



**SORALUCE**

# VTC | VERTICAL TURNING CENTRES



## VERTICAL TURNING CENTRES

# PRECISION



## VTC VERTICAL TURNING CENTRES

The VTC range has been designed to create new high standards of turning and machining capability for users in the most demanding industries.

Proven performances in combining turning, milling, drilling and grinding operations with high precision and mass productivity have created an important position for the VTC range in the following industries: aerospace, railways, power generation, marine, large precision bearings, mining, valves and subcontracting.

# High precision, multifunction machine

## BACKGROUND CONCEPTS

### RIGIDITY

The VTC machines are extremely rigid. The main elements of the machine such as the base, the columns and the cross rail are ribbed castings providing a high degree of stability to the machine assembly. They are fully stress relieved prior to final machining to enable the machine's structure to absorb the stresses and dampen the vibrations induced by cutting forces even under the heaviest cutting conditions. The RAM is made from a normalised steel forging, induction hardened and precision ground.

### Multifunction machine

Combining turning, milling, drilling, grinding and special measuring devices in a single machine tool has generated considerable interest in SORALUCE's VTC range. SORALUCE has also designed and manufactured several special new heads/spindles for customised milling applications, such as head with Y axis and head with B axis.



### Accuracy

The VTC range is optimised to achieve excellent machining results regarding dimension accuracy and surface finish performing the best results for X, Z and C axes positioning and reducing deformations due to thermal expansion.

### Thermal stability

The machines design and their structural cast iron components, enable a high thermal stability face to temperature changes caused by the main motor, ram motor, etc. During every machine test, we check that those thermal expansions do not affect the quality of the machining.

### Hydrostatic

SORALUCE has developed the VTC-H range in order to meet the market demand for the large diameter Vertical Turning Centres.

Hydrostatic technology has been applied in the following areas of the machine:

- Hydrostatic slideways are used in both the X and Z axes.
- The table is supported radially and axially by hydrostatic elements.

# CONSTRUCTION CHARACTERISTICS

## MAIN SPINDLE

The main spindle is driven from the motor through a two-speed “epicycloidal” gearbox. From this, the drive to the spindle is provided through a gear reduction transmission.

A pressurised re-circulating oil lubrication system ensures adequate lubrication for the main spindle gearbox and the table bearing. This oil is cooled to ensure thermal stability and minimise table thermal growth, an oil chiller unit is also provided.

The C axis positioning and repeatability, produces highly accurate parts during milling and drilling operations.

## Manual table

The chuck is casting or steel made, depending on the required turning speed. T-slots allows to clamp a huge range of different pieces, with 4 or 8 jaw boxes.

## Automatic table

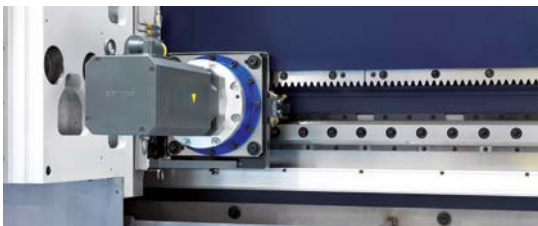
The automatic chuck allows to clamp quickly and easily a piece. Additionally, the pressure of the blocking jaws is controlled in order to adequate the clamping force to each piece.

# VTC 2100/2500/2800/3200/4000

## TRAVERSE

The cross rail is positioning each 200 mm and blocked hydraulically in order to guarantee repeatability. The movement is done by means of hydraulic cylinders.

## X AND Z AXES



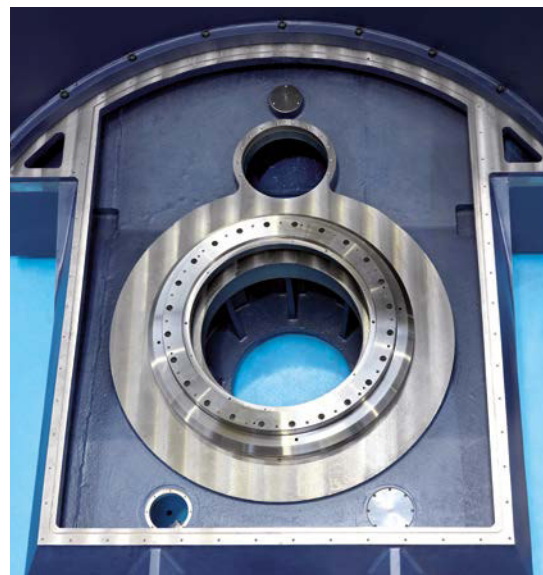
The slideways design is based on roller guidance system for both X and Z axes. These SORALUCE designs enable the maximum rigidity avoiding any stick slip effect and improving interpolation results.

The transmission system is developed with double rack and pinion system. This system eliminates any positioning error due to the backlash and long ballscrew deformations.

The RAM design optimises thermal expansion and provides the maximum rigidity. The vibration and dampening mechanism developed by SORALUCE is fully integrated with the slideways and optimised to give the best turning results.

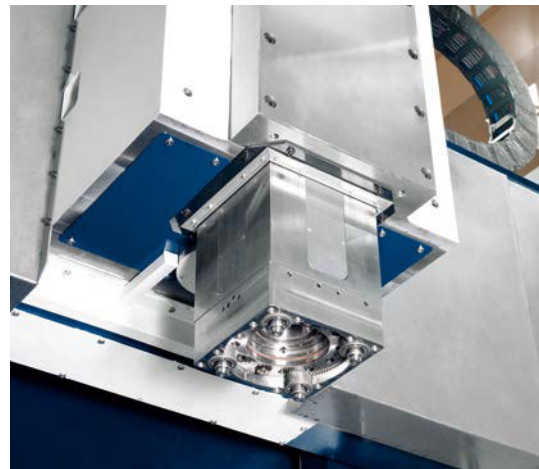
## TABLE

The rotary table is directly mounted on a high precision crossed roller bearing. The SORALUCE design enables highest accuracy and rigidity for hard vertical turning operations. The main crossed roller bearing is assembled one by one based on SORALUCE expertise in this field.



## MOTORISED RAM

Main axis is mounted on high precision bearings. This axis is highly balanced and distance between bearings is optimised in order to avoid critical speed of the axes. For milling operations with the straight milling head, coolant is going directly through the axis. For maintenance purpose, the axis is easily demountable.



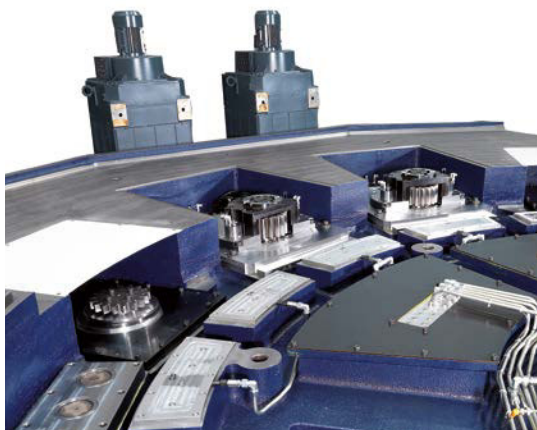
## VTC-H 5000-H/6000-H/8000-H

### TRAVERSE

The cross rail is positioning each 200 mm and blocked hydraulically in order to guarantee repeatability. The movement is by means of ballscrews and servomotors, working together with a hydraulic counterbalance system.

### TABLE

The table is directly mounted on a hydrostatic bearing system. SORALUCE offers different range of hydrostatic bearing systems depending on the axial load as well as the peripheral speed requested case by case. SORALUCE designs cover cases from a single hydrostatic axial bearing system to double / triple systems. Additionally SORALUCE developments ensures an easy maintenance of hydrostatic systems.



### X AND Z AXES



The slideways design is based on full hydrostatic system for both X and Z axes. These SORALUCE designs enable the maximum rigidity for heavy turning work.

The transmission system is developed with double rack and pinion system. This double system eliminates any positioning error due to the backlash and long ballscrew deformations.

The RAM design optimises thermal expansion and provides the maximum rigidity. SORALUCE implements a full hydrostatic mechanism for the slideways, offering maximum rigidity and vibration dampening.

## TOOL HOLDERS AND HEAD CHANGE

Tool-holders and milling heads are positioned by a Hirth coupling and blocked by 4 hydraulic clamping devices. With this system, we guarantee high degree of repeatability and coolant and fluids fluent recirculation without leakage.



▲ Tool holders for modular tools: Capto, KM...



▲ Part probing system



▲ ATC (Automatic Tool Changer)



▲ Tool presetting system



▲ Straight and 90° milling heads for live tools



  
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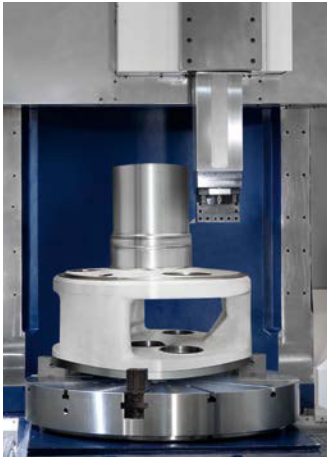


## TECHNICAL SPECIFICATIONS VTC

CHARACTERISTICS		VTC-2100	VTC-2500	VTC-2800	VTC-3200	VTC-4000
Table diameter	mm	1800	2100	2400	2800	3500
Turning diameter	mm	2100	2500	2800	3200	4000
Table speed	rpm	320	260	200	175	100
Table drive motor	kW	55 / 71 / 92				
Max. work piece weight	kg	17000	20000	25000	30000	50000
RAM size	mm	250 x 250				
RAM stroke "Z"	mm	1500				
Maximum height table to RAM	mm	1870 / 2270 / 2670 / 3070		1800 / 2200 / 2600 / 3000		1782 / 2182 / 2582 / 2982
RAM traverse "X"	mm	2470	2870	3330	3730	4600
Vertical traverse of cross rail, "W" traverse	mm	800 / 1000				
Live spindle power	kW	22 / 30 / 37 / 40				
Live spindle speed	rpm	3000				
Standard ATC	tool	18 / 2 x 18				
Approx. weight	kg	55000	70000	80000	90000	120000

CHARACTERISTICS		VTC-5000-H	VTC-6000-H	VTC-8000-H
Table diameter	mm	4000	5000	7000
Turning diameter	mm	5000	6000	8000
Table speed	rpm	60	60	35
Table drive motor	kW	55 x 2 / 71 x 2 / 92 x 2		
Max. work piece weight	kg	80000	100000	150000
RAM size	mm	300 x 300	300 x 300 / 400 x 400	
RAM stroke "Z"	mm	2000		
Maximum height table to RAM	mm	3250 / 3600	3600 / 4650	4650 / 6200
RAM traverse "X"	mm	5600	6600	8800
Vertical traverse of cross rail, "W" traverse	mm	2000	2000 / 3500	
Live spindle power	kW	30 / 37 / 40	37 / 40	
Live spindle speed	rpm	3000 / 2000	2000 / 1500	
Standard ATC	tool	18 / 2 x 18		
Approx. weight	kg	150000	180000	220000

# FLEXIBILITY: TURNING, MILLING, GRINDING, DRILLING, MEASURING



▲ Gearbox body turning



▲ Engine casing turning / drilling



▲ Generator housing turning / drilling / milling



▲ Ring turning / milling / drilling



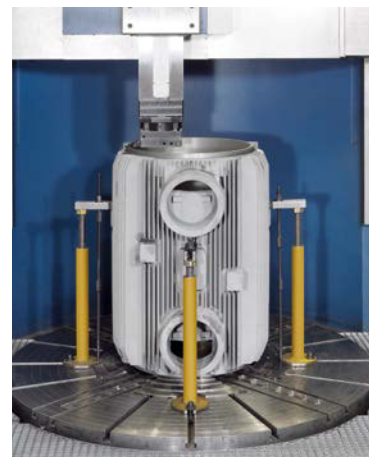
▲ Rotor turning



▲ Marine propeller turning / boring / milling



▲ Ring turning / grinding



▲ Mechanical industry part turning / milling



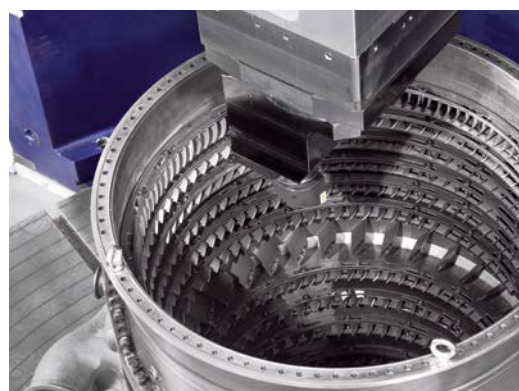
▲ VTC Vertical turning centres



▲ Motor housing turning / drilling



▲ Gear turning



▲ Aerospace motor compressor turning / grinding / measuring



# SORALUCE GLOBAL SOLUTIONS



Bed type milling centre



Floor type multi-function milling boring machines



Multitasking milling-turning centre



Fixed table travelling column milling machines

## YOUR LIFECYCLE PARTNER



**PROJECT  
MANAGEMENT**



**PERSONNEL  
TRAINING AND  
PRODUCTION  
ASSISTANCE**



**TECHNICAL  
ASSISTANCE BY  
LOCAL SERVICE  
ENGINEERS**



**SPARE PARTS  
MANAGEMENT**



**MINIMUM  
RESPONSE TIME**

**DANOBATGROUP**

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