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Item	Qty	Description
1000	1	Vertical CNC-machining center Machine No. 378-02 Year of construction: 2020 Condition: function tested
1040	1	According to described below scope of delivery Travelling column machine with 5 axes and swivel rotary table Processing medium air
1060	1	Machine base without concrete filling Splash guard cover with fully enclosed workspace with loading doors, electrically interlocked, including interchangeable safety windows, workspace partition with stainless steel covers, Height 2,070 mm above floor, including machine lamp Machine base prepared for installation of a 2-axis swivel mechanism Minimum distance spindle nose - table surface 118,5 mm Travel Y-Axis 270 mm Z-Axis 310 mm X-Axis 450 mm
1080	1	Spindle head single-spindle for integration of 1 motor spindle
1100	1	Main drive with water-cooled motor spindle pressurized with sealing air and monitoring of the tool clamping 10.0 kW at 100% duty cycle 18.0 kW at 25% duty cycle spindle speed range up to 40,000 min ⁻¹ torque max. 9 Nm acceleration from 0 to 36,000 min ⁻¹ (CR - main spindle drive) or deceleration in 2.4 seconds Drilling capacity diam. 12 mm Tapping capacity M 8 Milling capacity 30 cm ³ /min made from steel E355

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| 1120 | 1 | <p>CHIRON spindle monitoring
 for the graphical display of the load at the main spindle through vibrations from the machining process on the screen.
 Direct feedback to the operator and machine protection through dynamic warning and switch-off threshold, as well as emergency shut-down at collision.</p> |
| 1140 | 1 | <p>Automatic tool changer
 robust, fully enclosed pick up tool changer,
 with mechanical impact protection and air blast taper cleaning
 No. of tool positions 24
 Tool taper HSK-E 40 DIN 69893
 Max. tool dia. 47 mm if all magazine pos. are occupied
 Max. tool dia. 100 mm if adjacent pos. are free
 Tool length max. 200 mm
 Max. tool weight max. 1.2 kg
 Tool change time approx. 0.8 s (depends on CNC)
 Chip to chip time approx. 2.3 s (depends on CNC)</p> |
| 1160 | 1 | <p>Feed drive for X-, Y- and Z-axes
 digital direct drive with direct measurement system, overpressurized
 Rapid traverse speed 75 - 75 - 75 m/min
 Axle acceleration 1.0 - 1.5 - 2.0 g</p> |
| 1180 | 1 | <p>Automatic centralised grease lubrication</p> |
| 1200 | 1 | <p>SIEMENS CNC-control 840D solution line
 incl. 10.4" TFT color monitor
 standard keyboard / control panel OP010S
 (IPC with Windows 10 / NCU 730.3), 1 channel
 operator interface Operate
 NC-memory 5 MB (max. 3 MB freely available)
 (max. 200 programs storage capacity)
 for executing part programs according to DIN 66025
 SSDR-memory with storage capacity 80 GB (max. 40 GB freely available)
 Power display, operating hour and piece counter on the screen,
 dark switching of screen, access authorization via key-operated switch,
 NC-diagnosis with help function, machine-diagnosis,
 USB-interface at control panel.</p> <p>Look ahead with dynamic pre-control,
 oriented spindle stop, re-start into program,
 subroutine technology in high-level language and parameter,
 simultaneous programming, cycle support,
 drilling cycles G81-G89, drilling and milling patterns,
 measuring in JOG, M and T functions,
 tool offsets for geometry, wear,
 4 programmable zero offsets G54-G57,
 30 zero shifts programmable via G-functions,
 tool radius correction with intersection computing,
 insert chamfers and radii, crossing radii,
 contour programming, scaling function, mirror function,
 polar coordinates, circular interpolation (360 degrees),
 3D and helical interpolation.</p> |

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Sending and receiving CNC-programs in networked operating by the connection with logical drives, for example a network, the wiring to the network is not included.

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| 1220 | 1 | <p>CHIRON RemoteLine
 for remote diagnosis and teleservice for optimization of the maintenance process and shortening of troubleshooting through faster diagnosis:
 Detailed information about the machine status is available to support both, internal and also optionally external experts, independent from time and location.
 This way a faster and more qualified support is possible.
 Possibility of remote control of the NC-control for the analysis of operation sequences and support with programming problems.
 Access to PLC for diagnosis, troubleshooting and programming.
 Notification service by text / email, e.g. at end of job or in the case of breakdown.
 Simple backup through use of the existing infrastructure in the internet.
 Safe access through defined user rights, access control and encryption of data.
 Access through Ethernet connection RJ45.</p> <p>Note:
 A contract must be concluded with the service department of Chiron Group SE for use.</p> <p>Pre-requisite:
 The connection of the machine to the internet through in-house network has to be provided by customer.</p> |
| 1240 | 1 | <p>CHIRON maintenance management on the screen
 display of the pending maintenance:
 advance warning = "prepare maintenance"
 warning = "carry out maintenance"
 machine stop = "catch up on maintenance"</p> <p>Brief instructions for the pending maintenance with graphic illustration on USB data-carrier.
 Password protected confirmation of the maintenance work carried out by the maintenance staff.</p> |
| 1260 | 1 | <p>5-axes-milling package
 for the machining of three-dimensional curved or tilted surfaces with 3 linear and 2 additional axes (TRAORI & CYCLE 800), incl. compressor CompCAD.
 5-axes-transformation with tool tracking.
 The machining task is programmed completely in Cartesian coordinates with Cartesian position and orientation. The resulting movements of all 5 axes are calculated internally with the 5-axes-transformation.
 5-axes-tool-length compensation</p> |

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The length of the tool is automatically computed and compensated in the movements of the axes.

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| 1280 | 1 | <p>2 axis rotary table type CASD 160
 consisting of:
 Interface for 4th and 5th axis
 smallest increment 0.0001°
 pneumatic supply controlled for sealing air
 pneumatic supply controlled for spindle clamping</p> <p>Tilting axis as B-axis
 tilting angle: $\pm 100^\circ$
 repetition accuracy $\pm 5''$ with
 absolute, direct measurement system ECN 225
 digital direct drive via torque motor
 max. transmittable torque 440 Nm
 with spring loaded spindle clamping, torque 410 Nm
 spindle speed 100 min⁻¹</p> <p>rotary table faceplate dia. 245 mm as C-axis
 with thread and locating hole grid M 16 x dia. 15H7 x 50 mm
 repetition accuracy $\pm 5''$ with
 absolute, direct measurement system ECN 225
 digital direct drive via torque motor
 max. transmittable torque 180 Nm
 with pneumatic spindle clamping system
 max. torque if the table is clamped 410 Nm
 max. transport load (workpiece weight): 80 kg on the faceplate
 spindle speed 200 min⁻¹</p> <p>Central rotary feedthrough for pneumatic or hydraulic supply
 6-fold, integrated into B- and C-axis
 with 6 O-ring connections in the center of the face plate</p> |
| 1300 | 1 | <p>Working hours and piece counter
 in the screen</p> |
| 1320 | 1 | <p>Socket at control panel
 (for description see "main circuit")</p> |
| 1340 | 1 | <p>Cabinet cooler as a door mounting unit</p> |
| 1360 | 1 | <p>Signal lamp for 3 signals
 Signal "red" = failure
 Signal "white" = machine loaded
 Signal "green" = machine is running</p> |
| 1380 | 1 | <p>Oil-free air service unit with electric main switching-off
 and automatic condensate separator,
 pressure control of the air supply
 and micro filter 0.01 μm for sealing air</p> |
| 1400 | 1 | <p>Cooling unit
 for the cooling of machine components</p> |

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| 1420 | 1 | Installation elements
For installation in an oil pan the installation directly on the sheet metal is not allowed. For out of it resulting problems there is no warranty. The machine documents for approval contain a proposal for the appropriate execution of the oil pan. |
| 1440 | 1 | Chip conveyor
emission 490 mm |
| 1460 | 1 | Machine preparation for air supply through the main spindle
With rotary feedthrough installed at the hollow shaft. |
| 1480 | 1 | Device flushing
executed with coolant |
| 1500 | 1 | Pneumatic connection controlled
with A/B connection for pneumatic clamping device One electrically controlled pneumatic connection for double-acting clamping cylinders, one pressure regulator, clamping pressure control by means of differential pressure switch (no pressure switch tracking in the event of a pressure change) |
| 1520 | 1 | CHIRON Lasercontrol 40 NT
min. tool dia 0.1 mm,
max. tool dia 40 mm,
for tool breakage control (in one working area),
for automatic tool measurement,
for automatic machine compensation in 2 axes,
including process-oriented measuring,
software for measuring cycles
and strategy program,
incl. air jet for tool cleaning
and test mandrel with tool holder |
| 1540 | 1 | Renishaw - probe - package RLP40Q
for part measuring and
automatic machine compensation,
probe with radio module and
tool taper suitable for machine spindle
tracing pin 58 mm with ruby ball dia. 4 mm
receiver RMI-Q with integrated interface
bracket for radio receiver
process oriented measuring
software for measuring cycles
and strategy program |

Remarks:

In order to carry out machine compensations with probe a suitable reference surface at the machine or at the fixture or an optional gauge block are necessary.

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| 1560 | 1 | <p>CHIRON Powersave
 software package for selective shutdown of installed consumers like axis motors, drives, spindles, seal air, airsensing and ancillary equipment in production breaks or during programmable points in time using a shift calendar.</p> <p>Definable points in time at which the machine starts demand-oriented automatically with a variable warmup program to recovery the production readiness.</p> |
| 1580 | 1 | <p>SIEMENS Tool lifetime monitoring with:
 tool place organization
 sister tool organization</p> |
| 1600 | 1 | <p>Feed per revolution
 for rigid tapping</p> |
| 1620 | 1 | <p>CHIRON Kinematics Fit with measuring ball
 To ensure best milling results 5-axis-machines require calibration at regular intervals. This option provides for automatic measuring of the machine kinematics by sampling a measuring ball in the working area and subsequent adjustment of the machine-transformation parameters for rotating and tilting axes.</p> <p>Pre-requisite: spindle probe and measuring ball.</p> |
| 1640 | 1 | <p>Direct switch
 in position 'door open'</p> |
| 1660 | 1 | <p>Universal, automatic loading and unloading system
 with 6-axis robot VARIOCELL UNO
 Fully integrated, with low space requirement.
 Unrestricted access to the working and loading area of the machine machine for changeover processes or manual loading using a revolving door.
 Integrated protective panelling with drip tray for dripping coolant. dripping coolant. Incl. storage space for NIO parts,
 Machine equipment: loader interface.</p> <p>FANUC LR Mate 200 iD 7L robot with FANUC R-30iB Mate Plus controller, prepared for the attachment of a workpiece gripper.
 Incl. "Start/Stop" button for defined stop and restart of the robot. start of the robot
 and "Run empty" button for running the machine empty.</p> <p>Preparation for blow-off device for blowing off the workpiece and clamping device,
 installed on the robot, incl. controlled pneumatic connection.</p> <p>Loading and unloading system prepared for mounting of a parts supply and removal device.</p> |

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Note: There are no workpiece-specific positions such as workpiece gripper and robot programming are included in the scope of delivery.

1680	1	Gripper No gripper included in the scope of delivery
1700	1	Feed and discharge belt for Variocell Uno consisting of: 2 x belts for infeed and outfeed Length 2,500 mm each Separation and positioning at pick-up position 2 x DNC reading unit for part identification NIO box within the cell incl. integration, testing and documentation
1720	1	Machine colour Two-component textured paint - 2-coloured light grey according to NCS S1502-B basalt grey according to RAL 7012
1740	1	Documentation acc. to CE of the first delivery into market 1 x safety regulations in a folder in English 1 x complete documentation on a USB as PDF Language of the operating manuals and safety in English
1760	1	Cutting tools The cutting tools have to be balanced according to DIN 69 888, class G 6, 3, in two levels, with max. operating speed