

FRYER

MACHINE SYSTEMS

Precision Built Solutions

HORIZONTAL MACHINING



DESIGNED, ENGINEERED
& ASSEMBLED IN USA

HB SERIES

High Performance Boring Mills

FRYER HB SERIES



HB-70

70"X 55" (72") Y 36" (46") Z

36" x 80" Table Size

10,000 lbs. Table Load

CAT 50/BT-50 -3,000 RPM Spindle

Machine Weight – 38,000 lbs.

HORIZONTAL MACHINING CENTERS

HIGH PERFORMANCE MOVING QUILL DESIGN



HB-120/ HB-160

120"/ 160"X 55" (72") Y 50"Z

40" x 126"/ 165" Table Size

10,000 lbs. Table Load

CAT 50/BT-50 -3,000 RPM Spindle

Machine Weight – 44-48,000 lbs



**DESIGNED, ENGINEERED
& ASSEMBLED IN USA**

The Fryer logo is displayed in a bold, italicized, sans-serif font. The letters are white and set against a solid red rectangular background that spans the width of the top of the page.


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INSIDE THE HB

A close-up photograph of the machine's spindle. A long, polished metal bar is held in a chuck. The spindle housing is cast iron with various ports and a blue air line. The Fryer logo is visible on the side.

50 TAPER BAR TYPE SPINDLE

50 taper 4" diameter bar/quill with 20" of W axis travel. 40 HP 3000 RPM spindle motor with 360 ft./lbs. of torque.

A photograph of the tool changer mechanism. It features a red arm that can move vertically and horizontally to select tools from a magazine. The tool holder is currently holding a tool.

AVAILABLE 24 TOOL AUTOMATIC TOOL CHANGER (ATC)

High Speed arm style ATC with 24, 40 or 60 tool capacity.

A photograph showing the machine's guideways. A red vertical bar is positioned on the left, and the heavy-duty metal ways are visible on the right. The machine is mounted on a thick, dark base.

HARDENED AND GROUND BOX WAYS

Box Ways on all 3 axes provide much higher rigidity to give you better tool life and minimize vibration. All friction surfaces are Turcite coated, oil fed and slide on top of the Box Ways for extremely low wear and high accuracy. Meehanite casting is machined twice and stress relieved.

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 production CNC. Easy to use for single piece jobs or production runs 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.

ALL AXES LASER CALIBRATED AND BALLBAR VERIFIED

Printed results of each are shipped with every machine.

MANUAL OPERATION

THE FRYER / SIEMENS 828-HS

The Fryer / Siemens 828-HS offers the flexibility to run the machine manually when needed. All the ShopMill conversational cycles that are used in a program are available in manual mode to run as a do-one operation. Axis jog buttons and do one positioning let you position your tool, turn on the spindle and make your cut. No knowledge of G code is needed.

ELECTRONIC HANDWHEEL

Axis and resolution select as well as Cycle Start and Feed hold Buttons allows for easy manual positioning of tools or table. You can also run the program with the available Handwheel Run feature.

ELECTRONIC STOPS

Allows you to set a stop position for any axis. Turn the handwheel or axis push buttons and you can't move past the stop position.



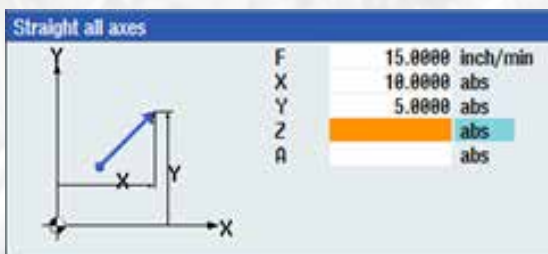
NEXT TOOL/PREVIOUS TOOL

Easy tool changes without commands using next tool/previous tool buttons.



OTHER MANUAL FEATURES

- **MANUAL SPINDLE CONTROL** Enter the RPM and spindle direction and push cycle start
- **JOG BUTTONS** Select the axis and adjust the feed rate override dial to your desired feed rate
- **TEACH MODE** Records positions with a push of a button as you move X Y and Z around. Can then be used to create a program or run by itself.



PUSHBUTTON POSITIONING

Move one axis or all at once with a controlled feed rate or in rapid. Positioning moves can be made in absolute or incremental.



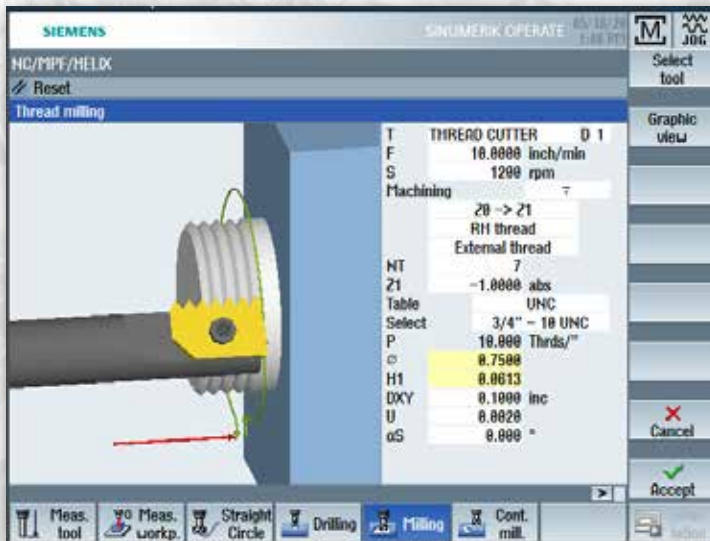
TAPERS AND CHAMFERS

Set the angle required and by turning the handwheel both axes move at the desired angle.

NO CNC EXPERIENCE NEEDED

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.

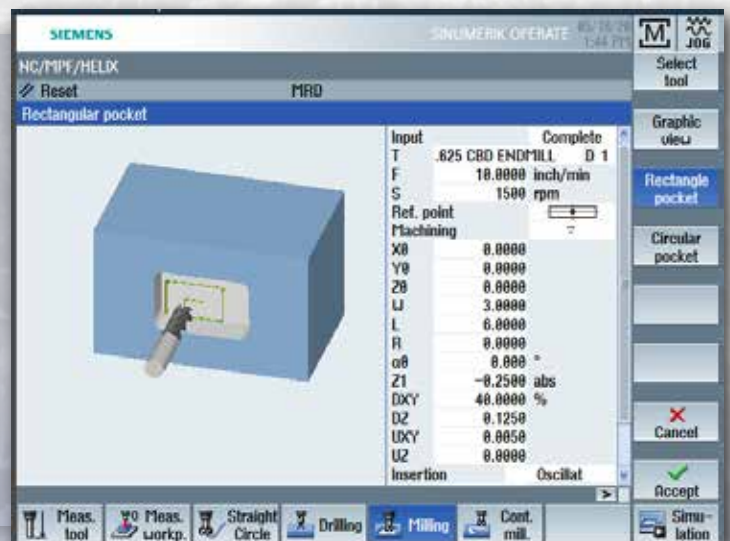


THREAD MILLING

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.

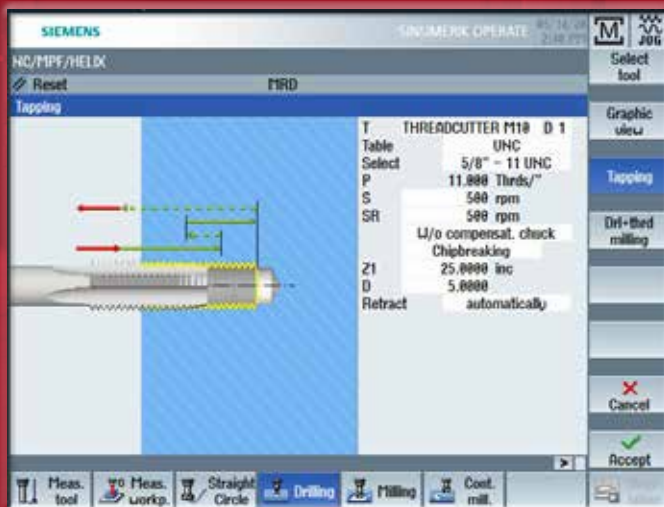
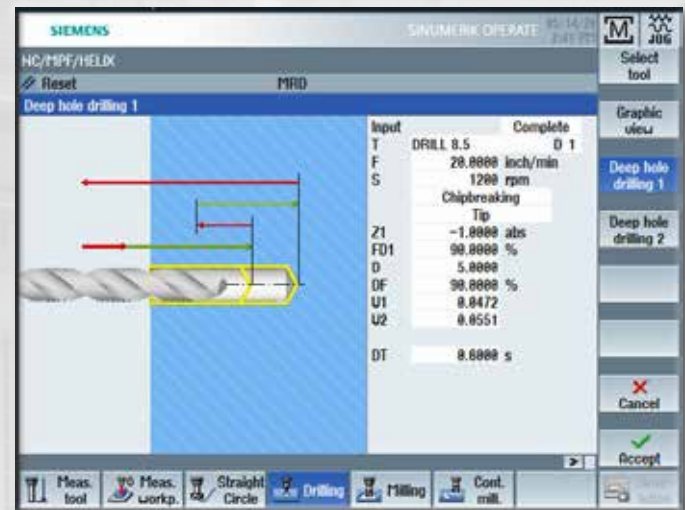


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PROGRAMMING

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.

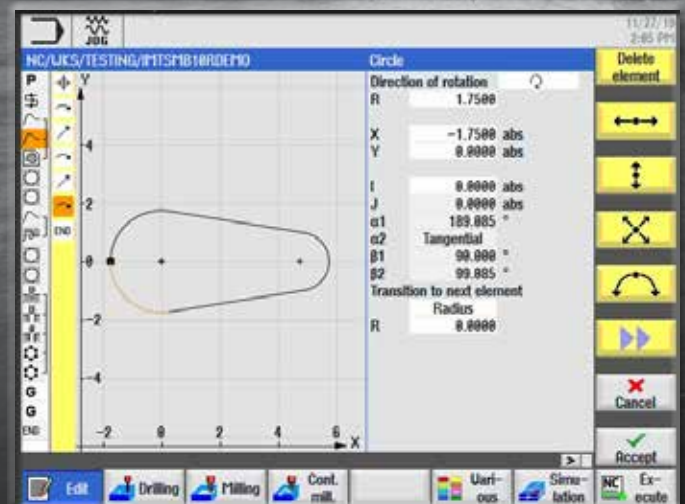


TAPPING CYCLE

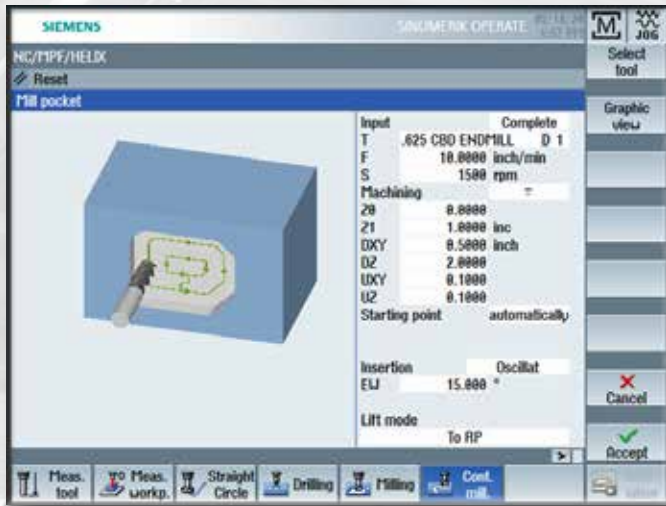
This cycle has several tap forms in inch and metric pre-defined. Tough material? Select Chipbreaking or Chip Removal. Enter the RPM and the control automatically calculates the feed rate.

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.



FROM DRAWING TO FINISHED PART

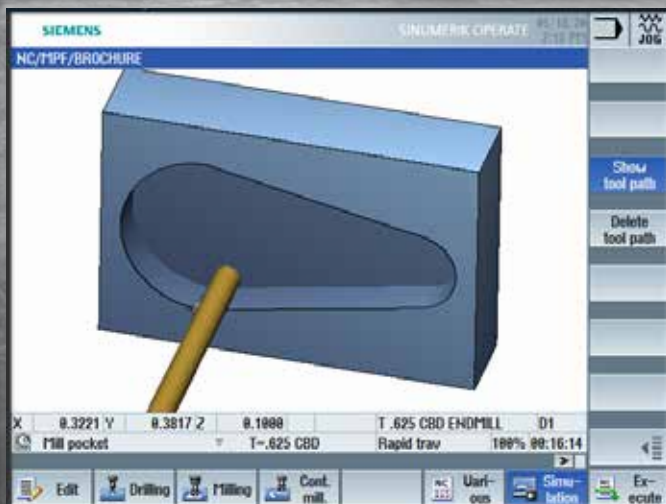
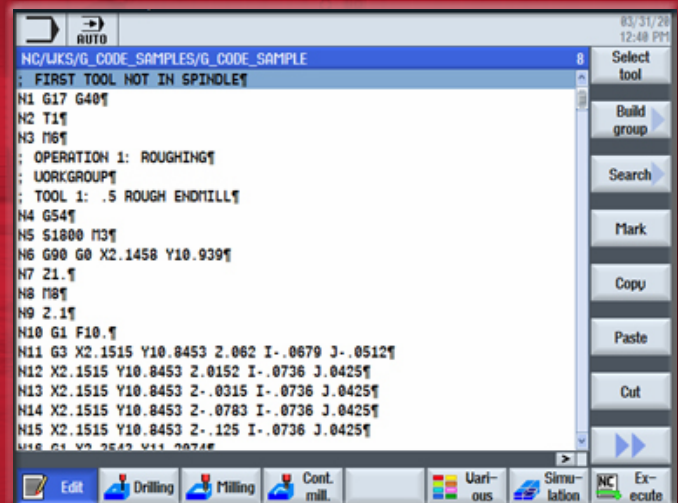


MACHINING THE CONTOUR

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.

G CODE PROGRAMMING

The Fryer / Siemens 828-HS also offers standard part programming in either Siemens G Code or emulated ISO/Fanuc mode. Programs posted from CAM systems can also be simulated before running. Full editing, renumbering as well as find and replace are included.



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 & PART PROBES

Wireless Renishaw or Marposs tool probes automatically set your tool length and diameter 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.



DEFINE TOOLS

The tool page is where tools are created. The 828-HS gives you an extensive library of tools to pick from. When naming tools you have the option of giving tools a number or a description of what they actually are. After you create the tool it shows a visual display of the tool. Multiple edges, tool wear adjustments and tool life monitoring are all standard.

FASTER, SIMPLER & MORE PRODUCTIVE

SET PART ZERO

Several standard cycles are available to set part Zero. They can be used with a conventional edge finder or an automatic part probe. These cycles can also be used to measure the part and display the values before removing it from the machine, much like a built-in CMM.



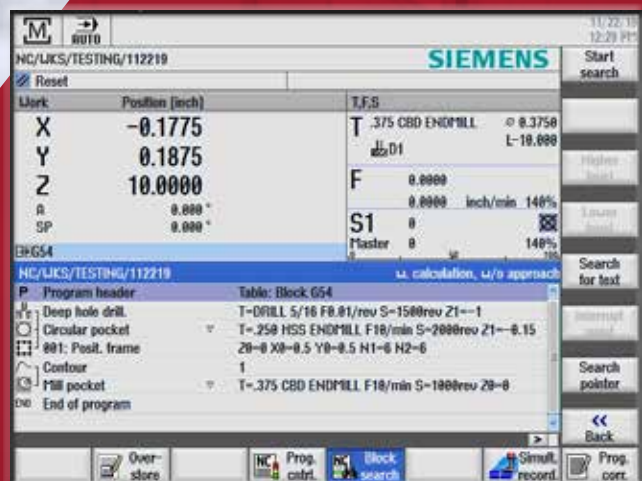
HANDWHEEL RUN

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)



SET TOOL LENGTH OFFSETS

Once the tools are created they are set either manually off the part or automatically with a tool probe. Standard tool measuring cycles set the length, and depending on the probe used, the tool diameter.



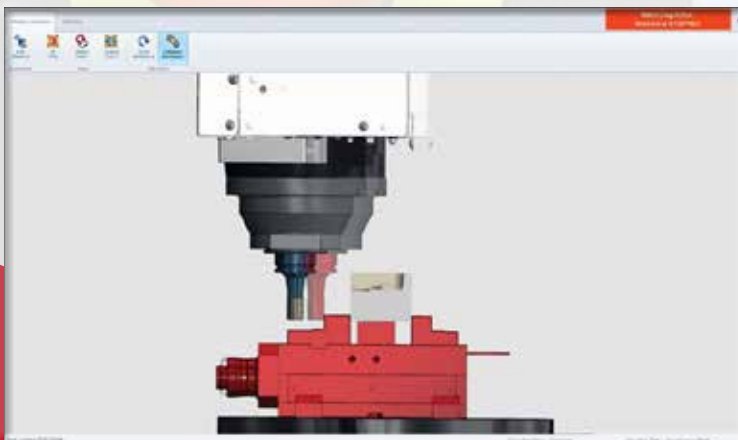
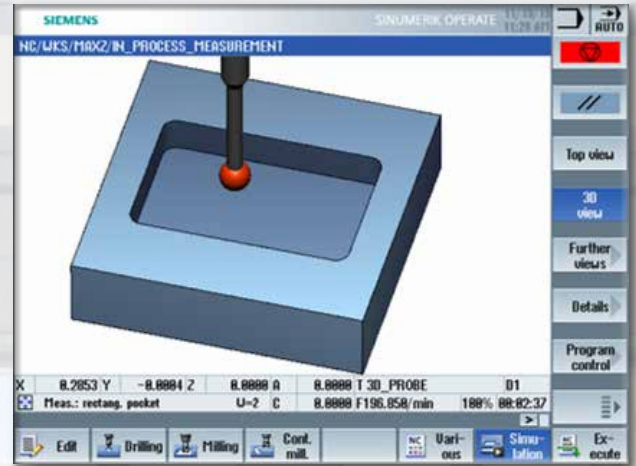
RUN PROGRAM

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.

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.

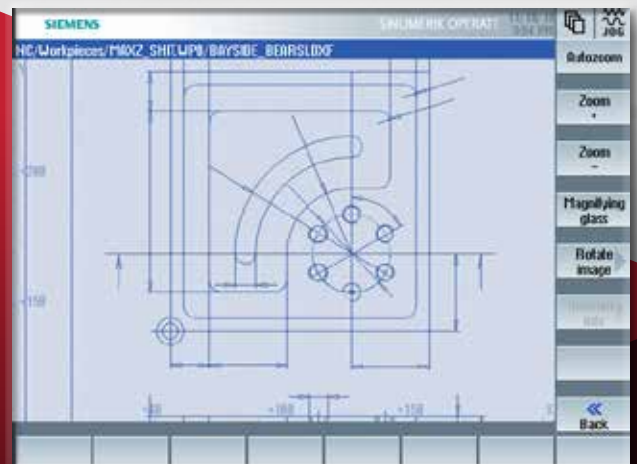


COLLISION AVOIDANCE - REAL-TIME, 3D PROTECTION MONITORING PROTECTION YOU CAN USE

828-HS Collision Avoidance provides protection by monitoring the static machine tool components in 3D and in real-time. Works in every operating mode including Jog, MDI and Automatic. With Collision Avoidance, the potential for machine components colliding is greatly reduced or even eliminated, making the process more cost-efficient.

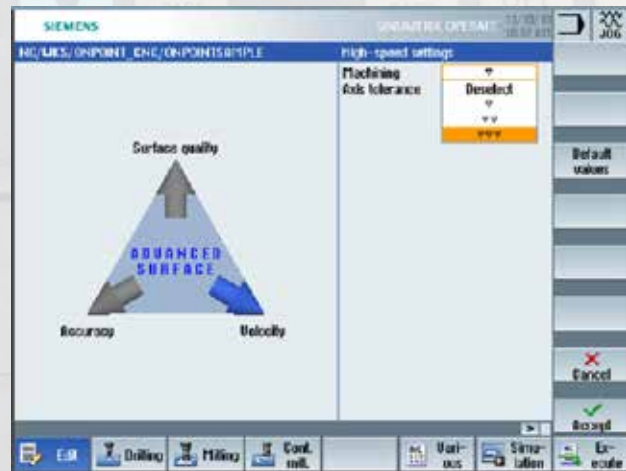
DXF FILE IMPORT FEATURE

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



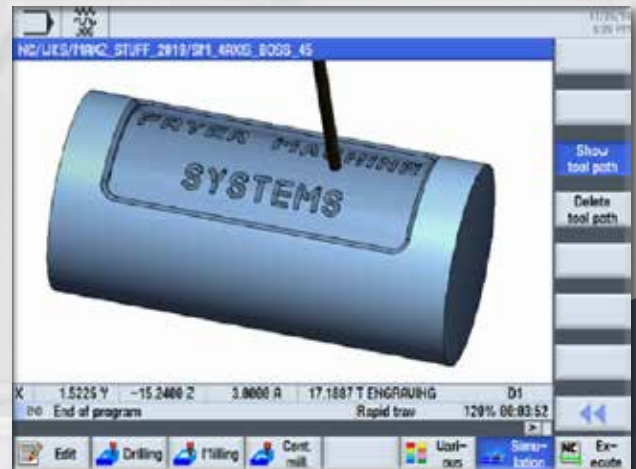
3D HIGH SPEED MACHINING

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.



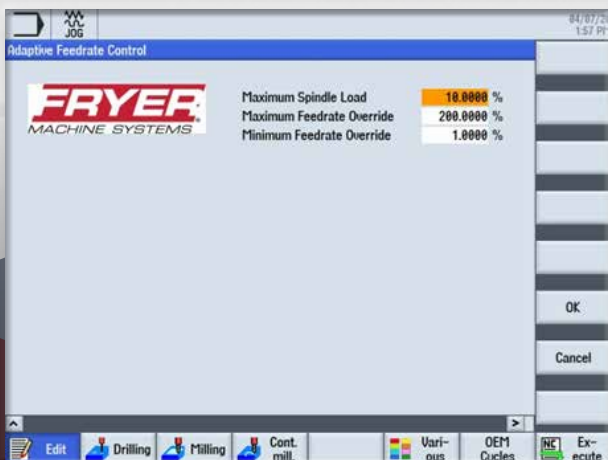
4TH AXIS SURFACE CYCLES

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.

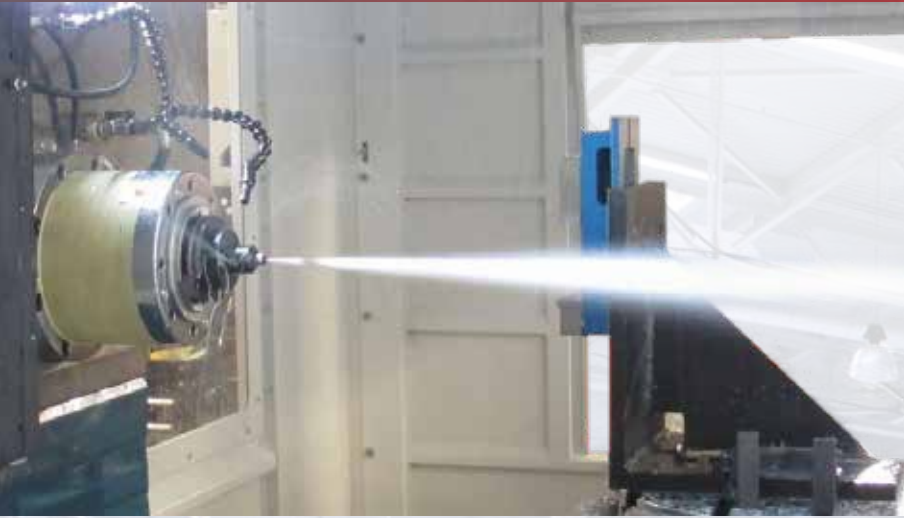


ADAPTIVE FEED CONTROL

The Adaptive Feed Control cycle monitors the spindle load and varies the feed rate accordingly. By entering the maximum spindle load and then entering a range of minimum and maximum feedrate override values, the control monitors these settings and adjusts the feeds automatically. When approaching corners and radii the feed rate will slow down, during straight line moves the feedrate increases to shorten the cutting time and help produce more parts per hour.



MACHINE OPTIONS

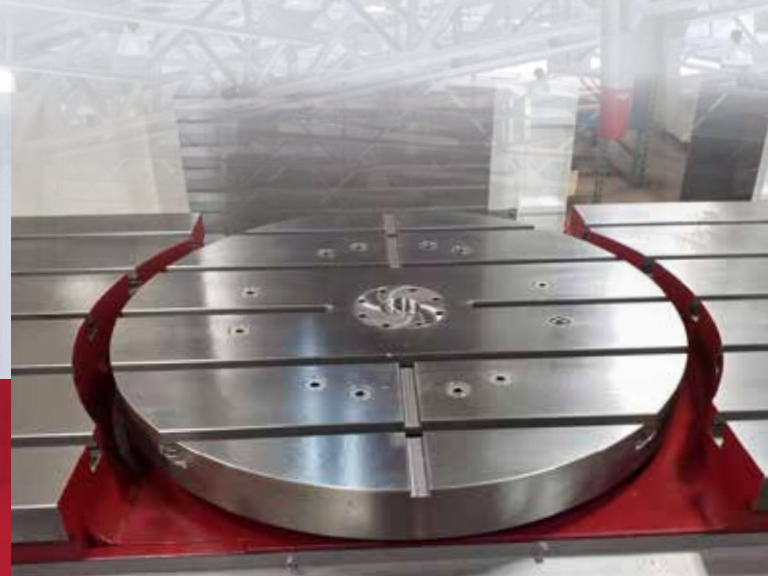


HIGH PRESSURE COOLANT THROUGH THE SPINDLE SYSTEM

Available in either 350 or 1000 PSI. Includes adjustable high volume 8 gallon / minute pump. Allows full pressure even with tool coolant holes up to .100" diameter. System includes 10-micron replaceable filter cartridge.

BUILT IN 4TH AXIS ROTARY TABLE

Flush mounted 4th axis table, platter available in 24", 36" and 40" diameters. Full interpolated contouring and positioning with 12 arc/sec accuracy. Includes rotary table controller and hydraulic brake.



CHIP CONVEYORS AND CHIP AUGERS

Fryer offers both chip augers and chip conveyors custom fit to the machine. An available washdown system washes chips down into the trough. A separate washdown hose is also included.



ADDITIONAL OPTIONS

- Heidenhain Glass Scales
- Chip Augers and Conveyors
- Cabinet A/C Unit
- Extended Y and Z travels
- Abrasive material protection package
- 2 Speed Autoshift gearbox
- 55 HP spindle motor upgrade



FRYER / SIEMENS ADVANCED 2300 CONTROL

The Fryer / Siemens Touch 2300 CNC provides world class technology and ultra-advanced features in an intuitive user interface. Based on the powerful Siemens 840D SL, this state of the art platform provides the ultimate for 5 axis and high speed machining. 19" touch screen features a high-resolution, digital color monitor with finger motions to control pinch, zoom and scroll. Shop floor programming, G code programming, large program storage, Ethernet connectivity, 3D solid model graphic verification speed the first article process.

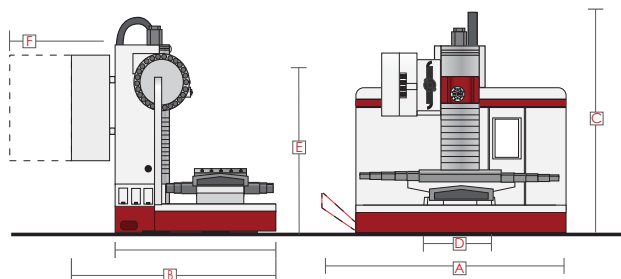
FANUC 0I-F AND 30I-B SERIES CONTROLS

Industry standard Fanuc controls are available on all Fryer machines. The 0i series Model F features up to 4 axis simultaneous capability and the 30i series Model B for complex 5 axis capability and beyond. All Fanuc controls include matching digital drives and axis servo motors as well as powerful Fanuc spindle motors. Many control options available such as AI Contour Control, High Speed Machining and Nano Interpolation allow custom configurations.



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HB SERIES SPECIFICATIONS		HB-70	HB-120	HB-160
MACHINE CAPACITY	X Travel	70"	120"	160"
	Y Travel	55" (72")	55" (72")	55" (72")
	Z Travel	36" (46")	50"	50"
	W Travel	20"	20"	20"
	Table Size	36" x 80"	40" x 126"	40" x 165"
	Table Load (Evenly Distributed)	10,000 lbs.	10,000 lbs.	10,000 lbs.
	T-Slots (No./Width)	5 / 0.866"	7 / 0.709"	7 / 0.709"
SPINDLE	Table Top to Floor	40"	38"	38"
	Bar Diameter (Quill Size)	4.330"		
	Bar Travel (W Axis)	20.0" Fully Programmable "W" axis		
	Spindle Motor HP (Peak)	40.0 HP (55 HP)		
	Spindle Speed (RPM)	30 - 3,000 RPM		
	Spindle Torque (Max)	360 ft/lbs. @ 350 RPM (1,400 ft/lbs with 2-speed gearbox)		
	Speed Ranges	1 Range (2-speed ZF gearbox optional)		
	Tool Type/Taper	CAT 50 or BT-50		
	Spindle Nose to Table Center	2" - 27"	7" - 43"	16" - 66"
	Spindle Center to Table Top	5" - 60"	5" - 60"	5" - 60"
BUILT-IN ROTARY OPTION	Platter Size	36"	40"	40"
	Maximum Rotation Speed	12 RPM		
	Maximum Table Load	10,000 lbs.		
	Positioning Accuracy	12 arc seconds		
	Position Repeatability	5 arc seconds		
ATC OPTION	Spindle Center to Table Top	0" - 53"		
	Tool Storage Capacity	24 Station Arm Type (30-40-60 tool)		
	Tool Change Time	4 seconds		
	Max. Tool Diameter (full)	5.90"		
	Max. Tool Diameter (adjacent empty)	9.85"		
PERFORMANCE	Max. Tool Weight	33.0 lbs.		
	Max. Tool Length	16"		
	Positioning Accuracy	+/- 0.0002"		
	Positioning Repeatability	+/- 0.0001"		
	Ballscrew Diameter	1.96"	3.14"	3.14"
	Rapid Traverse	750 IPM X, Y, Z	600 IPM X, Y, Z	600 IPM X, Y, Z
	Cutting Feed Rate	0.001 - 600 IPM		
GENERAL INFO	Servo Type	AC Digital Brushless		
	Axis Thrust (Peak)	7,500 lbs.		
	Air Pressure Requirements	90 PSI; 5 CFM		
	Coolant Capacity	100 Gallons		
	Coolant Flow	5 Gal/Min		
	Power Requirements	80 AMP 380-500 VAC (208-250 VAC)		
	Shipping Dimensions* (WxDxH)	120" x 94" x 96"	140" x 105" x 105"	180" x 105" x 105"
	Operating Dimensions (WxDxH)	195" x 185" x 145"	260" x 185" x 145"	300" x 185" x 145"
	Machine Weight	38,000 lbs.	44,000 lbs.	48,000 lbs.



	HB-70	HB-120	HB-160
Overall Width (A)	195"	260"	300"
Overall Depth (B)	185"	185"	185"
Maximum Machine Height (C)	145"	145"	145"
Door Width (D)	78"	78"	78"
Console Height (E)	63"	63"	63"
Electrical Cabinet Swing (F)	36"	36"	36"
Approximate Machine Weight	38,000 lb	44,000 lb	48,000 lb

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

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Specifications subject to change without prior notice.