

# Vertical Machining Centers

## VECTOR 1400 M SI

**SKU : 181427**

The Vector 1300/1400 series is the perfect solution for machining very large and heavy workpieces. The innovative design of the machine base made of high-quality Meehanite casting with a low center of gravity, and the use of only the highest quality components guarantee the consistently high precision even in multi-shift production. Thanks to a wide range of accessories, the machining centers become a tailor-made complete solution for specific applications. KNUTH also offer automation solutions for this series, with which you can increase your productivity even more.

- Spindle on multiple bearings ensures minimal vibrations
- 30-bar CTS to ensure optimum machining quality
- Designed for multi-shift operation
- Many customization and automation possibilities
- 2-year standard warranty



### TECHNICAL SPECS

#### WORKING AREA

Table dimensions	1500 mm x 700 mm
Table load capacity	1500 kg
Workpiece weight (max.)	1500 kg
Spindle nose-to-table surface distance	150 mm - 850 mm
Number of T-slots	6 positions
T-slot (width x spacing)	18 mm x 100 mm

#### TRAVELS

Travel X-axis	1400 mm
Travel Y-axis	720 mm
Travel Z-axis	700 mm

#### HEADSTOCK

Spindle speed	10000 1/min
Spindle mount	SK 40 ISO 7388-1 (DIN 69871)

#### RAPID FEED

Rapid feed	24 m/min
------------	----------

#### FEED

Work feed	10000 mm/min
-----------	--------------

#### TOOLING

Number of tool stations	24 positions
Tool size Ø x L (max.)	80 mm x 300 mm
Tool-changing time chip/chip	3.9 sec
Tool-change time tool/tool	1.8 sec

#### ACCURACIES

Positioning accuracies	± 0,005/ 0.0002" mm
Repeatabilities	± 0,003 / ± 0.00012" mm

#### DRIVE CAPACITY

Main drive, continuous load	17 kW
Motor rating X-axis	5.5 kW
Motor rating Y-axis	5.5 kW
Motor rating Z-axis	5.5 kW

#### CONTROL

Control	Siemens
---------	---------

#### MEASURES AND WEIGHTS

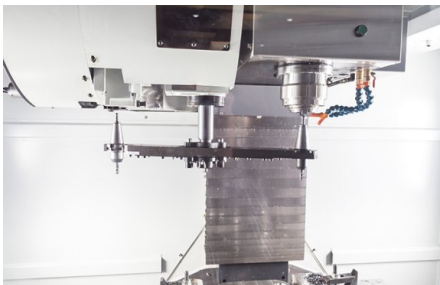
Weight	9500 kg
Overall dimensions (length x width x height)	3.8 m x 2.6 m x 3.3 m



*Linear-roller guides for super quiet operation*



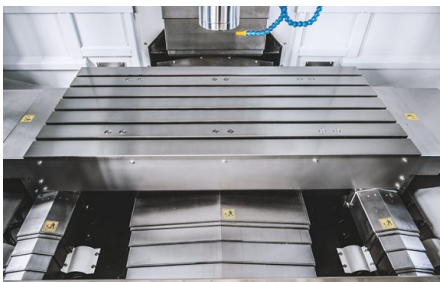
*Siemens Sinumerik 828D with ShopMill*



*Tool changer with double-arm and spindle*



*Wide opening front doors*



*Additional guides for even more load capacity and increased stability*

## PRODUCT DETAILS

- The large VECTOR Series is perfectly equipped for large jobs and can be ordered with customized accessories to provide flexible solutions for constantly expanding requirements

### Machine Design

- The extra-wide column base and large guide distances ensure the necessary rigidity for fast machining processes requiring high precision
- During the development of this series, modern FEM analysis tools were used for the simulation of countless load conditions in order to guarantee superior stability of the machine frame in real-world applications, which now exceeds all expectations for this class of machines
- All axes move on premium, fully enclosed linear roller guideways and precision ball screws and are driven by dynamic servo-motors

### Extra-rigidity at all the right places

- The VECTOR features larger guideways that are equipped with additional guide carriages for even higher load capacities, more rigidity and higher speeds during heavy-duty machining operations
- Preloaded ball screws with larger and additional bearings ensure superior efficiency and longer life

### Spindle

- Main spindle runs on multiple bearings to ensure excellent absorption and dissipation of forces during machining
- The advanced design of our spindles ensure low heat accumulation under load
- Large pre-loaded bearings ensure radial stability during heavy-duty machining operations
- High-temperature lubricants ensure optimum lubrication at any operating temperature and a long tool life
- Clamping the tool between contact surfaces at the taper and workpiece flange ensures maximum hold of the tool in the spindle

### Tool Changer

- The VECTOR is equipped with the best tool changer to allow full utilization of the machining center's capacity
- With only 1.8 seconds tool changing time, the dual-arm gripper also is one of the fastest tool changers on the market

### Handling

- The totally enclosed workspace features a large door and side doors for easy access, safety and cleanliness
- Electrical equipment is divided into separate control cabinets for high and low voltage systems, which results in a significant reduction of heat accumulation and noise
- An electronic hand-wheel simplifies machine set-up
- The automatic central lubrication system ensures proper lubrication of all lube points

## CONTROLS & SOFTWARE

### Siemens 828D control with Shopmill

## **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
- Integrated 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**

Siemens 828D control with Shopmill  
Coolant through spindle 30 bar with double filter

24-station tool changer with dual-arm  
 ST 40 mount  
 Spindle oil cooler  
 Chain-type conveyor with chip container  
 Electronic hand-wheel  
 Oil skimmer  
 Automatic central lubrication  
 Coolant system flush gun  
 Chip wash system  
 Heat Exchanger for electric control cabinet  
 Telescoping axis cover  
 Preparation for Renishaw TS 27 R  
 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

- 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: Simultaneous Recording, SKU : 253380
- Ø 210mm 4th axis (4th axis, servo motor, driver, air brakes)(Si), SKU : 253606
- Ø 250mm 4th axis (4th axis, servo motor, driver, air brakes)(Si), SKU : 253607
- manual tailstock ST-210T for rotary table for X.mill, SKU : 253619
- manual 8" chuck for rotary table for X.mill, SKU : 253623
- Upgrade from 10.4" to 15" touch screen (for PPU260 or higher), SKU : 253674
- 200mm diam. 4th & 5th axis, SKU : 253682
- Spindle speed upgrade to 12000 rpm, belt-type, SKU : 253781
- Top cover for Vector 1300-1600, SKU : 253783
- Upgrade for ATC from 24 to 30 tools (BT40) for Vector 1300-1600, SKU : 253843
- Renishaw OMP40-2T Workpiece Scanning Probe, SKU : 253288
- Renishaw SET OMP40-2T measuring probe +OTS Toolsetter (SK 40), SKU : 254026
- Renishaw OTS Toolsetter, SKU : 254285



## KNUTH on YouTube Information to the point

On our YouTube channel you can find videos for nearly all machines from our program. We show the machines from current deliveries and you get an impression of the handling, the processing quality and the machining performance.

**Are you interested in a machine for which you cannot find a current video?  
Please feel free to contact us!**