DUGARD

Since 1939

Dugard 660/850
Vertical Machining Centres

Model shown - Dugard 850

Dugard

Superior Value in Capacity, Precision and Efficiency

660/850

Spindle Speed
10,000rpm (standard)
8000 / 12,000 / 15,000rpm (optional)

Tool Capapcity
24 tool twin arm type (standard)
20 tool carousel type (optional)
32 tool twin arm type (optional)

Rapid Traverses
X axis 30m/min
Y axis 30m/min
Z axis 24m/min

Positioning Accuracy
± 0.004mm / 300mm (JIS B6338)
0.014mm (VDI 3441 PS)

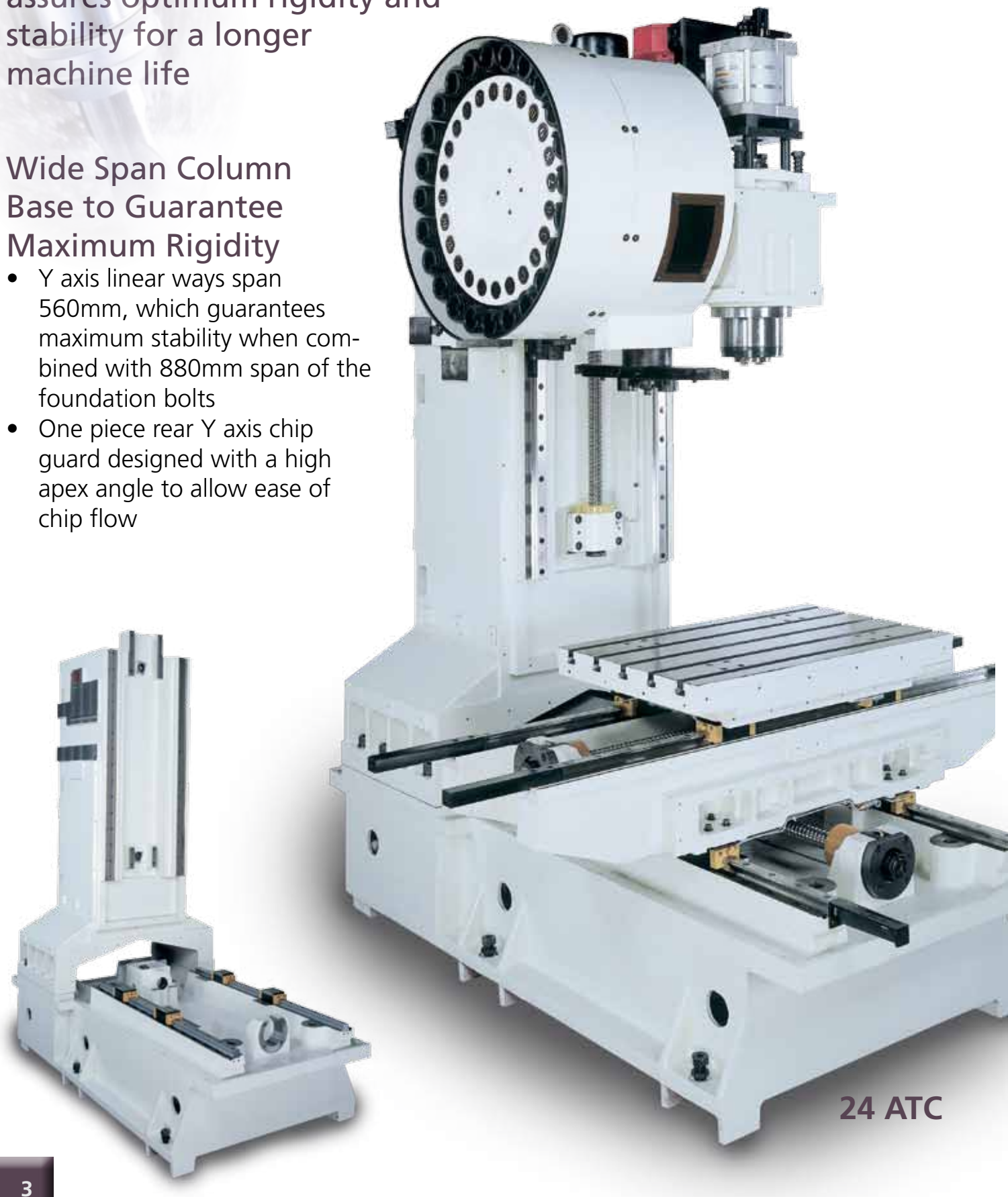
Repeatability Accuracy
± 0.003mm (JIS B6338)
0.010mm (VDI 3441 PS)

Rugged Construction

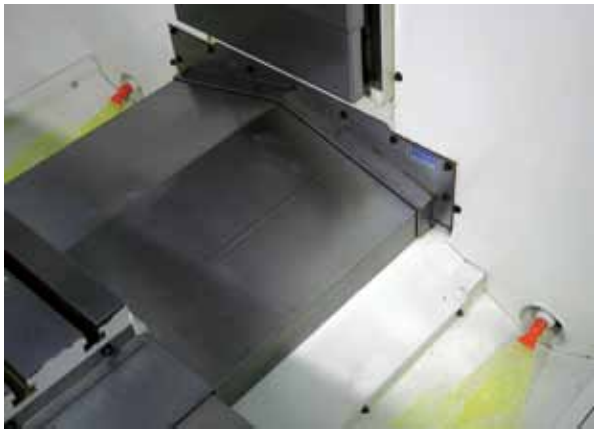
The heavy duty design and construction assures optimum rigidity and stability for a longer machine life

Wide Span Column Base to Guarantee Maximum Rigidity

- Y axis linear ways span 560mm, which guarantees maximum stability when combined with 880mm span of the foundation bolts
- One piece rear Y axis chip guard designed with a high apex angle to allow ease of chip flow

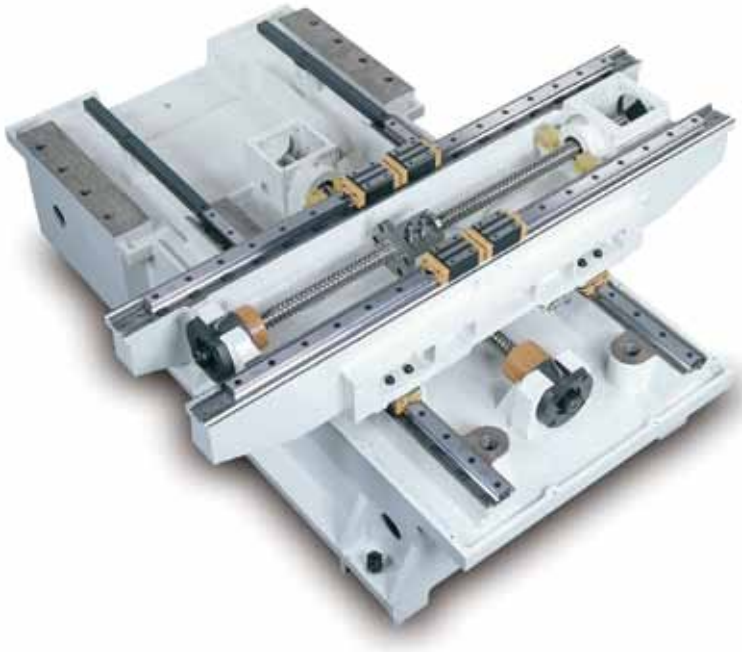


24 ATC



Easy Chip Flow Splash Guard Design

- High apex angle chip guard design provides easier chip flow
- Standard rear flood nozzles creating coolant jets to aid chip clearance

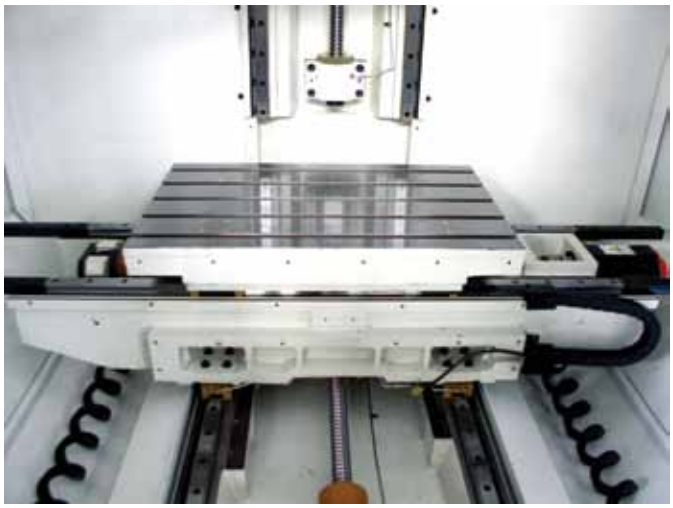


High Precision Ball Screws on 3 Axes

High precision class C3 ball screws are used for all three axes.
Precision pre-tensioned, 40mm diameter double anchored and laser calibrated for high accuracy

High Speed and Rigid Roller Linear Ways on X/Y/Z Axis

- 35mm linear ways on all 3 axes with extended bearing blocks on the Z axis for added rigidity
- 530mm Y axis travel makes the machine ideal for precision mould and job-shop machining
- Dual chip auger is optional



High Accuracy Spindle Design

Large diameter spindle design with 70mm ID ABEC class 7 (P4) super high precision angular contact ball bearings, fully supported for radial and axial thrust forces.

Fully temperature controlled refrigerated spindle cartridge

Belt Driven Spindle

10,000 rpm (standard)
8,000 / 12,000 rpm (option)

Directly Coupled Spindle

12,000 rpm (option)
15,000 rpm (option)

High rigidity, Big Plus double contact taper

Uses BT40 holders for standard machining and Big Plus for heavy duty machining

ATC Mechanism (opt)

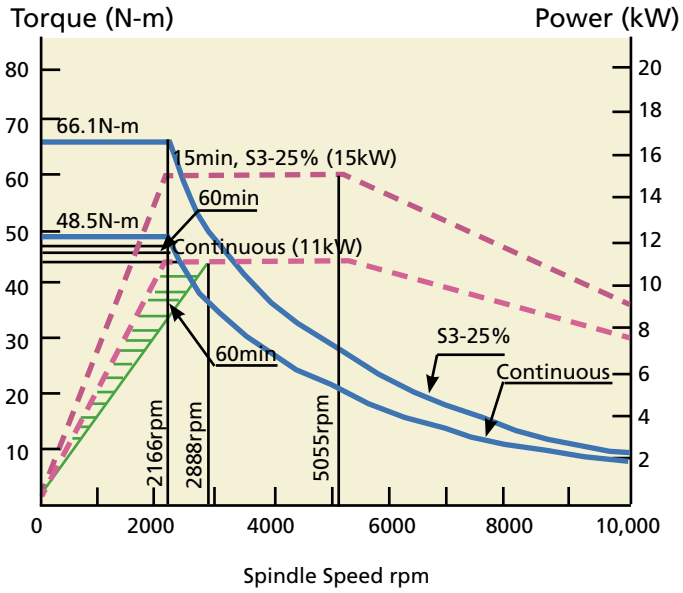
Type	Carousel	Arm
Tool Shank	BT40 / CT40 / DIN40 / JT40	
Tool Capacity	20 (std)	24/32 (opt)
Tool Selection	Absolute	Random
Tool Access	Bi-Directional	

Twin Arm Type ATC (std)

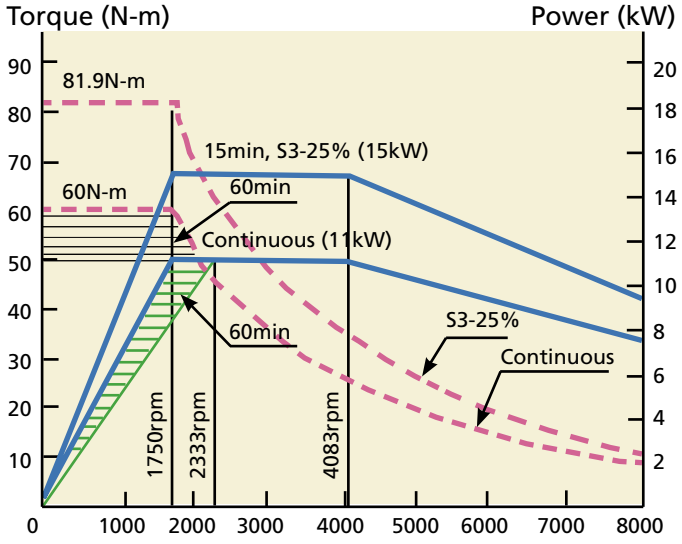
Directly Coupled Spindle (opt)

Torque Charts

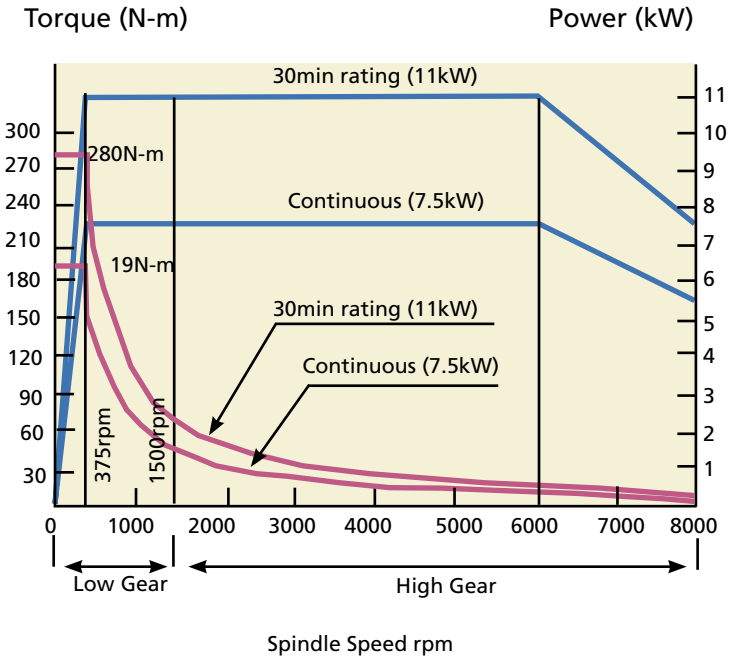
1. 10,000rpm spindle
Fanuc ß 12i (15kW) spindle motor



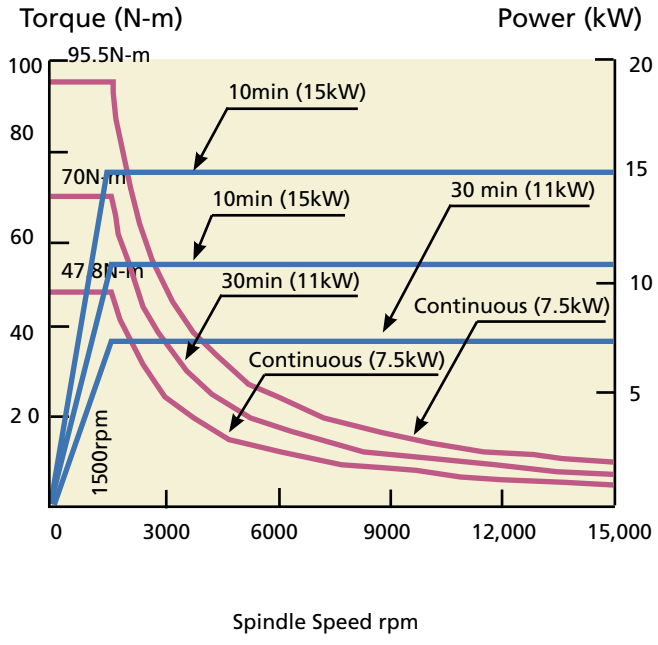
2. 8000rpm spindle
Fanuc ß 12i (15kW) spindle motor



3. 8000rpm spindle
Fanuc α 8i (11kW) with ZF gear box



4. Directly coupled 15,000rpm spindle
Fanuc α 8i (11kW) with ZF gear box



State of the Art Controls For Increased Productivity

FANUC
0iMD/ 18iM control

Siemens
828D control
with Shopmill

Heidenhain
ITNC530 control

Standard Control

Fanuc 0iMD 8.4" LCD monochrome monitor

Other Available Controls

- Fanuc 0iMD 8.4" TFT LCD with AICC & data server (option A)
- Fanuc 18iM 8.4" TFT LCD
- Heidenhain iTNC530 15" TFT LCD colour monitor

Inspection

Laser Calibration

After assembly, all machines are inspected using state-of-the-art laser equipment. This process of inspection ensures all axes are verified and calibrated to provide the best possible accuracy and repeatability.

Ball Bar Testing

The test is carried out using a precision test bar which outputs micron changes in length. The bar is fixed to the spindle and table. The machine is then put through a series of circular moves in the X/Y plane, and $^{1}/_{2}$ circle moves in the X/Z and Y/Z planes. Encoder data from the bar is fed into a computer, which outputs a chart of machine accuracy. Any deviations in squareness or length show up as distorted circles that are very easy for technician to spot. This chart assures that the machine is accurate and properly aligned.

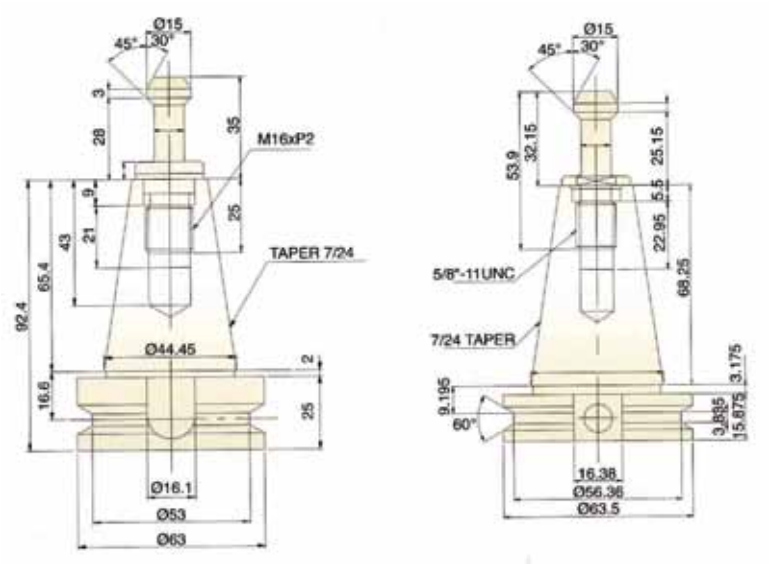
Workpiece Measurement (option)

Tool Measurement (option)

Dugard 660/850

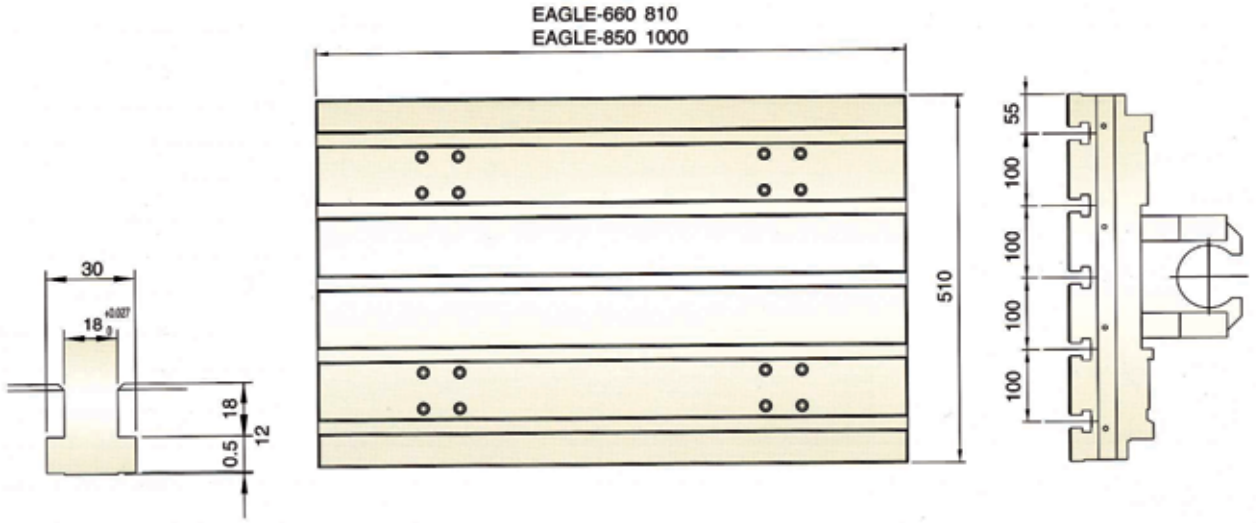
Tool Shank and Pull Stud

Unit : mm



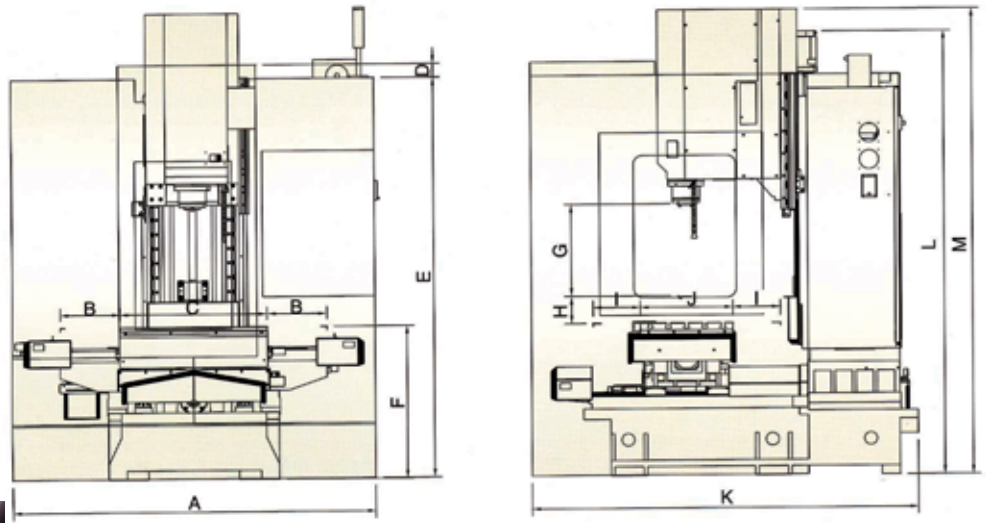
Working Capacity

Unit : mm



Machine Dimensions

Unit : mm



Item	Dugard 660	Dugard 850
A	2000mm	2300mm
B	330mm	425mm
C	810mm	1000mm
D	76mm	
E	2227mm	
F	850mm	
G	510mm	
H	150mm	
I	260mm	
J	510mm	
K	2125mm	
L	2467mm	
M	2590mm	

Vertical Machining Centres

Description	Dugard 660	Dugard 850
Table		
Table size	810 x 510mm	1000 x 510mm
T-slots (no x wid x dis)	5 x 18mm x 100mm	
Table Load	500kg	
Travel		
X Travel	660mm	850mm
Y Travel	530mm	
Z Travel	510mm	
Spindle		
Spindle Nose to Table	150~660mm	
Spindle Centre to Column	585mm	
Spindle Taper	BT40 (CT40 opt)	
Spindle Speed	80~10,000rpm (8000 / 12,000 / 15,000rpm opt)	
Feedrates		
Rapid on X/Y/Z Axes	30/30/24 m/min	
Cutting Feedrate	1~10,000 mm/min	
Accuracy		
Posiioning	±0.004mm	
Repeatability	±0.003mm	
Tool Changer		
Tool Capacity	24 twin arm	
Tool Shank	BT40, CT40 or DIN40	
Pull Stud	P40T-1	
Max Tool Diameter	76mm, 24 station cam-arm type	
Max Tool Weight	7kg	
Motor		
Drive Motor X, Y, Z Digital	1.8 / 1.8 / 2.5kW	
Coolant Pump	0.76kW	
General		
Power Required	15KVA	
Air Required	5kg/cm^2 ; 200L/min	
Floor Space (L x W x H)	2000 x 2060 x 2583mm	2300 x 2060 x 2583mm
Machine Weight approx	5500kg	5800kg

*Specifications are subject to change without prior notice

Standard Accessories

1. 24 twin arm ATC
2. Coolant system
3. Fully enclosed splash guard
4. Central lubrication system
5. Rear chip flush system
6. Leveling bolts and pads
7. Operation manual & parts list
8. 4th axis wiring
9. Through spindle coolant preparation
10. BT40 pull studs
11. Chip flushing device at rear
12. Heat changer for electric cabinet
13. Spindle air blast
14. Spindle oil chiller
15. Work light
16. Tool kit
17. Status light
18. Air gun
19. Coolant gun
20. Linear scale

Optional Accessories

1. CT-40 or DIN-40 pull studs
2. Chip conveyor
3. Belt: 8000rpm / 12,000rpm spindle
4. Directly coupled: 12,000 / 15,000rpm spindle
5. 4th axis preparation
6. 4th axis rotary table and motor
7. Spindle oil chiller
8. Through spindle coolant device
9. Chip flushing device at rear side
10. Automatic tool length measurement
11. Dual screw type chip conveyor
12. 20 carousel type ATC
13. 32 chain type tool magazine
14. Oil skimmer

www.dugard.com

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