VLC SERIES

Vertical lathes

VLC 2000
VLC 2000 2R
VLC 2500
VLC 2500 2R
VLC 3000
VLC 3000 2R
VLC 4000
VLC 4000 2R

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.

Vertical VLC 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 2000–4000

Single-column units are up to a 2,500mm; diameter; double-column machines are available with a diameter of 3,000 mm and more. Vertical VLC lathes with a diameter of 2000 mm and above are particularly suitable for machining large, tall and heavy workpieces. For increased productivity, a second slide can be added.

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 support is designed for continuous control system operated carriages. The clamping plate speed is controlled depending on the position of the cross slide support 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 support 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 support 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.

SINGLE OR DOUBLE-COLUMN DESIGN

Vertical VLC lathes up to 2,500 mm in size are designed as single-column units. The single-column design has a number of advantages compared to the double-column bolted system. The solid design is decidedly more robust, the quality ribbed construction and hardened guideways ensure maximum rigidity during machining. The double-column design is mostly preferred due to the transport and handling requirements as well as additional material and financial savings.

CONFIGURED FOR CHALLENGING, HIGH-DEMAND MACHINING

All VLC machines with clamping area sizes of 2,000 mm and above are available in the HARD version, maximising the robustness and rigidity of their principal structural components. The model features a grey cast iron bed using premium quality Brazilian ore. Unlike rival products, our columns are of solid design even in the elevated (higher) models suitable for processing particularly tall workpieces.


Single-column design


Double-column design


Robust bed construction


Ribbed design


Column installed on the bed

VARIABLE DESIGN

Vertical VLC lathes with a clamping area of 2000 mm and above are characterized by their variability. Key features include different workpiece clamping methods, a pallet system, multiple tool clamping options, single or double slide units, elevated (higher) models for machining tall workpieces, as well as units equipped with a powerful and highly accurate Master-Slave drive. The possibilities are virtually limitless, with strong emphasis on quality, functionality and practical application.

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.

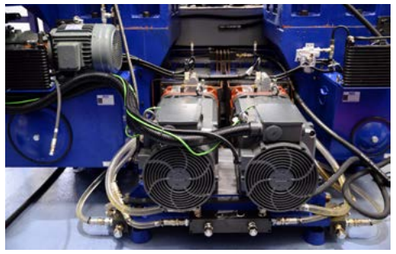
High-output machining is understandably dependent on the performance of the main drive and the clamping plate gearbox. Line VLC machines come with Siemens drives as standard with the drive output tailored to user requirements.

Two-slide design

Up to 60-position turret

Magnetic workpiece clamping

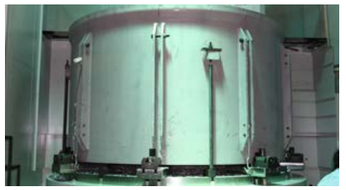
Pallet replacement

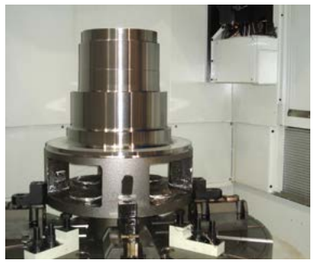


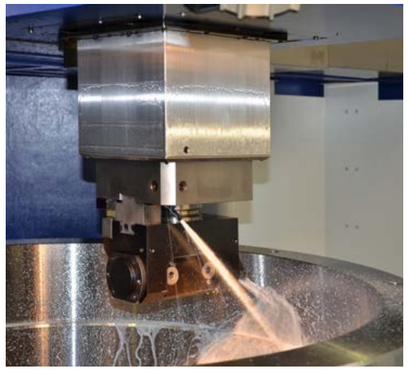
Master-Slave drive

5-point holder clamping

Ergonomic operation







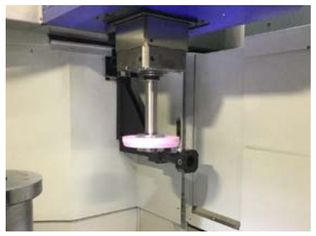
Equipment and Options

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 support and main support 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



Grinder

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

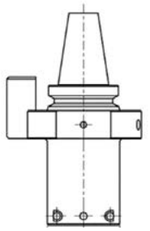
L2LV

L2PV

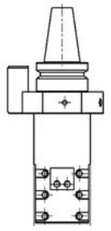
L2XX

Standard triaxial*

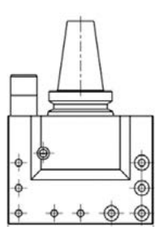
L3BB



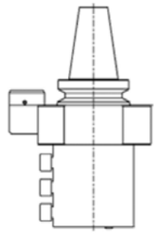
L3BT



L3ST

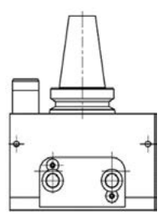


L3BH

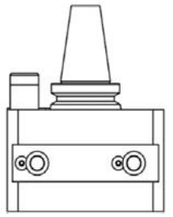


CAPTO C6 triaxial*

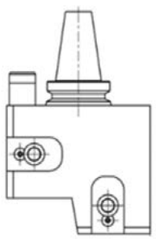
L3HH



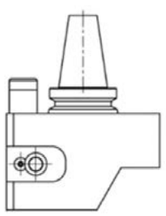
L3VV



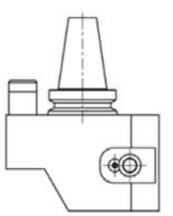
L3VH



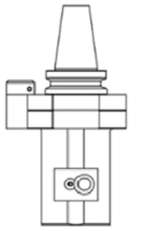
L3LV



L3PV



L3XX



* Illustrative MAS BT 403 holder diagram

Technical Specifications

		VLC 2000	VLC 2000C	VLC 2000 2R	VLC 2000C 2R	VLC 2500	VLC 2500C	VLC 2500 2R	VLC 2500C 2R	VLC 3000	VLC 3000C	VLC 3000 2R	VLC 3000C 2R	VLC 4000	VLC 4000C	VLC 4000 2R	VLC 4000C 2R
Number of controlled axes		2	3	2	3	2	3	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				Manual 8 jaw clamping plate including a vice set											
Multi-tool turret		Automated tool change, off the work area															
Ram unit diameter		220 × 220 (250 × 250)		220 × 220 (250 × 250)		250 × 250 (280 × 280)		250 × 250 (280 × 280)		250 × 250 (280 × 280)		250 × 250 (280 × 280)		250 × 250 (280 × 280)		250 × 250 (280 × 280)	
Operating range																	
Max. swing diameter	mm	2,600		2,600		3,000		3,000		3,600		3,600		4,600		4,600	
Clamping surface diameter	mm	2,000		2,000		2,500		2,500		3,000		3,000		4,000		4,000	
Max. workpiece weight	kg	15,000		15,000		20,000		20,000		30,000		30,000		35,000		35,000	
Max. workpiece height	mm	2,050 (2,450, 2,650)		2,050 (2,450, 2,650)		2,050 (2,450, 2,650)		2,050 (2,450, 2,650)		2,000 (2,600, 3,200)		2,000 (2,600, 3,200)		1,900 (2,500, 3,100)		1,900 (2,500, 3,100)	
Travels																	
X-axis travel	mm	-1,000, +1,350		X2: -1,350, -650 / X1: -50, +1,350		-900, +1,600		X2: -1,600, -650 / X1: -50, +1,600		-1,500, +1,825		X2: -1,650, -700 / X1: -50, +1,650		-2,000, +2,500		X2: -2350, -700 / X1: -50, +2,350	
Z-axis travel (ram travel)	mm	950 (1,200, 1,400)		950 (1,200, 1,400)		1,200 (1,200, 1,400)		1,200 (1,200, 1,400)		1,500		1,500		1,500		1,500	
Cross slide repositioning	mm	1,150 (1,550, 1,550)		1,150 (1,550, 1,550)		1,150 (1,550, 1,550)		1,150 (1,550, 1,550)		1,200 (1,400, 2,000)		1,200 (1,400, 2,000)		1,200 (1,400, 2,000)		1,200 (1,400, 2,000)	
Feed																	
X-axis fast feed	mm/min.	12,000		12,000		12,000		12,000		12,000		12,000		12,000		12,000	
Z-axis fast feed	mm/min.	10,000		10,000		10,000		10,000		10,000		10,000		10,000		10,000	
Main spindle (SP1)																	
RPM range - 1st gear	RPM	1-50		1-50		1-40		1-40		1-40		1-40		1-14		1-14	
RPM range - 2nd gear	RPM	50-220		50-220		40-180		40-180		40-120		40-120		14-80		14-80	
S1/S6 rating - 40% *	kW	85/128		85/128		85/128		85/128		58/87	2 × 41/62	58/87	2 × 41/62	110/165	2 × 85/128	110/165	2 × 85/128
Max. torque	Nm	62,362		62,362		76,998		76,998		97,740	92440	97,740	92440	243,000	375,840	243,000	375,840
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	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	xxx	1,200-2,500	xxx	1,200-2,500	xxx	1,200-2,500
S1/S6 rating - 40% *	kW	xxx	11/17	xxx	11/17	xxx	11/17	xxx	11/17	xxx	11/17	xxx	11/17	xxx	17.5/26	xxx	17.5/26
Max. torque	Nm	xxx	720	xxx	720	xxx	720	xxx	720	xxx	720	xxx	720	xxx	946	xxx	946
Multi-tool turret																	
Type of clamping taper		SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871	SK50	BT50/DIN69871
Turret capacity		12	16	12 × 2	16 × 2	12	16	12 × 2	16 × 2	16		16 × 2	16 × 2	16		16 × 2	16 × 2
Max. tool holder weight	kg	50		50		50		50		50		50		50		50	
Maximum tool size	mm	40 × 40		40 × 40		40 × 40		40 × 40		40 × 40		40 × 40		40 × 40		40 × 40	
Max. tool holder height	mm	380		380		380		380		380		380		400		400	
Tool holder replacement time	sec	40		50				50				60				60	
Other specifications																	
Coolant tank	L	900		900		1,100		1,100		2,000		2,000		2,500		2,500	
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		3 × 400 V, 50 Hz		3 × 400 V, 50 Hz		3 × 400 V, 50 Hz	
Total power consumption	KVA	115	130	125	150	115	130	125	150	115	185	135	170	130	200	165	215
Approximate machine dimensions	mm	6,900 × 4,700		7,900 × 4,700		7,600 × 5,200		8,600 × 5,200		11,000 × 8,700		12,000 × 8,700		12,500 × 10,000		13 500 × 10 000	
Approximate height	mm	6,300 (7,100, 7,700)		6,300 (7,100, 7,700)		6,700 (7,100, 7,700)		6,700 (7,100, 7,700)		6,700 (7,100, 7,700)		6,700 (7,100, 7,700)		7,400 (8,000, 8,600)		7,400 (8,000, 8,600)	
Machine net weight	kg	55,000 (57,000, 59,000)		60,000 (62,000, 65,000)		62,000 (64,000, 66,000)		67,000 (70,000, 73,000)		72,000 (82,000, 92,000)		78,000 (85,000, 95,000)		102,000 (112,000, 124,000)		108,000 (115,000, 127,000)	

*More optional equipment available

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11/2023