Miyano

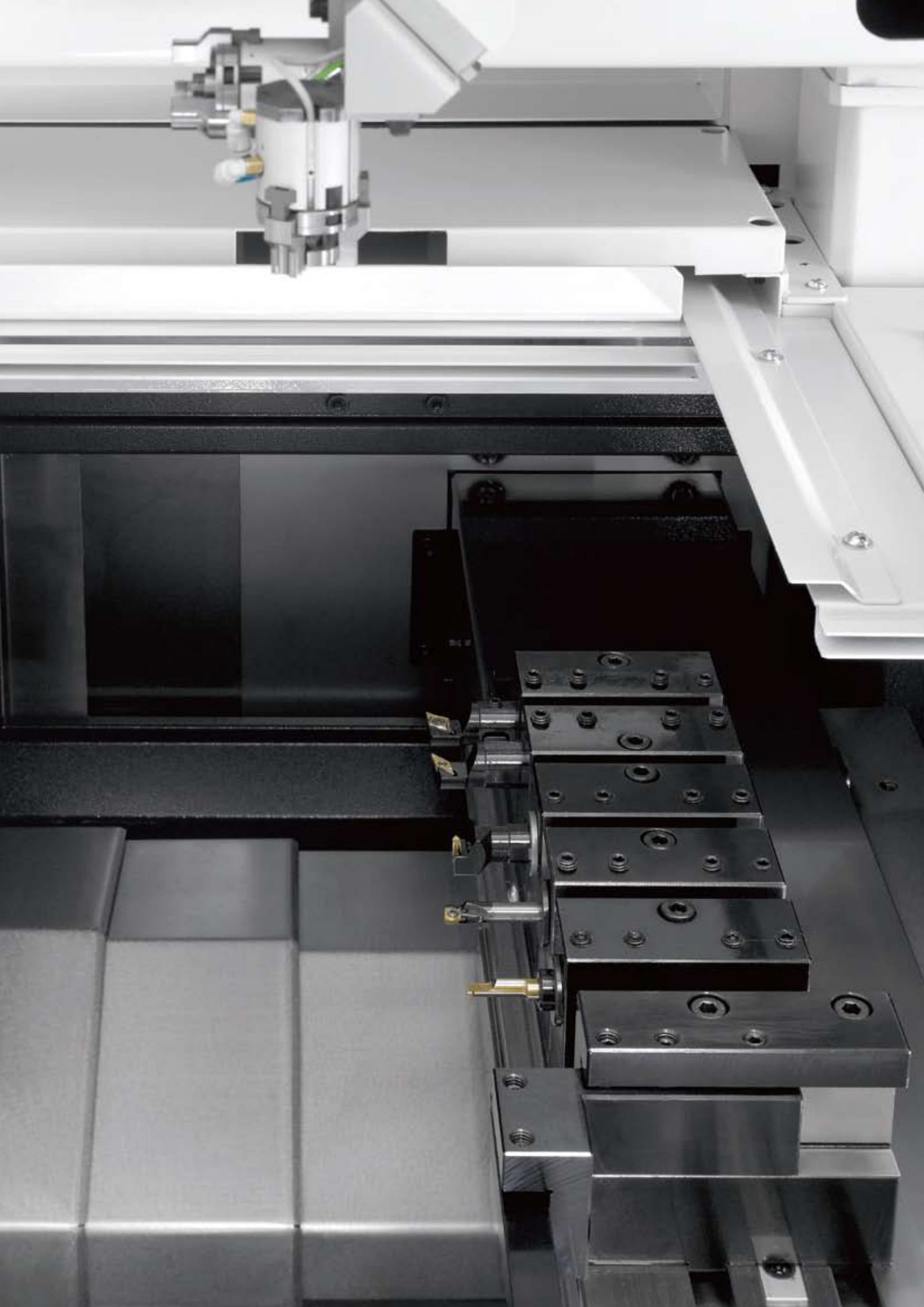
GN4200

High Precision CNC Lathe

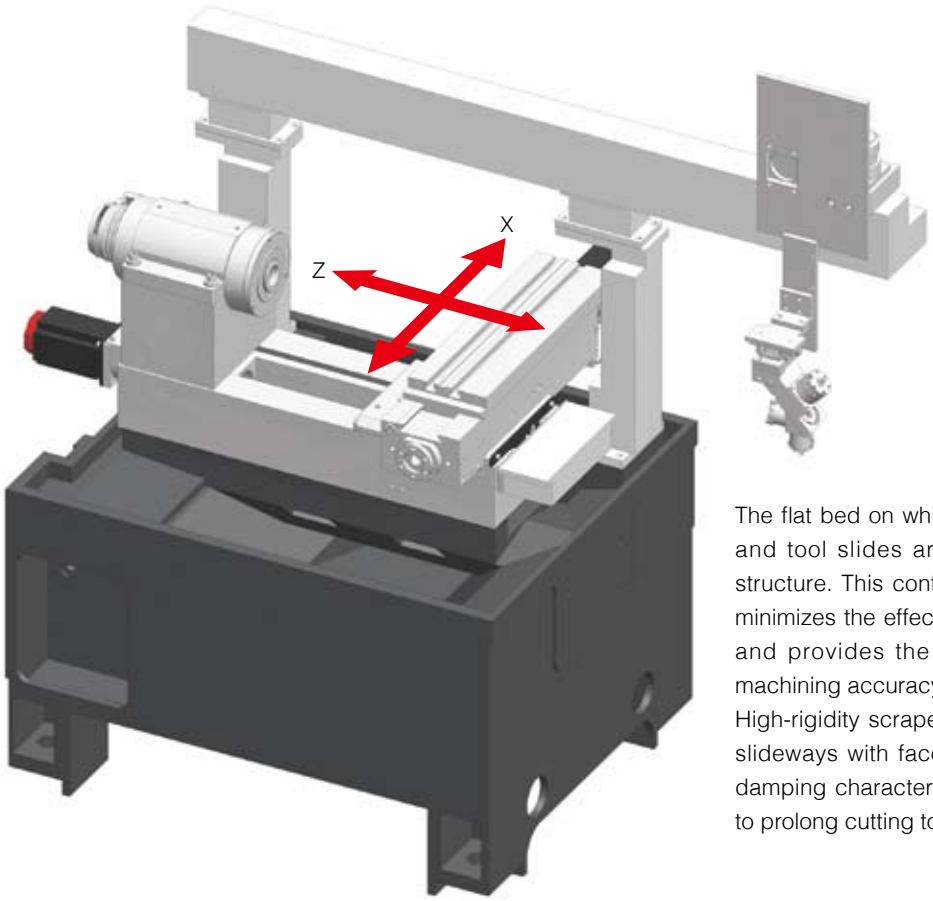
Designed for high-precision machining of small-diameter workpieces, this machine has a wing type fixed spindle for low thermal influence installed on a thermally symmetrical machine base. It inherits the “design concept for high precision” that is a tradition at Ocean Cincom.

Combined with slideways with excellent damping characteristics finished by highly skilled masters of the art of scraping, this construction ensures outstanding machining accuracy in dimension and in roundness.

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.



Basic Construction



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.

Original winged spindle headstock

Main spindle is mounted using a wing sleeve system. The construction is such that only the “wing” parts make contact with the slide faces and the central part of the sleeve is suspended, so spindle heat generation is uniform and heat is not easily transmitted to the headstock.

Slideway configuration offering high positioning accuracy

Because the spindle and tool slide are arranged on the same slideway the thermal deformation is also in the same direction and uniform, so the spindle center is always at a constant position.

Program-controlled slideway lubrication

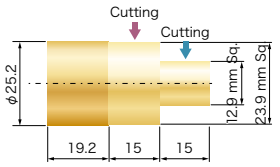
The supply of lubricating oil to a slideway results in a very slight lift and yawing, affecting machining accuracy to a very small degree. The use of “program-controlled lubrication”, which enables control matched to cycle times, makes it possible to generate an oil film of the ideal thickness and achieve stable high accuracy.

Increased Speed for High-efficiency Machining

A tool table with an X-axis slide stroke 50 mm bigger than on existing machines allows a wide range of fixed and rotary tools to be mounted. Faster cycle times are achieved with quick acceleration/ deceleration of axis moves over short travel distances.

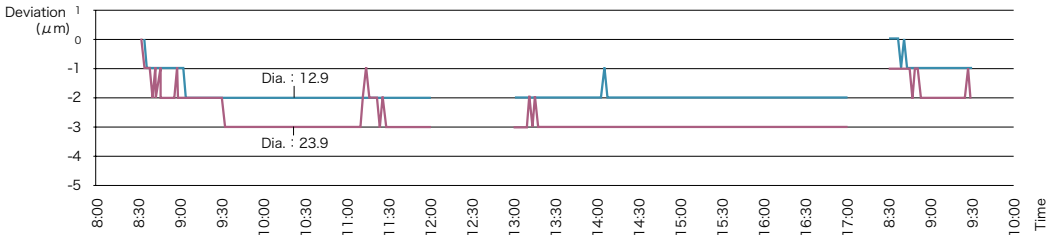
Machining accuracy

Test piece

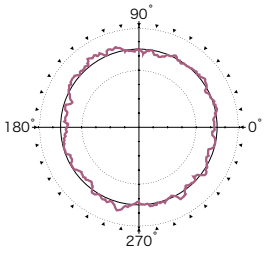


Material	: BSBM
Spindle speed	: 2500 m^{-1}
Feed	: 0.05 mm/ rev
Depth of cut	: 0.1 mm
Machining time	: 1'40"
Cycle time	: 2'

Accuracy



Roundness: 0.25 μm

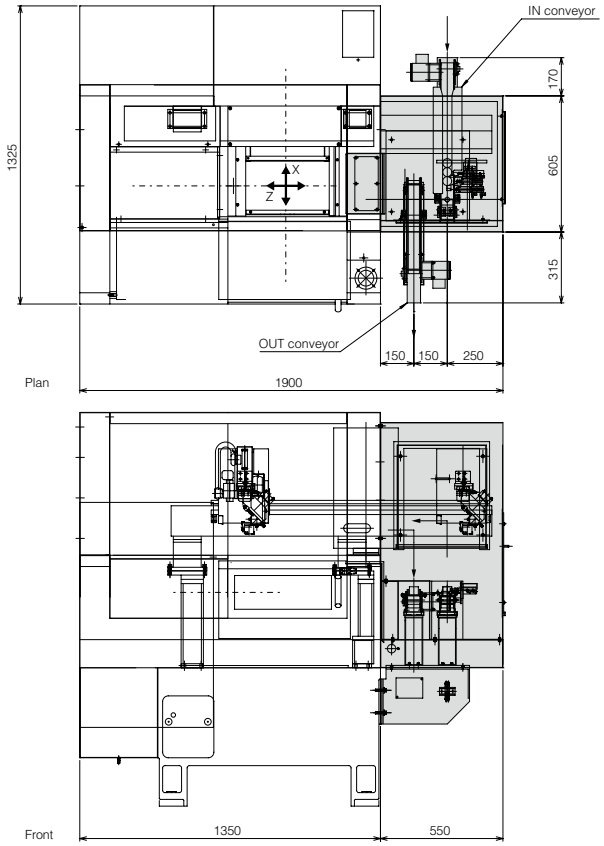


Dry cutting test results

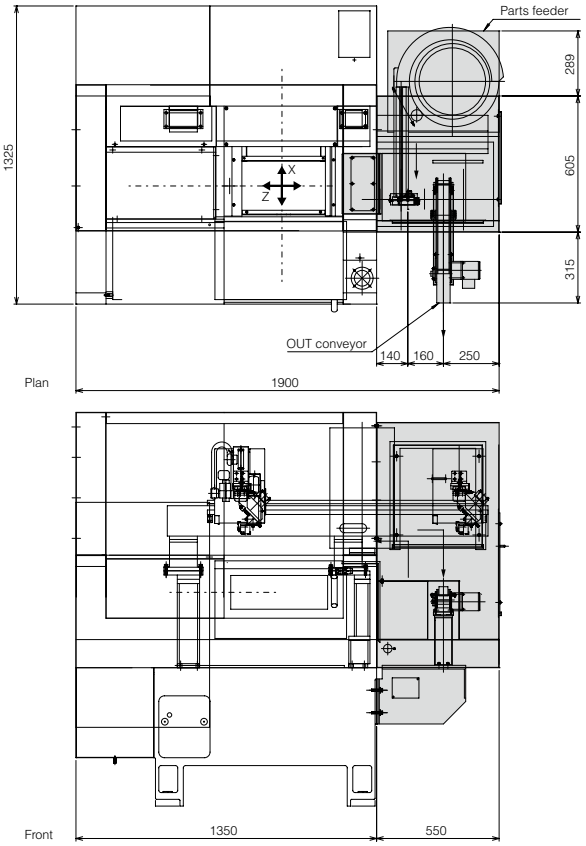
	O.D. changes				No. of test piese (pcs.)	Roundness (μm)	Cylindricity (μm)	Rouughness
	1 day	1-hour stop	Next day	Start change				
23.9 mm Sq.	3μm	0μm	1μm	0μm	1	0.25	0.5	0.252
					100	0.2	0.5	0.246
					200	0.25	0.6	0.245
12.9 mm Sq.	2μm	0μm	0μm	0μm	1	0.35	0.75	0.27
					100	0.35	0.6	0.271
					200	0.25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

Example configurations

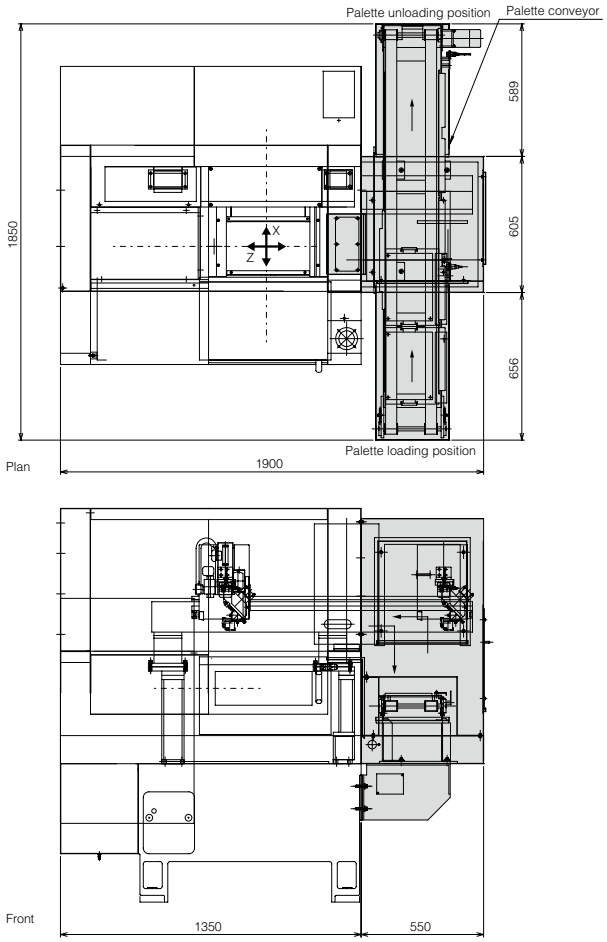
IN conveyor/ OUT conveyor



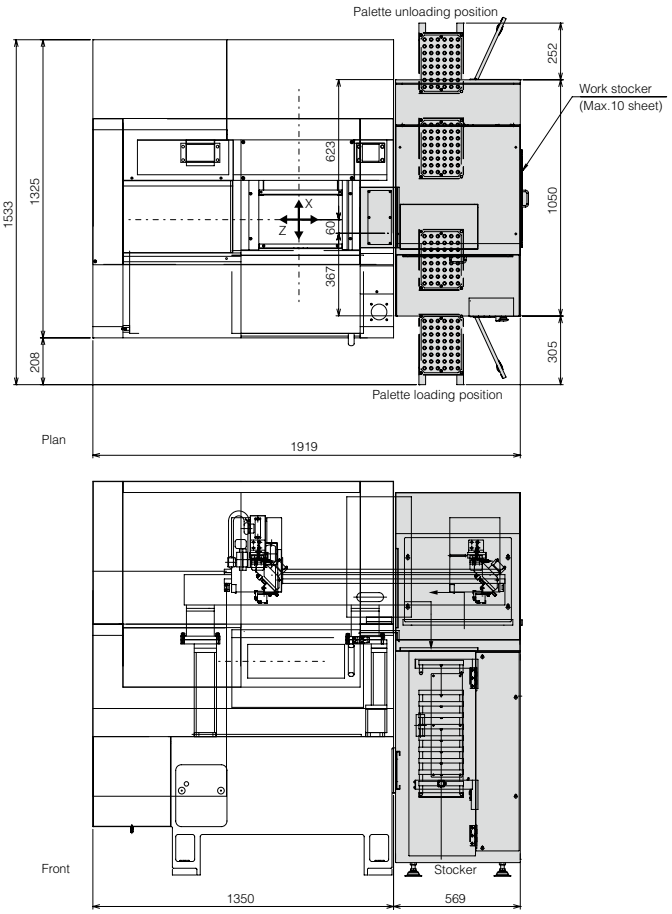
Part feeder/ OUT conveyor



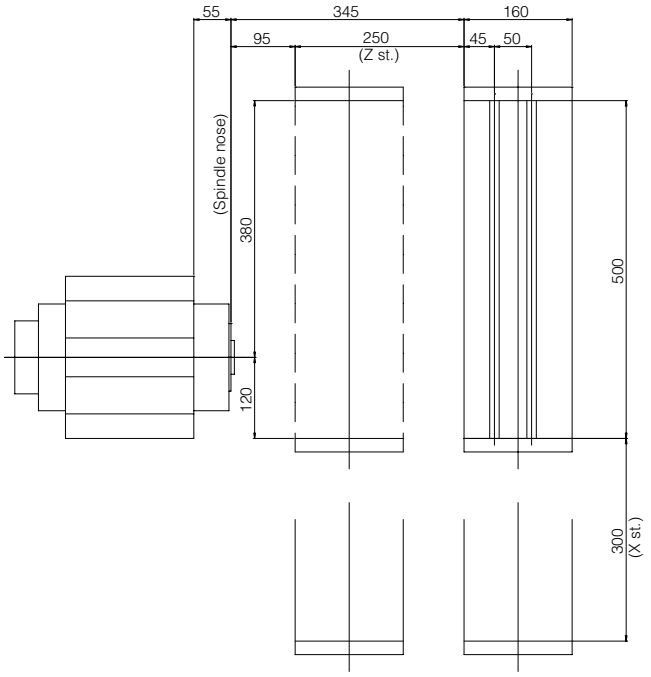
Pallet conveyor



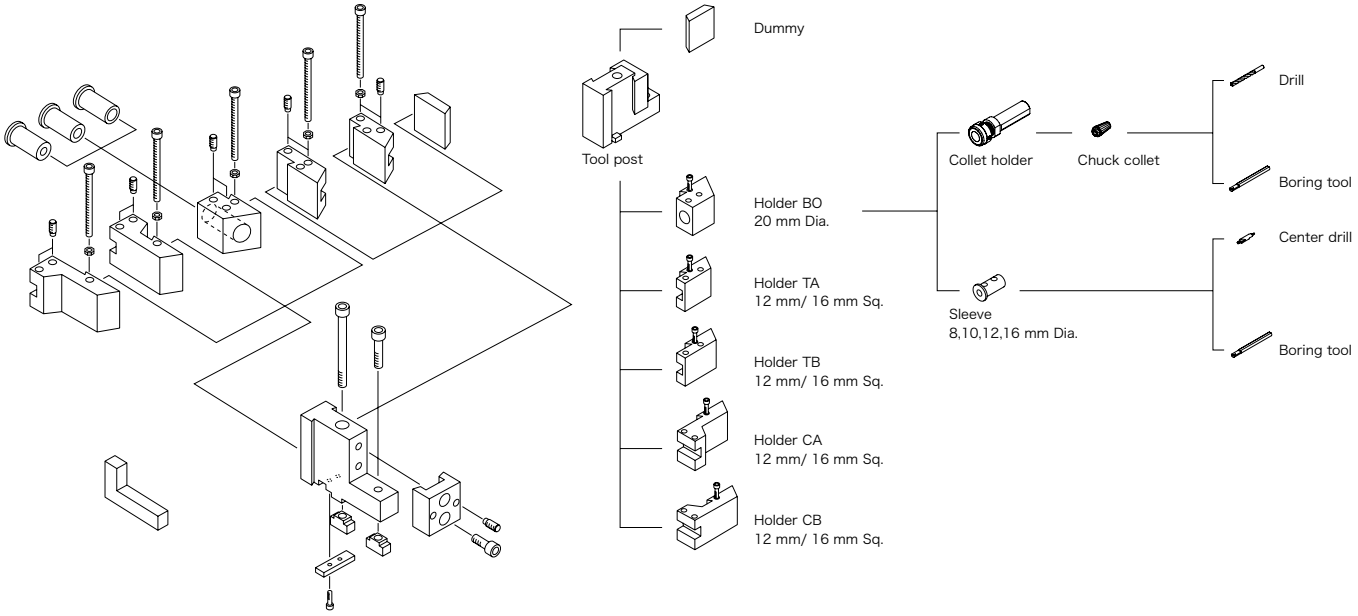
Pallet stocker



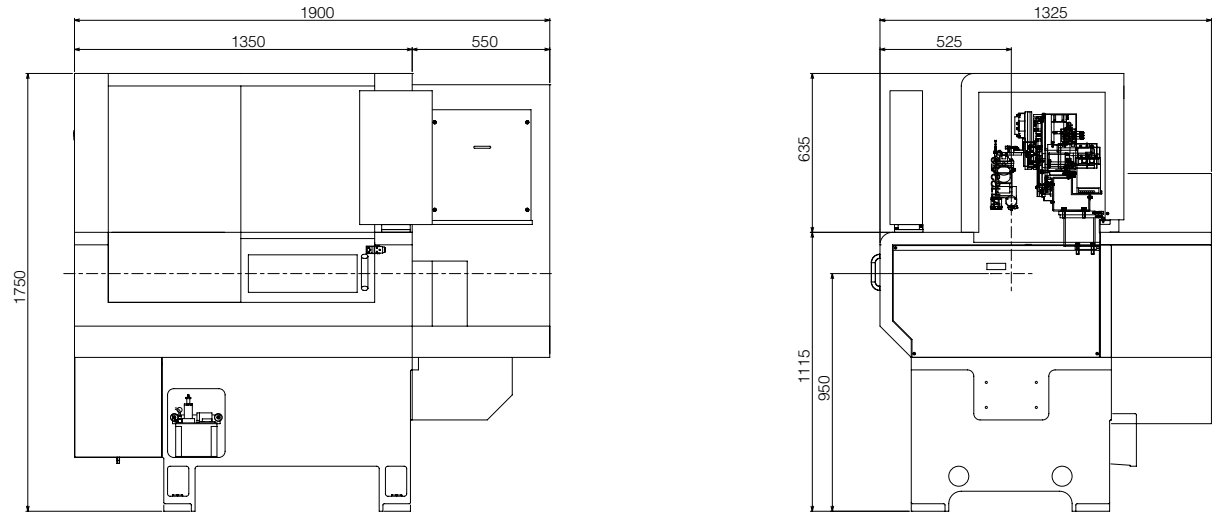
Tooling area



Tooling system



External view



Machine specifications

Items		GN-4200
Machining capacity		
Max. Diameter of collet chuck	Fine precision air chuck	45 mm Dia.
	Pull type collet chuck	40 mm Dia. (Stationaryφ35mm)
Max. Machining length		80 mm
Spindle		
Number of spindle		1
Spindle nose		Special flat
Through hole diameter		26 mm Dia.
Inner diameter of draw tube		15.4 mm Dia.
Max. spindle speed		8,000 min^{-1}
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 travel	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		10, 12, 16 mm Sq.
Diameter of drill shank		20 mm Dia.
Motor		
Spindle drive		3.7 kw
Coolant		
Tank type		Separate type
Tank capacity		125 L
Mchine dimensions		
Machine height		1,695 mm
Floor space		W 1,350 × D1,325 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 piece size		40 × 40 mm Dia.
Max. weight capacity		250 g
Control system		PMC axis control
Control soft		Flexible loader control
Drive system	Right and left operation	Rack & pinion
	Upper and lower sides	Rack & pinion
Options		
Spindle air blow, High pressure coolant, Coolant level switch, Counter, Signal tower, Coolant mist collector,		
Automatic power shut off, Chip conveyor, Chip Box.		

NC Specification

NC unit	FS 0i-TD
Controlled axis	X, Z, with loader 2-axis (E,Y)
Min output increment	X-axis: 0.00005 mm (Radius value)
	Z-axis: 0.0001 mm
Parts program storage capacity	512Kbyte
No of registered programs	400
Spindle function	Directly specified spindle speed (G97)
	Constant cutting speed control (G96)
Cutting feed	Feed / min (G98), Feed / rev. (G97)
Rapid feed rate override	F0,10, 20, 30, 40, 50, 60, 70, 80, 90,100%
Cutting feed rate override	0-150% (16step)
Interpolation	G01, G02, G03
Threading	G32, G33, G34, G92
Canned cycle	G90, G92, G94
Coordinate system setting	Automatic system setting or G50
Tool compensation	64 pieces
Tool selection and work cordinate settings,	Taabbaa at the specified position for each turret tool wear and tool
wear compensation	compensation is selected by bb.
Direct input of tool position	by measured MDI
Data input and output function	RS-232C, USB memory interface, PC card slot
Automatic operation	Single cycle automatic operation,
	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),	
Multi-language display, Manual pulse generator, Memory protect,	
Spindle orientation, Alarm display	
NC option package	
Chamferring/Corner R, Direct drawing dimension programming,	
Canned cycles for drilling	
Custom macro B, Multiple repetitive canned cycle (G70-G76),	
Extended part program editing.	
Background editing, Operating time/Parts No. display, Clock function,	
Spindle rigid tapping, Tool nose R compensation,	
Tool life management system,	
NCoption	
Cs-axis control	

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PRINTED IN JAPAN JUN. 2015