

FRYER
MACHINE SYSTEMS

The Toolroom Company

TOOLROOM MILLING



CM SERIES

Precision Compact Mill

INSIDE THE CM-20

**20"X 13"Y 20"Z
12" x 24" Table Size
8,000 RPM Spindle
10 Tool ATC**

RIGID HEAD

Features 8,000 RPM CAT-40 spindle, 7.5 HP spindle motor and optional rigid tapping.

10 STATION (20 OPTIONAL) AUTOMATIC TOOL CHANGER (ATC)

Optional ATC is easy to set up and allows automated operation of the machine.

STEEL WAY COVERS

High quality telescoping way cover offers excellent protection (optional).



WHY WE'RE BUILT BETTER

ABSOLUTE ENCODERS

Remembers your position with the power off. All fixture offsets and tool offsets are maintained so you don't have to re-indicate parts like on other controls.

FRYER / SIEMENS 828-HS CONTROL

The ultimate toolroom CNC. Easy to use for single piece production but includes features unmatched by any other builder. Regenerative drives save you over 40% on electricity.

PRECISION GROUND C3 GRADE DOUBLE NUT BALLSCREWS

Provides incredible 0.0002" accuracy for your most demanding jobs.



MANUAL OPERATION

DO ONE CYCLES

The Do One cycles allow you to quickly drill, bore or tap holes automatically by filling out a simple screen. Once the operation is completed the machines returns to manual mode. Includes pocket cycles, thread milling, drilling, boring, rigid tap, engraving and keyway slots.



ELECTRONIC STOPS

Allows you to set a stop position for any axis. Crank the handles and you can't move past the stop position.

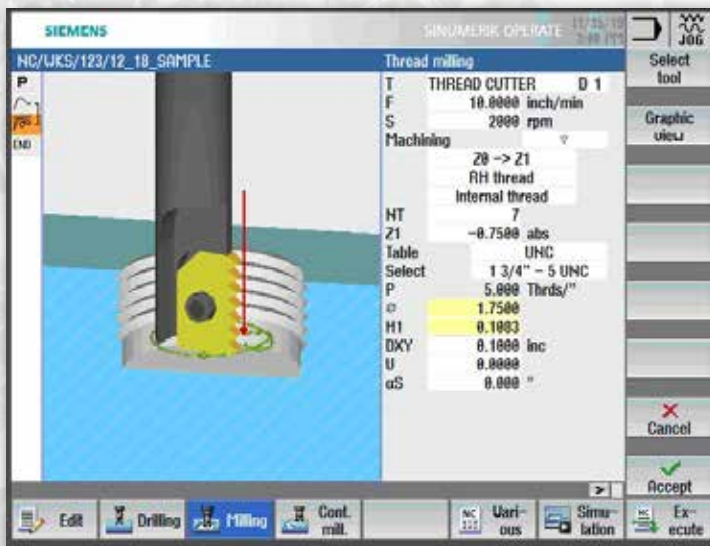
TAPERS AND CHAMFERS

Set the angle required and by turning one handle both axis move at the desired angle.

OTHER MANUAL FEATURES

- Manually run spindle in either RPM or Constant Surface Speed.
- One button tool selection for easy tool changes.
- Teach mode

NO CNC EXPERIENCE NEEDED

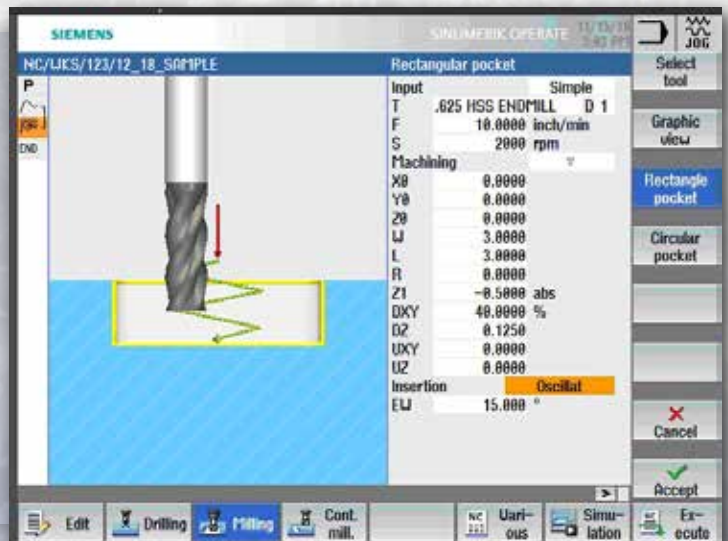


THREAD MILLING

What is usually a tricky programming operation becomes a simple fill in one box procedure. The Thread Mill cycle can run by itself in Manual Mode without having to write an entire program. External/internal threads, inch/metric, right hand/left hand threads are all there in the same do-one cycle.

POCKETING

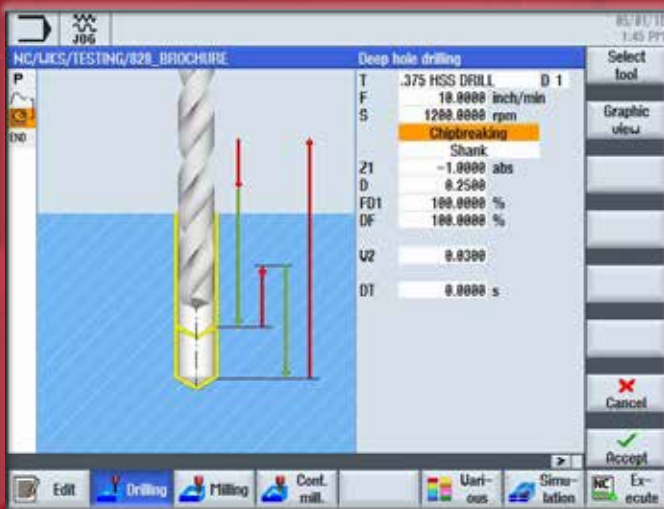
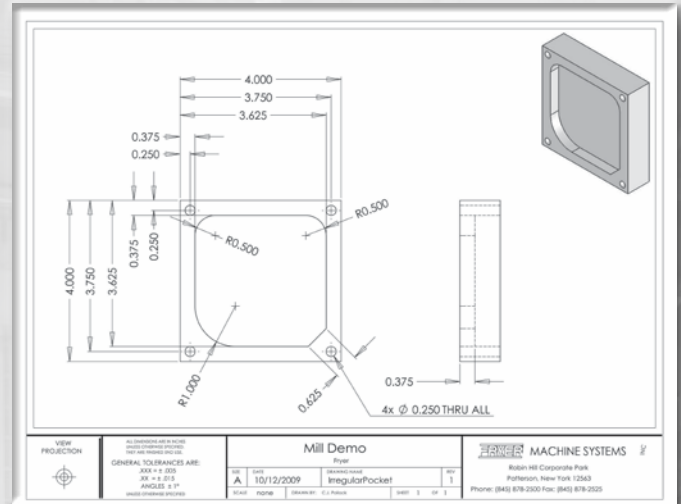
You just need to make one quick pocket so why write an entire program? In Manual Mode all machining cycles are available to run by themselves with no program required. You choose your tool, speeds and feeds, pocket size, depth and how you want your tool to enter the material. The cycle does the rest.



PROGRAMMING

PART PRINT

Programming in ShopMill on the Fryer / Siemens 828-HS control is straight forward with no need for G codes. Enter dimensions directly off the print.

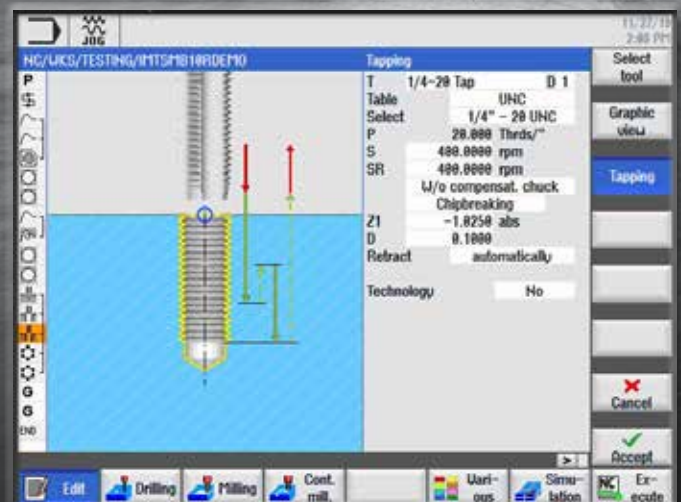


DRILLING CYCLES

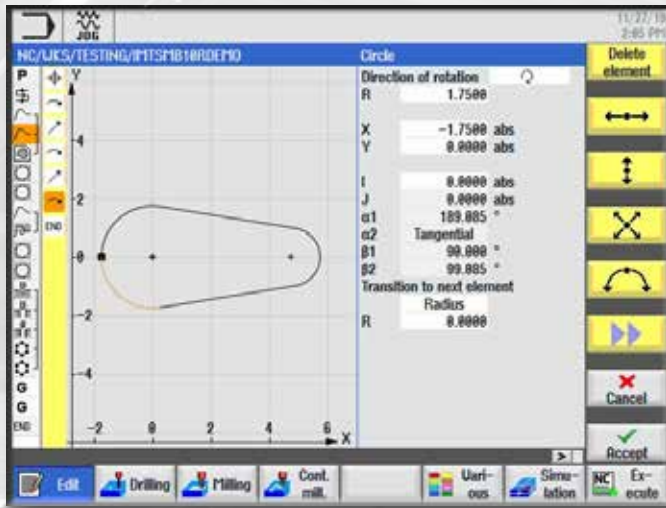
Several drill cycles are available, chip breaking, chip removal, center drilling, reaming etc. All canned cycles retain the last numbers entered saving you time and money.

TAPPING CYCLE

This cycle has several tap forms in inch and metric pre-defined. Tough material? Select Chipbreaking or Chip Removal. Rigid tapping, not usually found on bed mills, is also available. Enter the RPM and the control automatically calculates the feed rate.



FROM DRAWING TO FINISHED PART

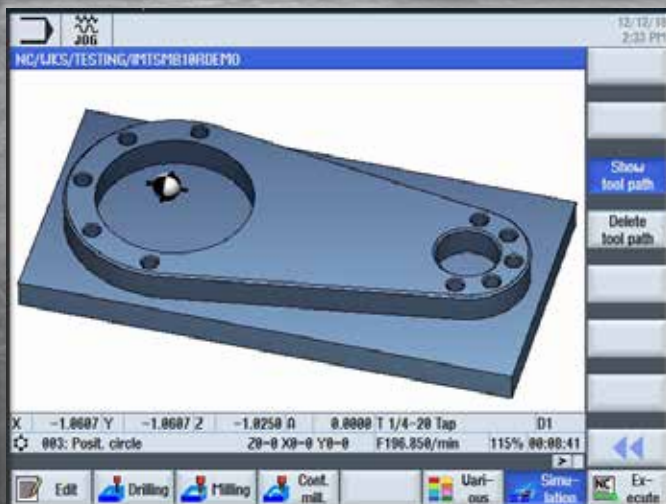
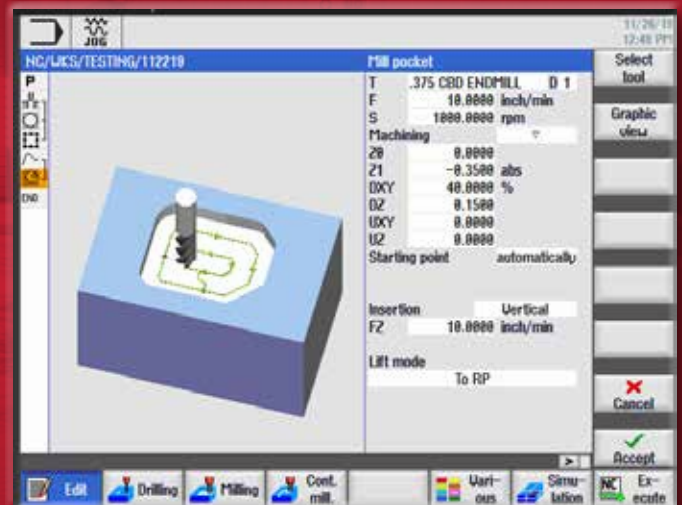


CONTOUR EDITOR

The Contour Editor lets you create simple or complex tool paths. As you enter dimensions the path is visually generated. Don't know an end point? The editor will fill-in missing points.

MACHINING THE CONTOUR

Once the contour is created you link to a cycle to machine it. Pocketing, Path Milling or Spigot all let you control how you want to machine the part. This cycle has a finishing operation and can also chamfer the edge of the part.



SIMULATION MODE

Before making any chips the full featured simulation mode lets you see the part in 3D to check if everything is correct compared to the print. Part can be rotated, zoomed and cut to see into different areas of the part. Hole in the wrong place? Fix it before you actually machine it. Simulation even shows cycle time.

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SETUP AND OPERATION

TOOL TABLE



Graphic display shows the type and name of the tool. You can also control spindle direction and coolant. Tool life monitoring is also standard for time in cut or part count.

AUTOMATIC TOOL PROBE

Tool probe automatically sets your tool length offsets. Includes predefined table locator with magnetic mount for fast use.

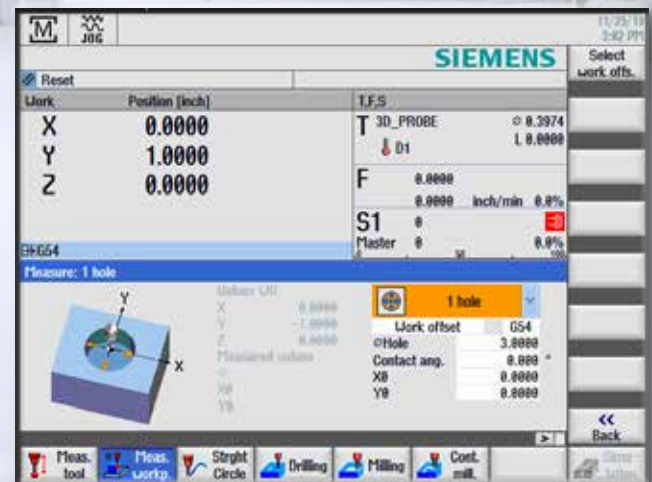


AUTOMATIC PART PROBE

Affordable Fryer wired part probe works on holes, pockets, angled parts etc. to quickly set work offsets



PART PROBING/ MEASURING CYCLES

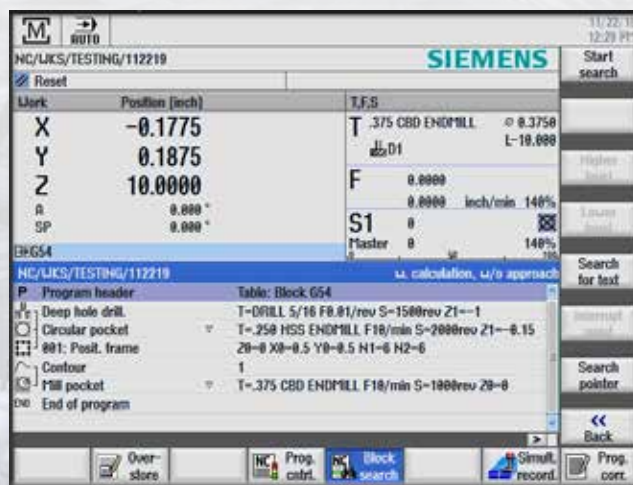


Several standard cycles are available to find centers of holes, part edges, and bosses. Cycles can also be used to measure finished parts and display the reading.

FASTER, SIMPLER & MORE PRODUCTIVE

RUN PROGRAM

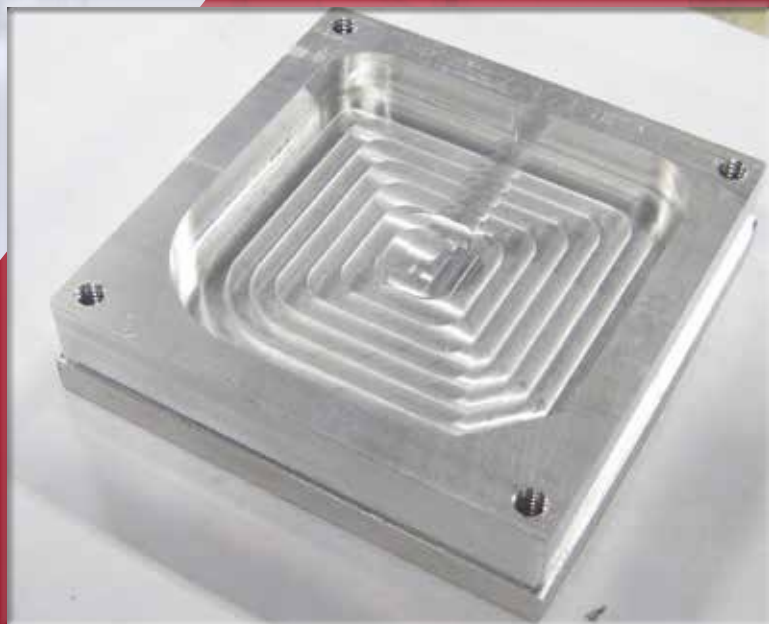
After the program is proved out in simulation you are ready to run. The Auto screen Block Search function lets you start anywhere in the program. Part counters and run times are also included.



HANDWHEEL RUN

This feature allows you to control your program execution with the optional electronic handwheel. Turning the handwheel causes the program to run with you in charge of the axis feed. Turn it slow or speed things up by cranking faster. When you stop turning the axes stop moving, turn the handle the opposite direction and the axes move backwards though the program. Designed to make proving-out programs easier with safety and confidence. (optional)

FINISHED PART

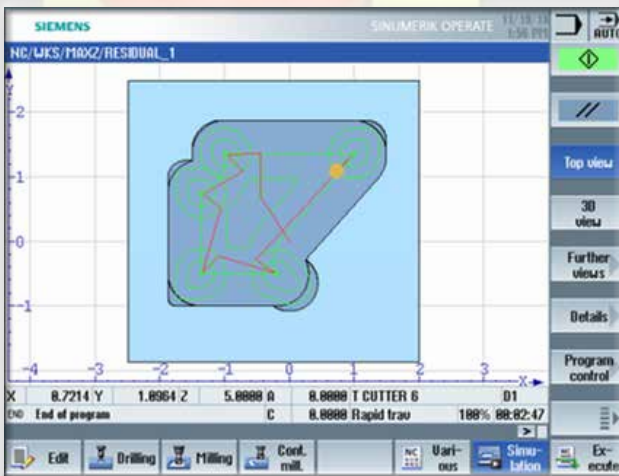
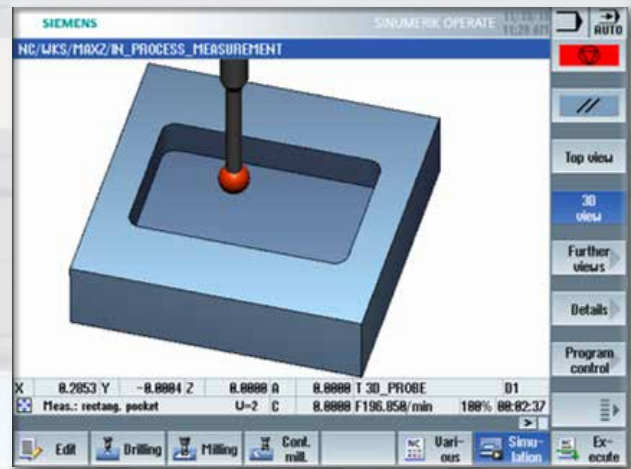


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CONTROL OPTIONS

IN-PROCESS PROBE MEASUREMENT CYCLES

This feature allows you to measure part features during program execution. Can also be used in MDI mode after cutting the part to then measure certain features and display the measurement.

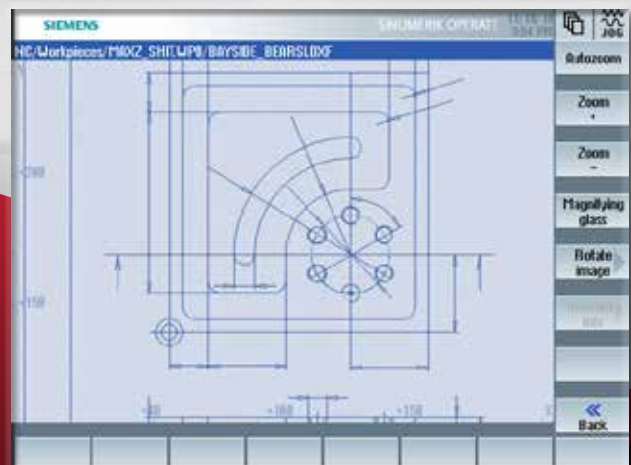


RESIDUAL MATERIAL DETECTION

This software option allows re-machining of pocket milling contours with a tool smaller than the original tool. The control will remember where material has already been machined and will cut only the residual material.

DXF FILE IMPORT FEATURE

Allows you to import DXF files and quickly convert to a conversational program. Automatically create points for drilling operations or contours for milling.



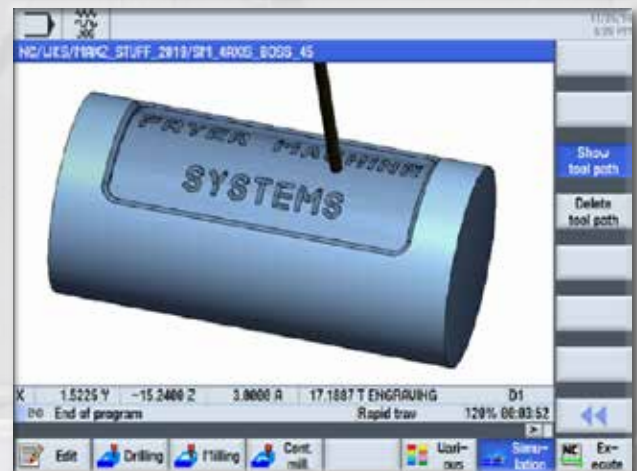
3D HIGH SPEED MACHINING

Features high speed 1.5ms block processing and 500 block look-ahead. Advance Surface features jerk control and nano smoothing with a compressor mode which determines optimal velocity for programs containing circular and linear blocks. High speed roughing parameters and lower speed finishing parameters provide incredible surface finish at lowest possible cutting time.



4TH AXIS SURFACE CYCLES

Allows programming of XYZ coordinates and cycles like pockets and engraving. These are then automatically projected onto a cylindrical surface. For use with 4th axis rotary tables.



SIEMENS OFFLINE PROGRAMMING SOFTWARE

Easy-to-use software package that installs on a standard desktop PC and duplicates the control functions. Allows full programming and part verification. Single package for lathe and mill.

MACHINE OPTIONS



HIGH SPEED SPINDLE

30 taper, 21,000 and 30,000 RPM option. Liquid cooled with refrigeration.



TOOL PROBE

Tool probe automatically sets your tool length offsets. Includes predefined table locator with magnetic mount for fast use.



REMOTE ELECTRONIC HANDWHEEL

Handy jog handwheel is located in a portable box for use anywhere on the machine. Features axis selection switch and a resolution selector for coarse or fine movements.



PART PROBE

Part probe automatically sets pocket centers, bosses, edges and skew angles. Simple graphic menus makes operations fast.



TOOL CHANGER

High speed automatic tool changer with 20 tool capacity.



4TH AXIS ROTARY TABLE

Fryer offers 4 models from 6" to 12" tables. Designed for full 4 axis simultaneous contouring with high precision gearing, disk brake and quick disconnect cables.



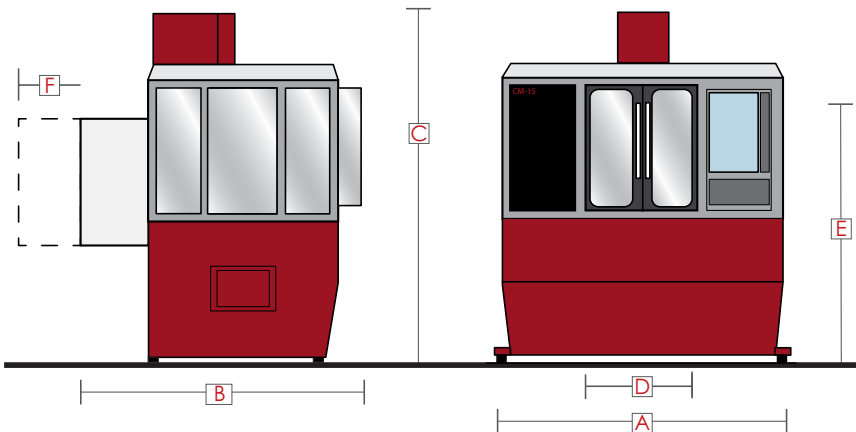
5 AXIS ROTARY TABLE

6" compact trunnion table with full 5 Axis or 3+2 operation. Perfect for multi-sided machining or complex 5 Axis parts.



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CM SERIES SPECIFICATIONS		CM-20
MACHINE CAPACITY	X Travel	20"
	Y Travel	13"
	Z Travel	20"
	Ballscrew Size	1.00"
	Table Load (Evenly Distributed)	450 lbs.
	Table Size	12" x 24"
	T-Slots (No./Width)	3 / 0.630"
	Table Top to Floor	30"
SPINDLE	Motor HP (Peak)	7.5 HP
	Spindle Speed (RPM)	60 - 8,000 RPM (10K, 12K, 15K, 21K, 30K optional)
	Spindle Torque (max)	35 ft/lbs. @ 350 RPM
	Tool Type/Taper	CAT 40 (BT option)
	Spindle Nose to Table (Max to Min)	3" - 23"
	Spindle Center to Column	15"
ATC	Tool Storage Capacity	10 Station (20 optional)
	Tool Change Time	5 Seconds
	Max. Tool Diameter (full)	3.5"
	Max. Tool Weight	10.4 lbs.
	Max. Tool Length	8"
PERFORMANCE	Positioning Accuracy	+/- 0.0002"
	Positioning Repeatability	+/- 0.0001"
	Resolution	0.0001"
	Rapid Traverse	500 IPM (1,200 optional)
	Cutting Feed Rate	0.001 - 400 IPM (1,200 optional)
	Servo Type	AC Digital Brushless
	Axis Thrust (Peak)	2,200 lbs. X, Y, Z
GENERAL INFO	Air Pressure Requirements	90 PSI - 3 CFM
	Coolant Capacity	10 Gallons
	Coolant Flow	2 GPM
	Door Open Width	30"
	Power Requirements	35 AMP 200-250 VAC 3 PHASE (380-500 VAC optional)
	Shipping Dimensions* (WxDxH)	65" x 80" x 80"
	Operating Dimensions (WxDxH)	65" x 80" x 80"
	Machine Weight	4,300 lbs.



CM-20	
Overall Width (A)	65"
Overall Depth (B)	80"
Maximum Machine Height (C)	80"
Door Width (D)	30"
Console Height (E)	63"
Electrical Cabinet Swing (F)	30.5"

* Requires some disassembly to meet these minimum dimensions. Contact factory for more information.

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Specifications subject to change without prior notice.