Dynamic

S32 CSL Series Model Swiss Type CNC Lathe

Dynamic CNC Swiss lathes provide superior mechanical advantages that equate to longer life, better performance and highly accurate machining specifications. The 32 CSL swiss lathe is built with ruggedness and ease of maintenance as a priority, with features and flexibility unmatched in an affordable and sophisticated design.

With simple to operate CNC systems and an easy to understand tool layout, the 32 CSL can provide performance and competitive cycle-times in a very cost competitive package. The 32 CSL can be ordered in several model configurations based on the features and axes required.
This proposal is based on the 5,6 or 7 axis Model 32 CSL, which incorporates both live spindles and a sub spindle.

The modularity of the 32 CSL allows it to be easily adapted to a wide variety of applications. Packages have been designed to accommodate a range of requirements. We can offer, chucker style or rotary bush guide bushes both with bar feed systems.

The accuracy and performance of the 32 CSL is the result of its superior mechanical advantages. The mechanical advantages are derived primarily from three key sources discussed in the following section.

We use quality components and employ quality engineering that provide a stable platform for quality part production.

Machine Base

The machine is constructed from Meehanite cast iron, designed to provide a balance between rigidity and low inertial mass. In applications that require a Fast cycle, but need high rigidity this can be critical.
The base does not compromise machining quality, it is a balance between structural requirements for low vibration and minimum weight for rapid axis response. The key casting components are bolted in place and pinned after alignment to provide accuracy and repeatability in alignment. The Main X,Y gantry is designed using a honeycomb style casting, this provides rigidity and torsional stiffness.

Slide System

Rails

The slide design incorporates high performance THK linear rails mounted to sturdy, rigid, Meehanite castings on X1, Y1, Z1, X2 and Z2 axes. These THK rails support 4 circuit preloaded ball tracks. Each track is connected to the centralized lubrication system.

Ball Screws

Precision ground class 3 THK ball screws are located by Class 7 angular contact THK thrust bearing sets. Each ball nut is connected to the centralized lubrication system.

Servo System

The axis motors are driven through a 1/1 ratio precision pulley system thus eliminating any thermal growth from the motor.
The Main Z axis motor is direct coupled to the ball screw for high thrust loads when drilling and turning.
The motors are AC Digital High Response servos, This type of motor is used due to its ability to smoothly accelerate and provide stable torque under load.

Each axis is equipped with absolute encoders allowing easy start up without homing on power up.

Main Spindle Systems

The 32 CSL spindle is configured to accept TF37 collets. This collet can accept up to 37mm (1.456") round stock.
Offering a standard 8,000 rpm spindle. The spindle employs five (5) class seven (7) NSK bearings in a conventional spindle design.

The hydraulic style closer provides solid clamping force for high load cutting.

The main spindle is available in 2 configurations, a Rotary Guide Bush or a "Rough Material Bushing"

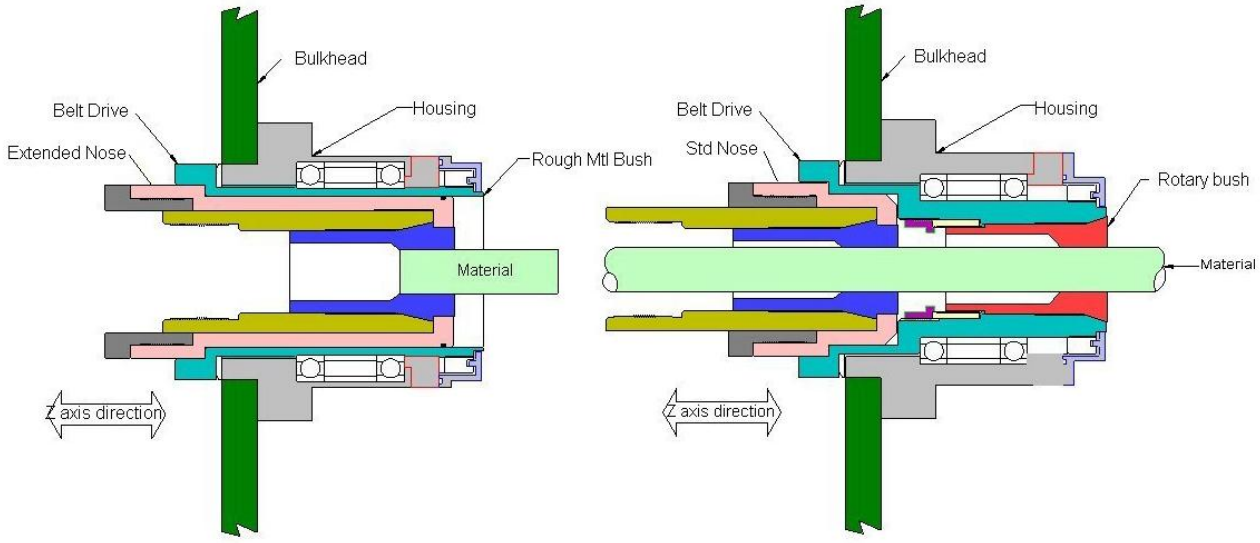
The rotary guide bush is direct driven from the main spindle.
These bushes are a "S&W TSD32" type collet.

Rough Material Bushing

The "Rough Material Bush" allows the machine to be used as a chucker.

The logic in this design is that standard drawn stock can be used if the diameter to length ratio of the part is 4/1 or less.

Safe time on setups, save money on standard material and reduce scrap to less than 1" per bar length.



Sub Spindle Systems

The 32 CSL sub spindle is configured to accept TF25 collets. This collet can accept up to 20mm (0.787”) round stock.

The spindle has an 8,000rpm capability.
This is equipped with an air blow through the part eject rod. Part ejection is monitored by proximity switch to ensure correct ejection.

A long part, rear eject option is available, and the rear door has the necessary slots to accommodate in the field addition of this option.

Both Spindle Systems

The 32 CSL spindles are configured to index in 5^{O} increments. The locator utilizes a gear and hydraulic pin lock, providing secure positioning and reliable repeatability.

C Axis Main Spindle

The Main spindle is optionally available with a worm and gear driven, contouring C axis.
This provides accurate 0.001^{O} positioning and direct rigid location for precise milling and drilling applications. The C axis worm gear disengages for turning work and is powered by its own servo motor.

Turning Tooling

Six 16mm square, turning tools allow a wide range of different tool profile to be held at one setup.
A standard cutoff confirmation arm allows reliable untended operation either on sub spindle or non sub spindle equipped machines.

Vertically aligned, this configuration allows chips to fall free into the conveyor and not hold on to other tools in the cutting area, lessening the chance of damage to the part from chips rubbing or deflecting coolant.

This gang tool rack is easily accessible from the front of the machine, this access allows quick change over when necessary, and are easy to see when offsetting.

Live Tooling

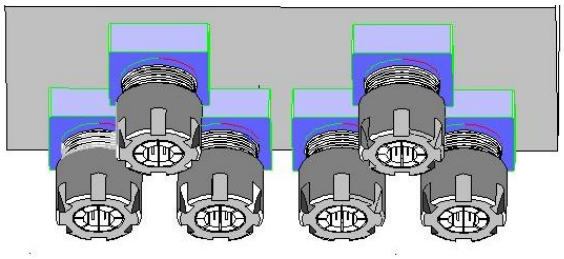
The 32 CSL series has the live tool capability to machine your difficult parts.

The operations that can be completed are numerous:

- Cross drilling
- Off center drilling
- Slotting
- Sawing
- Face milling
- Helical milling

Radial Tooling

The Main spindle features an innovative 6 radial tool configuration featuring 6000rpm and ER20 (12mm capacity) collets.



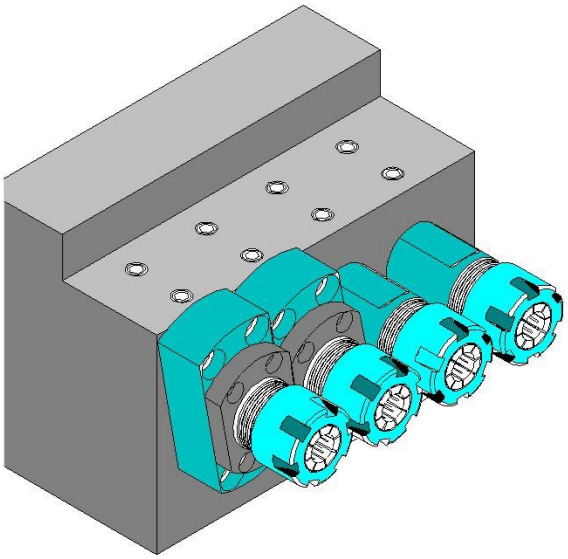
The extra two tools are in-front of and straddled between the 4 rear tools. This configuration allows extra capacity without compromising rigidity or accessibility.

Main Spindle Axial Tooling

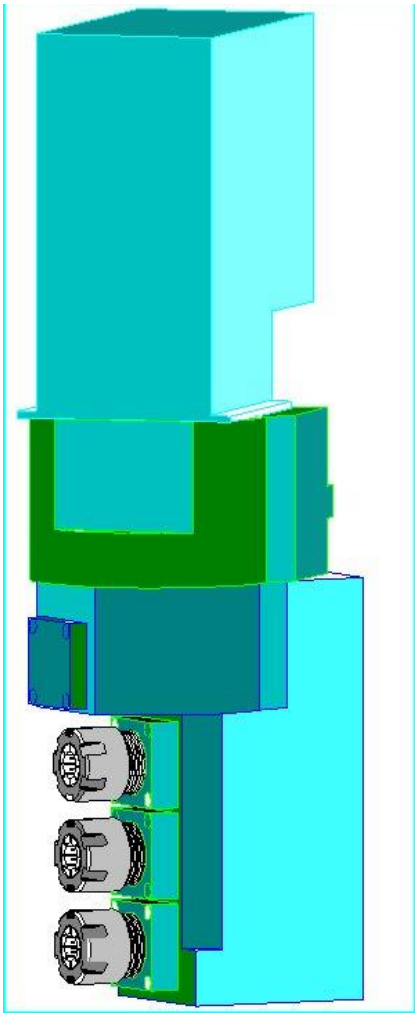
The Axial spindles are configured in a 4 tool configuration

Featuring two non rotating ER 20 collets for each spindle, and two ER20 live spindles on the main spindle. The live spindles speed is 3000rpm

These tools are mounted on a Hydraulic slide to advance into the work zone, providing clearance as easy access for the sub spindle and B axis.



Main Spindle B Axis Tooling



The B axis attachment provide 3 ER20 live tool spindles in a vertical configuration.

This axis is available in 2 options:

- Manually adjustable angle
- Programmable angle

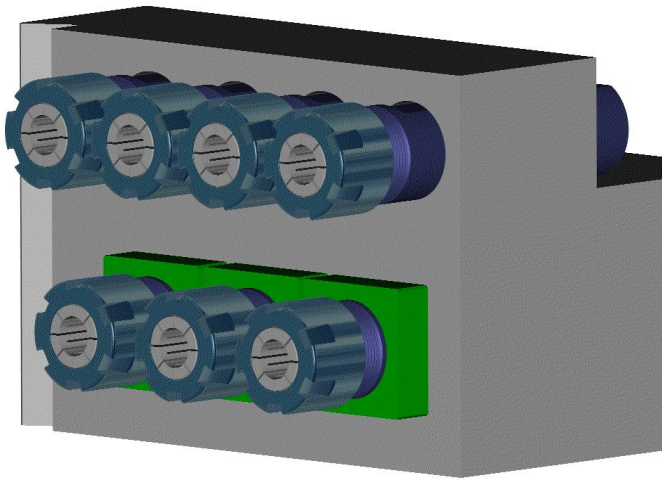
The axis is adjustable through 90^{O}
It can be used as additional radial tooling or additional axial tooling, or for drilling or milling angular features.

Rigid tapping capability extends the use of this optional tooling.

0.75hp and 4000 rpm speed provides a wide range of uses.

The fully programmable axis allows rotation to position from within the program. Allowing different angles to be drilled with the same tool or different angles with each tool.

Sub Spindle Tooling



The Sub spindle is supported with up to 7 axial spindles.

- 4 Fixed axial (ER20)
- 3 Live axial (ER20) optional

The live tools are mounted on a hydraulic slide that moves the tools into a working position.

Tooling Configurations

The **32 CSL** line consists of 3 basic machines.

These machines are divided by the Main spindle capacity.
Either 20, 25, or 32mm capacity.

Standard Machine Features

These features are standard on the 32 CSL series.

- Part Catcher with Conveyor
- Air Blow on the Sub Spindle
- Part Eject with confirmation on the Sub Spindle
- Cutoff Confirmation Arm
- Synchronous operation on both spindles
- 6 Turning tools (Main spindle)
- 6 Radial live tools (Main spindle)
- 2 fixed axial tools (Main spindle)
- 2 live axial tools (Main spindle)
- 4 fixed tools (Sub spindle)

If we do not have the exact configuration you require, please contact us.

Optional Machine Features

These features are optional on the 32 CSL series.

- 3 tool B axis (Manual or Fully Programmable positioning)
- 3 Live tools on sub spindle on Hydraulic slide.
- Main Spindle C axis
- Chip Conveyor
- Rough Material Bushing

Mitsubishi Meldas M65 Control

These features are standard on the M65 control:

- Color LCD screen
- Offline connectivity. (RS232)
- Up to 64 tool offsets
- Cycle-time timer
- Part counter
- Direct drawing input of part dimensions (angular co-ordinate input)
- On screen messages for operator
- Drilling, threading and roughing canned cycles
- Macro programming with multi level parameter access
- Man readable messages in program list and program
- Synchronous link of main and sub spindle
- Synchronous link of Z axes
- Twin channel operation

Meldas M65 G code list

G00	Positioning
G01	Linear interpolation
G02	Circular interpolation CW
G03	Circular interpolation CCW
G04	Dwell
G107	Cylindrical interpolation
G09	Exact stop check
G10	Program parameter/Compensation input
G11	Program parameter input mode cancel
G12.1	Milling interpolation ON
G13.1	Milling interpolation cancel
G16	Milling interpolation plane selection Y-Z cylindrical plane
G17	Plane selection X-Y
G18	Plane selection Z-X
G19	Plane selection Y-Z
G20	Inch command
G21	Metric command
G22	Barrier check ON
G23	Barrier check OFF
G22	Soft limit ON
G23	Soft limit OFF
G27	Reference point return check
G28	Automatic reference point return
G29	Return from reference point
G30	2nd, 3rd and 4th reference point return
G31	Skip function
G31.1	Multi-step skip function 1
G31.2	Multi-step skip function 2
G31.3	Multi-step skip function 3
G32	Thread cutting
G34	Variable lead thread cutting
G35	Circular thread cutting CW
G36	Circular thread cutting CCW
G37	Automatic tool length measurement
G40	Tool nose R compensation cancel
G41	Tool nose R compensation left
G42	Tool nose R compensation right
G46	Tool nose R compensation (direction automatically selected) ON
G43.1	1st spindle control mode
G44.1	2nd spindle control mode
G47.1	2-spindle synchronous control mode
G50	Coordinate system setting / Spindle clamp speed setting
G50.2	Scaling cancel
G51.2	Scaling ON
G250	Polygon machining mode cancel (Spindle-tool axis synchronization)
G251	Polygon machining mode ON (Spindle-tool axis synchronization)
G52	Local coordinate system setting
G53	Machine coordinate system selection

Meldas M65 G code list cont.

G54-G59	Work piece coordinate system selection
G61	Exact stop check mode
G62	Automatic corner override
G63	Tapping mode
G64	Cutting mode
G65	User macro call
G66	User macro modal call A
G66.1	User macro modal call B
G67	User macro modal call cancel
G68	Facing turret mirror image ON
G69	Facing turret mirror image OFF
G68	Facing turret mirror image ON or balance cut mode ON
G69	Facing turret mirror image OFF or balance cut mode cancel
G70	Finishing cycle
G71	Longitudinal rough cutting cycle
G72	Face rough cutting cycle
G73	Formed material rough cutting cycle
G74	Face cut-off cycle
G75	Longitudinal cut-off cycle
G76	Compound thread cutting cycle
G76.1	2-systems simultaneous thread-cutting cycle (1)
G76.2	2-systems simultaneous thread-cutting cycle (2)
G90 G77	Longitudinal cutting fixed cycle
G92 G78	Thread cutting fixed cycle
G94 G79	Face cutting fixed cycle
G80	Hole drilling fixed cycle cancel
G79 G83.1	Deep hole drilling cycle 2
G83	Deep hole drilling cycle (Z axis)
G84	Tap cycle (Z axis)
G85	Boring cycle (Z axis)
G87	Deep hole drilling cycle (X axis)
G88	Tap cycle (X axis)
G89	Boring cycle (X axis)
G84.1	Reverse tap cycle (Z axis)
G88.1	Reverse tap cycle (X axis)
G96	Constant surface speed control ON
G97	Constant surface speed control OFF
G98	Asynchronous feed (Feed per minute)
G99	Synchronous feed (Feed per rotation)
G90	Absolute value command
G91	Incremental value command
G98	Fixed cycle initial return
G99	Fixed cycle R point return
G113	Polygon machining mode cancel (spindle/spindle synchronization)
G114.1	Spindle synchronization control
G114.2	Polygon machining mode ON (spindle/spindle synchronization)
G115	Start point designation synchronizing Type 1
G116	Start point designation synchronizing Type 2
G117	Miscellaneous function output during axis movement

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Machine Specifications*

Cutting Features

Main spindle speed	8,000rpm (10,000 on 20CSL)	
Maximum Material Diameter	1.375" rd.	35mm rd
Max. machining length	10.55"	268mm
Front I/D fixed tools	2	
Max. drilling diameter	0.984"	25mm
Max. Tapping diameter	0.512" (13mm) with ER20 collets	13mm
Turning tool #	6	
Turning tool size	0.625 x 0.625 x 6"	16mm x 16mm x 150mm
Cross slide live tool #	6	
Live tool drilling diameter	0.512" (13mm) with ER20 collets	13mm
Axial live tools	2	
Live tool drilling diameter main	0.512" (13mm) with ER20 collets	13mm
Live tool drilling diameter sub	0.512" (13mm) with ER20 collets	13mm
Indexing Capability	5^{O} with locator pin clamping both spindles	
C Axis Travel*	360^{O} in 0.001^{O} increments and full contouring capability	
Sub spindle speed	8,000rpm	
Maximum Material Diameter	1.25" rd.	32mm rd
Max front eject length	10.55"	268mm
Collet Type	TF 37 both spindles	
Rotary Bush Type	TSD 32	
Collet Activation	Hydraulic with M code & push button	
Feed Rates	250 ipm maximum	(minimum feed 0.000050")
Rapid Traverse	709 ipm	18m/min
Position Repeatability	±0.0001"	±0.0025mm
Position Accuracy	±0.0001"	±0.0025mm
Spindle TIR Max.	0.00005"	±0.00127mm
Coolant Type	Oil or Water based	
Coolant pump #	2	
Coolant pump size	0.24hp	0.18Kw

Requirements

Compressed Air	0.35 SCFM	10L/min
Pressure	71psi	$5kg/cm^2$
Voltage	220 VAC 3 phase	
Power Requirements	7.5 KVA	
Machine Weight	8792 lbs max	3988kg
Machine Dimensions L x D x H	98" x 50" x 70" Max	2480mm x 1280mm x 1780mm

Specifications are subject to change without notice.

Machines

S20 CSL
S25 CSL
S32 CSL

Optional Accessories

B Axis with 3 live tools (Manual adjustment)
B Axis with 3 live tools (Programmable adjustment)
3 live tools on Sub Spindle
Rough Material Guide Bush
Pipe type long part ejection device
Chip Conveyor
Chip Bin
Fanuc 18iTTB control
Includes complete Fanuc servo system.
Cf Axis on Main Spindle

Warranty

Dynamic warrants to the purchaser that on the day of delivery, Dynamic machines and parts thereof shall be free from defects in materials and workmanship.
For mechanical parts, for a period of twelve (12) months commencing on the date the machine is delivered to the purchaser. Dynamic will, at its sole discretion, either replace or repair any machine or part thereof defective in workmanship or material, at no charge to the purchaser.
For control parts, including the control, motors, servo drives, and feed back devices, the warranty will be for a period of twenty-four (24) months commencing on the date the machine is delivered to the purchaser.

General Warranty Conditions are as follows:

- All warranty coverage is F.O.B.Dynamic Machinery Resources, Inc.
- The warranty period for material is one (1) year from the date of shipment, excluded from warranty are items subject to wear from machining parts, such as paint, windows, light bulbs, seals, belts, etc. and any consumables such as lubricants and filters.
- The warranty coverage period for labor in support of a new system is twelve (12) months from the date of shipment, exclusive of travel and subsistence expenses. The choice of repair or replacement of warranty items will be the exclusive choice of Dynamic. Items replaced under warranty will be covered for the un-expired portion of the original warranty.
- Materials and labor provided to customers on systems under warranty for the purpose of correcting failures due to improper use, maintenance or configuration changes of the system are specifically excluded from any warranty coverage for either labor, material or expenses incurred in providing the service.
- This warranty does not cover improper usage, installation, maintenance, or damages that occur during shipping.
- Dynamic shall be held blameless for any “Loss of Use” considerations due to warranted or unwarranted interruptions in use of this operating system
- Additional Warranty information is included in the complete quotation

Dynamic

Real Machines. Solid Performance.

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