

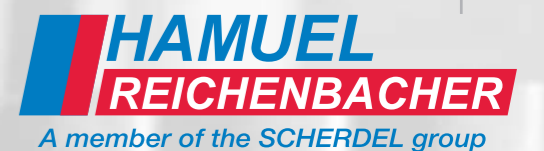
MACHINE TYPE:	HSTM	1000 XL	1500 XL	2000 XL
Measuring systems				
Linear axes X / Y / Z		Absolute linear glass scale		
Rotary axes A / B / C		Absolute rotary encoder		
Tool data				
Tool holder	HSK-A	63		
Max. tool diameter	mm	80		
Max. tool length	mm	250		
Max. tool weight	kg	6		
Tool magazine (disk)	Places	24 (36 optional)		
CNC controller				
SIEMENS		Sinumerik 840D		
Work piece spindle A / C				
Interface fixture similar	HSK-B	100		
Torque (S1)	Nm	1.050		
Speed max.	min ⁻¹	180		
Optional:				
Interface fixture	HSK-B	160		
Torque (S1)	Nm	1.650		
Speed max.	min ⁻¹	125		
Cooling lubricant				
Spindle, outer low pressure		40 l/min at 3 bar		
Cabin flushing (optional)		150 l/min at 3 bar		
Spindle, inner high pressure (optional)		38 l/min at 40 bar		
Minimum quantity lubrication, outside (optional)		Yes		
Chip disposal				
Chip conveyor		Front transverse		
Machine weight				
Transport weight, approx.	kg	22.000	25.000	28.000
Machine dimensions				
Length (inc. chip conveyor), approx.	mm	7.500	8.500	9.500
Width, approx.	mm	3.750	3.750	3.750
Height, approx.	mm	4.095	4.095	4.095

Technical changes and further developments are reserved.

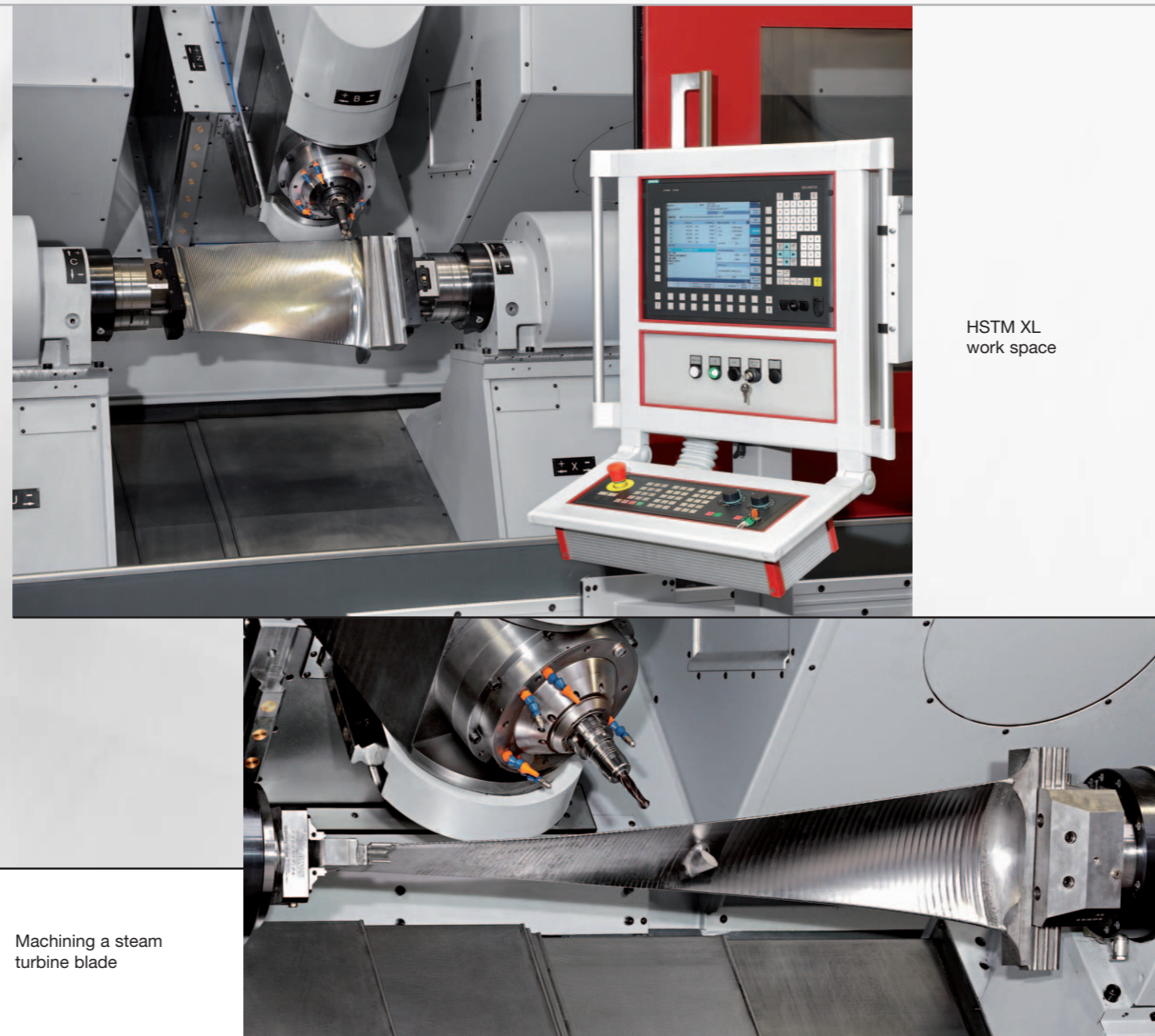


CNC turning milling centre
HAMUEL
HSTM XL series

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CNC turning milling centre
HAMUEL
HSTM XL series



HSTM XL
work space

Machining a steam
turbine blade

CNC turning milling centre HSTM XL series

The turning milling centre with horizontal work piece arrangement is particularly suited for machining turbine and compressor blades, blisks and/or radial compressors. The work area is inclined to the front at an angle of 45° to ensure optimal mass distribution, excellent loading options and impressive view of the machining layout. The machine meets the highest requirements for modern blade machining with regards to achievable accuracy and surface quality. The robustness and rigidity, together with integrated HSC support, ensure peak productivity. The compact design of the machine enables rapid and flexible erection at the customer without particular requirements regarding foundation characteristics.

Machine design

The machine consists of a single machine base on which all components are optimally positioned for the machining of horizontally clamped work pieces. The inclined construction of the roller-guided linear axes in the machine room guarantees excellent removal of chips. This can be additionally sup-

ported by the optional workspace flushing. Standard interfaces on the rotary axes and peripheral components are essential features of this machine, designed for peak productivity.

Slides carry both work piece spindles A and C on the front transverse X axis, the work piece is clamped between these spindles with suitable clamping devices. Both slides can be moved relative to one another to simplify loading/unloading. After the work piece is mounted, both work piece spindles are synchronized with regards to angle of rotation and linear movement by the NC so that no torsional deformation can act on the work piece during milling.

While the work piece is linearly positioned with X and rotationally with A/C, the tool is driven by the motor spindle in the linear axes Y and Z and the swiveling axis B. To change the tool, the motor spindle moves to the tool changing position and is swiveled through 90° so that the tool change can be implemented with a double gripper.

Milling spindle

The extremely powerful motor milling spindle supplies a high performance potential for the machining of a wide range of work pieces, ranging from high-temperature resistant alloys, titanium and steel to aluminum.

All cooling and lubrication options are available for the milling process. All variants can be selected, ranging from classic wet machining, dry machining, high pressure cooling through the spindle and minimum quantity lubrication. The machine comes equipped as standard with two oil and emulsion mist separator devices.

Work piece spindles

Both work piece spindles, A-axis and C-axis are mounted on roller bearings as standard, and are driven directly by a torque motor. Hydrostatic bearings are also an option.

Measuring systems

Absolute scales are used in the linear axes X, Y and Z and direct absolute encoders in the A and B axes, both from Heidenhain. These meet even the highest of requirements for 5-axes machining of work pieces, particularly turbine blades.

Feed drives

Maintenance-free frequency-controlled three-phase motors with digital interfaces (control) for CNC control are used in all axes.

Lubrication

All ball screw spindles and guides are supplied with grease at specific intervals. The B axis is also lubricated. The motor spindle is lubricated for life.

Safety devices

All safety devices and operating points comply with specified EU directives. The machine is CE certified.

Setting up the machine

One-piece transportation (crane hook machine) means that rapid installation and commissioning of the machine is possible and rapid availability for production start is guaranteed.

TECHNICAL DATA

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HAMUEL
HSTM XL series

MACHINE TYPE:	HSTM	1000 XL	1500 XL	2000 XL
Milling spindle				
Speed range	min ⁻¹		15.000	
Key speed	min ⁻¹		3.800	
Spindle power (S1)	kW		54	
Spindle torque (S2)	Nm		136	
Work piece dimensions				
Max. blade length without fixture	mm	1.075	1.575	2.075
Blade width / interference zone	mm	650/700	650/700	650/700
Max. work piece weight	kg	200	250	300
Main axes				
X-axis	mm	1.400	1.900	2.400
Y-axis	mm	700	700	700
Z-axis	mm	830	830	830
B-axis (tool rotary axis)	Degree	± 95°	± 95°	± 95°
A-axis (work piece spindle 1)		endless	endless	endless
C-axis (work piece spindle 2)		endless	endless	endless
Positioning accuracy to VDI/DGQ 3441				
X-axis (P/Ps)	mm		0.015/0.008	
Y-axis (P/Ps)	mm		0.015/0.008	
Z-axis (P/Ps)	mm		0.015/0.008	
A-axis (P/Ps)	Degree		0.003	
B-axis (P/Ps)	Degree		0.003	
C-axis (P/Ps)	Degree		0.003	
Travel speeds				
X-axis	m/min		40	
Y-axis	m/min		40	
Z-axis	m/min		40	
B-axis	min ⁻¹		50	
A-axis (HSK-B 100)	min ⁻¹		180	
C-axis (HSK-B 100)	min ⁻¹		180	
Optional:				
A-axis (HSK-B 160)	min ⁻¹		125	
C-axis (HSK-B 160)	min ⁻¹		125	