

DUGARD

Machine Tools That Create Solutions Since 1939

DUGARD
Heavy Duty

HD Range

Dugard Heavy Duty Vertical Machining Centres

Reverse axis table design reduces the footprint by up to 40%



DUGARD Machine
Tools

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Model shown - Dugard HD1680B



Heavy duty boxways available on Dugard HD Range

The unique inverted slideway design on the whole Dugard HD range offers a fully supported table across the full X axis movement, eliminating table overhang and X axis distortion, and the footprint is 40% smaller than standard VMCs

Dugard **HD1363**

- X axis travel 1300mm
- Y axis travel 630mm
- Z axis travel 600mm
- Maximum table loading 1200kg
- Footprint 3400 x 2700mm
- Machine weight 9300kg

Dugard **HD1680**

- X axis travel 1600mm
- Y axis travel 800mm
- Z axis travel 700mm
- Maximum table loading 2000kg
- Footprint 4000 x 2980mm
- Machine weight 13,000kg

Dugard **HD1886**

- X axis travel 1800mm
- Y axis travel 860mm
- Z axis travel 700mm
- Maximum table loading 2000kg
- Footprint 4500 x 3150mm
- Machine weight 14,000kg

Dugard **HD2210**

- X axis travel 2200mm
- Y axis travel 1000mm
- Z axis travel 900mm
- Maximum table loading 3000kg
- Footprint 5300 x 3700mm
- Machine weight 16,500kg

Ballscrew and the size of linear way

Model	Outer diameter of ballscrew	Precision	Size of linear way	Precision
2210	X axis Ø63	C3	55	P
	Y axis Ø63	C3	55	P
	Z axis Ø63	C3	55	P
1886	X axis Ø45	C3	55	P
	Y axis Ø45	C3	45	P
	Z axis Ø45	C3	45	P
1680	X axis Ø45	C3	45	P
	Y axis Ø45	C3	45	P
	Z axis Ø45	C3	45	P
1363	X axis Ø45	C3	45	P
	Y axis Ø45	C3	45	P
	Z axis Ø45	C3	45	P

Full range of machines all use wide roller linear way

2200L Accuracy

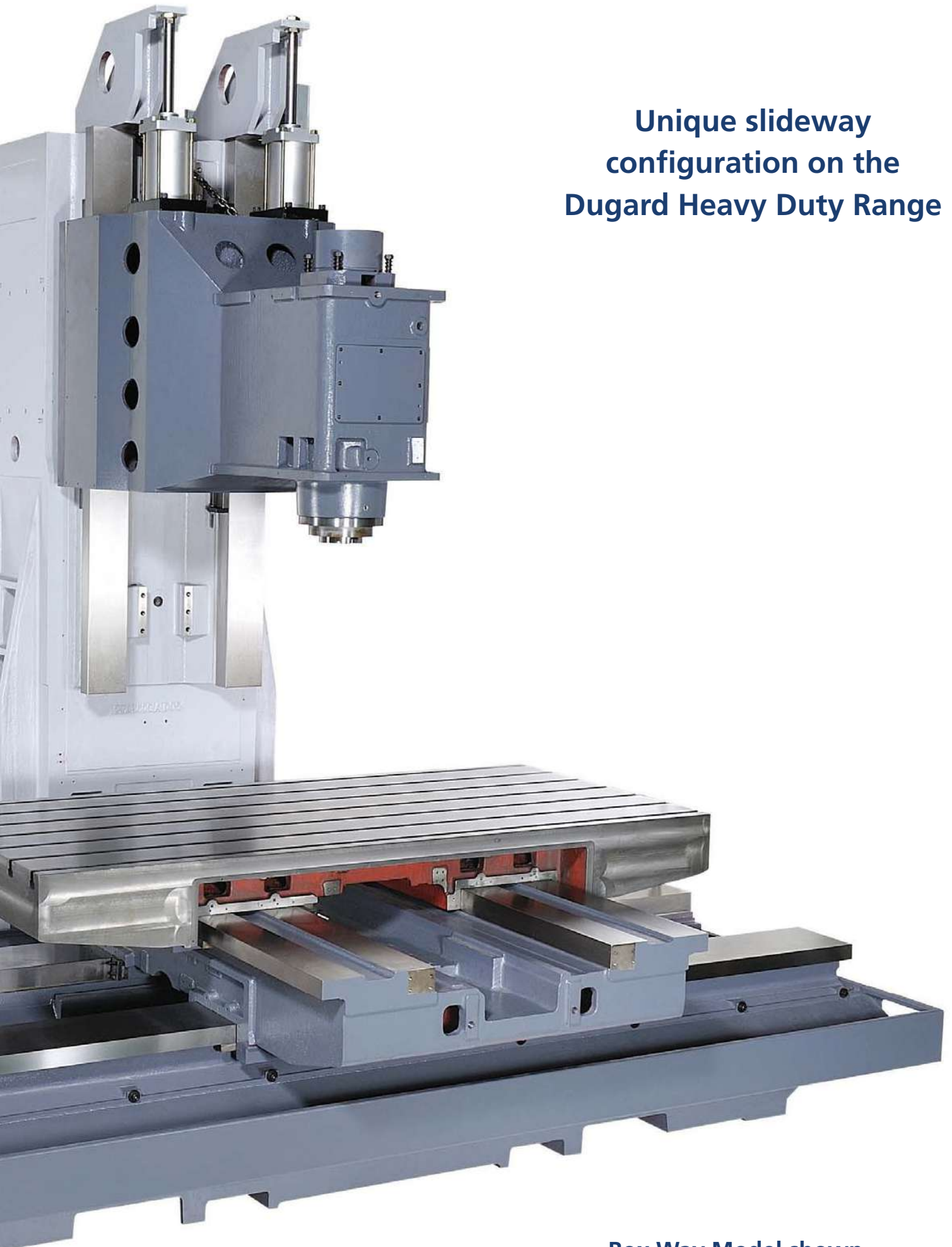
Accuracy	ISO 10791-4	JIS B 6338
Travel	Full	300mm
2 way position A	0.014mm	0.004mm
2 way repetition R	0.010mm	±0.003mm

Heavy duty boxways (B) available on all models
6000rpm gearbox, BBT50 direct drive spindle

High speed linear rollerways (L) available on all models
10,000rpm, BBT50 direct drive spindle

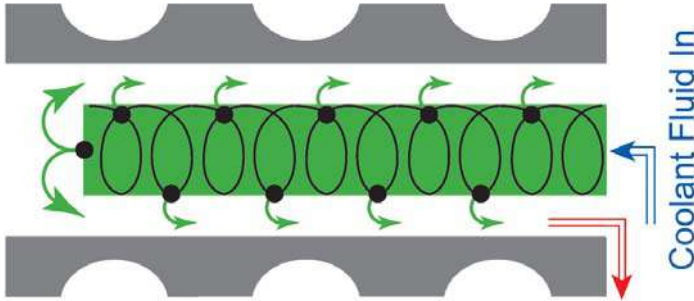


**Unique slideway
configuration on the
Dugard Heavy Duty Range**

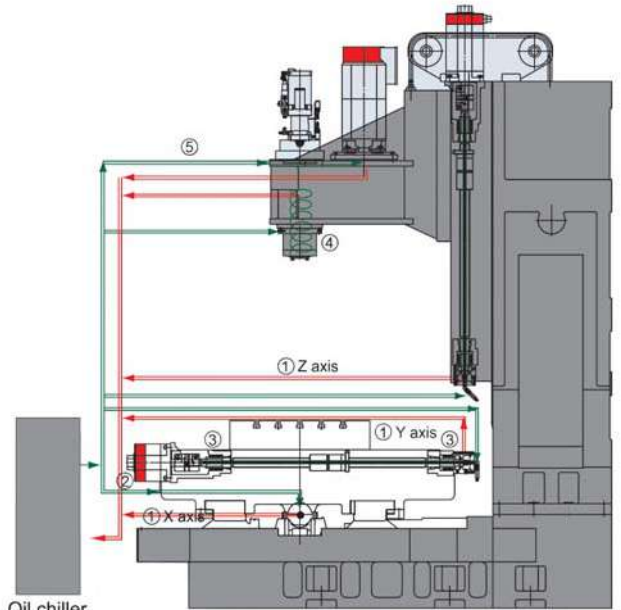
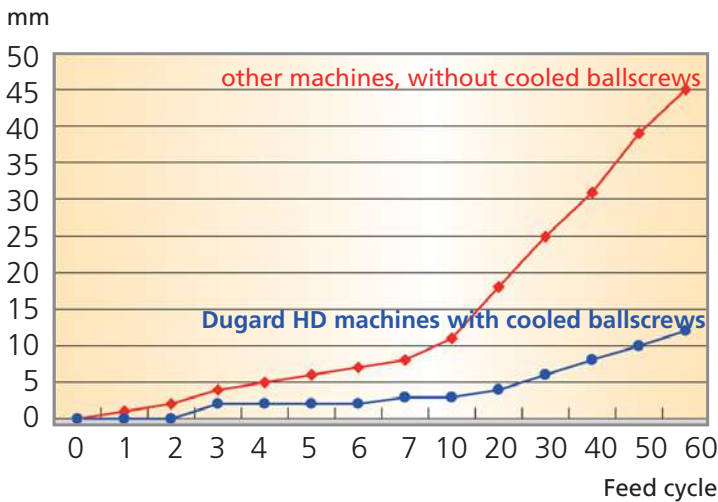


Box Way Model shown

3 axes refrigerated cooling through ballscrews



Giving superb repeatability even during heavy duty cycles (see chart below)



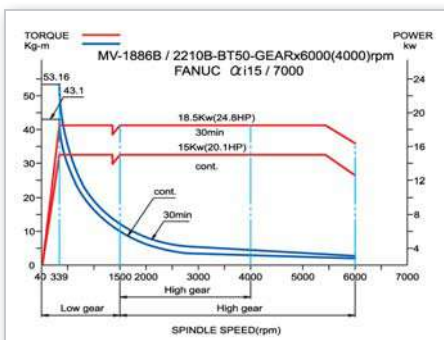
- ① ③ Coolant through device is equipped with the 3 axes ballscrew
- ④ Spindle oil circulation chiller
- ⑤ Spindle cast iron base equipped with oil circulation chiller

X, Y and Z axis cooled ballscrews

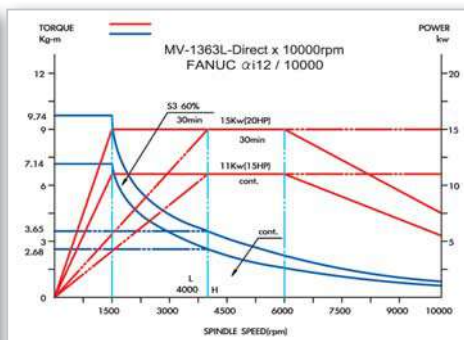


Spindle Construction and Motor Torque Output Chart

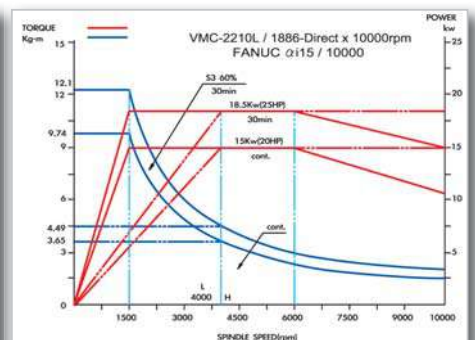
α i15-7000 BT-50# Gear



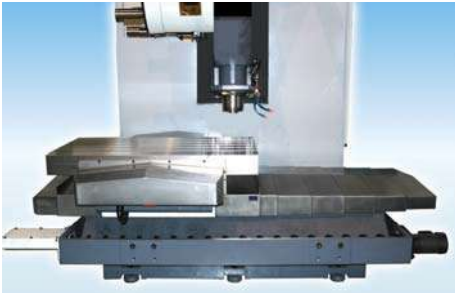
α i12-12000 Direct



α i15-10000 Direct



Fully supported saddle and work table with **No Overhang**



Fully supported table



Dual layer box type base



Maximum width of slideways



Heavily ribbed castings



Spindle



Precise head scraping for spindle

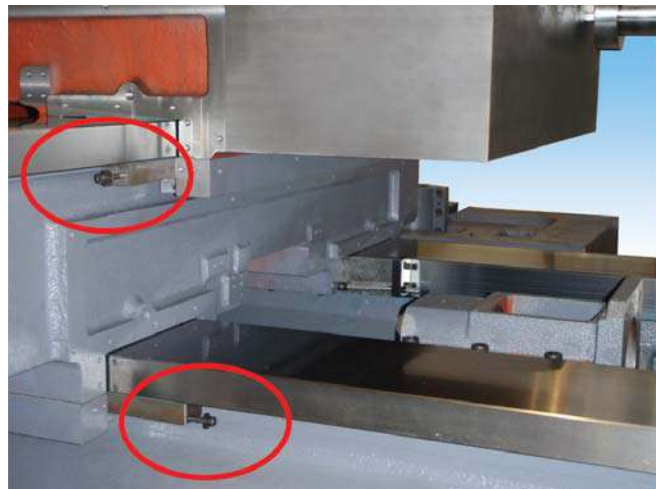


6 sliding blocks on spindle head

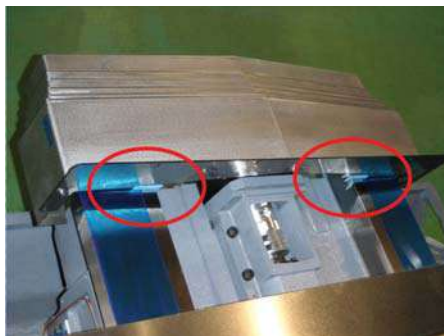


Reliable lubrication system

Work Table



18 pieces of GIB on 3 axes stops spindle head droop, saddle and work table crabing



The sliding cover is wheel mounted so it will not damage the slideways

Saddle



State of the Art Controls

Choice of various controls to meet your requirements. Each one features user-friendly operation, powerful functions and maximum dependability

Standard Control



Fanuc 0iMD Alpha Package

- 10.4" TFT LCD colour monitor
- AICC with 200 block look ahead
- Background edit
- Manual Guide i

Other Available Controls



Heidenhain iTNC 530

- 18" TFT LCD colour monitor
- Super high speed
- Huge programme storage
- Conversational programming



Siemens 828D

- 10.4" TFT LCD colour monitor
- Shopmill conversational programming
- Super high speed
- USB/PC card storage



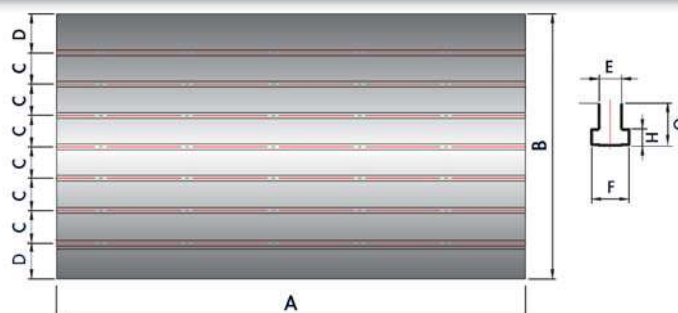
Various interfaces for programme saving, loading and software updating including:



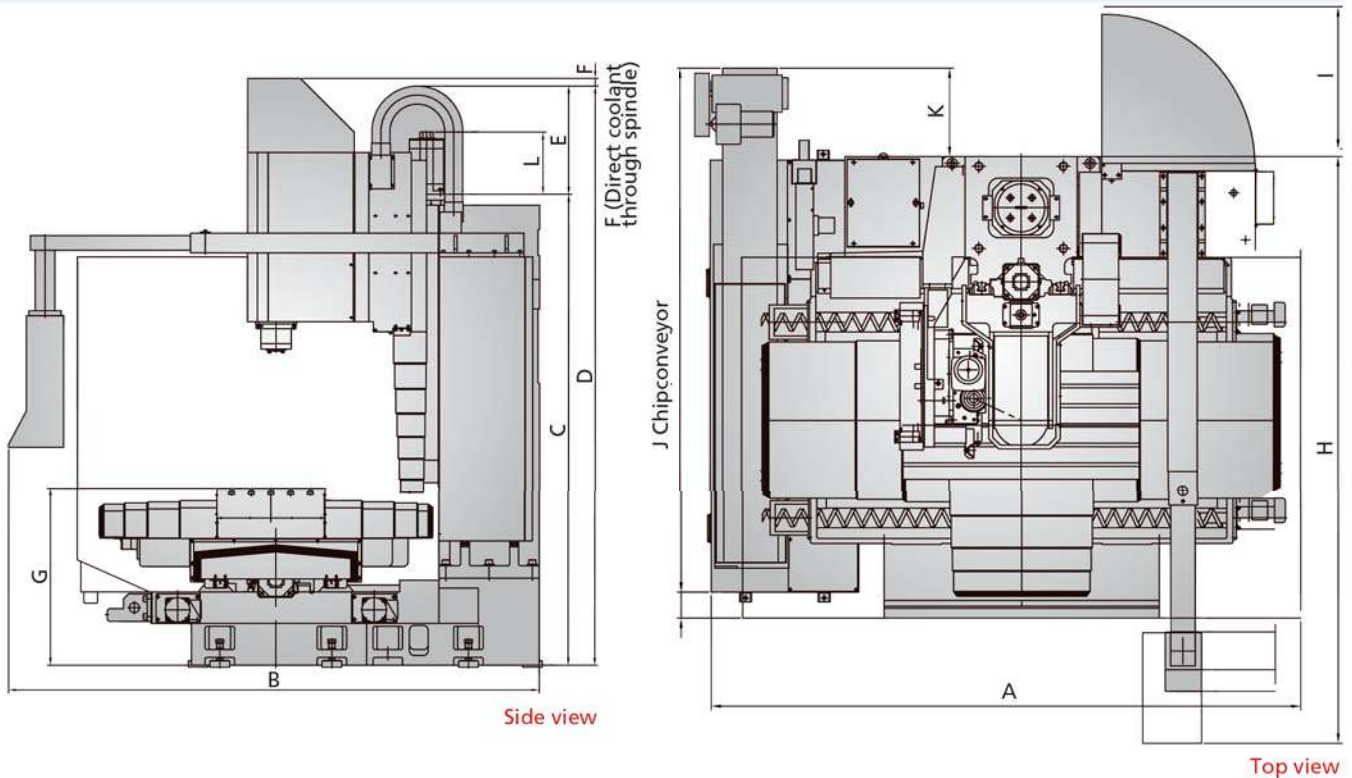
- CF memory card
- RS-232C
- Ethernet

Work Table Size (mm)

Model	A	B	C	D	E	F	G	H	T slot
1363	1450	600	100	75	18	30	33	12	5
1680	1600	700	100	50	18	30	33	12	7
1886	1800	860	150	130	18	30	33	12	7
2210	2200	1000	150	50	22	38	43	16	7



Machine Dimensions



Model	A	B	C	D	E	F	G	H	I	J	K	L
1363	3400	2700	2395	3046	405	82	900	2985	724	2668	450	243
1680	4000	2980	2670	3155	485	82	870	3265	680	2834	406	317
1886	4500	3150	2700	3185	485	82	870	3435	680	2834	406	317
2210	5300	3700	3050	3500	450	82	970	3745	639	2834	154	391

Standard Accessories

- 3 axes coolant-through ball screw device
- Dual auger chip crew conveyors
- Coolant system
- Central lubrication system
- Work lamp and pilot lamp
- 24 station ATC unit
- Spindle air blast
- 3 colour alarm lamp
- Spindle load meter
- Leveling blocks and screws (foundation bolt)
- M-code 30 auto power off
- Heat exchanger for electrical cabinet
- RS-232/PCMCIA interface
- Adjustment tools
- Spindle oil chiller
- M-code air blow chip
- Air gun and coolant pump
- Operation panel and storage tank
- Disk oil-skimmer
- Fully enclosed guarding
- Folded operation cabinet

Optional Accessories

- Spindle thermal compensation device
- Deep hole drilling
- Heavy duty coolant pump
- Tool length measurement system
- Work-piece measurement
- Chip conveyor
- A/C cooler for electrical cabinet
- Coolant through spindle system (20 bar)
- Oil-mist draft device
- 4th axis rotary table
- Optical linear scale
- Data server
- ATC 32/40 pockets
- DNC link and CF card
- HSK/CAT tool shank
- Siemens/Heidenhain control options

Description	Unit	1363L	1363B	1680L
Table				
Table size	mm	1450 x 600		1600 x 600
T-slot	mm	18 x 5 x 100		18 x 7 x 100
Table load (max)	kg	1200		
Travel				
X travel	mm	1300	1300	1600
Y travel	mm	630	630	800
Z travel	mm	600	600	700
Spindle				
Spindle nose to table	mm	140~740	100~700	170~700
Spindle centre to column	mm	710	690	822
Spindle centre to column cover	mm	630	630	750
Spindle speed	rpm	8000 belt (opt10,000 direct)	4000 / 6000 gear	8000 belt (opt 10,000 direct)
Feedrates				
Rapid on X/Y/Z axes	m/min	32 x 32 x 30	24 x 24 x 20	20 x 20 x 20
Cutting feedrate	m/min	1~20	1~15	1~20
Counterbalanced head	Z axis			
ATC				
Tool pocket magazine capacity CAM	piece			
Tool change method				
Max tool diameter	mm			
Max tool dia without neighbour tool	mm			
Maximum tool length	mm			
Maximum tool weight	kg			
Motor				
Feed AC servo motor (feed AC servo motor power)	kW	$\alpha 12 / \alpha 12 / \alpha 12B$ (3/3/3)	$\alpha 22 / \alpha 22 / \alpha 22B$ (4/4/4)	$\alpha 22 / \alpha 12 / \alpha 22B$ (4/3/4)
Spindle AC servo motor	kW	opt direct / $\alpha i 12 / \alpha i 8$		opt direct / $\alpha 15$
Spindle AC servo motor (continuous/30 mins)	kW	Belt $\alpha i 8$ (11/15)	Gear $\alpha i 8$	Belt $\alpha 15$ (15/18.5)
Coolant chiller 20L		400PTSBM3	750PSBM	400PTSBM3
Coolant pump	kW			
Coolant tank capacity	L	350		350
Pneumatic supply	kg/cm ²			
Power	KVA	30		
General				
Bi-directional repeat precision R		ISO 10791-4 R : 0.007mm/full, J		
Positioning precision A		ISO 10791-4 A : 0.010mm/full, J		
Footprint	mm	3400 x 2700		4000 x 2700
Total weight (approx)	kg	9300		12,500

*Specifications are subject to change without prior notice

1680B	1886L	1886B	2210L	2210B
700	1800 x 860		2200 x 1000	
x 100	22 x 5 x 150		22 x 7 x 150	
2000			3000	
1600	1800	1800	2200	2200
800	860	860	1000	1000
700	700	700	900	900
870	175~875	200~900	160~1060	170~1070
800	952	930	1070	1060
750	860	860	1000	1000
4000 / 6000 gear	8000 belt (opt 10,000 direct)	4000 / 6000 gear	8000 belt (opt 10,000 direct)	4000 / 6000 gear
18 x 18 x 15	20 x 20 x 20	18 x 18 x 15	16 x 16 x 12	12 x 12 x 12
1~15	1~15		1~10	
BBT50 / 24T (opt 32T)				
random bi-directional, arm type				
110				
200				
300				
15				
$\alpha 22 / \alpha 22 / \alpha 22B$ (4/4/4)	$\alpha 22 / \alpha 22 / \alpha 22B$ (4/4/4)		$\alpha 30 / \alpha 30 / \alpha 30B$ (7/7/7)	
	opt direct / $\alpha 15$		opt direct / $\alpha 15$	
Gear $\alpha 15$ (15/18.5)	Belt $\alpha 15$ (15/18.5)	Gear $\alpha 15$ (15/18.5)	Belt $\alpha 15$ (15/18.5)	Gear $\alpha 15$ (15/18.5)
750PSBM	400PTSBM3	750PSBM	400PTSBM3	750PSBM
1.27				
350			450	
6				
40			45	
S B 6336-4 $\pm 0.003\text{mm}/300\text{mm}$			R : 0.010 mm	
IS B 6336-4 0.004mm/300mm			A : 0.014 mm	
2980	4500 x 3150		5300 x 3700	
13,000	13,500	14,000	16,500	

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