

Pos	Mng	Designation	Price
1000	1	CNC machining center MT 733 two	
1040	1	***Basic machine*** Consisting of:	
1060	1	<p>Machine base frame The inherently rigid base frame of the machining center is made of mineral casting and has a portal design and has its well-known positive properties.</p> <p>Depending on the configuration, the machine concept opens up the possibility of complete machining of bar materials or chuck parts.</p> <p>Thanks to the modular construction kit structure, different production technologies can be used in any order. can be combined. This creates the Flexibility of dynamic workpiece machining with up to five axes, even in the first clamping position.</p> <p>After a high-precision, automated workpiece transfer, the component is finish-machined in the second clamping position. The result is an economical interlinking of different processes.</p> <p>The right machine for every machining task - that's what we mean by Excellence in Manufacturing.</p>	
1080	1	* Left workspace configuration *	
1100	1	<p>Technical design X-axis Travel distance: 615 mm Rapid traverse speed: 65 m/min Acceleration max. : 7 m/s² Feed force: 4,000 N Feed drive version: Ball screw drive To achieve a higher cutting performance, the X1 axis is controlled in the gantry system.</p>	
1120	1	<p>Technical design Y-axis KGT Travel distance: 290 mm Rapid traverse speed: 65 m/min Acceleration max. : 9 m/s² Feed force: 4,000 N Feed drive version: Ball screw drive</p>	

- 1140 1 **Technical design Z-axis**
Travel: 500 mm
Rapid traverse speed: 65 m/min
Acceleration max. : 13 m/s² Feed force: 8,000 N
Feed drive version: Ball screw drive
- 1160 1 *Precise control of the linear axes is ensured by direct measuring systems in all Unear axes and an additional STAMA laser measurement in accordance with VDI/DGQ 3441.*
- 1180 1 **Main spindle unit left**
The motorized milling spindle attached to the left portal of the machining center has the following technical features:
- 1200 1 *HSK-T63 motorized milling spindle 12,500 rpm Tool holder: HSK-T63 Pull-in force: 18 kN*
Spindle bearing diameter: 80 mm Max.
Speed: 12,500 1/min Performance data:
Drive power 20% ED: 61 kW from 2,910 rpm
Drive power 100% ED: 61 kW from 3,880 rpm
Torque 20% ED: 200 Nm up to 2,910 rpm
Torque 100% ED: 150 Nm up to 3,880 rpm
- Main spindle unit incl. automatic blowing/rinsing device for reliable cleaning of the tool holder during the change process and automatic tool feed control by means of an analog sensor.*
- Clamping milling spindle**
Mechanical clamping of the motorized milling spindle to increase the possible infeed and outfeed. the turning precision.
- 1220 1 **Tool magazine left**
Tool magazine for automatic tool change in low-wear design. For storing tools for the left-hand milling spindle. Tool magazine in the following design:
- 1240 1 *Number of available magazine slots: 64 Tool diameter max. when fully loaded: 78 mm*
Tool diameter max. with free secondary positions: 140 mm Tool length max. : 300 mm
Tool holder: HSK-A/T63 Tool weight max.: 10 kg Total chain load max. : 115 kg

The maximum weight per tool can vary depending on the tool contour.

Chip-to-chip time according to VDI 2852: approx. 2.9 s (control-dependent)

- 1260 1 **Automatic tool magazine chain pre-tensioning** The required pre-tensioning of the tool magazine chain is ensured automatically by means of sensor monitoring and cyclical re-tensioning of the magazine chain.
- 1280 1 **Rotary swivel unit Clamping position 1**
 3-axis NC unit for all-round machining of workpieces with complex shapes and angular positions in one clamping position.
 The rotary swivel unit is mounted on the linear slide unit of the X1 axis and is designed for 5-axis operation during milling.
 To increase positioning accuracy, the rotary axes are equipped with direct measuring systems. The rotary swivel unit consists of the components listed below:
- 1300 1 RGM 175 precision swivel unit
 Design of the B-axis in the form of a backlash-free and highly torsionally rigid geared rotary axis.
 Technical data:
 Swivel angle: -30 to +90 degrees
 Swivel axis repeatability: $\pm 1''$ Swivel axis max. speed: 61 1/min
 Clamping torque tangential swivel axis: 3,000 Nm Clamping torque tangential counter bearing: 1,800 Nm
- 1320 1 Turning spindle FT
 Technical data:
 Interface to optional clamping system: Short taper mount to DIN ISO 702-1 A2 No. 8 Turning spindle max. clearance : No clearance Turning spindle repeatability: $\pm 8''$
 Max. speed: 4,200 rpm Nominal speed: 2,300 rpm
 Clamping torque tangential turning spindle: 1,400 Nm Torque 15% ED: 180 Nm
 Torque 100% ED: 100 Nm
 Drive power 15% ED: 43 kW
 Drive power 100% ED: 24 kW
 Tensile/compressive force min.: 11 kN
 Tensile/compressive force max. : 46 kN

Please note:

Depending on the selection of workpiece-specific clamping devices, there may be restrictions in the maximum speed!

- 1340 1 *** Configuration right workspace ***
- 1360 1 **Technical design X-axis**
 Travel one plus/two: 520/525 mm stroke in the working area (total 992/997 mm)
 Rapid traverse speed: 65 m/min
 Acceleration max. : 7 m/s^2 Feed force: 4,000 N
 Feed drive version: Ball screw drive
 To achieve a higher cutting performance, the X2 axis is controlled in the gantry system.
- 1380 1 **Technical design Y-axis KGT**
 Travel distance: 290 mm
 Rapid traverse speed: 65 m/min
 Acceleration max. : 9 m/s^2 Feed force: 4,000 N
 Feed drive version: Ball screw drive
- 1400 1 **Technical design Z-axis**
 Travel distance: 500 mm
 Rapid traverse speed: 65 m/min
 Acceleration max. : 13 m/s^2 Feed force: 8,000 N
 Feed drive version: Ball screw drive
- 1420 1 Precise control of the linear axes is ensured by direct measuring systems in all linear axes and an additional STAMA laser measurement in accordance with VDI/DGQ 3441
- 1440 1 **Main spindle unit right**
 The motorized milling spindle attached to the right-hand portal of the machining center has the following technical features:
- 1460 1 HSK-T63 motorized milling spindle 12,500 rpm Tool holder: HSK-T63 Pull-in force: 18 kN
 Spindle bearing diameter: 80 mm Max.
 Speed: 12,500 1/min Performance data:
 Drive power 20% ED: 61 kW from 2,910 rpm
 Drive power 100% ED: 61 kW from 3,880 rpm
 Torque 20% ED: 200 Nm up to 2,910 rpm
 Torque 100% ED: 150 Nm up to 3,880 rpm
- Main spindle unit incl. automatic blowing/rinsing device for reliable cleaning of the tool holder during the change process and automatic tool feed control by means of an analog sensor.

Clamping milling spindle

Mechanical clamping of the motorized milling spindle to increase the possible infeed and outfeed.
the turning precision.

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|------|---|---|
| 1480 | 1 | <p>Tool magazine right
Tool magazine for automatic tool change in low-wear design.
For storing tools for the right-hand milling spindle. Tool magazine in the following design:</p> |
| 1500 | 1 | <p>Number of available magazine slots: 64 Tool diameter max. when fully loaded: 78 mm
Tool diameter max. with free secondary positions: 140 mm
Tool length max. : 300 mm
Tool holder: HSK-A/T63 Tool weight max.: 10 kg Total chain load max. : 115 kg
The maximum weight per tool can vary depending on the tool contour.
Chip-to-chip time according to VDI 2852: approx. 2.9 s (control-dependent)</p> |
| 1520 | 1 | <p>Automatic tool magazine chain pre-tensioning The required pre-tensioning of the tool magazine chain is ensured automatically by means of sensor monitoring and cyclical re-tensioning of the magazine chain.</p> |
| 1540 | 1 | <p>Rotary swivel unit Clamping position 2
3-axis NC unit for all-round machining of workpieces with complex shapes and angular positions in one clamping position.
The automatic workpiece transfer for finishing the workpiece machined in the first clamping position takes place in the horizontal swivel axis position. (Workpiece transfer under rotation is possible when using turning spindles)
The rotary swivel unit is mounted on the linear slide unit of the X2 axis and is designed for 5-axis operation during milling.
To increase positioning accuracy, the rotary axes are equipped with direct measuring systems. The rotary swivel unit consists of the components listed below:</p> |
| 1560 | 1 | <p>RGM 175 precision swivel unit
Design of the B-axis in the form of a backlash-free and highly torsionally rigid geared rotary axis.</p> |

Technical data:

Swivel angle: +30 to -180 degrees

Swivel axis repeatability: $\pm 1''$ Swivel axis

max. speed: 61 1/min

Clamping torque tangential swivel axis: 3,000 Nm Clamping

torque tangential counter bearing: 1,800 Nm

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|------|---|---|
| 1580 | 1 | <p>Turning spindle FT</p> <p>Technical data:</p> <p>Interface to optional clamping system: Short taper mount to DIN ISO 702-1 A2 No. 8 Turning spindle</p> <p>max. clearance : No clearance Turning spindle</p> <p>repeatability: $\pm 8''$</p> <p>Max. speed: 4,200 rpm Nominal speed: 2,300 rpm</p> <p>Clamping torque tangential turning spindle: 1,400 Nm Torque 15% ED: 180 Nm</p> <p>Torque 100% ED: 100 Nm</p> <p>Drive power 15% ED: 43 kW</p> <p>Drive power 100% ED: 24 kW</p> <p>Tensile/compressive force min. : 11 kN</p> <p>Tensile/compressive force max. : 46 kN</p> <p>Please note:</p> <p>Depending on the selection of workpiece-specific clamping devices, there may be restrictions in the maximum speed!</p> |
| 1600 | 1 | <p>* Configuration machine *</p> |
| 1620 | 1 | <p>Center protection</p> <p>Center guard for separating the working areas in a low-wear plastic design.</p> |
| 1640 | 1 | <p>Tool set-up via insertion station</p> <p>The tools are set up via the tool loading station located on the rear of the machine.</p> <p>The correct position orientation of the tools is ensured by a sensor-monitored tool insertion control. Menu-guided tool data management for setting up the tool magazine with cutting tools.</p> <p>The input menu of the TOUCHLine secondary control panel is identical to the input menu on the main control panel.</p> <p>The tool is assigned directly:</p> <p>SIEMENS: 32-digit tool - Ident - no. in numeric or alphanumeric format.</p> <p>FANUC: 8-digit tool Ident number in numeric format.</p> |

- 1660 1 **Basic hydraulic equipment**
 The basic scope of the machining center includes a hydraulic power unit (max. pressure: 120 bar) and the tools required for workpiece clamping and for clamping the workpiece of the rotary axes. Clamping pressure for workpiece clamping can be set manually. The software and hardware required for this and renewed pressure monitoring are also part of the basic machine scope.
- 1680 1 **Cooling machining center**
 Use of a central compressor cooling unit for cooling the components listed below:
 - Milling spindle(s)
 - Rotating spindle(s)/axis(es)
 - Axle drive(s) of the swivel axle(s)
 - Hydraulic unit
 cooling capacity: 7.6 kW
 The air conditioning of the switch cabinet is realized by additional compressor cooling units.
 Cooling capacity: 2 x 2.5 kW
- 1700 1 **Workspace lighting**
 Work area lighting with energy-saving LED technology. Each work area is equipped with a light for optimum illumination of the machining process.
- 1720 1 **Full encapsulation of the working area**
 The machine is encapsulated in the entire working area.
 The drive components are located outside the encapsulated working area.
 An extraction system is recommended.
- 1740 1 **Protective device**
 Cladding of the working area, executed in accordance with the valid guidelines of the German UW and the Euro standards DIN EN ISO 12100-2 and DIN EN ISO 14119.
 Manually operated workspace door(s) with electrical protection and interlock.
- 1760 2 **Roof covering Y-axis comfort**
 Design of the V-roof cover in the form of a reinforced working area cover.
 To simplify the set-up process (e.g. when changing chucks), the V-roof cover is equipped with a manually operated and electrically secured quick-release mechanism.

- 1780 1 **Axis movement with safety gate open**
 When the safety guard is open, axis movements are and rotation of the spindle(s) is only possible in set-up mode. In addition to selecting the relevant function button, pressing the consent button is required to trigger these movements.
 Max. axis speed: 2 m/min Max. spindle speed: 800 1/min
- 1800 1 **Machine design/painting**
 The machining center on offer is painted in the following colors: Light gray: NCS S 1502-B
 Dark gray: NCS S 7502-B
- 1820 1 **Automatic centralized lubrication**
 All linear guides and ball screws are connected to a central grease lubrication system is connected. The lubrication cycle is automatically controlled by the PLC. If the reservoir is empty, a message appears on the HMI.
- 1840 1 **Installation data**
 Exact data regarding installation area, static and dynamic floor loads, connected loads, etc. can be found in the customer-specific installation plans.
 Control voltage: 24 V direct current Valve voltage: 24 V direct current Customer infrastructure requirements:
- 1860 1 Mains connection
 Supply voltage machine 3x400 Volt± 10% neutral conductor loadable
 Protective conductor present
 Frequency 50 Hz
 Voltage socket 230 Volt± 10% socket type VDE-SCHUKO
 Machine weight approx. 28,000 kg
- 1880 1 Compressed air connection min.: 6 bar
 Air purity according to ISO 8573-1 class [4:4:4]
 Supply line cross-section inside min. : 13 mm
 The machining center is equipped with electrical and mechanical components that guarantee their functionality within a prescribed temperature range between 18° C and 35 C.°
- 1900 1 **Installation elements without base tray**
 The scope of delivery of the machining center includes

TAMA

*Support elements for leveling and fixing the machine directly to the hall floor without using a floor pan.
Incl. necessary accessories.*

1920 1 *****Machine control*****
Consisting of:

1940 1 **Machine control Siemens 840D sl**
*Operating system: Windows User
interface: SINUMERIK Operate*

*24-character alphanumeric program names,
Creation of subroutines in DIN or high-level language and
parameter max. 7-fold nesting,
3D linear interpolation G1 (max. 4 axes simultaneously).
Max. 5 axes simultaneously for machines with
turning and swiveling devices.
Circular interpolation G2/G3, helical interpolation,
polar coordinates or Cartesian coordinate mass, 49 zero
offsets directly via G function fnkl. additive zero offset,
coordinate rotation, mirroring, scale factor.
Inserting chamfers and radii,
Siemens standard drilling and milling cycles
(additionally G81 - G86 like Siemens 840C),
Thread cutting without compensating chuck.*

*Tool call T via max. 32-digit alphanum. names. Tool data
can be entered via the program or directly on the control
panel.
Tool monitoring tool life or number of pieces. Tool radius
compensation G41/G42 with intersection calculation or
transition radii.
Restart in the program, operator guidance.*

*Read-in and program creation during machining. Dialog
programming in DIN 66 025 including graphic contour
creation up to max. 3 axes.
Diagnostic display and operating messages in plain text.
Oriented spindle stop.
Measuring systems:
Digital absolute or digital incremental measuring systems
Screen dimming.*

1960 1 **Control unit user interface**
Language Control texts German

- 1980 1 **NCU High Performance**
 NCU 730.3 with 10 MB RAM
 (approx. 8 MB freely available; depending on the expansion level}
- 2000 1 **TOUCHLine HMI**
 TOUCHLine 24ⁿ HMI in vertical arrangement for displaying the control system manufacturer-specific user interface, on-screen keyboard and other value-added functions.
 Additional functions (e.g. maintenance instructions via HMI direct access).

 USB 2.0 interface and USB stick 1GB analysis tools for service, Ethernet card is included USB 2.0 connections for: Keyboard, mouse Bluetooth for wireless communication.

 Recording of access authorization using the Electronic Key System. This enables access and changes to be logged.
- 2020 1 The main control unit attached to the front of the machine can be moved, swiveled and adjusted in height to enable ergonomic machine operation.
- 2040 1 **JOB list**
 With this control function, different workpieces {individual or batch production) can be controlled via the CNC control can be called up.
- 2060 1 **Remote diagnosis during the warranty period (SIEMENS)**
 For the duration of the warranty, the machine will be equipped with a remote diagnosis system free of charge. This service is free of charge during the warranty period. At the end of this period, there is the possibility of an extension on an annual basis.

 Prerequisite:
 The connection of the machine for Internet access via the in-house network must be provided by the customer free of charge.
 Customer provides at least 4 weeks before machine installation:
 - Network connection with Internet access.
 - Checklist of connection data.

 Remote diagnosis via the Internet
 Device for diagnosing the machine from a service point.
 - Simatic Step 7

- Teamviewer installed on PCU.
 - Pre-installed software in the NC control.
 - Ethernet card is integrated in the control unit and prepared for connection to a LAN with TCP/IP protocol.
- > RJ45 network socket mounted in the switch cabinet.

2080	1	***Documentation*** consisting of:
2100	1	Documentation Operation, maintenance, safety Operating instructions in accordance with Machinery Directive 2006/42/EC in 1 copy in A4 folder and 1 x on CD in PDF file format Language Operation / Safety German
2120	1	Documentation spare/wear parts/parts list Documentation spare/wear parts/parts list in 1 copy in A4 folder and 1 x on CD in file format PDF language piece! / Drawings German
2140	1	Documentation of electrical and fluidic diagrams Documentation of electrical and fluidic diagrams in 1 copy in A4 folder and 1 x on CD in PDF file format Language Schemes German

- 2180 1 *****Automation options*****
Consisting of:
- 2200 1 **Workpiece loading chuck parts**
The insertion of chuck parts into the working area is facilitated by the X/Z gantry loader in vertical workpiece position. The workpiece is loaded in clamping position 1 using an optional gripper unit. Provision of raw parts by an optional material feed system. Workpiece loading consisting of:
- 1 NC-controlled X/Z traversing unit
- Position of the unmachined part handling on the left-hand side of the machine, including the required protective covers.*
- Workpiece data for chuck part machining: Workpiece diameter max.: 260 mm Workpiece length max. : 250 mm (depending on clamping device} Workpiece weight max. : 35 kg with undergrip gripper jaws*
- Workpiece handling portal**
Finished workpieces are unloaded using the unloading device on the right-hand side of the machine. X / Z gantry loader in horizontal or vertical workpiece position. The workpiece is removed from the work area in clamping position 2 by means of an optional gripper unit. The finished parts are discharged onto an optional workpiece storage system. Workpiece removal consisting of:
- 1 NC-controlled X/Z traversing unit
- Workpiece weight max. : 35 kg with undergrip gripper jaws Position of the finished part handling on the right-hand side of the machine, including the required protective covers.*
- 2220 1 **KD - Magnetic gripper insertion**
The magnetic gripper attached to the workpiece handling system is used to insert chucked parts into the work area. The following requirements for the raw part must be met:
- Workpiece weight max. 35 kg
 - Surface max. Ra 12.5
 - Air gap max. 0.5 mm
 - Gripping/adhesive surface must be clean
 - Temperature max. 40 G°
 - Raw part-0 max. 270 mm
 - Pipe length max. 100 mm (depending on 0)

- 2240 1 **KD - Magnetic gripper output**
 The magnetic gripper attached to the workpiece handling system is used to eject chucked parts into the work area. The following requirements for the finished part must be met:
 -Workpiece weight max. 13 kg
 - 0-toothing from 65 mm to 234 mm
 - Gripping/adhesive surface must be clean
 - Temperature max. 50 C°
 - Acceleration Automation max. 2 m/s²
- Note: Residual magnetism may be present in the workpiece after unclamping.
- 2260 1 **Sealing cap / lining processing**
- 2280 1 **KD - Feeder belt**
 Task Description:
 Feed raw parts to the standard loader accumulating
 The parts variance is between 0 125 and max. 0 270 and max. 90mm high (max. weight acc. 35 kg {calculated according to the parts table approx. 26kg}) Dimension belt length 2,700 long
1. Scope of offer
 2 hinged belt conveyors 190.5 mm wide non-curved and flat belt conveyors
- 1.1 General system description
 The workpiece carriers/workpieces are transported by a continuously circulating slat-band chain on which the workpieces rest loosely. Or, in the case of flat belt conveyors, via a flat belt in cycles
 The workpieces are stopped at the automatic stations and positioned if necessary
- 1.2 Technical data -Hinged belt conveyor speed approx. 3 m/min
 approx. 3m/min flat belt conveyor
 Conveyor chain Altratec SBKF 190.5 wide hardened steel non-curved
 - Surface belt MT GREEN OR comparable
 -Lines - Cycle time Not known Sec
 -Transport height of top accumulation roller chain approx. 1,150 mm
 -Stopping accuracy stopper± 3 mm
 - Pick-up position Via adjustable stop
 -support version Altratec profile
 ± 30 mm adjustable,
 with foundation angle
 -Workpiece Blanks Saw cuts
 aluminum and steel
 Workpiece weight max. 35 kg (26 kg) for the largest external dimension

		Workpiece dimensions	min. 0 125 Raw
		min 0 100 Ftg part	
		max. 0 270 Raw	
		max. 0 250 Ftg	
		min. height 30 Roh	
		min. height 23.8 Ftg	
		max. height 85 Roh	
		max. height 81.4 Ftg	
		Workpieces are dry	
		Transport / Autonomy Quantity outbound transport	250heaviest part
		12.54kg = 14 parts	
		Limited by max. load 180kg	
		-Oil	pans/drip
2300	1	pansgalvanized steel InK Installation and	
		commissioning.	
		KD - Laxative belt	
		Task Description:	
		Discharge of finished parts	
		Via flat belt conveyor	
		Parts are placed in pairs (i.e. the loader places the finished parts in two positions).	
		Discharge transport is intermittent. The buffer quantity is limited by the maximum load of the FGF of 180 kg.	
		1.2 Technical data - Conveyor speed hinged belt	appr
		ox.3 m/min	
		approx. 3m/min flat belt conveyor	
		- Surface beltMT GREEN OR comparable	
		-Length of flat belt conveyor approx. 4100 mm	
		-Transport height accumulation roller chain top approx. 1,150 mm	
		-Stopping accuracy stopper± 3 mm	
		- Pick-up position Via adjustable stop	
		-Column designAltratec profile	
		± 30 mm adjustable,	
		with foundation angle	
		- Transportation / Autonomy Quantity outbound transportation 0	
		250 heaviest part 12.54kg = 14 parts	
		Limited by max. load 180kg	
		-Oil pans/drip pansgalvanized steel	
		1 pc. Transport system flat belt conveyor approx. 4100 x 600 x 1,150 high	
		consisting mainly of:	
		1 Drive unit and deflection unit	

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with SAF 37 brake, 0.18 - 0.36 KW, 400 V and 50 Hz, conveying speed v
= approx. 3 m/min.

1 Conveyor line, approx. 4,000 mm long, (center distance)

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with side guide AITRATEC standard version
 Covered with PE profile over the transport length and end stop as fall protection Including conveyor belt without cleats over the belt width and 125 mm distance
 4 pcs. ALTRAPROFIL supports with adjustable feet with foundation fixing bracket, without dowels.
 Adjustable for a conveyor height of approx. 1,150 mm ±30 mm Belt upper edge transport height
 1 Pcs. Galvanized steel Sump tray integrated in the frame with drain tap.
 4 pcs. Light barrier transmitter/receiver for cycle signal through workpiece and belt full signal
 1 pcs Light grid at the lay-on position Handling with transmitter and receiver
 Query width up to max. 200
 1 pcs. 1 + 1 emergency stop and release button (emergency stop button wired to Harting plug) Incl. installation and commissioning.

2320 1

*****Options coolant/ chips*****

Consisting of:

2340 1

Chip conveyor Link belt low wear

The removal of chips takes place thanks to the combination of a chip screw and a universal link belt conveyor in a low-wear design.
 This version of the chip conveyor is recommended for primary machining of abrasive materials with a Brinell hardness of > 180 HB and high-alloy steels. Ejection height above floor: 1050 mm
 Chip ejection: Rear (on right-hand side)

2360 1

Coolant cleaning paper belt 600 Coolant cleaning system with a compact belt filter mounted on the 1400 1 coolant tank.

The high liquid level ensures good utilization of the filter paper.
 Suitable for all common materials. Signal device for paper shortage.
 Storage of the dirty filter fleece in the sludge box. Incl. 1 roll of filter paper
 Filter capacity emulsion: 600 l/min Filter capacity oil: 250 l/min
 Average nominal filtration: < 50 µm Flushing pump for external tool cooling and supply of the machine-specific flushing functions.
 Nominal flow rate of 250 l/min, with pressure optimally adapted to the flushing functions.

IK 70 bar

Internal coolant supply through the work spindle(s).
 Coolant pressure max. : 70 bar
 Total available volume flow max. : 37 l/min High energy efficiency thanks to frequency-controlled High-pressure pump. The IK pressure can be programmed in seven stages using M functions.
 Incl. protective filter (100 µm) in the supply line with mechanical switchover to second filter element and clogging indicator via differential pressure switch.
 Incl. two wire mesh filter elements. Filter fineness: 100 µm

- 2370 1 **Coolant recooling**
 Use of a compressor cooling unit for recooling the cooling medium (emulsion/cutting oil). Cooling capacity: 11.6 kW
 Unit for separate installation.
 Incl. all necessary control and regulation devices.
- 2380 1 **Flushing gun**
 Flushing gun for manual cleaning of the work area.
- 2400 1 **Coolant supply through 1 spindle 70 bar**
 2 pcs. 1x per AR internal coolant supply through the work spindle.
 > 70 bar high-pressure coolant pump with frequency-controlled drive motor.
 > Volume flow: Q= up to 40 l/min
 > Incl. Vario valve, pressure can be programmed in 7 stages using M functions.
 > (Only possible in conjunction with coolant cleaning system with filter fineness 60 µm).
 > Incl. double switch filter with mechanical switchover to second filter element.
 > Contamination indicator via differential pressure switch.
 > Incl. 2 wire mesh filter elements.
 > Filter fineness 100 µm.
 > To protect downstream components from coarse dirt
- 2420 1 *****Extraction / deletion options*****
 Consisting of:
- 2440 1 **Preparation for central extraction**
 Preparation of the machine for connection to the customer's central extraction system.
 Scope:
 2 connection pieces 0 175 for 2 working chambers. Incl. baffle plate in the working chamber.

- 2460 1 *****Pneumatic / hydraulic options*****
Consisting of:
- 2480 1 **Air supply for milling spindle(s) 6 bar**
Air supply 6 bar through the internal coolant line(s) of the milling spindle(s).
Selectable via M function.
- 2500 1 **Clamping pressure preselection NC Clamping position 1**
The clamping pressure required in clamping position 1 can be with the workpiece clamping released, can be set in the range of 15-50 bar by parameterizing the NC program. Design of the clamping circuit in proportional valve technology.
- 2520 1 **Clamping pressure preselection NC Clamping position 2**
The clamping pressure required in clamping position 2 can be with the workpiece clamping released, can be set in the range of 15-50 bar by parameterizing the NC program. Design of the clamping circuit in proportional valve technology.
- 2540 1 *****Tool area options*****
Consisting of:
- 2560 2 **Buffer station for consistently short chip-to-chip times**
The buffer station enables automatic sorting of the next tool next to the storage location of the tool in use with flexible magazine location allocation and tool access times > 4 s, so that the magazine chain only has to be switched one magazine position further during the subsequent tool change. This enables consistently short chip-to-chip times with flexible magazine space allocation.
- 2580 1 **Tool plan creation (basic)** Interfering edge analysis for tools in combination with the clamping device, the workpiece, the work area and the workpiece positions to be machined. Excl. detailed plan.
- 2600 1 **Provision of tools by the customer**
the following equipment required for production
- unless they are supplied by STAMA - shall be provided by the Buyer free of charge at least 6 weeks />before the confirmed delivery date.
{May change depending on the project, deviating definition at the latest at the start-up date)
- Tool equipment (preset, measured and labeled)
- Tool and setting drawings including cutting value specifications, Schedule
- A sufficient number of spare tools

In principle, the goods must be provided ready for use. A later provision may affect the delivery date. If additional costs are incurred due to defective or late provision of materials(>,>) these will be invoiced at cost in accordance with the current STAMA assembly conditions and the delivery date is postponed according to the current production capacity utilization!

Please note:

Interfering edge inspection for tools in combination with the clamping device, the workpiece, the work area and the workpiece positions to be machined must be carried out by the customer, except for the tool plan creation option (basic) is included in the scope of the order!

2620	1	<p>***Machine operation options*** Consisting of:</p>	
2640	2	<p>Rotating viewing window(s) 1 rotating viewing window per workspace, integrated in the safety glass of the workspace door. This makes it possible to monitor the machining process when machining with cooling lubricants.</p>	1
2660	1	<p>Status light 3-colored The 3-color status light is mounted on the machine guard and has the following display functions: Color green = program is running in automatic cycle Color green flashing= automatic mode, program not running Color yellow= error message or operator message pending Color red= NC alarm with feed stop</p>	
2670	1	<p>Handwheel portable Euchner Transportable handwheel for manual movement of the NC axes (7 pre-assigned, one selectable) in set-up mode. When the safety door is open, operation only with integrated enabling button. Axis speeds are reduced to 2 m/min in this case. The main spindle speed is limited to 800 rpm. Incl. emergency stop button</p>	

- 2680 1 **Hardware keyboard**
 Full hardware keypad in sealed design, suitable for use in industrial environments.
 Protection class: IP68
 Interface: USB
 The keypad is permanently attached to the keypad support on the main control unit and can be swiveled away when not in use.
- 2700 1 *****Other versions*****
 Consisting of:
- 2720 1 **Platform for machine operation**
 Three-sided, two-stage platform for ergonomic machine operation.
 Design of the standing surfaces in slip-resistant, slip-proof and replaceable sheet metal profile gratings.
 The platform has height-adjustable support legs and drive-in openings for easier transportation.
 Paint finish: NCS S 7502-B (dark gray)
- 2740 1 **Platform for WKZ set-up**
 Single-level platform for ergonomic tool set-up via insertion station.
 The standing surface is made of slip-resistant, slip-proof and replaceable sheet metal profile gratings.
 The platform has height-adjustable set-up elements and drive-in openings for easier transportation.
 Paint finish: NCS S 7502-B {dark gray)
- 2760 1 **UPacking / loading** One-way packaging for truck transport Loading onto trucks.
- 2800 1 **Workpiece clamping device by customer**
 The following equipment required for production - unless they are supplied by STAMA - must be provided by the Buyer free of charge **at least 6 weeks** before the confirmed delivery date.
 {May change depending on the project, deviating definition at the latest at the start-up date)
 - Workpiece clamping device incl. drawings and clamping pressure specifications
 - Measurement logs of the clamping device with function log
 As a rule, the clamping device must be provided ready for use.
 Late provision of materials may affect the delivery date. If additional expenses are incurred due to defective or late provision of materials, these shall be invoiced at cost in accordance with the current STAMA assembly conditions
 and the delivery date is postponed according to the current production capacity utilization!

2820 1 **Clamping device Removal workpieces**

Clamping device AB 1 consisting of:

- 1 piece AP-RC 315 A8 precision power chuck
- 1 piece tie rod
- 1 piece Drawbar reducer
- 1 piece Hard gripper jaws GG-D 063 0A 210 - 0A 290 Quick jaw change, Proofline® = coolant- and dust-tight, low-maintenance
- Chuck body and inner parts are case-hardened

Clamping device AB 2 consisting of:

- 1 piece precision pull-down chuck TXC-315
- 1 piece pull rod
- 1 piece Drawbar reducer
- 3- Jaw chuck, Proofline®= coolant and dust-tight, low-maintenance
- Active pull-down, centrifugal force compensation 3 sets of top jaws in special design (1 set = 3 pieces)
- Hardened top jaw in special design Smooth clamping 0 must be agreed in case of order (prepared for resizing on the machine)
- 3 boring rings for finishing the clamping 0 on the machine
- 3 pcs. workpiece stop, hardened and ground Support-0 must be clarified in the order depending on the workpiece.
- 3 hardened and ground control rings for checking the Clamping diameter

2840 1 **Package deal with cycle time**

The offer you have received is an indicative price offer. Changes or adjustments to individual offer items (e.g. automation) in connection with tools, devices, special expansion stages and machine approvals, We reserve the right to make changes due to the generally increasing level of detail in the offer phase. The scope of the offer only includes the cycle time calculation listed under the item Cycle time calculation. Furthermore, no process specifications were taken into account when preparing the offer!

- 2860 1 **Cycle time calculation**
 The scope of the offer includes only the services provided by the STAMA Maschinenfabrik GmbH assured cycle time calculation(s):
 - Zst_7020621-1-2_Sauter_receiving_disc 0847175_180306_pra
 - Zst_7020621-2-1_Sauter_Rastring 118666_181012_pra
 - Zst_7020621-3-1_Sauter_Rastring 084717_181015_pra Other cycle time calculation(s) than those listed are not part of the offer.
- 2870 1 **Warranty extension**
 Our valid warranty period of 12 months is extended by 12 months.
 The warranty extension begins after expiry of the regular warranty period and covers the complete machine including CNC and PLC control.
 Pure wear parts are excluded. Observe the replacement deadlines for Makrolon panes according to the machine documentation
 The warranty for the main spindle(s) is limited to a maximum of 6,000 hours!
- 2880 1 *****NC control options*****
 Consisting of:
- 2900 1 **STAMA technology package: 3+2 axes Pos.**
 The package includes functions that simplify the programming of 5-axis machining operations in positioning mode.
 Licensing and setup of the following functions:
 - TRACYL - Cylinder interpolation
 - TRANSMIT - Rotary axis replaces a linear axis
 - 3D tool correction
 - Extension of the contour milling cycles to include residual material detection
 - CYCLE800 - Swivel cycle {not in rotary mode}
- 2920 1 **CNC program transfer via network**
 This makes it possible to read and save NC programs on the machine controller in networked operation. Prerequisite:
 - Connection of the machine in the company network environment.
 - Read/write rights for Siemens standard users.
commissioning effort:
1 day installation at the customer's premises in accordance with STAMA installation guidelines (billed separately at cost).

- 2940 1 **STAMA DATALine**
The cross-machine application and service platform for accessing machine data from any end device with a standard web browser enables the collection, calculation and storage of data, as well as its use and visualization. Incl. industrial PC in the control cabinet and the following apps:
- Production Overview
Display of the machine status as an overview or in detail over a freely definable period of time.
- Statistic
Display of the productivity or utilization time (per day, week, month or year) of the machine over a freely definable period and the downtime causes recorded on the machine.
- Parts Overview
Display of produced quantities per NC program, per period and monitoring of production times.
- Machine Live
Display of the current process on the machine with display of the current program, status of the machine with active tool, NC block, NC block number, operation mode and feed override.
- NC Logger
For logging NC program changes with backup function. (only for Siemens version)
- Alarm monitor
Display of the top 10 list of alarms, sorted by frequency and duration.
- Spindle Monitor
Illustration of the use of the main spindle with speed ranges.
- Please note:
Network connection required!
- 2960 1 **STAMA ECO PACKAGE and Wake Up Timer**
Saves energy by selectively switching off machine functions when the machine is at a standstill. Includes:
Power Saving Utility Menu - PSU
- Staggered power cut-off
the extraction system, drives, lighting, hydraulic unit(s) and coolant pumps.

STAMA Pneumatics Power Safe

- Staggered shut-off of the sealing air for measuring systems, work spindles and swivel axles.

Wake up timer

In order to start programs at certain intervals, the machine can be switched to a defined program mode, energy-saving state (wake-up mode). From this state, the machine can reactivate itself via a timer function and start a defined program in which the desired machine functions can be executed.

*****Measurement / tool breakage options******

2980 1

Consisting of:

*** Left workspace configuration* Wireless**

3000 1

Renishaw touch probe

3020 1

Repeatability: 1 µm Data

transmission:

Radio, automatic calculation in the CNC controller

Operation with battery, service life: approx. 1 year

Functions:

- Internal measurement X-Y of a hole or window with 2-point measurement
- Internal measurement only X- or Y-axis with 2-point measurement
- External measurement X-Y on a rectangle with 2-point measurement
- Probing a surface in Z- with 1-point measurement
- Probing an edge in the X or Y direction with 1-point measurement

SCOPE OF DELIVERY:

- 1 measuring probe with tool holder
- Stylus insert, ball diameter 6 mm, stylus length 50 mm
- Calibration ring with magnet
- Software heat compensation (measuring cube required)

Measuring cube

3040 1

1 x precision measuring cube with precision bore for installation in the work area, including the necessary attachments. For calibrating the measuring probe.

3060 1

Tool breakage control Whisker Switch

Tactile, non-productive time-reducing tool breakage monitoring for drilling tools thanks to the probe head with sensor needle integrated in the tool magazine.

Not suitable for detecting chipped cutting edges.

Testable tool diameter min. :

0.5 mm (depending on tool length)

Testable tool length range: 90 mm to 300 mm

3080	1	<p>* Configuration right workspace *</p>
3100	1	<p>Wireless measuring probe Renishaw <i>Repeatability: 1 µm</i> <i>Data transmission:</i> <i>Radio, automatic calculation in the CNC control system</i> <i>Battery operation, service life: approx. 1 year</i> <i>Functions:</i></p> <ul style="list-style-type: none"> - <i>Internal measurement X-Y of a hole or window with 2-point measurement</i> - <i>Internal measurement only X- or Y-axis with 2-point measurement</i> - <i>External measurement X-Y on a rectangle with 2-point measurement</i> - <i>Probing a surface in Z- with 1-point measurement</i> - <i>Probing an edge in the X or Y direction with 1-point measurement</i> <p>SCOPE OF DELIVERY:</p> <ul style="list-style-type: none"> - <i>1 measuring probe with tool holder</i> - <i>Stylus insert, ball diameter 6 mm, stylus length 50 mm</i> - <i>Calibration ring with magnet</i> - <i>Heat compensation software (measuring cube required)</i>
3120	1	<p>Measuring cube <i>1 x precision measuring cube with precision bore for installation in the work area, including the necessary attachments. For calibrating the measuring probe.</i></p>
3140	1	<p>Tool breakage control Whisker Switch <i>Tactile, non-productive time-reducing tool breakage monitoring for drilling tools using the probe head with sensor needle integrated in the tool magazine.</i> <i>Not suitable for detecting chipped cutting edges.</i> <i>Testable tool diameter min. : 0.5 mm (depending on tool length)</i> <i>Testable tool length range: 90 mm to 300 mm</i></p>
3150	1	<p>*** Tool breakage options Independent of workspace *** <i>Consisting of</i></p>
3155	1	<p>Tool breakage detection Toolinspect <i>Device for detecting tool breakage via fault and overload monitoring.</i> <i>This system uses the torque sensor signals from the feed drives and evaluates them with fault, overload and pre-warning limits for each machining operation.</i> <i>If necessary, training will be provided at cost.</i> <i>Tools from a diameter of 3 mm can be monitored (depending on the required cutting performance and motor torque)</i></p>

Offer summary

Pos	Mng	Designation	Total price
1000	1	Technical system MT 733 STAMA	
1040	1	***Basic machine***	
1060	1	Machine base frame	
1080	1	* Left workspace configuration *	
1100	1	Technical design X-axis	
1120	1	Technical design Y-axis KGT	
1140	1	Technical design Z-axis	
1160	1	Laser measurement in general	
1180	1	Main spindle unit left	
1200	1	Motorized milling spindle HSK-T63 12,500 1/min	
1220	1	Tool magazine left	
1240	1	Number of available magazine slots: 64	
1260	1	Automatic chain pre-tensioning Tool magazine	
1280	1	Rotary swivel unit Clamping position 1	
1300	1	RGM 175 precision swivel unit	
1320	1	Turning spindle FT	
1340	1	* Configuration right workspace *	
1360	1	Technical design X-axis	
1380	1	Technical design Y-axis KGT	
1400	1	Technical design Z-axis	
1420	1	Laser measurement in general	
1440	1	Main spindle unit right	
1460	1	Motorized milling spindle HSK-T63 12,500 1/min	
1480	1	Tool magazine right	
1500	1	Number of available magazine slots: 64	
1520	1	Automatic chain pre-tensioning Tool magazine	
1540	1	Rotary swivel unit Clamping position 2	
1560	1	RGM 175 precision swivel unit	
1580	1	Turning spindle FT	
1600	1	* Configuration machine *	
1620	1	Center protection	
1640	1	Tool set-up via insertion station	
1660	1	Basic hydraulic equipment	
1680	1	Cooling machining center	
1700	1	Workspace lighting	
1720	1	Full encapsulation of the working area	
1740	1	Protective device	
1760	2	Roof covering Y-axis comfort	
1780	1	Axis movement with safety gate open	
1800	1	Machine design/painting	
1820	1	Automatic central lubrication	
1840	1	Installation data	
1860	1	Mains connection	
1880	1	***Installation data 2***	
1900	1	Installation elements without base tray	

1920	1	***Control***
1940	1	Machine control Siemens 840D sl
1960	1	Language user interface Control NCU
1980	1	High Performance
2000	1	TOUCHLine HMI
2020	1	Main command device movable
2040	1	JOB list
2060	1	Remote diagnosis during the warranty period (SIEMENS)
2080	1	***Documentation***
2100	1	Documentation Operation, maintenance, safety
2120	1	Documentation Spare parts / wear parts / parts list
2140	1	Documentation Electrical and fluidic diagrams
2160	1	Base price of the machine
2180	1	-*Options Automation-*
2200	1	Workpiece loading chuck parts
2220	1	KD - Magnetic gripper infeed KD -
2240	1	Magnetic gripper outfeed
2260	1	Sealing cover / chuck processing KD -
2280	1	Feeding belt
2300	1	KD laxative belt
2320	1	***Options coolant / chip conveyor* chip
2340	1	conveyor link belt low-wear coolant cleaning paper
2360	1	belt 600/IKZ 70bar coolant recooling
2370	1	Flushing gun
2380	1	KD - IK70 bar
2400	1	***Extraction / deletion options***
2420	1	KD - Preparation for central extraction
2440	1	◆ Options Pneumatics/
2460	1	hydraulics*** Air supply Milling
2480	1	spindle(s) 6 bar Clamping pressure
2500	1	preselection NC clamping position 1
2520	1	Clamping pressure preselection NC
2540	1	clamping position 2
2560	2	***Tool area options***
2580	1	Buffer station for consistently short chip-to-chip times
2600	1	KD - Tool plan creation (basic)
2620	1	KD - Tools provided by customer
2640	2	*-Machine operation options***
2660	1	Rotating viewing window(s) Status
2670	1	display 3-color
2680	1	Portable handwheel
2700	1	Euchner hardware
2720	1	keyboard
2740	1	***Execution Other***
2760	1	Platform Machine operation
2800	1	Platform WKZ set-up Packaging
2820	1	/ loading
2840	1	KD workpiece clamping device by Kun KD
2860	1	clamping device SMW
2870	1	KD - Flat-rate offer with cycle time



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2880	1	***NC control options***
2900	1	STAMA technology package: 3+2 axes Pos.
2920	1	CNC program transfer via network
2940	1	STAMA DATAline
2960	1	STAMA EGO PACKAGE and Wake Up Timer
2980	1	***Measuring / tool breakage options***
3000	1	* Left workspace configuration *
3020	1	Wireless measuring probe Renishaw
3040	1	Measuring cube
3060	1	Tool breakage control Whisker Switch
3080	1	* Configuration right workspace *
3100	1	Wireless measuring probe Renishaw
3120	1	Measuring cube
3140	1	Tool breakage control Whisker Switch
3150	1	*** Tool breakage options Workspace-independent ***
3155	1	Tool breakage detection Toolinspect
3160	1	
3180	1	
3200	1	
3220	1	
3240	1	
3260	1	