Vertical Machining Centers

VECTOR 650 M SI

SKU : 181430

The Vector series is the compact all-in-one machining solution, designed and preconfigured for complex manufacturing challenges. The machines are designed using the latest FEM analysis software. The production takes place under strict quality control in order to guarantee perfect execution. Both the tried and tested Meehanite cast and the delta construction of the column ensure additional stability of the machine frame. The consistently high-quality components guarantee smooth operation during multiple shifts.

- Available with Siemens or Heidenhain controller
- Extra-wide Y-shaped Meehanite column for maximum stability
- 30-bar CTS to ensure optimum machining quality
- Designed for multi-shift operation
- Many customization and automation possibilities

TECHNICAL SPECS

WORKING AREA

Table dimensions	31 in x 22 in
Table load capacity	1320 lbs
Spindle nose-to-table surface distance	6 in - 28 in
Spindle center - column	20 in

TRAVELS

Travel X-axis	25.6 in
Travel Y-axis	22 in
Travel Z-axis	22 in
Guideway	Roller

HEADSTOCK

Spindle speed	10000 rpm
Spindle mount	SK 40 ISO 7388-1 (DIN 69871)
Torque, constant	42 ft.lb.
Spindle bearing	7012 x 4
Spindle drive method	Riemenantrieb

RAPID FEED

Rapid feed X-/ Y-axis	1417 in/min
Rapid feed Z-axis	590.55 in/min

FEED

Work feed X-axis	393.7 in/min
Work feed Y-axis	393.7 in/min
Work feed Z-axis	393.7 in/min

TOOL HEAD

Tool change type	Doppelarm
Number of tool stations	24 positions
Tool selection	Memory random
Tool size Ø x L (max.)	3.15 in x 11.81 in
Tool weight max.	15 lbs
Tool-change time tool/tool	1.8 sec
Tool-changing time chip/chip	3.9 sec

ACCURACIES

Repeatabilities	± 0003 / ± 0.00012" in
Positioning accuracies	± 0005/ 0.0002" in

DRIVE CAPACITY

Main drive, continuous load	12.07 Hp
Total power consumption	15 kVA
Voltage	400 V
Mains frequency	50 Hz

CONTROL

Control	Siemens

MEASURES AND WEIGHTS

Overall dimensions (length x width x height)	96 in x 87 in x 107 in
Weight	8800 lbs

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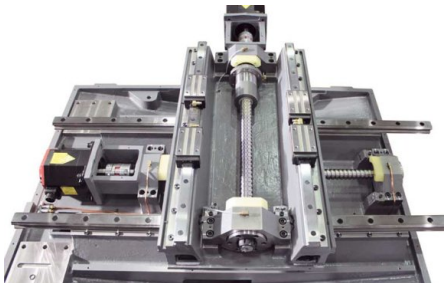
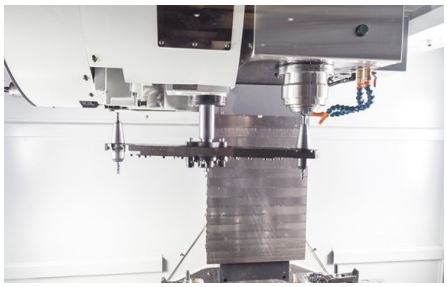


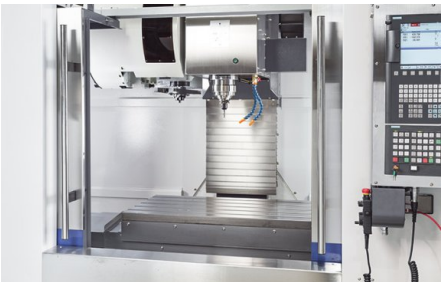
Linear guides and preloaded preloaded ball screws

Linear-roller guides for super quiet operation

Siemens Sinumerik 828D with ShopMill



Tool changer with double-arm and BT40 spindle



Wide opening front doors

PRODUCT DETAILS

Highlights

- Rigid machine structure with extra deep center of gravity and small footprint
- Siemens 828D control with ShopMill and Siemens drives guarantee maximum process reliability and efficient programming

Machine Design

- 30 mm preloaded ball screws combined with a digital drive package provide a rigid table guide and high torque
- A major focus during development of this machine was a space-saving design
- Dual-arm tool changer with 24 stations ensures adequate flexibility and capacity for every day production needs
- The Vector Series features linear guides on X, Y and Z to ensure high accuracy made possible by lower friction
- 435 psi internal cooling for optimum machining quality

Spindle

- Spindle runs on multiple bearings to ensure excellent absorption and dissipation of forces during machining

Tool Changer

- Changing times (1.8 seconds tool-to-tool and 3.9 seconds chip-to-chip) increase spindle up-time and machine output

Control Siemens Sinumerik 828D

- The top specialist for demanding milling operations
- Compact, robust, maintenance-free control panel-based CNC
- Comfortable program and parameter input via QWERTY keyboard
- 100 adjustable zero offsets
- Synchronous actions, and quick output of help functions
- Siemens Sinumerik 828 D
- Maximum machining precision
- Intelligent kinematic transformations for machining of cylindrical parts, and for angled workpiece levels
- SINUMERIK MDynamics with the new Advanced Surface feature: for perfect part surfaces and shortest machining times in die making applications
- Siemens Sinumerik 828D CNC highlights, specifications and features
- ShopMill: shortest programming time for single parts and small batch productions
- ProgramGUIDE: fastest machining time and maximum flexibility for high-volume series productions
- Unique spectrum of technology cycles - from milling contours with residual material recognition to process measurements
- Animated elements: unique operation and programming assistance with animated sequences
- Advanced data transfer options via USB stick, CF card and network (Ethernet)
- Easy message: maximum machine availability due to process monitoring per texting (SMS)
- SINUMERIK MDynamics package with Advanced Surface for mold making applications
- Jerk-limited acceleration
- Dynamic feed-forward control
- 4-axis simultaneous interpolation (X, Y, Z and rotary axis)
- Linear, circular and helical interpolation
- Tapping without compensating chuck, plus thread cutting
- Oriented spindle hold
- Toggle between inch and metric units
- FRAME concept for individual coordinate transformations, rotations, scaling and mirroring

CONTROLS & SOFTWARE

Siemens 828D control with Shopmill

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SINUMERIK 828 D – The workhorse in the compact class of CNCs

Highlights

- Compact, robust, maintenance-free control panel-based CNC
- Comfortable program and parameter input via QWERTY keyboard
- Maximum machining precision
- Intelligent kinematic transformations for machining of cylindrical parts, and for angled workpiece levels
- SINUMERIK MDynamics with the new Advanced Surface feature: for perfect part surfaces and shortest machining times in mold making applications
- ShopMill: shortest programming time for single parts and small batch productions
- ProgramGUIDE: fastest machining time and maximum flexibility for large series productions
- Unique spectrum of technology cycles - from milling contours with residual material recognition to process measurements
- Animated Elements: unique operation and programming assistance with animated sequences
- Modern data transfer options via USB stick, CF card and network (Ethernet)
- Easy Message: maximum machine availability due to process monitoring per texting (SMS)

CNC hardware

- Control-panel based high-performance CNC Control
- Robust front control panel made of magnesium die-casting
- Integreated full-size QWERTY keyboard
- Maintenance-free design (no buffer battery required)

CNC performance data and functions

- SINUMERIK MDynamics package with Advanced Surface for mold making applications
- Dynamic feed-forward control
- 4-axis simultaneous interpolation (X, Y, Z and rotary axis)
- Linear, circular and helical interpolation
- Tapping without compensating chuck, plus thread cutting
- Oriented spindle holder
- Toggle between inch and metric units
- FRAME concept for individual coordinate transformations, rotations, scaling and mirroring
- 100 adjustable zero offsets
- Synchronous actions and quick help function output

CNC technology cycles

- Technology cycles for programGUIDE and ShopMill work step programming are available
- Large selection of drilling cycles
- Large selection of milling cycles for standard geometry
- Large selection of position patterns for drilling and milling operations
- High-speed settings for mold making applications
- Geometry calculator for free contour input
- Machining cycle for contour pockets / contour spigots with isolated contours

Graphic features

- Animated Elements: input help for machining parameters with animated sequences
- Graphical online help system, similar to PC system
- Graphical CNC simulation with level display

CNC tool management

- Display of tool and magazine data on one screen
- Tool management with plain-text tool names
- Loading/unloading feature for easy magazine assignment
- Tool management with tool life monitoring
- 10.4“ TFT color monitor
- Jerk-limited acceleration

STANDARD EQUIPMENT

Prepared for Renishaw TS 27
Siemens 828D control with Shopmill
Coolant flow through spindle, 30 bar with double filter

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24-station tool changer with dual-arm
Main spindle motor 12 HP
ST 40 mount
Spindle oil cooler
Chain-type conveyor with chip container
Electronic hand-wheel
Oil skimmer
Automatic central lubrication
Coolant gun
Chip flushing system
Heat exchanger for electric control cabinet
Telescoping axis cover
USB port
CF card reader
Totally enclosed work space
Work lamp
3-color signal lamp
Coolant system
Adjustable machine feet
Operating tools
Operator instructions

OPTIONAL EQUIPMENT

- Top cover for X.Mill/Vector 650-1000, SKU : 252819
- Renishaw OMP 40 workpiece measuring, SKU : 252820
- Arm Type BT40 upg. from 24 to 30 tools, SKU : 252967
- Connection for 4th axis (wiring only and axis chart), SKU : 253019
- Siemens Function: P25: 3D Simulation, SKU : 253378
- Siemens Function: P13: Residual Material Detection, SKU : 253379
- Siemens Function: P22: Simulataneous Recording, SKU : 253380
- Renishaw TS27R tool measuring system, SKU : 253386
- Siemens measuring cycles, SKU : 253438
- Renishaw OTS wireless tool setter (OTS), SKU : 253598
- Ø170mm 4th axis (4th axis, servo motor, driver, air brakes)(Si), SKU : 253605
- Ø210mm 4th axis (4th axis, servo motor, driver, air brakes)(Si), SKU : 253606
- Ø250mm 4th axis (4th axis, servo motor, driver, air brakes)(Si), SKU : 253607
- Prepared for Renishaw OMP40, SKU : 253613
- Manual tailstock ST-170T for rotary table, SKU : 253618
- Manual tailstock ST-255T for rotary table, SKU : 253620
- Manual chuck, 6'', for rotary table, SKU : 253622
- Manual chuck, 9'', for rotary table, SKU : 253624
- Upgrade from 10.4" to 15" Touchscreen (Si) for Vector, SKU : 253674
- Renishaw OMP 60 workpiece measuring system (BT40), SKU : 253681
- 7.87" diam. 4th & 5th axis for Vector 650/850/1000 (Si), SKU : 253682
- Upgrade from 828D PPU260 to 840DSL IPC447E 10.4" for Vector, SKU : 253835
- Spindle upgrade from ST40 to BBT40 for X.Mill/Vector 650-1000, SKU : 253951
- Spindle upgrade from ST40 to HSK63 for Vector 650-1000, SKU : 253953
- 12,000 rpm, direct drive CTS for Vector 650-1200(Si), SKU : 253956
- Reinforced machine base with 800 mm Z axis travel, SKU : 253625
- Spindle speed upgrade to 12000 rpm, belt-type, SKU : 253781

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