

WELE

WELE

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WELE

We lead the way by a new business model

VTC SERIES



Vertical Turning Center



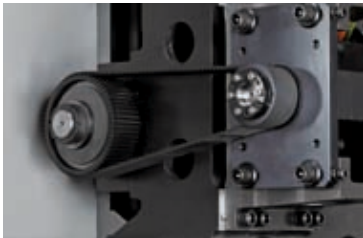
WELE MECHATRONIC CO., LTD



	VTC1612-20	VTC1616-20	VTC2016-24	VTC2020-24	AA65 Series	AA80 Series	AA90 Series	AQ Series	VQ Series	UG Series	UA Series	VTC Series	
VTC2520-30	VTC2525-30	VTC3025-35	VTC3032-35	VTC4032-48	RB Series	SB Series	LB Series	MB Series	HB Series	UB Series	MG Series	MVB Series	MT Series

Rigid Construction and Design Concept

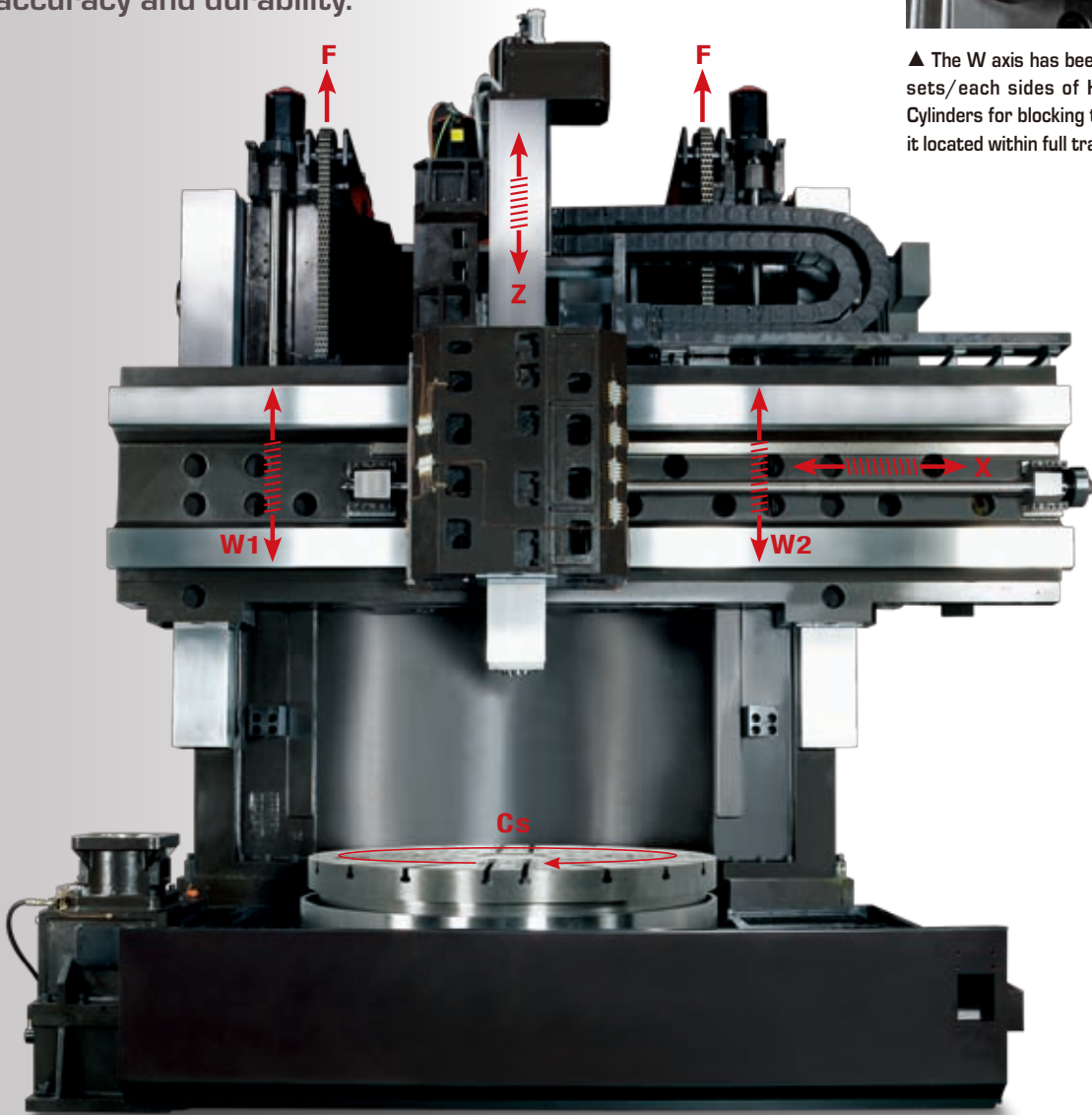
- Every main casting or welding part is FEM analyzed to ensure the maximum rigidity.
- Uses the twin servo motor to drive W axial moving cross rail. (GO: 20 m/min)
- The clamping force has 18 tons in cross rail positioning. (two sets for each sides, 4500kg times 4 sets equal to 18000kg)
- The hydro-static bearing is integrated with the bed and Turning Table also the oil tank, the temperature and pressure of oil is automatically controlled, so the thermal distortion is minimized and dynamic accuracy is ensured.
- Every important contacting surface (total 66 surfaces) is manually scrapped to obtain the best flatness, geometric accuracy and durability.



▲ The X, Z and W axes with twin driver have equipped with the torque limit mechanism which protect the servo motors.



▲ The W axis has been equipped with two sets/each sides of Hydraulic Clamping Cylinders for blocking the W axis wherever it located within full travel.



▲ Above figure shown as VTC1616's main structure without sheet metal.



Online Spec.



Online Video



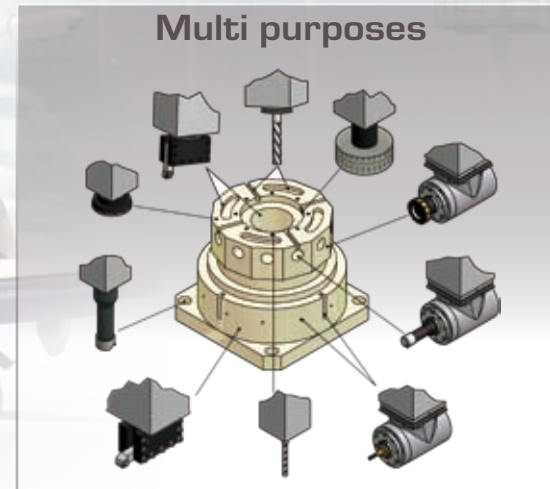
▲ Above figure shown as VTC 1616 has attached with angular head and full splash guard system.

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Application

WELE developed VTC series machines to meet the customers' vary demands and general purpose, such as:

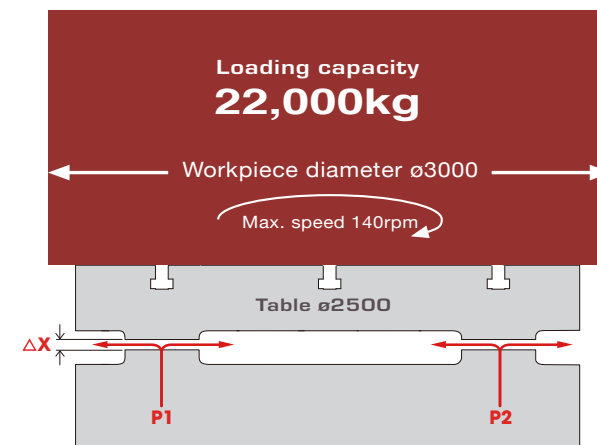
- Energy & Oil industry
(ex. Windmill power generator's parts)
- Aerospace industry
- Ship building industry
- Transportation industry
(ex. Railway engineering)
- Gas and Mining industry
(ex. Mining machine parts)
- Huge and round shape parts
(ex. Bearing, Gear, Hub, and Valve parts)



High Rigidity of Turning table

- WELE own developed hydro-static bearing for the ultra-heavy loading and cutting force.
- Cs axis backlash eliminated design which Indexing Increment is 0.001 degree.
- Available for rough and fine machining while the Cs axis does the milling work.
- Hydro-static bearing system has equipped with twin Hydraulic Supply unit, to ensure in case of Power Failure status for protect the bearing.

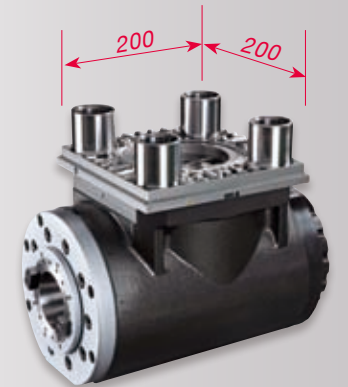
Hydro-Static Bearing



Multi-Functions puzzle type magazine design

Individual design:

- Full size Curvic Coupling design for heavy cutting purpose. (200mm square, rectangle shape)
- Auto-exchange in vertical type tool and Multi-head Attachment.
- Angular head attachment with built-in unclamping device has been well designed which can provide tool exchange for milling, drilling, tapping tools, could reduce the tool exchanging time.
- Attached clamping mechanism has 4 sets of Self-Lock by hydraulic cylinders which to secure the clamping and provides heavy cutting performance.



▲ Angular head



▲ Grinding wheel



▲ Turning tool holder



● 16 pockets tool magazine(STD) ; Two sets of curvic coupling attachment and 12 tools.



● Automatic exchange for multi-head attachment.

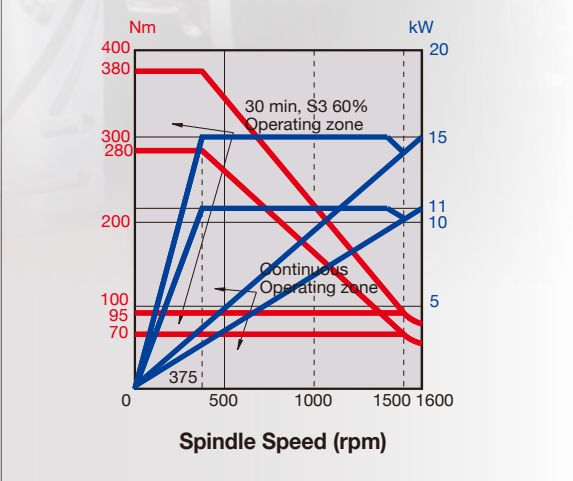


● Automatic tool exchange for vertical tools.

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Powerful Spindle & Turning Table Output Torque

Milling spindle (Gear driven), α12i 11/15kW



Turning Table (Gear driven)

Model		Power, kW (cont./ 30min)	Speed, rpm	Torque, Nm
VTC1616	STD	37 / 45	260	20,063
	OPT	60 / 75	200	29,000
VTC2525	STD	60 / 75	140	52,507
	OPT	100	124	96,636

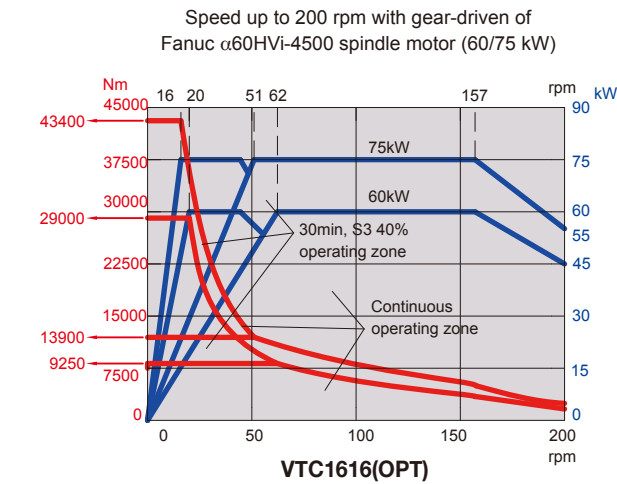
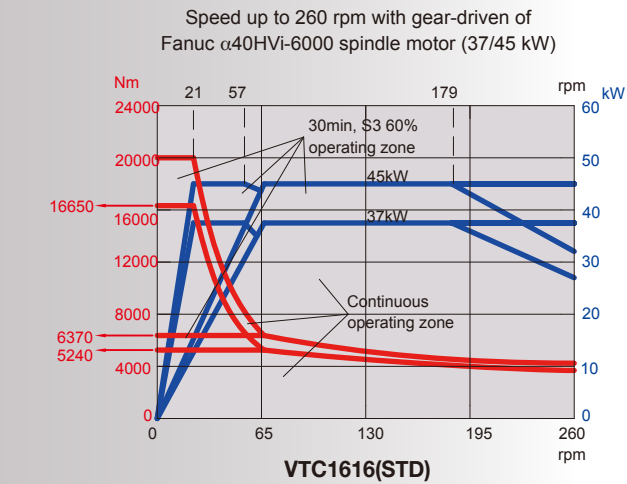
High Efficiency Cutting Performance

VTC1616-20, 37/45 kW at turning spindle, 11/15kW at milling spindle, Material: SCM440.

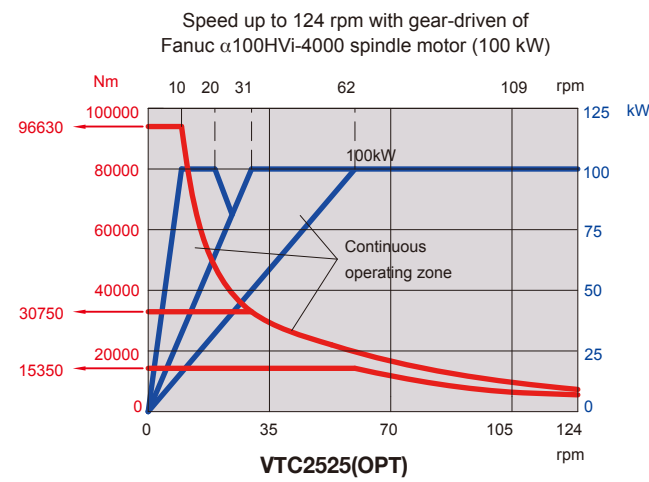
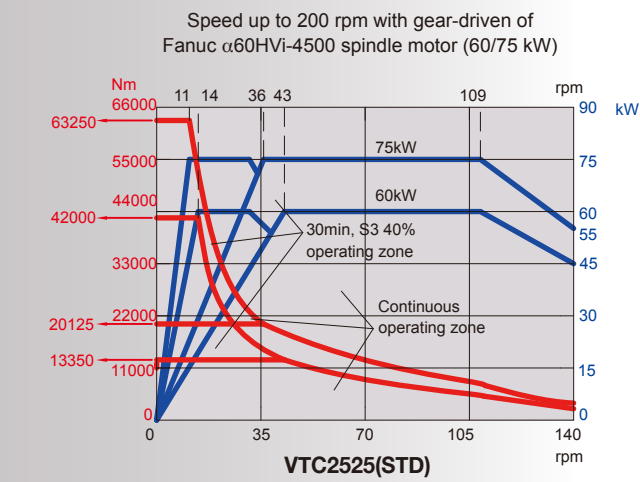


	VTC 1616-20
Z axis elongation	600 mm
Linear velocity (Vc)	115 m/min
Cutting depth (Ap)	10 mm
Feed per rev. (fz)	1 mm/rev
Mass removal rate (MRR)	1,150 cc/min
Taiwan A brand	720 cc/min
Japan A brand	1,000 cc/min
Japan B brand	1,055 cc/min

Turning Table (Gear driven)



Cutting tool	Ø125 x 8
Cutting width (Ae)	100 mm
Cutting depth (Ap)	4 mm
Feedrate (f)	1000 mm/min
Mass Removal rate (MRR)	400 cc/min
Taiwan A brand	170 cc/min
Japan A brand	317 cc/min



Cutting tool	Ø40 x 4
Cutting width (Ae)	8 mm
Cutting depth (Ap)	32 mm
Feedrate (f)	1432 mm/min
Mass Removal rate (MRR)	366 cc/min
Taiwan A brand	95 cc/min

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Genius Design and Experienced Technology

Machine accuracy is base on the flatness less than 3μm in 1.2m by 1.2m. (JIS 0 grade standard: flatness less than 7μm in 1m by 1m).

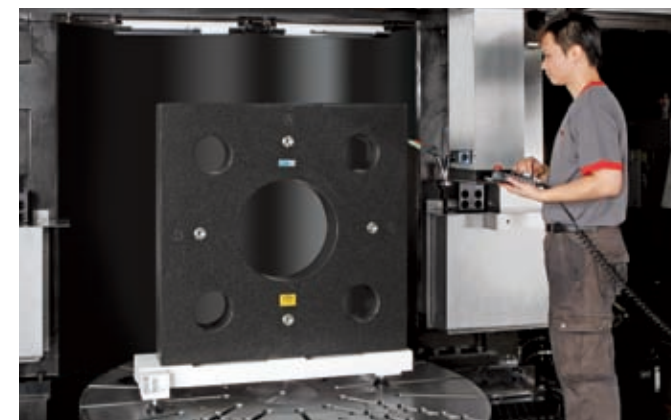
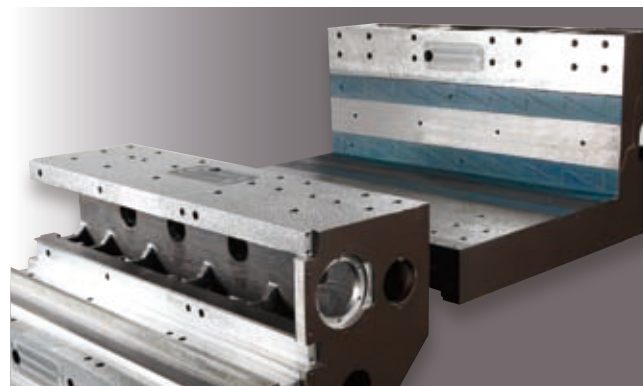
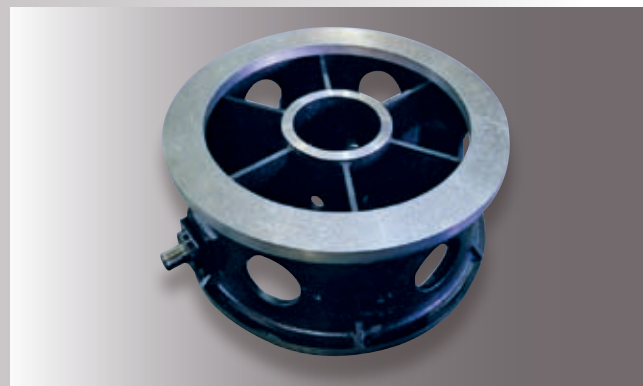


Strictly Quality Assurance

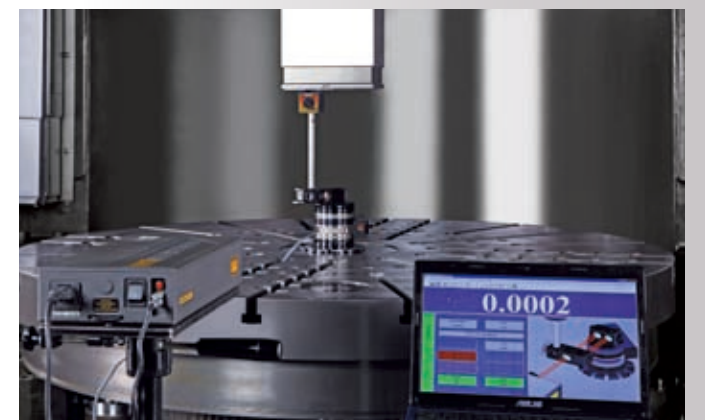
The completely quality control procedure. Using the advanced and precise equipment as CMM, autocollimator, laser interferometer, Ball Bar test, Balancer . Ensure the excellent quality of machine.



The series machine has scraping work in 66 contact surfaces. To ensure the machine has excellent accuracy and repeatability.



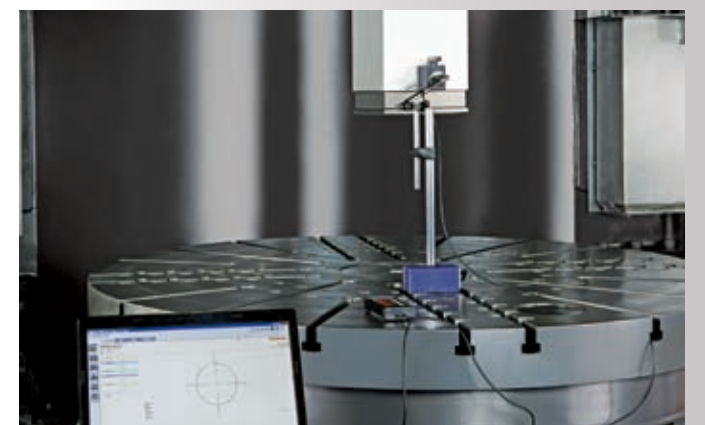
Strictly geometric accuracy measurement.



Cs axis rotation indexing positioning accuracy measurement.



X axis laser positioning accuracy measurement.

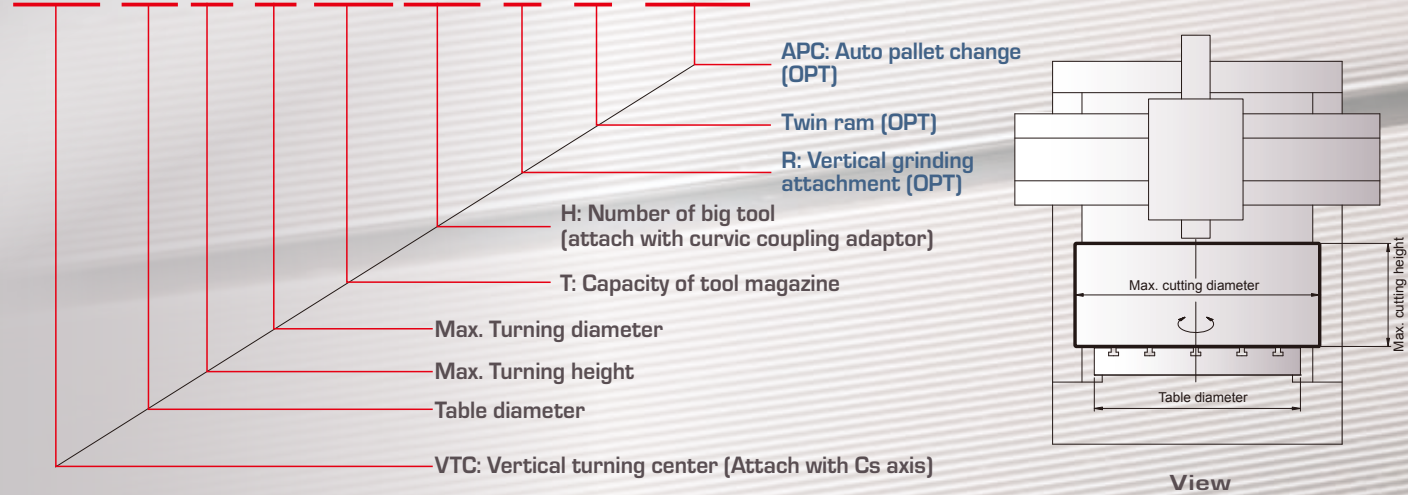


Ball Bar circular measurement in X,Z axes.

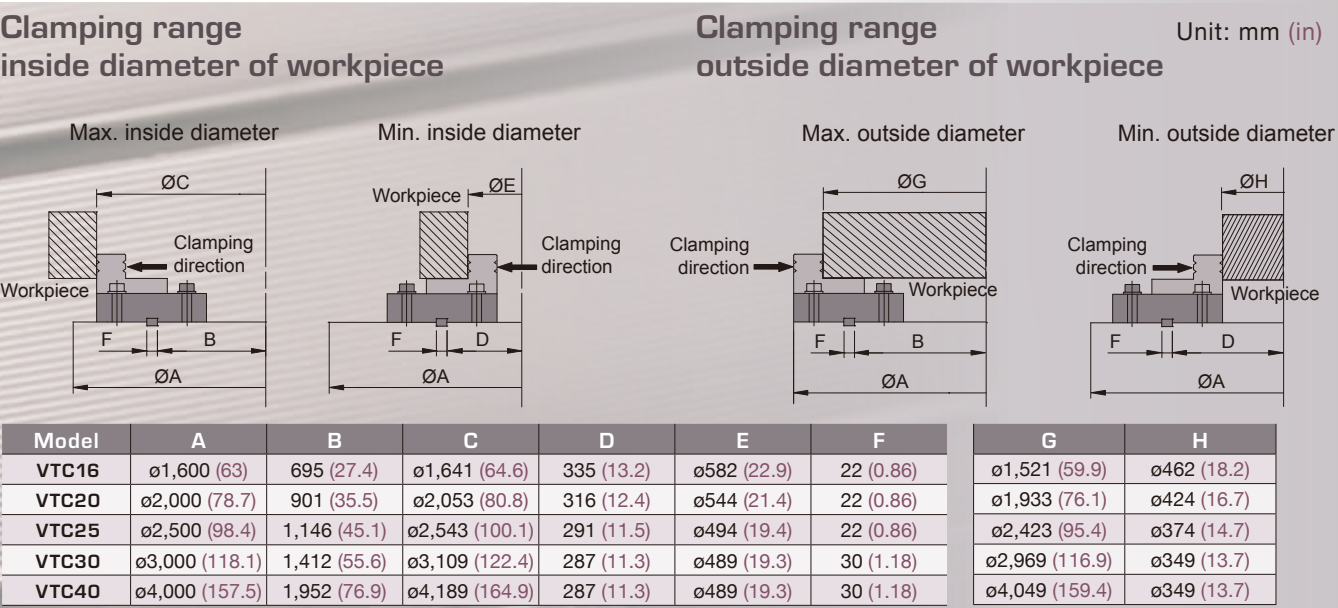
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Definition of Machine Specification

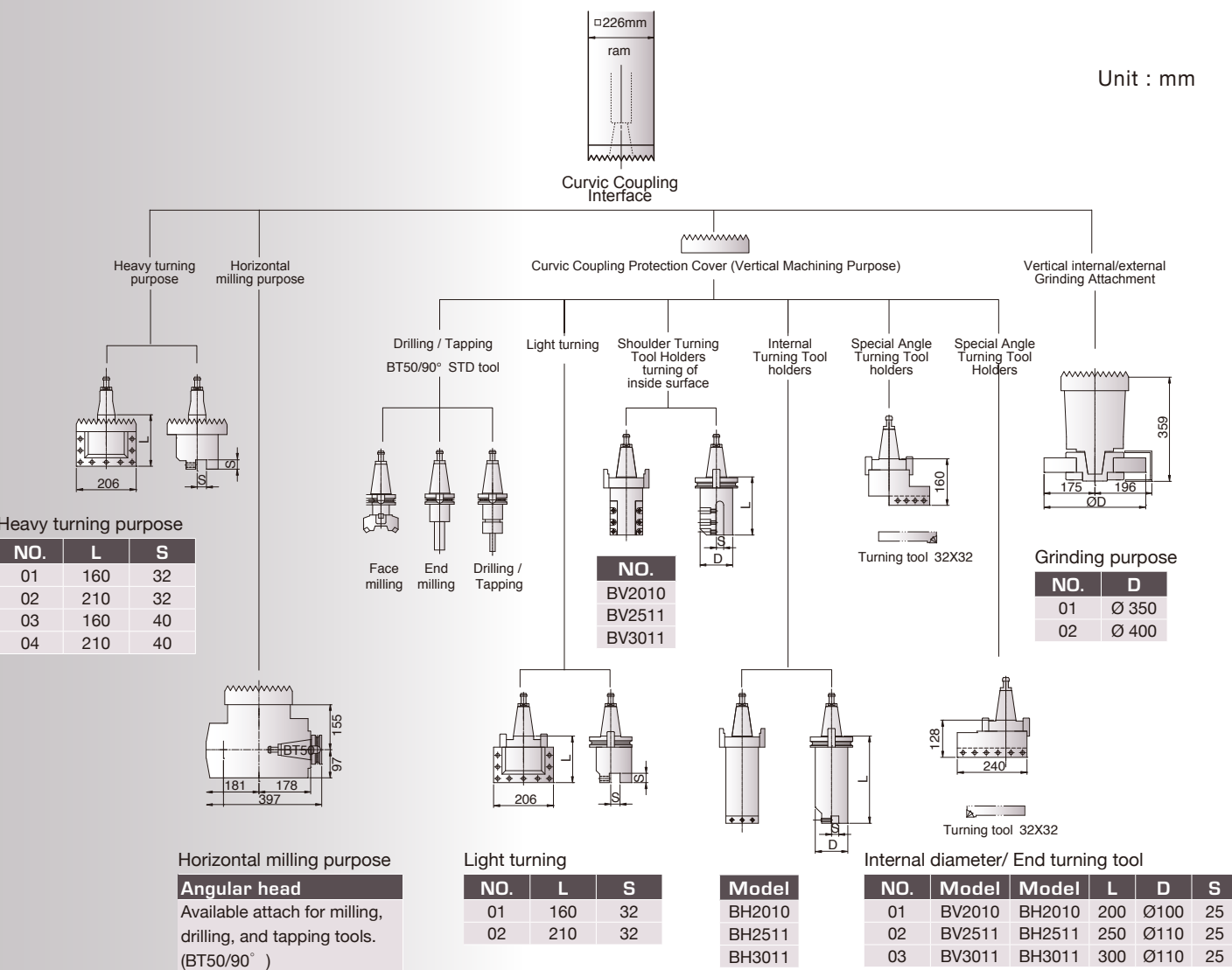
VTC abcd-ef-xxTyyH-G/R/APC



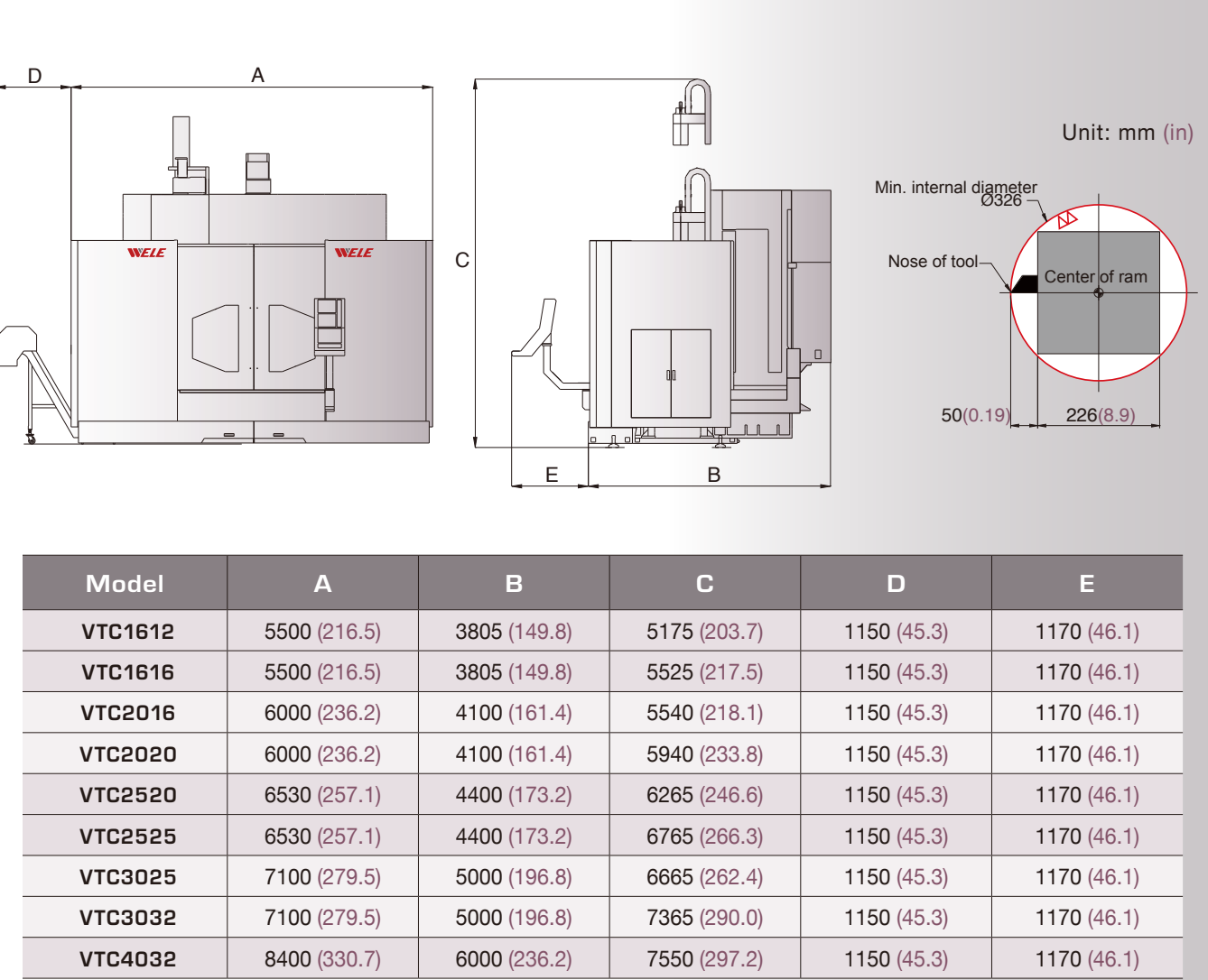
Working Envelope Dimensions



Spindle Configuration



Machine Dimensions and Space Requirement



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Technical Specifications

Specification	Unit	VTC1612-20	VTC-1616-20	VTC2016-24	VTC2020-24	VTC2520-30	VTC2525-30	VTC3025-35	VTC3032-35	VTC4032-48
Machining Capacity										
Turning table diameter	mm(in)	Ø1600 (62.99)		Ø2000 (78.74)		Ø2500 (98.43)		Ø3000 (118.11)		Ø4000 (157.48)
Max. turning height capacity	mm(in)	1200 (47.24)	1600 (62.99)	1600 (62.99)	2000 (78.74)	2000 (78.74)	2500 (98.43)	2500 (98.43)	3200 (125.98)	3200 (125.98)
Max. swing diameter	mm(in)	Ø2000 (78.74)		Ø2400 (94.49)		Ø3000 (118.11)		Ø3500 (137.8)		Ø4800 (188.98)
Distance from table to ram's surface	mm(in)	1400 (55.12)	1800 (70.87)	1800 (70.87)	2200 (86.61)	2200 (86.61)	2700 (106.3)	2700 (106.3)	3400 (133.86)	3400 (133.86)
X axis travel	mm(in)	-810 to 1180 (-31.89 to 46.46)		-1010 to 1380 (-39.76 to 54.33)		-1260 to 1680 (-49.61 to 66.14)		-1510 to 2000 (-59.45 to 78.74)		-2410 to 2600 (-94.88 to 102.36)
Z axis travel	mm(in)	1050 (41.34)	1050 (41.34)	1050 (41.34)	1250 (49.21)	1250 (49.21)	1500 (59.06)	1500 (59.06)	2500 (98.43)	2500 (98.43)
W axis travel	mm(in)	800 (31.5)	1100 (43.31)	1200 (47.24)	1500 (59.06)	1500 (59.06)	1900 (74.8)	1900 (74.8)	2500 (98.43)	2500 (98.43)
Turning Table and Spindle Unit										
Turning table speed	rpm	2~260		2~200		2~140		2~116		1~86
Turning table motor	kW(HP)	37/45 (49/60)		37/45 (49/60)		60/75 (80/100)		60/75 (80/100)		100 (134)
Turning table output torque	Nm(lb-ft)	20063 (14796)		26802 (19766)		52507 (38722)		63009 (46467)		139766 (103072)
Turning table loading capacity	kg(lb)	14000 (30864.72)		18000 (39683.21)		22000 (48501.7)		25000 (55115.57)		50000 (110231.15)
Ram section (square)	mm(in)	226 (8.9)		226 (8.9)		226 (8.9)		226 (8.9)	300 (11.81)	300 (11.81)
Milling spindle motor (Ram)	kW(HP)	11/15 (15/20)		11/15 (15/20)		11/15 (15/20)		11/15 (15/20)		11/15 (15/20)
Milling spindle speed (Ram)	rpm	1600		1600		1600		1600	1200	1200
Milling spindle output torque (Ram)	Nm(lb-ft)	304 (224)		304 (224)		304 (224)		304 (224)		304 (224)
Turning spindle taper		ISO 50		ISO 50		ISO 50		ISO 50		ISO 50
Milling spindle taper (Ram)		ISO 50		ISO 50		ISO 50		ISO 50		ISO 50
Tool Magazine		16T		16T		16T		16T		16T
Feedrate										
X axis rapid feedrate	mm(in/min.)	12000 (472.44)		10000 (393.7)		10000 (393.7)		10000 (393.7)		12000 (472.44)
Z axis rapid feedrate	mm(in/min.)	8000 (314.96)		8000 (314.96)		8000 (314.96)		8000 (314.96)	10000 (393.7)	10000 (393.7)
X/Z axis cutting feedrate	mm(in/min.)	2000 (78.74)		2000 (78.74)		2000 (78.74)		2000 (78.74)		5000 (196.85)
W axis cutting feedrate	mm(in/min.)	2000 (78.74)		2000 (78.74)		2000 (78.74)		2000 (78.74)		2000 (78.74)
Accuracy										
XZ axis positioning accuracy (VDI)	mm(in)	0.015 (0.0006)		0.02 (0.0008)		0.02 (0.0008)		0.025 (0.001)		0.025 (0.001)
XZ axis repeatability accuracy (VDI)	mm(in)	0.008 (0.0003)		0.01 (0.0004)		0.01 (0.0004)		0.012 (0.0005)		0.012 (0.0005)
Cs axis positioning accuracy (VDI)	arcsec	30"/360°		30"/360°		30"/360°		30"/360°		30"/360°
Cs axis repeatability accuracy (VDI)	arcsec	15"		15"		15"		15"		15"
Space requirement										
Machine height (Max.)	mm(in)	5175 (204)	5525 (217.52)	5540 (218.11)	5940 (233.86)	6265 (246.65)	6765 (266.34)	6665 (262.4)	7365 (289.96)	7550 (297.24)
Machine weight (Max.)	kg(lb)	30000 (66138)	34000 (74957)	40000 (88184)	42000 (92594)	44000 (97003)	46000 (101412)	60000 (132277)	65000 (143300)	73000 (160937)

**Product specifications and accessories are subjected to change without notice.

Standard and optional accessories

●: STANDARD ○: OPTION

Item	Model	VTC1612-20	VTC1616-20	VTC2016-24	VTC2020-24	VTC2520-30	VTC2525-30	VTC3025-35	VTC3032-35	VTC4032-48
FANUC 0iTD controller		●	●	●	●	●	●	●	●	●
FANUC 31iB controller		○	○	○	○	○	○	○	○	○
SIEMENS 828 controller		○	○	○	○	○	○	○	○	○
Two steps gear transmission on spindle		●	●	●	●	●	●	●	●	●
4 jaws manual chuck		●	●	●	●	●	●	●	●	●
W axis cross rail up & down driven by dual servo motors		●	●	●	●	●	●	●	●	●
Cross rail up & down clamping in any position by hydraulic system		●	●	●	●	●	●	●	●	●
Counter balance system on cross rail		●	●	●	●	●	●	●	●	●
Ram spindle stepless gear transmission		●	●	●	●	●	●	●	●	●
Torque limit clutch on X, Z and W axis		●	●	●	●	●	●	●	●	●
Twin feedback system on X, Z and W axis		●	●	●	●	●	●	●	●	●
16 pockets puzzle type tool magazine		●	●	●	●	●	●	●	●	●
24 pockets Puzzle type tool magazine		○	○	○	○	○	○	○	○	○
32 pockets Puzzle type tool magazine		○	○	○	○	○	○	○	○	○
Hydraulic system		●	●	●	●	●	●	●	●	●
Penumatic system		●	●	●	●	●	●	●	●	●
Centralized guide ways lubrication system		●	●	●	●	●	●	●	●	●
Coolant system and tank with 420L capacity		●	●	●	●	●	●	●	●	●
Full enclosure guarding system		○	○	○	○	○	○	○	○	○
Spindle cooling system		●	●	●	●	●	●	●	●	●
Recycling collectors for lubrication on X, Z, W axis		●	●	●	●	●	●	●	●	●
Heat exchanger on electrical cabinet		●	●	●	●	●	●	●	●	●
Upgrade to air conditioner instead of heat exchanger on electrical cabinet		○	○	○	○	○	○	○	○	○
Hydraulic unit chiller		○	○	○	○	○	○	○	○	○
Coolant chiller		○	○	○	○	○	○	○	○	○
Operation cycle finish and alarm lights		●	●	●	●	●	●	●	●	●
Work light		●	●	●	●	●	●	●	●	●
Caterpillar type chip conveyor and bucket		●	●	●	●	●	●	●	●	●
Spray hose for chip wash down		●	●	●	●	●	●	●	●	●
Air flush coolant system		●	●	●	●	●	●	●	●	●
Bed coolant flushing system		●	●	●	●	●	●	●	●	●
RS-232 and RJ45 interface		●	●	●	●	●	●	●	●	●
MPG remote handwheel		●	●	●	●	●	●	●	●	●
Technical manuals		●	●	●	●	●	●	●	●	●
Tool kit and foundational bolt		●	●	●	●	●	●	●	●	●
Data server (including 1G Card)		○	○	○	○	○	○	○	○	○
Horizontal head attachment		○	○	○	○	○	○	○	○	○
Automatic Cs axis and 0.001 degree indexing positioning function		○	○	○	○	○	○	○	○	○
Automatic tool length measurement (Blum or Renishaw)		○	○	○	○	○	○	○	○	○
Automatic workpiece measurement (Blum or Renishaw)		○	○	○	○	○	○	○	○	○

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