VSC SERIES

Vertical lathes

VLC 1000
VLC 1250 ECO
VLC 1250 HARD
VLC 1600 ECO
VLC 1600 HARD

TURN
succeed with every turn

About the Company

TDZ Turn s.r.o.

TDZ Trun s.r.o. is a Czech machining company based in Brno specializing in the manufacture of its own series of both **vertical** and **horizontal** lathes.

Since its beginnings in 2006, the company has focused exclusively on the production of robust CNC vertical lathes – **VLC** with clamping space from 800 mm to 4,000 mm.

In 2014, the company's product portfolio was extended with manual horizontal lathes – **HLM** with swing diameters up to 2,000 mm – and with CNC horizontal lathes – **HLC** with swing diameters up to 2,500 mm.

In 2016, the first vertical lathes **VSC** were made, with swing diameter of up to 1,200 mm.

TDZ Turn is primarily active on the Czech, Slovak and German markets where it ranks among the most stable and trusted suppliers of universal machine tools.

VLC vertical lathes are CNC controlled machine tools. These machines are highly versatile, ideal for both co-operative production and dedicated industries. They come in basic (turning) configurations or equipped with rotary tool drives and a controlled C-axis. Optional features include an all-enclosed design and high-pressure cooling. Clamping surface diameters range from 1,000 mm up to 4,000 mm (a swing diameter of 4,600 mm).

VERTICAL VLC LATHES 1000–1600

Vertical VLC lathes in this size are single column, robust and reliable machines. They are suitable for both piece and small to medium batch production, where the use of a hydraulic chuck is recommended. To increase productivity, the machines can be equipped with a more powerful drive.

VLC MACHINE DESIGN

The machine framework consists of the bed and the column. The bed functions as the machine base, housing primarily the main clamping plate cross bearing and the main two-speed gearbox drive. The column with sliding guide surfaces forms the base for the cross slide feed mechanisms repositioning. The cross slide motion is generated by an electric motor via a trapeze thread and a feed nut.

Travelling along the sliding surfaces of the cross slide. the cross slide is designed for continuous control system operated carriages. The clamping plate speed is controlled depending on the position of the cross slide and the clamping plate.

The Z-axis feed ram is of a highly rigid conicoid design. It is located on the guideway of the cross slide suport. The cross slide guideway, cross slide and ram are carefully aligned on the guideways keys to achieve the required accuracy. The holder/tool clamping mechanism is built into the lower section of the ram. The cross slide and ram motions is generated by a servo drive via a clutch and ball screw.

In triaxial machines, the rotary tool drive shaft passes through the ram, propelled by an electric control motor via a two-speed gearbox.

The multi-tool turret (rotary tools and turning holders) is located on the right side of the cross slide. The multi-tool turret is separated from the work area by a hinged cover (door). Automatic tool and holder change in the ram occurs in the turret. The standard (turning) configuration comes with a 12-position turret while the version with driven tools uses a 16-position turret. Optionally, the machine can be fitted with up to a 60-position turret.

VLC “ECO”

The **VLC 1250** and **VLC 1600** vertical lathes are available in **ECO or HARD versions.** Both models feature a grey cast iron bed using premium quality Brazilian ore. ECO machines are designed for standard machining operations and come at a lower purchase price in comparison. They can be equipped with a number of useful optional equipment, but are not available in elevated configurations.

Standard multi-tool turret

32-Position turret

New 2023 design

Fully enclosed design

VLC “HARD”

VLC 1250 HARD and **VLC 1600 HARD** models are designed for heavy-duty machining operations and can also be configured for processing extra high workpieces, with the main drive in Master-Slave design, etc. All vertical VLC lathes with 2000mm clamping plate sizes and higher are avialable in the HARD version.

ECO design

HARD design

MAIN BED, WORKPIECE CLAMPING

Vertical VLC lathes feature a main bed **cross-roller bearing** to handle high radial and axial loads. The main bed is characterized by high thermal stability, low vibration and robust design. The clamping plate assembly consists of a ring gear housing the cross-roller bearing, the main drive pinion and optionally the C-axis mechanism.

A manual clamping plate, a hydraulic chuck and/or a magnetic plate are recommended depending on customer requirements. Depending on the clamping needs, standard vises or other non-standard clamping methods can be recommended.

Cross-roller bearing

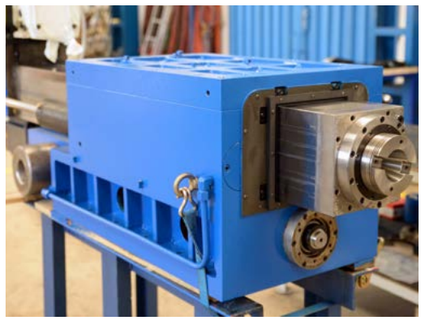
Main bed

Manual clamping plate

ELEVATED DESIGN

The VLC 1250 HARD and VLC 1600 HARD vertical lathes are available in versions with an extended column for high-workpiece machining. Regarding the elevated (higher) design, we recommend using an extended ram travel or a larger cross-section of the conicoid ram.

VLC 1250IIC HARD



Detailed slide view

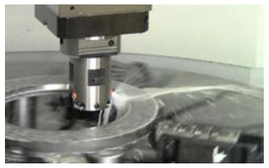
Clamping plate extension segments

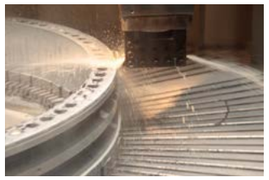
COMPREHENSIVE MACHINING

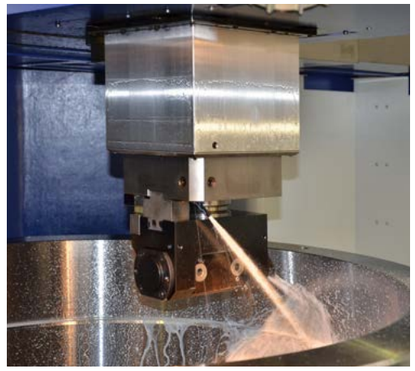
As standard, machines with two controlled axes is designed for turning only. The rotary tool drive, in combination with a third controlled C-axis, facilitates additional machine functions such as drilling, milling, threading or grinding. In addition, the machine functions can be further extended by using an angle head.

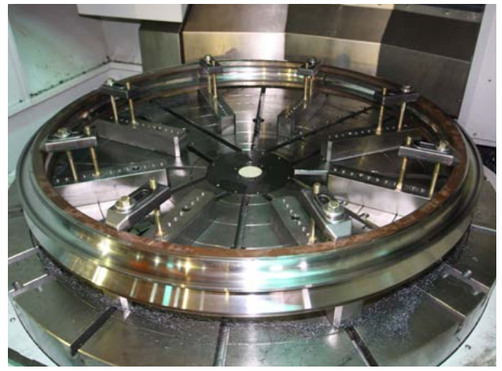
The rotary tool drive enables the 2,500 rpm or 3,000 rpm for auxiliary grinding as standard. The maximum spindle speed can be tripled using a 1:2 or 1:3 acceleration head.

High-output machining is understandably dependent on the performance of the main drive and the clamping plate gearbox. VLC machines come with Siemens drives as standard with the drive output tailored to user requirements.









Equipment and Options

Machine design	
Standard	**Optional**
Sinumerik 828D control system	Sinumerik ONE / FANUC control system
SHOPTURN system programming	Manual guide-I for FANUC control system
10.4" control system panel	15" or more control panel, touch screen, adjustable
Smaller additional control panel - dial (standard)	Sinumerik HT 2 panel
System reports in the customer's language	
Main spindle drive	Increased main drive performance
2-speed main drive gearbox	
Rotary tool spindle drive (triaxial units)	Increased rotary tool spindle performance
2-speed rotary tool drive gearbox (triaxial units)	
Axial feed drives	
Main spindle frequency converter	
Balanced concoid ram	Greater ram cross-section, extended ram travel
Manual clamping plate	Hydraulic chuck, magnetic plate
Clamping vice set	Customized clamping system
12 position multi-tool holder turret (16 positions for triaxial units)	Greater turret capacity
Chip removal conveyor including a chip box	
Work area enclosure	Fully enclosed design
Manually operated work area doors	Automated work area door operation
Cooling system, coolant tank	
6 bar tool cooling pressure	Greater cooling pressure, cooling pressure control, mist extraction
Manual workpiece rinsing - rinse gun	
Automated lubrication of sliding surfaces and ball screws	
Automated cooling of the main bed and main bed bearing	
Linear X-axis measurement (ruler)	
Linear Z-axis measurement (ruler)	
X and Z axis sliding guideways	
Switchboard air conditioning	
Oil separator - oil skimmer	
Cooling emulsion paper filtration	
Network connection set-up	Remote diagnostics
High performance work area led lighting	
Work area light signalling (stop-go)	
Anchoring and installation material	Anchor hole drilling
RAL grey/RAL blue combination coating	
Manuals and technical documentation in the customer's language	
Machine pre-acceptance prior to shipment to the installation site	
Basic operation and maintenance training (8 hours)	Additional operator and maintenance training
Packaging, packaging material	
24-Month warranty	Warranty extension, service contract
Service response within 24 to 48 hours after notification	Earlier service response
	Transport to the place of use
	Machine installation at the place of use
	Delivery and commissioning at the place of use
Tooling	
Standard	**Optional**
Set of 5 standard tool holders	More tool holders, CAPTO tool holders
	Workpiece probe
	Tool probe
	Angle head (triaxial units)
	Auxiliary grinding equipment (triaxial units)

Workpiece probe

Tool probe

Swivel jaws

Tool Holders

- Biaxel holders are clamped into the spindle cavity using the SK50 taper shank as standard.
- Triaxial holders are available in MAS BT 403 or DIN 69871 types
- A set of 5 standard holders is included in the basic machine package

Standard biaxial

L2BB

L2BT

L2ST

L2BH

CAPTO C6 biaxial

L2HH

L2VV

L2VH

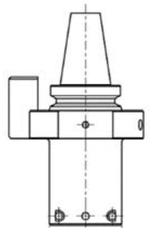
L2LV

L2PV

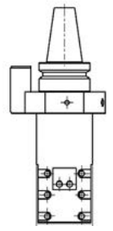
L2XX

Standard triaxial

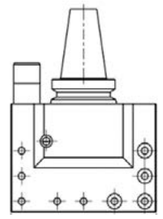
L3BB



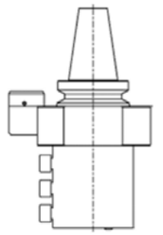
L3BT



L3ST

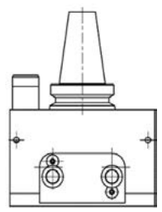


L3BH

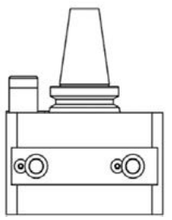


CAPTO C6 triaxial*

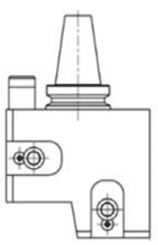
L3HH



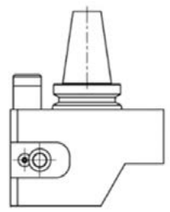
L3VV



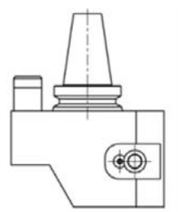
L3VH



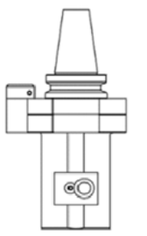
L3LV



L3PV



L3XX



* Illustrative MAS BT 403 holder diagram

Technical Specifications

		VLC 1000	VLC 1000C	VLC 1250 ECO	VLC 1250C ECO	VLC 1250 HARD	VLC 1250C HARD	VLC 1600 ECO	VLC 1600C ECO	VLC 1600 HARD	VLC 1600C HARD
Number of controlled axes		2	3	2	3	2	3	2	3	2	3
Machine design											
Control system		Sinumerik control system with SHOPTURN function									
Workpiece clamping		Manual 4 jaw clamping plate including a vice set									
Multi-tool turret		Automated tool change, off the work area									
Ram unit diameter	**mm**	180 × 180 (220 × 220)		220 × 220 (250 × 250)		220 × 220 (250 × 250)		220 × 220 (250 × 250)		220 × 220 (250 × 250)	
Operating range											
Max. swing diameter	**mm**	1,400		1,600		1,600		2,000		2,100	
Clamping surface diameter	**mm**	1,000 (1,200)		1,250 (1,400)		1,250 (1,400)		1,600 (1,800)		1,600 (1,800)	
Max. workpiece weight	**kg**	5,000		8,000		8,000		8,000		10,000	
Max. workpiece height	**mm**	1,200		1,500		1,500 (1,900, 2,100)		1,500		1,500 (1,900, 2,100)	
Travels											
X-axis travel	**mm**	-400, +720		-100, +835		-600, +875		-100, +1125		-800, +1015	
Z-axis travel (ram travel)	**mm**	800		900 (1,200)		900 (1.200, 1.400)		900 (1,200)		900 (1.200, 1.400)	
Cross slide repositioning	**mm**	500		750		800 (1,200, 1,400)		750		800 (1.200, 1,400)	
Feed											
X-axis fast feed	**mm/min.**	1,200		1,200		1,200		1,200		1,200	
Z-axis fast feed	**mm/min.**	10,000		10,000		10,000		10,000		10,000	
Main spindle (SP1)											
RPM range - 1st gear	**RPM**	1-160		1-140		1-140		1-62		1-62	
RPM range - 2nd gear	**RPM**	160-600		140-400		140-400		62-300		62-300	
S1/S6 rating - 40% *	**kW**	41 / 62		41 / 62		41 / 62		41 / 62		41 / 62	
Max. torque	**Nm**	13,133		13,042		13,042		29,914		29,914	
Rotary tool spindle (SP2)											
RPM range - 1st gear	**RPM**	xxx	1-1,200	xxx	1-1,200	xxx	1-1,200	xxx	1-1,200	xxx	1-1,200
RPM range - 2nd gear	**RPM**	xxx	1,200-2,500	xxx	1,200-2,500	xxx	1,200-2,500	xxx	1,200-2,500	xxx	1,200-2,500
S1/S6 rating - 40% *	**kW**	xxx	7 / 10.5	xxx	7 / 10.5	xxx	7 / 10.5	xxx	7 / 10.5	xxx	7 / 10.5
	Nm	xxx	266	xxx	266	xxx	266	xxx	266	xxx	266
Multi-tool turret											
Type of clamping taper		SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871
Turret capacity		12	16	12	16	12	16	12	16	12	16
Max. tool holder weight	**kg**	50		50		50		50		50	
Maximum tool size	**mm**	40 × 40		40 × 40		40 × 40		40 × 40		40 × 40	
	mm	400		400		400		400		400	
Tool holder replacement time	**sec**	40		40		40		40		40	
Other specifications											
Coolant tank	**L**	550		550		550		550		550	
Machine power supply		3×400 V, 50 Hz		3×400 V, 50 Hz		3×400 V, 50 Hz		3×400 V, 50 Hz		3×400 V, 50 Hz	
Total power consumption	**KVA**	85	105	85	105	85	105	85	105	85	105
Approximate machine dimensions	**mm**	4,600 × 4,000		4,600 × 5,200		5,600 × 4,300		5,300 × 5,500		5,900 × 4,500	
Approximate height	**mm**	4,900		5,200		5,400 (5,800, 6,600)		5,200		5,400 (5,800, 6,600)	
Machine net weight	**kg**	22,000		25,000		36,000 (38,000, 40,000)		27,000		40,000 (42,000, 44,000)	

*More optional equipment available

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