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# FVP *SERIES*

Vertical Machining Center

# FEELER VERTICAL MACHINING CENTER

## Create A New Standard in Machining Efficiency!



FVP-1000A/800A



FV-1500A



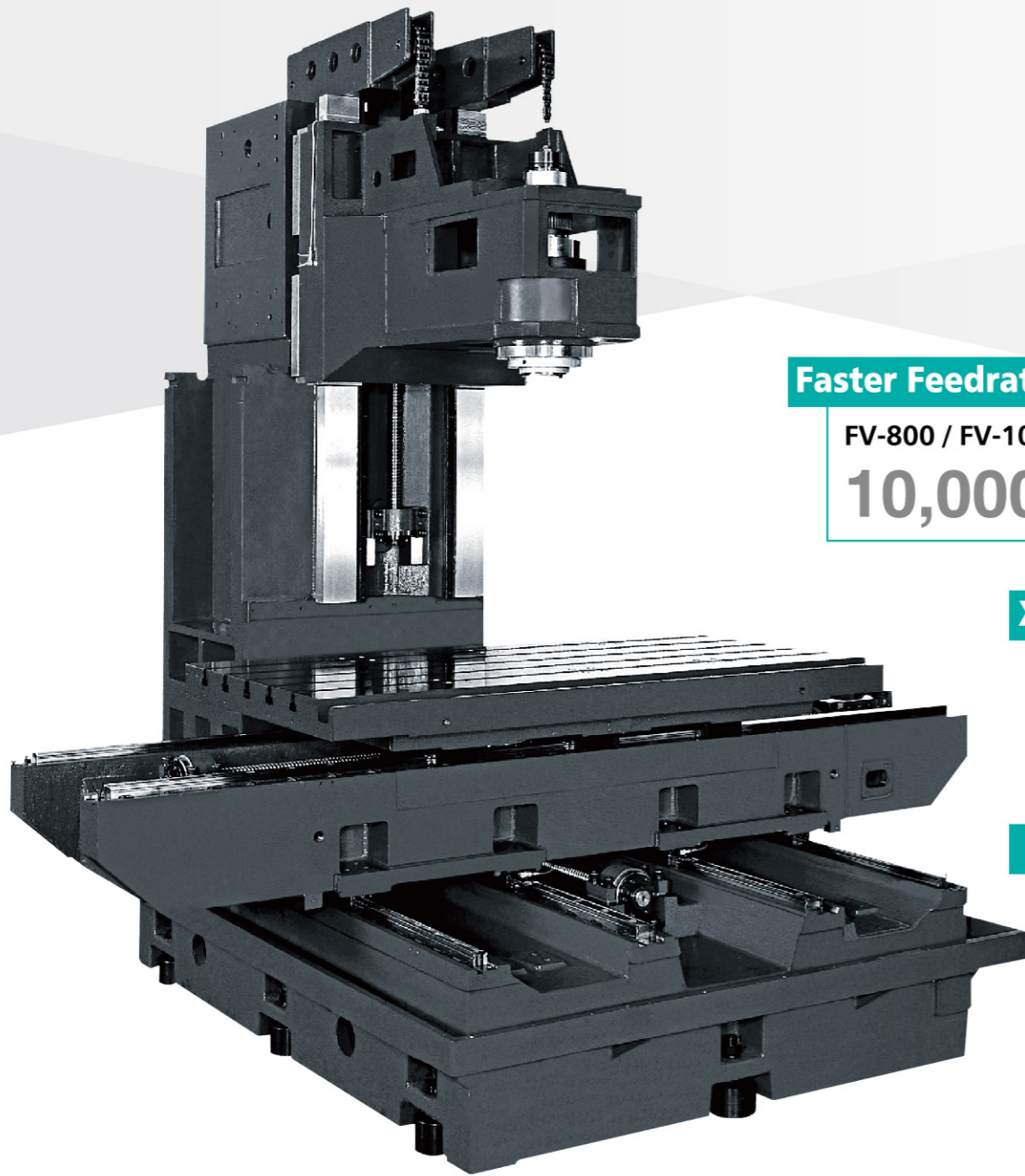
FVP-1300A



FV-1600A

■ X, Y-axis Linear Ways, Z-axis Box Ways

# Stable, Rigid Machine Structure



## Greater Table Loading Capability

FV-800 / FV-1000	500kg	➔	<b>800kg</b>
FV-1300	1,000kg	➔	<b>1,500kg</b>
FVP-800 / FVP-1000			
FVP-1300			

## Faster Feedrate

FV-800 / FV-1000 // FV-1300	10,000 m/min	➔	<b>15,000 m/min</b>
FVP-800 / FVP-1000 / FVP-1300			

## X-axis Travel Increased

FV-1000	1,000 mm	➔	<b>1,020 mm</b>
FVP-1000			

## X, Y, Z-axis Feedrate Increased

FV-800 / FV-1000	24/24/15 m/min	➔	<b>32/24/24 m/min</b>
FV-1300	18/18/15 m/min	➔	<b>32/24/24 m/min</b>
FVP-800 / FVP-1000			
FVP-1300			

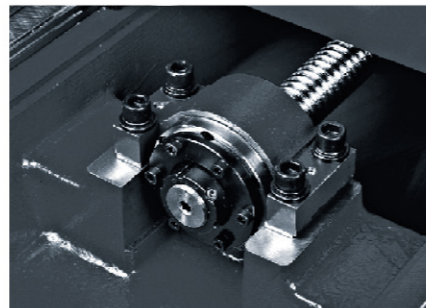
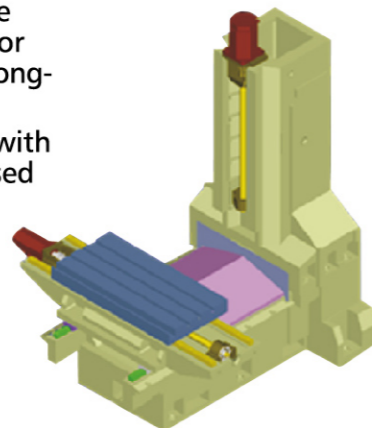
FV-1500A has 4 linear guide ways on Y-axis. All other models have 2.

## Rigid Cast Iron

- The machine structure and major parts are manufactured from Meehanite cast iron for outstanding material stability and assures long-term deformation-free performance.
- Boxways for the spindle head are coated with low friction TURCITE-B, providing increased cutting rigidity.

## FEM Analysis

The entire machine construction is subjected to ANSYS and NASTRAN Finite Element Analysis (FEA) to achieve optimum rigidity and stability.



## High Precision Ball Screws

Pre-tensioned ball screws on X, Y, Z axis ensure accuracy and eliminate positioning error.

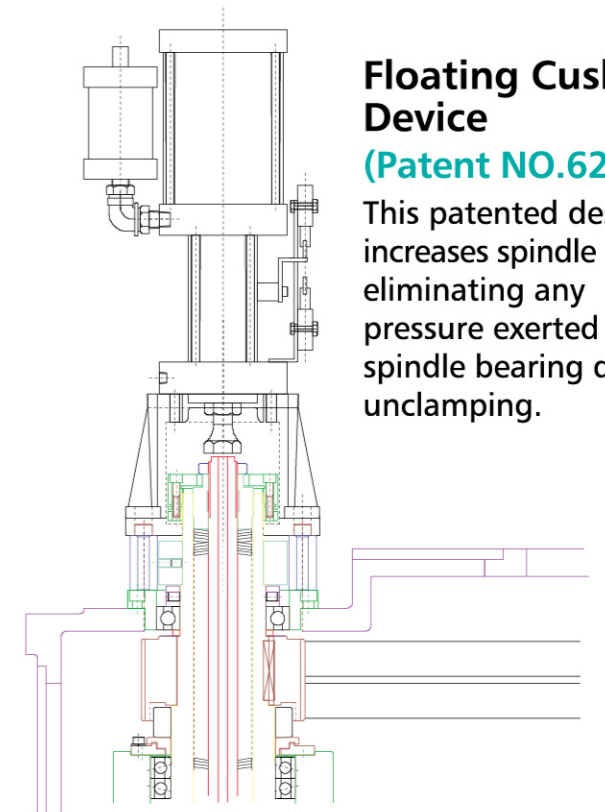
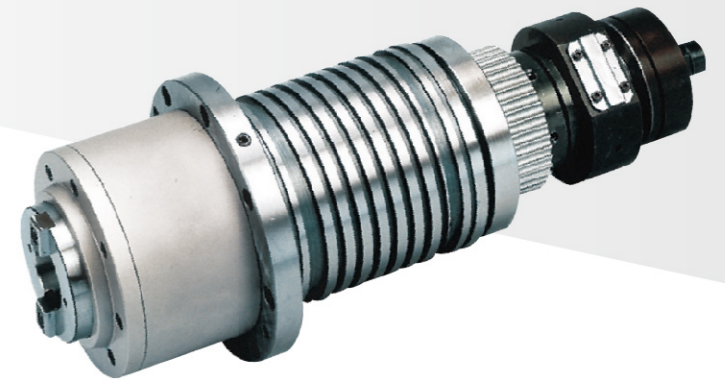
## No Counter Weight on Z-axis

(FVP-800 / FVP-1000 / FVP-1300)

- Increased Z-axis motor horsepower combined with brake.
- Increase circularity accuracy on Z-axis.
- Eliminate structural vibration caused by counter-balance weight.

## Unique Spindle Unit Design

- The P4 angular contact bearings ensure the spindle's maximum rigidity and highest accuracy. Through dynamic balancing of each spindle, the vibration is reduced to less than 0.002 mm at top speed.
- High torque spindle motor reduces the spindle noise tremendously and provides powerful cutting performance.
- Clamping jaws and special floating cushion device, with spindle axial clearance less than 0.002 mm, provide stable tool clamping and unclamping.
- Advanced labyrinth spindle nose design with air seal system prevents coolant and dust from entering the bearing. As a result, longer service life and better accuracy are achieved.



## Floating Cushion Device

(Patent NO.62889)

This patented design increases spindle life by eliminating any pressure exerted on spindle bearing during unclamping.



## Crystal Scanning Control Panel

The self-illuminated crystal scanning control panel provides operator easy identification in a poor working environment. Keys are coolant-resistant, bump-resistant, oil-resistant, and changeable. The control panel is an information processing center and efficiently controls all functions.

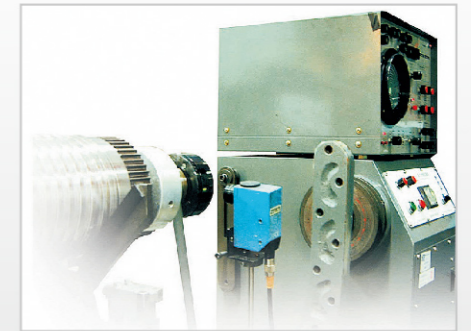
## Precision Inspection Accuracy Guaranteed

At FEELER, we have a strong commitment to provide the best possible machining centers that meet or exceed customers' expectations. Over the years, we have implemented a world class quality control system and the state-of-art inspection equipment.



### ZEISS 3D Coordinate Measuring Machine

FEELER utilizes the 3D Coordinate Measuring Machine (CMM) to inspect critical parts ensuring outstanding parts accuracy.



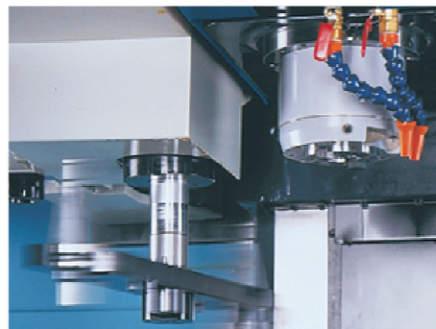
### Spindle Dynamic Balance Test

A high precision balance tester is applied to inspect the spindle dynamic balance. It is also employed to inspect the spindle chattering at high speed. Rigid CastIron.



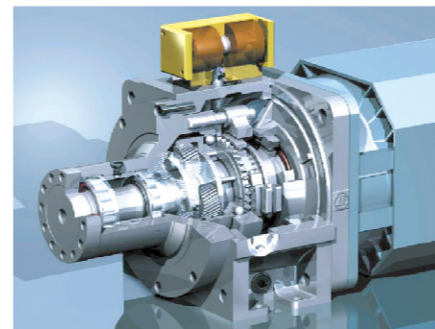
### Carousel Type ATC

The Carousel Type tool changer- with capacity of 22 tools to meet flexible machining requirements for molds and parts production.



### Dependable, Efficient ATC

FEELER'S ATC designs are all subjected to 1 million cycle of continuous test for durability and stability to assure maximum dependability of operational performance.



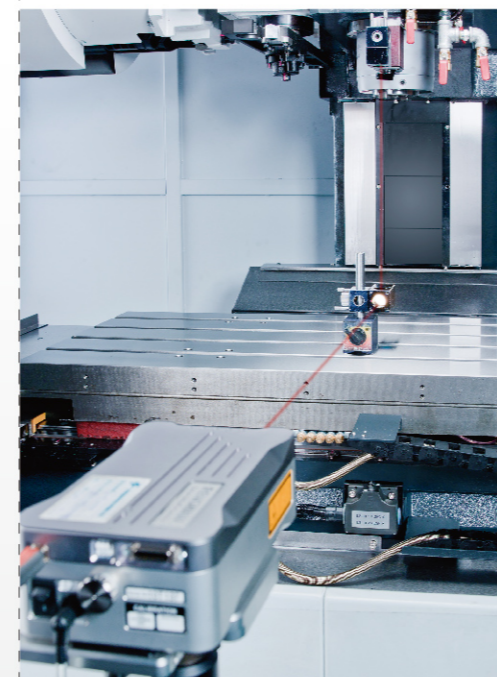
### ZF Gearbox

Optional 2-speed planetary gearbox allows smooth operation and optimum torque output in both low and high speed ranges. 4:1 gear ratio delivers extra high power and torque when spindle revolution is below 1,000 rpm.



### Chain Type Chip Conveyor Screw Type Chip Conveyor

Screw type and chain type chip conveyors are both available as an option.



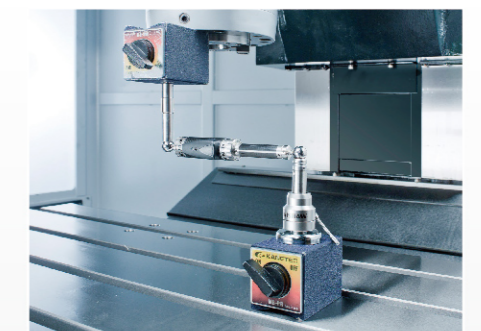
### Laser Inspection

The laser equipment provides positioning accuracy inspections, ensuring machining accuracy and repeatability.



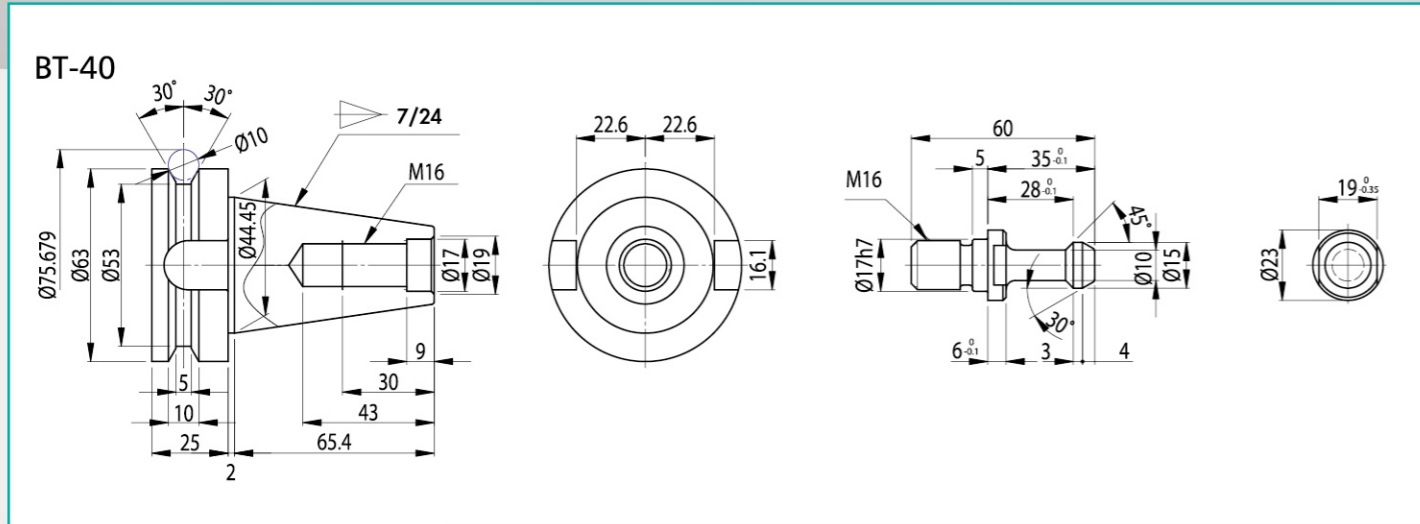
### Ball Bar Testing

The ball bar tester is used to inspect the circularity accuracy for a servo axis running on a surface. This test will ensure circle cutting accuracy.

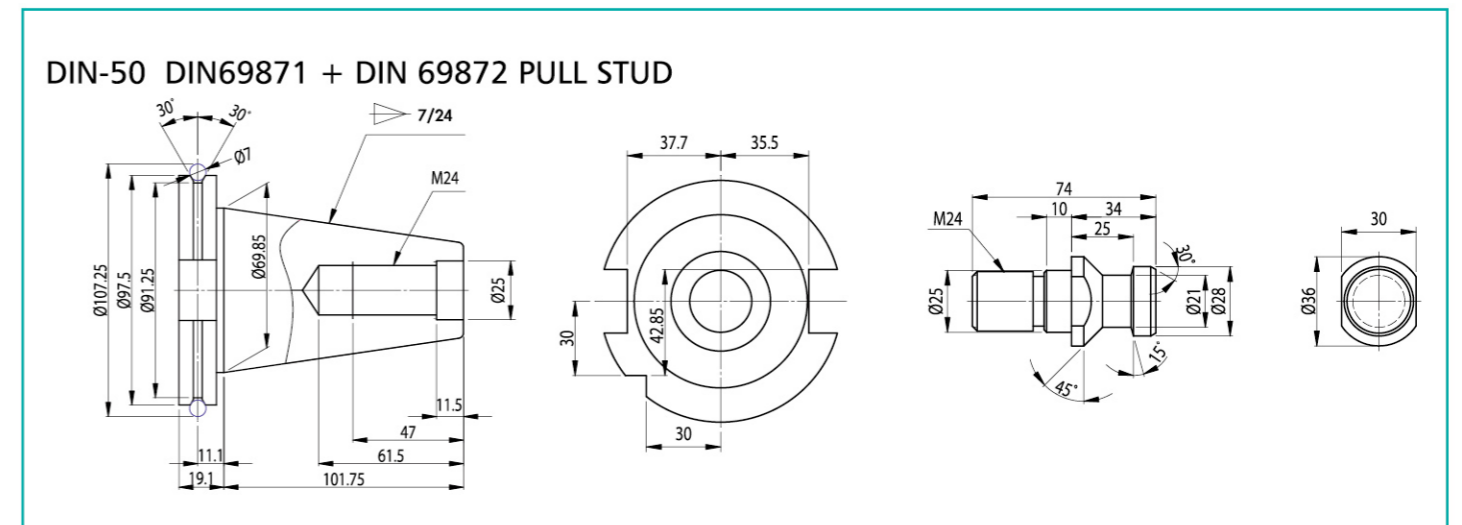
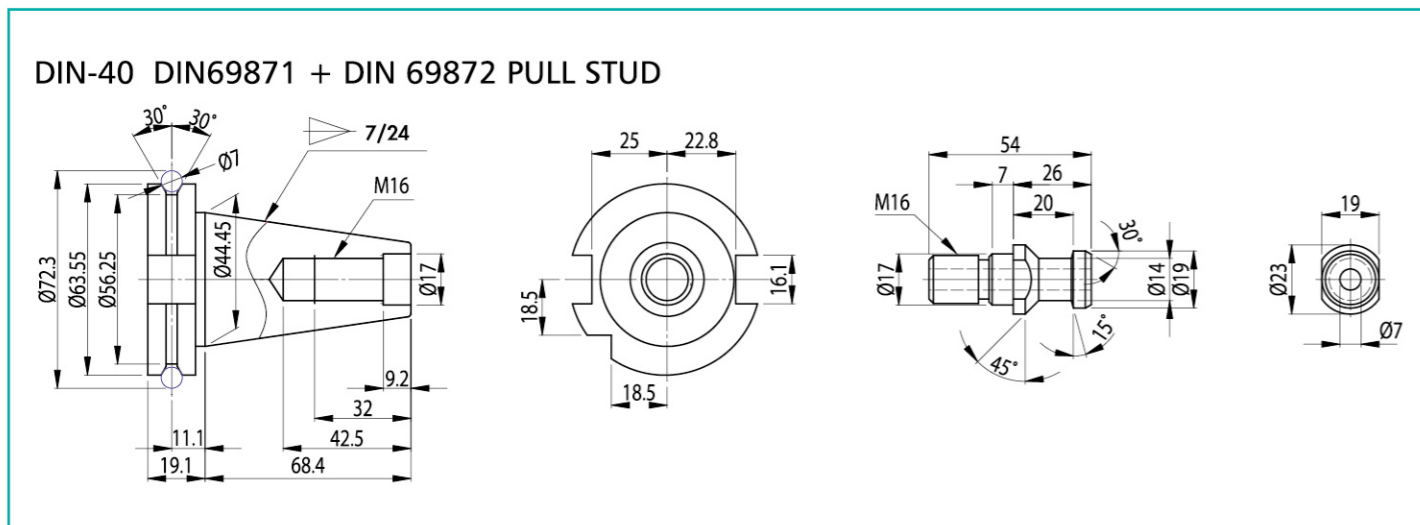
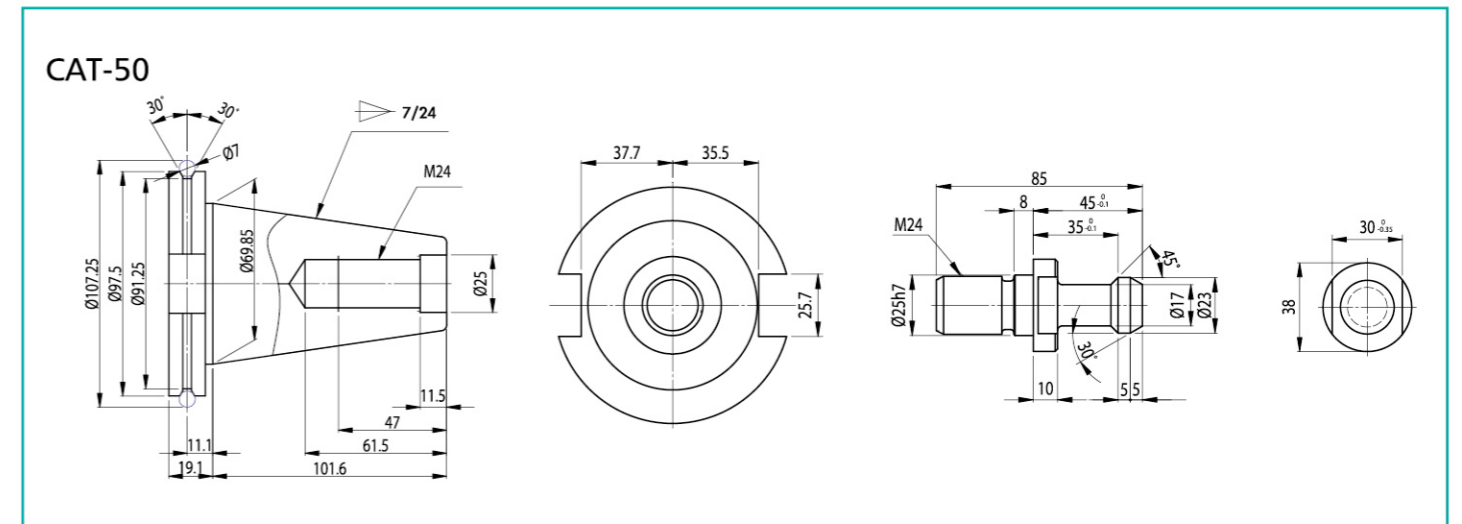
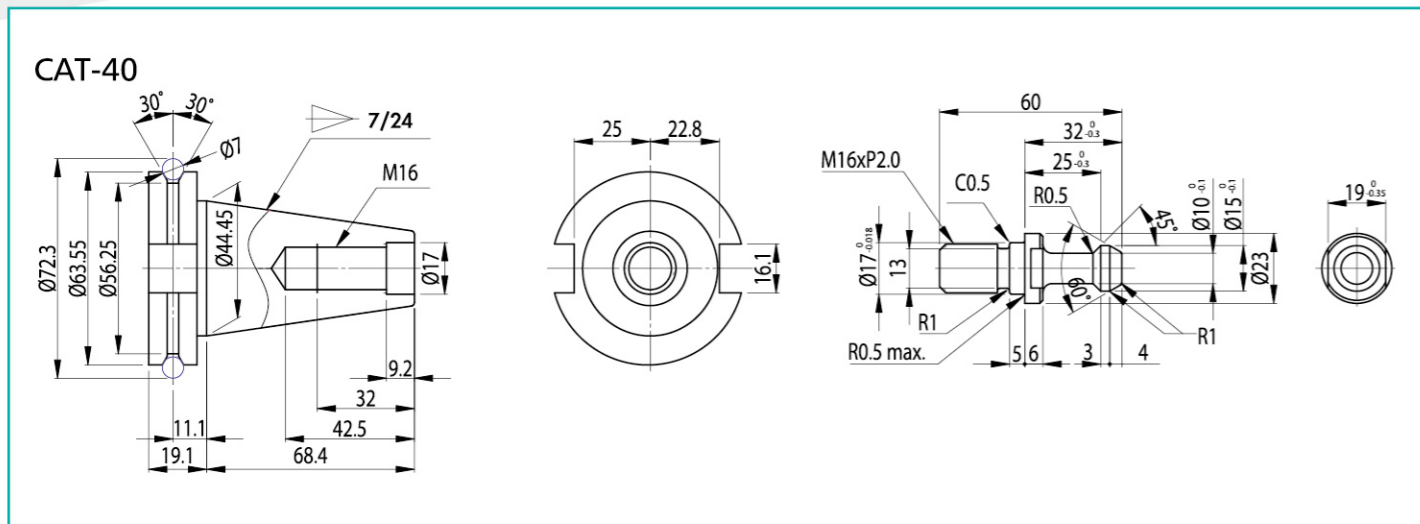
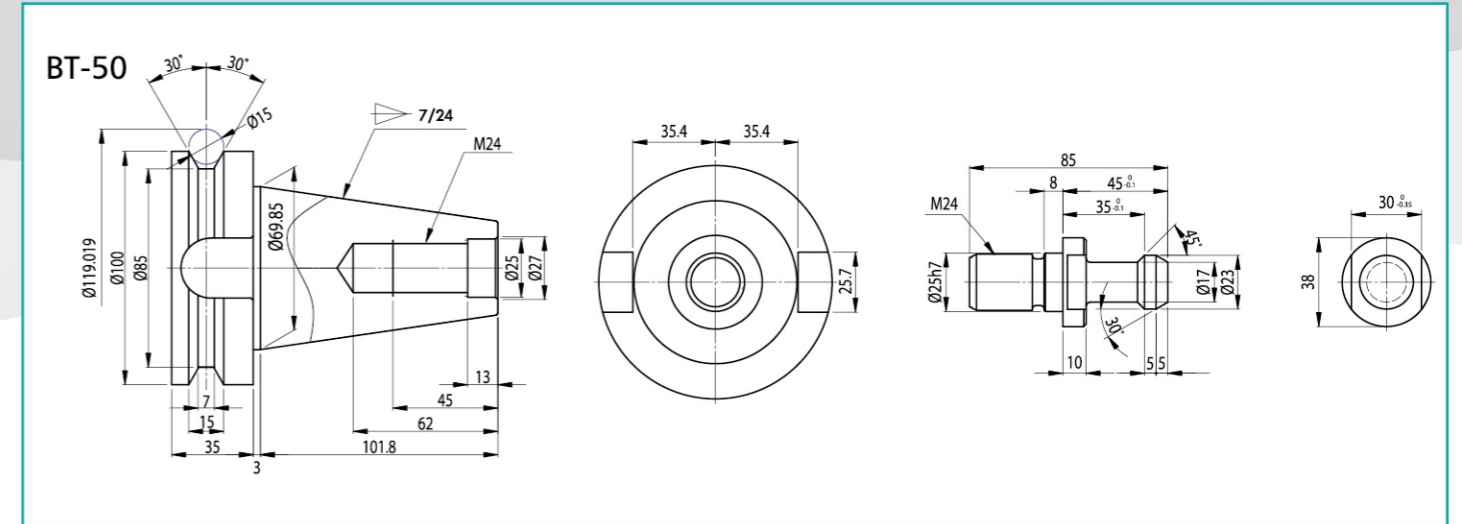




## ■ Tool Shank Dimensions



## ■ Tool Shank Dimensions



# MACHINE SPECIFICATIONS

MODEL	Unit	FVP-800(A)	FVP-1000(A)	FVP-1300(A)	FV-1500A	FV-1600(A)
<b>TRAVEL</b>						
X-axis travel	mm	800	1,020	1,300	1,525	1,600
Y-axis travel	mm	500	500	610	760	800
Z-axis travel	mm	505	505	560	650	800
Table height from floor	mm	100 ~ 605	80 ~ 585	125 ~ 685	150 ~ 800	100 ~ 900
Table center to column surface	mm	510	510	640	810	850
<b>TABLE</b>						
Table dimensions	mm	950 x 425	1,150 x 475	1,420 x 600	1,700 x 750	1,680 x 800
Maximum load	kg	800	800	1,500	1,500	1,000
T-slot (W x No. x pitch)	mm	18mm x 3 x 100mm	18mm x 4 x 100mm	18mm x 5 x 100mm	22 mm x 5 x 125 mm	18 mm x 6 x 125 mm
<b>SPINDLE</b>						
Spindle speed	rpm	10,000	10,000	10,000	6,000	8,000
Spindle taper		7/24 taper No.40	7/24 taper No.40	7/24 taper No.40	7/24 taper No.50	7/24 taper No.40
Dia. of spindle	mm	Ø70	Ø70	Ø70	Ø100	Ø70
Spindle motor	kw	7.5/11	7.5/11	7.5/11	11/15	9/11
<b>FEEDRATE</b>						
X-axis rapid traverse	m/min	32	32	32	15	18
Y-axis traverse	m/min	24	24	24	15	18
Z-axis traverse	m/min	24	24	24	12	15
<b>ATC</b>						
No. of tools		22 (24)	22 (24)	22 (24)	24	22 (24)
Pull stud		P-40T (45°)	P-40T (45°)	P-40T (45°)	P-50T (45°)	P-40T (45°)
Maximum tool weight	kg	8	8	8	15	8
Maximum tool length	mm	250	250	250	350	300
Maximum tool diameter	mm	Ø80	Ø80	Ø80	Ø100	Ø80
Maximum tool diameter (no adjacent)	mm	Ø150	Ø150	Ø150	Ø200	Ø150
Tool changing time (tool to tool)	sec	Arm type 50Hz/2.0sec 60Hz/1.7sec Carrousel 50Hz/7.1sec 60Hz/7.0sec	Arm type 50Hz/2.0sec 60Hz/1.7sec Carrousel 50Hz/7.1sec 60Hz/7.0sec	Arm type 50Hz/2.0sec 60Hz/1.7sec Carrousel 50Hz/7.1sec 60Hz/7.0sec	60Hz /3.5sec	Arm type 50Hz/2.0sec 60Hz/1.7sec Carrousel 50Hz/7.1sec 60Hz/7.0sec
<b>OTHER</b>						
Floor space	mm	2,435 x 2,350	2,800 x 2,350	3,550 x 2,370	3,720 x 3,070	4,300 x 3,050
Machine weight	kg	4,850	4,950	7,100	11,500	11,000
Maximum machine height	mm	2,795	2,795	2,665	3,200	3,190
Power capacity	KVA	25	25	25	25	20
Air source	kgf/cm <sup>2</sup>	6~8	6~8	6~8	6~8	6~8

\* Specification and design characteristics are subject to change without prior notice.

(Controller: Fanuc / Mitsubishi / Siemens / Heidenhain)

## Standard Accessories:

- \* Belt Type Transmission
- \* Rigid Tapping
- \* Spindle Air Blast
- \* Fully Enclosed Splash Guard
- \* Coolant Unit
- \* Pneumatic System
- \* Automatic lubrication System
- \* Load Meter (FANUC only)
- \* Leveling Bolt & Plates
- \* Full set of manuals
- \* Carousel type ATC
- \* 3 Color Alarm Light

## Optional Accessories:

- \* Spindle Speed 12,000rpm(#40)
- \* Spindle Oil Cooler
- \* ZF 2-stage Gear Box  
(For FVP-1300A/FV-1500A/FV-1600A)
- \* Screw Type Chip Conveyor
- \* Chain Type Chip Conveyor & Bucket
- \* Coolant Through Spindle & Filtering System
- \* High pressure Pump
- \* Programmable Coolant Nozzle
- \* 4th-Axis Rotary Table Interface or Package
- \* Auto Tool Length Measurement & Breakage Detection
- \* Arm Type ATC
- \* Heat Exchanger
- \* Chip Flushing System & Coolant Gun
- \* Transformer
- \* Workpiece measurement

## Machine Dimensions and Table Dimensions

