CS SERIES

Ultimate 2 spindle CNC lathe with
Fuji's expertise in turning and automation.

High Speed / Space Saving Design

FUJI Turning

Continuous Improvement
Parallel Front Facing Spindles
High Speed, Highly Rigid, Space Saving Design
Fuji built high speed robot and peripheral devices
Fuji engineered work holding / Optional Auto Gauging

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High Rigidity

Robust Structure

■ CSD200

Max. O.D. cutting stock **4mm**

Max. Grooving width **5mm**

■ CSD300/CSS300

Max. O.D. cutting stock **7mm**

Max. Grooving width **7mm**

■ CSD400/CSS400

Max. O.D. cutting stock **7mm**

Max. Grooving width **10mm**

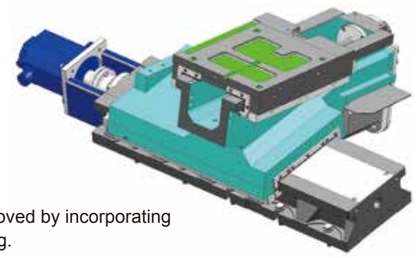
Material	Cutting speed (m/min)	Feed speed (mm/rev)
S45C	150	0.3

Material	Cutting speed (m/min)	Feed speed (mm/rev)
S45C	100	0.1

The above-mentioned data is actual values, but not a performance guarantee.

Highly Rigid Slides

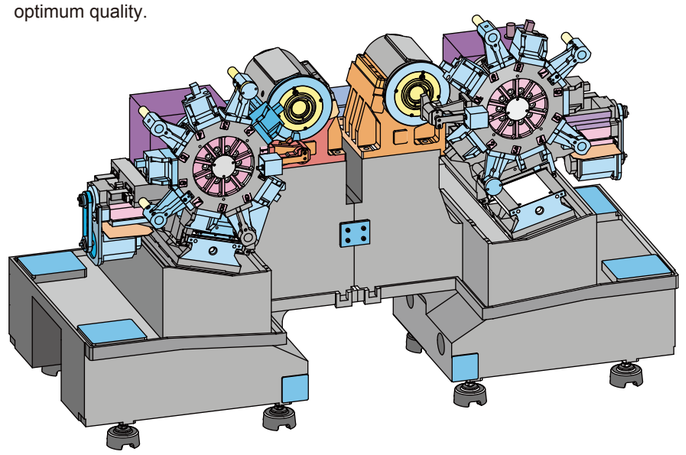
The CSD 300/400 utilizes box way construction in both x and z axis.
The compact CSD200 utilizes linear roller ways in both axis and long type slide for z axis for high rigidity.



Ball screw rigidity has been improved by incorporating a 3 x 3 row x axis support bearing.

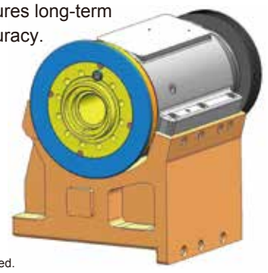
Column

The thermally stable and space saving design bed is equipped with zero-center type headstock and high speed turret, ensuring optimum quality.



Zero-center Type Headstock

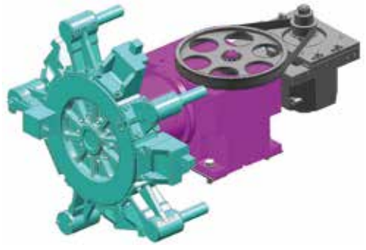
The zero-center type headstock has a thermally symmetrical design, which keeps thermal displacement to the absolute minimum. The air purge mechanism of the headstock completely protects the headstock against cutting oil and chips. This mechanism, along with grease lubrication, assures long-term processing accuracy.



※CSD200 is not included.

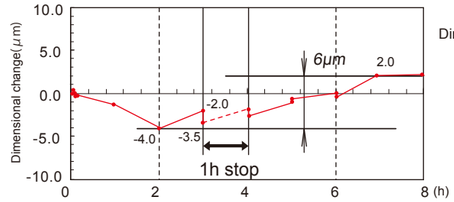
High Speed Indexing Turret

Cam type turret with high speed indexing by servo motor. Turret clamps by 3 piece hydraulic coupling eliminating cutting vibration to the lowest possible level.



Excellent Thermal Displacement Properties

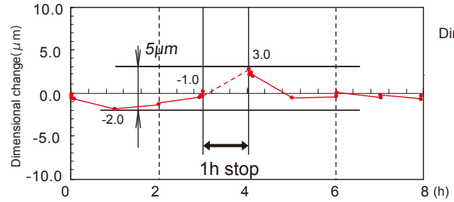
■ CSD200



Dimensional change after 8h running **6.0μm**

Dimensional change after 1h stop **1.5μm**

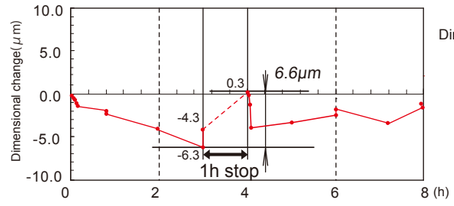
■ CSD300/CSS300



Dimensional change after 8h running **5.0μm**

Dimensional change after 1h stop **4.0μm**

■ CSD400/CSS400



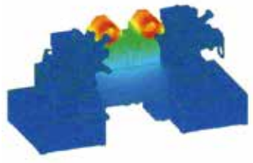
Dimensional change after 8h running **6.6μm**

Dimensional change after 1h stop **4.6μm**

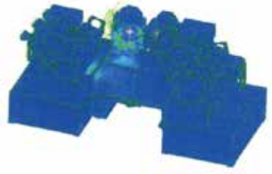
The above-mentioned data is actual values, but not a performance guarantee.

Optimal Bed Configuration

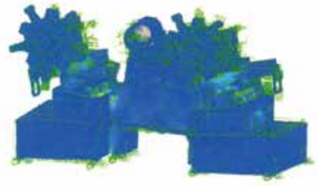
Fuji engineered bed is designed to be highly rigid while minimizing thermal displacement. In this design, both the feedback of the latest CAE analysis and the actual result are optimized.



Heat analysis



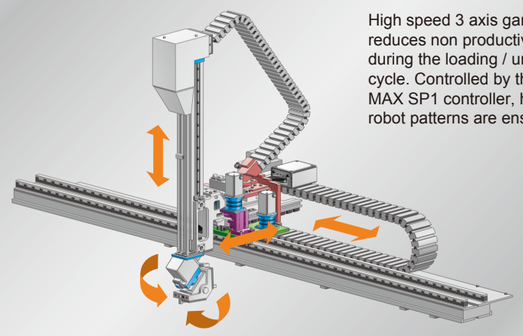
Static rigidity analysis



Dynamic rigidity analysis

Amazing Speed Fastest Robot in its class

High Speed 3 axis Gantry Robot



High speed 3 axis gantry robot reduces non productive times during the loading / unloading cycle. Controlled by the FUJI MAX SP1 controller, high speed robot patterns are ensured.

Swivel Head Robot Chuck

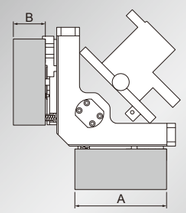
Non productive time reduction utilizing the swivel head design.

Fastest Robot in its class

		CSD200 (CSD200 Dual-G)	CSD300 (CSS300)	CSD400 (CSS400)
Carrying capacity	kg	3+3	5+5	15+15
Max. traverse speed	m/min	180	165	135
Max. up/down speed	m/min	150	120	75
Max. front/back speed	m/min	70	70	50
Min. tact time	sec	19.0 (11.0)	21.2 (13.0)	36.2 (21.0)

The above-mentioned data is actual values, but not a performance guarantee.

Robot Chuck

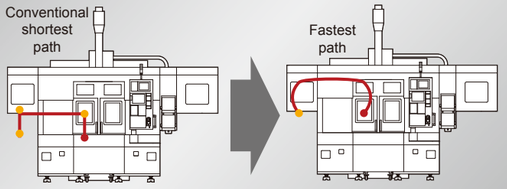


	Work size (A×B)
CSD200	Φ120mm×60mm
CSD300	Φ200mm×100mm
CSS300	
CSD400	Φ300mm×150mm
CSS400	

Class 300/400 utilizes hydraulic robot chucks – yielding better grip for faster robot traverse speeds.

MAX SP1 Robot Controller

Simultaneous multi axis control.



Auto routing for fastest path.
Non productive time is reduced approximately 20% by instructing just the target positions. Rapid acceleration /deceleration moves are eliminated.

Easy Teaching

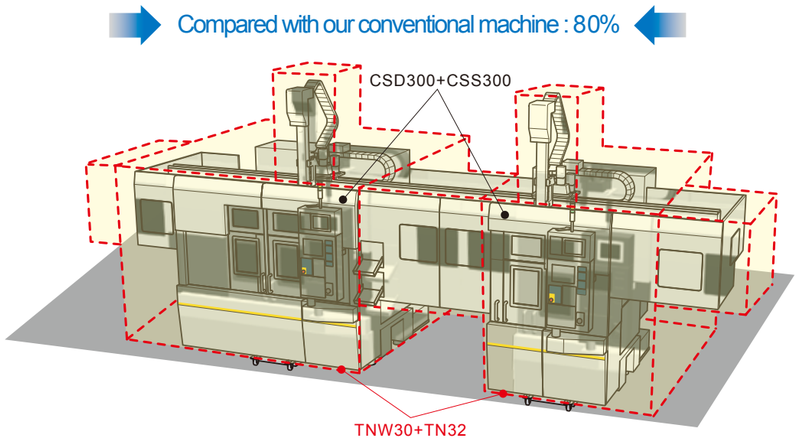
Robot teaching becomes simplified with the graphic interface and panel PC combined into one pendant. With the MAX SP1, by instructing the target positions, the most efficient robot path is calculated automatically.

Smooth ECO

In addition to faster robot speed, an added benefit is it's energy saving operation. Electric consumption of the robot can be reduced by up to 35% automatically by the speed of the robot matching the tact time of the line.

Optimal Space

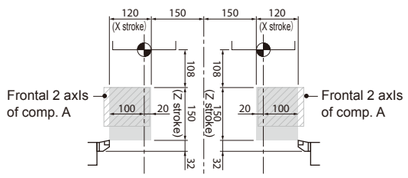
Reduction of Floor Space



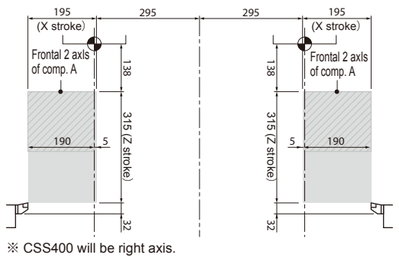
In comparison, front facing spindle designs can save up to 80% of the floor space as compared to opposing spindle designs.

Optimal Machining Space

■ CSD200

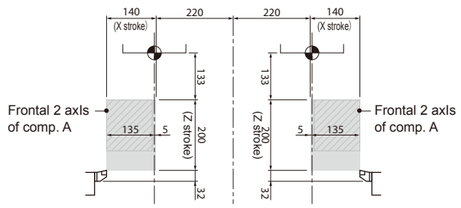


■ CSD400
CSS400

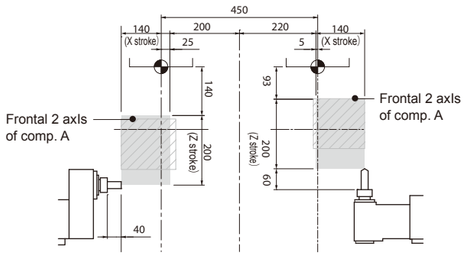


※ CSS400 will be right axis.

■ CSD300
CSS300



■ CSD300R



System Layout

Flexible machine configuration with various optional devices.

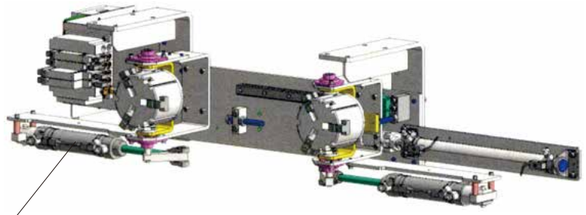
Work Stocker

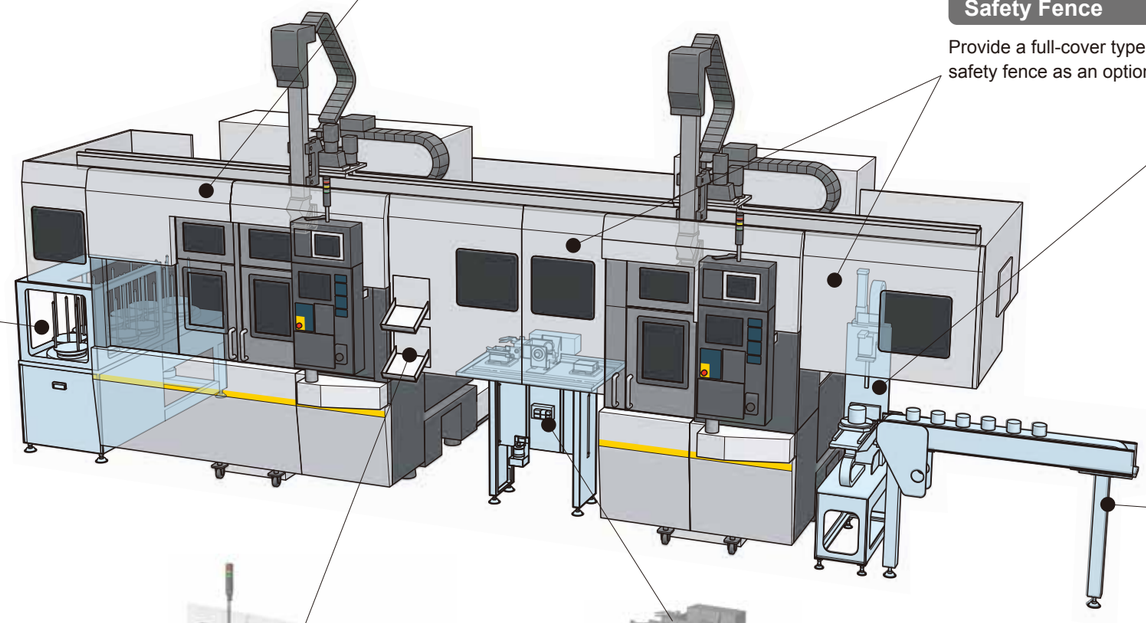
10/12/20 pallet work stockers available.

		MP5-20	MP5-30	MP5-40
Pallet quantity	pcs	20	12	10
Work size	mm	Φ120	Φ203	Φ300
Max. stacking height	mm	345	325	315
Max.load (pallet)	kg	25	40	50

Work Turn Over Device

Enables front and back machining on the same machine. Residing in the robot traverse area, the turn over station has no influence on cycle time.





Safety Fence

Provide a full-cover type safety fence as an option.

Auto Gauge

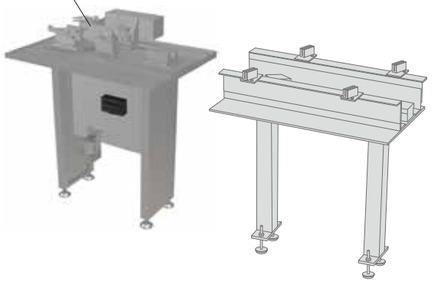
Placed on the side of the machine, this device ensures part quality by gauging specific process dimensions and automatically feeding back this information to the NC for dimensional compensation.

Work Chute

The robot periodically takes out the workpiece and puts it in the quality check chute. This chute is also used to discharge autogauging and seating confirmation NG parts.

Parts Turn Over / Parts Shift Device

Parts shift device to automatically transfer parts to the next robot, or Parts turn over device to present the parts in the correct orientation for the next process.



Conveyor

Transfer the work between machines in a fully automated way.

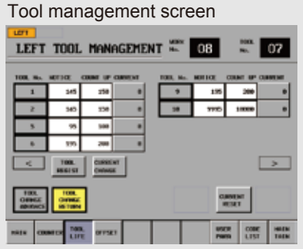
User Friendly Operation

Touch Panel for Machine (NC)

Tool Management

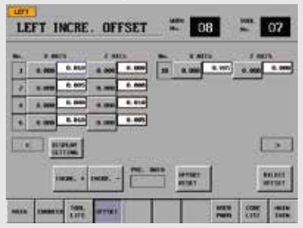
Display only necessary information for quick and intuitive operation.

Tool management screen



Put the tools being in use together on a screen. Give a forecast before the counter value reaches the tool life setting value.

Constant compensation screen



Use a constant as the conpensation value. Perform the addtion or subtraction by simple operation.

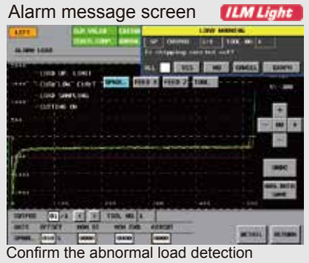
Quality Control Support

Records of production information, offset history, and Load Detecting Function support your quality control.

Offset records

A tool wear tendency and a offset history can be confirmed by the offset transition.

Alarm message screen ILM Light



Confirm the abnormal load detection caused by a tool breakage during the machining *optional function.

Operation Navigation

Support quick operation by navigating necessary operations on the screen.

Operation navigation screen

Display necessary conditions for each machine operation.

Alarm message screen

Display the method to recover from alarms, instead of referring to the manual.

Touch Panel for Robot (MAX)

Production Information

Cycle time history

Confirm the cycle time history, machining time as well as robot load / unload time.

Counter screen

Confirm the production counter and quality check counter.

Guidance Function

Robot and peripheral unit information

Confirm automation alarms by visual screen and message navigation.

I/O status screen

Convenient to check the I/O status with name display.

Operaton panel for CS series automatic lathe

For spindle (L) For spindle (R)

The frequently used buttons which adopt push button switch, were prepared for the left and right spindle separately. It enables quick operation without changing the button selection.

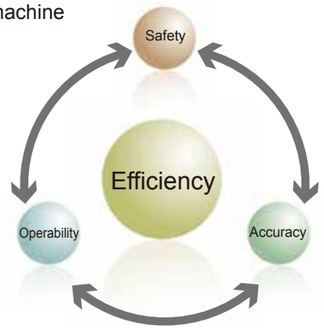
Teaching Setting

Safety aera setting screen

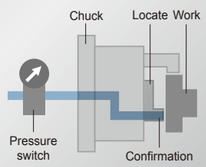
Calcuate the fastest path automatically by setting the movable safety aera, instead of setting each motion point.

Various Options

Fuji prepares various options in the CS series for making full use of the machine and provides it's customers with an optimum production system.



Air Confirmation

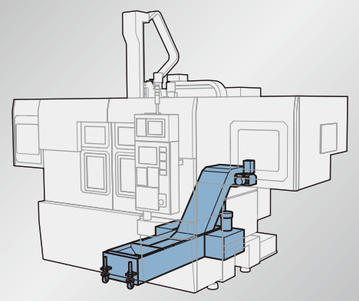


Confirms that the part is securely up against the locates. If air confirmation is not made the cutting process does not begin。

Through Spindle Coolant

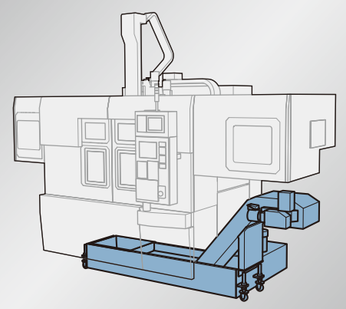
Coolant can be directed through the spindle for the clearing of chips in ID turning.

Chip Conveyor



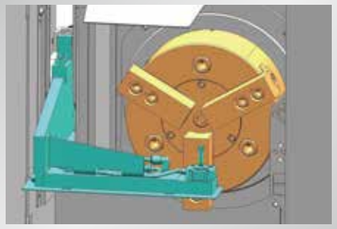
Single chip conveyor. Hinge, scraper or magnetic conveyors available.

Chip Conveyor (side exit)



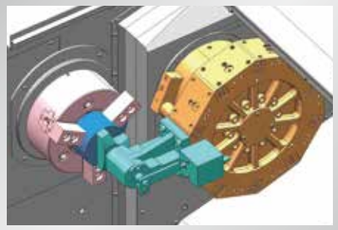
Side exit conveyor can be ordered for floor layouts where rear exit does not work.

Tool detector



This single unit performs three tasks:
Automatic tool compensation. Tool damage detection and tool setting. An air blower is provided near the sensor to prevent inaccuracies due to trapped chips.

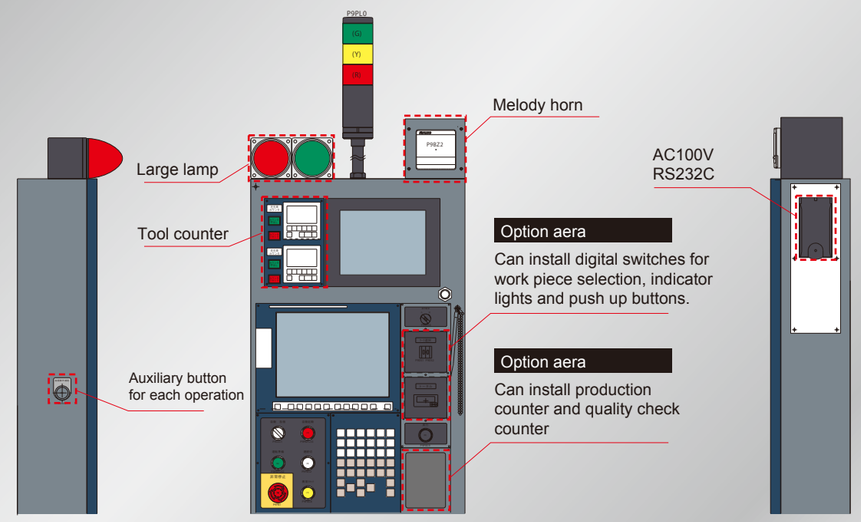
Work Pusher



Work pusher device can be installed on the turret to push the part into the chuck utilizing z axis on the turret slide. This ensures that the work piece is up against the locates. When used in conjunction with air confirmation a stable process is achieved.

Operation Panel Option

Installation space is reserved for option on the operation panel; therefore it is possible to add various options as customers required.



Other Options

- ○Mist collector
- ○Dust collector
- ○Control panel cooler
- ○Medium pressure coolant
- ○Chip crusher
- ○Oil separator
- ○Andon system

CS SERIES

CSD200

●2 spindle and 2 turret lathe
●Chuck size : 6～8inch
●Max. work size : Φ120mm×60mm
●Max.load : 3kg＋3kg

CSD200

●2 spindle and 2 turret lathe (Dual-Gautry)
●2 gantry robots

CSS300

●1 spindle and 1 turret lathe

CSD300
CSD300R

●2 spindle and 2 turret lathe
●Chuck size : 8～10inch
●Max. work size : Φ200mm×100mm
●Max.load : 5kg＋5kg

Live tool specification

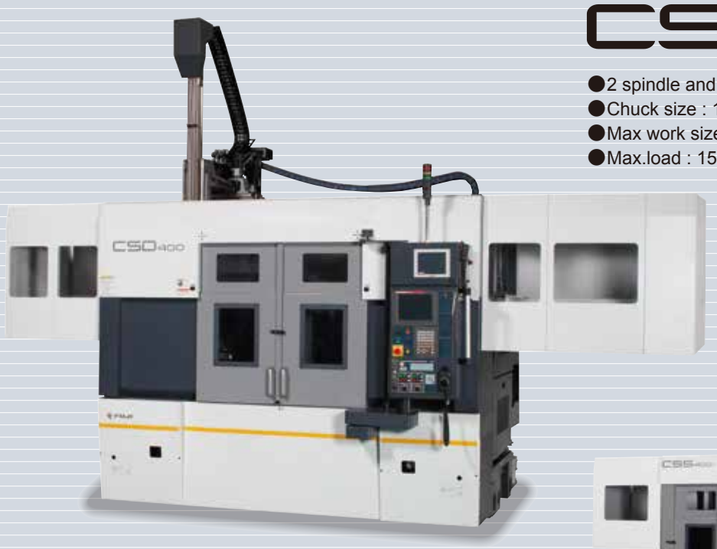
	CSD300R
Max. clamping tool dia.	φ16 [mm]
Number of station	10 [position]
Spindle speed	Max.4000 [min-1]
Spindle motor	2.7kw [3.7HP]

Performance (Drill/Tapping)

	Dril	Tapping
Max. Cut dia (φ)	φ16 [mm]	M12×1.75 [mm]
Spindle speed	50 [m/min]	10 [m/min]
Cutting speed	1000 [min-1]	265 [min-1]
Cutting feed	0.21 [mm/rev]	464 [mm/min]

CSD400

●2 spindle and 2 turret lathe
●Chuck size : 10～12 inch
●Max work size : Φ300mm×150mm
●Max.load : 15kg＋15kg



CSS400

●1 spindle and 1 turret lathe

Machine Specifications

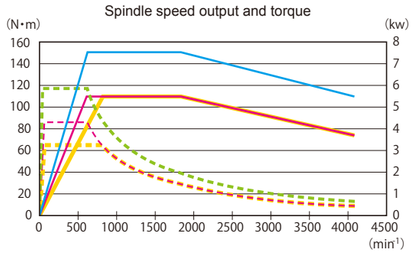
				CSD200 / CSD200 Dual-G	CSD300・CSD300R / CSS300	CSD400 / CSS400
Machine specifications	Work size		mm	Φ120×60	Φ200×100	Φ300×150
	Max swing dia		mm	Φ250	Φ310	Φ420
	Spindle dia.		mm	80	100	120
	Spindle nose			A2-5	A2-6	A2-8
	Spindle bore		mm	42	56	67
	Spindle speed		min^{-1}	Max. 4000	Max. 4000	Max. 2220
					Max. 3630 *1 *2	
	Spindle motor (Cont. /15 Min)		kW	5.5 / 7.5	7.5 / 11	15 / 18.5
					11 / 15 *1 *2	
	Number of tool station		station	8	10	12
	Chuck size		inch	6~8	8~10	10~12
	Slide stroke	X-axis	mm	120	140	195
		Z-axis	mm	150	200	315
	Rapid traverse	X-axis	m/min	24	24	24
		Z-axis	m/min	24	24	24
	Feed setup unit	X-axis	mm	0.001	0.001	0.001
		Z-axis	mm	0.001	0.001	0.001
	Servo motor	X-axis	kW	1.2	1.2	1.8
		Z-axis	kW	1.2	1.2	1.8
					1.8*1 *2	
	CNC control			FANUC 0i-TD	FANUC 0i-TD	FANUC 0i-TD
					FANUC 32i-B *2	
	Power capacity		KVA	40/40	50/29	64/36
					60*1/34*1	
					56*2	
Robot specifications	Robot type			LX-30S	LX-30H	LX-30B
	Carrying capacity		kg	3 + 3	5 + 5	15 + 15
	Robot controller			MAX -SP1-SRV	MAX -SP1-SRV	MAX -SP1-SRV
Machine size	Floor space >>> Footprint		mm × mm	1900 × 2150	2260 × 2150 / 1260×2150	2720 × 2360/1490×2360
	Machine height		mm	3045 (Robot included)	3240 (Robot included)	3715 (Robot included)
	Machine weight		kg	4500 / 5000	5500 / 3500	7500 / 4500

*1 North America *2 CSD300R

Spindle Output Characteristics

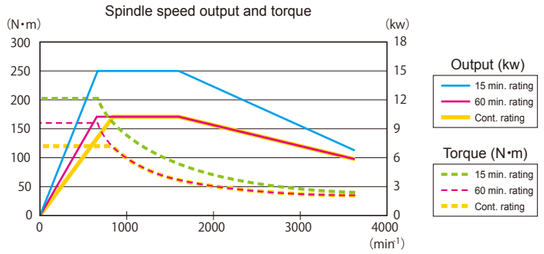
CSD200

Standard spec. (Max. speed 4000min^{-1})



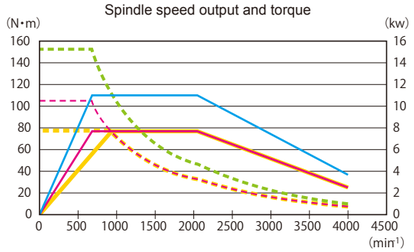
CSD300R/North America CSD300

Standard spec. (Max. speed 3630min^{-1})

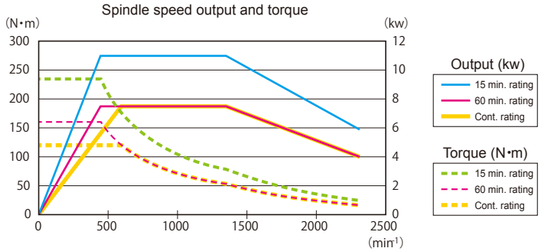


CSD300/CSS300

Standard spec. (Max. speed 4000min^{-1})

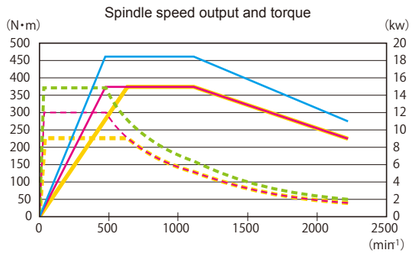


Optional spec. (Max. speed 2310min^{-1})

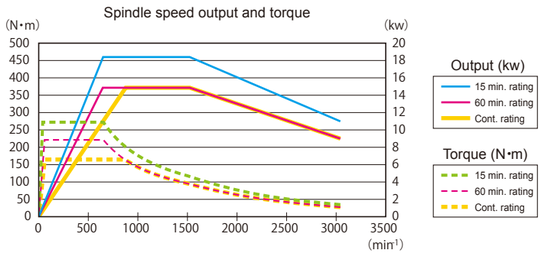


CSD400/CSS400

Standard spec. (Max. speed 2220min^{-1})

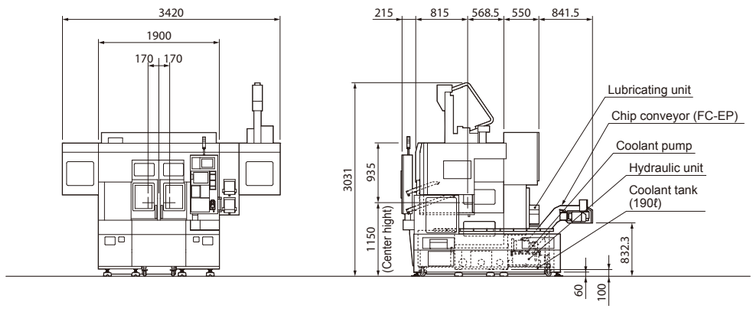


Optional spec. (Max. speed 3000min^{-1})

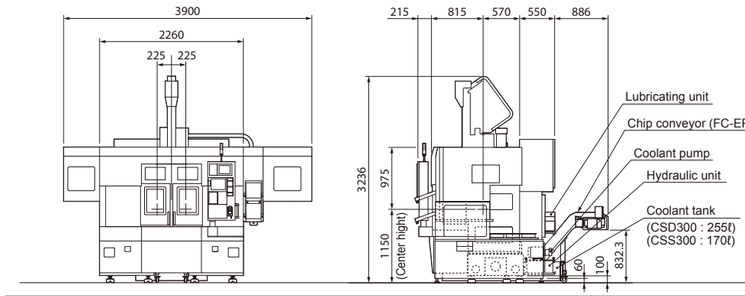


Machine Overview [mm]

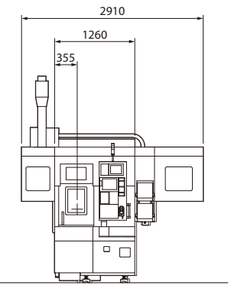
CSD200



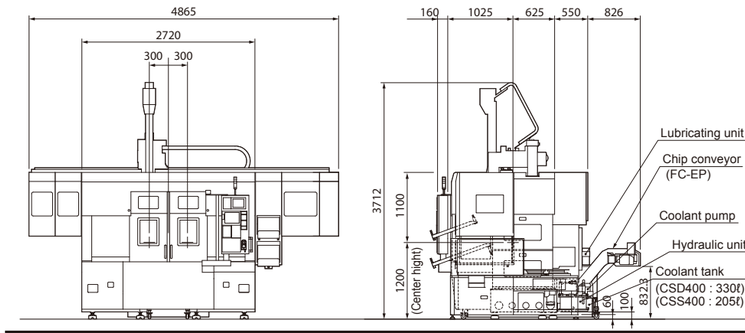
CSD300



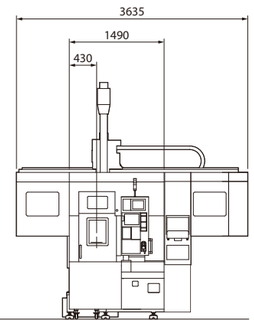
CSS300



CSD400

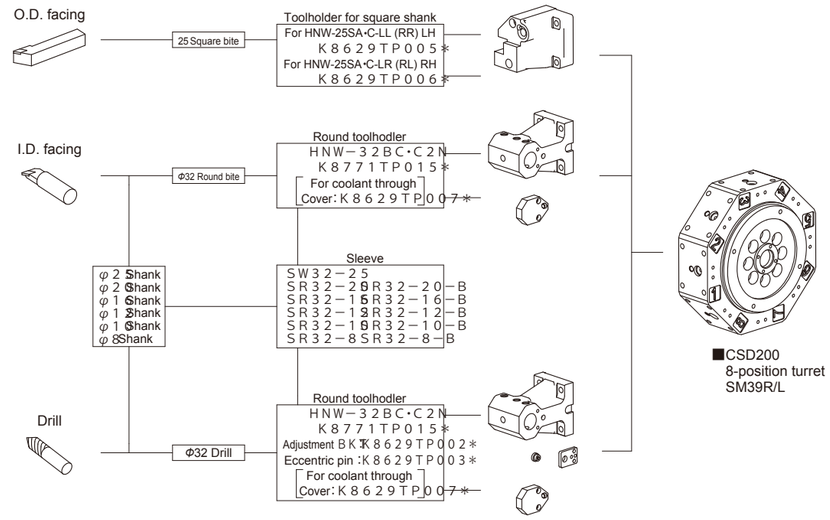


CSS400

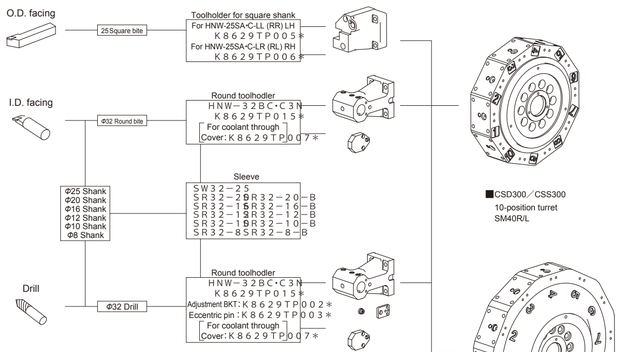


Tooling system

CSD200



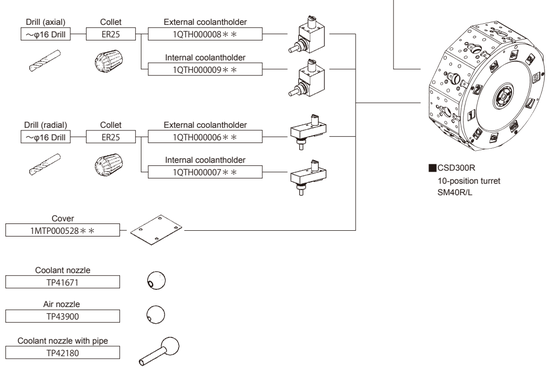
■CSD300・400
CSS300・400



■CSD300／CSS300
10-position turret
SM40R/L

■CSD400／CSS400
12-position turret
SM41R/L

■CSD300R



■CSD300R
10-position turret
SM40R/L

The above mentioned drawing is a system equipment with options.

FUJI *Spindle Chuck*

Besides the machine tools, FUJI offers the chuck and tooling solution too. Special customized chucks are also available. Please feel free to contact us.

Standard chuck

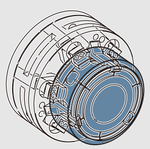
FUJI provides with self-designed and self-produced chuck in standard specification.

Wedge type 3-jaw chuck | Pin arbor chuck | Ball lock chuck | Compensating Chuck | I.D. collet chuck | O.D. collet chuck

Special chuck

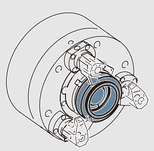
FUJI's experienced technical team offers customers the best chuck solution with rich know-how.

I.D. collet chuck with anti-vibration clamps



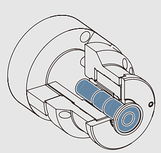
For the O.D. machining of the deep bowl type work piece, clamp the depth of internal diameter of the work piece securely with I.D. collet, and fasten the work piece with anti-vibration clamps.
Work piece wrap can be avoided by the compensation from the anti-vibration clamps.

S collet chuck with fingers



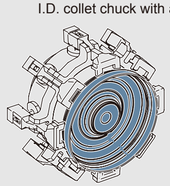
Perform the end face clamping basing on the internal diameter of the work piece.
Hold the internal diameter with collet, and clamp the end face of the work piece with fingers.
Then the collet unclamps and moves back for I.D. machining.

O.D. collet chuck with chips outlet



Fix a chips outlet in the O.D. collet chuck, for disposing the chips which interferes with the clamping for long shaft work piece.
By clamping the work piece securely with double taper, the chuck can ensure the rigidity of the work piece.

I.D. collet chuck with anti-vibration clamps



Equipped with anti-vibration clamps, this special chuck can prevent the vibration during the O.D. machining of thin sheet type work piece. Clamp the internal diameter of the work piece with collet securely, and fasten the periphery with the anti-vibration clamps.
Work piece wrap can be avoided by the compensation from the anti-vibration clamps, which are driven by built-in air cylinder.

The order-to-delivery of special chuck

Work piece determination

Chuck selection
Chuck type
Clamping position
Clamping method
Use air confirmation or not
Use coolant or not

Chuck production
In-company production/assembly

Inspection
Inspection in real machine
Real achining

Delivery

NC Specifications

Axis Control	Controled systems CSD:2 CSS:1 Controled axes 2×2 *2 2 3×2 *2 Simultaneously controled axes 2 (X,Z)×2 2 (X,Z) 3 (X,Z,C)×2 *2 Controled spindle axes 1×2 1 2×2 *2 Least input increment (X-axis dia.) 0.001mm Flexible feed gear HRV2 control Inch/metric conversion Interlock Machine lock Emergency stop Overtravel Stored stroke check 1 Mirror image Follow-up Servo OFF/mechanical handle Chamfering ON/OFF Backlsh compensation Backlsh compensation for each rapid traverse and cutting feed Position switch Unexpected disturbance detection	Feed Function	Rapid traverse rate Feed per minute Feed per revolution Tangential speed constant control Cutting feedrate clamp Automatic acceleration/deceleration Rapid traverse bell-shaped deceleration Feedrate override Jog override Override cancel Manual per revolution feed	Tool Functions	Tool offset counts 128 (CSD) 99 (CSS) 99 (CSD300R) Tool position offset Tool geometry/wear offset Tool life management Tool offset value counter input Radius/tool nose R offset Direct input of tool offset value measured Tool offset memory common for part systems *1
Operation	Automatic operation MDI operation Program number search Sequence number search Prevention of operator errors Buffer register Dry run Single block JOG feed Manual reference position return Reference position setting without DOG Reference position setting with mechanical stopper Reference position return speed setting Reference position shift Manual handle feed 1 machine Incremental feed	Programming	Tape code EIA/ISO Auto recognition Label skip Parity check Control in/out Optional block skip : 1 block Max. programmable value : ±9-digit Program number : O4-digit Sequence number : N5-digit Absolute/incremental programming Decimal point programming/ pocket calculator type decimal point programming Input unit 10 times multiply Diameter/radius programming Rotary axis designation Rotary axis roll-over Coordinate system setting Automatic coordinate system setting Coordinate system shift Direct input of coordinate system shift Workpiece coordinate system G code system A/B G code system A *2 G code systemA/B/C Optional chamfering/corner R Programmable data input G10 Programmable parameter input Sub program call :10 folds nested Custom macro Addition of custom macro common variables 800 Macro variables common for part systems *1 Interruption type custom macro Canned cycles Multiple repetitive cycles Canned cycles for drilling Circular interpolation by R programming	Operational Function	Part program storage : 1Kbyte 2500m (CSD) 512Kbyte 1280m (CSS) Number of registerable programs : 800 2 systems total(CSD) 1000 2 systems total(CSD300R) 400 (CSS) Part program editing Program protect Extended part program editing Background editing *3
Interpolation	Positioning G00 Exact stop mode G61 Tapping mode G63 Cutting mode G64 Exact stop G09 Linear interpolation G01 Circular interpolation G02/G03 Dwell G04 Polar coordinate interpolation Cylindrical interpolation Threading/synchronous cutting G32 Multiple threading Continuous threading Skip G31 Reference position return G28 Reference position return check G27 2nd reference position return G30	Auxiliary and Spindle Functions	M Function : M3-digit S Function : S4-digit T Function : T4-digit High-speed M/S/T/B interface Blocking control *1 Multiple command of auxiliary function Spindle serial output Spindle override Spindle orientation Rigid Tapping *2 CS Contour Control *2	Setting/ Display	Status display Clock function Current position display Program comment display Parameter setting and display Self-diagnosis function Alarm display Alarm history display Operator message history display Operator history display Help funtion Run hour and parts count display Actual cutting feedrate display Actual spindle speed and T code display Optional system name display *1 Operating monitor screen System configuration screen Servo information screen Spindle information screen Servo adjustment screen Spindle adjustment screen Servo waveform display Periodic maintenance screen Maintenance information screen Multi-language (Standard) : English, Japanese Dynamic language selection Erase CRT screen display Data protection key 4types
			Data Input/Output	Reader/Punch Interface : ch1 External data input Memory card input/output } Switch either on USB memory input/output }
			Communications	Embedded ethernet
			Display	10.4" color LCD with touch panel

A previous arrangement may be necessary depending on the specifications.
*1 Except CSS
*2 CSD300R Only
*3 Except 300R

	CSD	CSD300R	CSS
*1	○	○	×
*2	×	○	×
*3	○	×	○