OKUMA

2-Saddle CNC Lathe

LU-S1600

2-Saddle CNC Lathe
LU-S1600

Intelligent Technology

Thermo-Friendly Concept

Collision Avoidance System

Machining Navi

SERVONAVI

The standard for compact 2-saddle turning centers
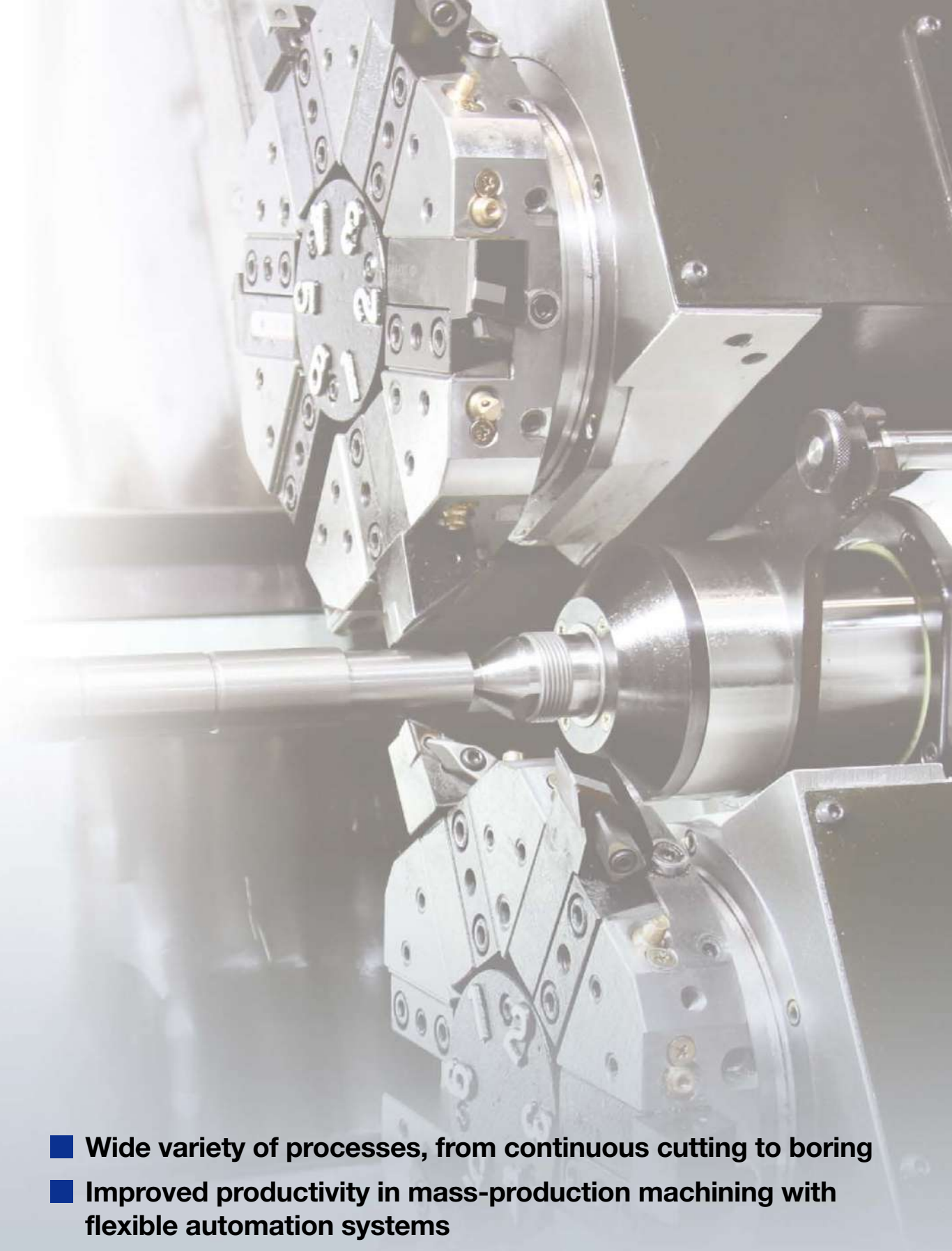
- ■ Wide variety of processes, from continuous cutting to boring
- ■ Improved productivity in mass-production machining with flexible automation systems
- ■ High-accuracy machining achieved even in long-run, continuous operations

Photos shown in this brochure include optional equipment.

Huge productivity improvements in mass-production machining

Much shorter lead time for shaft workpieces

Shorter cycle times with simultaneous machining on upper and lower turrets. Faster parts machining contributes greatly to improved shop floor QCD (quality, cost, delivery).
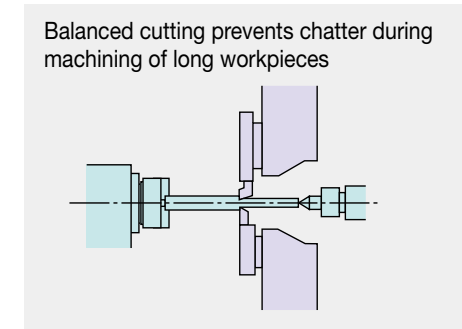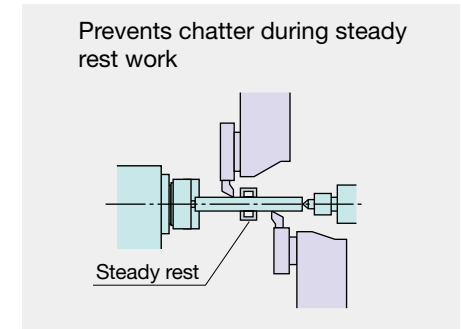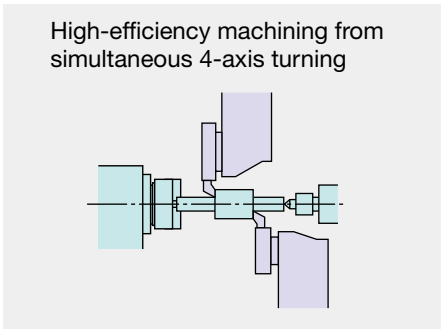
Machining Example

■ OD turning including continuous cutting

Cycle time: **1 min 28 sec**

Size: ø35 mm × L350 mm
Material: FCD600

Diverse machining range with simultaneous 4-axis machining

Effective use of simultaneous 4-axis control enables machining suited to the user's workpiece.

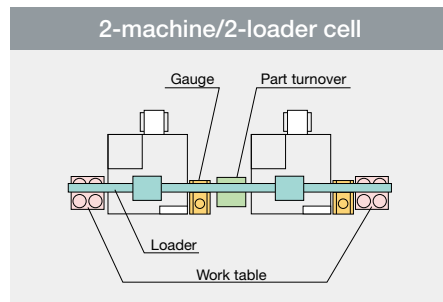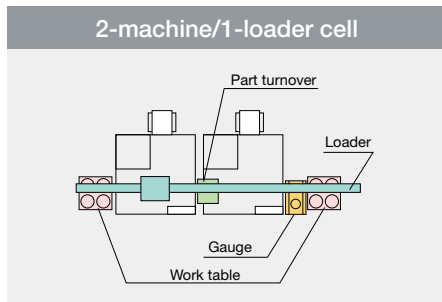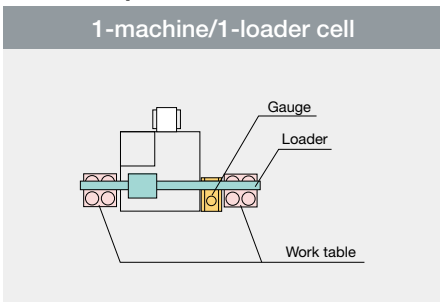| High-efficiency machining from simultaneous 4-axis turning	Prevents chatter during steady rest work	Balanced cutting prevents chatter during machining of long workpieces
	Steady rest	

1-machine 1-loader applications to full-scale production lines

Okuma proposes the best automation systems for customers' machining needs, including all peripheral devices, from work tables to gauges. The highest productivity with stable quality is achieved through all-out pursuit of speed, cost, and quality in mass-production parts machining.

● Get outstanding flexibility from 1-machine/1-loader to multi-machine lines, with optimum cycle times, operation mix, work flow, floor space and the like.

● Selection of work tables, part turnover stands, post-process gauges and other peripherals, can provide an ideal system arrangement to meet your needs.

Loader Specs

1-machine/1-loader cell	2-machine/1-loader cell	2-machine/2-loader cell
Gauge, Loader, Work table	Part turnover, Loader, Gauge, Work table	Gauge, Part turnover, Loader, Work table

• Blanks and finished parts can be stacked on one work table. (Not possible with 2-machine/2-loader specs.)
• 2-machine/2-loader cell machines can be laid out in parallel.

High precision machining of long workpieces with a movable steady rest (Optional)

A movable steady rest can be attached to the tailstock or lower turret rails. High accuracy machining can be done even with long workpieces which are susceptible to chatter and runout.
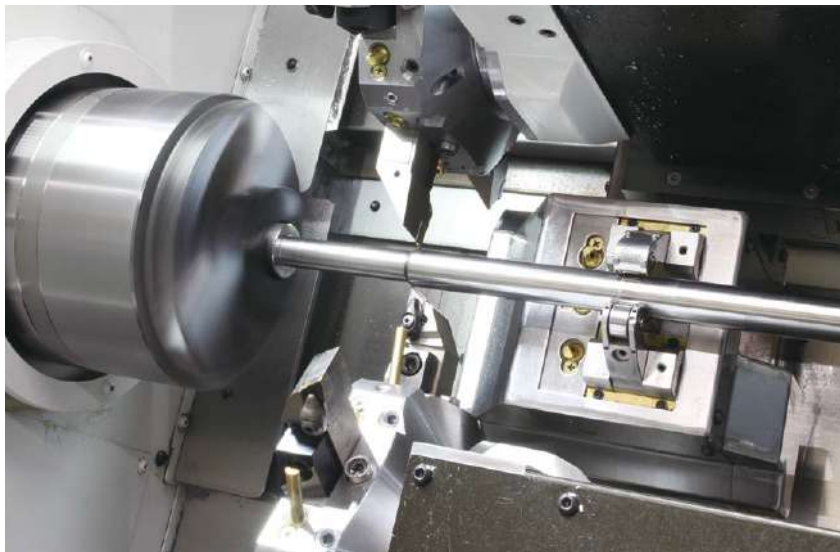
The steady rest in this photo has tailstock slideway install specs

Smooth, powerful machining

Powerful turning

■ Machining capacity
(15/11 kW spindle [Opt] actual data)
● Turning: **2 mm^2** (S45C)

Cutting speed:	150 m/min
Infeed:	4 mm
Feed:	0.5 mm/rev

Motor placed in minimal thermal deformation location

Mounting the spindle motor outside the bed minimizes the effect of thermal deformation on machining accuracy. Outside motor mount also makes maintenance work easier.

Tough structure stands up easily to continuous cutting

The upper and lower turret feed axes use slide guideways for easy handling of continuous cutting, which places a large burden on the machine.
Rugged structure from placement of multiple ribs within the bed gives substantial construction while maintaining a compact size.

Machine configuration for outstanding workability

60° slant bed construction ensures superior visibility of the tool edge and machining status, plus a working chamber sufficient for loader handling. Operator burden is also decreased with workability considerations including workpiece loading/unloading position and tool change position for working ease.
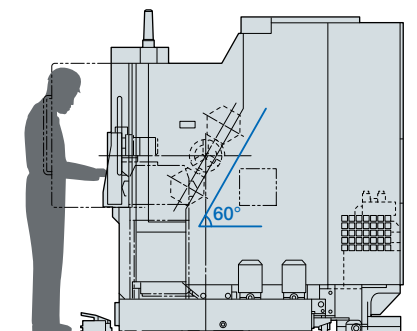
Select the control you are familiar with

The availability of both OSP and FANUC systems lets you choose the controller you are familiar with. Smooth startup of production lines after machine installation can be achieved by sharing part programs from other machines.

OSP-P300LA   FANUC 0i-TF

Broad range of workpieces, wide variety of operations

The large working range allows for machining of up to a maximum of ø160 mm. The LU-S1600 can also handle boring bars up to ø32 mm, for powerful machining of inner diameters of CVJ outer rings and other workpieces. Various other applications are also possible, including balanced simultaneous 4-axis cuts on upper and lower turrets, inner and outer diameters.

Fast turret movement

● Turret indexing time:
0.15 sec per station
(both upper and lower)

Achieves stable machining

Stable machining of long workpieces with highly rigid tailstock that uses a MT No. 5 revolving center.
An optional built-in tailstock for MT No. 4 centers is also available.

Smooth, continuous operation with complete chip handling

XB double wipers are used on the lower turret where chips accumulate, while a chip flusher is used on the saddle top. Chip discharge is greatly improved with the use of a single stainles steel sheet for the guideway cover on the spindle side, enabling continuous mass-production operations.
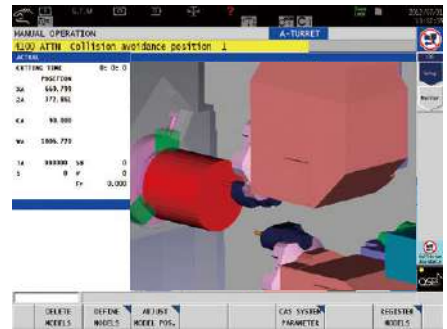
Note: The "actual data" referred to above for this brochure represent examples, and may not be obtained due to differences in specifications, tooling, cutting, and other conditions.

Okuma's Intelligent Technology reduces operator burden

Collision prevention
Collision Avoidance System [Optional]

■ Allowing operators to focus on making parts

NC controller (OSP) with 3D model data of machine components—workpiece, tool, chuck, fixture, headstock, turret, tailstock—performs real time simulation just ahead of actual machine movements. It checks for interference or collisions, and stops the machine movement immediately before collision. Machinists (novice or pro) will benefit from reduced setup and trial cycle times, and the confidence to focus on making parts.

### ■ Collision prevention during automatic operation

NC program is read in advance and axial travel commands are checked for interference with consideration of zero point and tool compensation values set in NC. Axial travel movement is stopped temporarily before collision occurs.

■ Collision avoidance in manual operation

Especially useful for machine operators setting up a job, collision avoidance in manual mode provides collision-free confidence and faster machining preparations.
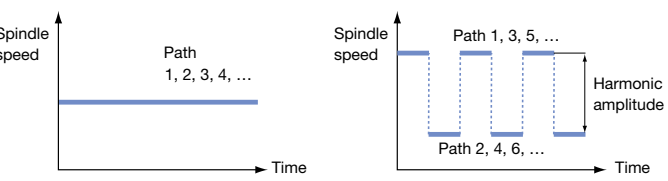
Virtual machine (interference check)

Cutting condition search for turning
Machining Navi L-g (Harmonic Spindle Speed Control)
[Optional]

Varying the spindle speed in accordance with the best amplitude and period makes it possible to suppress chatter during turning operations. Tool life can be extended and cycles times reduced with use of the optimum cutting conditions, producing significant effects in deep-hole boring bar, threading, and grooving applications.
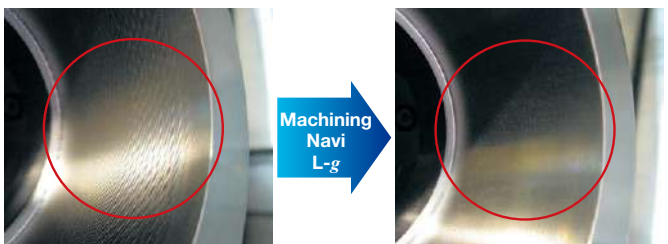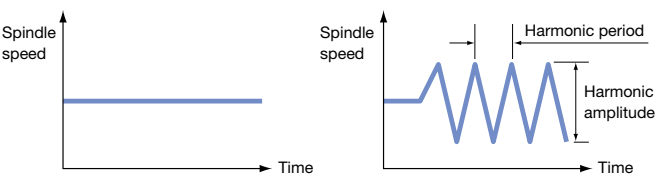
Cutting condition search in threading
Machining Navi T-g (threading)
[Optional]

When chatter occurs in threading, general methods to resolve the problem have been to either lower cutting conditions at the expense of productivity, or to use special chatter-resistant tools at some cost. Machining Navi T-g (threading) provides optimum control, increasing or decreasing spindle speed on each path to inhibit the periodic vibrations that are a cause of chatter.

Spindle speed — Time

Spindle speed — Harmonic period / Harmonic amplitude — Time

Spindle speed — Path 1, 2, 3, 4, … — Time

Spindle speed — Path 1, 3, 5, … / Path 2, 4, 6, … — Harmonic amplitude — Time

Machining Navi L-g

Normal threading

Machining Navi T-g

Chatter marks

Smooth surface, clean finished threads

Manageable Deformation—Accurately Controlled
Thermo-Friendly Concept (OSP only)

■ The unique approach of "accepting temperature changes."

Machine deformation is straightforward thanks to a simplified thermal deformation structure and design technology to distribute heat evenly. This controls complex twisting and slanting while also making it possible to predict the deformation.
Okuma's original, highly accurate control technology also precisely controls for thermal deformation that changes as a result of room temperature changes, whether or not there is coolant, or other reasons.

### ■ Minimizes dimensional changes from thermal deformation

Accurate control in a wide range of usage situations, including use of coolant and travel stop during noon break.

■ Fewer tool compensation checks

Compensation due to ambient temperature changes and temporary midday or evening machine stops is performed fewer times thanks to outstanding dimensional stability. This leads to better machine utilization, improving efficiency especially for mass-production machining.

Machining dimensional change over time (actual)
ø10 μm (Upper turret) ø14 μm (Lower turret)
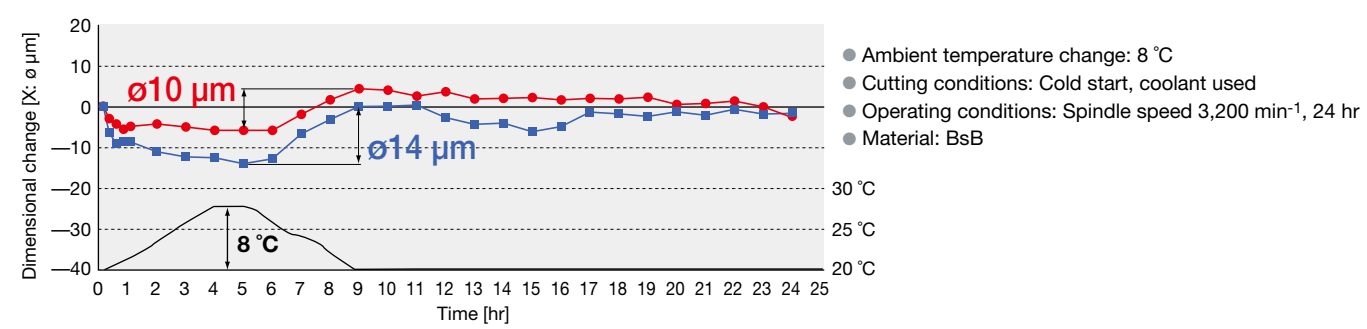
- Ambient temperature change: 8 ˚C
- Cutting conditions: Cold start, coolant used
- Operating conditions: Spindle speed 3,200 min^{-1}, 24 hr
- Material: BsB

(graph: Dimensional change [X: ø μm] vs Time [hr], ø10 μm, ø14 μm, 8 ˚C)

Next-Generation Energy-Saving System
ECO suite

A suite of energy saving applications for machine tools

■ Operation only for the time required for each unit
ECO Idling Stop

Idling time can be set by individual unit for the spindle, feed shaft, and peripheral equipment. By reducing the idling time, power consumption can also be reduced.

■ On-the-spot check of energy savings
ECO Power Monitor

Power is shown individually for spindle, feed axis, and peripheral equipment on OSP operation screen. The energy-saving effect from peripheral equipment stopped with ECO Idling Stop can be confirmed on the spot.

● Intermittent/linked operation of chip conveyor, or mist collector during machining
"ECO Operation" (Optional)

● Example of equipment that can use Idling Stop

● Example of Power Monitor check
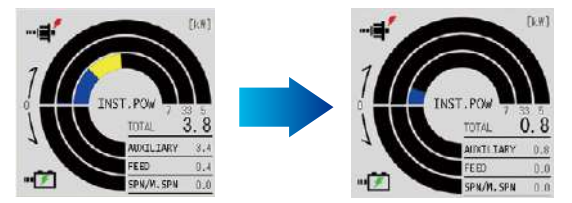
Before ECO Idling Stop

After ECO Idlling Stop

The Next-Generation Intelligent CNC
OSP suite OSP-P300LA

With revamped operation and responsiveness— ease of use for machine shops first!

Smart factories implement advanced digitization and networking (IoT) in manufacturing to achieve enhanced productivity and added value. The OSP has evolved tremendously as a CNC suited to advanced intelligent technology. Okuma's new control uses the latest CPUs for a tremendous boost in operability, rendering performance, and processing speed. The OSP suite also features a full range of useful apps that could only come from a machine-tool manufacturer, making smart manufacturing a reality.

Smooth, comfortable operation with the feeling of using a smart phone

Improved rendering performance and use of a multi-touch panel achieve intuitive graphical operation. Moving, enlarging, reducing, and rotating 3D models, as well as list views of tool data, programs, and other information can be accomplished through smooth, speedy operations with the same feel as using a smart phone. The screen display layout on the operation screen can also be changed to suit operator preferences and customized for the novice and/or veteran machinists.

Smooth operations even with wet or work-gloved hands

Enlarge

Rotate

"Just what we wanted."— Equipped with many suite applications!

This became possible through the addition of Okuma's machining expertise based on requests we heard from real, machine-shop customers. The brainpower packed into the CNC, built by machine tool manufacturer, will "empower shop floor" management.

Increased productivity through visualization of motor power reserve
Spindle Output Monitor
S11

The specified spindle output (red line: short time rating, green line: continuous rating) and the spindle output in current cutting (blue circle) are simultaneously displayed on the screen, for real-time view of power reserve during cutting. This allows speeding up cutting by increasing the spindle speed or feed rate while monitoring the graph to ensure that the blue circle does not cross the lines.

Easy programing without keying in code
Scheduled Program Editor
S10
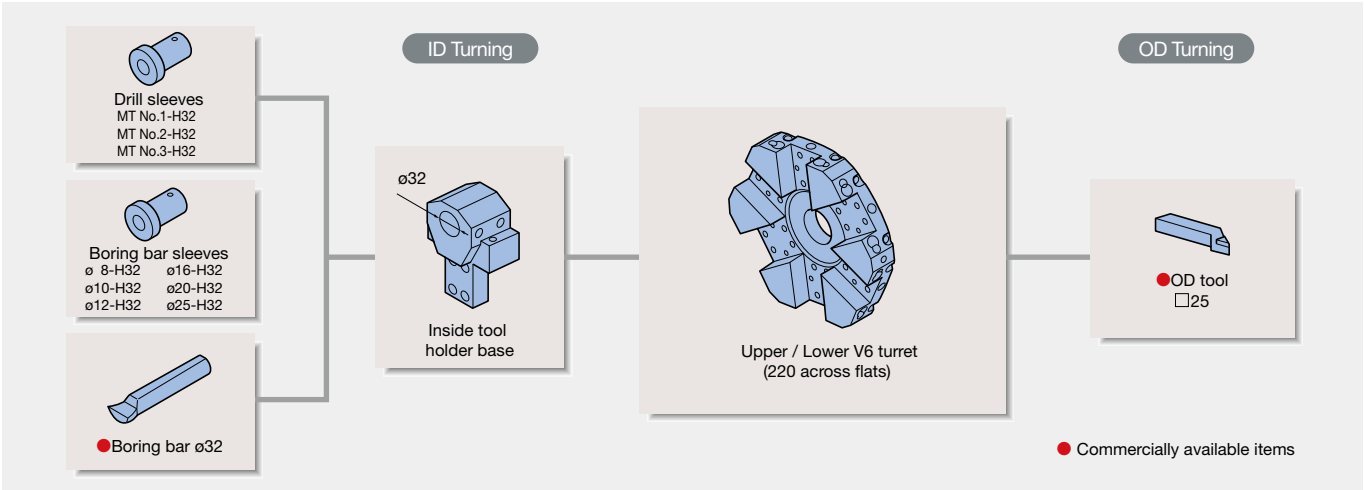
Monitoring operating status even when away from the machine
E-mail Notification
S15

■ Machine Specifications

	Item	Unit	LU-S1600		
			480 DBC	550 DBC	1000 DBC
Capacity	Standard chucks		8 inch		
	Swing over bed	mm (in.)	ø500 (19.69)		
	Max. turning diameter	mm (in.)	ø160 (6.30)		
	Max. turning length	mm (in.)	480 (18.90)	550 (21.65)	1,000 (39.37)
Travel	XA, XB axis	mm (in.)	100 (3.94)		
	ZA, ZB axis	mm (in.)	500 (19.69)	570 (22.44)	1,100 (43.31)
Spindle	Speed	min⁻¹	40 to 4,000: OSP/FANUC [50 to 6,000: OSP only]		
	Nose type		JIS A2-6 [ø140 flat]		
	Front bearing dia.	mm (in.)	ø100 (3.94)		
	Bore dia	mm (in.)	ø62 (2.44)		
Turret	Type (both upper/lower)		V6		
	No. of tools (both upper/lower) tool		6		
	OD tool shank dimensions	mm (in.)	□25 (0.98)		
	ID tool shank diameter	mm (in.)	ø32 (1.26)		
	Indexing time	sec/1 index	0.15		
Feedrate	Rapid feedrate	m/min (fpm)	X: 20 Z: 30 (X: 65.62 Z: 98.43)		
Tailstock	Movable tailstock		Handle [NC]		
	Tapered bore type		MT No. 5 (revolving center) [MT No. 4 (built-in center)]		
	Travel	mm (in.)	340 (13.39)	300 (11.81)	700 (27.56)
	Quill diameter	mm (in.)	ø90 (3.54)		
	Quill travel	mm (in.)	120 (4.72)		
Motor	Spindle drive [OSP]	kW (hp)	4,000 min⁻¹: 11/7.5 (15/10) (30 min/cont) [15/11 (20/15) (30 min/cont)]		
			[Integral motor 6,000 min⁻¹: 11/7.5 (20 min/cont) 15/11 (15 min/cont)]		
	Spindle drive [FANUC]	kW (hp)	4,000 min⁻¹: 11/7.5/7.5 (15 min/60 min/cont)		
			[4,000 min⁻¹: 15/11/11 (15 min/60 min/cont)]		
Machine size	Machine height	mm (in.)	2,054 (80.51)		2,247 (88.46)
	Floor space (machine only)	mm (in.)	2,440 × 1,980 (96.06 × 77.95)		3,235 × 2,282 (127.36 × 89.84)
	Spindle center height	mm (in.)	Side discharge : 1,145 (45.08)		
	Machine weight	kg (lb)	5,000 (11,000)		6,200 (13.640)
CNC			OSP-P300LA , FANUC 0i-TF		

[ ]: Optional

■ Tooling System

Drill sleeves
MT No.1-H32
MT No.2-H32
MT No.3-H32

Boring bar sleeves
ø 8-H32   ø16-H32
ø10-H32   ø20-H32
ø12-H32   ø25-H32

●Boring bar ø32

ID Turning

ø32

Inside tool holder base

OD Turning

Upper / Lower V6 turret
(220 across flats)

●OD tool
□25

● Commercially available items

■ Standard Specifications & Accessories

Spindle	JIS A2-6 40 to 4000 min⁻¹
	OSP: 11/7.5 kW (30 min/cont)
	FANUC: 11/7.5 kW (15 min/cont)
Turret (both upper and lower)	V6 turret bolt clamp
Tailstock	MT No. 5 (revolving center)
Accessory	Hydraulic unit
equipment	Coolant system
	Full-enclosure shielding
	Work lamp (LED)
	Foot switch for chucks
	Foot switch for tailstock quill
	Lubrication monitor
	XB axis double wiper
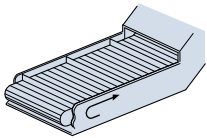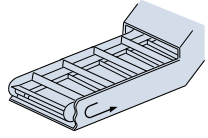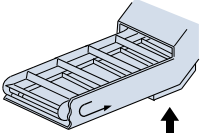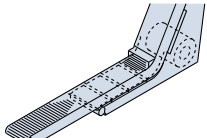
■ Standard chuck size

	Solid/hollow chuck	
OD chuck	8-inch	10-inch
Standard spindle A2-6	●	●
High-power spindle A2-6	●	●
High-speed spindle ø140	●	
High-speed high-power spindle ø140	●	

■ Optional Specs & Accessories

High-power spindle	JIS A2-6 40 to 4,000 nin⁻¹
	OSP: 15/11 kW (30 min/cont) FANUC: 15/11/11kW (15 min/60 min/cont)
High-speed spindle	OSP only: ø140 flat 50 to 6,000 nin⁻¹ 11/7.5 kW (20 min/cont)
High-speed high-power spindle	OSP only: ø140 flat 50 to 6,000 nin⁻¹ 15/11 kW (15 min/cont)
Turret (both upper and lower)	V6 turret, wedge clamp
Front cover	Automatic full door (safe tape SW, area sensor), two-hand cycle start button
Chucking	Chuck auto open/close confirm, chuck high/low pressure switch
	(re-gripping), chucking miss detection
Tailstock	Auto tailstock quill advance/retract confirm, tailstock thrust high/low switch,
	tailstock quill position detection (multi-sizing, high accuracy sizing),
	2-speed tailstock quill, low tailstock thrust.
Face driver	High thrust spindle, face plate, labyrinth protective cover
Air blower (blast)	Chuck air blower, tailstock air blower, spindle ID air blower,
	turret air blower (internal piping, common coolant nozzle)
Coolant blower	Shower coolant (A, B), spindle ID coolant (A, B)
Dustproofing measures	Spindle air purging, X-axis double wiper (XA:-side 10 mm travel limit),
	Z-axis double wiper (ZA + ZB)
Gauging	In-process work gauging
Touch setter	M (manual), A (automatic)
Automation	Workrest, parts catcher, bar feeder
Stopper in spindle	
Coolant	High pressure coolant unit, coolant high/low pressure switch (upper/lower turret),
(pressure, sensor related)	coolant sensors (level sensor, flow sensor)
Steady rest	Tailstock slideway SLU-A1 vertical travel 45 mm, lower slideway, lower cross-slide
Mist collector	
Optional high accuracy	AbsoScale (XA, XB, XA + XB), coolant temperature regulator,
specifications	hydraulic oil temperature regulator
Raised machine height	20 mm, 45 mm, 70 mm, 95 mm

■ Chip conveyor: typical shapes and applications

| Name	Hinge type	Scraper type	Magnet scraper type	Hinge scraper type (With drum filter)
Application	● For steel	● For castings	● For castings	● For steel, castings, nonferrous metal
Features	● General use	● Magnet scraper for sludge processing ● Easy for maintenance ● Blade scraper	● Suitable with sludge ● Not suitable for nonferrous metals	● Filtration of long and short chips and coolant
Shape				

Note: Machine platform may be necessary depending on the type of conveyor.

■ Spindle output/torque diagrams

〈OSP-P300LA〉

■ Standard spindle
- Spindle speed: 4,000 min⁻¹
- Max output: 11/7.5 kW (30 min/cont)
- Max torque: 140.5/95.5 N-m (30 min/cont)
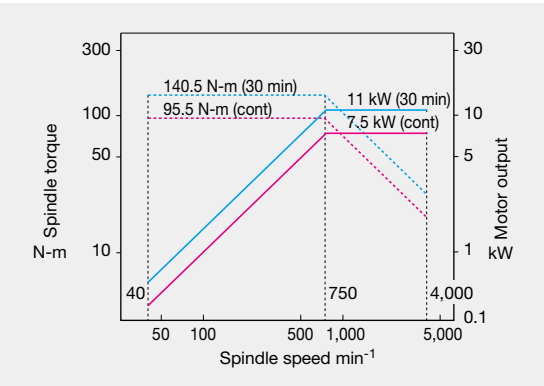
■ High-power spindle
- Spindle speed: 4,000 min⁻¹
- Max output: 15/11 kW (30 min/cont)
- Max torque: 191/140 N-m (30 min/cont)
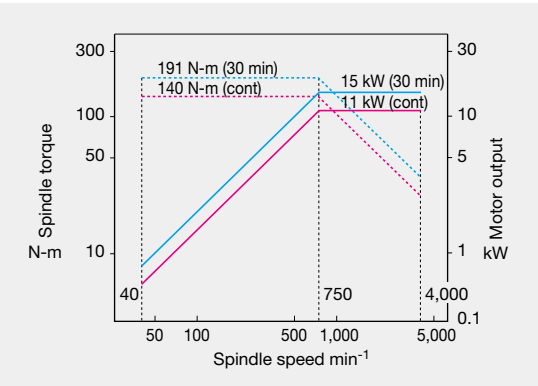
■ High-speed spindle
- Spindle speed: 6,000 min⁻¹
- Max output: 11/7.5 kW (20 min/cont)
- Max torque: 160/66 N-m (20 min/cont)
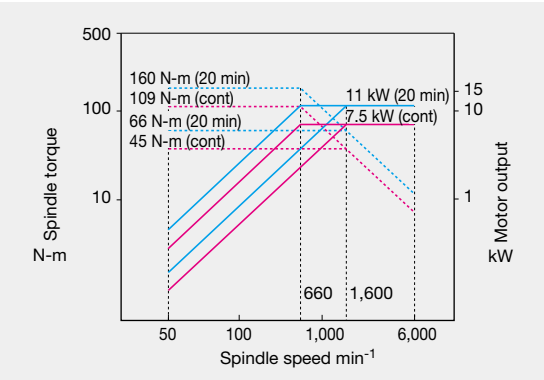
■ High-speed high-power spindle
- Spindle speed: 6,000 min⁻¹
- Max output: 15/11 kW (20 min/cont)
- Max torque: 202/148 N-m (20 min/cont)

〈FANUC 0i-TF〉
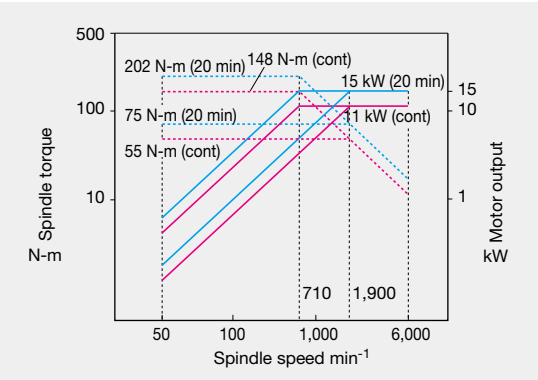
■ Standard spindle
- Spindle speed: 4,000 min⁻¹
- Max output: 11/7.5/7.5 kW (15 min/60 min/cont)
- Max torque: 140/95.5/71.5 N-m (15 min/60 min/cont)
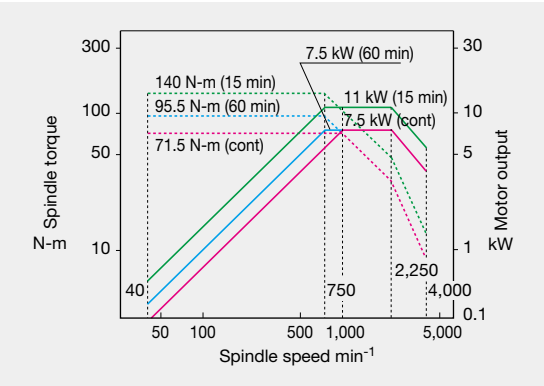
■ High-power spindle
- Spindle speed: 4,000 min⁻¹
- Max output: 15/11/11 kW (15 min/60 min/cont)
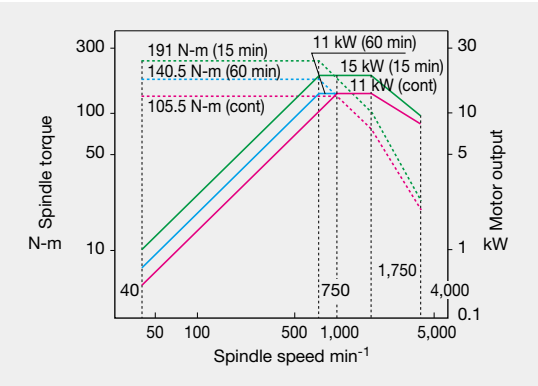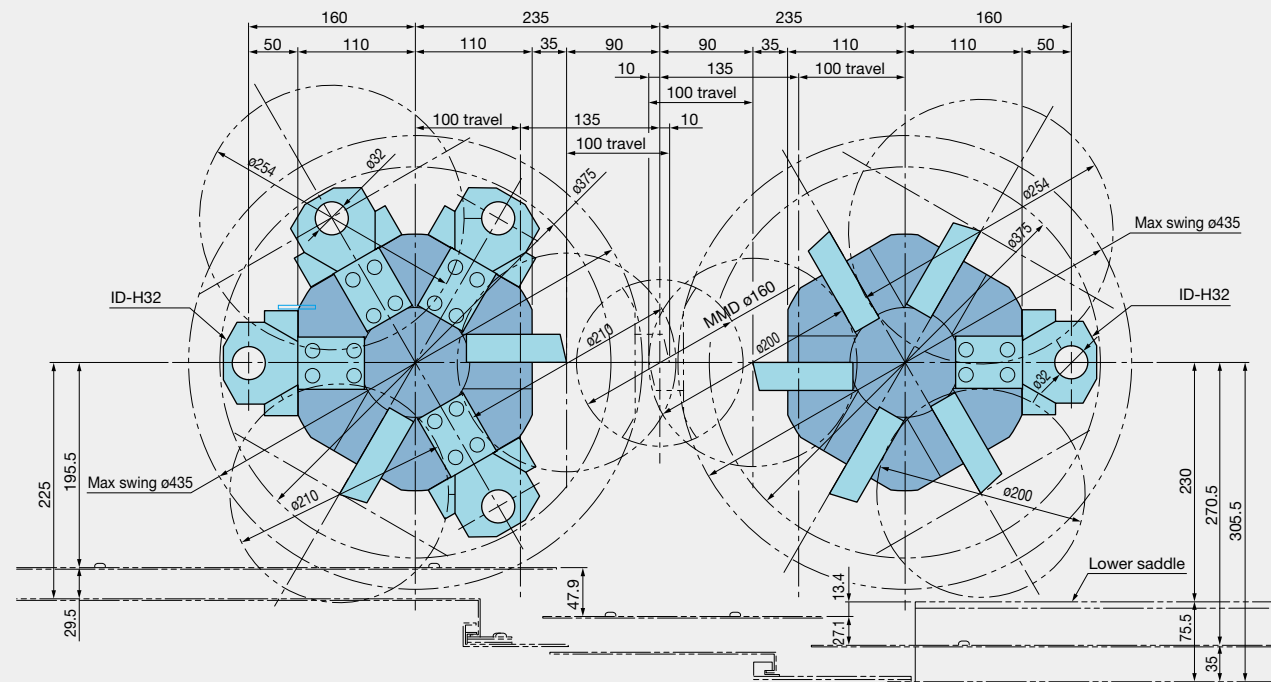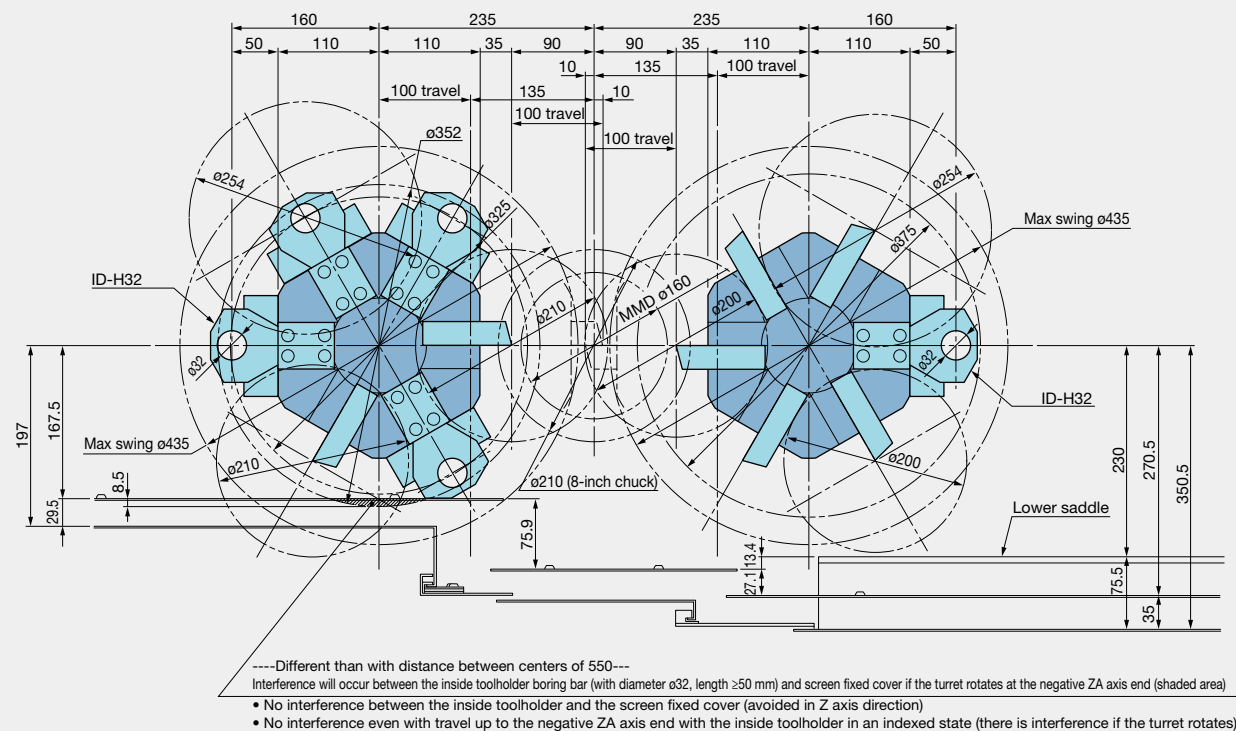- Max torque: 191/140.5/105.5 N-m (15 min/60 min/cont)

■ Turret interference drawings

Unit : mm

〈DBC 550〉

ID-H32

100 travel
135
10
100 travel

Max swing ø435

ID-H32

MMD ø160

Max swing ø435

Lower saddle

〈DBC 1000〉

ID-H32

100 travel
135
100 travel

Max swing ø435

MMD ø160

ø352

Max swing ø435

ID-H32

ø210 (8-inch chuck)

Lower saddle

----Different than with distance between centers of 550---
Interference will occur between the inside toolholder boring bar (with diameter ø32, length ≥50 mm) and screen fixed cover if the turret rotates at the negative ZA axis end (shaded area)
• No interference between the inside toolholder and the screen fixed cover (avoided in Z axis direction)
• No interference even with travel up to the negative ZA axis end with the inside toolholder in an indexed state (there is interference if the turret rotates)

■ Working Ranges

Unit : mm

〈DBC 550/480〉 Direct OD
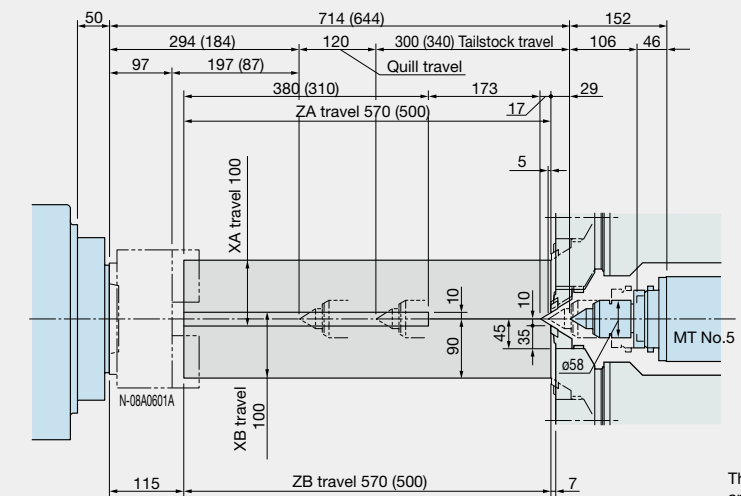
714 (644)
294 (184)   120   300 (340) Tailstock travel
97   197 (87)   Quill travel
380 (310)   173
ZA travel 570 (500)

XA travel 100

XB travel 100

MT No.5
ø58

ZB travel 570 (500)

The values with DBC 480 mm specifications are given in parentheses.

〈DBC 550/480〉 ID

714 (644)
294 (184)   120   300 (340) Tailstock travel
97   197 (87)   Quill travel
380 (310)   157
ZA travel 570 (500)

XA travel 100

XB travel 100

MT No.5
ø58

ZB travel 570 (500)
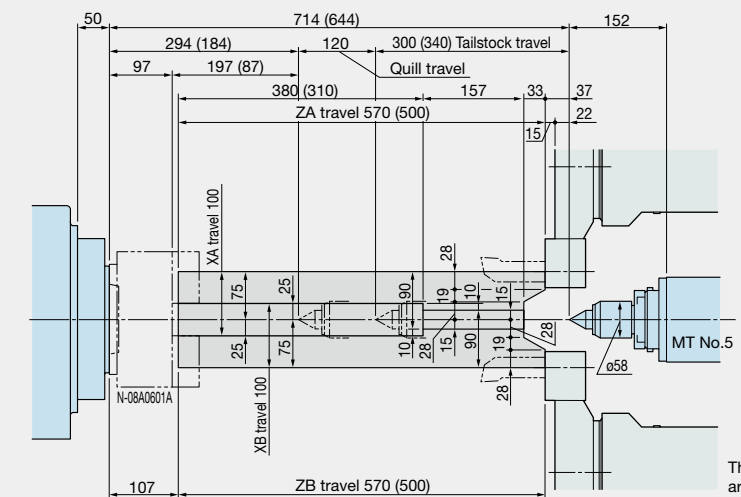
The values with DBC 480 mm specifications are given in parentheses.

〈DBC 550〉 With steady rest tailstock guide

ZA/ZB: travel 570   181
115
270   Steadyrest travel 300   296
139   131   Steadyreast arm width 26   MIN : 296
14   12   MAX : 596

Steady rest (SLU-A1-Z)

N-08A0601A

MT No.5
ø58

97   197   24   120
294   120   Tailstock travel 300
714   Quill travel   152

13

14

Unit : mm

〈DBC 1000〉 Direct OD

ZA travel 1,100

XA travel 100
XB travel 100
Quill travel
Tailstock travel 700
ZB travel 1,100

MT No.5
ø58
N-08A0601A

〈DBC 1000〉 ID

1,244
700 Tailstock travel
Quill travel
ZA travel 1,100
XA travel 100
XB travel 100
ZA travel 1,100

MT No.5
ø58
N-08A0601A

〈DBC 1000〉 With steady rest tailstock guide

ZA/ZB : travel 1,100
Steadyrest travel 513.5
Steadyreast arm width 26
MIN : 322
MAX : 835.5
Inchworm method
Steadyrest (SLU-A1-Z)
N-08A0601A
MT No.5
ø58
Tailstock travel 700
Quill travel
1,244
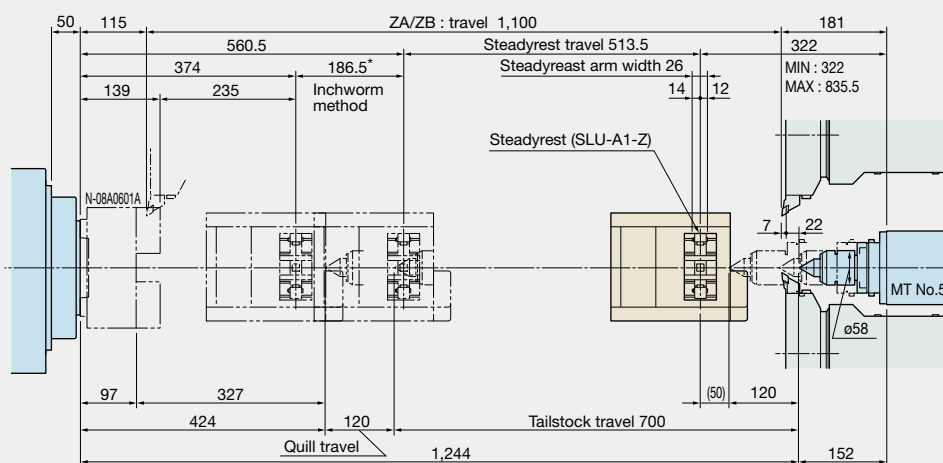
• By moving the tailstock to the spindle, the steady rest travel is shifted

Unit : mm

〈DBC 500〉

150 side tank removal space
NC control
Side tank removal space
(opened door dimensions)
Lube tank
(Maintenance space)
Rear conveyor removal space
( ) H chip conveyors.

〈DBC 1000〉

Side tank removal space
(opened door dimensions)
(Maintenance space)

■ Standard Specifications

Basic Specs	Control	Turning: X, Z simultaneous 2-axis + 2-axis.
	Position feedback	OSP full range absolute position feedback (zero point return not required)
	Min / Max inputs	8-digit decimal, ±99999.999 to 0.001 mm, 0.001° Decimal:1 µm, 10 µm, 1 mm (1°, 0.01°, 0.001º)
	Feed	Override: 0 to 200%
	Spindle control	Direct spindle speed commands (S4) override 50 to 200%, Constant cutting speed, optimum turning speed designate
	Tool compensation	Tool selection: 32 sets, tool offset: 32 sets
	Display	15-inch color display operational panel, multi touch panel
	Self-diagnostics	Automatic diagnostics and display of program, operation, machine, and NC system problems
	Program capacity	Program storage: 4 GB, operation buffer: 2 MB
Operations	Suite apps	Applications to visualize and digitize information needed on the shop floor
	Suite operation	Highly reliable touch panel suited to shop floors. One-touch access to suite apps.
	Easy Operation	"Single-mode operation" to complete a series of operations
	Programing	Program management, edit, multitasking, scheduled programs, fixed cycles, special fixed cycles, tool nose R compensation, M-spindle synchronized tapping, fixed drilling cycles, arithmetic functions, logic statements, trig functions, variables, branch statements, auto programming (LAP4), programming help
	Machine operations	MDI, manual (rapid traverse, pulse handle), load meter, operations help, alarm help, sequence, return, manual interrupt & auto return, data I/O, spindle orientation (electric)
	MacMan	Machining Management: machining results, machine utilization, fault data compile & report, external output
Communications/Networks		USB ports, Ethernet
High speed/accuracy		Hi-G control, TAS-C (Thermal Active Stabilizer–Construction)
Energy-saving functions	ECO suite	ECO Idling Stop, ECO Power Monitor

■ Optional Specifications

Item	Kit specs [1] NML E	NML D	3D E	3D D	OT-IGF E	OT-IGF D
New Operations						
Advanced One-Touch IGF-L (Real 3D incl)					●	●
Programming						
Circular threading		●		●		●
Program notes		●		●		●
User task 2 I/O variables, 8 each						
Work coordinate system select 10 sets						
50 sets						
100 sets						
Tool compensation (Std: 32 sets) 64 sets						
96 sets						
200 sets						
999 sets						
Common variables 1,000 sets (Std: 200 sets)						
Thread matching (spindle orientation required)						
Threading slide hold (G34, G35)						
Variable spindle speed threading (VSST)						
Inverse time feed						
Spindle synchronized tapping (rigid tapping)						
Monitoring						
Real 3-D simulation			●	●	●	●
Cycle time over check		●	●	●	●	●
Load monitor (spindle, feed axis)			●	●	●	●
Load monitor no-load detection (load monitor ordered)						
Status Logger						
Tool life management		●		●		●
Tool life warning						
Operation end buzzer						
Chucking miss detection	Included in machine specs					
Work counters Count only						
Cycle stop						
Start disabled						
Hour meters Power ON						
Spindle rotation						
NC operating						
NC operation monitor (counter, totaling)		●	●	●	●	●
NC work counter (stops at full count with alarm)						
Status indicator (triple lamp) Type C [Type B]		●	●	●	●	●
Measuring						
In-process work gauging	Included in machine specs					
Z-axis automatic zero offset by touch sensor						
C-axis automatic zero offset by touch sensor						
Gauge data output File output						
Post-process work gauging interface Set levels (5-level, 7-level)						
BCD						
RS-232-C (dedicated channel)						
Touch setter [M, A]	Included in machine specs					

Item	Kit specs [1] NML E	NML D	3D E	3D D	OT-IGF E	OT-IGF D
External Input/Output and Communication Functions						
OSP-MTConnect [3]						
RS-232-C connector						
DNC link DNC-T3						
DNC-C/Ethernet						
DNC-DT						
USB (additional) 2 additional ports possible						
Automation/Untended Operation						
Auto power shutoff M02, alarm						
Warmup function (by calendar timer)						
Tool retract cycle						
External program selections A (pushbutton) 8 types						
B (rotary switch) 8 types						
C (digital switch) BCD, 2-digit						
C2 (external input) BCD, 4-digit						
Okuma loader (OGL) interface	Including loader specs					
Third party robot and loader interface [2] Type B (machine)						
Type C (robot and loader)						
Type D						
Type E						
Bar feeders Bar feeder	Included in machine specs					
Interface only						
Cycle time reduction [2] Operation time reduction		●	●	●	●	●
Chuck open/close during spindle rotation						
Tailstock adv/ret during spdl						
High-Speed/High-Accuracy Functions						
0.1 µm control [2]						
Pitch error compensation						
Energy-saving function ECO suite						
ECO Operation Chip conveyor intermit/link op						
Mist collector intermit/link op						
Spindle Power Peak Limiter						
Other Functions						
Collision Avoidance System (CAS)						
One-Touch Spreadsheet						
Machining Navi L-g, T-g (threading)						
Variable spindle speed control (VSSC)		●	●	●	●	●
Spindle dead-slow cutting						
Spindle speed setting						
Manual cutting feed						
Spindle power peak cutting						
Short circuit breaker						
External M signals [2 sets, 4 sets, 8 sets, 16 sets]						
Edit interlock						
OSP-VPS (Virus Protection System)						

*1. NML: Normal, 3D: Real 3D simulation, OT-IGF: One-Touch IGF, E: Economy, D: Deluxe
*2. Engineering discussions required.
*3. API library (THINC-API) needed when adding OSP-MTConnect.

■ Standard Specifications

Number of control axes	Simultaneous 2 axes (X, Z)	Program input	Program memory: 512 KB
Interpolation system	Positioning, linear, arc, threading, taper		No. of registered programs: 400
	Polar coordinate interpolation, cylindrical interpolation		Chamfering, corner R
Command system	With absolute incremental		Complex shape fixed cycle (I + II)
Minimum input increment	X, Z axes both 0.001 mm		Extension program editing
Maximum command value	±99999.999 mm decimal point input		RS-232-C input/output interface
Operating panel	10.4 inch color LCD		Custom macros
Monitor functions	Display language English/Japanese		Additional custom macros, common variables (total 600)
	Operating time, no. of parts display		Programmable data input
	Electronic buzzer		High-speed skip
	Graphic display		Program protection key switch
Machine operation	Constant cutting speed control		Background editing
	Oriented spindle stop (1 point M19)		Single fixed cycle
	Continuous threading function		Inch/metric switch
Communications/networking	USB memory input/output	Compensation functions	Thermal deformation compensation
			Tool nose radius compensation
			Tool shape and wear compensation
			No. of tool compensations Upper turret: 64, Lower turret: 64
			AI contouring control I

■ Optional Specifications

Monitor functions	Tool counter	
	Workpiece counter	
	Multi-counter	
	Hour meters	
	Status indicator	Yellow, red, triple lamp
	Tool life management	Okuma software, spare tool jump
	Abnormal load detection	Spindle + feed
Machine operation	Oriented spindle stop	4 points (M19, 119, 129, 139)
	Post-process work gauging interface	Quantitative compensation method (5 steps, 7 steps)
	Auto power shutoff	
	Earth leakage circuit breaker (ELCB)	
Program input	External program selection	Digital switch with 2-digit display
	Workpiece coordinate system selection	6 sets
	Additional RS-232-C channels	
	Program restart	
	Spare M code	2, 4, 8
Automation	Robot loader interface	
	Bar feeder interface	
Other	Control panel lamp	
	Control panel air conditioning	Temperature regulator, dehumidifier
	AV100V 1A socket	Operation panel, in control panel

When using Okuma products, always read the safety precautions mentioned in the instruction manual and attached to the product.

● The specifications, illustrations, and descriptions in this brochure vary in different markets and are subject to change without notice.
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