



The Micro Dynamics Tera 40V Vertical Machining Center was designed for the machining of all workpieces small to medium in size. The rigidity and the power of the machine, coupled with its DYPEC® Thermal Compensation, makes the machine one of the most accurate and versatile machining center available for all type of manufacturing facilities from aerospace, to medical, to general job shops. It's the complete machine at a very affordable price.

Machine Main Features

- ✓ Powerful Mitsubishi M830VW CNC Control
- ✓ Heavily ribbed, Meehanite FC300 Cast Iron
- ✓ High Torque Integral Spindle Motor from ATE is rated at 41 HP and delivers 104 Ft-Lbs of torque
- ✓ Integral Motor 15,000 RPM Spindle for high efficiency machining
- ✓ 1.5 Sec Spindle Acceleration to 12,000 rpm
- ✓ Spindle Oil Cooler by Inverter Control for Precise Control
- ✓ DYPEC® Thermal Compensation
- ✓ Large Size 45mm (X) and 55mm (Y, Z) Cross Roller Linear Rails
- ✓ Large Diameter Ballscrews 45mm X, Y and Z axis
- ✓ High Horsepower Servos generating 3,942 lbs Thrust X, Y and 7,548 Lbs in Z
- ✓ High rapid traverse rates of 2,047 X, Y and 1,889 Z
- ✓ SSS Gen 4 High Speed Super Smooth Surface for Mold and Die
- ✓ 8,190 Block Look Ahead
- ✓ 15" Touchscreen display with built in "Operator Convenience" HMI
- ✓ DYCON® on board simple conversational programming
- ✓ Floor Space 142" (including chip Conveyor) x 133" depth

Standard Features

- ✓ 40 Station High Speed Automatic Tool Changer
- ✓ Fully Enclosed Splash Guards
- ✓ Chip Management System with Scraper Type Chip Conveyor and Wash Down
- ✓ Flood Coolant and Tool Tip Air Blow
- ✓ Coolant Thru Spindle Capable
- ✓ 15,000 RPM with 41 HP Integral Spindle capable of achieving 104 FT-Lbs of torque
- ✓ Built in Integrated Automation setup using Ethernet/IP
- ✓ Rigid Tap to 6,000 RPM
- ✓ DYPEC® - Dynamic Predictive Error Compensation
- ✓ 32 GB Of Data Server Memory
- ✓ 2MB Main Memory ** (Capable of running on CF Card 64GB)
- ✓ Multi Axis CRT/Operator Panel for better Ergonomics



TERA 40V SPECIFICATIONS

TRAVEL

X Axis.....	40"
Y Axis.....	28"
Z Axis.....	25"
Spindle Nose to Table Surface	3.93" ~ 28.94"
Spindle Center to Column Front.....	28.86"
Door Open Width for Work Piece.....	42.2"

TABLE

Table Size.....	44.1" x 27.6"
T-Slots (Width x Quantity).....	0.71" x 6 (P=3.94")
Max. Workpiece Size	40" x 28" x 25"
Max. Table Load	3,300 lbs.
Table Height (from the ground).....	35.43"

FEEDRATE

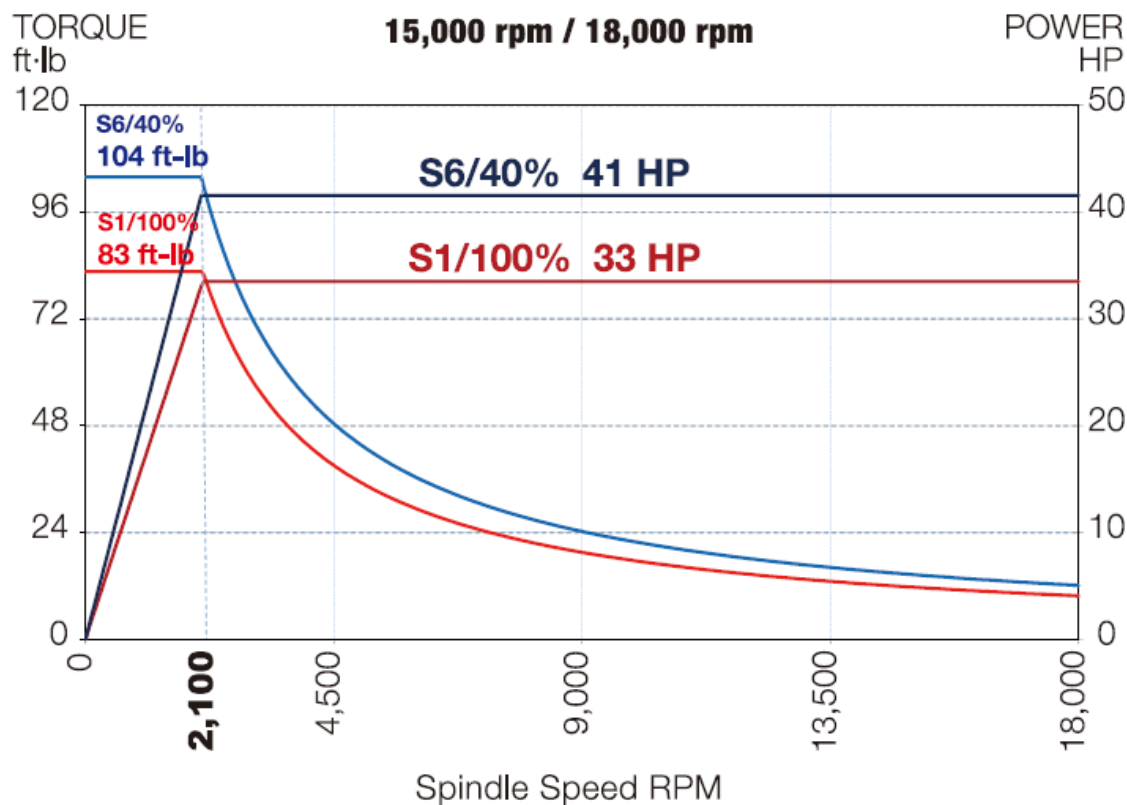
Rapid Feedrate - X Axis.....	2,047 ipm
Rapid Feedrate - Y Axis.....	2,047 ipm
Rapid Feedrate - Z Axis.....	1,889 ipm
Cutting Feedrate	0 ~ 787 ipm
Acceleration Time - X Axis.....	0.98 G
Acceleration Time - Y Axis.....	0.83 G
Acceleration Time - Z Axis.....	0.76 G
Torque - X Axis.....	1,787 lbs
Torque - Y Axis.....	1,787 lbs
Torque - Z Axis.....	2,954 lbs

AXIS INFO

Ball Screw - X Axis.....	Φ1.77" x P0.63"
Ball Screws – Y & Z Axis	Φ1.77" x P0.63"
Linear Guideways - X Axis.....	THK – SRG45LR - 2 Trucks
Linear Guideways - Y Axis.....	THK – SRG55R - 2 Trucks
Linear Guideways - Z Axis.....	THK – SRG55LR - 2 Trucks
X Axis Servo Motor	4.69 HP
Y Axis Servo Motor	4.69 HP
Z Axis Servo Motor	6.03 HP

SPINDLE

Spindle Taper NST No.40 Dual Contact
 I.D. of Spindle Bearing $\Phi 2.76"$
 Spindle Motor Power 41 (2 min.) / 33 HP
 Max. Cutting Torque 104 ft-lbs.
 Spindle Speed 50 ~ 15,000 rpm
 Spindle Acceleration (0 -> Max.) 2.5 sec (15,000 rpm)
 Spindle Deceleration (Max. -> 0) 3.2 sec (15,000 rpm)
 Spindle Driving Mechanism Built-in
 Max. Speed for Rigid Tapping 6,000 rpm
 Clamping Force 2,205 +/- 10% lbs



AUTOMATIC TOOL CHANGER

Magazine Capacity 40 Tools
 Tool Selection Bi-Direction / Random
 Tool Shank Type CT 40 ANSI 5.50 / BT40 JIS6339
 Max. Tool Dia. x Length $\Phi 2.95" \times 9.45"$
 Without Adjacent Tool $\Phi 5.9"$
 Max. Tool Weight 15.4 lbs.
 ATC Cam Box Motor 0.74 HP
 ATC Time (Tool to Tool) 1.9 sec
 ATC Time (Chip to Chip) 3.2 sec



COOLANT SYSTEM

Cutting Coolant Pump Motor	1.48 HP
Base Wash Pump Motor	1 HP
Pump Flow Rate	15.85 gpm
Pump Pressure	29 psi
Coolant Tank Capacity.....	107 gal

POWER & AIR REQUIREMENTS

Power Consumption (220V/3PH)	40 KVA
Main Breaker Capacity.....	125 Amp
Main Power Cable Size.....	22 mm2
Pneumatic Supply	300 (0.6MPa) L/min (ANR)

GENERAL

Foot Print Size (W x D)	119.6" x 108.2"
Machine Height (H)	116.3"
Machine Net Weight.....	16,446 lbs.

ACCURACY (Full Travel ~ Laser Calibrated)

Positioning Accuracy / Full Stroke.....	0.0002" (VDI 3441)
Repeatability Accuracy	0.0001" (VDI 3441)

Accuracy data is based on VDI 3441 standards. Based on a 5 run, Bi-Directional Rapid Program. All test results are based on factory conditions and may vary based on environment and installation foundation at site.

TERA 40V CONSTRUCTION DETAILS

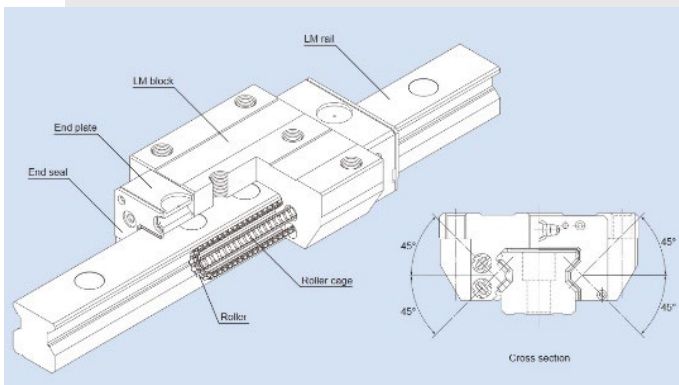
High Speed, High Horsepower Integrated Spindle Design



The heart of the Micro Dynamics machine series is the Spindle design. The integrated spindle and motor combination deliver 41 HP Peak Performance coupled with a high speed 15,000 rpm spindle. The spindle has 106 Ft-Lbs. of torque, making it ideal for machining a wide variety of materials. This spindle design makes it ideal for superior finishes and accuracies required in Aerospace, Medical, Die Mold, and General-Purpose applications.

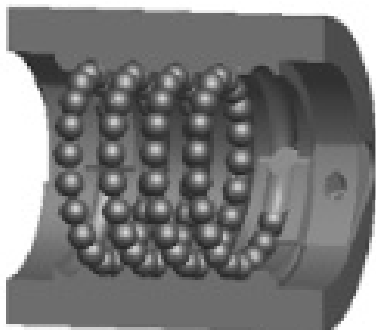
The design of the spindle allows for easy maintenance and inexpensive repairs. The spindle can achieve acceleration up to 12,000 rpm in 1.5 seconds. Dual contact design is a standard feature.

Large THK Guideways



The LM Cross Roller design uses Ultra-High Rigidity guides that allow for high performance machining in difficult applications. Superior performance and stiffness are achieved by using this patented design. The rollers are aligned at a 45-degree angle to achieve rigidity in all directions.

High Speed FSC Ball Nut and Ball Screws



Micro Dynamics machines are designed with the best possible motion control system to achieve shorter cycle times without sacrificing machine longevity. “FSC” type internal recirculating ball nuts are used which allows for faster acceleration and deceleration of each axis. This tubeless machined nut design with tangent ball circulation generates less heat and maintains zero backlash.

DYPEC® – Dynamic Predictive Error Compensation



The exclusive DYPEC® Thermal Compensation System was developed through years of testing and research. With up to eight thermal sensors and proprietary software compensates for the effects of thermal growth that occurs during machine operation. From a “cold” machine start a continuous 48-hour test is performed to collect data and correct for position deviation. This test allows for correction of machine deviation resolution of .1 micron.

Coolant / Air Thru Spindle Ready



As a standard feature each machine is equipped to accept coolant thru the spindle or air through the spindle. All hoses, couplings and fittings are rated for a max of 1,500 psi of coolant pressure. Each machine can also be equipped with a Minimum Oil Machining device for operations that do not allow coolant.

Coolant and Chip Management System



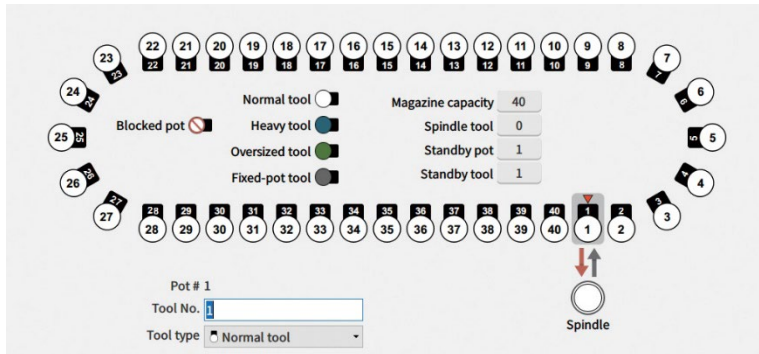
Each Micro Dynamics machine comes standard with a chip management system. The chip management system comes with flood coolant, base wash, dual auger chip conveyors which discharge into a scraper style chip conveyor. The customer can choose conveyor direction to either side of the machine. Production ready machines have the factory option of rear chip discharge to enable a minimal floor footprint.

Oil Chiller



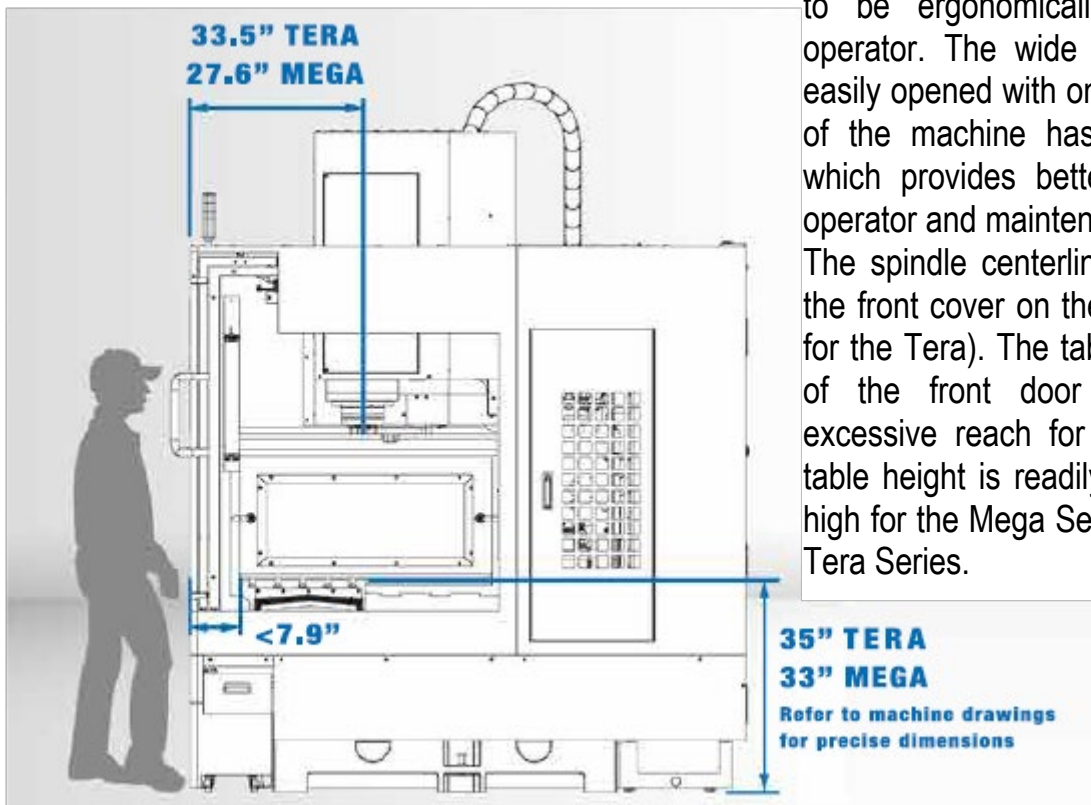
All Micro Dynamics machines are equipped with an oil chiller unit as standard. The oil chiller increases the longevity of the spindle bearings and works in conjunction with the DYPEC® system to maintain positional accuracy.

Tool Magazine Monitor



The standard Tool Magazine Monitoring System allows the operator to quickly see where the tools are in the Magazine. Standard features included with this system are Oversize, Normal, or Heavy tool. This allows the operator to have options in selecting Oversize or Heavy tool locations in the ATC magazine.

Ergonomics



Micro Dynamics machines are designed to be ergonomically friendly to the operator. The wide front door can be easily opened with one hand. The inside of the machine has extra illumination which provides better visibility for the operator and maintenance personnel. The spindle centerline is only 28" from the front cover on the Mega Series (33" for the Tera). The table comes within 8" of the front door which eliminates excessive reach for the operator. The table height is readily accessible at 33" high for the Mega Series and 35" for the Tera Series.

Powerful Mitsubishi 830VW CNC Controller

Micro Dynamics machines are equipped with the Mitsubishi 830VW CNC Control which is the latest in Mitsubishi's line up of advanced CNC technology.



The M830VW series control is powered by Mitsubishi's exclusive processor that has a block look ahead capability of 8,190 blocks. Matched with the new high responsive servo motors, the motion control responsiveness is unmatched in the industry.

The control comes with SSS 4G Super Smooth Surface which reduces machine vibration during high speed cutting and optimizes the acceleration times for each axis. This allows for shorter cycle times with a much higher degree of accuracy and optimal surface finish.

The 15" Intuitive touch screen allows for easy operation by both experienced and novice operators. The touch screen allows navigation similar to many smart phones and tablets. The M830VW Control is fully loaded with advanced options included at no additional cost.

- 15" Touch Screen Display
- High Speed High Accuracy Mode G5P20000
- 8,190 Block Look Ahead
- 540m/min Feed with 1mm/block, 9,000 blocks/secs
- 32GB Data Server (Can be used as Main Memory*)
- 2 MB of Resident Main Memory
- 64 Bit Mitsubishi Micro Processor
- 1,000 Program Storage
- 300 Sets Work Offsets
- 999 Tool Offsets
- 400 Tool Life Management
- 700 Macro Variables
- Main and Sub programs single file execution
- USB, RS232C Input/output
- Ethernet Data Input/output
- On Board Navi Mill Conversational Programming
- SSS 4th Generation Super Smooth Surface
- Helical Interpolation
- Nurbs Interpolation
- Cylindrical Interpolation
- Involute Interpolation
- Spline Interpolation2
- Scaling
- Tolerance Control
- Spiral Conical Interpolation
- Tool Center Point Control
- 3D Tool Radius Compensation
- Work piece Offset for Rotary Axis
- Inverse Time Feed
- Polar Coordinate Command
- Ethernet/IP Field Network Ability
- Programmable in Position check

On Board HMI

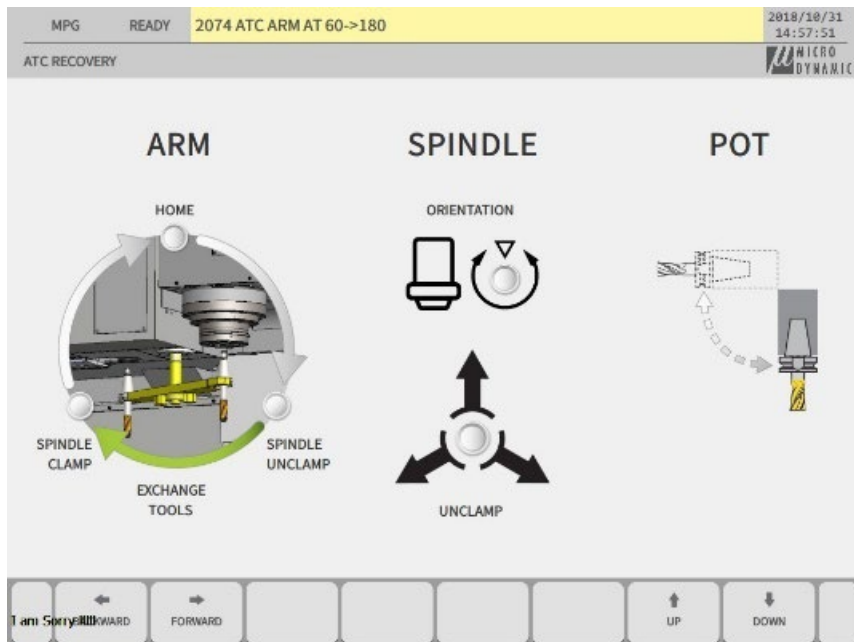


The onboard HMI developed by Micro Dynamics has many enhanced capabilities which simplify procedures. These enhancements reduce setup time and increase productivity.

The HMI also has enhanced maintenance functions that allow for maintenance procedures to be performed more easily

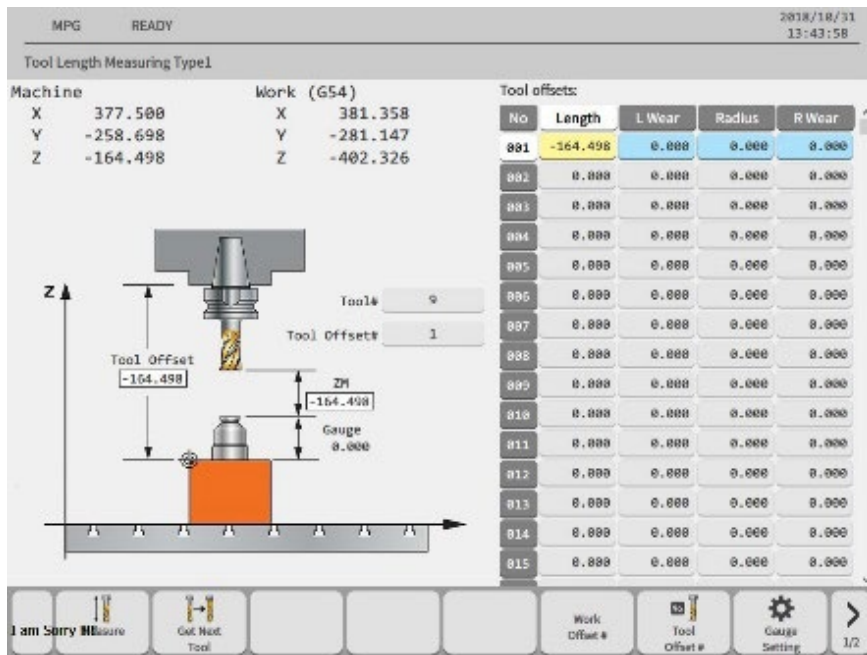
The onboard HMI is driven by a powerful PC computer that works with the CNC Controller and the built in Ethernet/IP system. Automation and remote machine monitoring can easily be interfaced using the built in Ethernet/IP system.

ATC Recovery



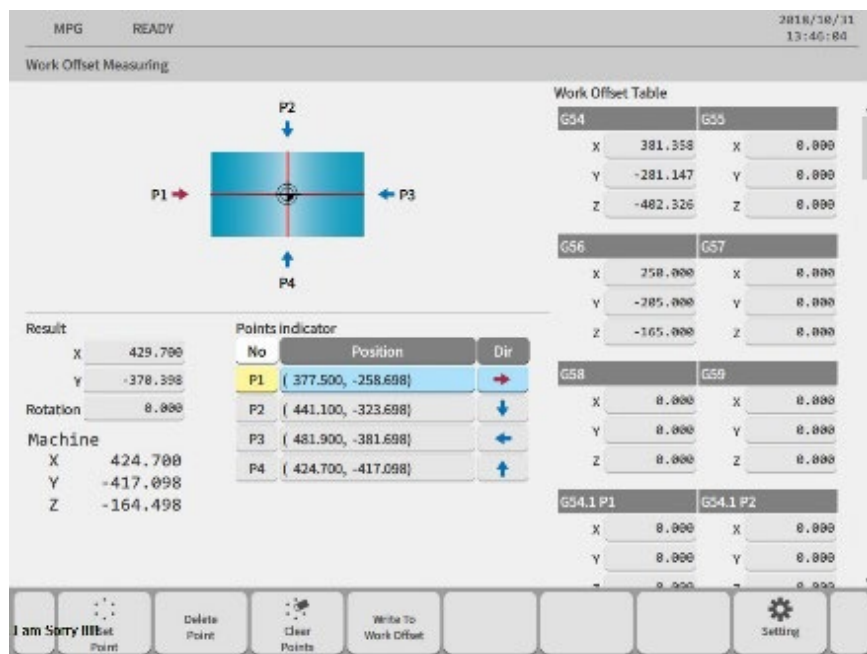
The Micro Dynamics HMI also features easy to use ATC recovery software. The ATC recovery screen shows the position of the ATC arm and has step by step instructions to recover from any malfunction.

Tool Setting



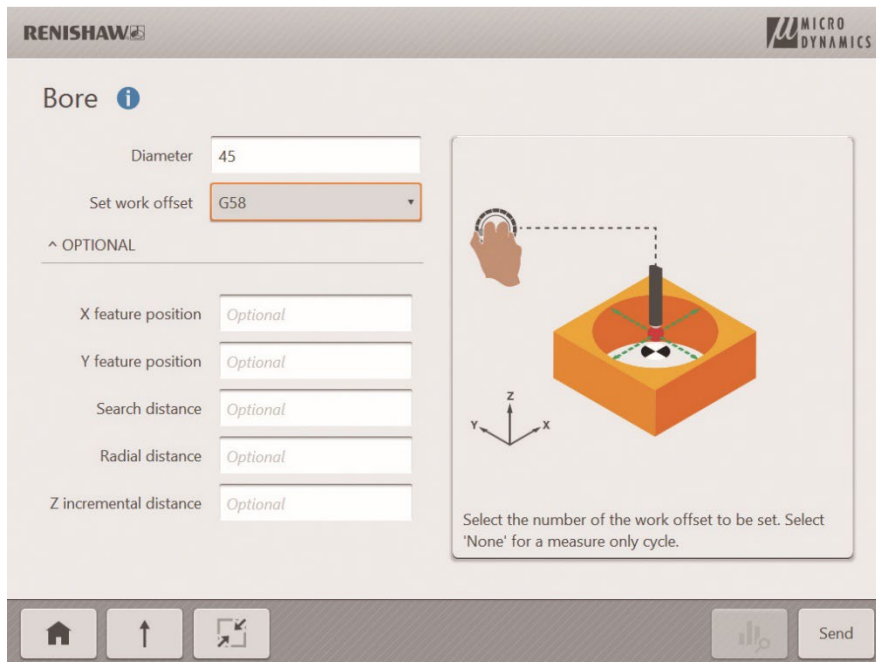
Setting tool offsets has also been simplified using the Micro Dynamics HMI. Machine operators and setup personnel can easily follow the on-screen instructions which greatly reduces the number of steps used on the previous generation of machines.

Workpiece Offset Measurement



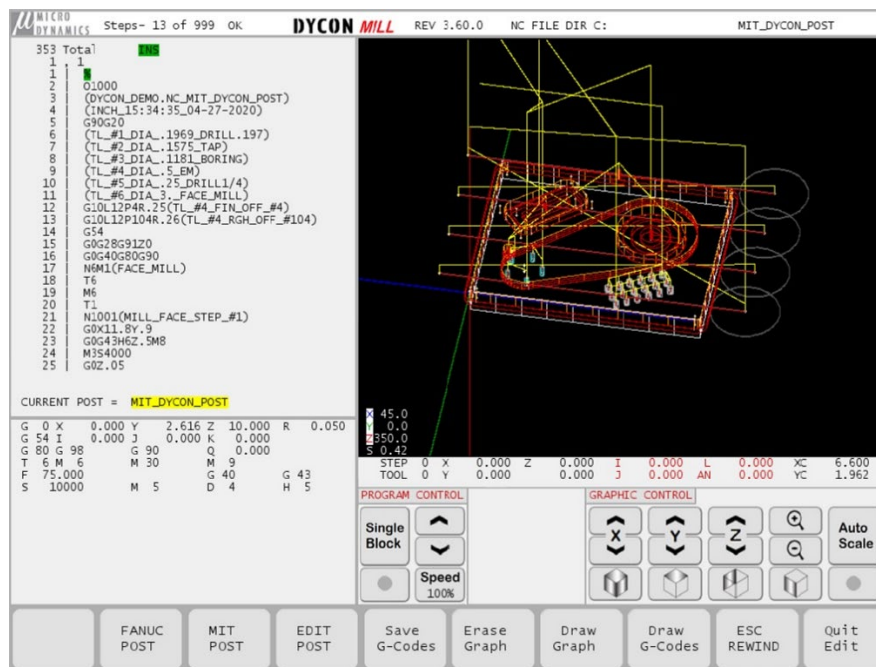
Setting work coordinate offsets has also been made easier with the Micro Dynamics HMI. The operator follows the on-screen instructions to quickly find and enter work offsets. There are many choices available to use based upon the part shape and part zero coordinates.

Renishaw Setup and Inspect



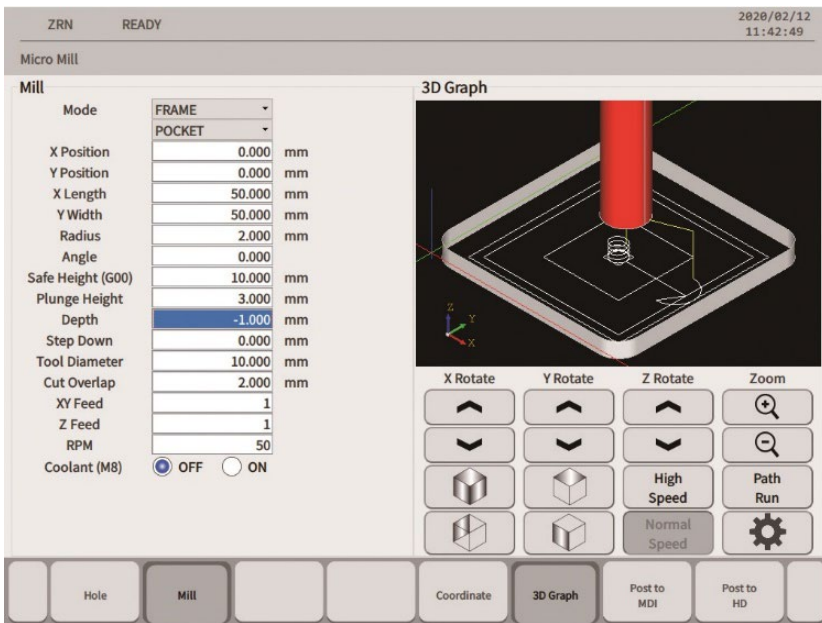
The Renishaw Set Up and Inspect GUI Interface is a standard feature on Micro Dynamics machines. Set Up and Inspect allows operators to quickly calibrate probes, set work offsets and generate part inspection routines. Renishaw part probes are an optional accessory.

DYCON® Dynamic Conversational Programming



DYCON® Conversational Programming System was developed and refined over the last 30 years. DYCON® quickly and easily produces NC code following simple and intuitive steps. DYCON® also can be installed on a desktop or laptop for easy offline programming.

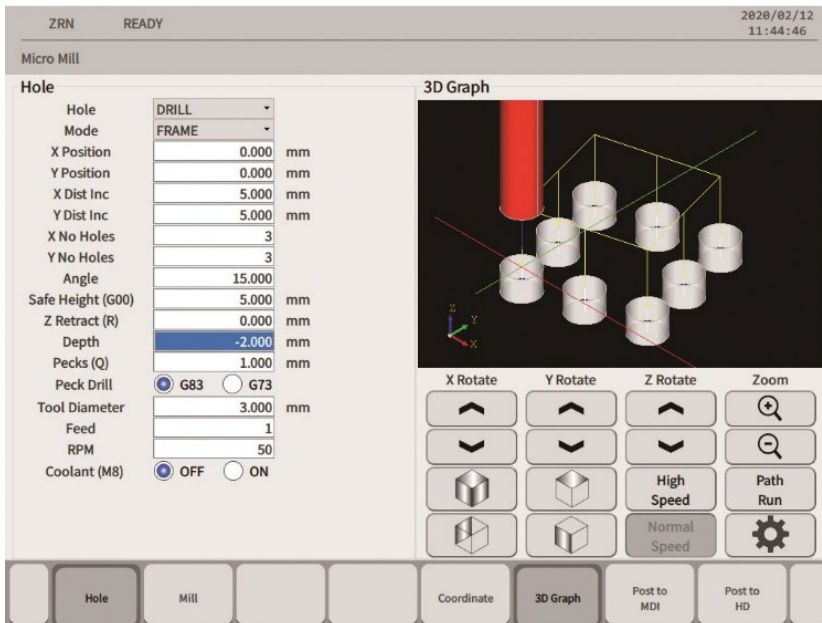
Micro Mill



Micro Mill is an interface that allows any operator to easily perform milling and drilling operations without using G-code.

The intuitive interface allows quick programming of a variety of features simply and quickly.

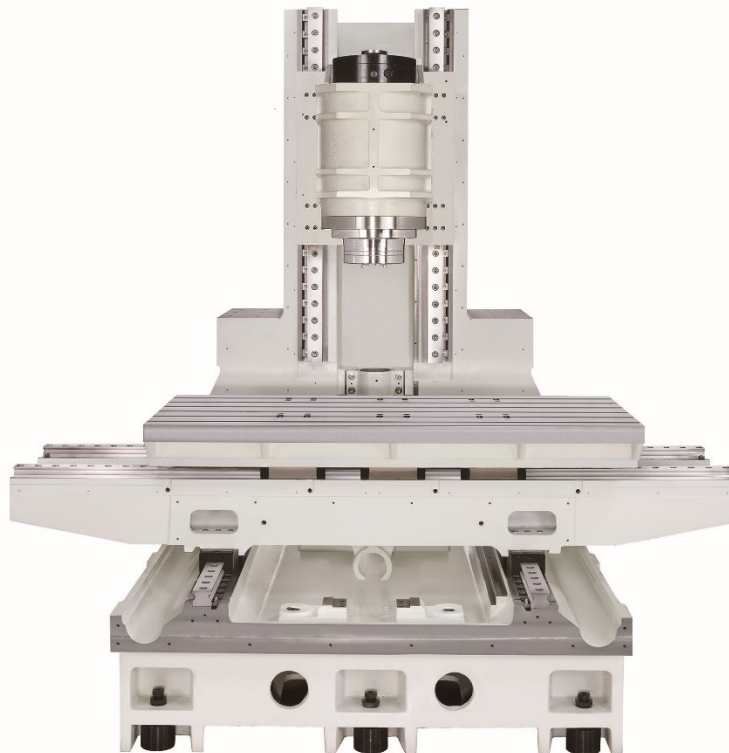
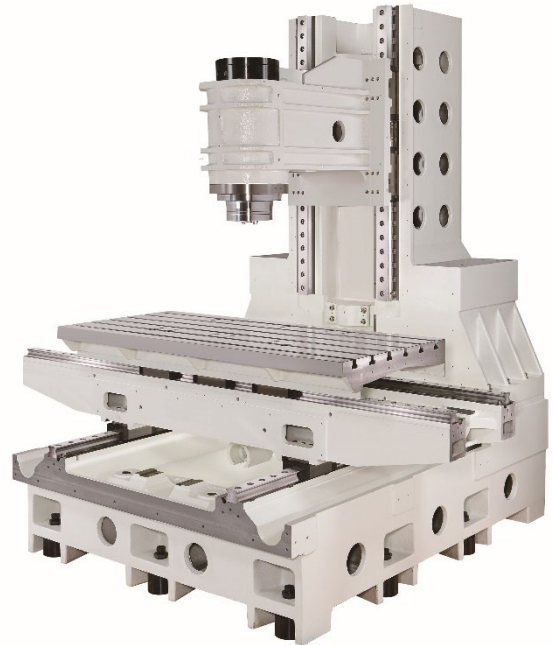
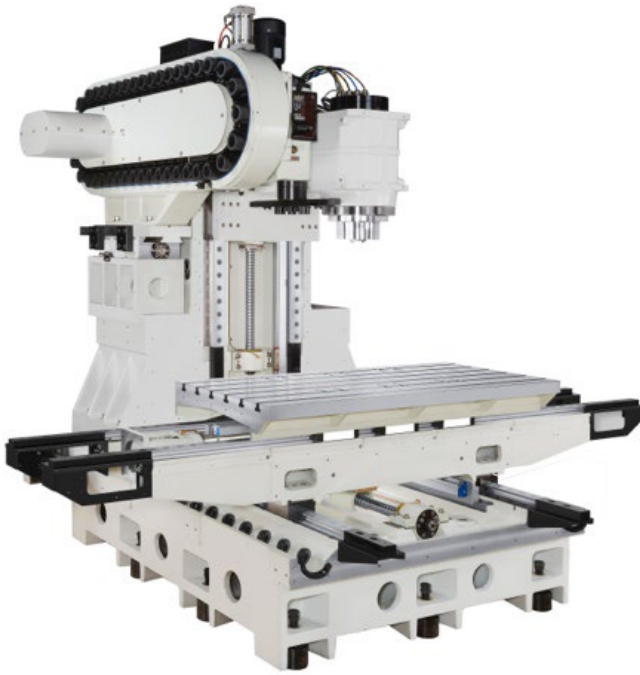
The Micro Mill, after inputting the data, will then back plot the tool path and convert to G – code.



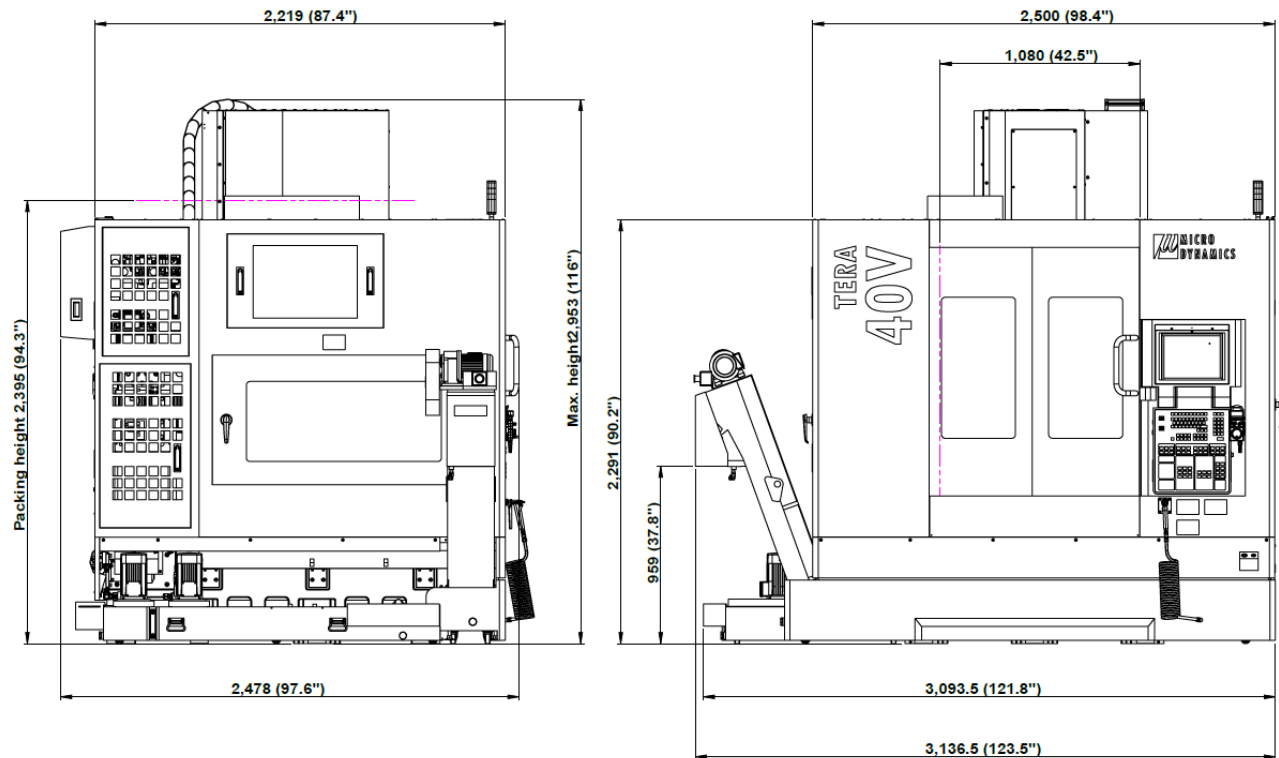
Once converted to G – code, it will then transfer it to “MDI” so that the operator can run it.

Going further, with the power of the controller, you can easily “cut and paste” the G – code from MDI and create a program in regular memory, combining all the features into one program.

Structure



Layout



Floor Layout

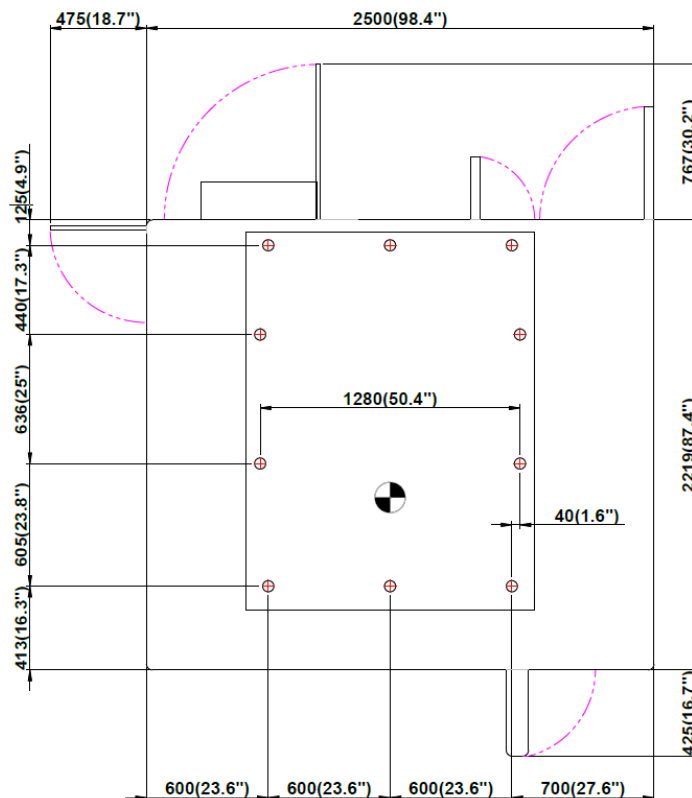
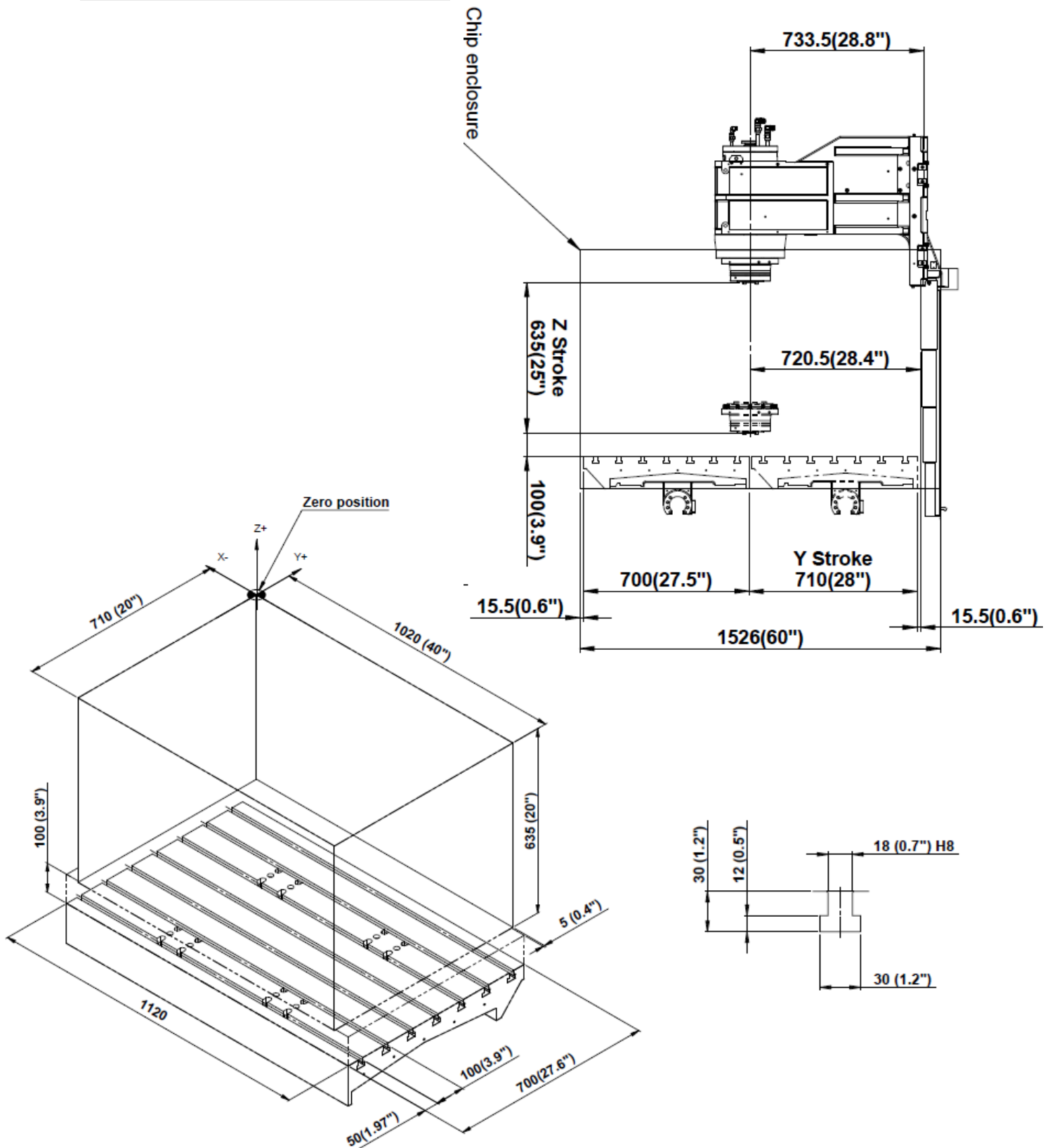
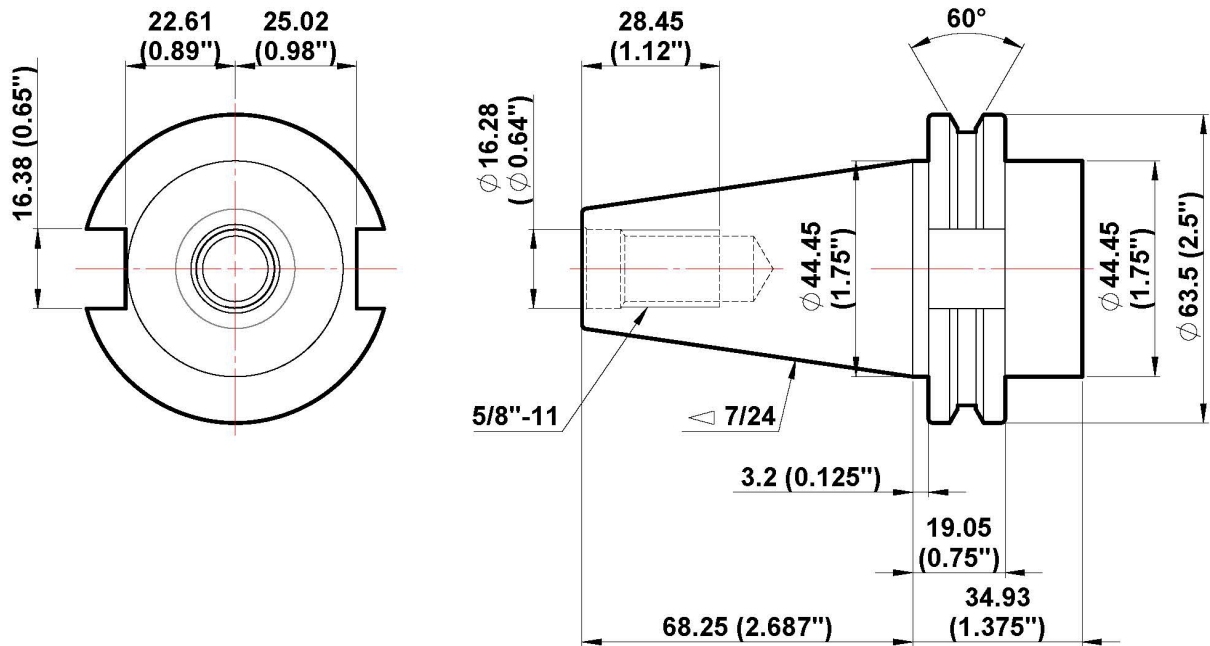


Table and Travel



CT40



Pull Stud CT40

