100% (10% increments)	
Cutting feed rate override		0 – 150% (10% increments)	
Feed per revolution and feed per minute		G98/G99	
Manual handle feeding		x1, x10, x100	
Reference point return		G28	
Reference point return check		G27	
2nd reference point return		G30 or G30P2	
Program input function			
Tape code		EIA/ISO auto-detection	
Absolute commands		X, Z, Y, C	X, Z, Y, C, B
Incremental commands		U, W, V, H	
Programmable data input		G10	
Coordinate system settings		G50	
Workpiece coordinate system		G54 to G59	
Program storage and editing			
Program storage capacity		512 KB	1 Mbyte (two systems in total)
Number of registered programs		400	800 (two systems in total)
Spindle and supplementary functions			
Spindle function		S4 digit	
Supplementary functions		M3digit	
Constant surface speed control		G96	
Tool and tool compensation functions			
Tool functions		T ○ ○ △ △ (○ ○ = Tool selection and shape compensation, △ △ = Wear compensation)	
Nose radius compensation		G40, G41, G42	
Operating functions			
Optional stop		M01	
Jog feeding		0 – 1,260 mm/min	
Input/Output interface			
PC card slot and USB memory slot			
Automatic operation			
One-cycle/Continuous operation, single block, block delete, machine lock			
Optional block skip, dry run, feed-hold, optional stop			
Others			
10.4" color LCD, supporting multiple languages, decimal-point input, Manual pulse generator, Memory protection, AC digital servos, etc.			
NC standard functions			
Chamfering/corner R, background editing, operating time/number of parts display			
Canned composite cycles (G70 to G76), spindle synchronization function (SY only)			
Spindle rigid tapping (Main and sub (SY only))			
Cylindrical interpolation, custom macro B, canned drilling cycles (G80 to G86)			
Tool service life management, superimposition control function (SY only)			

LX
08
C

Powerful and highly rigid.

Citizen presents: An 8-inch chucking machine especially designed to comply with the basic performance required of machine tools following careful analysis. The rigid turret uses precision scraped square guideways providing excellent vibration damping characteristics, the rigid spindle is supported by double-row cylindrical roller bearings and angular contact ball bearings, and the heavy 30° slanted bed is in a platform-like surface table where the turret and the spindle are mounted. The high levels of basic performance accomplished give consistently high machining accuracy.

Advantages

Outstanding thermal stability thanks to smooth chip flow.

Minimum dimensional changes.

High rigidity, slanted bed and turret with 10 stations for powerful machining.

Convenient and simple operation.

Machining accuracy in hard turning.

3.66 m²



Machining examples

Examples of circular and free-form surface machining

Internal turning
(thread cutting, stepped internal turning)

Spherical and free-form surface turning

Taper turning

Grooving and width setting turning

External + Face turning

Standard

1

NO.	CURRENT	PRESET	X-WEAR	Z-WEAR
001	500	1200	0.000	0.000
002	300	950	0.000	0.000
003	0	0	0.000	0.000
004	0	0	0.000	0.000
005	500	500	0.000	0.000
006	0	0	0.000	0.000
007	500	000	0.000	0.000
008	500	000	0.000	0.000
009	500	1000	0.000	0.000
010	0	0	0.000	0.000

MEM ***** 11:15:14

M SEARCH RESET *INPUT INPUT

- 1 **Tool counter**
Used to set and reset the tool counter stop value and enter the tool wear offsets.

Options

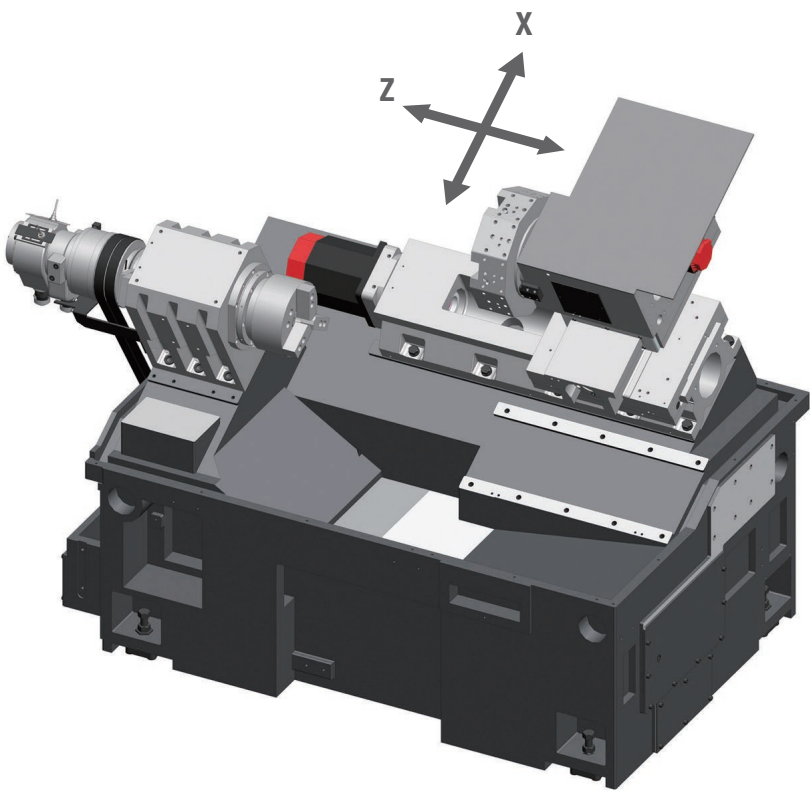
1

2

- 1 **Option device**
Used to select an auxiliary device such as a part catcher to be operated manually.
- 2 **Chip conveyor**

Kinematics

100% flat faces to mount major machine units
The flat faces of the 30° slanted bed where major machine units such as spindles and tool slides are mounted assure rigidity by adopting the platform-like surface table.
This structure maintains stable flatness in the face of external and internal factors that work to impair machining accuracy, minimizing changes in relative dislocation between the workpiece and tool nose.



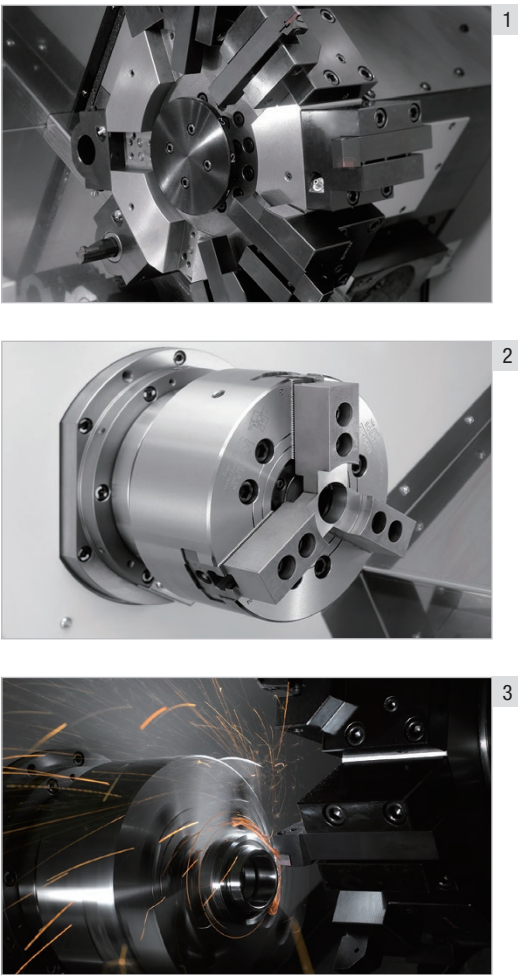
Working area

- 1 **Highly rigid turret**
For the turret, subject to cutting forces and vibration under severe conditions, precision scraped square guideways are used on all axes to increase rigidity and vibration damping characteristics.

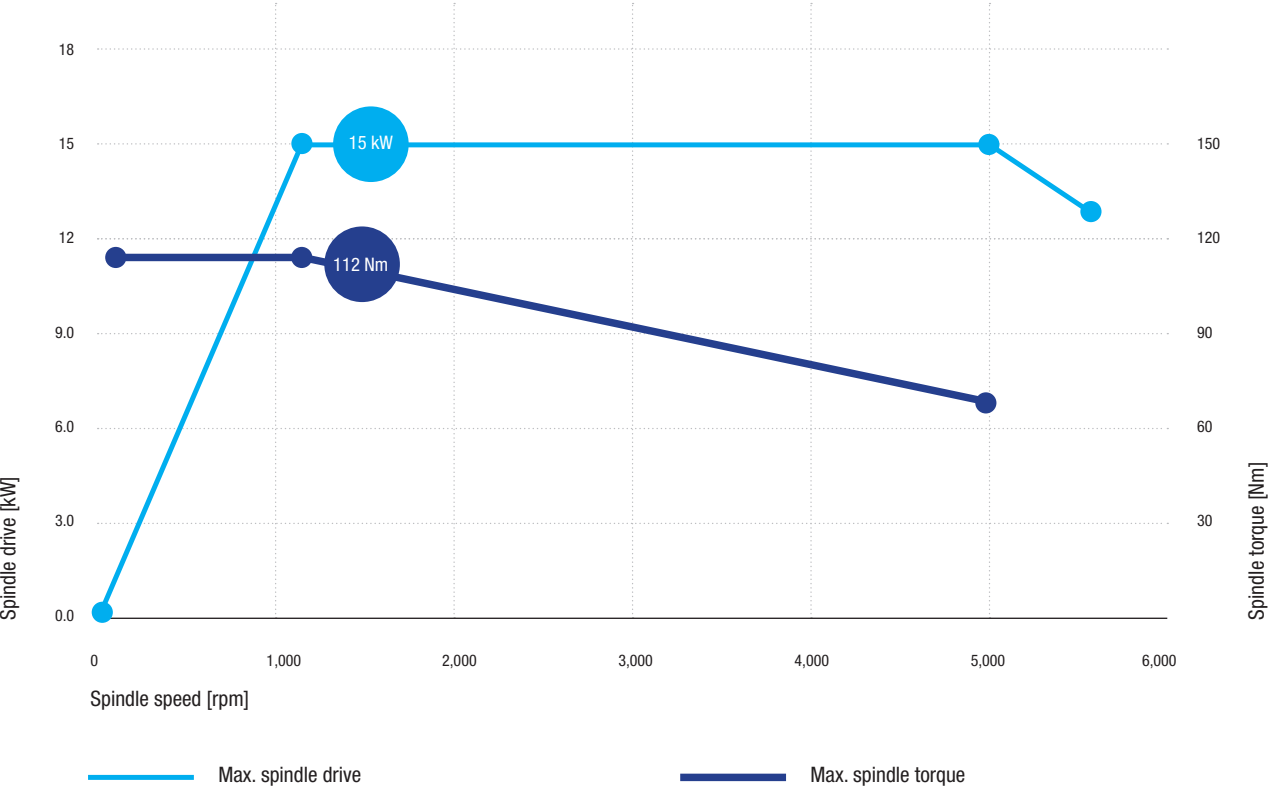
A two-piece curvic coupling is used to clamp the turret, prioritizing rigidity. This also realizes a compact mechanical structure.
- 2 **Rigid 8-inch spindle**
The spindles manufactured in the dedicated in-house production lines feature rigid double-row cylindrical roller bearings and angular contact ball bearings to support the spindle at the front and rear. By spacing them sufficiently far apart, the bearable moment load and straightness of the center of rotary axis are improved.
- 3 **Hard turning**
Hard turning is a kind of turning process for machining quenched materials on an NC lathe using CBN or ceramic tools.

Advantages of hard turning over grinding

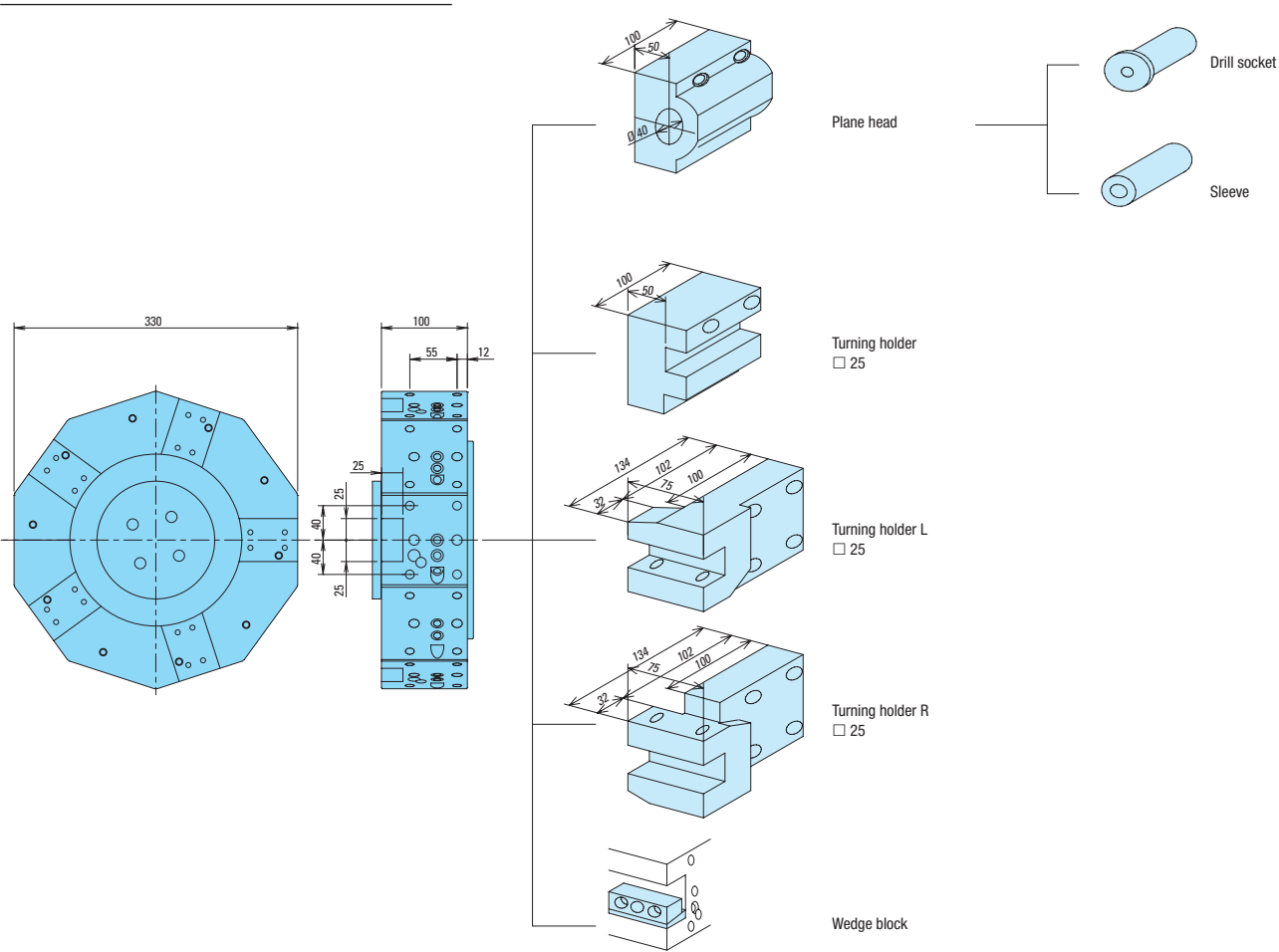
 - Initial investment cost (machine price) is low.
 - Several grinding processes can be integrated into turning processes performed on a single NC lathe.
 - Since all machining processes including outer and inner turning, circular machining and free-form surface machining can be performed in one chucking, geometrical accuracy, such as straightness, squareness and concentricity, is considerably improved.
 - Cycle time can be reduced thanks to short loading and unloading time.
 - Dry cutting is environmentally friendly – reduced use of coolant, and recovery of resources by recycling chips instead of disposing of the sludge generated in grinding.



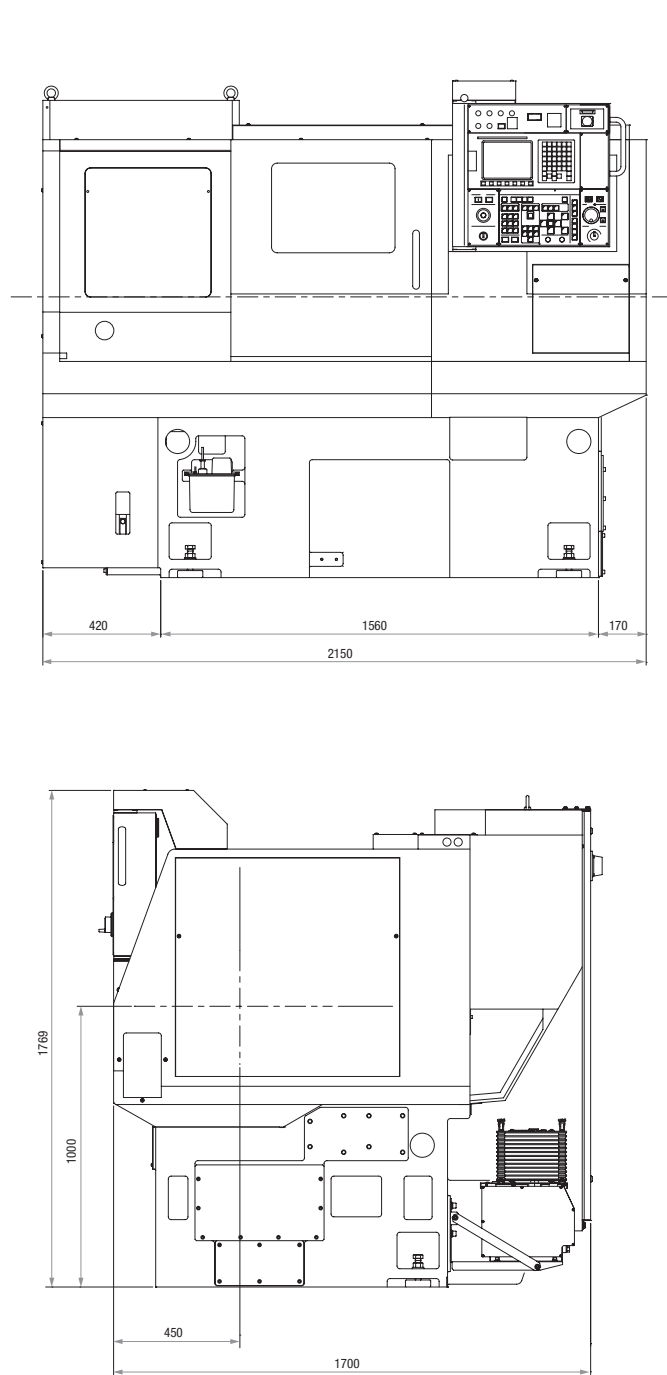
Performance diagram



Tooling System



Floor plan



Machine specification

Item	LX-08C
Machining capacity	
Maximum work length	320 mm
Max. machining diameter	Ø 210 mm
Spindle	
Number of spindles	1
Spindle speed range	40 – 4,000 rpm
Spindle draw tube dia.	Ø 52 mm
Chucking system	Hydraulic thru-hole chuck cylinder
Collet Chuck	Hardinge S22 with pad
Power chuck type	8" thru-hole power chuck
Tool slide	
Number of tool slide	1
Type of tool slide	10-station turret
Size of turning tools	□ 250 mm
Size of drill & boring tools	Ø 40 mm
Turret index time	0.26 sec./station-to-station.
Slide	
Slide stroke	X axis 175 mm
	Z axis 435 mm
Rapid feed rate	X axis 12 m/min
	Z axis 16 m/min
Tailstock (Option)	
Type of slide	Hydraulic
Max. slide travel	300 mm
Rotary center	MT4
Max. slide thrust	4.3 KN/34 bar
Min. slide thrust	0.36 KN/3 bar
Quill type	Hydraulic
Max. slide travel	Quill 90 mm + Manual 220 mm
Rotary center	MT4
Max. slide thrust	4.3 KN/34 bar
Min. slide thrust	0.36 KN/3 bar
Tank capacity	
Hydraulic oil tank capacity	10 l
Lubrication oil tank capacity	2 l
Coolant tank capacity	150 l
Machine dimensions	
Machine height	1,734 mm
Floor space	2,150 mm × 1,728 mm
Machine weight	4,500 kg
Motors	
Spindle drive	AC 7.5/11 kW
Coolant pump	AC 0.18 kW
Power supply	
Voltage	AC 200 V ± 10%, 50/60 Hz ± 1%
Power consumption	22 kVA
Air supply	5 bar (5 kgf/cm ²)
Fuse	100 A
NC Specifications	
FANUC Oi-TD	
Axial control	X, Z
Simultaneous control axis	2 axis (Positioning, Linear interpolation)
Minimum setting unit	0.001 mm
Minimum output unit	X : 0.0005 mm, Z: 0.001 mm
Interpolation functions	G00, G01, G02, G03
Interpolation functions	512 Kbyte (1280 m)
Spindle function	S4 digit direct spindle speed input (G97)
Feed	F3.4 digit feed per revolution, F6 digit feed per min.
Feed rate override	0 – 150 % (in 10 % increments)
Rapid traverse rate	X: 12 m/min, Z: 16 m/min
Interpolation functions	G01, G02, G03
Thread cutting	G32, G92
Canned cycle	G90, G92, G94
Tool function	T AABB (AA=Tool number and geometry, BB = Wear offset number)
Tool position direct input function	by measurement in MDI mode
Automatic operation	1 cycle/Automatic operation; Single block, Block delete, Machine lock, Optional block skip, Dry run, Feed hold
NC standard functions	
Circle radius command, Nose radius compensation, Constant surface speed control (G96), Background editing, Programmable data input (G10), Run hour/Parts count display, Multiple repetitive cycles (G70 – G76), Spindle rigid tapping, Polar coordinate interpolation, Custom macro B, Canned cycles for drilling (G80 – G86), Tool life management.	
Others	
8.4" color LCD/ MDI, Expanded program storage capacity: 400; Decimal point input, Manual pulse generator; Memory protection, Digital servo motor, etc.	

LZ 01 R/RV

Fast loading due to moving spindle and automation.

These are high-precision chucking machines equipped with a general-purpose in-machine loader head. The loading time is shortened substantially through coordinated operation of the loader head and spindle.

By constructing the turret with a single slide in the Y axis direction only (01RV), and by assigning the X axis and the Z axis that runs on a linear guide to the spindle, both rigidity and high-speed travel are achieved.

The enriched system configuration designed based on the loader head accommodates a wide range of automation needs.

Advantages

Roundness.

Dimensional accuracy.

Highly rigid turret & high-rigidity spindle.

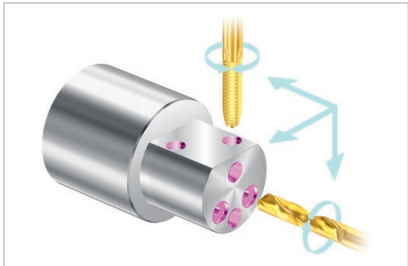
Machining of complex parts.

3.26 m²



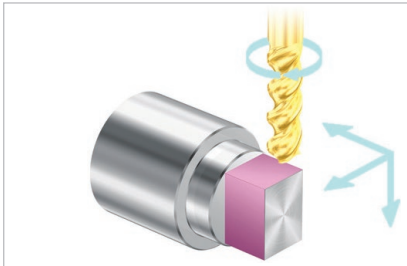
Machining examples

Basic complex machining



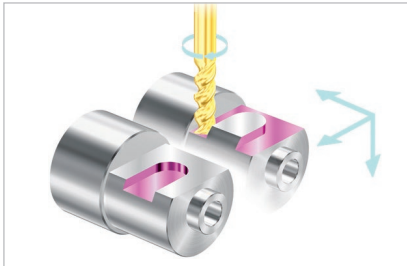
By using the Y-axis, the machining time for off-center drilling and off-center tapping can be shortened. The tapping accuracy with a rigid tap is also improved. (01RY)

High precision milling



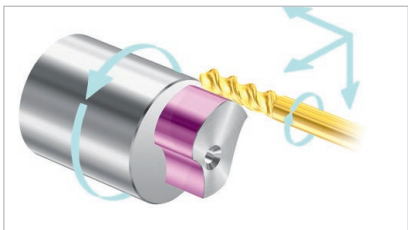
Accurate positioning by the C-axis and high precision combined machining by the Y-axis allow for a wider range of machining. (01RY)

Flat milling



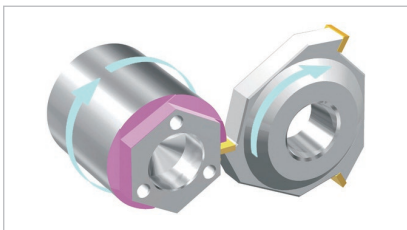
Separating the machining into rough cutting and finishing improves both the accuracy and the quality of the machined surface. (01RY)

Contouring



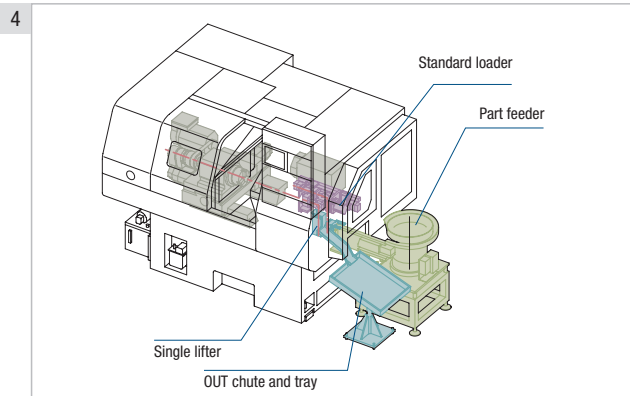
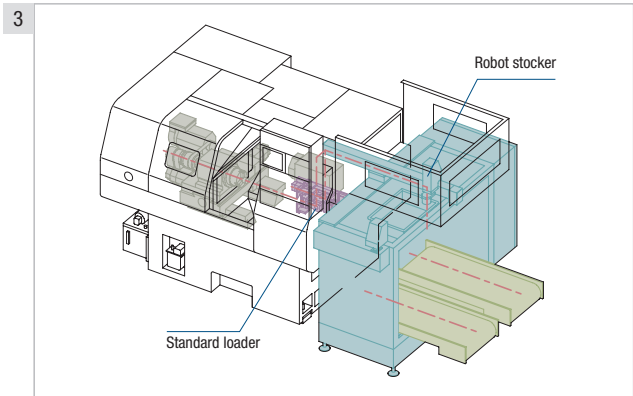
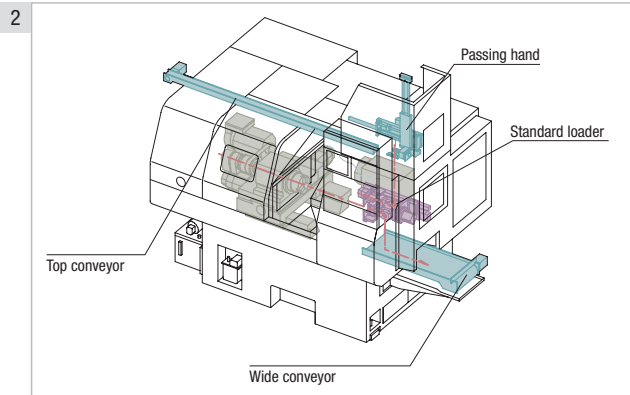
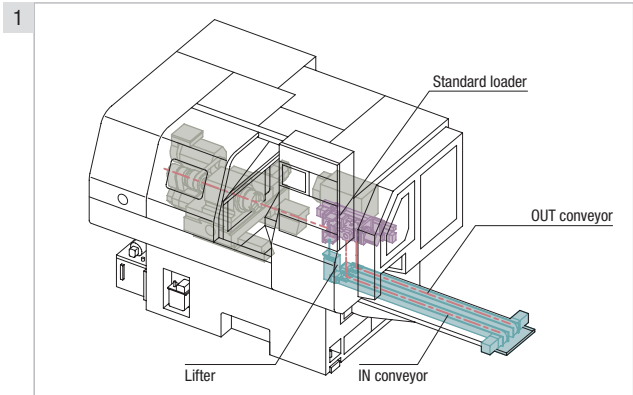
Simultaneous 2-axis control including the C axis in combination with the X, Z or Y axis can be used for contouring. (01RY)

Polygon machining



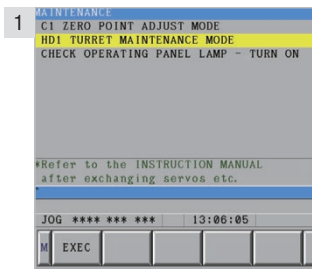
Synchronizing the revolving tool speed with the spindle speed at two times permits polygon machining, such as two-, four- and six-sided machining, with a polygon cutter.

Standard



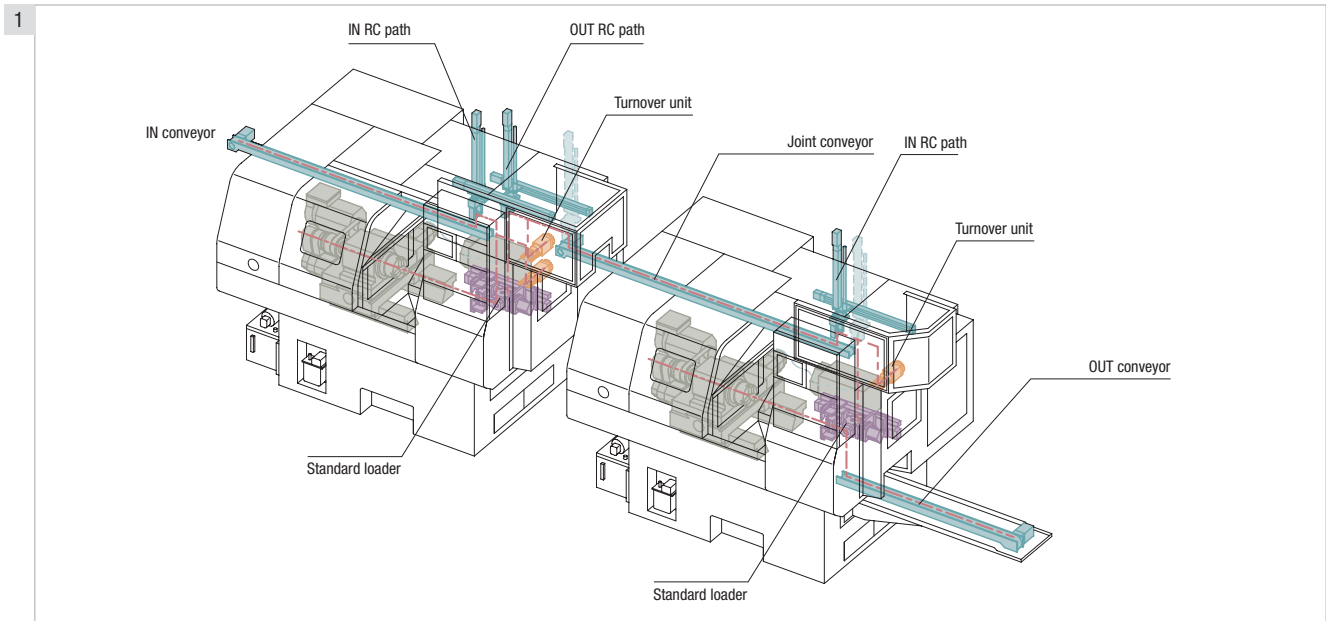
- 1 Conveyor system, bottom
- 2 Conveyor system, top (semi-standard)
- 3 Robot stocker system
- 4 System with part feeder underneath (semi-standard)

Standard



- 1 **Maintenance:** Used to set ON / OFF for the maintenance items. Used to set ON / OFF for turret zero point adjustment.
- 2 **Turret maintenance:** Used to adjust the turret zero point.

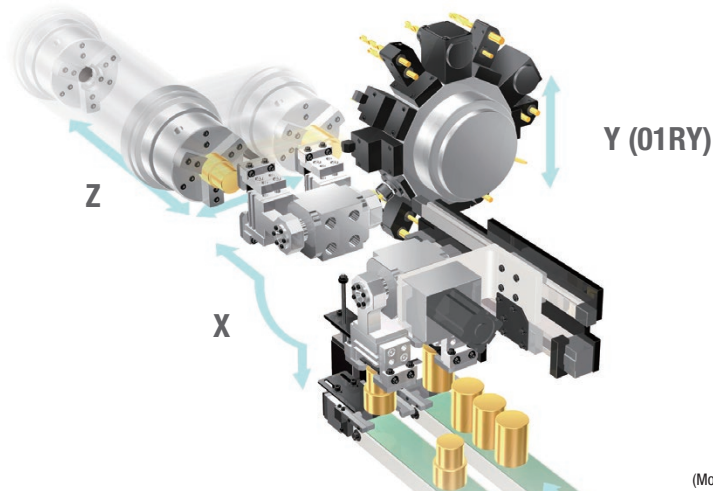
Options



- 1 Tandem configuration with two units connected in series

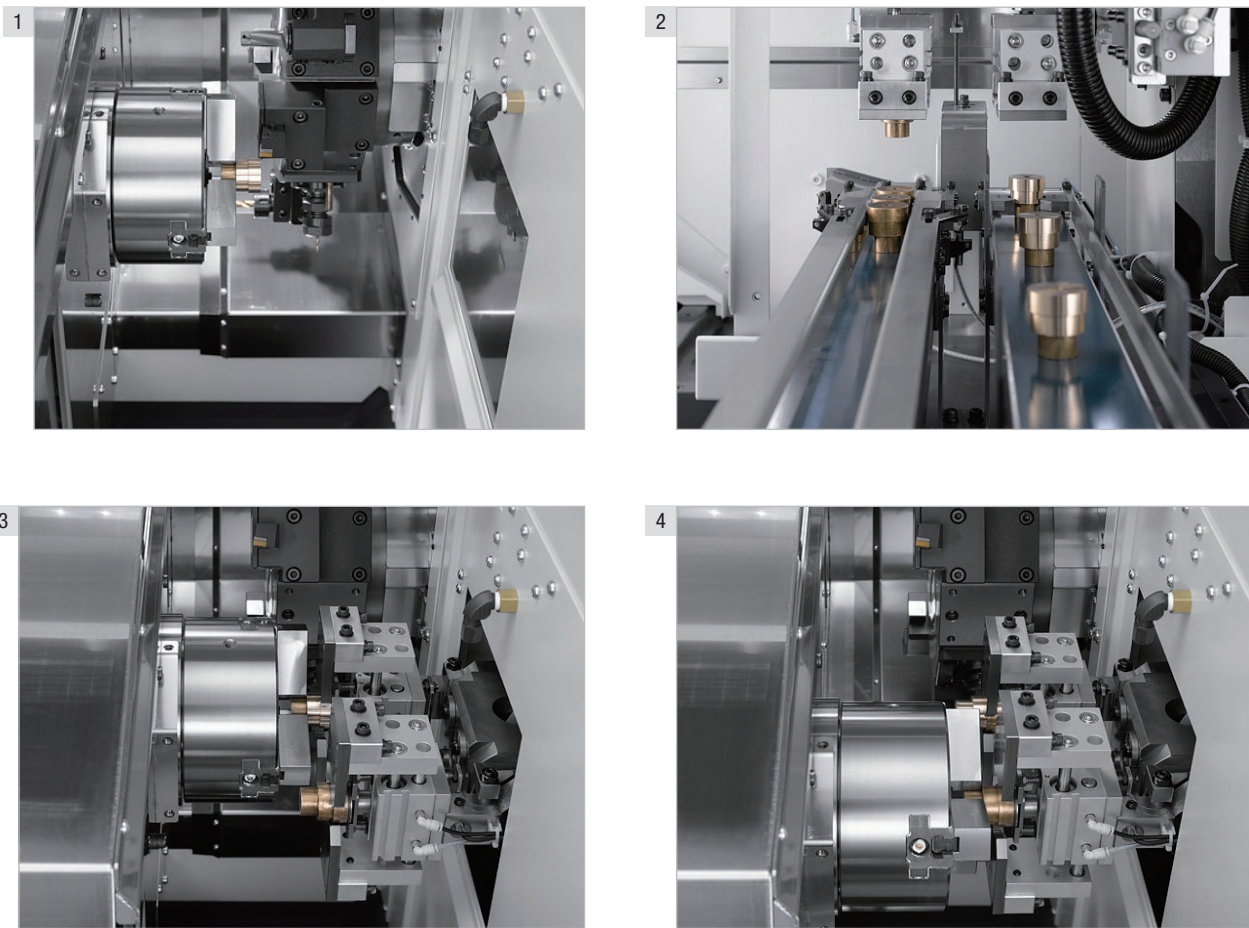
Kinematics

The loader head and spindle operate in coordination for loading/unloading, which means that the travel distance is reduced, and this helps to shorten machining time through high-speed loading with a loading time of 5.5 seconds.



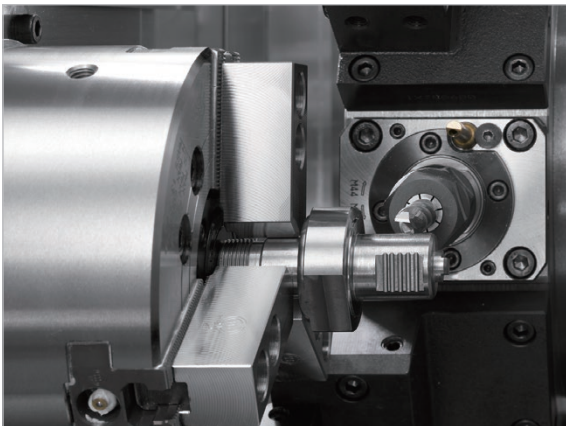
(Model with option)

Working area



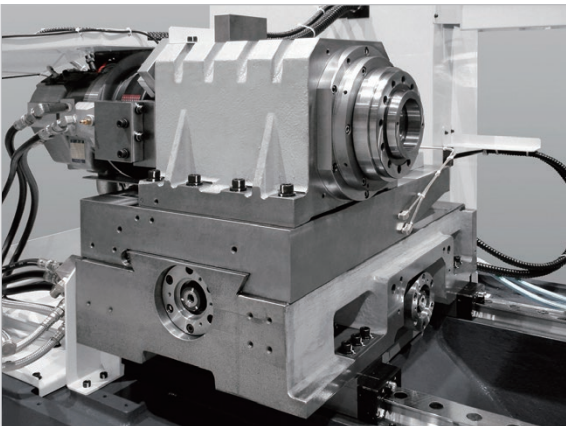
Loader cycle

- 1 In the tooling zone: machining of the workpiece is completed.
- 2 At the loader side: the IN hand grips a blank and carries it into the tooling zone.
- 3 The OUT hand receives the machined workpiece.
- 4 The spindle moves to the position of the IN hand and receives the blank from the IN hand.



Highly rigid turret

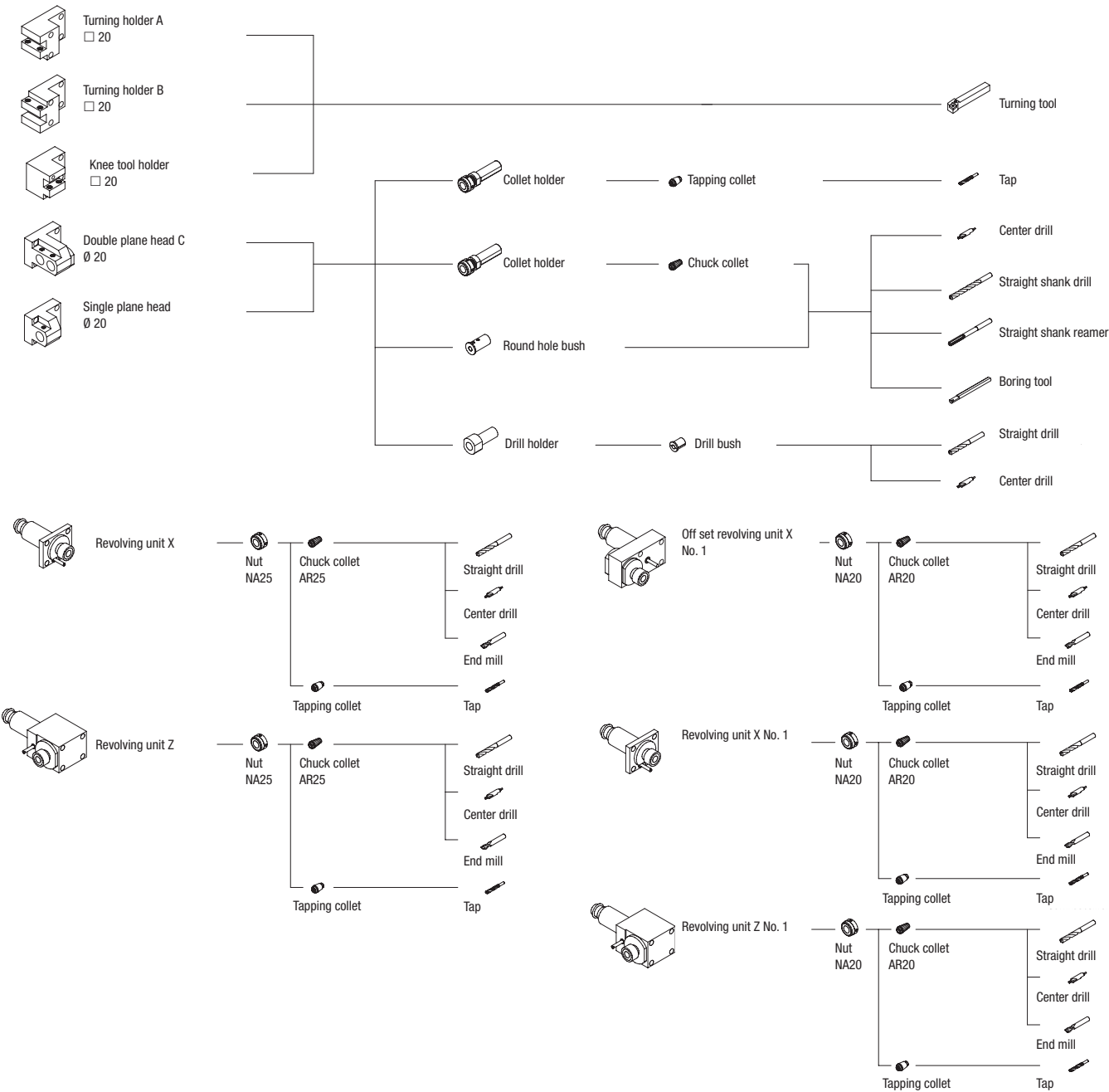
Combining an original double-column type Y-axis mechanism (01RY) with a turret slide on the Y-axis only instead of having X-axis and Z-axis slides enables high-precision machining in turning work.



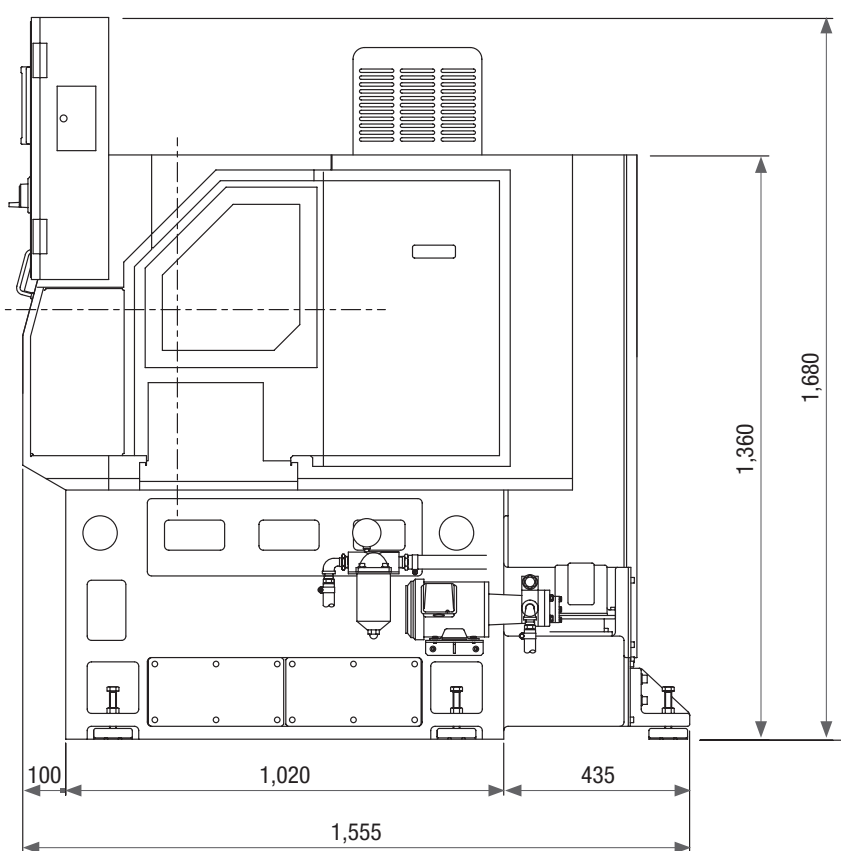
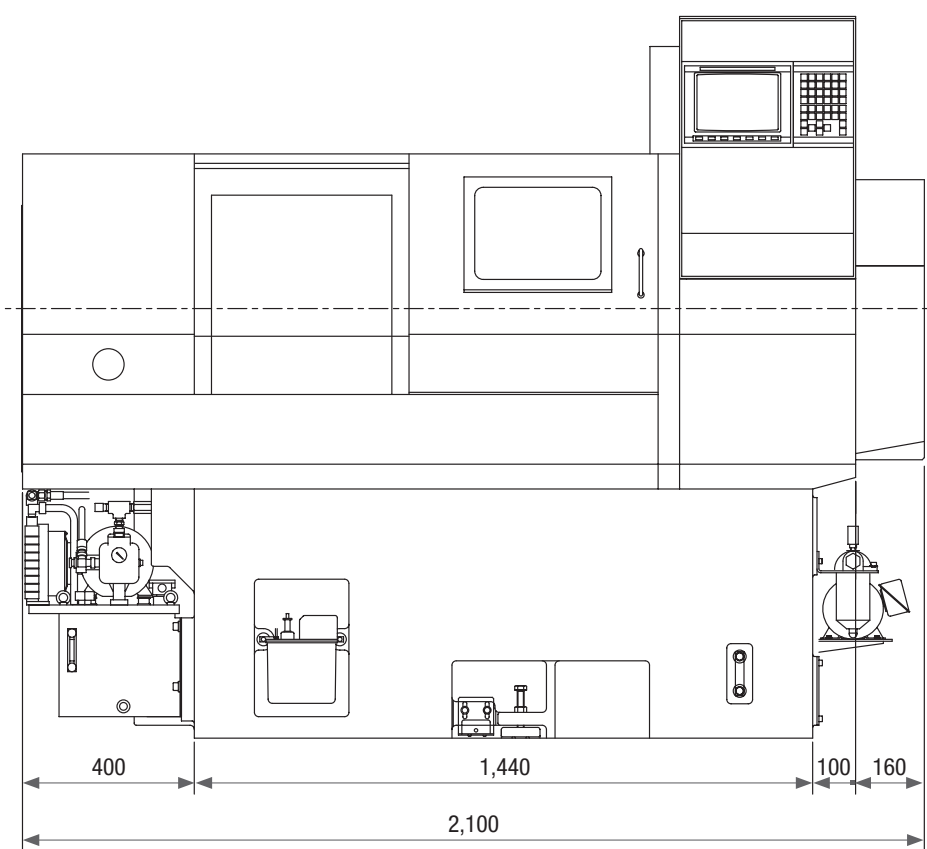
High-rigidity spindle and roller type linear guide

Adopting a linear guide for the Z-axis allows increased speed, with a rapid traverse rate of 24 m/ min. And because a roller type linear guide is used, the rigidity is equivalent to that of a square slide.

Tooling System



Floor plan



Machine specification

Item	LZ-01R2	LZ-01RY2
Machining capacity		
Maximum work length	80 mm	
Maximum blank diameter		
Power chuck type	Ø 70 mm	
Chuck collet	Ø 50 mm	
Spindle		
Number of spindles	1	
Spindle speed range	60 – 6,000 rpm	
Inner diameter of draw tube	Ø 32 mm	
Chuck system	Hydraulic cylinder	
Type of collet chuck	Spindle collet chuck	
Power chuck size and type	6" Hydraulic chuck	
Turret		
Number of turrets	1	
Turret stations	12	
Tool shank size	□ 20 mm	
I.D tool hole size	Ø 25 mm	
Index time	0.2 sec./1 pos.	
Slide		
Slide stroke	X axis	245 mm
	Z axis	240 mm
	Y axis	– ±35 mm
Rapid feed rate	X axis	20 m/min
	Z axis	24 m/min
	Y axis	– 12.5 m/min
Turning tool		
Number of rotary tools	max. 6	
Spindle speed range	100 – 4,000 rpm	
Machining capacity	Drilling	max. Ø 13 mm
	Tapping	max. M8 x 1.25
Tank capacity		
Hydraulic tank capacity	17 l	
Lubricating tank capacity	2 l	
Coolant tank capacity	140 l	
Machine dimensions		
Machine height	1,680 mm	
Floor space	2,100 mm x 1,555 mm	
Machine weight	3,600 kg	4,000 kg
Motors		
Spindle motor (50 % ED/Cont.)	5.5/7.5 kW	
Rotary tool motor	2.5 kW	
Power supply		
Voltage	AC 200 V ± 10 %, 50/1 Hz ± 1 HZ	
Power consumption	19 KVA	20 KVA
Air supply	5 bar (5 kgf/cm²)	
Fuse	75 A	
Loader specification		
Hands type	Double gripper	
Max. work size	Ø 70 x 80 mm	
Min. work size	Ø 10 x 10 mm	
Max. work weight	0.7 kg x 2	
Servicing time	6.0 sec	
Control & driving method	PMC & air operating	

NC specifications	FANUC Oi-TD
Controlled axis	LZ-01R2: X, Z, C, A (Option) LZ-01RY2: X, Z, Y, C, A
Number of simultaneous control axes	4 axes
Min. input increment	0.001 mm / 0.001 °
Min. output resolution	X-axis: 0.0005 mm, Z axis: 0.001 mm
Program storage capacity	512 kB (1280 m)
Spindle function	4-digit S word (G97), Constant surface speed control (G96)
Feed rate	F3.4 mm/rev, F6 mm/min
Feed rate override	0 – 150 % (in 10 % increments)
Interpolation functions	G00, G01, G02, G03
Thread cutting	G32, G92
Canned cycles	G90, G92, G94
Tool function	Taabb (aa=Tool number and geometry, bb=Wear offset number)
Tool position direct input function	by measurement in MDI mode
Input/Output interface	Memory card, USB
Automatic operation	1 cycle/Automatic operation; Single block, Block delete, Machine lock, Optional block skip, Dry run. Feed hold
Others	8.4" color LCD/ MDI, Expanded program storage capacity: 400; Decimal point input, Manual pulse generator; Memory protection Circle radius command, Nose radius compensation, Constant surface speed control (G96), Background editing, Programmable data input (G10), Run hour/Parts count display, Polar coordinate interpolation, Multiple repetitive cycles (G70-G76), Spindle rigid tapping, Cylindrical interpolation, Custom macro B, Canned cycles for drilling (G80-G86), Tool life management
NC standard functions	
NC option	Helical interpolation function

VC 03

This space-saving high-precision lathe is perfect for micro-processing.

This machine was specially designed for high precision machining and is often used by watch manufacturers. Clock screws and other microparts in 0.1 mm range are the core competence of the VC 03. In combination with the "machine construction for high accuracy" inherited from the GN series, this opens up new possibilities in machining technology.

Advantages

High-precision turning machine.

Variety of machinable geometries.

Machine construction for high precision.

Compact footprint.

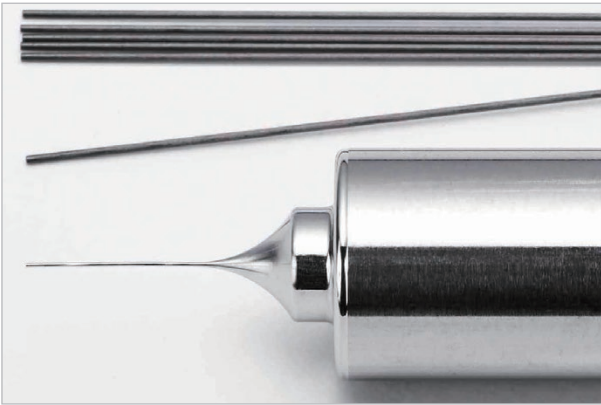
2.11 m²



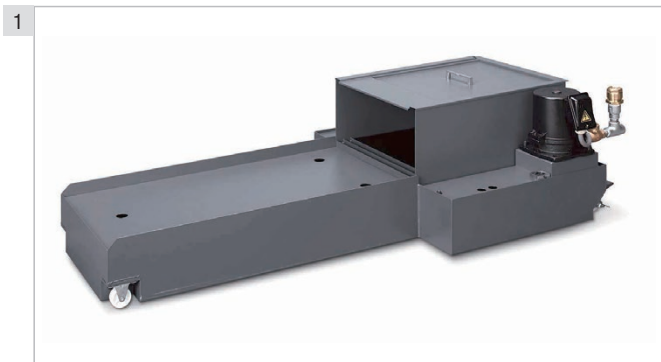
Workpiece example

Name Example workpiece
Material Steel

Micromachining compared to a pencil mine
(Diameter = 0.2 mm)



Standard



- 1 Separately installed coolant tank
- 2 Collet chuck (pull type)
- 3 Power chuck
- 4 Collet chuck (fixed type)
- 5 Diaphragm chuck
- 6 Fine precision chuck

Features



Options



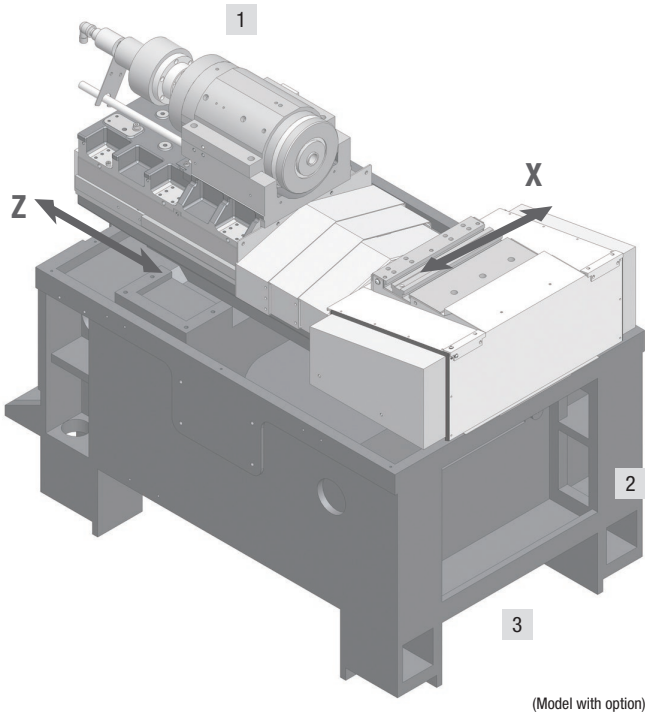
- 1 Gantry loader
- 2 Pallet conveyor
- 3 Rotary stocker

What is more...
LFV technology as an option



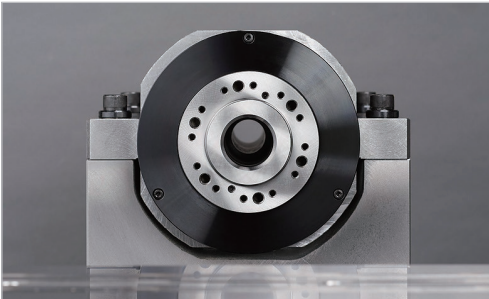
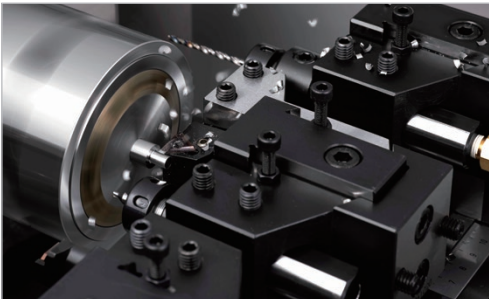
Kinematics

- 1 Wing type headstock**
The spindle section is constructed such that only the "wing" parts make contact with the slides and the central part of the sleeve is suspended, so spindle heat generation is uniform and heat is not easily transmitted to the headstock.
- 2 Base with thermally symmetric design**
A base that is a monobloc casting with a left/right symmetrical construction has the advantage that heat transfer is also symmetrical at left and right, which cancels out the effects that the machine's heat generation has on machining.
- 3 Separately installed coolant tank**
The coolant tank has been made a separable type to restrict the thermal effects of chips and coolant that have absorbed cutting heat and installed between the machine legs separately from the machine



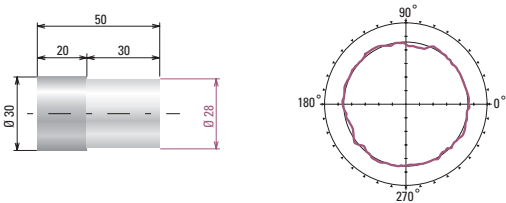
Working area

- 1** The basic concept in designing the machine is preventing thermal displacement over time and the heat of machining being transferred to the body of the machine. This is achieved by a frame and bed with a thermally symmetric design, backed up by a wing-type headstock and a separately-installed coolant tank. Built-in motor with a forced cooling function gives smooth rotation with low vibration thanks to beltless drive, and this construction ensures outstanding shape accuracy. The incorporation of a high-speed gantry loader with a service time of 3.5 seconds and peripheral devices such as an IN/OUT stocker allows a whole range of automation needs to be accommodated.
- 2 Wing type headstock**
The spindle section is constructed such that only the "wing" parts make contact with the slides and the central part of the sleeve is suspended, so spindle heat generation is uniform and heat is not easily transmitted to the headstock.

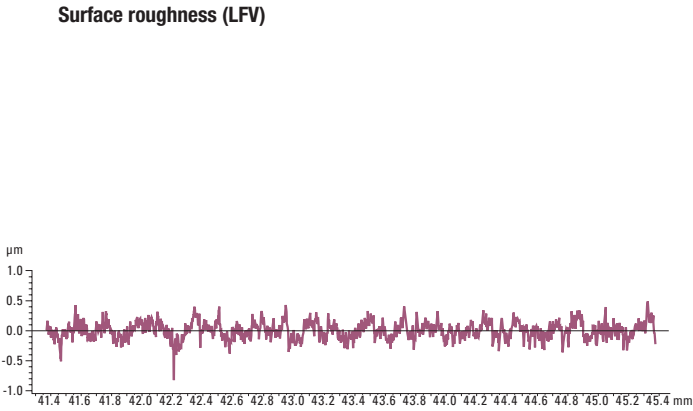


Machining accuracy

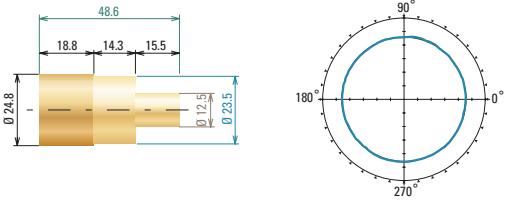
Test piece (LFV)
Material: SUS304
Spindle speed: 1,250 rpm
Feed: 0.01 mm/rev
Nose R: 0.4 mm
Frequency: 1.5 times per spindle rotation



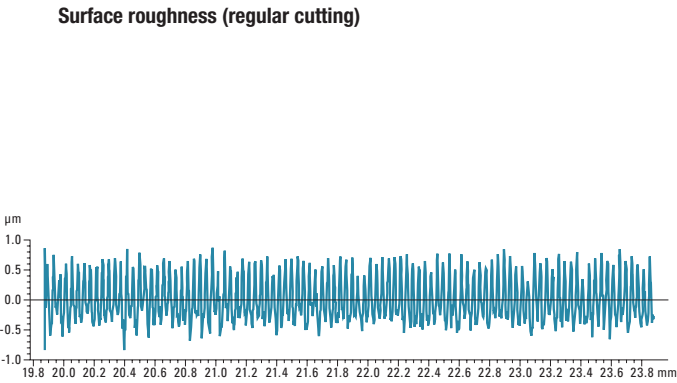
Roundness (LFV)
Roundness: 0.80 μm
Scale: 0.5 μm



Test piece (regular cutting)
Material: BsBM
Spindle speed : 3.000 rpm
Feed: 0.04 mm/rev
Nose R: 0.2 mm

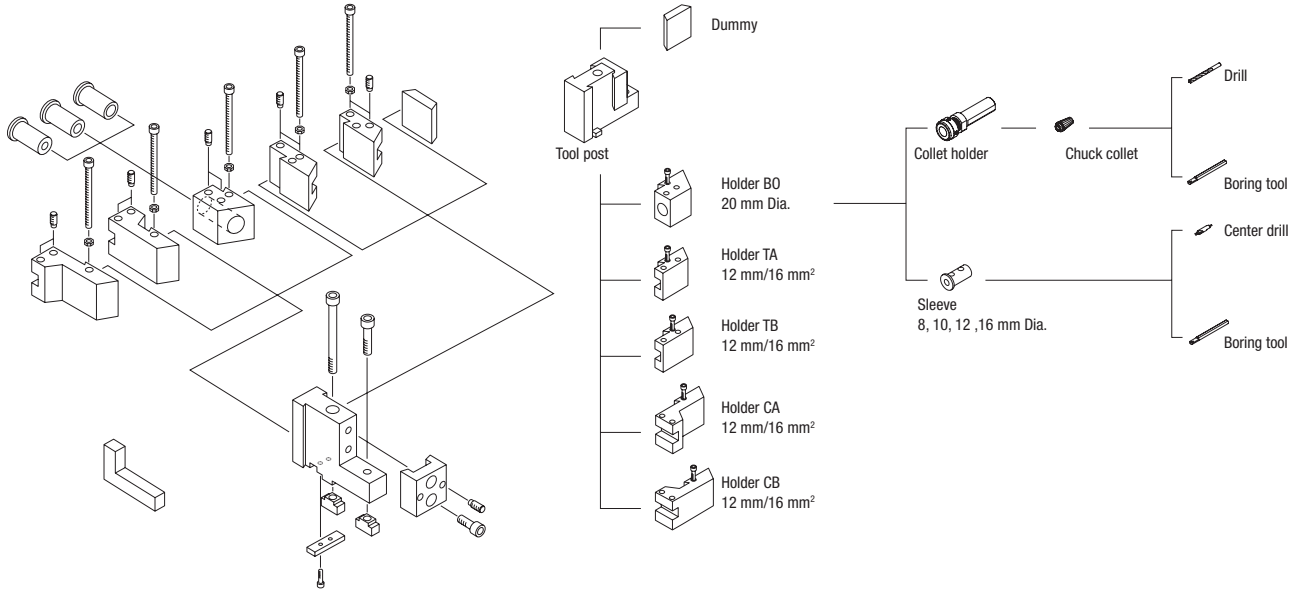


Roundness (regular cutting)
Roundness: 0.18 μm
Scale: 0.5 μm

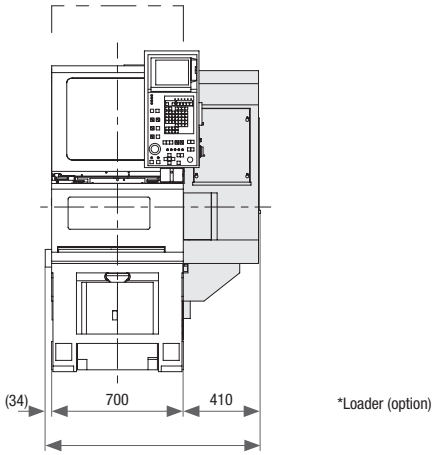
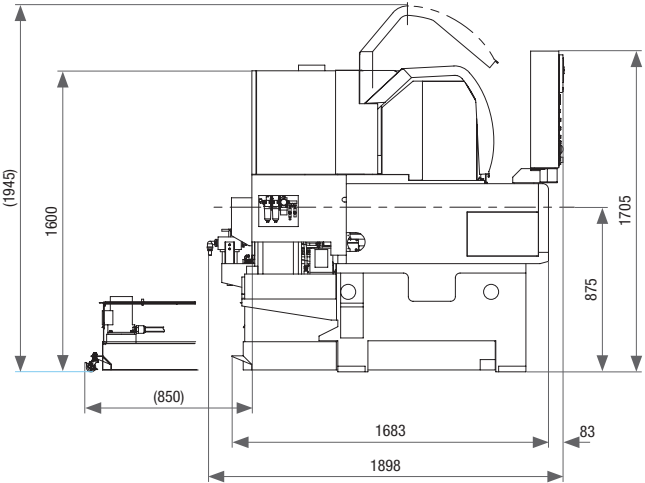


* Although the values stated here are the results of actual measurement, please note that they are not guaranteed.

Tooling System



Floor plan



Machine specification

Item	VC03
Machining capacity	
Max. Work diameter	
Pull type collet chuck	Ø 40 mm
Fixed type collet chuck	Ø 35 mm
Fine precision air chuck	Ø 45 mm
Power chuck type	Ø 45 mm
Diaphragm Chuck	Ø 45 mm
Maximum machining length	50 mm
Max. work length with loader	40 mm
Spindle	
Number of spindles	1
Spindle nose	Flat
Through hole diameter	Ø 17 mm
Inner diameter of draw tube	Ø 11 mm
Spindle speed range	8,000 rpm
Slide	
Number of tool platens	1
Type	Horizontal linear tool platen
Control axis	2-Axis (Simultaneously X, Z)
Slide stroke	X axis 180 mm
	Z axis 200 mm
Rapid feed rate	X axis 20 m/min
	Z axis 30 m/min
Tools	
Shank size of square turning tool	□ 10, 12, (16) mm
Number of tools	Standard 5
Diameter of drill shank	Ø 20 mm
Motor	
Spindle drive 15 min./cont.	2.2/3.7 kW
Coolant pump	0.18 kW
Air supply	
Air pressure supply	5 bar (5 kg/cm ²)
Tank capacity	
Spindle cooling device	7 l
Lubricating system	0.8 l
Coolant tank	90 l
Equipment power supply	
Power consumption	11 kVA
Machine dimensions	
Spindle center height	875 mm
Machine height	1,705 mm
Floor space / depth	700 mm / 1,683 mm
Machine weight	1,500 kg
Others	
Splash guard interlock	
Loader specifications (Optional)	
Type	2-Axis NC
	1 saddle 2 hands
Conveyance capability	
Max. Work Size	Ø 40 x 40 mm
Max. Work Weight	250 g
Feed rate	Right and left operation 108 m/min
	Upper and lower sides 90 m/min
Control unit	
Control system	PMC axis control
Control soft	Flexible loader control
Drive system	Right and left operation Rack & pinion
	Upper and lower sides Rack & pinion
NC Specifications	
MITSUBISHI M70V	
Controlled axis	X, Z
Min. input increment	0.0001 mm, 0.00001 inch, 0.0001 deg
Min. input increment	X-axis: 0.00005 mm (Radius value) Z axis: 0.0001 mm
Interpolation	G01, G02, G03
Thread cutting	G32, G76, G92
Rapid feed override	0–100 %
Cutting feed override	0–200 %
Program storage capacity	16 kB (40 m)
No of registered programs	64
Spindle function	Spindle speed S4-digits, directly specified (G97),
Tool function	T AABB (AA = Tool number & geometry, BB = Wear compensation number)
Tool compensation	40
Data input-and-output	RS-232C, Memory card interface
Others	
8.4" color LCD, Chamfering/Corner R, Drilling canned cycle, Custom macro, Multiple repetitive cycle, Spindle orientation, Tool nose compensation R (G40, G41, G42), Run hour/parts count display,	
Options	
Cs outline control	
Optional accessories	
Gantry loader, Chuck Systems, Air Blow, High pressure & inner coolant, Spindle inner coolant, Automatic fire-extinguisher, Automatic power off, Chip conveyor, Chip box, Coolant mist collector, Coolant mist collector duct, Damper & duct, Warning light, Specification color, etc.	

GN 4200

Maximum precision due to hand scraped guides and high-precision spindle.

Designed for high-precision machining of small-diameter workpieces, this machine has a wing type fixed spindle for low thermal influence installed on a thermally symmetrical machine base. It inherits the “design concept for high precision” that is a tradition at Ocean Cincom. The slideways grant excellent damping characteristics and are finally precision scraped by experienced experts. Based on these constructive properties, the user receives a complete package designed for excellent machining accuracy in terms of dimensional stability and concentricity. The workpieces can of course be handled manually, but the machine also flexibly accommodates automation including high-speed gantry loaders and robots. This makes high-precision machining even more efficient.

Advantages

Maximum precision due to hand scraped guides and high-precision spindle.

Increased speed for high-efficiency machining.

Outstanding machining accuracy.

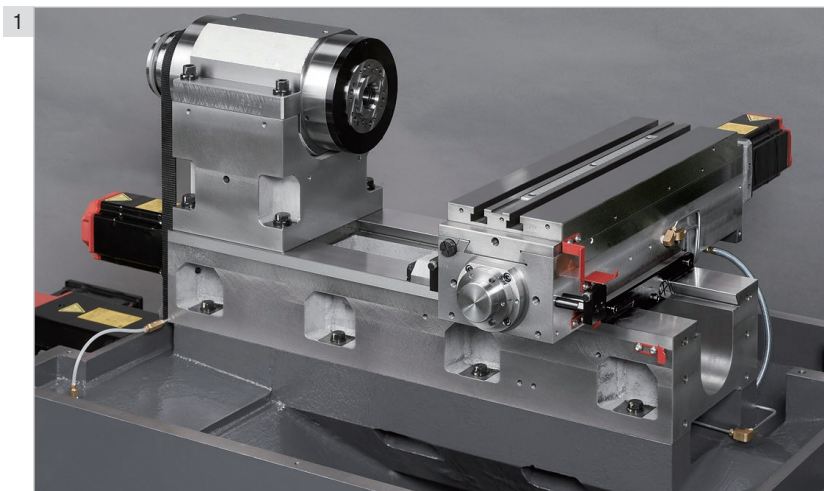
Program-controlled slideway lubrication.

Loading & unloading system.

1.79 m²



Standard



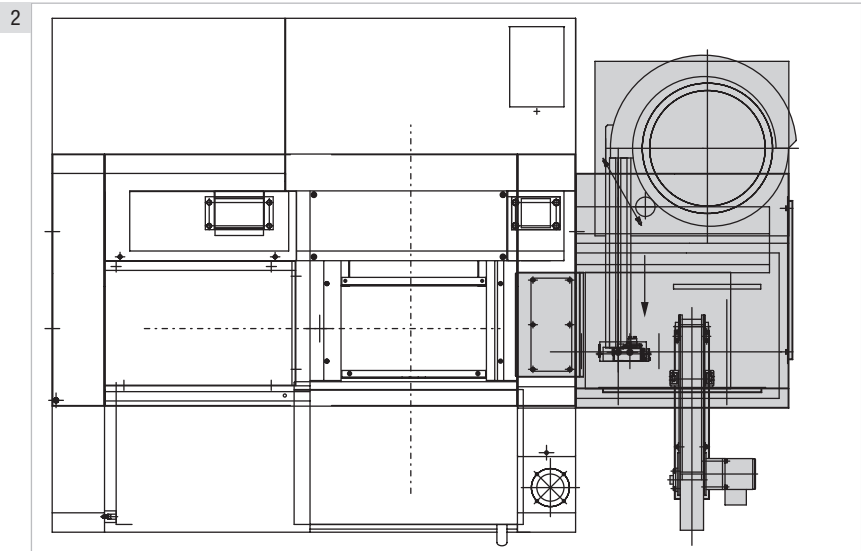
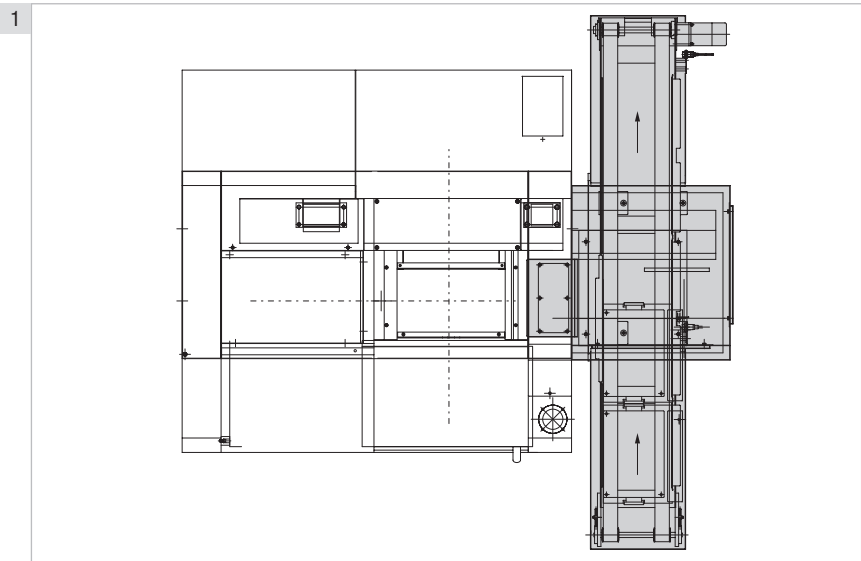
1 Slideway configuration offering high positioning accuracy

What is more...
Program-controlled slideway lubrication

Options

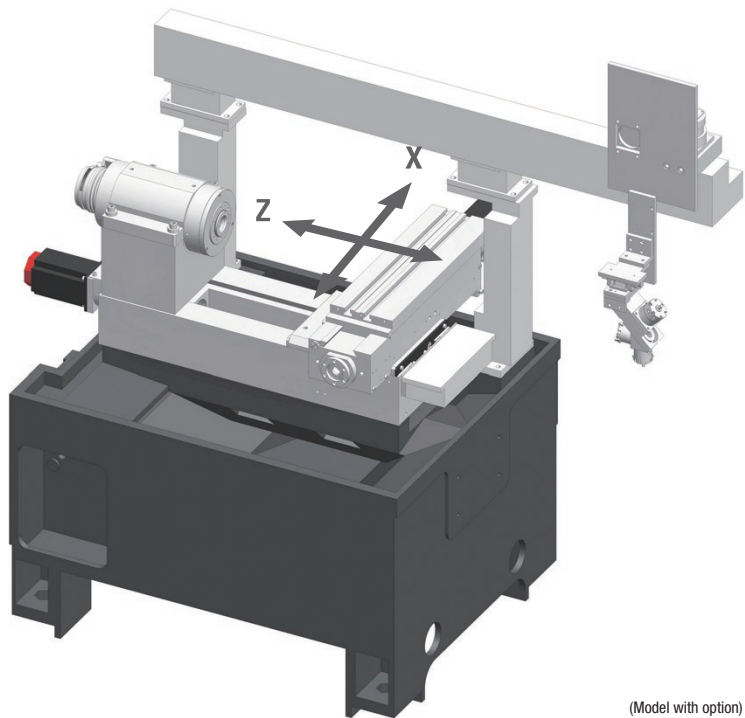
- 1 Pallet conveyor
- 2 Part feeder – Loading & unloading

What is more...
Pallet stocker
Conveyor belt – Loading & unloading



Kinematics

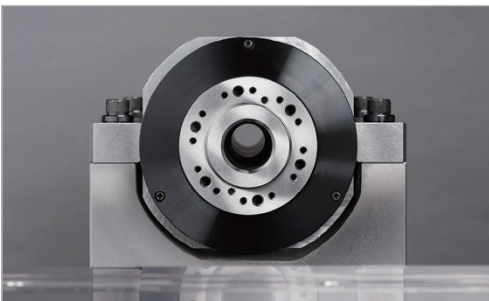
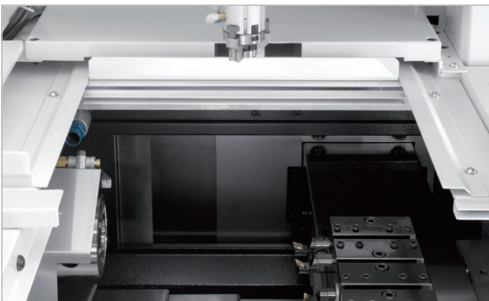
The flat bed on which major machine units such as spindles and tool slides are mounted has a thermally symmetric structure. This configuration with left/right thermal symmetry minimizes the effects of heat on the structure of the machine and provides the ideal form to counter deterioration in machining accuracy due to temperature changes. High-rigidity scraped slideways are used on all axes. These slideways with face contacts have exceptional rigidity and damping characteristics, achieve powerful cutting, and help to prolong cutting tool life.



(Model with option)

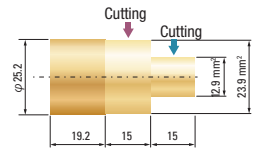
Working area

- 1 Designed for high-precision machining, a tool table with an X-axis slide stroke 50 mm longer than on existing machines allows for comprehensive and flexible tooling.
- 2 Faster cycle times are achieved due to quick acceleration/ deceleration of the axis over short travel distances.
- 3 Original winged spindle headstock



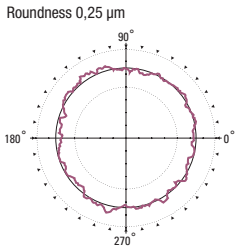
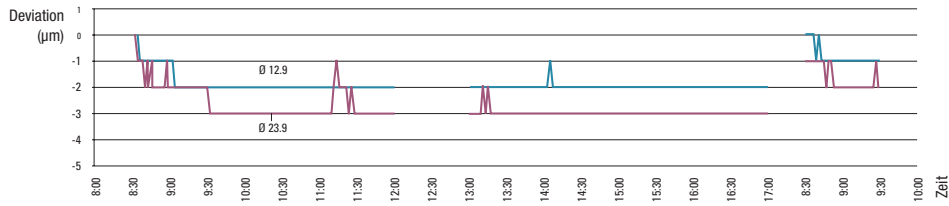
Machining accuracy

Test piece



Material: BSBM
Spindle speed: 2500 rpm
Feed: 0.05 mm/rev
Depth of cut: 0.1 mm
Machining time: 1'40"

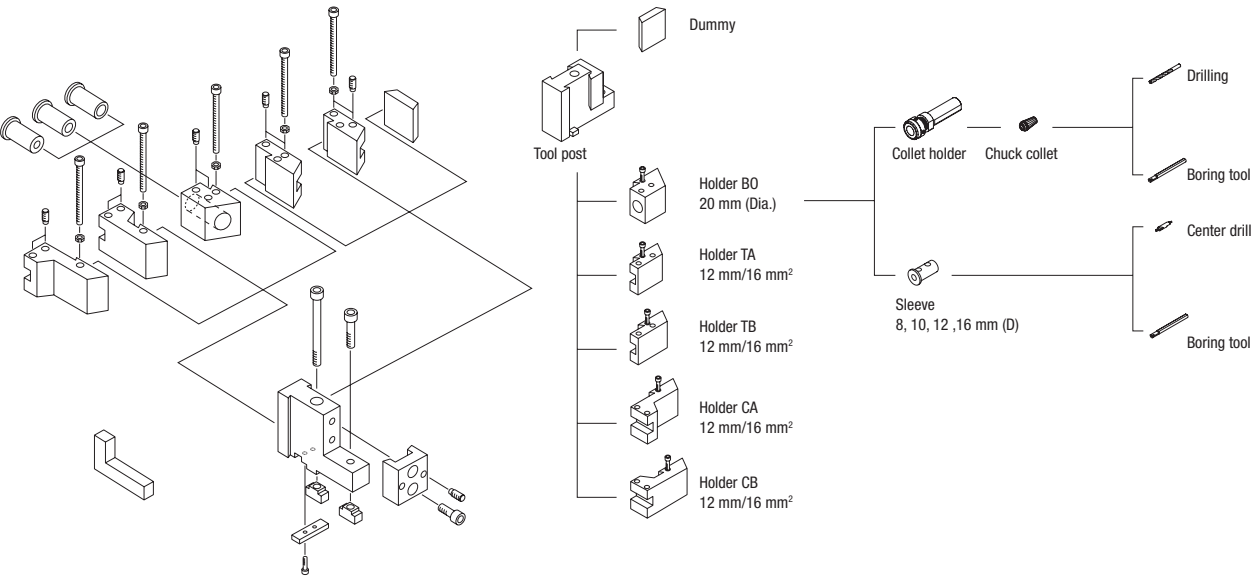
Accuracy



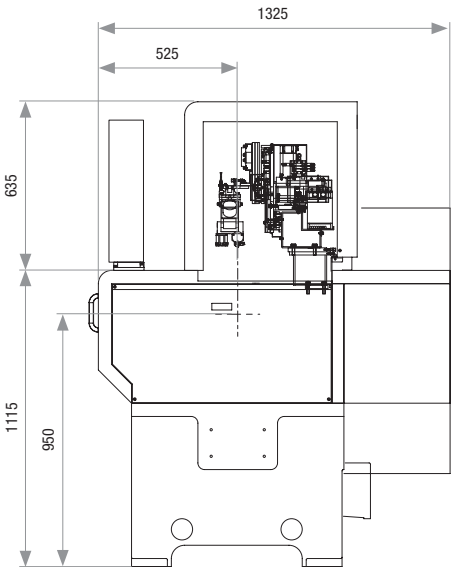
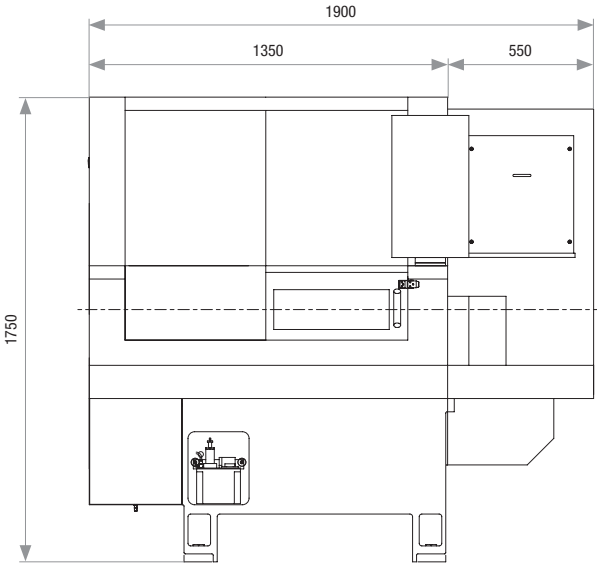
Dry cutting test results

	O.D. changes				No. of test piece (pcs.)	Roundness (μm)	Cylindricity (μm)	Roughness
	1 day	1-hour stop	Next day	Start change				
23,9 mm ²	3 μm	0 μm	1 μm	0 μm	1	0.25	0.5	0.252
					100	0.2	0.5	0.246
					200	0.25	0.6	0.245
12.9 mm ²	2 μm	0 μm	0 μm	0 μm	1	0.35	0.75	0.27
					100	0.35	0.6	0.271
					200	0.25	0.6	0.263

Tooling System



Floor plan



Machine specification

Item	GN4200
Machining capacity	
Max. Diameter of collet chuck	
Fine precision air chuck	Ø 45 mm
Pull type collet chuck	Ø 40 mm (stationary Ø 35 mm)
Maximum machining length	80 mm
Spindle	
Number of spindles	1
Spindle nose	Flat
Through hole diameter	Ø 26 mm
Inner diameter of draw tube	Ø 15.4 mm
Max. spindle speed	8,000 rpm
Slide	
Number of Tool Platens	1
Type of slide	Horizontal gang tool post
X axis	Dovetail slide
Z axis	Dovetail slide
Control axis	2-axis (simultaneously X, Z)
Slide stroke	
X axis	300 mm
Z axis	250 mm
Rapid feed rate	
X axis	12 m/min
Z axis	12 m/min
Tools	
Shank size of square turning tool	Ø 20 mm
Diameter of drill shank	□ 10, 12, 16 mm
Motor	
Spindle drive	3.7 kW
Coolant	
Tank type	Separate type
Tank capacity	125 l
Machine dimensions	
Machine height	1,695 mm
Floor space	W 1,350 x D 1,325 mm
Machine weight	1,500 kg
Power supply	AC 200V ± 10%
Electrical capacity	11 KVA
Loader specifications (Optional)	
Tpe of loader	2-axis gantry loader (2 hand)
Max. work size	40 x 40 mm Dia.
Max. work weight	250 g
Control system	PMC axis control
Control soft	Flexible loader control
Drive system	
Right & left operation	Rack & pinion
Upper and lower sides	Rack & pinion
NC specifications	
NC unit	FS Oi-TD
Controlled axis	X, Z, with loader 2-axes (E,Y)
Min. output resolution	0.00005 mm (Radius value)
X axis	0.00005 mm (Radius value)
Z axis	0.0001 mm
Program storage capacity	512 kB
No of registered programs	400
Spindle function	Directly specified spindle speed (G97) Constant surface speed control (G96)
Cutting feed rate	Feed/min (G98), Feed/rev. (G97)
Rapid feed override	F0,10, 20, 30, 40, 50, 60, 70, 80, 90,100%
Cutting feed rate override	0 – 150 % (in 16 increments)
Interpolation	G01, G02, G03
Thread cutting	G32, G33, G34, G92
Canned cycle	G90, G92, G94
Coordinate system setting	Automatic system setting or G50
Tool compensation	64
Single block, Block delete, Machine lock, Optional block skip, Dry run, Feed hold	
Others	
8.4" color LCD, Circular interpolation by R programming, Programmable data input (G10), Display in several languages: Manual pulse generator; Memory protection, Alarm display	
NC option package	
Chamfering/Corner R; Direct drawing dimension programming; Drilling canned cyle; Custom macro; Multiple repetitive canned cycle; Expanded workpiece program editing; Background editing; Run hour/parts count display; Clock function; Rigid tapping (spindle); Tool radius N compensation; NC option; Cs axis control	
Options	
Spindle air blow, High pressure coolant, Coolant level switch, Counter, Signal tower, Coolant mist collector, Automatic power shut off, Chip conveyor, Chip Box.	

GN 3200W 3200

Efficient and space-saving, hand in hand with traditional precision.

Designed for high-throughput machining of small diameter workpieces, this machine has a wing type fixed spindle for low thermal influence and maximum thermal stability installed on a thermally symmetrical machine base. It inherits the “design concept for high precision” that is a tradition at Ocean series. The slideways grant excellent damping characteristics and are finally precision scraped by experienced experts. Based on these constructive properties, the user receives a complete package designed for excellent machining accuracy in terms of dimensional stability and concentricity. The workpieces can of course be handled manually, but the machine also flexibly accommodates automation including high-speed gantry loaders and robots. This makes high-precision machining even more efficient.

Advantages

High-precision turning machine.

Loading/unloading just takes 3.5 seconds.

High/improved efficiency through space saving design.

High-precision positioning and exceptional accuracy.

Intelligent rigid construction with zero thermal deformation.

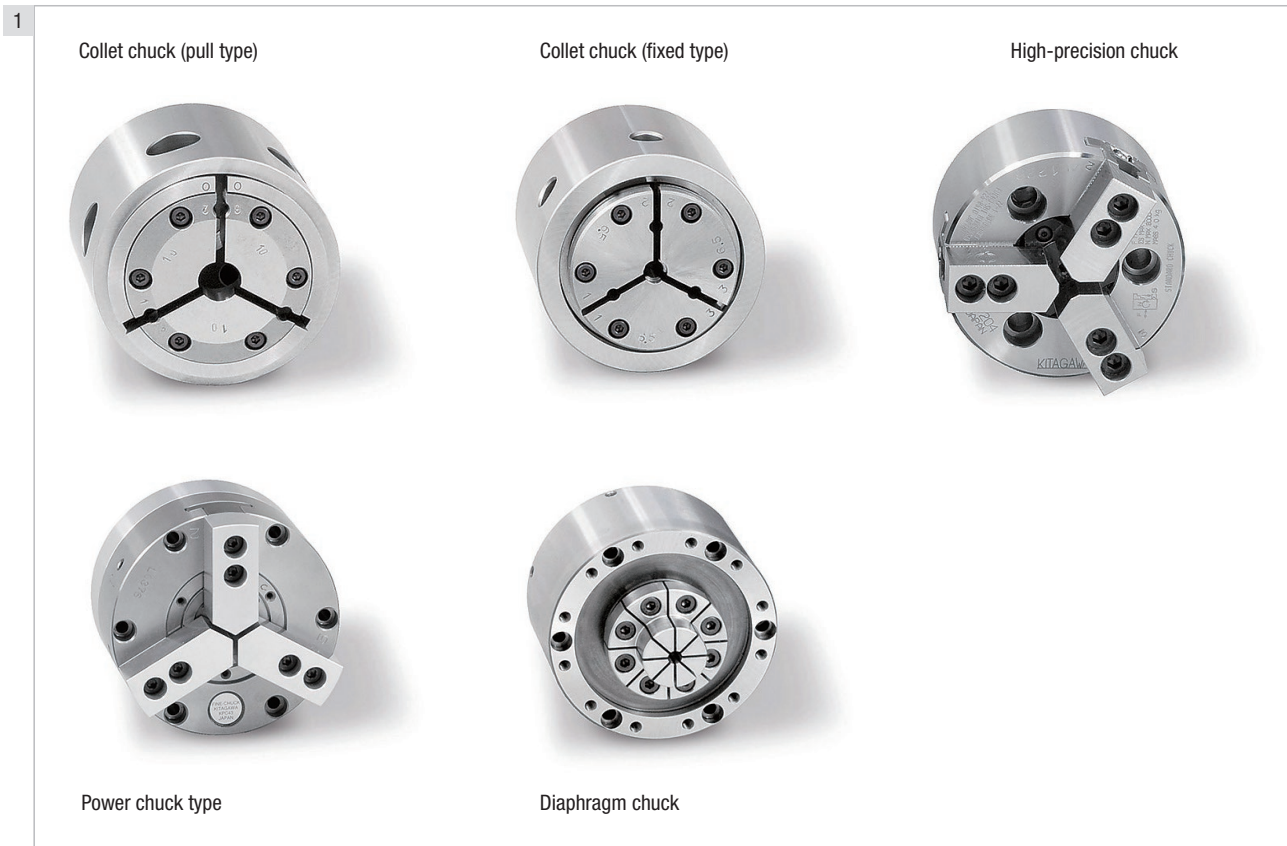
Stable construction for maximum precision.

2.08 m²
(3200W)

1.04 m²
(3200)



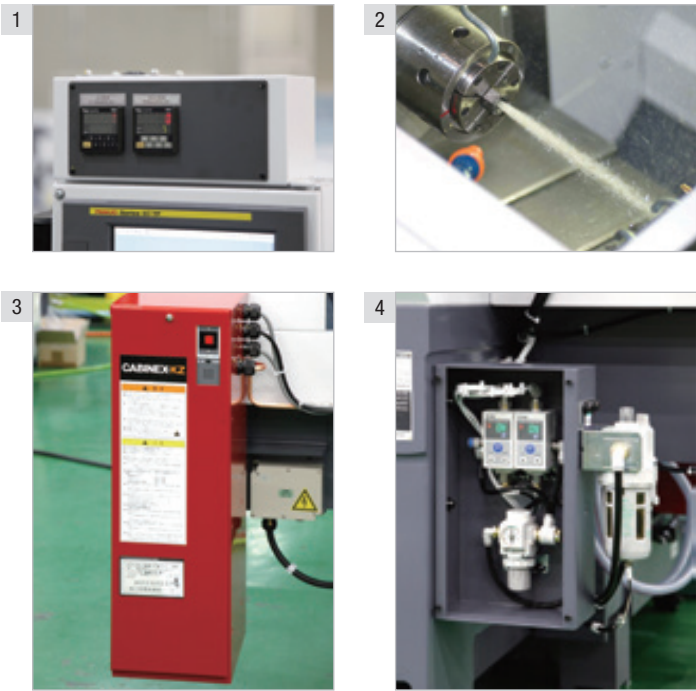
Standard



1 Chuck system

Options

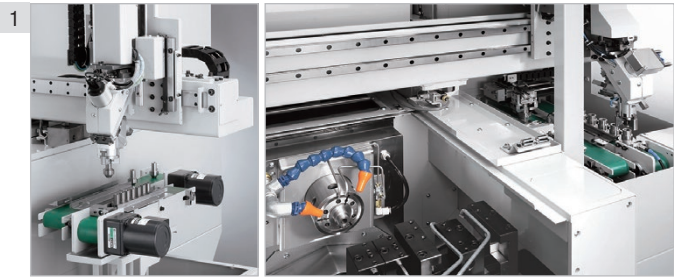
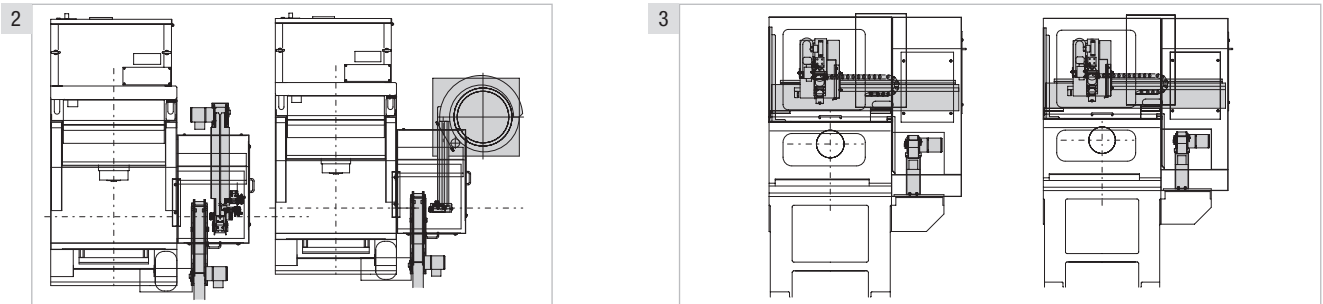
- 1 **Total and preset counter**
These are separately mounted counters providing information about the internal counter function of the NC control unit.
- 2 **High-pressure coolant supply through the spindle**
Coolant is discharged from the chuck under pressure. This is also useful when cleaning the through-holes or for cleaning the chuck.
- 3 **Automatic fire extinguishing unit**
- 4 **By air pressure measurement**, the correct contact with the stopper may be measured when clamping a new workpiece.



Konfigurations

- 1 High-speed gantry loader
2 Conveyor belt
3 Part feeder

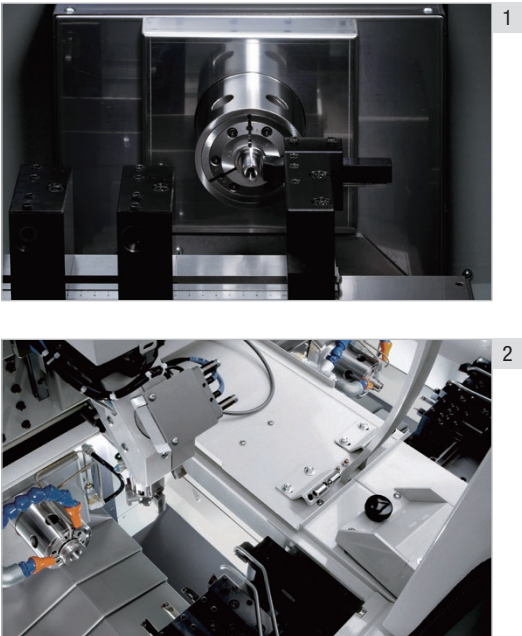
High-efficiency production is achieved in combination with devices like newly designed high-speed gantry loaders featuring excellent cost performance, and part feeders, conveyors and pallet stockers.



Working area

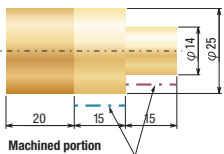
- 1 **GN3200**
A compact design with a total machine width of 700 mm and a floor space requirement of 1.04 m² has made it possible to shorten production lines and improve factory space utilization. The incorporation of a high-speed gantry loader with a loading time of 3.5 seconds and a wide choice of infeed and outfeed devices allows stand-alone automation or integration with other processes. A combination of a single slide construction, achieved using slides with excellent damping characteristics and a lubricating oil discharge control has increased follow-up performance for very small axis movement and has brought lost motion as close to zero as possible. Built-in spindles with forced cooling and built-in sensors give smooth rotation with low vibration thanks to beltless drive. This construction ensures outstanding accuracy and repeatability.

- 2 **GN3200W**
The GN3200W is the twin spindle version of the GN3200 which, equipped with a high speed loader, makes even higher productivity available. The machine width is 33 % shorter than on previous Miyano models and the required floor space has been reduced by 27 %, realizing significant space saving and optimum space utilization. A wide choice of infeed/outfeed devices, single or double high speed gantry loaders, transfer and turnover units makes the machine the best choice to meet specific automation needs. The basic concept in designing the machine is preventing thermal displacement over time and the heat of machining being transferred to the body of the machine. This is achieved by a frame and bed with a thermally symmetric design, backed up by a wing-type headstock and a separately-installed coolant tank.



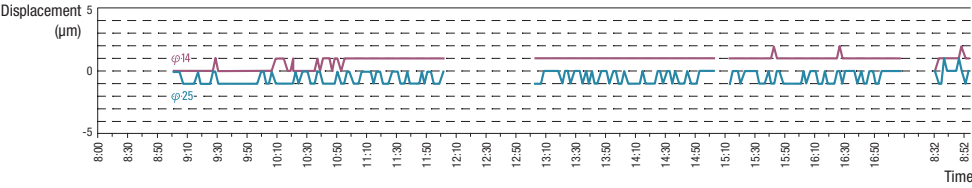
Machining accuracy

Test piece

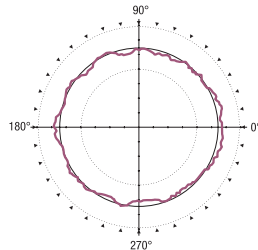


Material: BSBM
Spindle speed: 2,500 rpm
Feed: 0.05 mm/ rev
Depth of cut: 0.1 mm

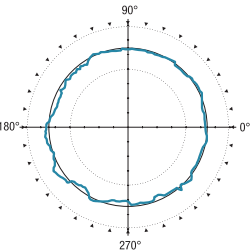
Dimensional accuracy



Roundness

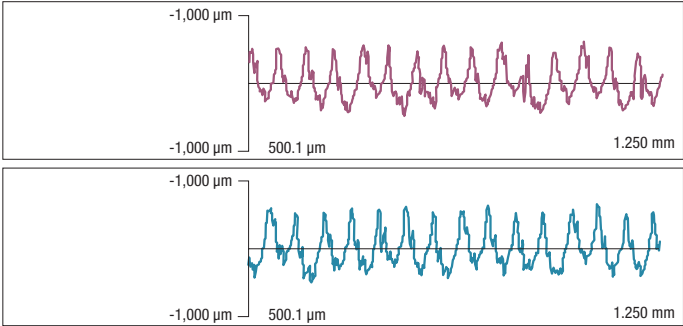


14 mm D
Roundness : 0.30 μm

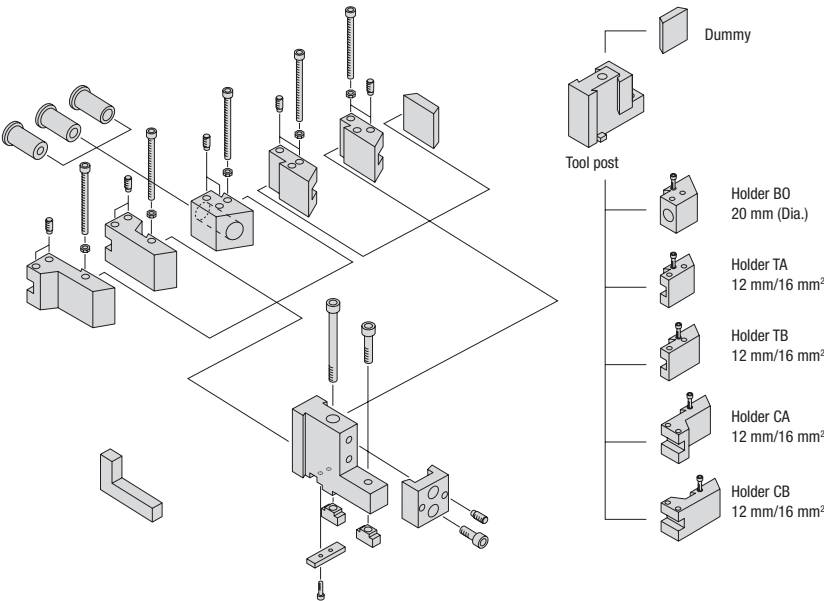


25 mm D
Roundness : 0.30 μm

Surface roughness

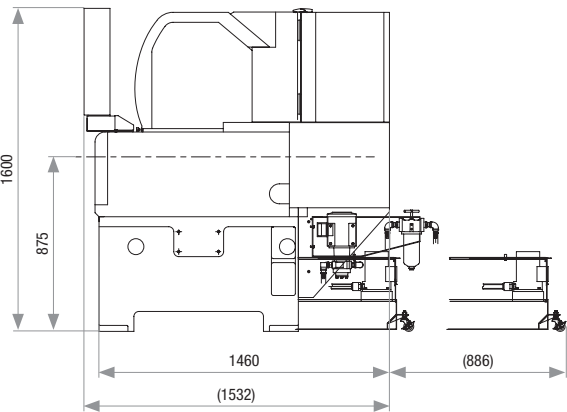
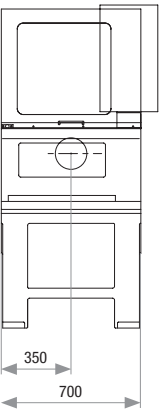


Tooling System

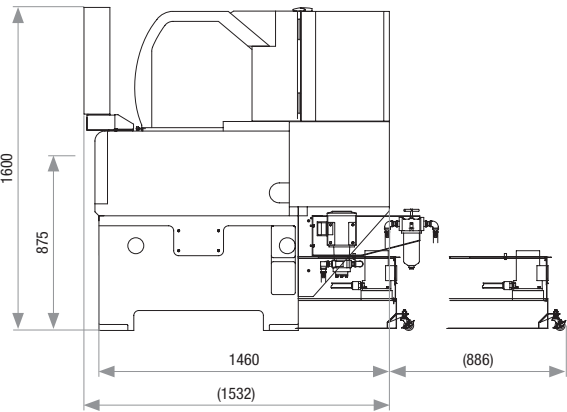
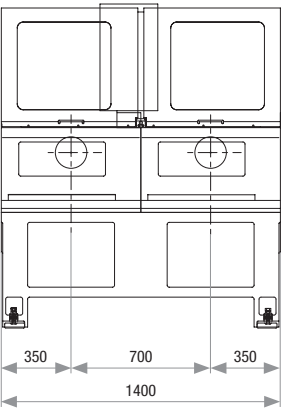


Floor plan

External view GN3200



External view GN3200W



Machine specification

Item	GN3200	GN3000W
Machining capacity		
Max. Diameter of chuck		
Pull type collet chuck	Ø 40 mm	Ø 40 mm
Fixed type collet chuck	Ø 35 mm	Ø 35 mm
Fine precision air chuck	Ø 45 mm	Ø 45 mm
Power chuck type	Ø 45 mm	Ø 45 mm
Diaphragm Chuck	Ø 45 mm	Ø 45 mm
Maximum machining length	Ø 50 mm	Ø 50 mm
Max. workpiece length with loader	Ø 40 mm	Ø 40 mm
Spindle		
Number of spindles	1	2
Spindle nose	Flat	Flat
Through hole diameter	Ø 17 mm	Ø 17 mm
Inner diameter of draw tube	Ø 11 mm	Ø 11 mm
Spindle speed range	8,000 rpm	8,000 rpm
Slide		
Number of tool platens	1	2
Type of slide	Horizontal linear tool platen	
	X axis	Dovetail
	Z axis	Dovetail
Control axis	2-Axis (Simultaneously X, Z) 2x2 axes (X, Z simultaneous)	
Slide stroke	X axis	180 mm
	Z axis	200 mm
Rapid feed rate	X axis	15 m/min
	Z axis	15 m/min
Tools		
Shank size of square turning tool	□ 10, 12, (16) mm	□ 10, 12, (16) mm
Number of tools	5	5x2
Diameter of drill shank	Ø 20 mm	Ø 20 mm
Motor		
Spindle drive 15 min./cont.	1.5/2.2 kW	1.5/2.2 kW
Tank capacity		
Spindle cooling device	7 l	9 l
Lubricating system	1.5 l	1.5 l x 2
Coolant tank	90 l	200 l
Air supply		
Air pressure supply	4 bar (4 kgf/cm²)	4 bar (4 kgf/cm²)
Equipment power supply		
Power consumption	7.2 KVA	14 KVA
Machine dimensions		
Spindle center height	875 mm	875 mm
Machine height	1,600 mm	1,600 mm
Floor space		
Width	700 mm	1,400 mm
Depth	1,460 mm	
Machine weight	1,500 kg	2,700 kg
Others		
Splash guard interlock		
Optional accessories: Gantry loader, Chuck Systems, Air Blow, High pressure & inner coolant supply, Spindle inner coolant, Automatic fire-extinguisher, Automatic power off, Chip conveyor, Chip box, Total and preset counter, Total and multi counter, Coolant mist collector duct, Damp & duct, Warning light, Specification color, etc.		
Loader specifications (Optional) 2-axes NC	1 saddle 2 hands	1 saddle 2 hands
	—	2 saddle 4 hands
Conveyance capability		
Max. Work Size	Ø 40 x 40 mm	Ø 40 x 40 mm
Max. Work Weight	250 g	250 g
Feed rate		
Right and left operation	130 m/min	130 m/min
Upper and lower sides	154 m/min	154 m/min
Control unit		
Control system	PMC axis control	PMC axis control
Control soft	Flexible loader control	Flexible loader control
Drive system		
Right and left operation	Rack & pinion	Rack & pinion
Upper and lower sides	Rack & pinion	Rack & pinion
NC specifications		
	GN3200: FS Oi-TD 1 system	GN3200W: FS Oi-TD 2 system
Controlled axis	X, Z	X, Z 2 axes x 2 systems
		Loader with one slide: 2 axes x 2 systems
		Loader with one slide: 2 axes x 1 system
Min. input increment	0.0001 mm, 0.00001 inch, 0.0001 deg	
Min. output resolution	X-axis: 0.00005 mm (Radius value) Z axis: 0.0001 mm	
Interpolation	G01, G02, G03	
Thread cutting	G32, G33, G34	
Rapid feed override	0–100 %	
Cutting feed override	0–150 %	
Program storage capacity	512 kB (1280 m)	Total of 2 systems 1 Mb (2560 m)
No of registered programs	400	800 (Total of 2 systems)
Spindle function	Direct speed programming via 4-digit S word (G97) / Constant surface speed control (G96)	
Tool function	T ##** (## = Tool number & geometry, ** = Wear compensation number)	
Tool compensation	64 pieces (total of 3 systems: 96)	
Data input-and-output	RS-232C, Memory card interface	
	8.4" color LCD, Work piece coordinate system (G52–G59), Inch/metric change, Chamfering/corner R, Programmable data input (G10), Direct drawing dimension programming, Drilling canned cycle, Custom macro, Multiple repetitive cycle, Background editing, Spindle orientation, Rigid tapping, Tool life management, Tool nose R compensation (G40, G41, G42), Actual cutting feed rate display, Operating time/Parts No. display	
Others		
Options	Polar coordinate interpolation, Cylindrical interpolation, Cs outline control.	



New Perspectives: thanks to Low Frequency Vibration (LFV) Cutting.

LFV, standing for “Low Frequency Vibration” cutting, is a new universally applicable and highly efficient cutting technology which allows machining virtually any part geometries from a highly diverse range of materials. While doing so, defined chip breaking significantly reduces the frequency of unnecessary machine stops caused by long chips.

Our machines equipped with LFV technology efficiently handle defined chip breaking when cutting difficult-to-machine materials thanks to their special control technology.

This technology opens up completely new possibilities in machining technology. Discover now this new “cutting-edge” technology.

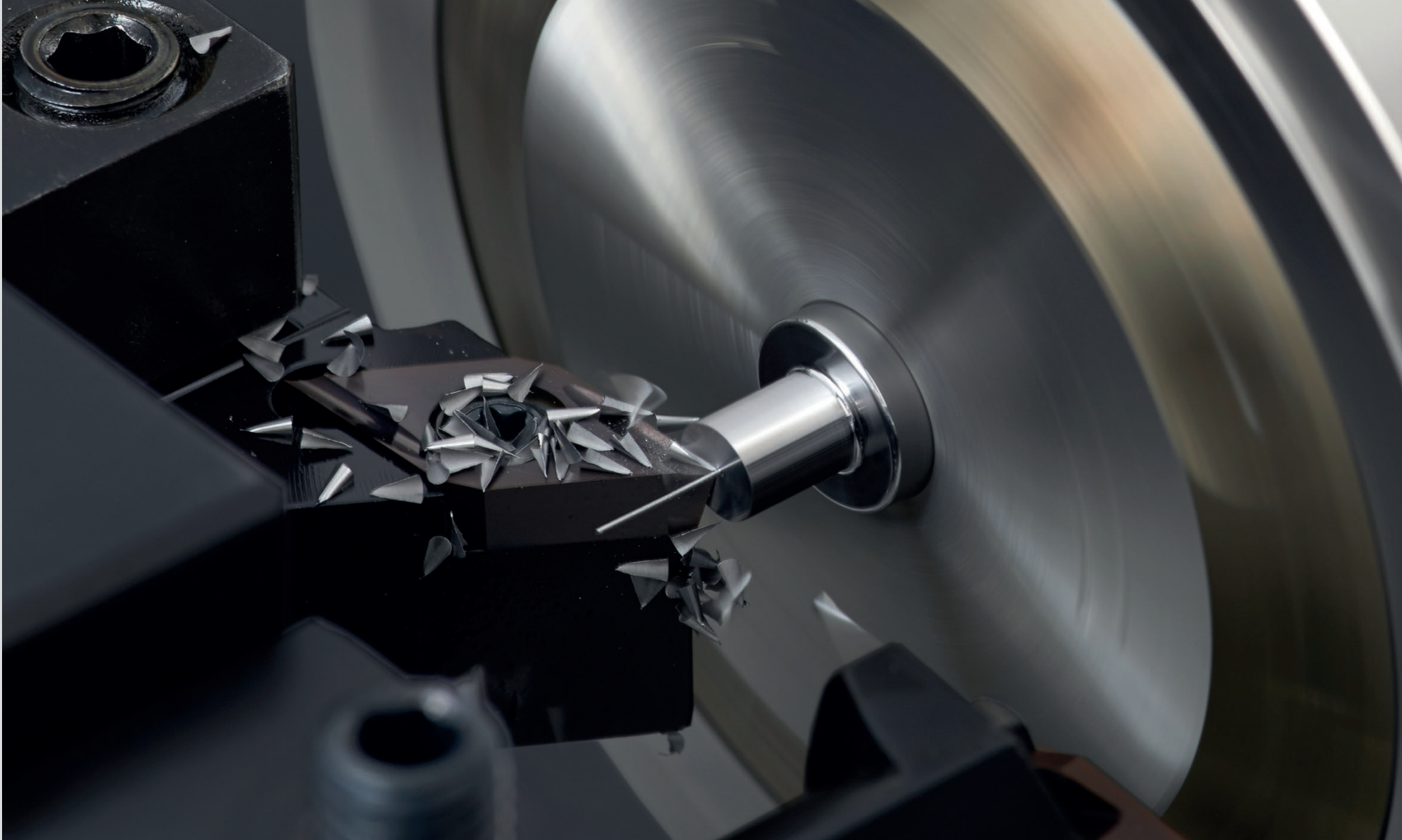
Advantages

Cutting resistance is lowered.

No built-up edge is formed.

No unnecessary machine stop.

Tool life is extended.



There are three different modes of Low frequency vibration cutting:

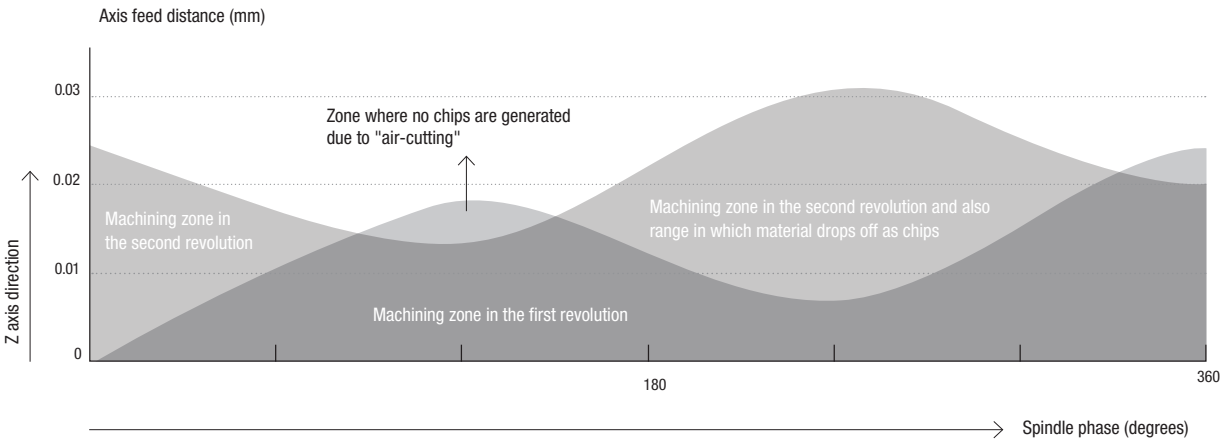
LFV mode 1
Multiple vibrations per spindle revolution

LFV mode 2
Multiple spindle revolutions per vibration

LFV mode 3
Vibration threading



LFV mode 1
Multiple vibrations per spindle revolution
Very fine and small chips



Laser-Technology

The hybrid system from Citizen – precision turning and laser cutting/welding.

Thanks to a state-of-the-art conversion kit, it has become possible to expand the functionality of a lathe by laser technology and enhance the metal processing range significantly.

The laser primarily adopts the part of a cutting tool, can also weld, supplements the usual cutter and replaces the latter in microscale applications. The strength of the hybrid system, comprising a lathe plus a laser system, lies in the repeatability as all sub-processes are handled on just one machine. This saves acquisition costs for a new stand-alone laser machine and also production costs when distributing the manufacturing process between two machines.

Advantages

Filigree cutting.

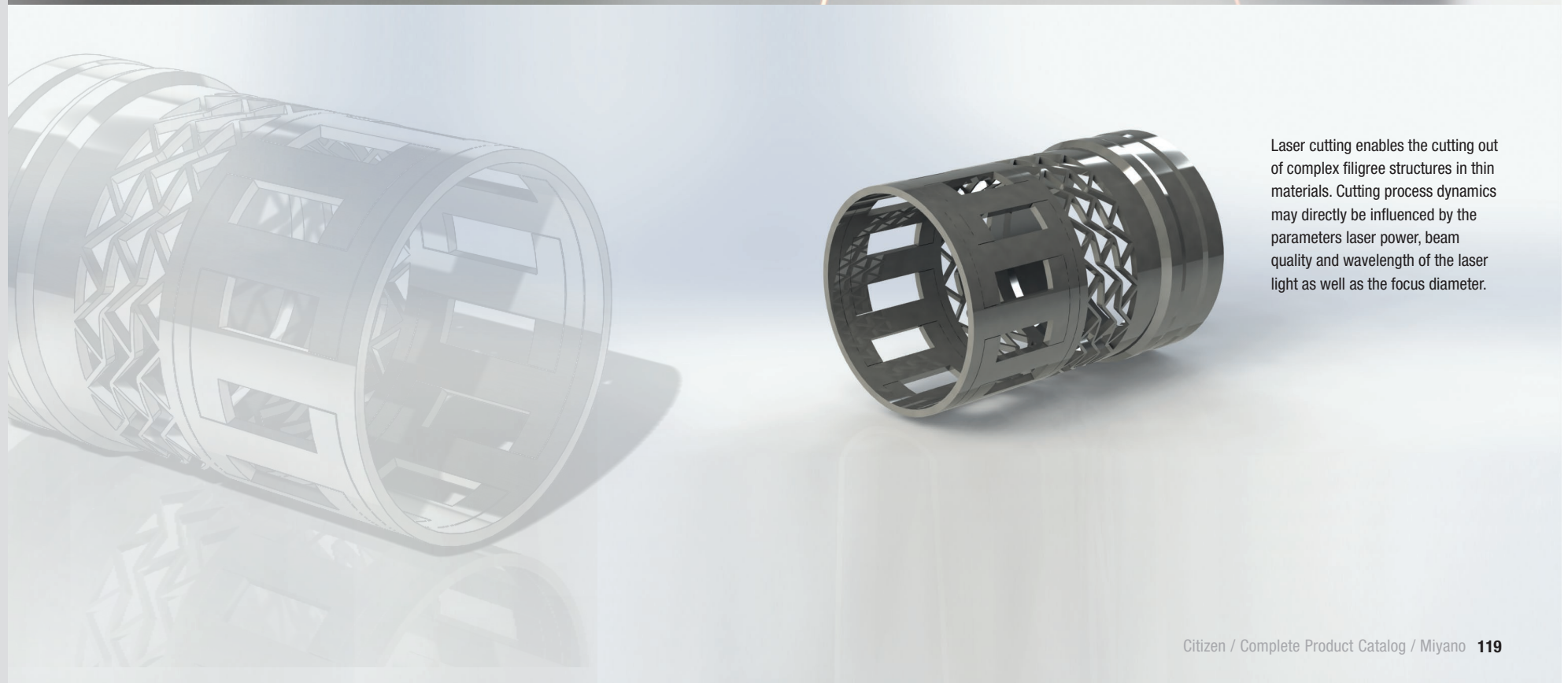
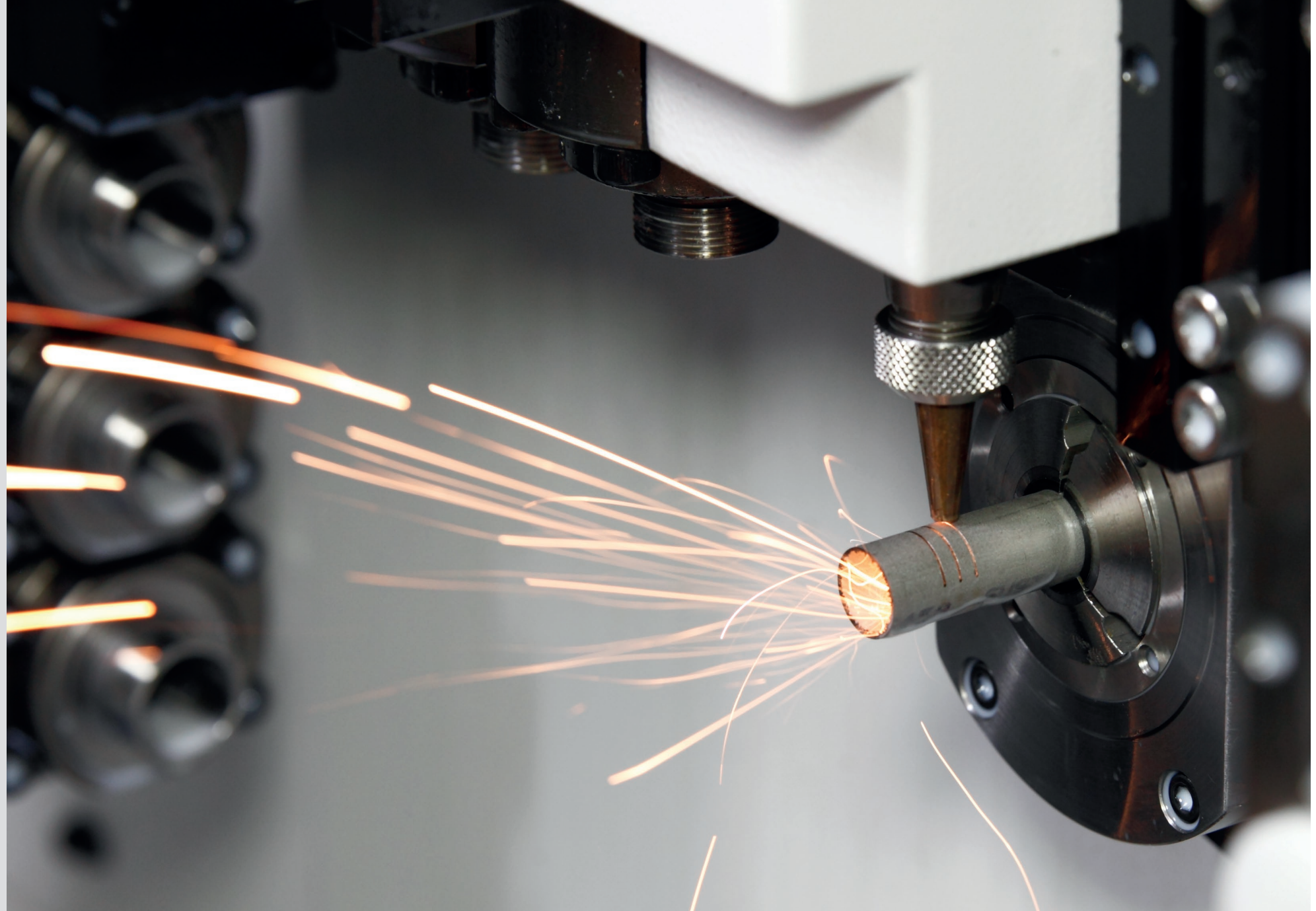
Corner radius close to 0.

Excellent beam quality.

High machining speed.

Long service life (approx. 20,000 hours).

Turning and laser machining on one machine.



Laser cutting enables the cutting out of complex filigree structures in thin materials. Cutting process dynamics may directly be influenced by the parameters laser power, beam quality and wavelength of the laser light as well as the focus diameter.

Industry 4.0

Industry 4.0 – trailblazing, digital transformation.

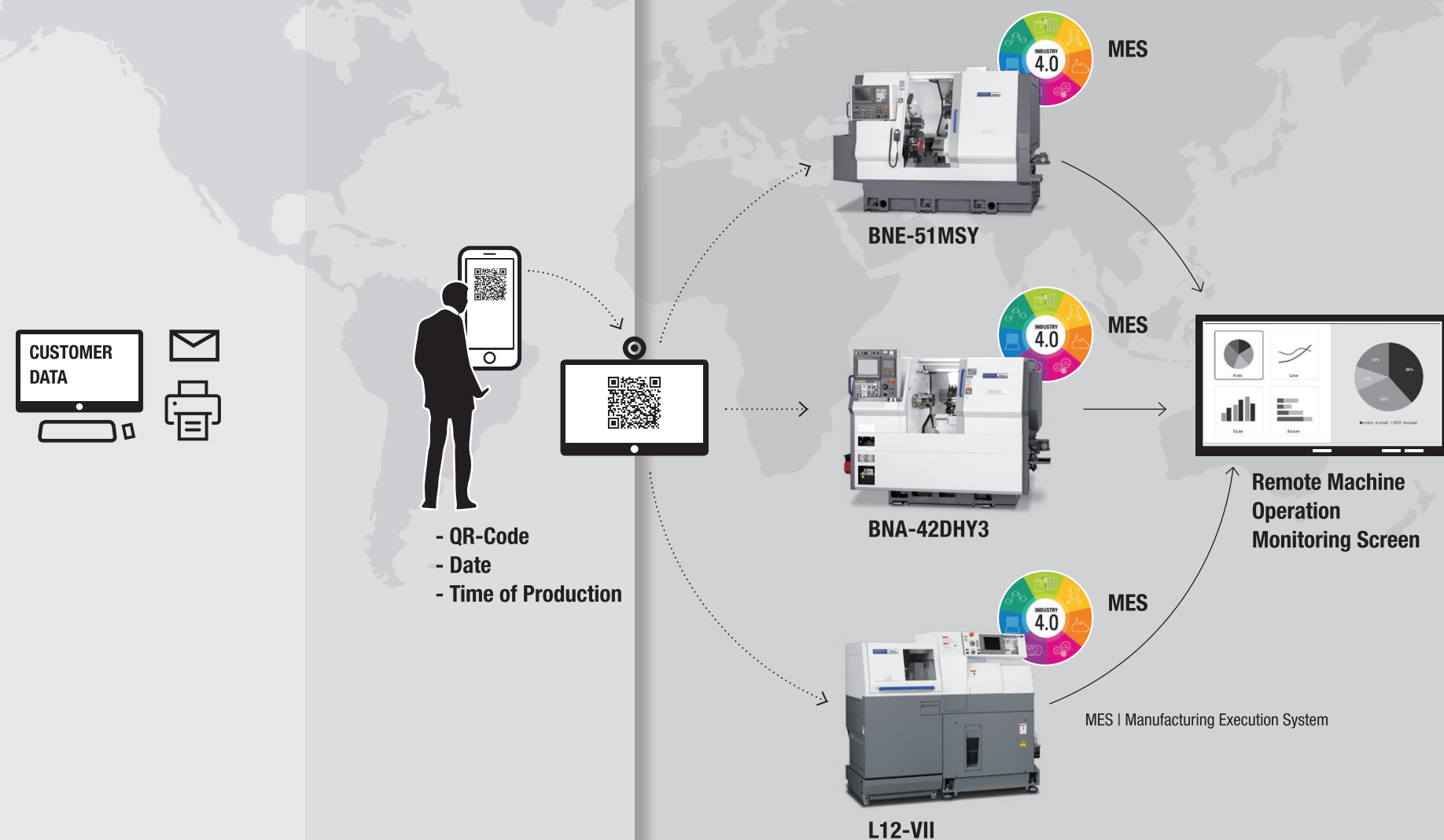
Thanks to progressive digitization, production steps within one machine – or also within several machines combined – may be monitored and documented in a more efficient way. The networking of machines is the key to process optimization and puts the economical factor first.

Using integrated sensors, the permanent supervision of the machine functions is granted which benefits the maintenance system during operation. Via remote maintenance, access to the machines from anywhere is possible and digital intervention may solve serious problems in case of an emergency.

This not only saves time but also unnecessary field service calls. Industry 4.0 pursues the target of achieving optimum machine availability due to digital networking.



01 02 03





Monitoring and controlling by sensor technology.

The sensors installed in the lathe detect parameters of the following measuring units: Temperature, acceleration and vibrations. Errors in the process sequence is detected by the sensors and directly transmitted to the PC of the operator in charge. In case of machines integrated in a production chain, a signal is sent to cooperating machines to make them stop the production. If e.g. an error occurs at the unloading unit, the production at lathe and loading system will be interrupted until the error is removed.

To grant a smooth exchange of data between the operating systems and make all units involved „speak the same language“, Citizen cooperates with a provider specialized in interface connections who bundles up a wide variety of computer languages to one common one.

01

The added value of Citizen Lathes.

Maintenance

Installed sensors check the temperature during the turning process and trigger an alarm in case overheating occurs at axes or spindles. The operating conditions may be queried at any time and even the smallest irregularities are indicated right away.



Barfeeder

02

Remote maintenance

If necessary, the machines connected to the network can be checked by a service technician via remote diagnosis. The remote diagnostics helps to avoid unnecessary machine stops, because the cause of defect can be identified beforehand and measures can be coordinated.

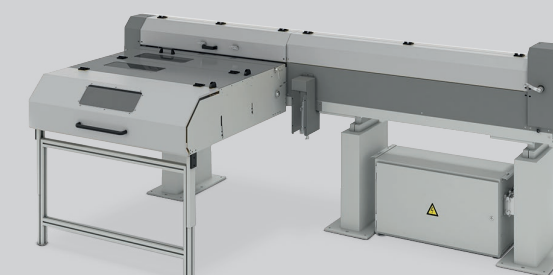


Machine

03

Process automation

CNC lathes can communicate technology-based and coordinate processes. The automation can also take place between barfeeder, lathe and unloading magazine to optimize the successive processes.



Unloading system

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