MCR

Horizontal Machining Center

for Machining lines

Compact | Flexible | Modular

www.bfwindia.com

Bharat Fritz Werner

MCR

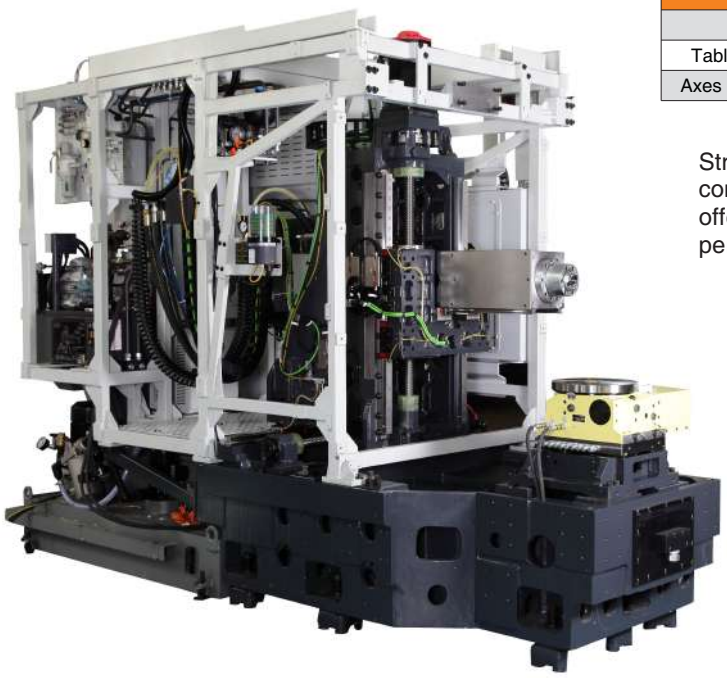
Horizontal Machining Center - 320 MCR | 400 MCR | 500 MCR

MCR, High speed Horizontal Machining Centers offer high speed, precision, flexibility, compact foot print and energy saving benefits.

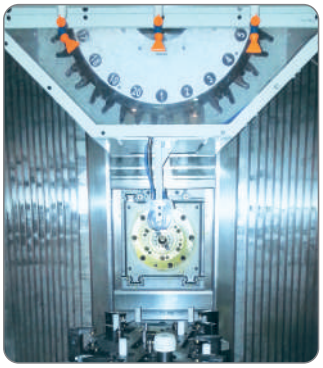
MCR is specially built to meet your requirement of machining power train components of passenger cars and light commercial vehicles. The fast, flexible and compact MCR comes to you with many advantages.

- A narrow width machine, easily accommodate in the machining lines.
- Single-lift quick installation
- Option of pallet changer-less configuration and with various tables such as NC table, rotary table, tilting table etc
- Option of various table configurations such as only B-axis, only A-axis, A+B or 5-axis etc.
- On-line hydraulics
- Sustained accuracy, roller guide-ways
- Option of thermal compensation sensors

Model	H 320 MCR	H 400 MCR	H 500 MCR
Spindle	BT 30 (HSK A50)	BT 40 (HSK A63)	BT 40 (HSK A63)
Table size (mm)	Dia 320 (Dia 400)	Dia 400 (Dia 500)	Dia 500
Axes strokes (mm)	500/ 350/ 350	500/ 400/ 400	500/ 550/ 500



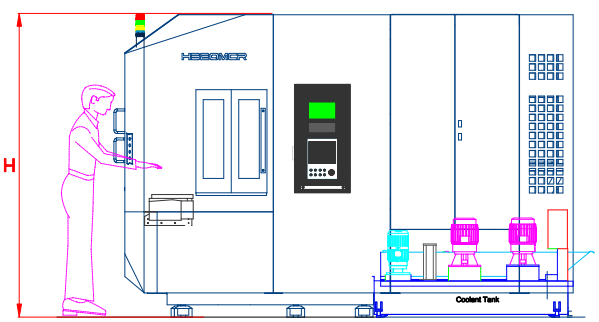
Structures are an ideal combination of rigidity and agility offering best-in-class cutting performance with lower idle times



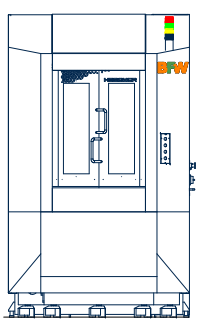
Direct pick up servo driven tool magazine

Machine Dimensions

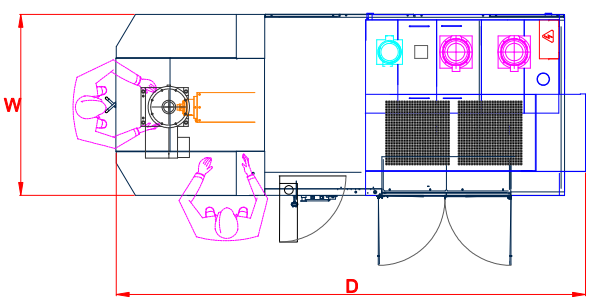
SIDE VIEW



FRONT VIEW

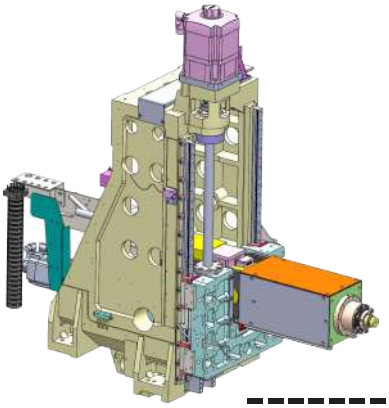


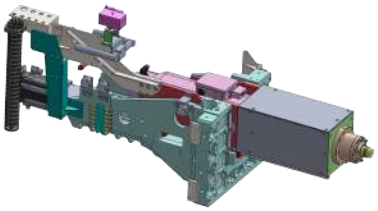
TOP VIEW



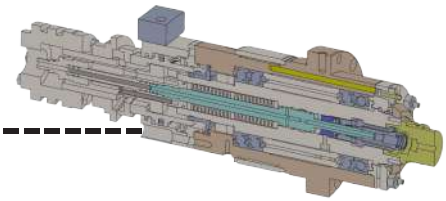
Model	All dimensions in mm		
	W	D	H
320 MCR	~ 1400	~ 4200	~ 2350
400 MCR	~ 1700	~ 4650	~ 2900
500 MCR	~ 1900	~ 4100	~ 2855

MCR



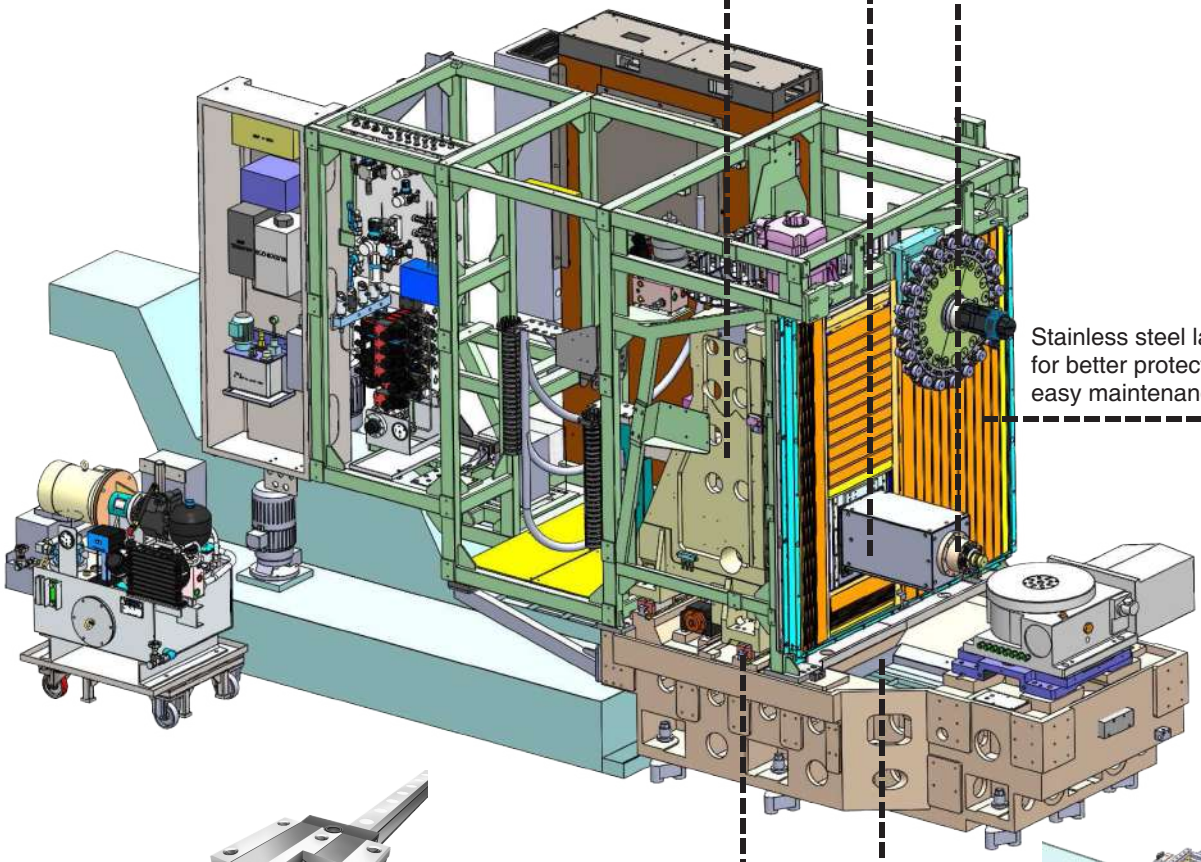


Ram-type spindle for better approach & shorter tool length

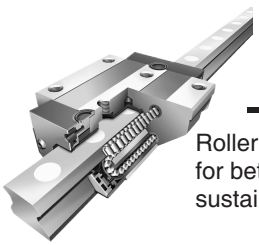


Inline / Direct-coupled spindle with unmatched agility & performance

Rigid, thermo-symmetric structures designed & FEA analyses for best strength to weight ratio

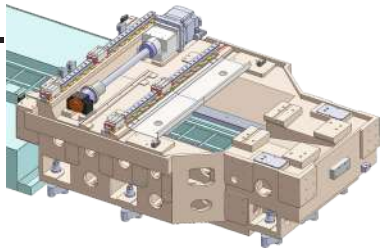


Stainless steel lamella covers for better protection and easy maintenance



Roller type LM guide-ways for better rigidity & sustained accuracies

Chip conveying system directly below the cutting zone



MCR

MCR HMC's for Crankshaft Oil Hole Drilling

Oil Holes in crankshaft are almost always at compound angles with each hole being at a different orientation from the other in the same crankshaft. This makes approaching the holes on a machining center difficult, there-by increasing the tool lengths & making the process impractical on a machining center.

However, following three important features of MCR machines make them ideally suited for this application.

- Z axis on RAM helps take the spindle very close to the component, even when the component is oriented at a compound angle.This reduces the tool length considerably which results in better cutting parameters & improve tool life.
- Central chip conveying system right below the cutting zone helps in most efficient chip removal from the cutting zone.
- Feasibility of using Minimum Quantity Lubrication (MQL) system with the machine. MQL has the following advantages:

» Cools the tool tip better than regular coolant. This helps in operating drills at nearly 8 times the feed rate of conventional deep hole drilling process.

» Higher feed rates ensures small, well-burnt chips which take away the heat from the component and are also easy to handle.

Chips generated are near-dry & clean, there-by-making them easier to handle & dispose.

» There is no need for high pressure coolant. Only minimal coolant for flushing the chips from the machining zone is all that's needed.

MQL is environmentally friendly, clean & green.

»

Reduced energy consumption by the cutting fluid system from 40% to 26% & metal working fluid cost from 17% to 14%.

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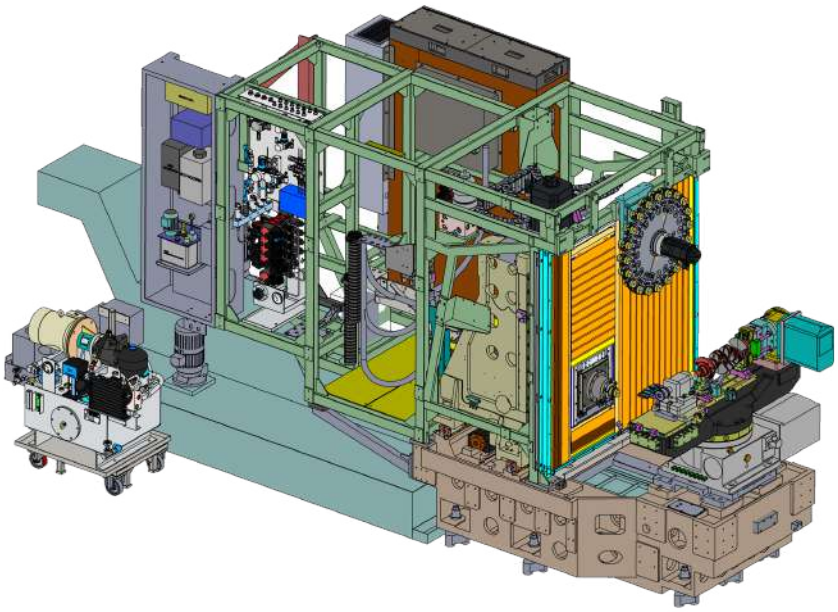
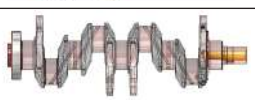


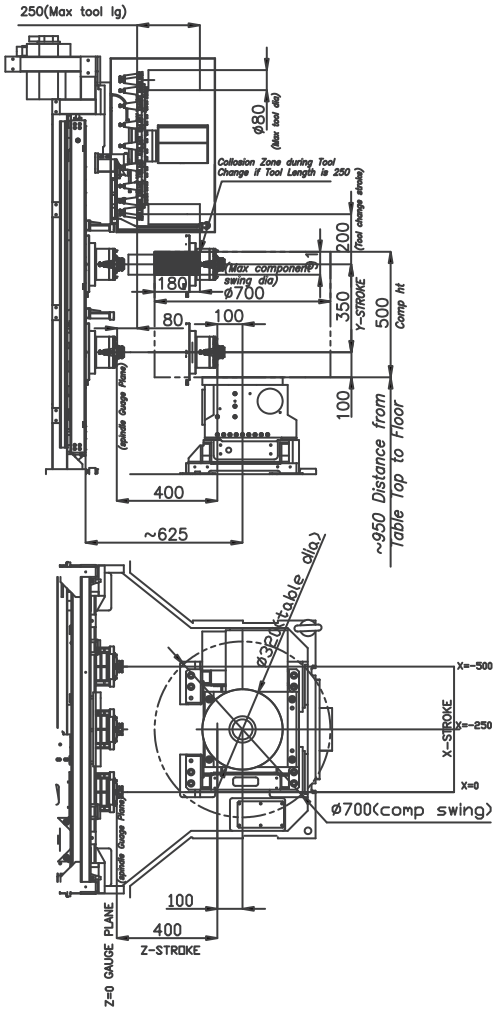
MCR for crankshaft oil hole drilling is a compact, green machine which provides at least 3 times more productivity than deep hole drilling SPMs.

Applications	Photo	Component	Hole Dia (mm)	L/ D Ratio	Cycle time for the component (sec)
2 wheeler & single cylinder engines		Single cylinder crankshaft	6	20-25	~ 48
Boat engines & generators		2-cylinder crankshaft	7	14-20	~ 56
Car, MUV, SUV & Tractors		3 cylinder crankshaft	5	18-22	~ 65
		4 cylinder crankshaft	5	18-22	~ 92

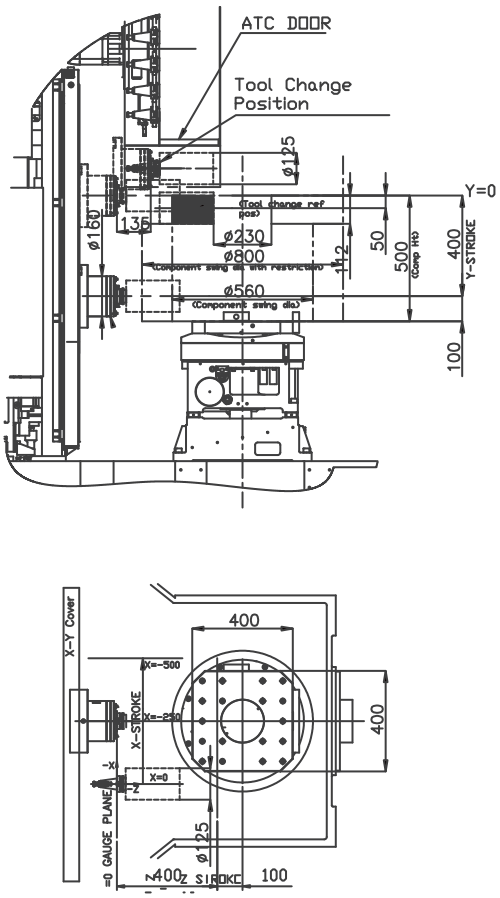
Material : Forged Steel. Typical Feed rate of 800mm/min to 1000mm/min.
Cycle times indicated above is representative only. Will vary from component to component.

Machine Stroke Diagram

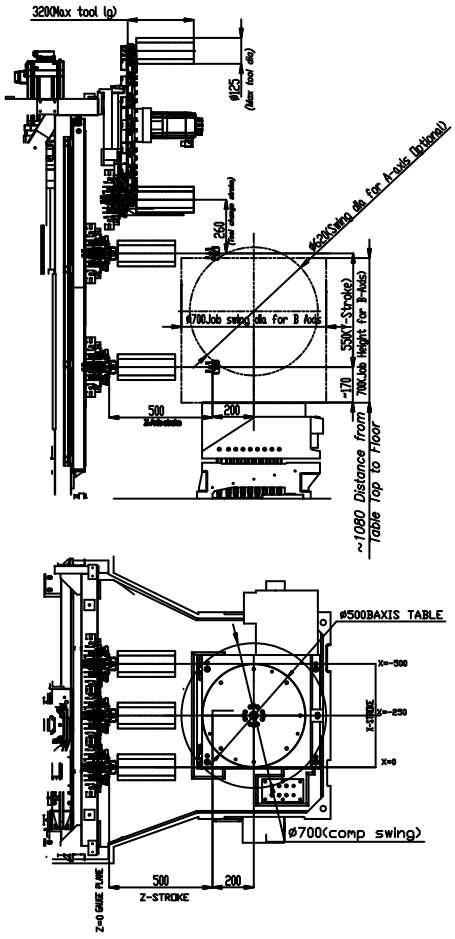
H 320MCR



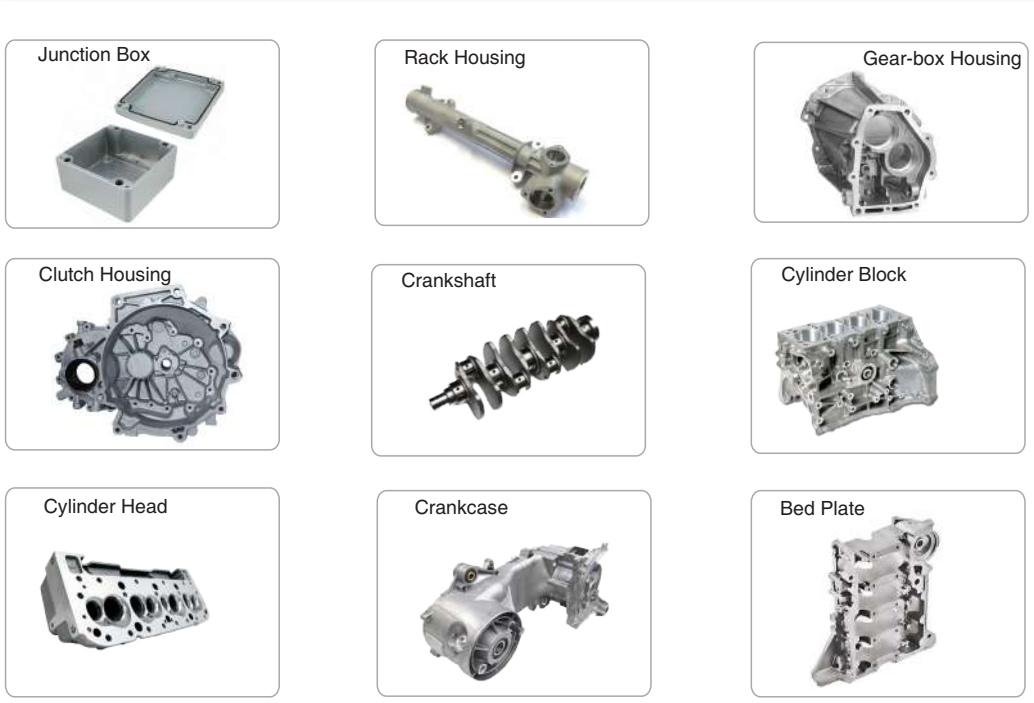
H 400MCR



H 500MCR

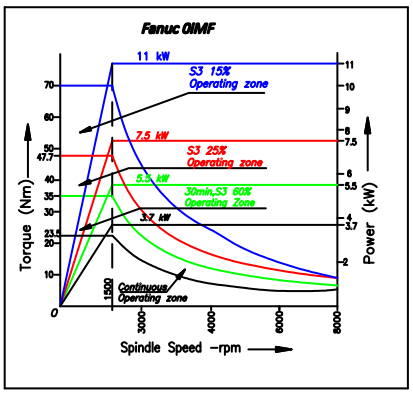


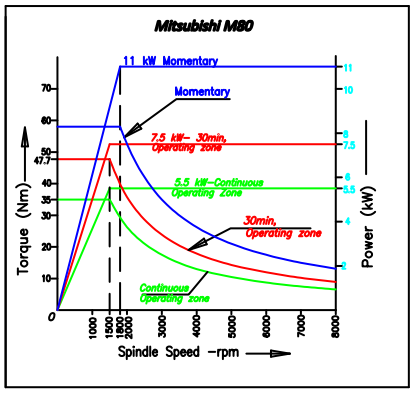
Applications

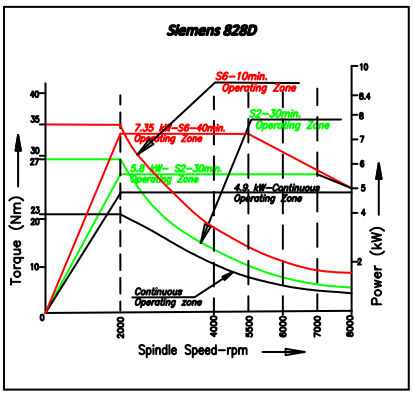


Spindle Characteristics

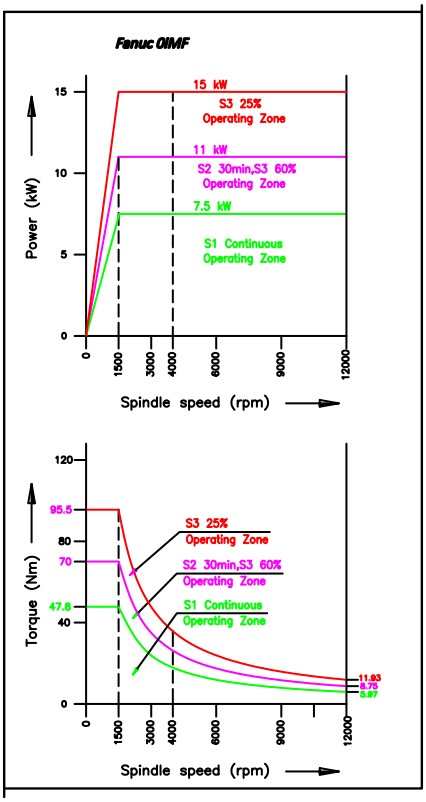
Power & Torque - H 320MCR

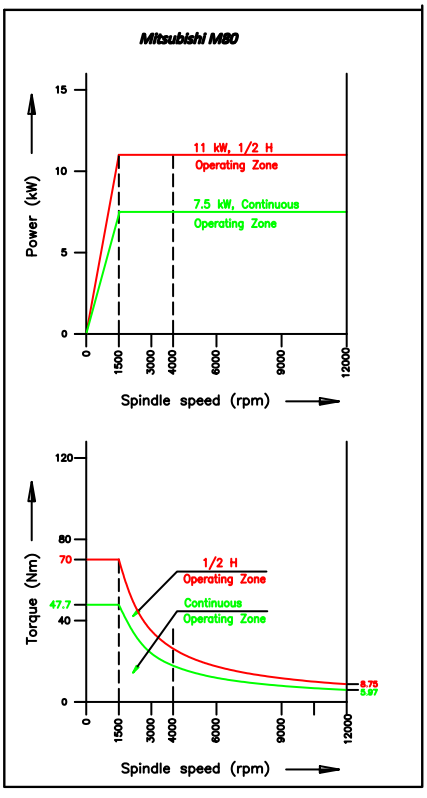


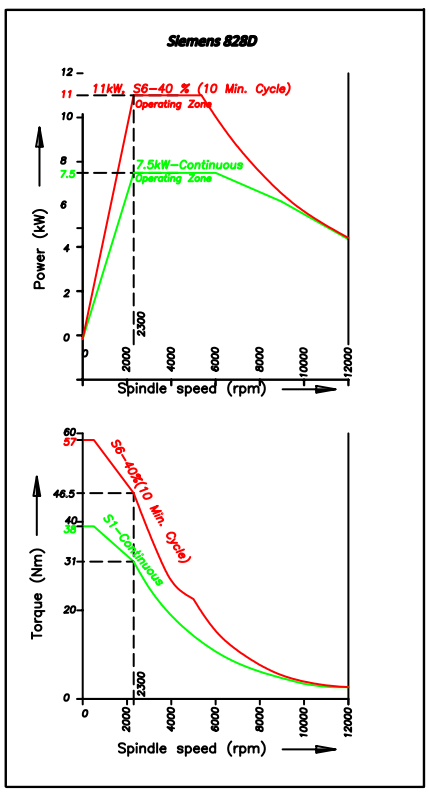




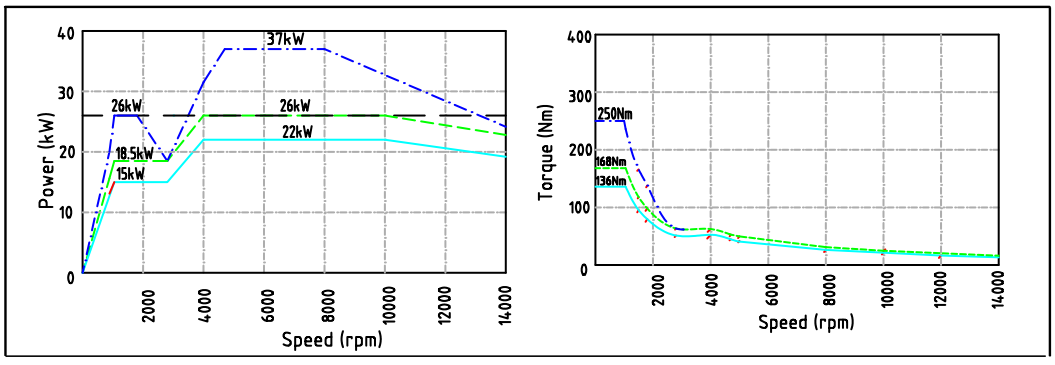
Power & Torque - H 400MCR/ 500 MCR







Power & Torque - H 500MCR



Technical Specification

Specification	Unit	H 320 MCR	H 400 MCR	H 500 MCR
Index Table				
Pallet size	mm x mm	Dia 320 (Dia 400)	Dia 400 (Dia 500)	Dia 500
Pallet type		Tapped holes with butting pads		
Maximum load on table	kg	300 (400)	300 (500)	650
Pallet height from ground level	mm	950, with 100 mm ground clearance	1200, with 100 mm ground clearance	1080, with 100 mm ground clearance
Maximum job swing - diameter x height	mm	700 x 500	560 x 500 (800 x 500)	700 x 700 (900 x 700)
Index positions	º	360 x 1º (360,000 x 0.001º)		
Axes				
X/ Y/ Z	mm	500/ 350/ 350	500/ 400/ 400	500/ 550/ 500
Table top - spindle centre distance	mm	100 - 450	100 - 500	170 - 720
Table centre - spindle face distance	mm	100 - 450	100 - 500	200 - 700
Feed rate	mm/min	1 - 40,000	1 - 20,000	1 - 20,000
Rapid traverse X/ Y/ Z axis	m/min	60	50	60
Spindle				
Power cont./ int.	kW	3.7/ 5.5/ 7.5/ 11	5.5/7.5 (7.5/ 11)	
Speed (max.)	rpm	8,000 (10,000) (12,000)	8,000 (10,000)	
Taper	type	BT 30 (HSK A50)	BT 40 (HSK A63)	
Maximum torque	Nm	35 with Siemens (58 with Mitsubishi) (70 with Fanuc)	57 with Siemens (70 - with Mitsubishi/ Fanuc)	
Spindle - High torque (with Fanuc only)				
Power cont./ int.	kW	NA	NA	22/37(15 %ED)
Speed (max.)	rpm	NA	NA	14000
Taper	type	NA	NA	HSK A63
Maximum torque	Nm	NA	NA	250
Automatic Tool Changer				
Pull stud		As per MAS-403 P30T-I	As per DIN 69872	As per DIN 69872
Number of tools	Nos.	20	20	20
Maximum tool diameter with adjacent pockets full/ empty	mm	80	80/ 125	80/ 125
Maximum tool length - BT (HSK)	mm	200 (300)	250 (350)	320
Maximum tool weight	kg	4	5	6
Tool changing time (tool to tool)	s	2.4	2.5	2.5
Minimum C-C time as per ISO 10791-9	s	3.9	4	5
Accuracy As Per ISO 230-2				
Linear Axis				
Positioning A	mm	0.010	0.010	0.010
Repeatability R	mm	0.007	0.007	0.007
B Axis				
Positioning A	arc sec	8 (25)	8 (25)	8 (25)
Repeatability R	arc sec	6 (15)	6 (15)	6 (15)
Installation Data				
Machine weight	kg	5,500	6,500	8,500
Total connected load	kVA	25	45	55
Floor area (for std machine) L x W	mm x mm	~1,400 x 4,200	~1,700 x 4,650	~1,900 x 4,100
Compressed air	bar	6	6	6
Power supply		415 V AC, 50 Hz, 3 Phase		
CNC System		Siemens 828D / Mitsubishi M80/ Fanuc 0i MF		

Data within parenthesis are optional features

Standard Features

- Roller type guide-ways for all linear axes
- Precise ball-screws for all linear axes
- Electronic counterbalance on the vertical axis
- Automatic centralised lubrication system
- Air blast for spindle taper cleaning
- Tool clamping through disc springs & de-clamp by hydraulics
- Basic coolant system with chip conveyor
- Lamella covers on linear axes X & Y
- Directly coupled spindle
- Absolute encoders on all axes
- Simultaneous interpolation upto 4 axes
- Linear, circular and helical interpolation
- Tool life management
- Machine alarm diagnostics
- Overhead shower wash
- Energy saving shower wash
- Overhead saving function
- Operator door safety interlock

Optional Features

- Automatic pallet changer (servo driven, rotary type)
- HSK spindle
- Continuous rotary table (0.001 deg x 360000)
- High pressure coolant through spindle system (16 bar/ 40 bar) with suitable filtration system
- Minimum quantity lubrication
- Intelligent sensors for axis thermal compensation
- Tool breakage sensor
- Mist collector
- Coolant chiller
- CE certification
- USB interface
- Fanuc CNC system
- AICC II function (only for Fanuc)
- Part program memory 2 MB
- 4th and 5th axis rotary table

Associates in India

Ahmedabad : Spinak Engineering , 9824033277
Bengaluru: JR Rao & Co, 9844102252
Bengaluru: Upnal CNC, 9341310391
Chennai: PN Engineering - 9840096822
Coimbatore: Astra Engineers, 9626269998
Ernakulam: Prompt Machine Tools, 9846056446
Hubballi: Nano Machine Tools, 9379276004
Indore: Alif Industrial Sales, 9329842594
Jalandhar: GRD Innovation Solutions, 9780153601
Jamshedpur: IMTS, 9334804275
Kanpur: Response Engineers, 9838070906
Kolhapur: Ganesh Technologies, 9822095229
Krishna: Mr K Sarath Kumar, 9908674736
Nagpur: AK Enterprises, 9373124916
Nashik: Smart Services, 09823019761
Vishakhapatnam: C& I Systems, 9848127436
Vapi: Deep Engineering, 9825610842
Belgaum: VI Machine Tools, 9343833266

Manufacturing Plants in India

Bangalore: (080) 39821100
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Off Tumkur Road, Bangalore 560022, India.
Ph +91 - 80-39821134/ 39821309
Fax: +91 - 80-28394816, e-mail: bfwexports@bfw.co.in
URL: www.bfwindia.com

BFW

Bharat Fritz Werner
Off Tumkur Road, Bangalore 560022, India
Ph 080-39821100/ 28395745
Fax: 080-28394816, e-mail:bfwmarketing@bfw.co.in | URL: www.bfwindia.com

Belgaum : Block 4, Plot 737, Khanapur Road, Near Railway Gate 3, Udyambag, Belgaum 590008.
Chennai : D22, First Floor, First Street, Sector 3, Ambattur Industrial Estate (South), Chennai - 600058. Ph: (044)26251505. E-mail: bfwchennai@bfw.co.in
Coimbatore : 7, Karayampalayam Road, Mylampatti (PO) Coimbatore - 641 062. Ph (0422) 262669, E-mail: bfwcoimbatore@bfw.co.in
Gurgaon : Spaze tech park; office no 769, 7th floor, tower B2, Sector 49, Sohna road, Gurgaon 0- 122018
Hyderabad : Flat No 204, 1-11-229, Ramaveda Srisampada Apt. Near Shyamalal Bldgs, Begumpet, Hyderabad - 500016, Ph: (040) 27762035, E-mail: bfwhyderabad@bfw.co.in
Kolkata : D - 4/ 4, Gillander House, 8, Netaji Subhash Road, Kolkata 700001. Ph (033) 40102140 - 42, 22623387, Fax (033) 4005691, E-mail: bfwkolkata@bfw.co.in
Mumbai : 206, Runwal Commercial Complex, LBS Marg, Mulund West, Mumbai 400080. Ph: (022) 25653362/ 58. Fax: (033) 40056911. E-mail: bfwmumbai@bfw.co.in
New Delhi : 510, Mahatta Towwers, B - Block, Community Center, Janakpuri, New Delhi 110058. Ph: (011) 25522210. Fax: (011) 45629699. E-mail: bfwdelhi@bfw.co.in
Pune : BFW House, 124 A, H block, MIDC, Pimpri, Pune 411018. Ph: (020) 32524638. E-mail: bfwpune@bfw.co.in
Punjab: : Suite No 205, 2nd floor, E-195, Industrial Area, Phase - VIII B, S A S Nagar, Mohali (Punjab) - 160071
Rajkot : 85-86, 4th Floor, Samruddhi Bhavan, Opp. Bombay Garage petrol pump, Gondal Road, Rajkot 360002. E-mail: bfwrajkot@bfw.co.in

Representatives at Jamshedpur(Jharkhand) - 938030800, Kolhapur (Maharastra)- 9370958107, Hosur (Tamilnadu) 9342336169

kanaka@bfw/MCR/08-12-2018