Auftragsbestätigung: 30038908

10	1 PC	T7 Magnum 1R 40/530/3200/12

Hedelius moving column machining centre Tiltenta 7 Magnum with NC-controlled, continously tilting, main spindle, 5-axes CNC-control Heidenhain iTNC 530, 22.00 kW/117 Nm main spindle drive 50-12,000 min-1, 50-station tool changer and in the fixed machining table integrated NC rotary table.

Traverse path:
X-axis V/H**: 3,200/2,630 mm
Y-axis: 750 mm
Z-axis V/H**: 695 / 800 mm
Distance between table and spindlenose:
Spindle vertical: 20 - 715 mm
Spindel horizontal: 200 - 1000 mm
Swivelling range: -98° to 98°
Face plate Ø: 750 mm

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Oscillating mode V*: 2 x 1330 mm
Feed rate X,Y,Z: 0-40/40/40 m/min

** vertical/horizontal

20 1 PC Machine decription T7-3200/ 1R Magnum

System Characteristics: Travelling Column Machining Centre (compliant with EN 12417 :2001+A2: 2009) with a 50 slot tool magazine, continuous swivelling main spindle and fixed, in-built machining table with integrated NC rotary table.

Application: for 2D, 2½D and 3D processing of steel, grey cast iron and metal workpieces in general machine, fixture and vehicle construction.

Swivelling Spindle: NC-controlled, continuous swivelling main spindle, including hydraulic clamping.
Technical Data:

Swivelling Range:	- 98° - +98°*
Swivelling Time 90°:	2.0 sec
Swivelling Accuracy:	<± 5"
Swivelling Turning Force:	2,400 Nm
Clamped Holding Torque:	4,200 Nm

NC Rotary Table: NC rotary table integrated into the machining table with hydraulic clamping and transformation for 5-side processing.
Technical Data:

Table Diameter:	750 mm
Swing Circle:	1,100 mm
Axial Runout Accuracy	0.015 mm
Drilling:	42H7 mm
T-Grooves:	18 mm
Aligning Groove:	18H8 mm

Number of T-Grooves: 7
Distance between T-Grooves: 100 mm
Component Accuracy: ± 5"
Max RPM: 8 min-1
Drive Torque: 2,800 Nm
Clamped Holding Torque: 6,000 Nm
Max Clamping Load: 800 kg

Operating Modes: As standard, the machine is equipped with the following operating modes: 1 and 2 pursuant to DIN EN 12417:2009-07.

Machine Bed: Torsion resistant, low stress annealed construction with in-built hollow chamber and grid-like machine table console for optimal chip collection. Heat treated in accordance with DIN 50049-3.1B.

Feed Slides: Strongly ribbed and vibration dampening grey cast iron feed slides for the X, Y and Z axes.

Main Spindle: Water-cooled CELOX motor spindle with SK 40 tool holder, hydraulically-operated tool clamping system and automatic cone exhaust.

Z-axis temperature structure shift:
-Celox Motor Spindle: + 0.0025 mm/1000 min-1 each in S1 continuous operation

Thermal Structure Shifts:
The energy released by the motors, heat radiation, changes in ambient temperature in the halls, changes to the cooling lubricant temperature and build-ups of hot chips can all contribute to structural shifts (through heating). To compensate for this, you should use a 3D workpiece measuring sensor, as well as a workpiece sensor (optional extras). To reduce the build-up of heat, cold water

preheating systems are available for Celox Motor Spindles.

Calibration: Tools and tool holders must generally be calibrated according to the state of the art. What calibration levels (in accordance with DIN7ISO 1940) are necessary and desir- able should be determined in each individual case, given that the necessary grades depend on the tool's rotation speed and weight.

Fixed Machining Table: Extremely durable, two-part grey cast iron machining table with 7x 18 mm T-slots. The middle T-slot is an 18H8 aligning groove.

Coolant/Chip Catcher: Leakproof chip con- veyor which continually removes any chips/shavings, complete with coolant pump, electrical connection and multifunc- tional controls integrated into the terminal.
Type: Scraper conveyor
Max Chip Length: 80 mm
Approx Discharge Height: 1050 mm
Pump: 1 bar/100l/min
Discharge Side: Right-hand side

Guidance System: Linear guidance system designed for high travel speed and chip/shaving volumes.

Feeding System: High dynamic digital three phase servo motors and polished ball screws on the X, Y and Z axes.

Spindle Positioning: Freely programmable spindle positions (orientated spindle position).

Coolant Supply: Coolant jets positioned in a semi-circle around the spindle tip for optimal

coolant supply to the tools.
-Centralised high pressure coolant supply system available as an optional extra!

Tool magazine: travelling tool magazine with directional logic and a double gripper that swings into the work room*.
Max Tool Weight: 5 kg
Max Tool Length: 330 mm
Capacity: 50 pcs.
Max Tool Diameter: 75 mm**
Swarf to swarf time
Vertical*** approx.: 10,5 sec
Horizontal *** approx.: 13,5 sec
*
When changing tools above the work piece, pay attention to the operational instructions.
**
100 mm where adjecent pockets are empty
***
With preselected following tool

Measuring System: Enclosed Heidenhain Length measuring devices with optical scanning on the X, Y and Z axes, incremental angle measuring on the B and C axes (swivelling head).

Switching Cabinet: Switching cabinet integrated into the machine's housing, complete with cabinet cooling and heating system.

Machine Housing: Completely closed machine housing with easy-handling sliding doors, polycarbonate safety glass and removable service side elements (approx 460 x 880 mm).

Workroom Lighting: Shockproof and

coolant-proof workroom lighting.

Central Lubrication: Fully-automated centralised lubrication along the X, Y and Z axes, oil bath lubrication on the B and and C axis.

Finish: 2-Component structured paint.
Machine: RAL 7016 (anthracite grey)
Casing: RAL 9002 (grey-white)
Doors: RAL 3003 (ruby red)
Spindle Hood: RAL 3003 (ruby red)

Accessories: Programming manual, operation manual, machine assembly elements

30 1 PC Heidenhain iTNC 530 - T-range

Components:
Main computer MC 7222
Controller unit CC 610X
Control panel
TFT colour flat panel display 15 inch

Program memory: Hard disk with approx. 21 GByte program memory

Block processing time 3D straight line without radius compensation >=0.5 ms

Input resolution and display step:
Up to 1 µm for linear axes
Up to 0.001° for rotary axes

Number of axes:
3 out of 3 interpolating linearly
Optional 4 out of 4 interpolating linearly
Optional 5 out of 5 interpolating linearly
2 interpolating circularly
Helix interpolation

Digital current and spindle speed control

Program input HEIDENHAIN conversational format, DIN/ISO and smarT.NC

Look Ahead function: The control system checks directional changes in advance for up to 99 blocks. The feed rate is automatically adjusted to suit the machine's dynamics.

Error compensation: Linear and non-linear axis errors, backlash, reversal spikes with circular movement, stick-slip friction

Position entry: Nominal positions for lines and arcs in Cartesian coordinates or polar coordinates; Dimensions absolute or incremental, Display and entry in mm or inches; Handwheel path display when machining with handwheel superimpositioning

Tool compensation: Tool radius in the machining plane and tool length Radius-compensated contour advance calculation for up to 99 blocks (M120); Three-dimensional tool radius compensation for later changes to tool data without having to recalculate the program

Tool tables: Multiple tool tables with up to 999 tools

Cutting data tables: for automatic calculation of spindle speeds and feed rates from tool-specific data (cutting speed, feed per tooth)

Constant contour speed: Relative to the path of the tool centre Relative to the tool's cutting edge

Parallel operation: Create program with graphic

support while a different program is being executed

3D machining: Reduced feed rate during plunging (M103); Especially jerk-free motion control; 3D tool compensation via surface normal vector; Keep tool perpendicular to the contour; Tool radius compensation perpendicular to the tool direction; Spline interpolation

Contour elements: Linear, chamfer, circular path, circle centre, circle radius; Tangentially connecting circular path; Corner rounding

Approaching and departing the contour: via straight line: Tangential or perpendicular; Contour: via circle

FK free contour programming: FK free contour programming in HEIDENHAIN conversational format with graphic support for workpieces not dimensioned for NC

Program structure: Sub-programs, program section repeat, any desired program as sub-program

Machining cycles: Cycles for drilling, deep drilling, reaming, boring, countersinking tapping with and without floating tap holder, cycles for milling inside and outside threads, multi-operation machining of straight and circular pockets, cycles for clearing level and oblique surfaces, multi-operation machining of straight and circular slots, linear and circular point patterns, contour train, contour pocket including contour-parallel, OEM cycles special machining cycles created by the machine manufacturer can also be integrated

Coordinate transformation: Datum shift, rotation, mirror image, scaling factor (axis-specific), tilting of the working plane

Q parameters: (programming with variables) Mathematical functions =, +, -, *, /, sin, cos, tan, arc sin, arc cos, arc tan, an, en, ln, log, logical operations (=, =/, <, >), parentheses, absolute value of a number, constant ?? (pi), negation, truncation of digits before or after decimal point, functions for calculation of circles, functions for text processing

Programming aids: Calculator, list of all current error messages, context-sensitive help function for error messages, graphic support for the programming of cycles, comment and structure blocks in the NC program

TNC guide: The integrated help system, user information is available directly on the iTNC 530.

Teach-In: Actual positions are transferred directly into the NC program

Test graphics (dependent on working space selected): Graphic simulation before a program run, even while another program is running
Plan view / projection in 3 planes / 3D view
Magnification of details

3D line graphics: For checking of programs created externally

Programming graphics (dependent on working space selected): In the "Programming" mode, the NC blocks are drawn on screen while they are being entered (2D pencil-trace graphics), even while another program is running

Machining time: Calculation of the machining time in the Test Run mode of operation, display of the current machining time in the Program Run operating modes, tool switch-over times are not taken into account.

Returning to the contour: Mid-program start-up in any block in the program, returning to the calculated nominal position to continue machining Program interruption, contour departure and return

Datum tables: multiple datum tables

Preset tables: a preset table for machine-specific reference points

Data interfaces: One V.24 (RS-232) and V.11 (RS-422) each, max. 115 kBit/s;
Fast ethernet interface 100 BaseT,
extended data interface with LSV-2 protocol for external operation of the iTNC 530 via data interface (ethernet) Heidenhain TNCremoNT software (TNCremoNT is not included in the scope of delivery)

USB interfaces at control panel

ECO MODE: Intelligent stand-by control for avoiding unnecessary energy intake via timed switching-off of unused units.

40 1 PC Spindle rpm 12000/29,0 KW

Upgrade the machine with a watercooled Celox spindle motor.
Spindle power: 29,0 kW/183 Nm
Spindelspeed: 12000 min-1
Tool Holder: SK40/DIN69871-A40

50 1 PC Extended Swivelling Range iTNC530/T

Extension of main spindle swivelling range to ± 98° including collision protection software.

60 1 PC Hand control unit HR 410

External hand held control unit with integrated electronic hand-wheel, 14 function and axis traversing buttons, complete with magnetic holder and connecting cable.

70 1 PC KinematicsOpt iTNC 530 for T-machines*

TNC function to allow automated measuring of and compensation for the swivelling spindle with integrated NC rotary table, including calibration ball.

For TNC-KinematicsOpt the machine needs to be equipped with a 3D touch probe system. The 3D scanner is not included in the KinematicsOpt package.

80 2 PC Swivelling angle head 40<ER25

Adjustable angled milling head for fitting to the working spindle, complete with holder plate for the pick-up magazine.

Specifications:
Type: WWX 05 - length 172 mm

Output:	ER 25 collet
Swivelling area:	90°
Clamping area:	2 - 16 mm
Transfer:	1:1 reversible

Rotational direction:Right / left
Max.rotating speed:8,000min-1/20%ED

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Continuous speed:2,500min-1/80%ED
Positioning speed: 360° scale
Torque: 30 Nm

Adjustment works are required when using the angle head on other Hedelius machining centres.

90 1 PC Moving Pick-up magazine W2-/60*

Pick-up magazine for two angled milling heads tools fitted on the left hand side of the machining table.

Cip to chip time approx: 50 sec.

The pick up magazine is pneumatically pushed into the x-axis. The useable length of the x-axis is then reduced by about 150 mm plus the tool length. Tools taken from the pick up magazine cannot be used in the other working chamber when the working area divider has been mounted.

100 1 PC Air nozzle for spindle head

Retrofitting the main spindle with a compressed air nozzle controlled via M-function.

110 1 PC Internal compressed air supply

Retrofitting the machine spindle with a internal compressed air supply controlled via M-function.
Max. air pressure: 5 bar.
Spindle speed max,; 10.000 rpm

120	1 PC	slantbed paperfilter system 900 l/T-F --- Separate slantbed paper filter coolant system 900 including automatic paper feed and fill level monitoring. Container capacity: 900 litres Filtering degree: 50 µm Filter power: 180 l/min Pump power: 2.5 bar 150 l/min Space required: 2120 x 1000 mm Position: Left Area: Cutting steel, grey cast iron and alu* *other materials are only possible with limitations.
130	1 PC	Internal Coolant Supply Line 25 bar/T-F --- High pressure coolant supply through the main spindle including high pressure coolant pump, fine-increment coolant pressure programming and double switch filter. A suction system should be connected to prevent a build-up of coolant residue. Filtration Grade: 25 µm Pump: 5.0-25.0 bar 20 l/min
140	1 PAA	Air guns --- Machine equipped with 2 compressed air pistols complete with quick-release connection, helix connection hose and holding device.

150 1 PAA Washing guns

Spray pistols installed in the machine working area, complete with coolant pump and holding device.
Pressure: 3 bar/20 l/min

160 1 PC Infrared receiver M&H 91.40

Infrared receiver integrated in the spindle casing to ensure reliable process communication with M & H 3D calliper 25.50 and the M & H Toolsetter 35.70.

170 1 PC 3D-infrared probe M & H 25.50

Switching 3D touch probe, incl. Transmitter unit, battery and storage box.

Sense direction 90°: ± X, ±Y, -Z
Sense speed: 0,5m/min
Approach speed: 2 m/min.
Tracer pin length: 50 mm
Ball diameter: 6 mm (Ruby)
Repeat accuracy: ±2 µ

180 1 PC Toolsetter M&H 35.70

Manually interchangeable, wireless 2D sensor system for measurement and control of tools as well as a magnetic docking station mounted onto the machining table.

Reproducibility: 10 µm

190	1 PC	Working area separating wall T7 ---------- Separating wall that can be screwed into the machine`s working area, complete with automatic oscillating switch over function.
200	1 PC	Commissioning of T7 ---------- by a technician from Hedelius. He will be supported from at least 1 technician from your company. The machine has to be placed in the factory on the right place, has to stand on the machine foot plates and has to be connected to electrical and pneumatic suplly.
210	1 PC	Torque braket 40/63 ---------- Retrofitting the spindle nose with a torque bracket for fixing the angled milling head, multi-spindle drilling head, thread cutting apparatus or other such devices.

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