



Vertical Machining Center
SERIES

V77/V77L V99/V99L



www.makino.co.jp



Atsugi and Fuji Katsuyama works are certified for ISO14001 and ISO9001.

*The specifications, figures, and overviews of products, peripheral devices and accessories in this catalogue may be changed without prior notice to incorporate improvements resulting from ongoing R&D programs.
*The all products in this catalogue include the optional specifications and equipment.
*The products, including technical data and software, may be subject to the Foreign Exchange and Foreign Trade Control Law in Japan.
Prior to any re-sale, re-transfer or re-export, please contact Makino to obtain any required authorization and approval.

M453Ee 1804/1 (V-T-D)



V Series – Suitable for machining of large- and medium-sized die/ mold, and precision parts which require accuracy of micron- order



Table size / Maximum payload

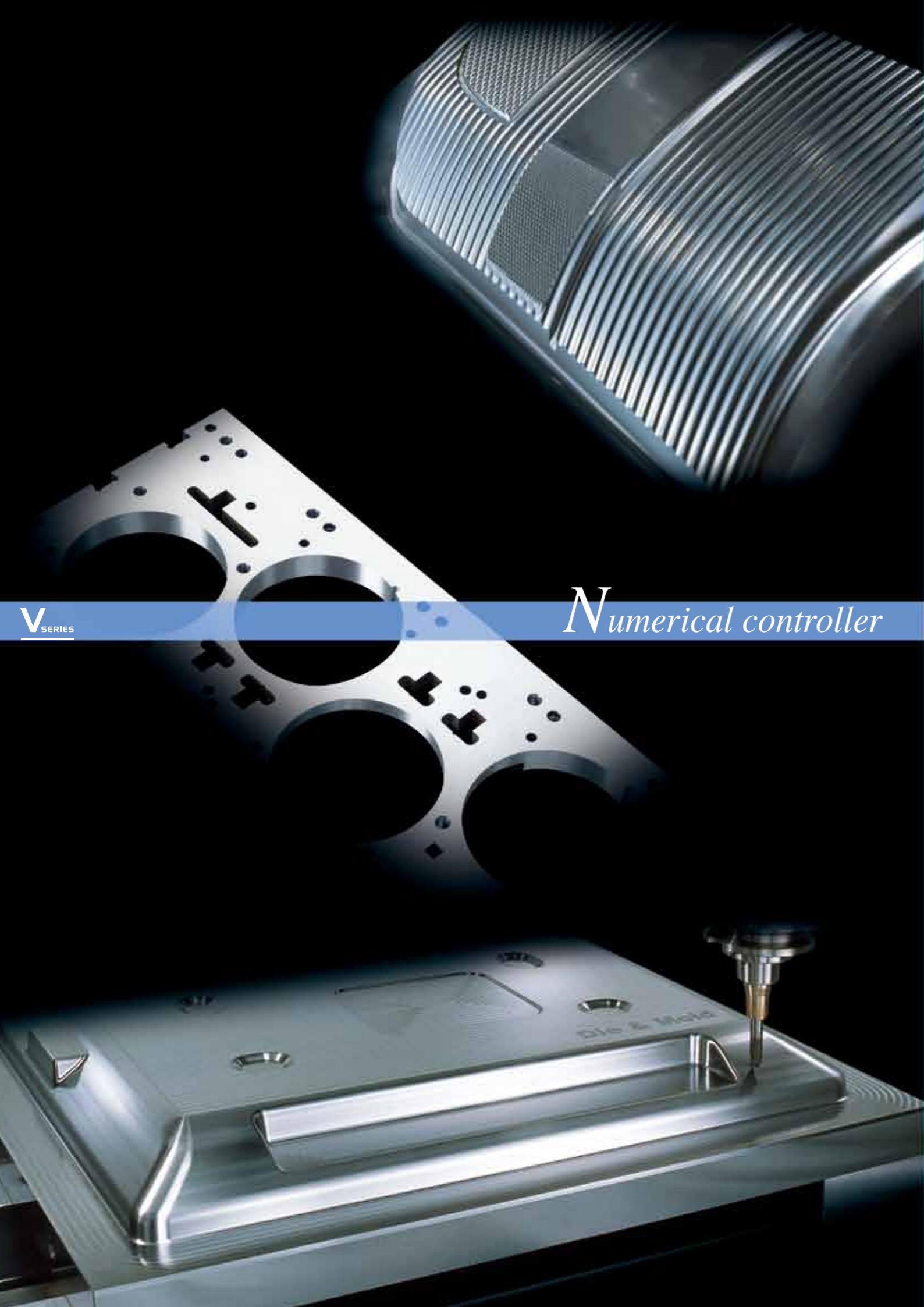
V77 — 1400 × 700 mm / 2500 kg

V99 — 1800 × 1000 mm / 4000 kg

V77L — 1650 × 700 mm / 2000 kg

V99L — 2300 × 1000 mm / 4000 kg





V
SERIES

Numerical controller

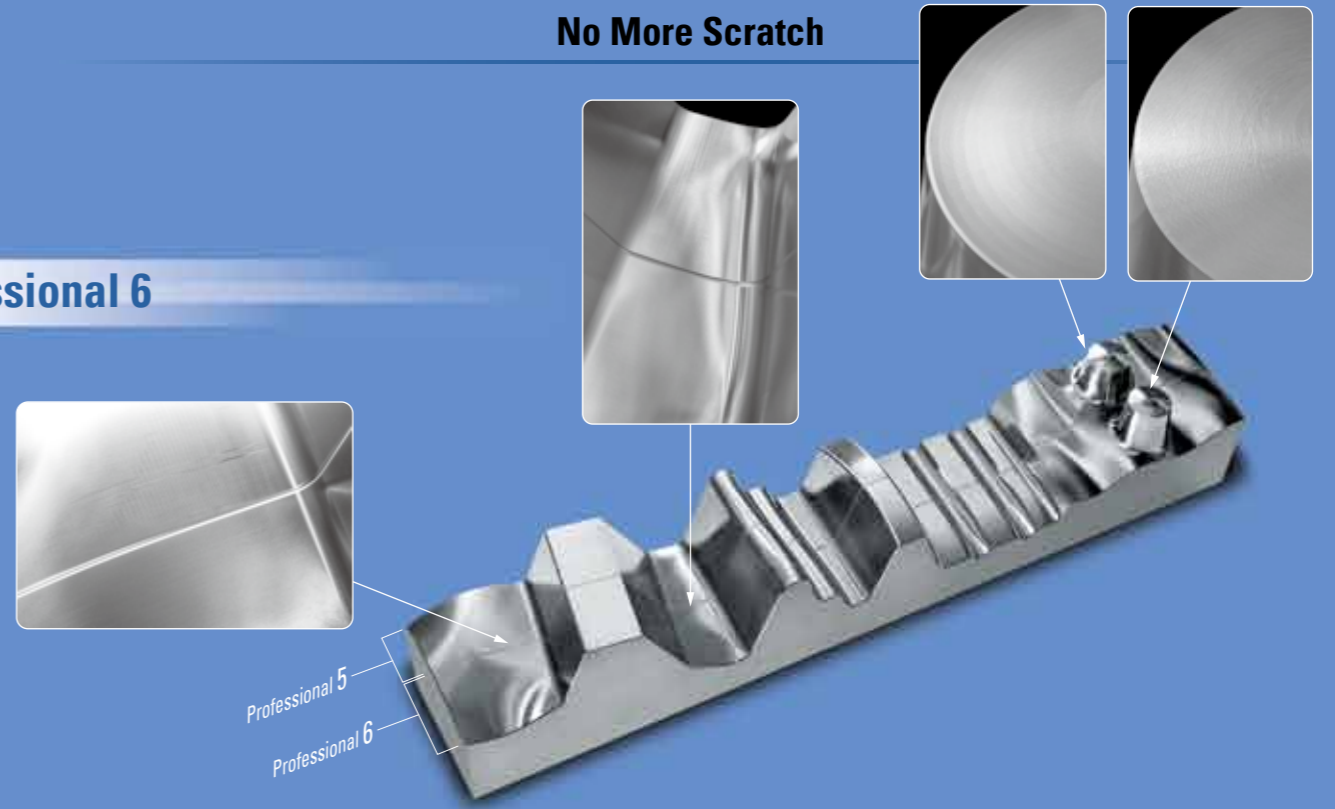
Professional 6

Spindle Crash Avoidance

Crash avoidance function "Collision Safeguard"



No More Scratch



Intuitive Operation

i Setup (optional equipment)

- Quick and easy measuring for setup by intuitive operation
- Code-free programming on dialogue screen





V77 Thermal guard (optional specification)

Spindle

The spindles exclude run-out and vibrations in the entire speed range. Accuracy of all parts, including not only rotating parts but also other parts, is controlled precisely in a submicron unit.

Spindle variations

#40	20000 min ⁻¹	BT40 / HSK-A63 *1
	30000 min ⁻¹	HSK-F63 *1
#50	12000 min ⁻¹	BT50 / HSK-A100 *1
	18000 min ⁻¹	HSK-A100 *1



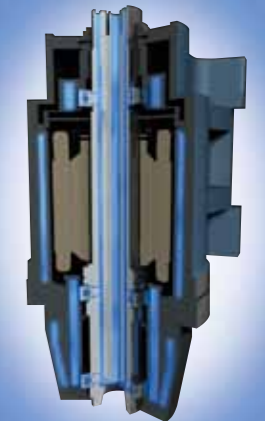
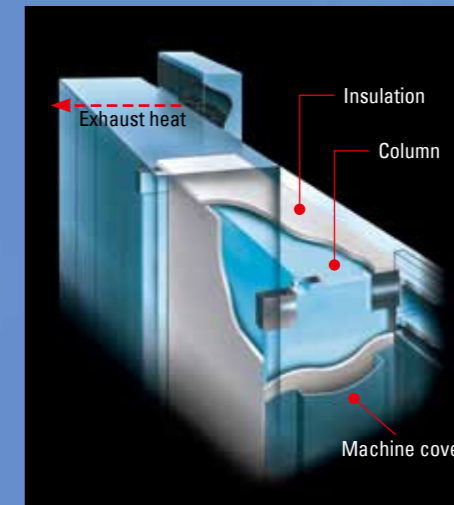
Spindle vibration: 3 μm or less *2 (in entire speed range)

Spindle thermal distortion: ±1 μm *2

*1: Optional specification *2: Actual value

Minimum thermal distortion

Column and bed are covered with insulating material, which reduces attitude change due to room temperature.



Spindle core and jacket cooling

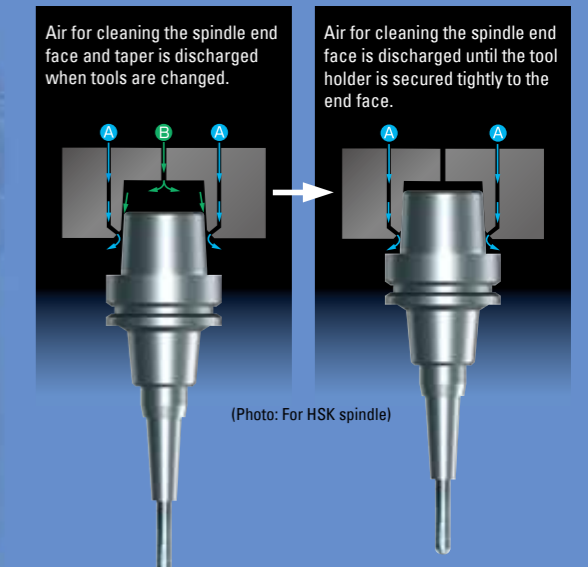
The inner side of spindle is directly cooled.

Chip evacuation

Chips with heat, generated during machining, are promptly flushed together with coolant through the built-in conveyor equipped below the table.



Chip penetration into the spindle taper hole is prevented by cleaning air.



(Photo: For HSK spindle)

Stability

for Long Machining

V SERIES



V77/V77L



Access-friendly design



Operator can set tools and perform maintenance work in a comfortable position.

Accessibility

for Easy Operation

V SERIES

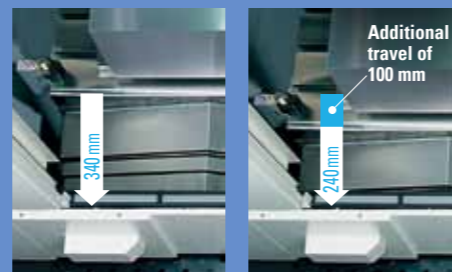


Operator door opens wide to the ceiling

V99/V99L



Table moves 100mm further in the direction of operator specially for work loading and setting.



Flexible control panel

Graphite machining facilitated by Makino's versatile V-Series

V77 GRAPHITE
V77L GRAPHITE

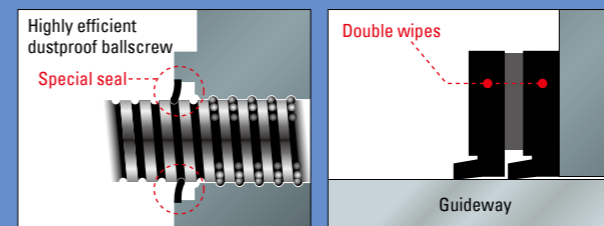


Advantages of graphite as a material for electrode

- Easy-to-cut
- Outstanding performance of rough EDM machining
 - Machining speed : 1.5 to 3 times faster than copper electrode
 - Specific gravity : 1/5 of copper
- Easy-to-polish
- Small thermal expansion rate
 - 1/4 of copper

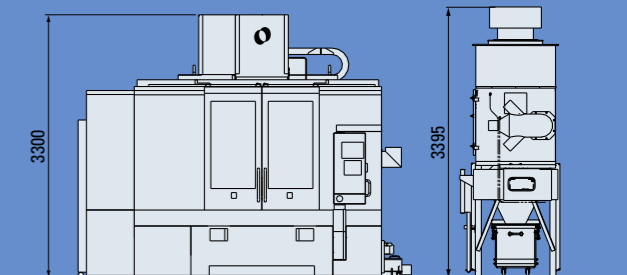
Graphite specification (standard) *Dust collector *Automatic air blower *Through-spindle air

Dust-proof design of feed mechanism

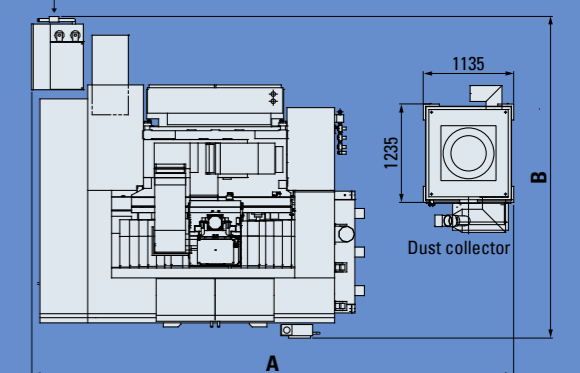


Machining chamber

Front View / Floor Plan (mm)



Spindle temperature controller



V77 GRAPHITE	A	6055 (#40) 6150 (#50)	B	3930 (#40) 3835 (#50)
V77L GRAPHITE	A	6305 (#40) 6400 (#50)	B	3960 (#40) 3865 (#50)

Machine Specifications

	V77 / V77 GRAPHITE V77L / V77L GRAPHITE	V99 V99L
■ Travels		
X × Y × Z axis	V77 / V77 GRAPHITE : 1200 × 700 × 650 mm V77L / V77L GRAPHITE : 1500 × 700 × 650 mm	V99 : 1500 × 1000 × 800 mm V99L : 2000 × 1000 × 800 mm
Distance from table surface to spindle end	250 - 900 mm	250 - 1050 mm
■ Table		
Size	V77 / V77 GRAPHITE : 1400 × 700 mm V77L / V77L GRAPHITE : 1650 × 700 mm	V99 : 1800 × 1000 mm V99L : 2300 × 1000 mm
Surface configuration	T-slot (18H8 × 6 slots)	T-slot (22H8 × 7 slots)
Maximum workpiece size (W × D × H) * with limitation	V77 / V77 GRAPHITE : 1400 × 700 × 550 mm V77L / V77L GRAPHITE : 1650 × 700 × 550 mm	V99 : 1800 × 1000 × 650 mm V99L : 2300 × 1000 × 650 mm
Height from floor to table surface	850 mm	900 mm
Maximum payload	V77 / V77 GRAPHITE : 2500 kg V77L / V77L GRAPHITE : 2000 kg	4000 kg

Cooling / lubrication	Spindle core cooling / Under race lubrication			
	Selectable		Selectable	
Interface	7/24 taper #40	7/24 taper #50	7/24 taper #40	7/24 taper #50
Speed range	50 - 20000 min ⁻¹	50 - 12000 min ⁻¹	50 - 20000 min ⁻¹	50 - 12000 min ⁻¹
Motor drive	18.5 / 15 kW (30 min / cont.)	22 / 18.5 kW (30 min / cont.)	18.5 / 15 kW (30 min / cont.)	22 / 18.5 kW (30 min / cont.)
Torque	95.5 / 63.7 N·m (10 min / cont.)	151 / 124 N·m (15 min / cont.)	95.5 / 63.7 N·m (10 min / cont.)	151 / 124 N·m (15 min / cont.)
■ Automatic tool changer				
Type of tool shank	JIS B6339 40T	JIS B6339 50T	JIS B6339 40T	JIS B6339 50T
Type of retention knob	MAS403 P40T1	MAS403 P50T1	MAS403 P40T1	MAS403 P50T1
Maximum tool diameter / length	120 mm / 300 mm	145 mm / 400 mm	120 mm / 400 mm	145 mm / 400 mm
Maximum tool weight	8 kg	20 kg	8 kg	20 kg
Tool storage capacity	20-tool			

■ Feedrates	20000 mm/min / 1 - 20000 mm/min	
Rapid traverse / Cutting feed	20000 mm/min / 1 - 20000 mm/min	

■ Machine size (standard)	V77 / V77L		V99 / V99L
Height	V77 : 3300 mm V77L : 3300 mm		V77 GRAPHITE : 3395 mm V77L GRAPHITE : 3395 mm 3500 mm
Width × depth	V77 : <#40> 3805 × 3960 mm <#50> 3900 × 3865 mm V77L : 4150 × 3833 mm V77 GRAPHITE : <#40> 6055 × 3930 mm <#50> 6150 × 3835 mm V77L GRAPHITE : <#40> 6305 × 3960 mm <#50> 6400 × 3865 mm		V99 : <H850> 5140 × 4700 mm* <H1200> 5340 × 4700 mm* V99L : <H850> 5650 × 4700 mm* <H1200> 5860 × 4700 mm*
Weight	V77 : 16500 kg V77L : 17500 kg V77 GRAPHITE : 17180 kg V77L GRAPHITE : 18180 kg		V99 : 24000 kg V99L : 27000 kg

■ Floor space (standard)	V77 / V77L		V99 / V99L
Width × depth	V77 : <#40> 4905 × 5205 mm <#50> 5000 × 5110 mm V77L : 5000 × 5110 mm V77 GRAPHITE : <#40> 6550 × 4270 mm <#50> 6550 × 4175 mm V77L GRAPHITE : <#40> 6800 × 4290 mm <#50> 6800 × 4195 mm		V99 : 6340 × 5200 mm V99L : 6535 × 5200 mm

*H850 : Left discharge lift-up chip conveyor with 850 mm height
*H1200 : Left discharge lift-up chip conveyor with 1200 mm height

Standard Specifications

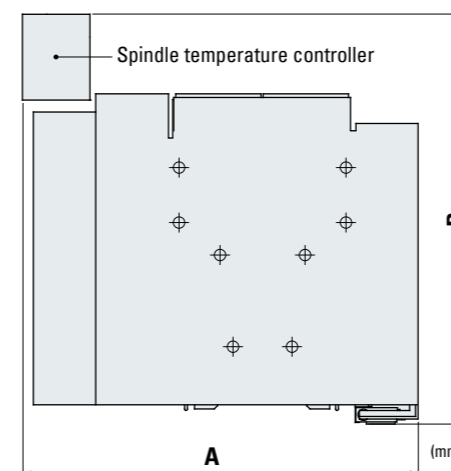
- 20000 min⁻¹ taper #40 spindle
- 12000 min⁻¹ taper #50 spindle
- Spindle temperature controller
- Scale feedback: 0.05μm
- 20-tool magazine
- Operator doorlock (operation mode)
- Fully enclosed splash guard
- ATC doorlock
- Operator side step (V99 / V99L)
- Lighting device inside of splash guard
- 3-nozzle coolant supply device (V77 / V77L, V99 / V99L)
- Conveyors in splash guard
- Coolant tank bucket specification (V77 / V77L)
- Left discharge lift-up chip conveyor (H1200 or H850) (V99 / V99L)
- Dust collector (V77 GRAPHITE / V77L GRAPHITE)
- Portable manual pulse generator with the handle enable button (V77 / V77L, V77 GRAPHITE / V77L GRAPHITE)
- Portable manual pulse generator with tool position display and the handle enable button (V99 / V99L)
- Slideway lubrication unit
- Automatic grease supply unit
- GI control
- User memory 2 GB + 1 GB
- Rigid tap
- Standard tool kit
- Leveling bolt
- ECO mode
- Professional 6
- Collision Safeguard (Pro. 6 screen type)

Optional Specifications (●) / Optional Equipment (★)

- 30000 min⁻¹ taper #40 spindle (HSK-F63 holder only)
- 18000 min⁻¹ taper #50 spindle (HSK-A100 holder only)
- HSK-A63 (selectable only with 20000 min⁻¹ spindle)
- HSK-A100 (selectable only with 12000 or 18000 min⁻¹ spindle)
- HSK-F63 (selectable only with 30000 min⁻¹ spindle)
- ★ Hale machining
- 30, 40, 80-tool magazine (taper #40)
- 30, 40, 60-tool magazine (taper #50)
- ★ Pallet changer (available on V77)
- Through-spindle coolant & air (1.5 MPa)¹
- Through-spindle air²
- ★ Automatic air blower²
- ★ Automatic air blower (high-power type) (V77 / V77L, V77 GRAPHITE / V77L GRAPHITE)
- Thermal Guard
- Inner splash guard washing coolant (V77 / V77L)
- Y axis telescopic washing coolant (V99 / V99L)
- ★ Workpiece washing gun (V77 / V77L, V99 / V99L)
- ★ Portable manual pulse generator with tool position display and the handle enable button (V77 / V77L, V77 GRAPHITE / V77L GRAPHITE)
- ★ Lift-up chip conveyor (hinge type) (V77 / V77L)
- ★ Lift-up chip conveyor with coolant filtration (scraper type) (V77 / V77L)
- ★ Conveyors in splash guard (scraper type) (V77 / V77L)
- Thermal chamber (Requires mist collector. Includes thermal guard) (V99 / V99L)
- ★ Coolant temperature controller (V77 / V77L, V99 / V99L)
- ★ Mist collector (V77 / V77L, V99 / V99L)
- ★ Oil skimmer (V77 / V77L, V99 / V99L)
- ★ Automatic workpiece measuring device
- ★ Automatic tool length measuring device
- ★ Automatic Non-contact tool measuring device
- ★ Air dryer
- ★ i Setup
- Super GI.5 control
- ★ Signal light 3-layer
- Special customer-specified machine colors

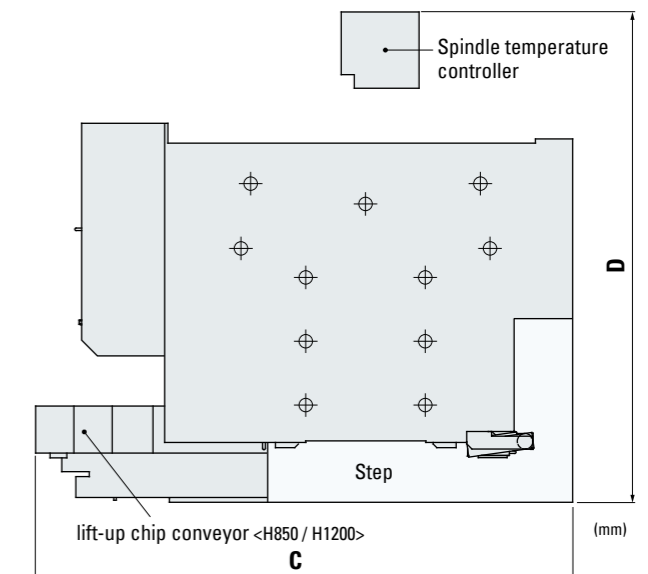
*1 Not selectable with 30000 min⁻¹ spindle
*2 V77 GRAPHITE / V77L GRAPHITE : Standard specification

V77 / V77L Floor Plan



A	V77 / V77L	B	V77	V77L
	3805 / 4150 <#40>		3960 <#40>	3833
	3900 / 4150 <#50>		3865 <#50>	

V99 / V99L Floor Plan



C	V99 / V99L	D	V99 / V99L
	5140 / 5650 <H850>		4700
	5340 / 5860 <H1200>		