CITIZEN
Micro HumanTech

Miyano

BNE42/51

Fixed Headstock Type CNC Automatic Lathe

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 powerful machining torque of 20 Nm and high rotational speeds of up to 6,000 min-1 can be mounted at all positions (12 positions) with independent drive. (Common to S/SY types)

S

Two Spindle Capacities

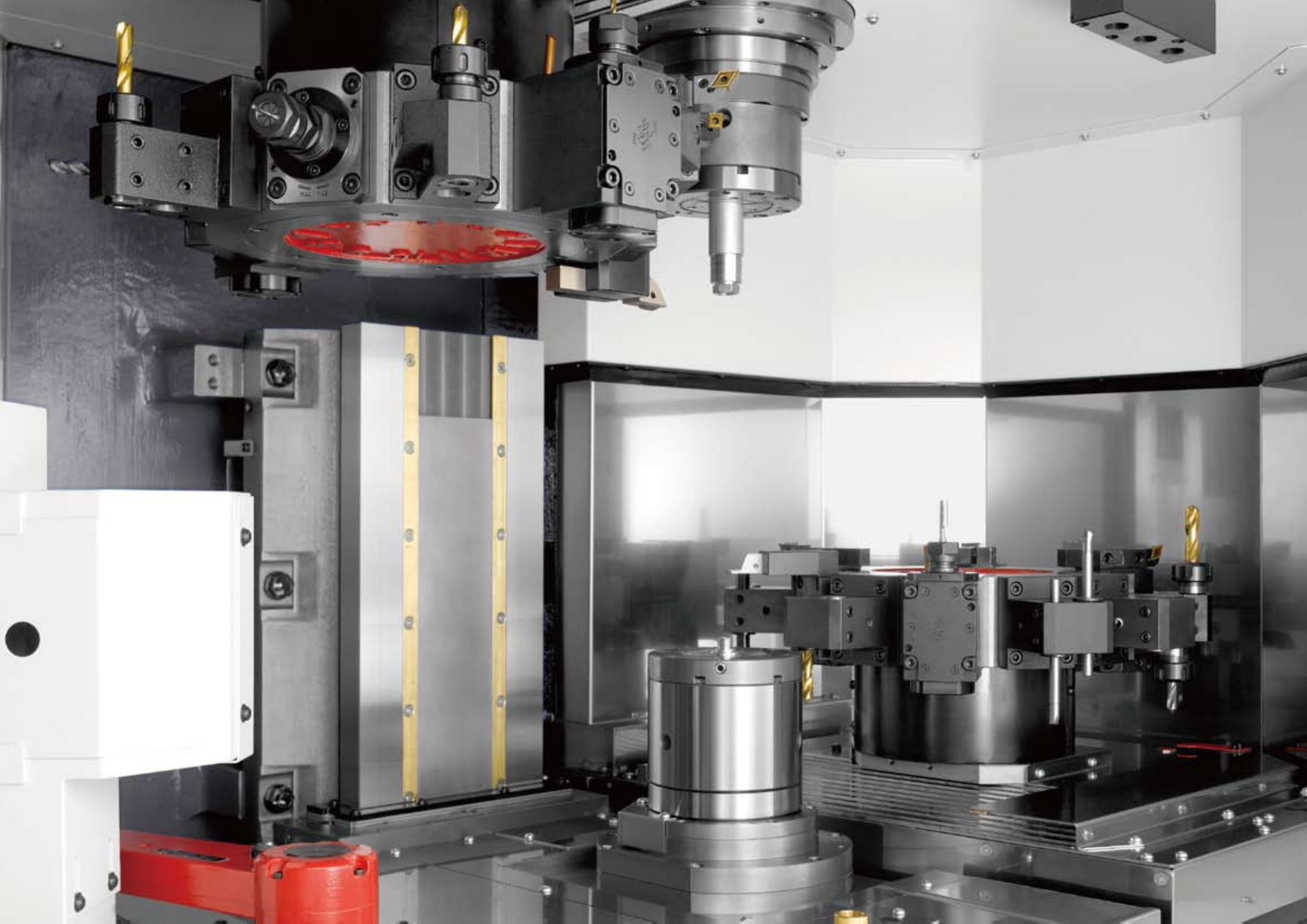
BNE42 42mm
BNE51 51mm
and two versions S without Y axis and SY with Y axis to turret HD 1.

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. (Common to S/SY types)

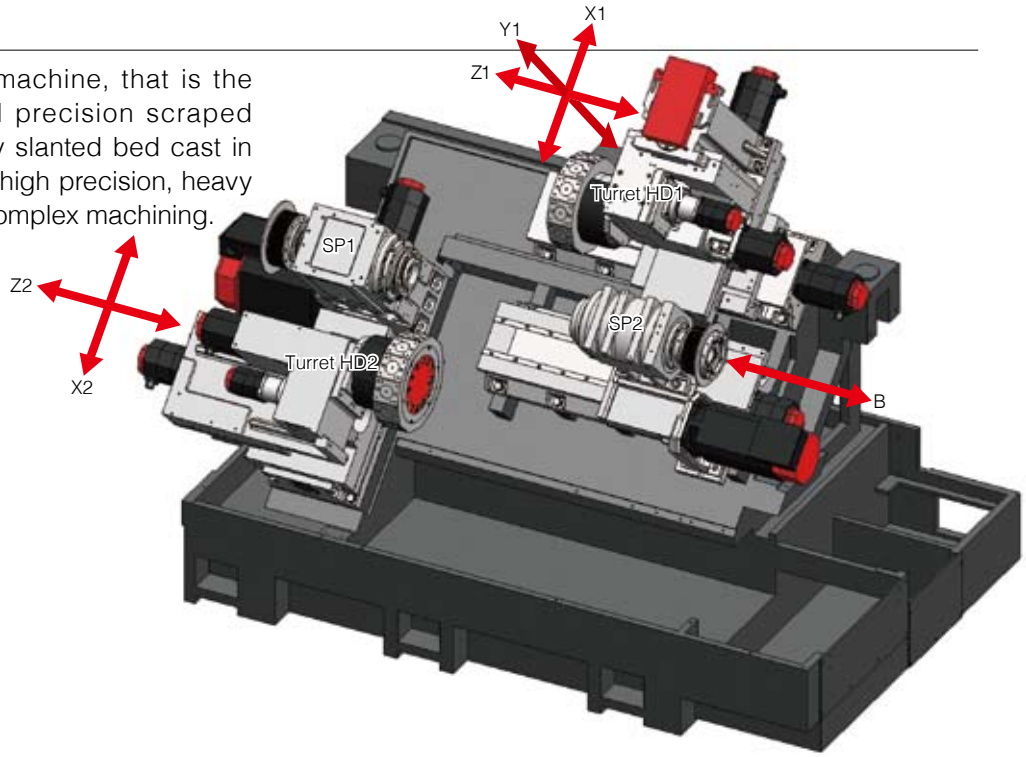
Newly Designed Covers

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. (Common to S/SY types)



Strong Construction

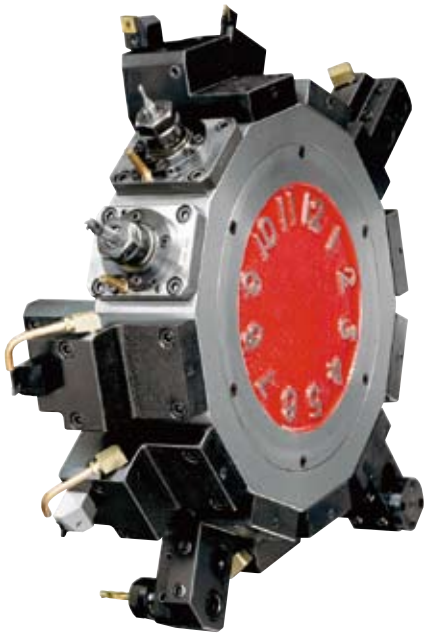
The basic construction of the machine, that is the combination of the highly rigid precision scraped square guideways and the heavy slanted bed cast in one piece, is the base to support high precision, heavy cutting and long tool life even in complex machining.



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.



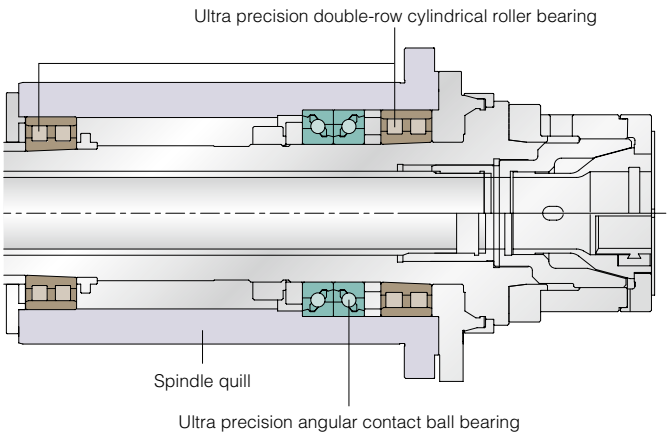
Spindle

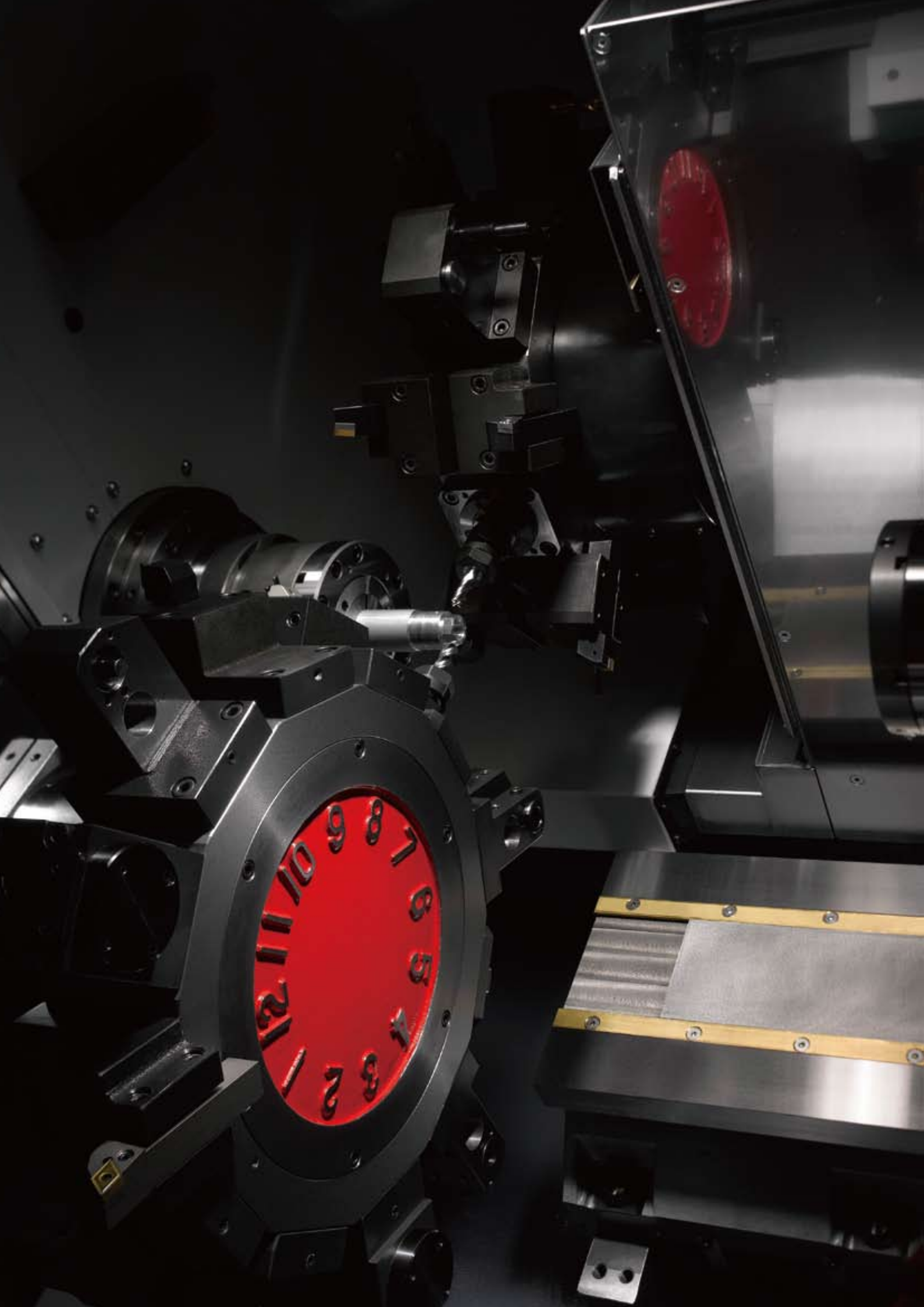
The main spindle of the 51S / 51SY is supported by “ultra precision double-row cylindrical roller bearings” and “ultra precision angular contact ball bearings” at the front and by “ultra precision double-row cylindrical roller bearings” at the rear to suppress radial run-out and thermal displacement 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.

Sectional view of type 51 spindle





Machining Examples

Polygon machining (Optional)

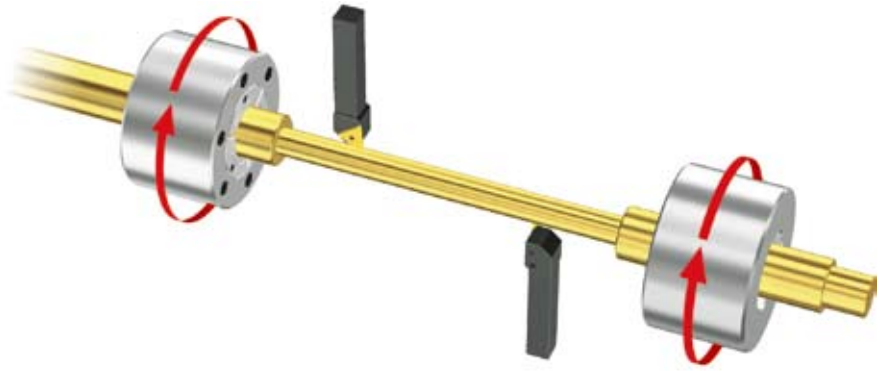
Synchronizing the revolving tool speed with the spindle speed at two times permits polygon machining, such as two-, four- and six-sided machining, with a polygon cutter.

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)

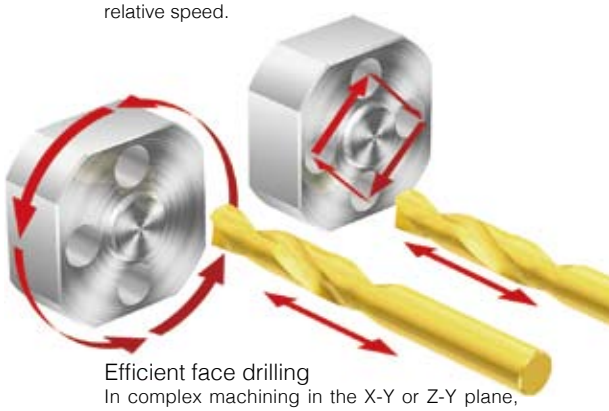
Differential velocity cutting by revolving tools

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 / simultaneous complex 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.

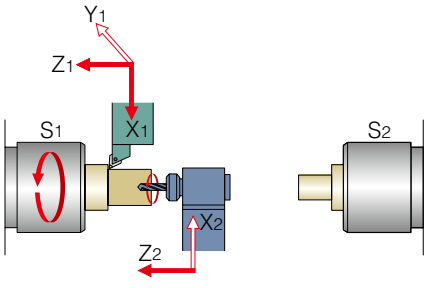


Efficient face drilling

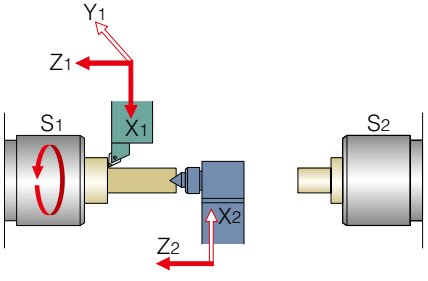
In complex machining in the X-Y or Z-Y plane, using C axis control to index the drilling position takes a long time. Using the Y axis allows efficient drilling on the end face. (SY type)

Machining Patterns

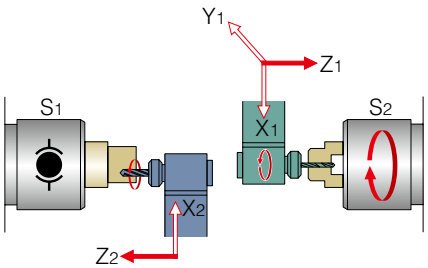
Differential cut



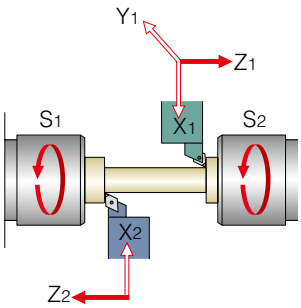
Center suport



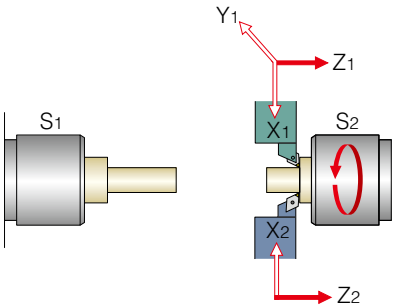
Drilling & tapping



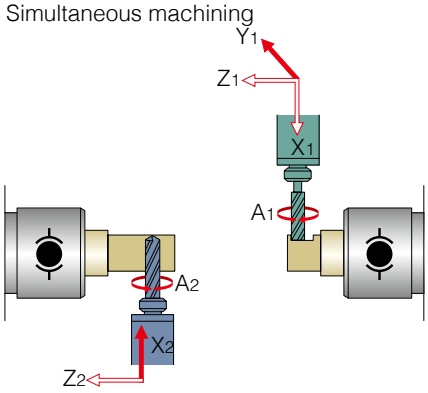
Long-shaft machining



Balanced turning

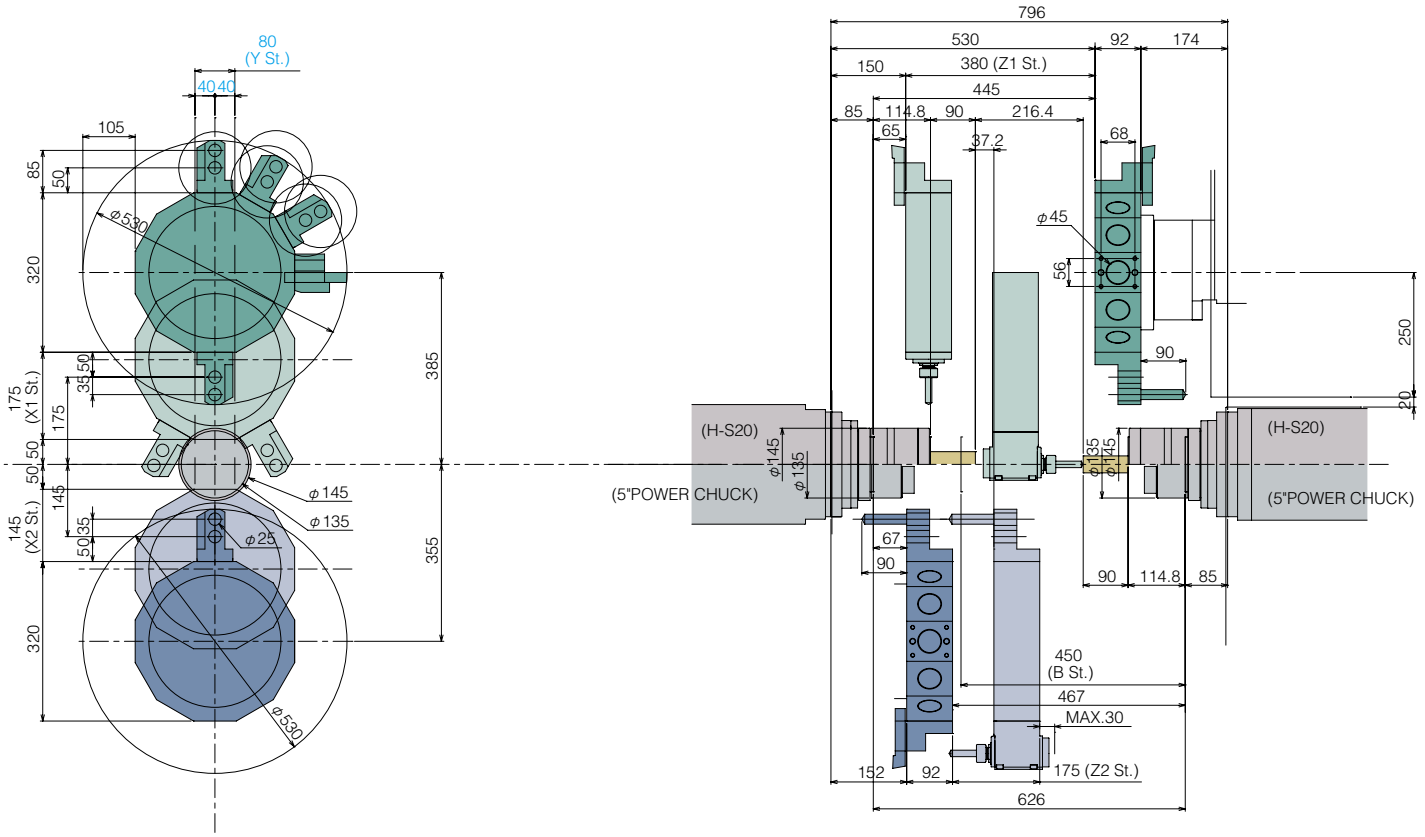


Simultaneous machining

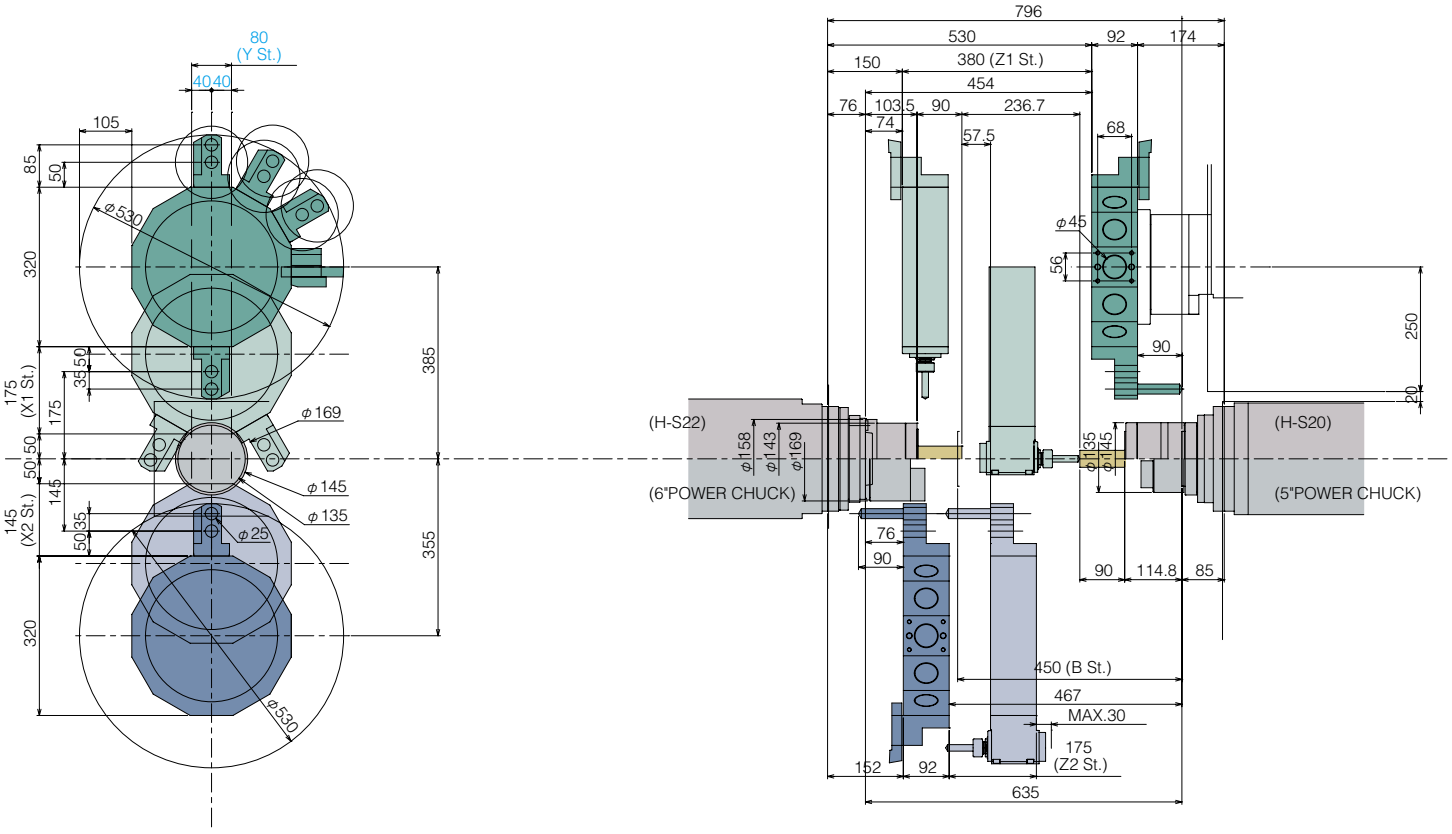


Tooling Area

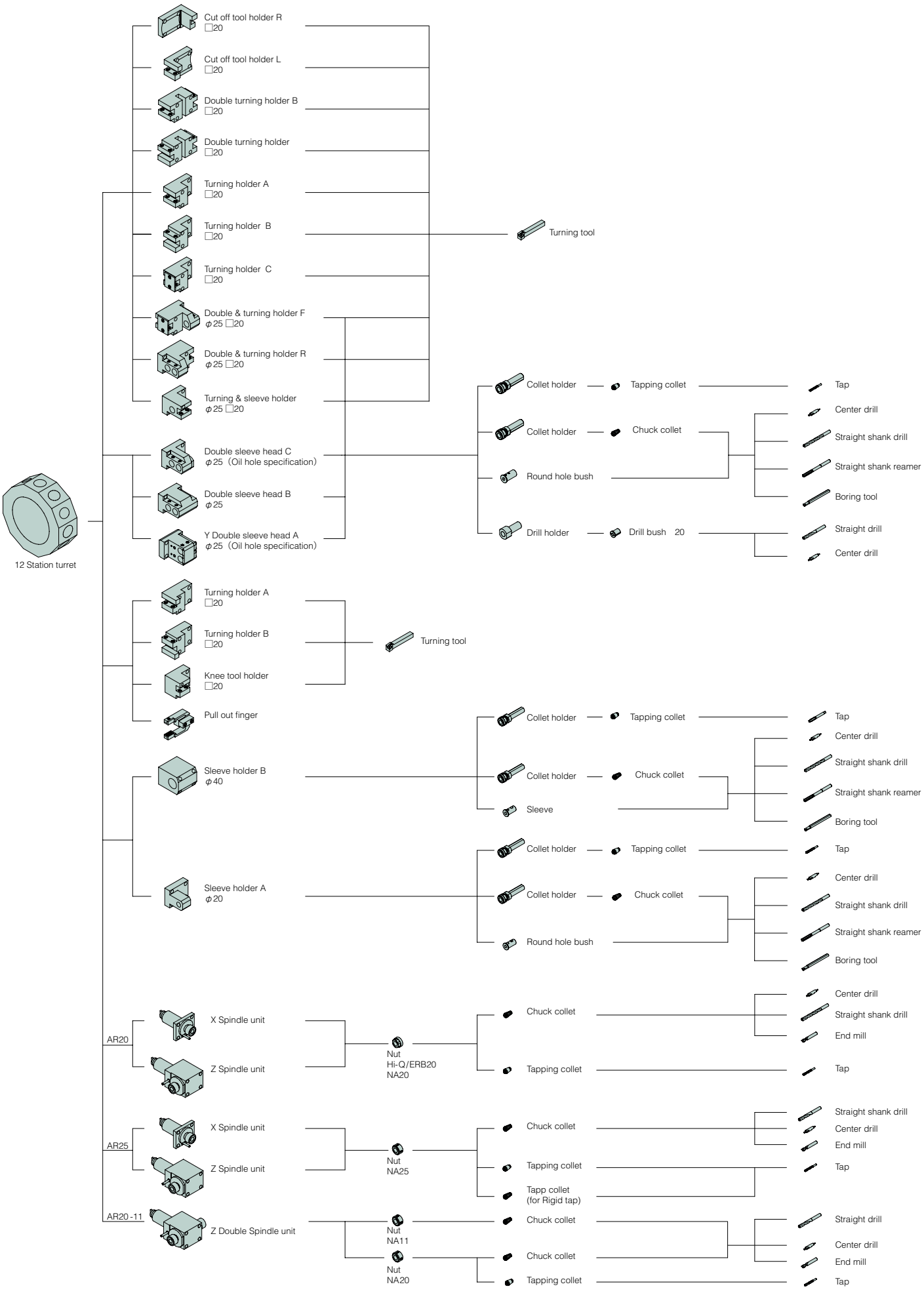
BNE42
SY



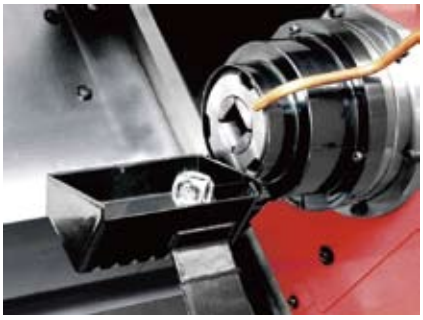
BNE51
SY



Tooling System



Accessories and Options



Part catcher
Catches finished workpieces without damaging them and transfers them to the part conveyor.

Revolving tool
Ensures high-power, stable milling at a torque of 20 Nm.

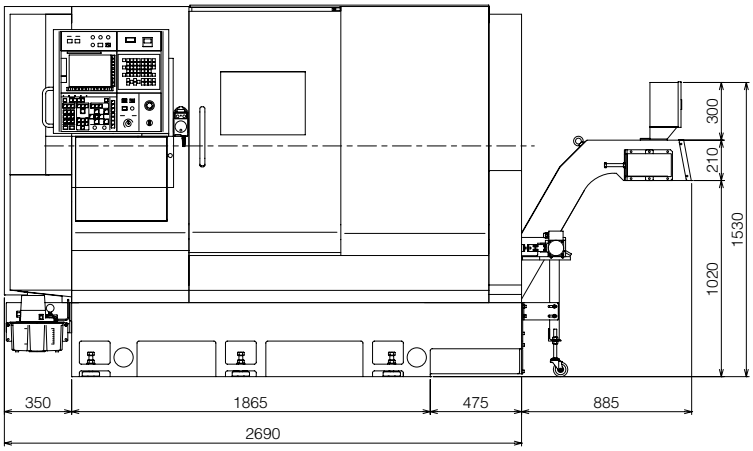
Automatic measuring device
Measures workpieces in the machine wirelessly using optical signal transmission.

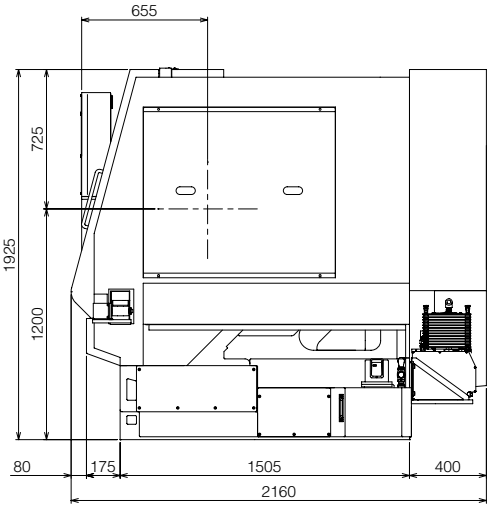
Bar feeder
A range of barfeeders is available for short or long bars.

Chip conveyor
Ejects chips smoothly. Various types are available to suit the application.

External View

S





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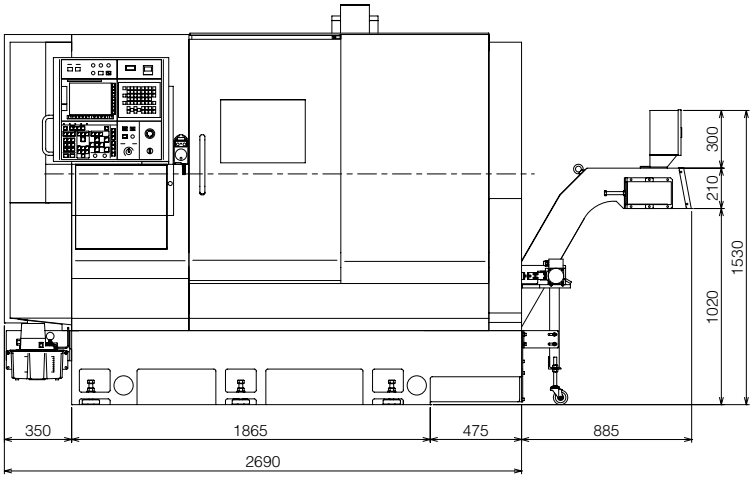
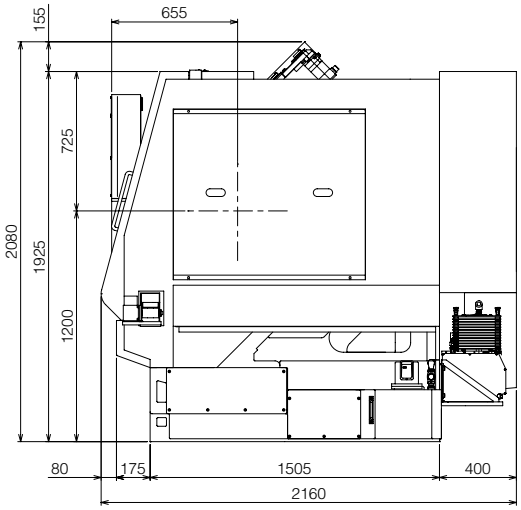
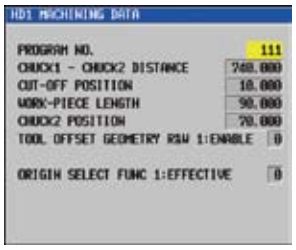


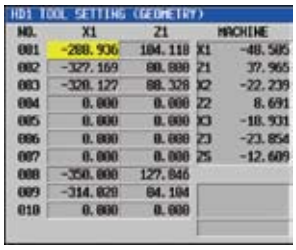


Support Screens



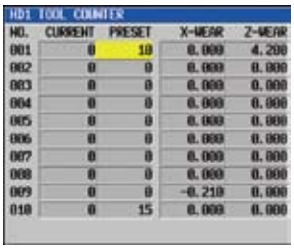
Machining data

Entering the machining length and position of the cut-off here makes it easier to measure geometry offsets and to mount tools.



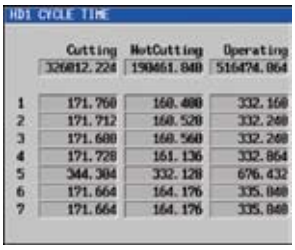
Tool setting

Used to measure geometry offsets. It can also be used for tool mounting support, to ensure that the overhang of all tools is fixed at a constant value.



Tool counter

Informs you of the timing (count-up) for tool changes in accordance with the set tool counter stop value.You can also enter wear offsets.



Cycle time

Allows you to measure the cutting time, non-cutting time and running time in each cycle.

Automatic running monitor (Spindle/ revolving tools)

Allows you to check the status of the spindle during automatic running.

Automatic running monitor (axis)

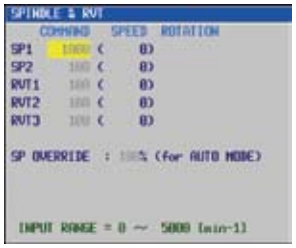
Allows you to check the status of feed axes during automatic running.

Automatic running monitor (status)

Allows you to check the machining conditions during automatic running.

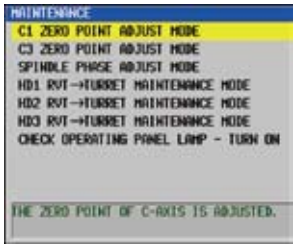
Start condition

Displays information on the start conditions for automatic running.



Spindle and revolving tool unit

Allows you to set the rotational speed (in manual operation) of the spindle and revolving tools, and to set the spindle override.



Maintenance

Used to turn the settings for maintenance ON and OFF.

Tool monitor (option device)

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.

NC Specifications

Model of NC	FS31i-B 2 system
Axial control	HD1: X1, Z1, (Y1), C1, A1
	HD2: X2, Z2, C2, A2, B2
Minimun setting unit	0.001mm, 0.001deg.
Interpolation functions	G01, G02, G03
Thread cutting	G32, G33, G92
Rapid feed override	0-100%
Feed rate override	0-150%
Feed rate perminute/Feed rate	G98/G99
program storage capacity	The sum total of 2 system:64Kbyte (160m)
Spindle function	S4 digit
Support function	M3digit
Constant surface speed control	G96
Tool function	Taabb (aa=Tool number and geometry, bb=Wear offset number)
Tool compensation number	32 pieces, 64 pieces(2 system)
Autmatic operation	Automatic operation, MDI operation, Program number search, Sequence number search,
	Dry run, Single block, Optional stop (M01), Jog feed, Manual reference point return ,
	Set up/ display function, Machine alarm message display, Self-diagnostic function,

	Periodical maintenance screen, Maintenance information screen, Help function,
	Actual speed display, Actual spindle speed and the T code display,
	Each group directory display.punch, Servo adjustment screen,
	Spindle adjustment screen, Hard & soft system configuration display.
Data input-and-output function	Memory card interface, USB memory interface.
Others	10.4" color LCD, Machine lock, Over tarvel, Stored stroke check, Chamfering ON/OFF,
	Backlash compensation, Synchronization / mixture control, Cs outline control,
	Spindle synchronous control, Superposition control, Polar coordinate interpolation,
	Optional block skip, Absolute command, Incremental command, A decimal point input,
	Coordinate system setup, Single form fixed cycle, The circle radius R command,
	Programmable data input.
Option	Cylindirical interpolation, Spindle rigid tap, Revolving tool rigid tap, Herical interpolation,
	Polygon turning, Work coordinate system, Inch / metric change,
	Tool nose radius compensetion, Custom macro, Multiple repetitive cycles,
	Program storage capacity addition, Background editing, Tool nose radius compensetion,
	Run hour and the number of parts display, Leader puncher interface, RS-232C port.

Machine specifications

Item		BNE-42S6	BNE-51S6	BNE-42SY6	BNE-51SY6
Machining capacity					
Maximum work length		90mm			
Maximum bar diameter	SP1	42mm Dia.	51mm Dia.	42mm Dia.	51mm Dia.
	SP2	42mm Dia.	42mm Dia.	42mm Dia.	42mm Dia.
Spindle					
Number of spindles		2			
Spindle speed	SP1	6,000 min^{-1}	5,000 min^{-1}	6,000 min^{-1}	5,000 min^{-1}
	SP2	5,000 min^{-1}			
Spindle nose	SP1	Flat	A2-6	Flat	A2-6
	SP2	Flat			
Draw tube Dia.	SP1	43 mm Dia.	52 mm Dia.	43 mm Dia.	52 mm Dia.
	SP2	43 mm Dia.			
Type of collet chuck	SP1	H-S20/ DIN173E	H-S22/ DIN177E	H-S20/ DIN173E	H-S22/ DIN177E
	SP2	H-S20/ DIN173E			
Power chuck size and type	SP1	5" (135 mm Dia.) Hydraulic	6" (169 mm Dia.)	5" (135 mm Dia.)	6" (169 mm Dia.)
	SP2	5" (135 mm Dia.) Hydraulic			
Turret					
Number of turret		2			
Turret stations	HD1	12ST.			
	HD2	12ST.			
Shank size of square turning tool		20 mm Sq.			
Diameter of drill shank		25 mm Dia.			
Revolving tool					
Number of revolving tools		Max.12+12			
Type of revolving tools		Single clutch			
Tool spindle speed range		Max. 6,000 min^{-1}			
Feed rate					
Rapid feed rate	X1axis	18 m/ min			
	X2axis	16.2 m/ min			
	Z1axis	20 m/ min			
	Z2axis	18 m/ min			
	Y1axis			12 m/ min	
	Baxis	20 m/ min			
Slide stroke	X1axis	175 mm			
	X2axis	145 mm			
	Z1axis	380 mm			
	Z2axis	175 mm			
	Y1axis			±40 mm	
	Baxis	450mm			
Motors					
Spindle motor	SP1	15/ 11 kw (15min. /cont)			
	SP2	5.5/ 3.7 kw (15min. /cont)			
Revolving tool motor		2.2 kw 20 Nm			
Hydraulic operating motor		1.5 kw			
Lubricating motor		0.023 kw			
Coolant motor		0.25 kw			
High-pressure coolant motor		0.8/ 1.36 kw (50/ 60Hz)			
Turret index motor		0.75 kw			
Power supply					
Capacity		43 KVA	44 KVA	43 KVA	44 KVA
Voltage		AC 200 V			
Air supply		0.5 Mpa			
Fuse		125 A			
Tank capacity					
Hydraulic oil tank capacity		10 L			
Lubricatibg oil tank capacity		4 L			
Coolant tank capacity		350 L			
Machine dimensions					
Machine height		1,925 mm		2,080 mm	
Floor spase		W2,690×D2,160 mm			
Machine weight		7,600 kg	7,800 kg	7,600 kg	7,800 kg
Optional accessories					
Spindle brake, Air blow, Work ejector, Automatic fire extinguisher, Automatic power shut-off, Chip box, Parts conveyor, Coolant level switch, High pressure coolant,					
Inner high pressure coolant & air blow, Tool setter, Parts Catcher, Parts Box, Collet chuck system, Chip conveyor, Total & preset counter, Oil mist collector, Signal tower,					
Filler tube, Spindle inner bushing, Bar feeder inner bushing, Cut-off confirmation, Parts carrier, Left over catcher, Drill checker.					

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CITIZEN
Micro HumanTech

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