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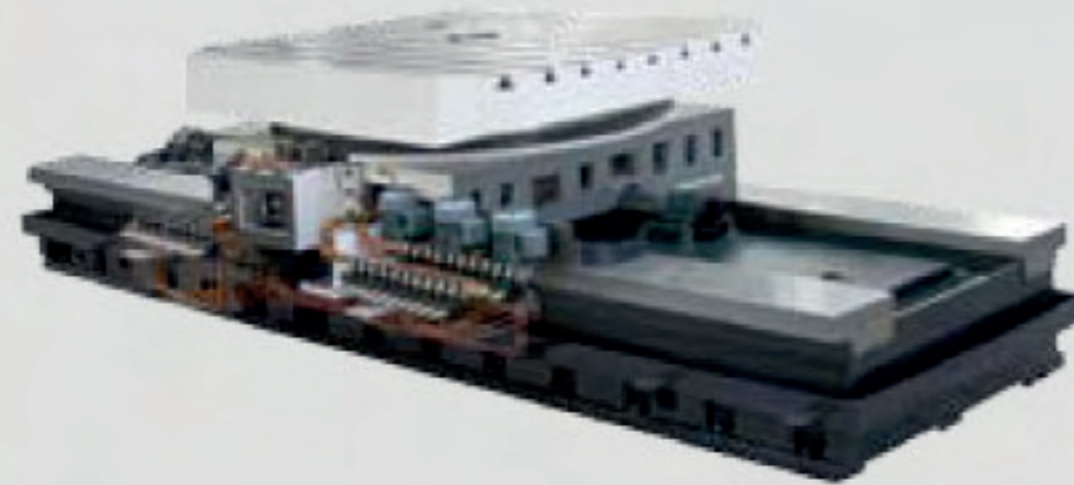


SHENYANG MACHINE TOOL

FBC SERIES FLOOR TYPE CNC BORING & MILLING MACHINE

Structural Features

This series of machine adopts the single-column, side-mounted headstock design. The column and saddle travel horizontally along the bed guideways. The headstock travels vertically on the column guideways. The spindle speed change incorporates an automatic gearbox to switch between high and low ranges. Siemens AC servo motors are installed on all axes. The X-axis adopts double-motor, double-gear and rack drive technology, which greatly improves the driving force of the X-axis, and eliminates backlash much more effectively over traditional single-motor double-gear technology. The two motors move synchronously, and in slight opposition to each other in a way that is controlled electronically by the CNC and drives to remove backlash. The Y-axis incorporates the double motor and double ball-screw drive system. The Z and W axes adopt single pre-loaded ball-screw drive system. X, Y, and Z (Ram) axes incorporate closed-system constant flow hydrostatic guideways, which give high performance, low vibration, and retain high precision over time. The system is powered by a VOGEL constant-flow multi-head pump. The W axis adopts western-made linear guideways as auxiliary ways, and is equipped with a linear encoder to make the extension and retraction of the spindle a full-loop controlled axis. X, Y, and Z axes all have Heidenhain linear encoders for feedback (the Y axis has two encoders) in order to realize complete closed loop feedback control, thus improving the positioning accuracy of the machine. The headstock incorporates a large cross-section CNC-controlled ram, which contains a CNC-controlled boring spindle within it. This makes the machine ideal for both surface and deep-hole machining. The ram incorporates double hydraulic cylinders with a proportionate valve system, and together with the CNC and drive mechanisms of the headstock, compensate for gravitational droop as the ram extends from the headstock. The spindle and ball screw supports all adopt western-made bearings. Main hydraulic, electrical, and pneumatic components are from western sources. The machine bed and column guideways are equipped with telescopic rust-proof steel covers to protect the guide-ways, ball screws, and improve the machine's appearance. The machine is equipped with SIEMENS 840D or FANUC 18i CNC control system. The main drive components, feed components, AC spindle motor, and AC servo feed motors are all imported which ensures stable and reliable performance of the machine.

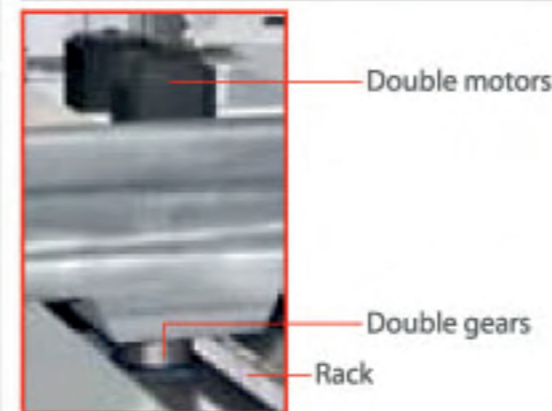
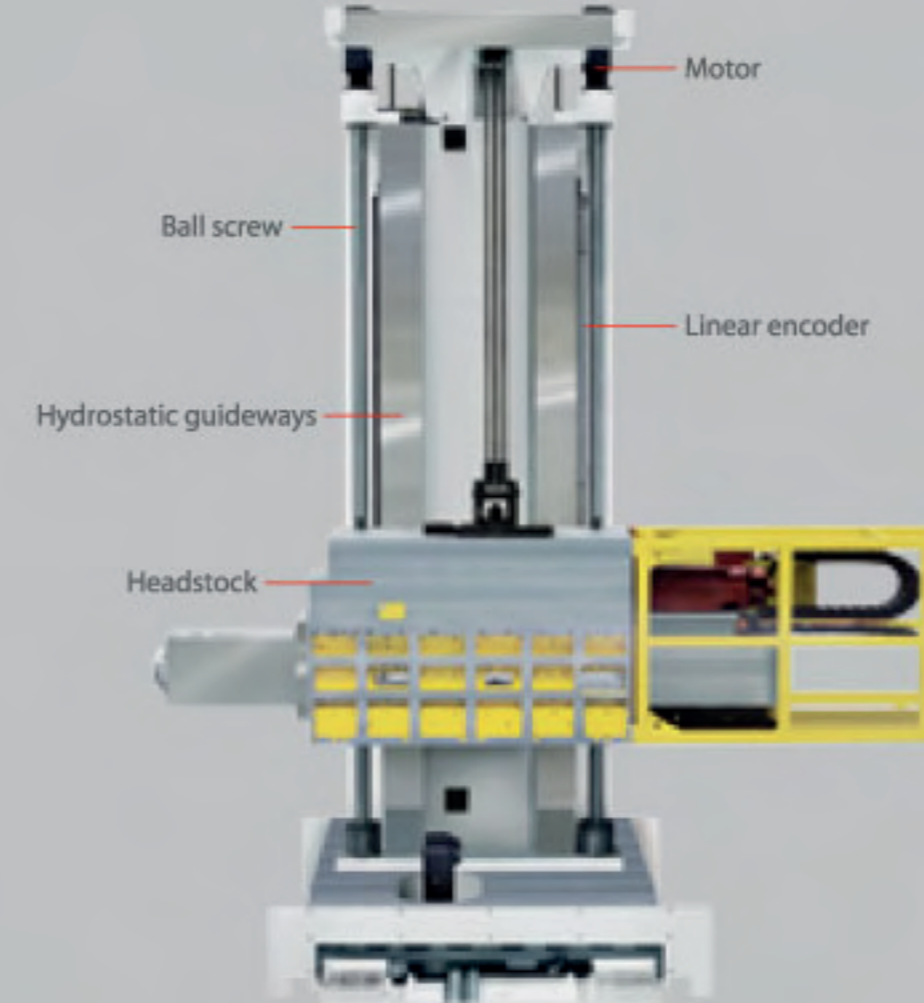


CNC rotary worktable



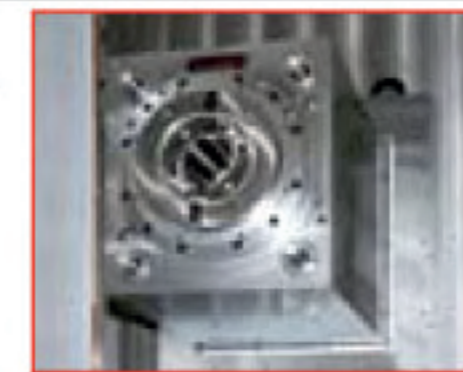
Hydrostatic guideways

Bed

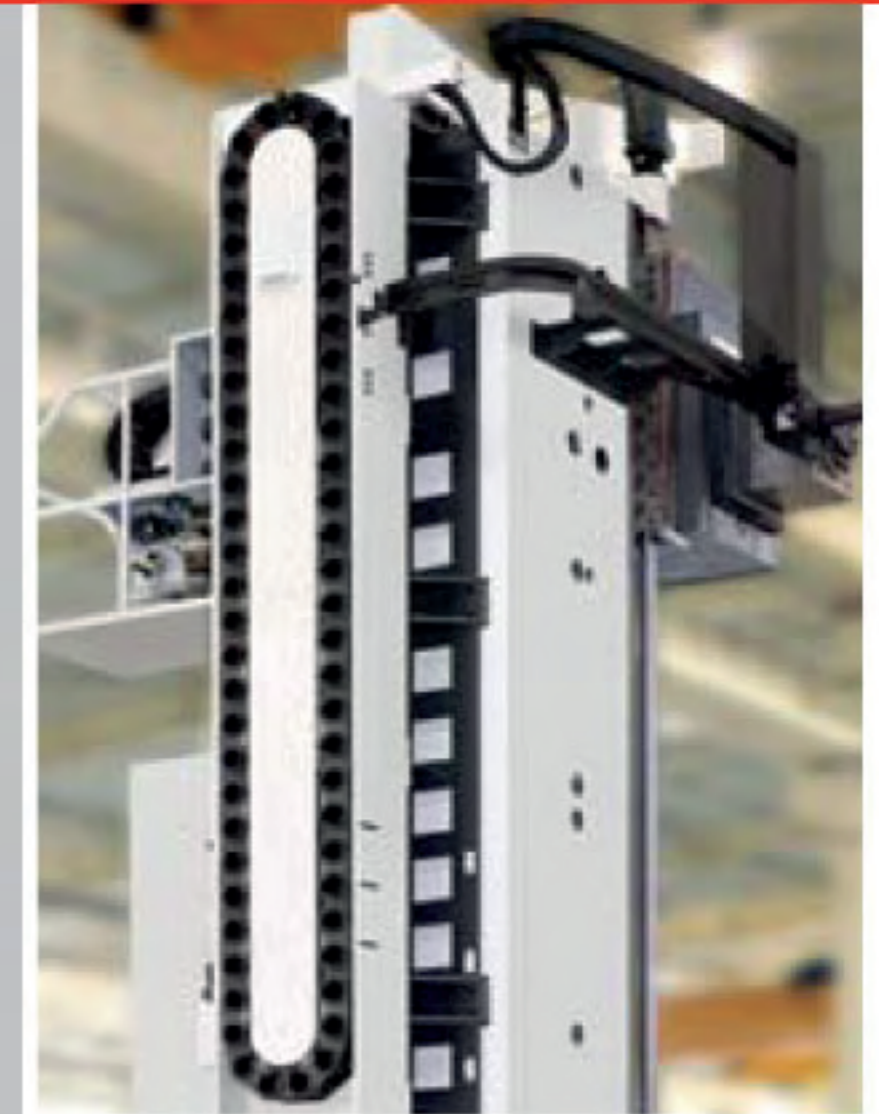


Double motors

Double gears
Rack



Square ram



FBC SERIES WORK TABLE OPTIONAL ACCESSORIES



FBC SERIES FLOOR TYPE CNC BORING & MILLING MACHINE

FBC SERIES

This series of machines are universal heavy duty machines with square-profile ram, suitable for the machining of large parts with drilling, milling, boring, reaming, spot facing, and threading operations, among others. They are widely used in the fields of energy, transportation, and petrochemical, etc. where heavy duty machining of large box-type parts is common.

FBC160r Characteristics

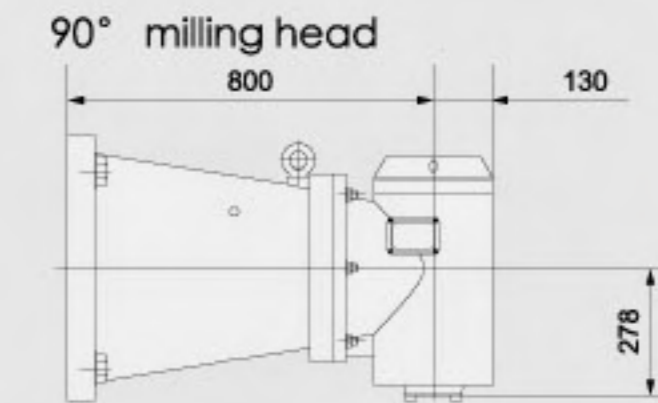
This machine adopts single column design with side-mounted headstock. The saddle moves horizontally along the bed-ways, the column is fixed on the saddle, and the headstock moves vertically along the column guideways. All axes of motion are driven by SIEMENS AC servo motors. The X-axis adopts double motors, double gears and rack technology, which greatly improves the X-axis driving force and its management. During the processes of starting and stopping, the two motors engage simultaneously, which improves acceleration performance significantly in comparison to more conventional single-motor double-gear configurations. Through CNC and drive control, the X-axis realizes forward and backward transmission free of backlash. The Y-axis motion incorporates a mechanism of column-fixed ball-screw being rotated by high-precision reduction gears in order to raise and lower the counterweight balanced headstock. The machine adopts an internal mechanical brake motor with 4 floating spring-loaded clamping devices with hydraulic release as a safety measure. The Z and W axes are driven by servo-motors connected to ball screws through reduction transmission. The X, Y, and Z axes are of low-friction design with plastic coating on the moving elements against steel ways with ample lubrication, in order to obtain low coefficient of friction, good adsorption of vibration, low high-frequency vibration, and high precision. The X-axis is equipped with a linear encoder from Heidenhain. The main hydraulic, electrical, and pneumatic components are all western-made. The machine bed and column guideways are equipped with way covers for improved protection and appearance. The operator's platform travels together with the headstock, which provides good observation of the machining process while ensuring the operator's safety. The machine's hydraulic system is fully interlocked with the functions of the machine for increased safety. The machine is equipped with the SIEMENS SINUMERIK 840D CNC control system. The main drives, feed drives, AC spindle motor and AC servo feed motors are all western-made for increased stability and reliable performance.



FBC SERIES OPTIONAL ACCESSORIES

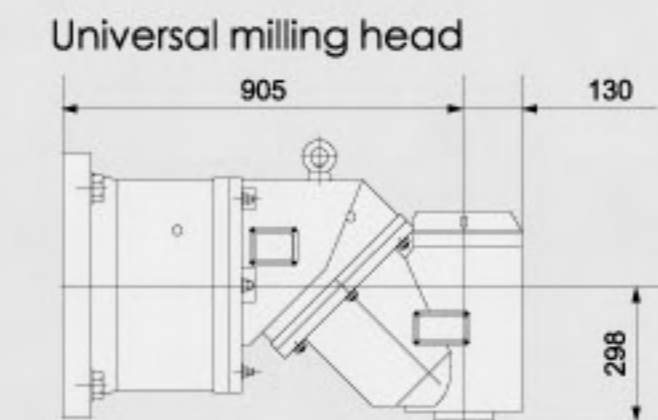
Vertical milling head

Speed	10-600r/min
Torque	3500Nm
Taper	ISO50



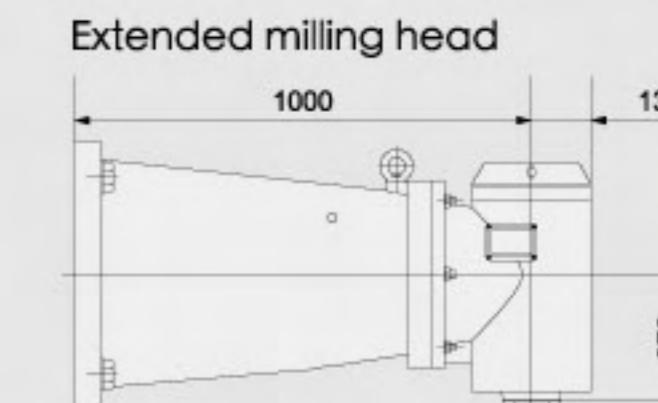
Universal milling head

Speed	10-600r/min
Torque	1200Nm
Taper	ISO50

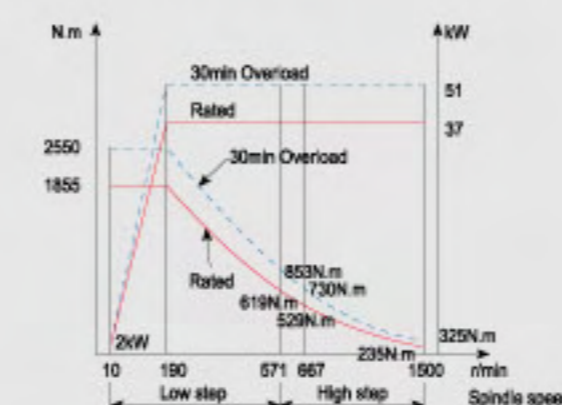


Extended milling head

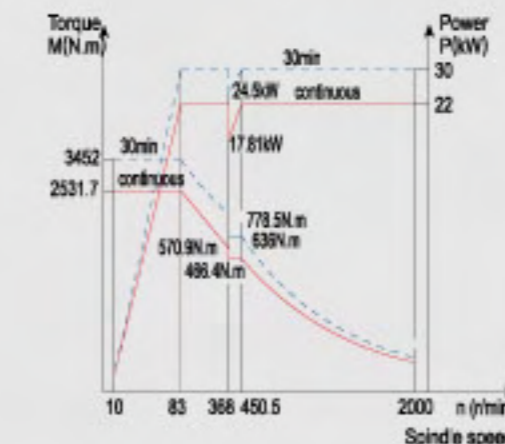
Speed	10-600r/min
Torque	2500Nm
Taper	ISO50



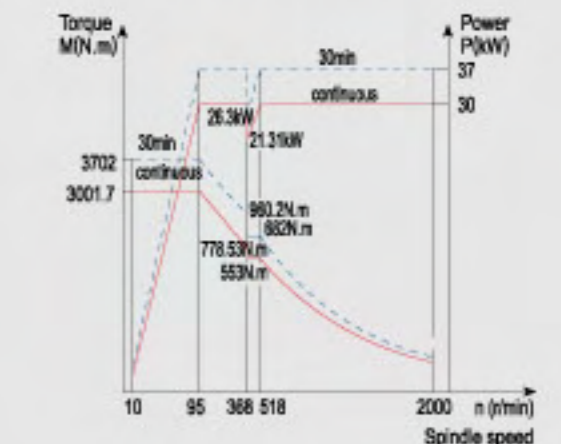
FBC130r SIEMENS 840D



FBC130 SIEMENS 840D (Standard)



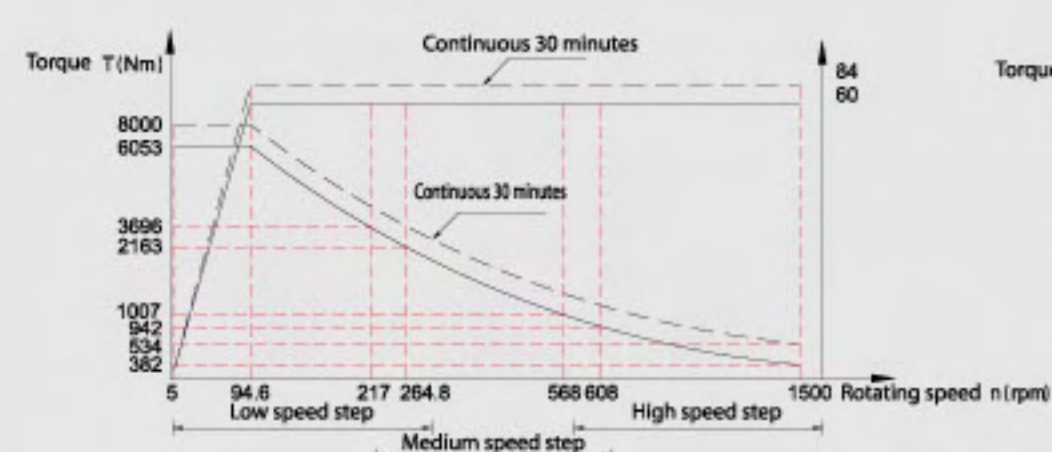
FANUC 18i (Optional)



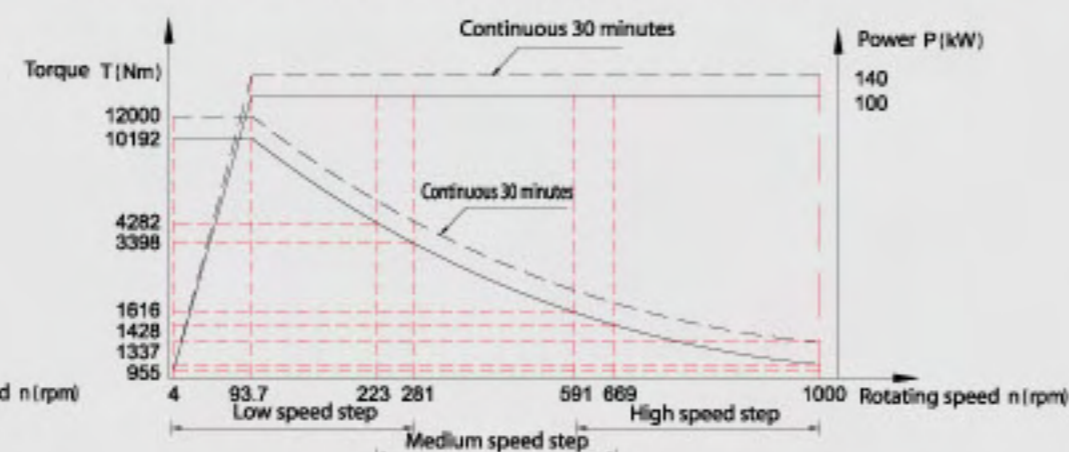
Model			Units	FBC160rh	FBC200rh	FBC260rh
Spindle	Dia. of spindle		mm	Ø160	Ø200	Ø260
	Taper of spindle			ISO50	ISO60	ISO NO60
	Dia. of milling spindle		mm	Ø260	Ø320	Ø400
	Speed of spindle		r/min	5-1500	5-1000	4-900
	Power of main motor		kW	60/84	100/140	129
	Max. torque		N.m	6000/8000	10000/12000	25000
	Section area of ram		mm	480×540	520×580	620×740
Machining range	Travel of slide X-axis		mm	6000(Every 2000mm increase)	6000(Every 2000mm increase)	12000(Every 1000mm increase)
	Vertical travel of headstock Y-axis		mm	3000(4000, 5000)	4000(5000)	6000(Every 500mm increase)
	Travel of ram Z-axis		mm	1200	1250	1800
	Travel of spindle W-axis		mm	1200	1200	1600
Feed	Cutting feed	X-axis	mm/min	1-10000	1-10000	1-8000
		Y-axis	mm/min	1-8000	1-8000	1-6000
		Z-axis	mm/min	1-6000	1-6000	1-4000
		W-axis	mm/min	1-6000	1-6000	1-4000
	Rapid traverse	X-axis	m/min	10	10	10
		Y-axis	m/min	8	8	6
		Z-axis	m/min	6	6	6
		W-axis	m/min	6	6	6
Positioning accuracy	JB/T8490.1-96 Executing national standard	X-axis	mm	0.015/1000	0.015/1000	0.025/1000
		Y-axis	mm	0.015/1000	0.015/1000	0.025/1000
		Z-axis	mm	0.012/1000	0.012/1000	0.015/1000
		W-axis	mm	0.012/1000	0.012/1000	0.015/1000
Repeatability	JB/T8490.1-96 Executing national standard	X-axis	mm	0.010	0.010	0.015/1000
		Y-axis	mm	0.010	0.010	0.015/1000
		Z-axis	mm	0.010	0.010	0.013/1000
		W-axis	mm	0.010	0.010	0.013/1000
CNC system			SIEMENS 840D(FANUC18i)			

Model	Units	FBC110	FBC130	FBC130r	FBC160	FBC160r
Dia. of spindle	mm	Ø110	Ø130	Ø130	Ø160	Ø160
Taper of spindle		ISO 7:24 No50	ISO 7:24 No50	ISO 7:24 No50	ISO 7:24 No50	ISO 7:24 No50
Dia. of milling spindle	mm	-	Ø221.44	Ø221.44	Ø260	Ø260
Speed of spindle	r/min	10-2500	10-2000	10-1500	10-1500	10-1000
Max. torque	N.m	1300/1700	2500/3000	1855/2550	3500/4800	6000/8200
Section area of ram	mm	-	-	480×480	-	480×540
Travel of column (slide) X	mm	4000 (in steps of 1000)				
Vertical travel of headstock (carrier) Y	mm	1500	1600	2000 (Optional 2500,3000)		3000(4000, 5000)
Travel of spindle	mm	550	800	700	1000	1000
Travel of ram	mm	-	-	700	-	700
Power of main motor	kW	17/22.5	22/30	37/51	37/51	37/51
Cutting feed X,Y	mm/min	1-6000	1-6000	1-6000	1-6000	1-8000
Z, W	mm/min	W:1-2000	W:1-3000	1-3000	W:1-3000	1-4000
Rapid traverse	m/min	X,Y:9 W:2.4	X,Y:8 W:3	X,Y:6 Z,W:3	X,Y:9 W:3	X,Y:8 Z,W:4
Magazine capacity	piece	40	40	40(60)	40	60
Shank specification		ISO 7:24 JT50	ISO 7:24 JT50	ISO 7:24 JT50	ISO 7:24 JT50	ISO 7:24 JT50
Pin standard		LDA-50	LDA-50	LDA-50	LDA-50	LDA-50
Positioning accuracy						
X, Y, Z, W	mm	X:0.02/1000 Y,W:0.016	X:0.02/1000 Y,W:0.020	X,Y:0.026/1000 Z,W:0.030	X:0.02/1000 Y:0.026 W:0.020	X,Y:0.026/1000 Z,W:0.030
Repeatability						
X, Y, Z, W	mm	X:0.01/1000 Y,W:0.016	X:0.01/1000 Y:0.016 W:0.018	X,Y:0.013/1000 Z,W:0.013	X:0.01/1000 Y:0.020 W:0.018	X,Y:0.013/1000 Z,W:0.013
Overall dimensions of machine (LxWxH)	mm	8000×2993×4500	8600×5120×5030	8500×5310×5552	10315×5410×5260	8500×5310×5552
Weight of machine	kg	30000	45000	55000	55000	65000
Total power capacity	KVA	50	70	85	85	200
CNC system		SIEMENS 840D				

FBC160rh Power and Torque Diagram



FBC200r Power and Torque Diagram



Model	Units	HTK140×160	HTK160×180	HTK160×200	HTK200×200	HTK200×200I	HTK200×250	HTK250×300	HTK65	HTK80
Area	mm	1400×1600	1600×1800	1600×2000	2000×2000	2000×2000	2000×2500	2500×3000	3000×3500	4000×4000
Load	kg	10000	10000	10000	10000	20000	20000	30000	65000	80000
Travel	mm	2000(optional 1000,3000,4000)	2000(optional 1000,3000,4000)	2000(optional 1000,3000,4000)	2000(optional 1000,3000,4000)	1600	1600(2000, 3500)	1600(2000)	2000(3000)	2000 (3000)
Speed	r/min	1	1	1	1	1	1	1	1	1
Travel speed	mm/min	1-6000	1-6000	1-6000	1-6000	1-6000	1-6000	1-6000	5000	1-5000
Positioning accuracy	mm	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.026	0.025/1000
B(4×90°)	sec	18"(4")	18"(4")	18"(4")	18"(4")	18"(4")	18"(4")	18"(4")	18"(4")	18"(4")
Repeatability	mm	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015/1000
B(4×90°)	sec	10"(4")	10"(4")	10"(4")	10"(4")	10"(4")	10"(4")	10"(4")	10"(4")	10"(4")
Overall dimensions	mm	5000×2200×1110	5000×2300×1110	5000×2300×1110	5000×2700×1110	4830×3339×1295	4830×3339×1295	5238×4000×1295	7310×4500×1695	8200×4000×1740
Weight of machine	kg	15500	16000	16500	17000	26000	28000	33000	60000	70000