

# Giddings & Lewis

## Horizontal Boring Mills



### Precision Large Capacity Machining

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- Modular design, configure the machine to the application
  - Robust construction yields rigid machining platform
  - Exclusive spindle growth compensation improves accuracy
  - Attachments add machining versatility

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# Giddings & Lewis Horizontal Boring Mills Offer a Wide Range of Configurations, Capabilities and Capacities

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## PT SERIES - PLAIN TABLE HORIZONTAL BORING MILL

Giddings & Lewis Plain Table HBMs are the machine of choice for producing a wide variety of parts. Flexibility is the hallmark of this configuration. The capabilities of the PT Series may be readily expanded with rotary tables, milling attachments or a number of other accessories.



## RT SERIES - ROTARY TABLE HORIZONTAL BORING MILL

Horizontal boring mills with built-in contouring tables offer the versatility of an additional axis making them well-suited for prismatic parts requiring work on multiple sides.



## MC SERIES - MACHINING CENTER HORIZONTAL BORING MILL

Offering high performance and versatility, the MC Series adds machining center capabilities to Giddings & Lewis horizontal boring mills. It automates large-part production and reduces non-cutting time with the standard heavy-duty pallet shuttle system and toolchanger. Multiple pallet configurations are available.



## CONFIGURE THE MACHINE TO MATCH THE APPLICATION

The modular construction of Giddings & Lewis boring mills allows manufacturers to choose the best machine design for the job. Choose the travels based on part families. Select the right headstock for the material.

Added benefits of the standard modules used in our machine construction include greater reliability and industry-leading delivery performance.

### Among the choices are:

- Table styles
- Spindles
- Controls
- Travels
- Attachments



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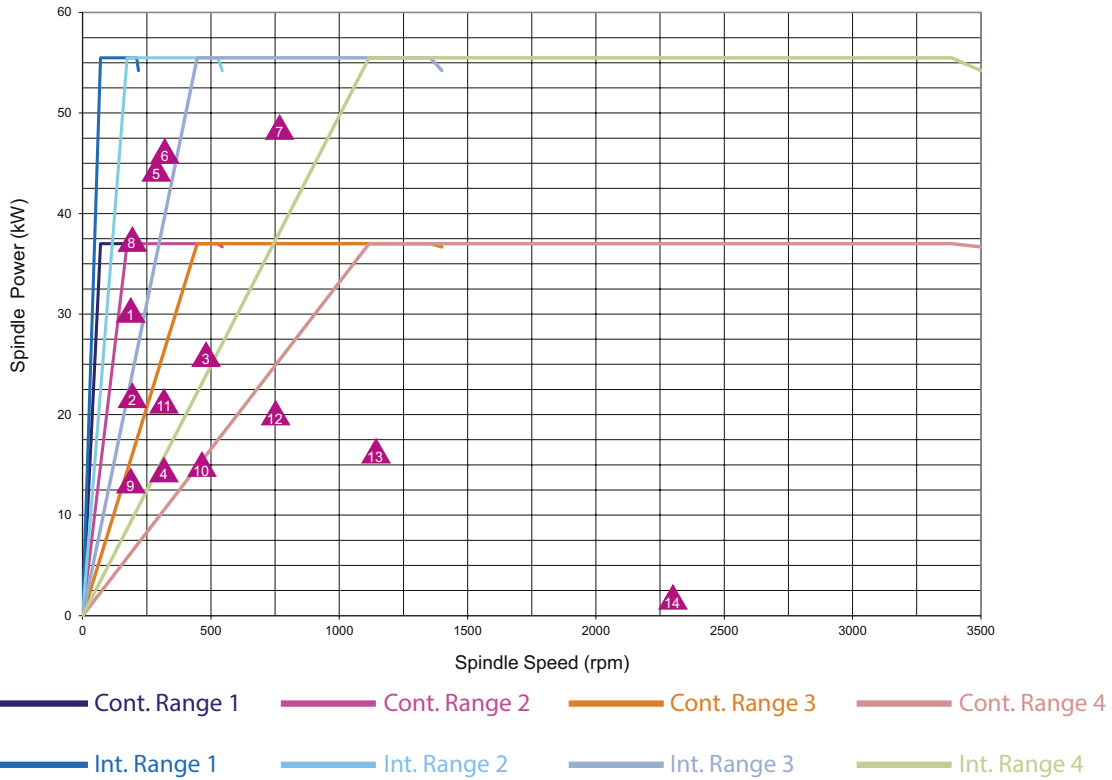
# Decades of Large-Part Application Experience

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# Power and Speed for Heavy Metal Removal on a Wide Range of Materials

TABLE-TYPE HORIZONTAL BORING MILL POWER VS SPEED  
4 Speed Headstock



GIDDINGS & LEWIS TABLE-TYPE HORIZONTAL BORING MILLS POWER VS SPEED

	Material	Axial DOC inch	Radial DOC inch	Feed rate ipr	Feed rate ipm	Spindle speed rpm	SFM	Cutter dia in	Tool	MRR in <sup>3</sup>	Cut power HP	Cut power kW
<b>Milling</b>												
1	A36 steel	0.060	7.000	0.700	140	200	419	8.0	high feed mill	58.8	41.2	30.7
2	A36 steel	0.200	7.000	0.150	30	200	419	8.0	face mill	42.0	29.4	21.9
3	A36 steel	0.500	2.000	0.105	50	477	500	4.0	helical mill	50.0	35.0	26.1
4	A36 steel	0.100	4.800	0.189	60	318	500	6.0	face mill	28.8	20.2	15.0
5	Steel 4140	0.200	6.000	0.173	49.5	286	600	8.0	face mill	59.4	59.4	44.3
6	Steel 4140	0.250	5.000	0.151	49.5	327	600	7.0	face mill	61.9	61.9	46.2
7	Steel 4140	2.000	3.000	0.014	10.8	764	600	3.0	helical mill	64.8	64.8	48.3
8	HY-80	0.060	6.000	0.700	140	200	419	8.0	high feed mill	50.4	50.4	37.6
9	HY-80	0.100	6.000	0.150	30	200	419	8.0	face mill	18.0	18.0	13.4
10	HY-80	0.100	4.000	0.105	50	477	500	4.0	helical mill	20.0	20.0	14.9
11	HY-80	0.100	4.800	0.189	60	318	500	6.0	face mill	28.8	28.8	21.5
<b>Drilling</b>												
12	Steel 4140			0.005		764	600	3.0	insert drill	27.0	27.0	20.1
13	Steel 4140			0.008		1146	600	2.0	insert drill	21.6	21.6	16.1
14	Steel 4140			0.005		2292	300	0.5	drill	2.3	2.3	1.7

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# Robust Construction Provides Superior Customer Value

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## ROBUST BED AND SADDLE

- One-piece column base and bed provides a rigid machining platform
- Saddle fully supports the table over its full travel
- Gray iron castings add damping characteristics
- Axis services are protected within channels in the main machine castings. Feedback scales, ballscrews, servo motors and utility carriers are further protected from contamination by steel telescoping way covers, reducing maintenance and machine life cycle costs.
- Wide way spreads stiffen all sliding members, increasing the machine rigidity



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## Rigid machining platform allows heavy cuts and yields high-precision

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## COLUMN DESIGN MAXIMIZES STIFFNESS

- X-bracing of the column adds structural integrity to resist deflection and minimize vibration
- Tapered walls minimize unsupported mass at the top of the column
- Wide column way spreads combined with a preloaded way system maximize dynamic stiffness
- Column is cast gray iron for added damping



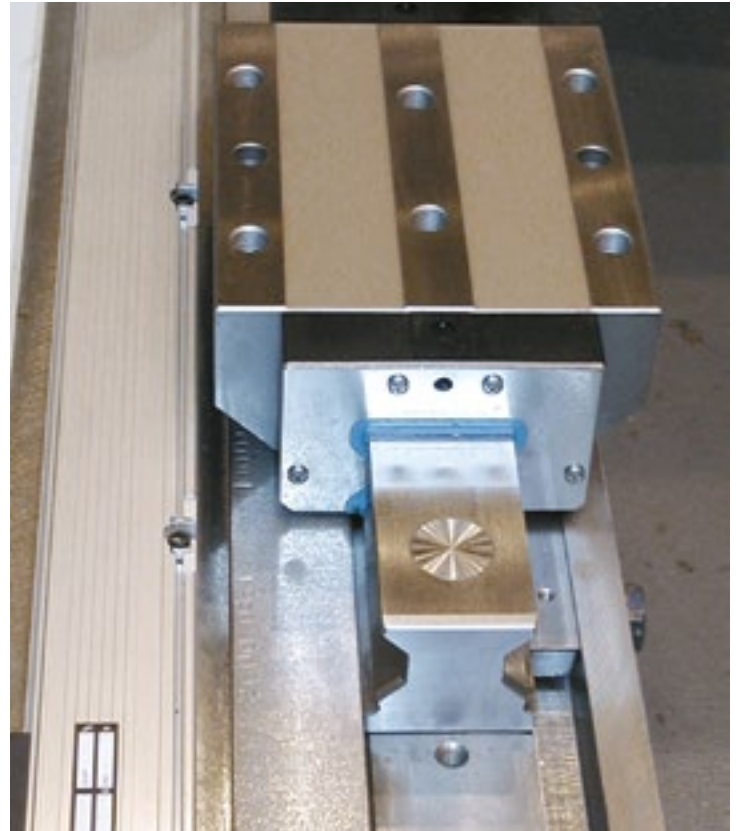
# High-Performance Drive/Way System and Maintenance-Friendly Services

## HIGH PERFORMANCE DRIVE/WAY SYSTEM

All Giddings & Lewis horizontal boring mills use a proven way system with hardened and ground preloaded roller guideways. The roller guideways reduce friction allowing faster traverse rates, up to 25 m/min (1000 ipm). The design of the roller packs optimizes way surface contact and rigidity.

- Hydraulically-damped ballscrews provide superior axis stiffness via constant preload which is unaffected by heat
- Large zero backlash ballscrews supply smooth motions and high thrust performance. The stiffness of the larger screws adds thrust and load-carrying capacity
- Special geared AC digital drives maintain high torque and impressive stiffness even at high traverse speeds and feed rates
- Digital servo drives are sized to handle the headstock positioning and weight influences
- Unsurpassed positioning accuracy is provided by the standard linear scale feedback system
  - Bidirectional positioning accuracy 0.007 mm (0.00028 in)
  - Bidirectional repeatability 0.005 mm (0.0002 in)

The high-performance drive/way system produces faster positioning speeds, enhanced contouring performance, increased thrust and dependable accuracy.



## MAINTENANCE-FRIENDLY SERVICES AREA

The layout of the hydraulic and pneumatic services area was designed using Visual Uptime Management principles. These principles improve and simplify maintenance while maximizing machine availability.

- All services are centralized
- The panel is accessible at floor-level
- Labeling is clear and specific
- Hoses are marked with the type of fluid or gas and the direction of flow:
  - Labels and noteplates are color coded
  - Solenoids are lighted
  - Gauges are marked with normal operating ranges
- Machine operators can quickly determine whether all systems are in their normal state

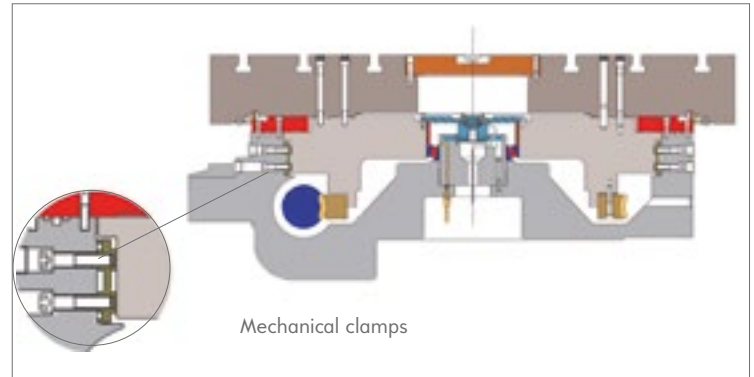


# Rigid Hydrostatic Table Accepts Heavy Loads

## HYDROSTATIC ROTARY TABLE

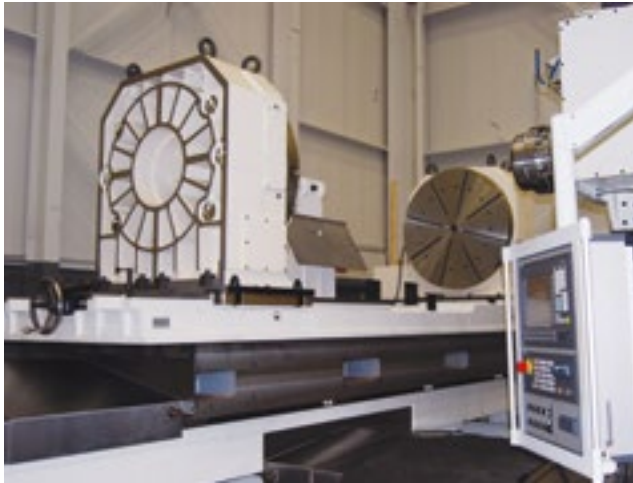
A built-in contouring rotary table is standard on the RT and MC Series of Giddings & Lewis horizontal boring mills.

- The table design features tapered roller radial bearings and preloaded hydrostatic axial bearings. Hydrostatic bearings add dynamic stiffness for heavy-duty, precise cutting
- The robust worm gear drive includes servo lock and a mechanical clamp. Once positioned, the table is not influenced by the clamp or the clamping force resulting in better repeatability and part quality.
- Standard rotary scale feedback provides unmatched positioning accuracy



Optional tables provide added machining flexibility

## TABLE OPTIONS



HBM with Indexing Table



HBM with Vertical Table

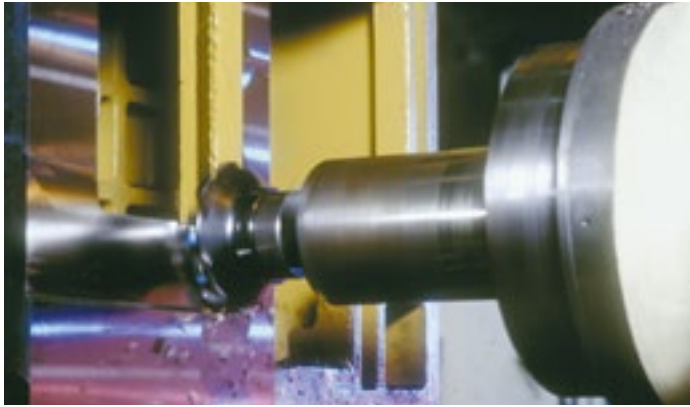


Plain Table with Optional Rotary Table



Trunnion Table

# Maximize Productivity by Choosing the Best Two- or Four-Speed Headstock for the Job

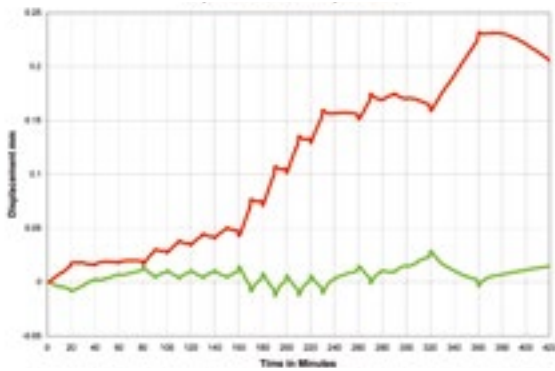


## VERSATILE LIVE SPINDLE

The live spindle is a programmable contouring axis. It extends the spindle reach which is useful in many machining processes especially internal boring operations.

- Infinitely variable spindle drive provides optimal cutting speed, tool life and part finish
- Turning, facing and contour boring operations are also possible with contouring heads, programmable boring bars or optional integrated contouring head. The result is reduced setups, improved cycle times and reduced tooling costs
- Standard coolant through-the-spindle enhances cutting and chip evacuation
  - 16 bar (232 psi) on 60 hz machines
  - 11 bar (160 psi) on 50 hz machines
  - Optional 70 bar (1015 psi)
  - Infinitely variable or programmable coolant through-the-spindle optional

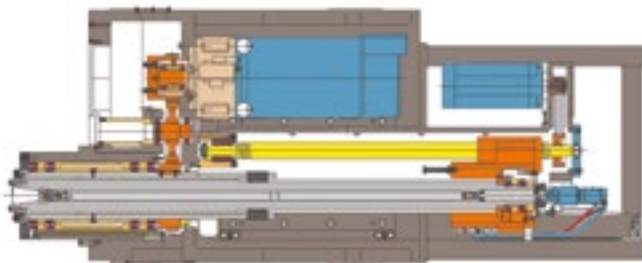
Spindle Growth Compensation



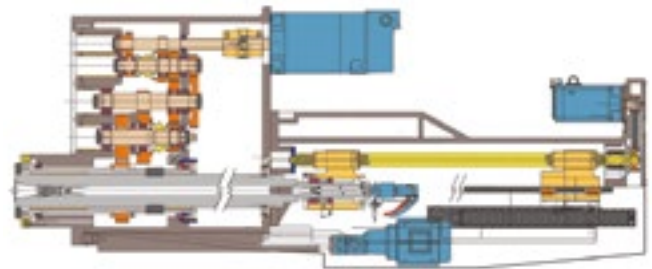
— With Thermal Compensation — Without Thermal Compensation

## EXCLUSIVE SPINDLE GROWTH COMPENSATION

Exclusive Giddings & Lewis Z-Axis thermal compensation software dynamically offsets spindle growth maintaining tight accuracies. Algorithms control spindle gauge line variation to less than 0.076 mm (0.003 inch) deviation over an average seven hour cycle.



Two-Speed Headstock



Four-Speed Headstock

		Two-Speed Headstock	Four-Speed Headstock	Four-Speed Headstock
Spindle Diameter	mm	130	130	155
	inch	5.1	5.1	6.1
Power	kW	30 / 45	30 / 45	37 / 56
	hp	40 / 60	40 / 60	50 / 75
Spindle Torque	Nm	1108 / 1662	4120 / 6190	5080 / 7500
	ft lb	817 / 1226	3039 / 4566	3747 / 5532
Spindle Speed	rpm	4000	3500	3500
Spindle Travel	mm	800	1000	1250
	inch	31.5	39.4	49.2
Tool Taper	SK 50 (Din 69871-1), #50 ANSI B5.50, ISO 50 Type B			



# Choice of High-Performance Control

## SIEMENS SINUMERIK 840D

The SINUMERIK 840D control is a state-of-the-art multi-tasking, multi-processing CNC with advanced block preprocessing. The control features advanced man/machine techniques to simplify operation and programming. Comprehensive resident diagnostics provide rapid alarm diagnosis and quick repair of any malfunctions.

## W/Z TRACKING

W/Z Tracking, available on 840D Solution Line controls, offers ease of programming and operator convenience.

- W/Z Tracking maintains constant zero between colinear axes
- Accounts for changes in machine geometry when one of the axes in a collinear set is repositioned in the part program
- After the W/Z relationship is established through part referencing, the control tracks all W and Z axis moves, displays their relationship and moves one or both axes to maintain the correct gap position

## FANUC 31i

Shorter cycles, enhanced performance and easier maintainability are achieved with the Fanuc Series 31i. Combining speed, precision and user-friendliness, the 31i, is used worldwide for all types of machining. Fanuc offers a version of W/Z tracking called Parallel Axis Tracking which maintains the correct part zero position during movement of the W and Z axis for horizontal boring mill machines

## All control choices include:

- Fast ethernet connection
- Rigid tapping
- High-level programming
- Remote hand-held pendant with MPG (manual pulse generator)

## SPINDLE LOAD MONITORING SOFTWARE

Giddings & Lewis spindle load monitoring software provides a simple operator interface and application. The operator sets cutting operation acceptance values and activates or deactivates load monitoring using M codes. Available on Siemens or Fanuc, the control retracts the tool or uses feed hold when the trip point is exceeded protecting the machine, tooling and part from damage.



SIEMENS SINUMERIK 840D



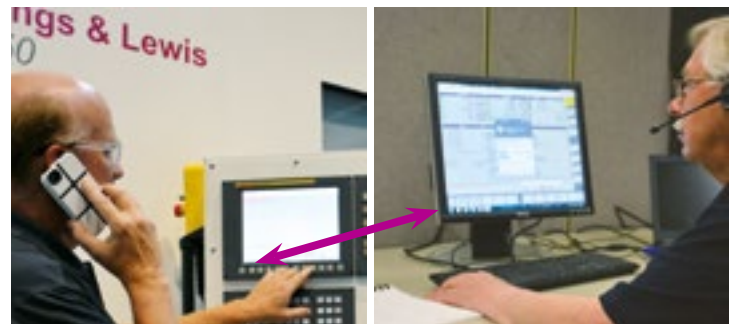
Fanuc 31i

## ADAPTIVE CONTROL

This easy-to-use feature adjusts the feedrate between programmed minimum and maximum values to compensate for changes in cutting conditions including depth of cut and hardness while maintaining the desired cutting horsepower. Giddings & Lewis adaptive control provides machine protection and enhances productivity by allowing aggressive feed rates.

## SPINDLE SPEED OSCILLATION CONTROL

Spindle Speed Oscillation Control provides a means of varying the spindle speed override from the part program. Varying the spindle speed can reduce or eliminate tool chatter.



## DIAGNOSTIC COMMUNICATION SYSTEM (REMOTE DIAGNOSTICS)

Benefit from quicker response and reduced machine maintenance costs by using remote diagnostics, standard on all new Giddings & Lewis machine tools. This feature allows the Global Services team the ability to see the machine tool control in order to diagnose issues. Connection to the control is via a laptop. The enabling software, TeamViewer®, establishes an encrypted, password-protected connection to the CNC over a VPN (virtual private network).

# Tooling and Attachments

## LARGE TOOL CAPACITY

Optional tool magazines are available with 60, 90, 120 or 200 position chain-type magazines. The tool changer is capable of changing not only heavy tools but attachments such as contouring heads and programmable boring bars as well.

- Maximum tool weight 50 kg (110 lb)
- Maximum tool moment, 110 Nm (81 ft lb)
- Maximum tool diameter:
  - Full magazine, 125 mm (4.9 in)
  - Two empty adjacent positions, 280 mm (11 in)
- Maximum length, 750 mm (29.5 in)
- Tool change time, 18 seconds
- Optional laser breakage detection
- Optional horizontal / vertical tool changer

## ACCESSORIES AND ATTACHMENTS

- Contouring heads
- Right-angle heads
- Orthogonal attachment
- Speed-up head
- Automatic attachment changing with attachment rack
- Engineered attachments
- Spindle supports



Attachment Rack



Large Capacity Tool Magazine



Contouring Head



Orthogonal Attachment



Programmable Boring Bar



Right Angle Attachment



Universal Right Angle Attachment

# Automation Options

## HBM WITH INTEGRATED CONTOURING HEAD

Giddings & Lewis horizontal boring mills, available with an integrated contouring head, increase productivity with the addition of U-axis turning capabilities. The live spindle and contouring head are combined in one headstock. Automatic changeover from the live spindle to the integrated contouring head increases spindle utilization, improves part accuracy and reduces cycle time. Both spindles use standard modular tooling, KM or Capto. The live spindle also accepts 50 taper tools. An auto-coupler allows use of programmable boring bars in the live spindle.



HBM with Integrated Contouring Head and Probe

## CHIP CONVEYORS

There are several optional chip conveyor configurations to match the application and machine installation.

- Single
- Double one-sided
- Double with a conveyor on each side
- Triple with a center and two side conveyors

## PROBES

- Tool probe
- Part probe

## CELLS AND SYSTEMS

For higher volume jobs, the automation of a pallet shuttle, cell or system optimizes production time. Operators are able to set up additional parts while the machine is cutting.

- Vertical turning center and horizontal boring mill tables are compatible allowing pallet shuttle connection
- Setup multiple boring mills or boring mills and vertical turning centers in a cell or system with a linear transport



VTC and HBM with Common Pallet Shuttle



Horizontal Boring Mills with Linear Transport



Horizontal Boring Mills and Vertical Turning Centers with Linear Transport

# Technical Data

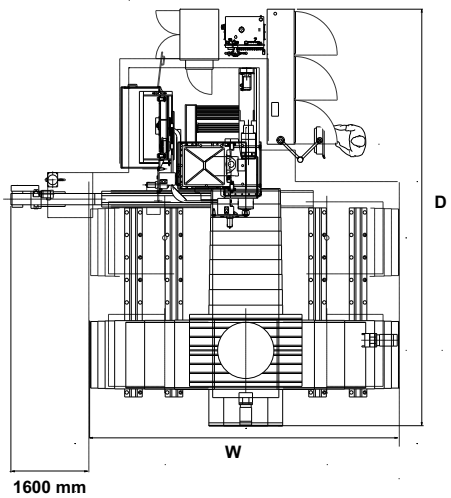
			PT 1500	PT 1800
<b>Capacities</b>	X-Axis travel	mm	3000	3600
		inch	118.1	141.7
	Optional X-Axis travel	mm		4200
		inch		165.4
	Y-Axis travel	mm	2100	2100
		inch	82.7	82.7
	Optional Y-Axis travel	mm	2600 / 3100	2600 / 3100 / 3600
		inch	102.4 / 122	102.4 / 122 / 141.7
	W-Axis travel	mm	1500	1500
		inch	59.1	59.1
Optional W-Axis travel	mm	2000 / 2500 / 3500	2000 / 2500 / 3500	
	inch	78.7 / 98.4 / 137.8	78.7 / 98.4 / 137.8	
<b>Table</b>	Size	mm	1500 x 3000	1800 x 3600
		inch	59.1 x 118.1	70.9 x 141.7
	Optional Table Sizes	mm		1800 x 4200
		inch		70.9 x 165.4
	Allowable load	kg	25,000	40,000
		lb	55,100	88,200
	Pallet load	kg		
		lbs		
	Pallet change time	sec		
	Number of positions			
Smallest increment	degree			
Index rate	rpm			
<b>Spindles</b>			Three headstock choices 130 to 155 mm (5.1 to 6.1 inch). See page 8 for details	
<b>Accuracies (ISO 230-2-97)</b>	X/Y/W Bidirectional accuracy A	mm	0.007	0.007
		inch	0.00028	0.00028
	X/Y/W Bidirectional repeatability R	mm	0.005	0.005
		inch	0.0002	0.0002
	X/Y/W Reversal B	mm	0.0025	0.0025
		inch	0.0001	0.0001
	Z Bidirectional accuracy A	mm	0.025	0.025
		inch	0.001	0.001
	Z Bidirectional repeatability R	mm	0.015	0.015
		inch	0.0006	0.0006
	Z Reversal B	mm	0.010	0.010
		inch	0.0004	0.0004
<b>Rapid Traverse* / Feed Rates</b>	Rapid traverse*	mm/min	25,000	25,000
		ipm	984	984
	Feed rate (feed/min)	mm	1 - 25,000	1 - 25,000
		inch	1 - 984	1 - 984
	Thrust	N	30,000	30,000
	lb	6,744	6,744	
<b>Power Requirements</b>			480 V, 3 ph, 60 hz (400 V, 3 ph, 50 hz)	
<b>Machine Dimensions</b>	Length x width x height	m	9.6 x 8.2 x 4.3	10.8 x 8.2 x 4.3
		ft	31.5 x 26.9 x 14.1	35.4 x 26.9 x 14.1
	Weight	kg	51,200	62,300
		lb	112,500	137,000

\* For X-axes greater than 2,500 mm (98.4 in) the rapid traverse is 18,000 mm/min (709 ipm)

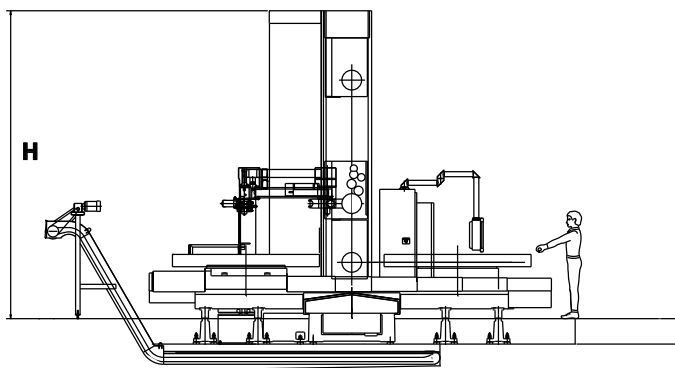
RT 1250	RT 1600	RT 2000	MC 1250	MC 1600
2500	2500	3200	2500	2500
98.4	98.4	126	98.4	98.4
3600	3600/4800	4400	3600/4800	3600/4800
141.7	141.7/188.9	173.2	141.7/188.9	141.7/188.9
2100	2100	2600	2100	2100
82.7	82.7	102.4	82.7	82.7
2600 / 3100	2600 / 3100 / 3600	3100 / 3600	2600 / 3100	2600 / 3100 / 3600
102.4 / 122	102.4 / 122 / 141.7	122 / 141.7	102.4 / 122	102.4 / 122 / 141.7
1500	1500	2000	1500	1500
59.1	59.1	78.7	59.1	59.1
2000 / 2500 / 3500	2000 / 2500 / 3500	2500 / 3500	2000 / 2500 / 3500	2000 / 2500 / 3500
78.7 / 98.4 / 137.8	78.7 / 98.4 / 137.8	98.4 / 137.8	78.7 / 98.4 / 137.8	78.7 / 98.4 / 137.8
1250 x 1600	1600 x 2000	1800 x 2000	1250 x 1250	1600 x 1600
49.1 x 63	63 x 78.7	70.9 x 78.7	49.1 x 49.1	63 x 63
1600 x 1800	1600 x 2500	2000 x 2000 (2500)	1250 x 1600 (1800)	1600 x 2000 (2500)
63 x 70.9	63 x 98.4	78.7 x 78.7 (98.4)	49.1 x 63 (70.9)	63 x 78.7 (98.4)
15,000	25,000	40,000	15,000	25,000
33,100	55,100	88,200	33,100	55,100
			7,000	15,000
			15,430	33,100
			75	75
360,000	360,000	360,000	360,000	360,000
0.001	0.001	0.001	0.001	0.001
3	3	3	6	3
Three headstock choices 130 to 155 mm (5.1 to 6.1 inch). See page 8 for details				
0.007	0.007	0.007	0.007	0.007
0.00025	0.00025	0.00025	0.00025	0.00025
0.005	0.005	0.005	0.005	0.005
0.0002	0.0002	0.0002	0.0002	0.0002
0.0025	0.0025	0.0025	0.0025	0.0025
0.0001	0.0001	0.0001	0.0001	0.0001
0.025	0.025	0.025	0.025	0.025
0.001	0.001	0.001	0.001	0.001
0.015	0.015	0.015	0.015	0.015
0.0006	0.0006	0.0006	0.0006	0.0006
0.010	0.010	0.010	0.010	0.010
0.0004	0.0004	0.0004	0.0004	0.0004
10	10	10	10	10
5	5	5	5	5
3	3	3	3	3
25,000	25,000	25,000	25,000	25,000
984	984	984	984	984
1 - 25,000	1 - 25,000	1 - 25,000	1 - 25,000	1 - 25,000
1 - 984	1 - 984	1 - 984	1 - 984	1 - 984
30,000	30,000	30,000	30,000	30,000
6,744	6,744	6,744	6,744	6,744
480 V, 3 ph, 60 hz (400 V, 3 ph, 50 hz)				
7.4 x 8.2 x 4.3	8.4 x 8.2 x 4.3	9.1 x 11.1 x 4.8	10.5 x 8.2 x 4.3	10.5 x 8.2 x 4.3
24.3 x 26.9 x 14.1	27.6 x 26.9 x 14.1	29.9 x 36.4 x 15.7	34.4 x 26.9 x 14.1	34.4 x 26.9 x 14.1
45,000	56,800	59,000	58,600	70,500
99,000	125,000	130,000	129,000	155,000

Technical data subject to change without notice

# Dimensions and Travels and Enclosure Options



Model	X Travel		W Width	
	mm	in	mm	in
PT 1500	3000	118.1	8000	315
PT 1800	3600	141.7	9200	362.2
PT 1800	4200	165.4	10400	409.4
RT & MC 1250-1600	2500	98.4	5750	226.4
RT 2000	3200	126	6850	269.7
RT & MC 1250-1600	3600	141.7	6850	269.7
RT 2000	4400	173.2	8050	316.9
RT & MC 1600	4800	189	8050	316.9



W Travel	D Depth	
	mm	in
1500	8260	325.2
2000	8760	344.9
2500	9260	364.6
3500	10260	403.9

Y Travel	H Height	
	mm	in
2100	4240	166.9
2600	4740	187
3100	5240	206.3
3600	5740	226

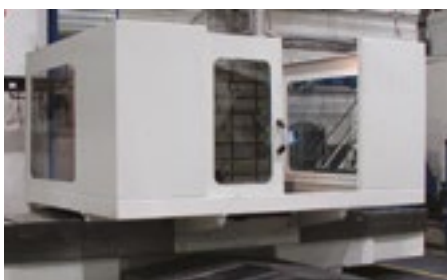


Table-Mounted Enclosure



Standard HBM Enclosure



Full Enclosure with Roof and Mist Collector

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# Global Services

## Complete Life-Cycle Support

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### GLOBAL PARTS SUPPORT

As the OEM, Fives Machine Tool Services & Solutions not only has the parts but the drawings and documents as well for all our legacy names including Giddings & Lewis. Parts are made to the same exacting specifications as the original machines.

Machine Tool Services & Solutions has a world-class call center with 24/7 operation and highly qualified parts specialists.

Contact us at 1-800-934-0735 or use our Parts Online application at [www.fivesgroup.com](http://www.fivesgroup.com)



### PREVENTIVE MAINTENANCE

Reduce the cost of machine ownership with preventative maintenance and reliability assurance programs. Critical, consumable parts are replaced and maintenance data supplied. Our factory-trained technicians provide professional, turnkey service.

### HEALTH CHECKS

Concerned about the status of a machine you own or are considering buying? Get a machine health check.

### MACHINE CERTIFICATION

Requalify your machine tools to original factory specifications with a turnkey certification.



### COMPLETE CARE

Turn your machine maintenance concerns over to Global Services. Develop an individualized complete care package based on your needs.

- On-site service
- On-site parts management
- Training
- Asset management
- Unit repairs
- Machine certification
- Preventative maintenance

### MACHINE RENEWAL

Return your machine to the original OEM specifications with a complete mechanical rebuild. Using genuine Giddings & Lewis parts and documentation, we have the expertise to do the job right.

### CONTROL RETROFIT

Increase production while reducing installation time with a control retrofit. Choose a Fagor, Fanuc or Siemens control along with upgrade packages for drives and motors.

# Giddings & Lewis Application Support

## PART PROCESSING ASSISTANCE

New or existing parts will benefit from process review and optimization by Fives application specialists.

- Quickly get new parts into production
- Optimize part programs
- Set up process monitoring options such as adaptive control
- Part fixturing assistance

## MACHINIST / CAPACITY SUPPORT

Utilize skilled machinists or programmers to launch your new machine into production. Whether it's one week or six months, Fives can support you with skilled machinists or programmers during your peak production times.

## ADVANCED OPERATOR TRAINING

Fives applications specialists can help you improve efficiency by using control features and options more effectively.

- Develop macros to handle repeat operations
- Implement tool management

## LEARN PROBING TECHNIQUES

Underutilized by many manufacturers, tool and part probing are options that can significantly reduce cycle times.

### Benefits:

- Automatically calculate fixture alignments, workpiece positions and rotary axis setup
- Reduce manual errors
- Improve part quality by performing in-process measurements
- Speed production and prevent compound problems by using tool probe capabilities to measure worn tools and detect broken tools



- **Modular design, configure the machine to the application**
- **Robust construction yields rigid machining platform**

- **Exclusive spindle growth compensation improves accuracy**
- **Attachments add machining versatility**



## CONTACT US

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