

MDV-Series

3-Axis Vertical Machining Centers for Production

Featuring High Speed and Precision + Conversational DXF + Standard G-Code



MDV Production Machining Centers

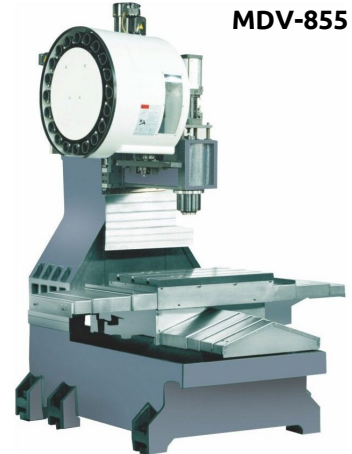
The MDV series machines are **versatile machining centers** designed for **all-purpose milling**. It is well-suited for production machining of prototypes, molds and bases, automobile, aerospace, medical, and other precision parts manufacturing. It features a rigid C-frame design with an extra wide base and enlarged roller-type rails, driven by direct-coupled Yaskawa digital drives and motors.

Standard Features:

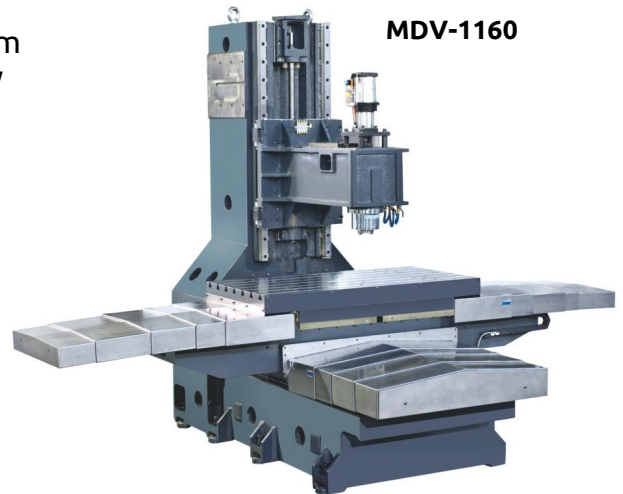
- Rigid high-precision design with wide **C-Frame base**, **A-Frame Column**, and large **40 mm Rails**.
- **36m/min Rapid Speeds** using latest **Yaskawa Digital Drives and Motors**.
- **24-Tool Arm Type Automatic Tool Changer**.
- High accuracy Taiwan **HIWIN Linear Roller Ways** and **PMI Ball Screws**.
- **CAT40 or BT40, 8000 RPM belt-driven spindle**, with **12K RPM direct-drive spindle** and **Coolant-Thru-Spindle** options.
- **Laser pitch error compensation** ensures 6um positioning accuracy and 3 um repeatability across work envelope.

Options:

- Chip Conveyor
- Oil Mist Collector
- 4th Axis Rotary Table
- Spindle Probe & Tool Setters
- CE/UKCA/UL Electrical and Safety



MDV-855



MDV-1160

Control Features

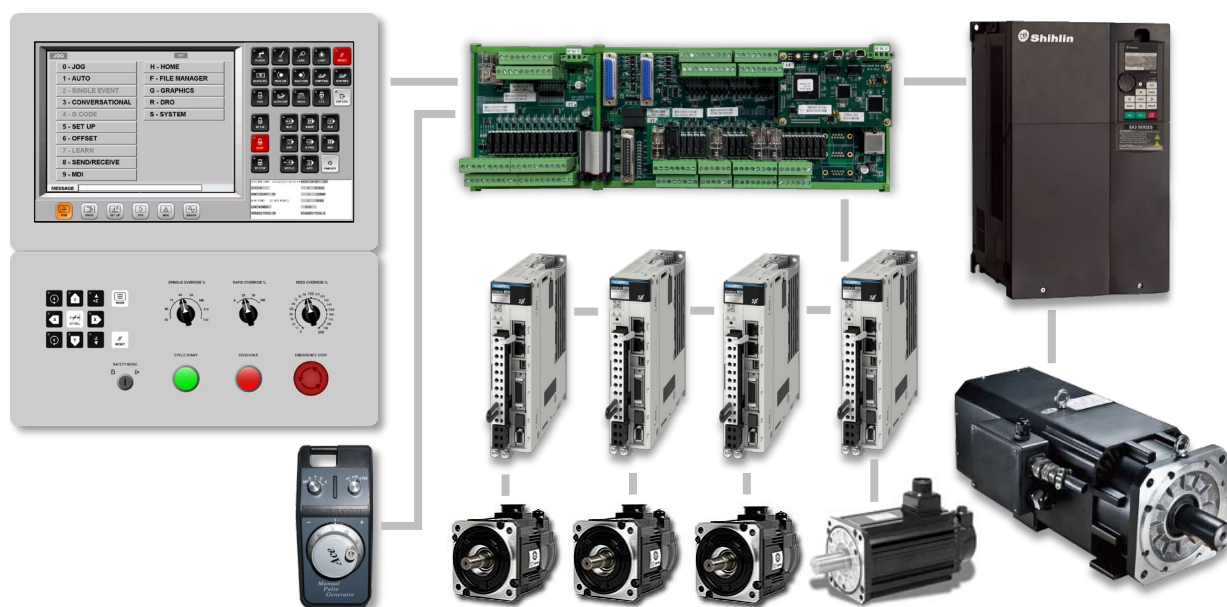


The **DynaPath WinDelta** control system is a powerful and versatile control featuring **standard JOG/MPG/MEM/MDI/EDIT modes** and a large LCD touchscreen for simple operation. Its **Advanced Motion Control** is equipped with **dynamic look-ahead** for accurate and smooth machining. The control is fully **Standard G-Code compatible** and can be programmed with its built-in **Conversational + DXF Editor**, or by transferring G-Code programs from the network or USB drive with no limit on file size. The control is also capable of **Networked File Management** and **Remote Diagnostics and Support**.

DynaPath WinDelta Control System

The WinDelta Control system is a PC-based, fully closed loop CNC control solution featuring advanced motion control, built-in software PLC, and a Windows-based HMI. The WinDelta CNC is designed for high-speed and high-precision machining, quick set up, easy programming, and universal compatibility, featuring:

- **Industrial Touchscreen LCD** interface for intuitive operation,
- **Advanced motion control** for high speed, high precision machining,
- **Conversational DXF Programming** with touch-based **CAD Editing** and **Import**,
- **Networked part program management**,
- **Remote diagnostics and support**,
- **Standard G/M-Code** for universal compatibility, with **G-Code Macro Programming**.

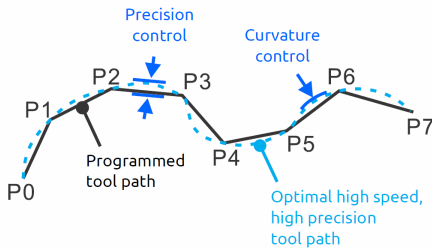


CNC Hardware Specifications

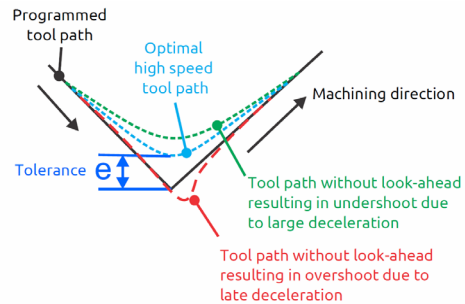
Control	• DynaPath WinDelta
Memory	• 4 GB DDR3
Storage	• 16 GB SSD
Ports	• RS232, RS422/RS485
	• RJ45 Network Port
	• 2x USB
Display	• 10.4", 12.1", 15.6", 17", 19"
	• Industrial Touchscreen LCD
	• >500 cd/m ² Luminance
Operating Panel	• MDI 1 st Panel
	• Operator's 2 nd Panel
	• USB Keyboard + Mouse/Trackpad

Handwheel	• Remote Jog Unit (MPG)
	• 2x Electronic Handwheels (*Option)
Axis Control	• EtherCAT or Yaskawa M-III Digital I/F
	• Max Simultaneous 4-Axis Milling
	• Dynamic 10,000-Block Look Ahead
	• 1ms Servo Update Rate
Standard I/O	• 32 DI/20 DO, 2DA/ENC/Pulse, 1 MPG
Expansion I/O	• 8 DI/18 DO
Power Input	• 24 VDC 6 A

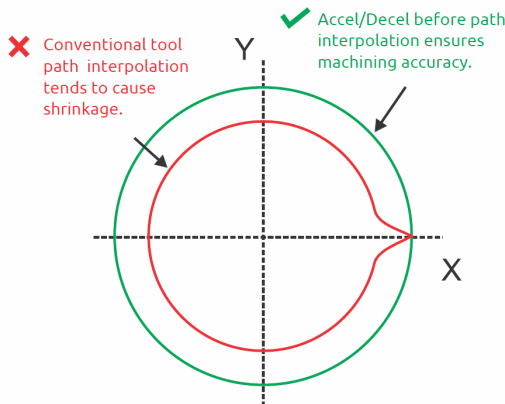
Path Smoothing algorithms provide precision control and curvature control. The result is the optimal tool path for speed and precision.



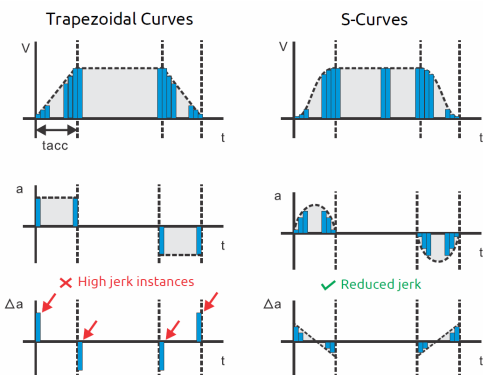
Look Ahead anticipates upcoming programmed motion commands and plans the optimal trajectory dynamically in real time.



Smart Interpolation ensures machining accuracy by performing acceleration and deceleration before path interpolation.

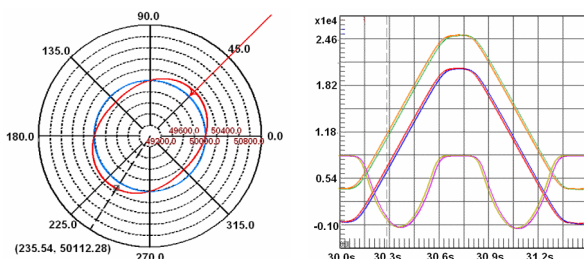


Jerk Reduction is performed by using trapezoidal or S-curve acceleration and deceleration, allowing smoother motion, higher machining speeds, and helps protect against machine wear.



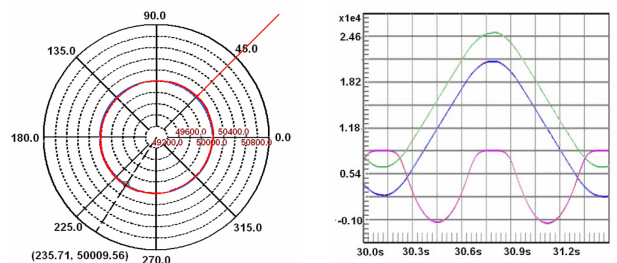
Without Feed Forward and Friction Compensation

XY and Z axes motion accuracy is prone to in correctable position errors, as demonstrated in the following plots on a circular tool path of 28.3mm diameter, at 8 m/min feed rate. In this case the final trajectory has a maximum position error exceeding 20 μm and more than 6 μm reversal spikes are presented.



With Feed Forward and Friction Compensation

XY and Z axes motion accuracy is greatly increased, as demonstrated in the following plots on a circular tool path of 28.3 mm diameter, at 8 m/min feed rate. The final trajectory has a maximum position error within 5 μm and the reversal spikes are less than 2 μm .



Quick Set Up + Conversational DXF Programming + G-Code

QUICK, EASY, AND ACCURATE SETUP

Automatic tool setter and spindle probe options enable quick and accurate setting up of parts. **Special Center Finding** and **Tool Setting** screens are easy to use and efficient, so you spend less time setting up and more time cutting.

CONVERSATIONAL DXF PROGRAMMING

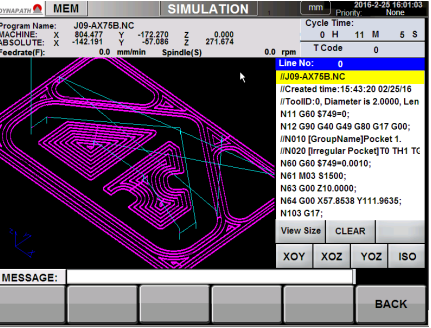
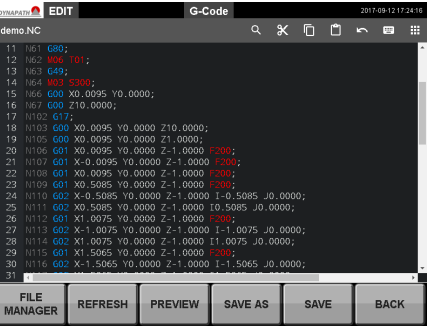
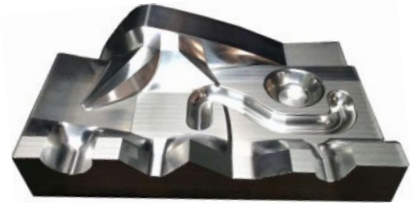
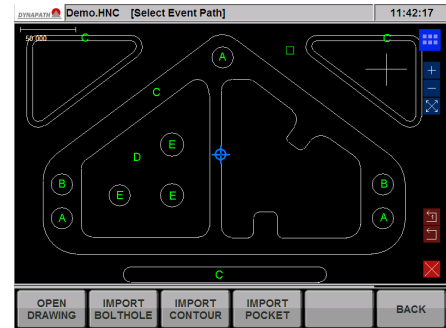
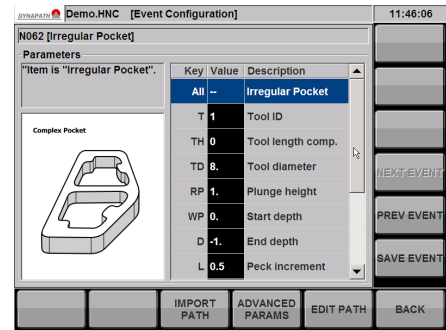
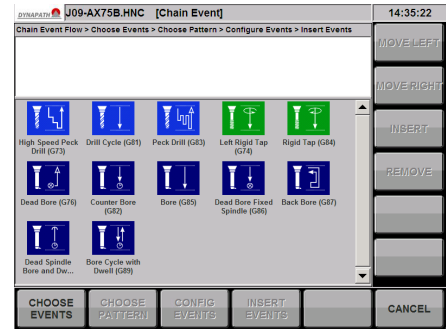
For general parts and jobs, the **Conversational Editor with DXF Import** enables any operator to **open and edit CAD drawings** then import geometry as **Conversational Events** to generate part programs without writing G-Code.

STANDARD G-CODE

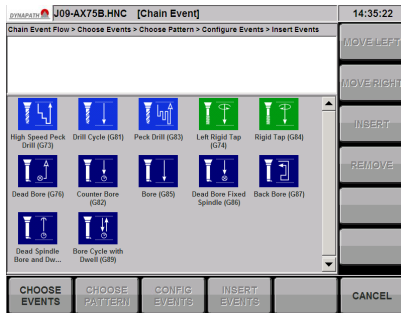
For CAD/CAM users, simply post-process to standard **ISO/EIA G-Code**, then send the program via **USB or networked file transfer** to the control. Advanced **G-Code Macro Programming** is also fully supported.



JOG									
WORK OFFSET									
	G54 (REF A)	G55 (REF B)	G56 (REF C)	G57 (REF D)	G58 (REF E)	G59 (REF F)			
X	266.923	550.000	295.159	295.159	295.159	295.159	X AXIS		
Y	-233.813	-320.000	-129.728	-129.728	-129.728	-129.728	Y AXIS		
Z	-133.120	-500.000	-65.044	-65.044	-65.044	-65.044	Z AXIS		
4th	0.000	0.000	0.000	0.000	0.000	0.000			
EXOPS									
X	0.000	358.058	358.058	91.135					
Y	0.000	-191.830	-191.830	41.983					
Z	0.000	-33.451	-33.451	99.669					
4th	0.000								
MACHINE									
SPINDLE (S)	0.0	rpm							
FEED RATE:	0.0	mm/min							
SPINDLE LOAD:	0.0	%							
G54	0.000	Enter							
MESSAGE:									
JOG	MPG	TOOL TABLE	ATC TABLE	ALIGN	BACK				

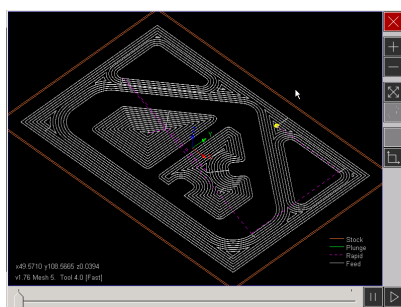
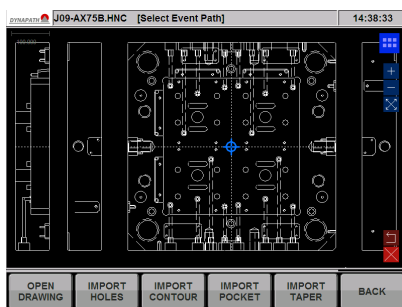
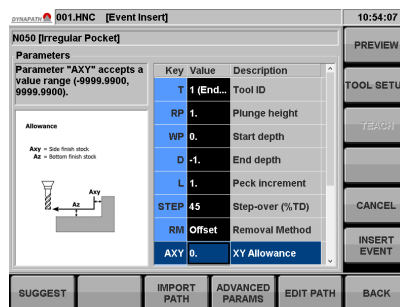
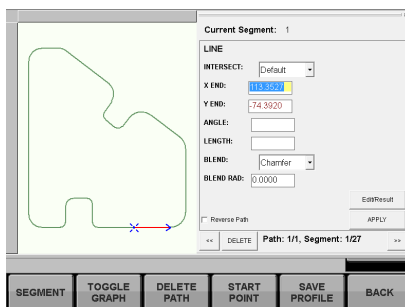


Conversational Programming + DXF Import + G-Code Editing



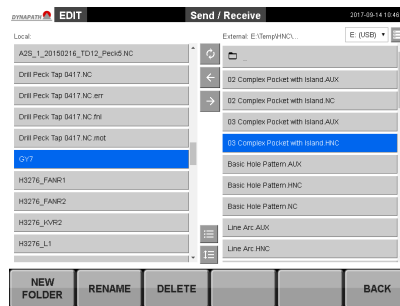
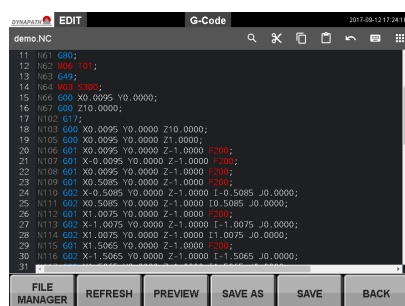
Built-in Events include standard drill, bore, tap, contour, pocket, helix, pattern, setup, and auxiliary events.

Conversational Graphics
convey detailed information
about event parameters
using graphical illustrations
to assist with data entry.

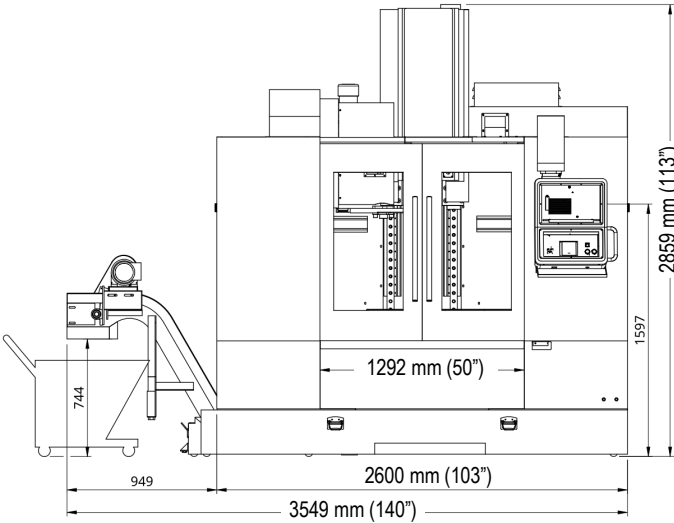
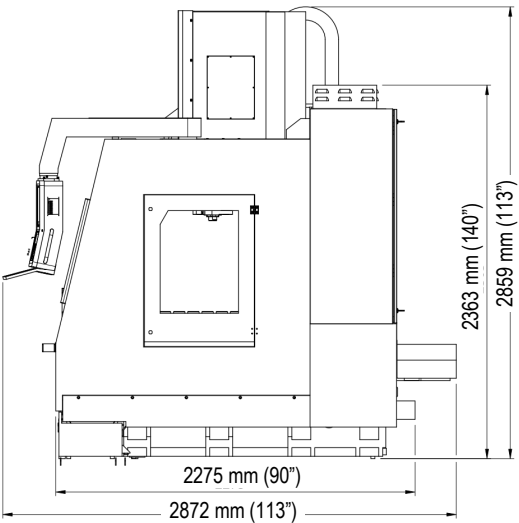
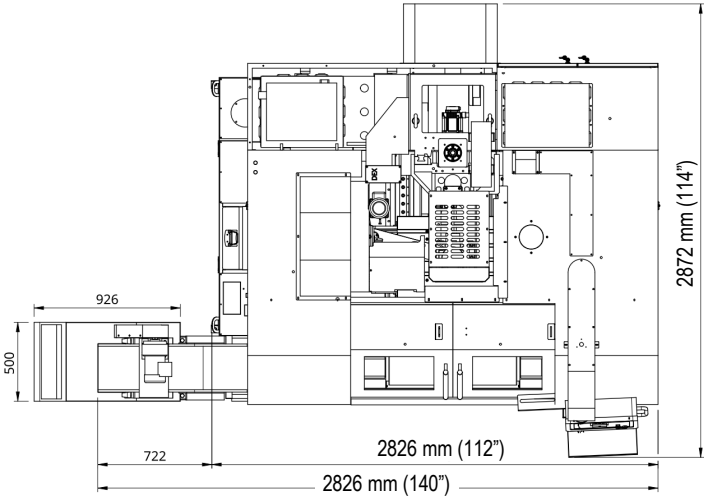
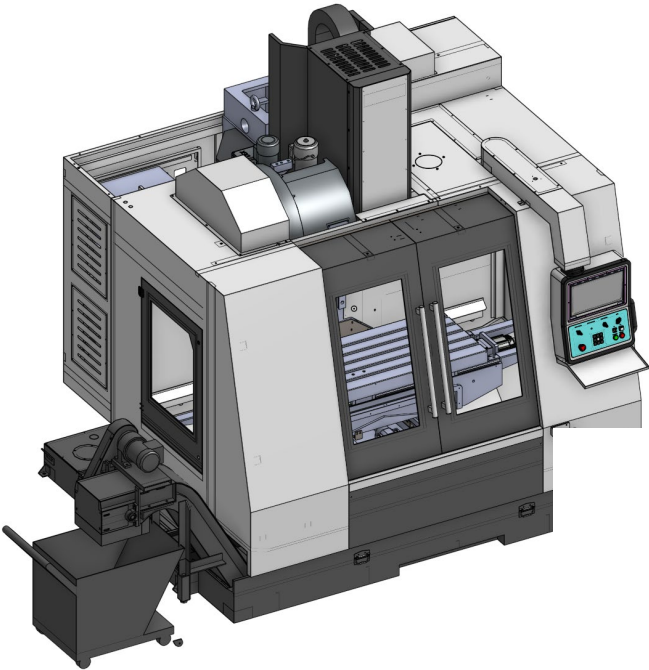


Preview Simulation allows visual inspection of generated tool paths and final dimensions.

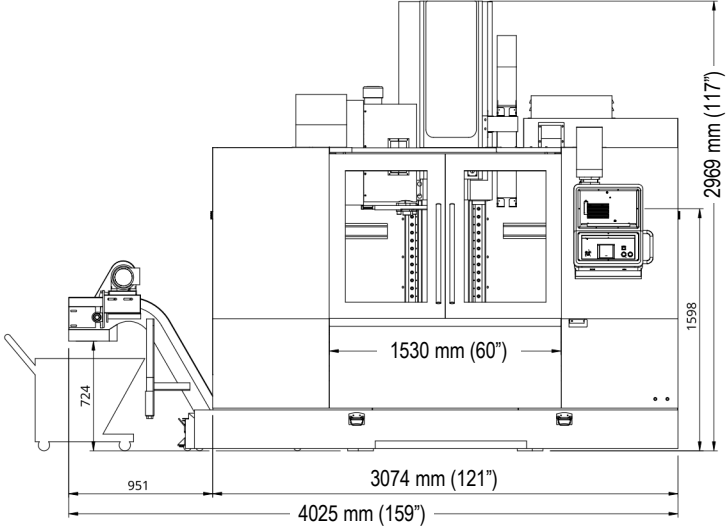
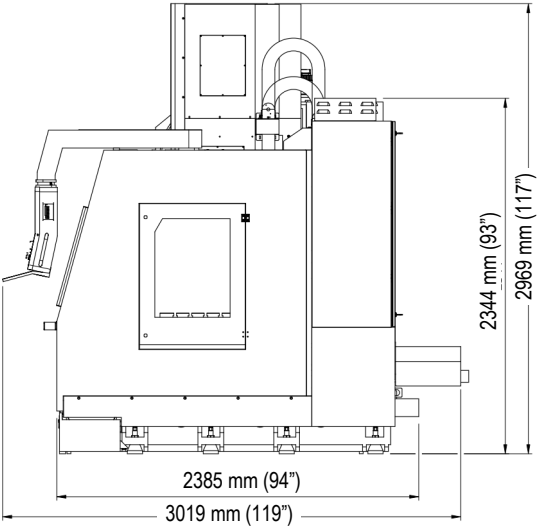
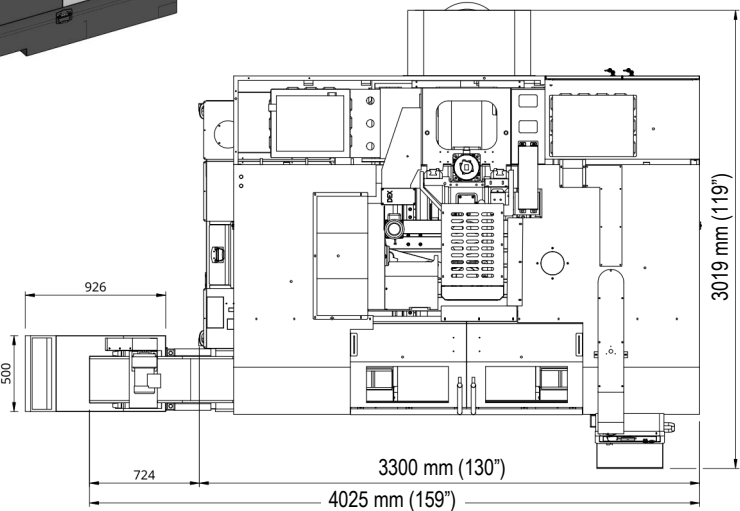
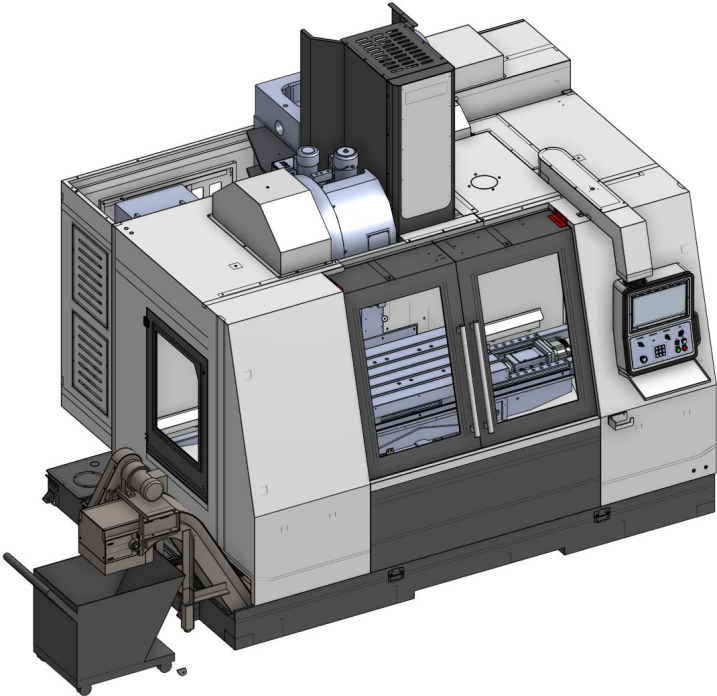
File Manager and Server allows USB file transfer and Networked FTP file management of all part programs and drawings on the control.



MDV-855L Dimensions



MDV-1160L Dimensions



MDV SPECIFICATIONS			
SPECIFICATION		MDV-855L	MDV-1160L
AXES	XYZ TRAVEL	800 x 550 x 550 mm (31.5" x 21.65" x 21.65")	1100 x 600 x 600 mm (43.31" x 23.62" x 23.62")
	AXES TYPE X/Y/Z	Linear Rails + Roller	Linear Rails + Roller
	SPINDLE NOSE TO TABLE	120 - 670 mm (4.72-26.38")	120 - 720 mm (4.72-28.35")
	TOOL TO COLUMN	590 mm (12.23")	650 mm (25.59")
	MOTORS X/Y/Z	1.8 / 1.8 / 2.9 kW Direct Drive	2.9 / 2.9 / 4.4 kW Direct Drive
	MAX TORQUE X/Y/Z THRUST	28.7 / 28.7 / 54 Nm 10707 N (2407 lbf)	54 / 54 / 71.6 Nm 26860 N (6038 lbf)
SPINDLE	DIAMETER	150 mm (5.91")	150 mm (5.91")
	TAPER	BT40 / CAT40	BT40 / CAT40
	BASE SPINDLE	8000 RPM Belt-Drive 7.5 kW (10 HP) Rated S1 Air Cooled	8000 RPM Belt-Drive 11 kW (15 HP) Rated S1 Air Cooled
	OPTIONAL SPINDLE	12000 RPM Direct-Drive 11 kW (15 HP) Rated S1 Spindle Chiller Oil Cooled Coolant Thru Spindle Option	12000 RPM Direct-Drive 15 kW (20 HP) Rated S1 Spindle Chiller Oil Cooled Coolant Thru Spindle Option
ATC	TOOL CHANGER	24-Tool Arm Type	24-Tool Arm Type
	MAX TOOL SPECS	Ø80 mm (Ø3.15") Diameter 200 mm (11.81") Length 8 kg (17 lbs) Weight	Ø80 mm (Ø3.15") Diameter 200 mm (11.81") Length 8 kg (17 lbs) Weight
MOTION	MAX RAPID SPEED X/Y/Z	36 m/min (1417 IPM)	36 m/min (1417 IPM)
	MAX CUTTING FEED X/Y/Z	24 m/min (945 IPM)	24 m/min (945 IPM)
	POSITIONING ACCURACY	0.006 mm (0.00024")	0.006 mm (0.00024")
	REPEAT ACCURACY	0.003 mm (0.00012")	0.003 mm (0.00012")
TABLE	TABLE SIZE	1000 x 550 mm (39.37"x 21.65")	1200 x 600 mm (47.24"x 23.62")
	SLOTS x OFFSET x WIDTH	5 x 90 mm x 18 mm (5 x 3.54" x 0.7)	5 x 100 mm x 18 mm (5 x 3.94" x 0.7)
	MAX TABLE LOAD	500kg (1100 lbs)	800kg (1760 lbs)
INSTALL	FLOOR SPACE W x L x H	2830 x 2875 x 2860 mm (112" x 114" x 113")	3300 x 3020 x 2970 mm (130" x 119" x 117")
	SHIPPING / MACHINE WEIGHTS	5800 kg (12760 lbs)	7000 kg (15400 lbs)
	COOLANT CAPACITY	250 L (65 gal)	350 L (90 gal)
	AIR REQUIREMENTS	6 kg/cm ² (90 psi), 200 L/min (7 CFM)	6 kg/cm ² (90 psi), 200 L/min (7 CFM)
	POWER REQUIREMENTS	20 kVA, 3 Phase, 220 V, 50 A Max	25 kVA, 3 Phase, 220 V, 60 A Max
CONTROL SPECIFICATIONS		MACHINE FEATURES	ADDITIONAL OPTIONS
• 15.6" Touchscreen LCD Display • 16 GB Program Storage • 2 USB, 1 LAN Ports • 4-Axis Synchronous Capable • MPG Offset and MPG Run • DRO + Semi-Auto Operation • Standard ISO G-Code + Macro Programming • Conversational Programming • DXF CAD Drawing + Import via Touch • File Send / Receive thru LAN / USB • FTP Networked File Server • Remote Diagnosis & Support • Remote Monitoring and Reporting • Dynamic 10,000 Block Look Ahead • Program Retrace, MPG Run		• 24-Tool Arm Type Tool Changer • Peck Rigid Tapping + Thread Milling • C3 Class Precision Ball Screws • Auto Lubrication System • Full Enclosure • Flood Coolant System & Chip Recovery Tray • Washdown and Hose Gun • LED Work Lights • Tri-color Light Post • Tools and Toolbox • One Year Warranty on All Parts	• 12,000 RPM Direct Drive Spindle with Coolant Through Spindle (CTS) • 4th Axis Rotary Table • Tool Setter System • Spindle Probe System • Chip Conveyor System • Oil Mist Collection System • CE / UKCA Safety and Electrical



MACH

MACHINE TOOLS

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