

HORIZONTAL MACHINING CENTRES

ZPS MCH630i / 800i / 1000i



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The machine functions are controlled by a CNC control system that allows machining of spatially complicated shapes when the tool follows a path created as output from a 3D CAD program. The spindle unit is mounted in the spindle head. All spindle units are standardly equipped with a rotary supply unit enabling supply of coolant or air to the tool through the spindle axis.

The rotary table plate is mounted in a preloaded radial/axial bearing and rotates around the vertical axis (B axis). Rotary motion of the rotary table plate is provided either by a torque motor (optional equipment) or a digitally controlled servo motor via a toothed belt and worm gear transmission. Four hydraulic clamps are used to clamp the pallet on the rotary table, which are automatically blown with pressurised air during pallet change.

The column moves on the base in the X-axis along a pair of linear guides. The spindle head moves on the column in the Y-axis along a pair of linear guides. The rotary table moves on the base in the Z-axis along a pair of linear guides. All guideways in the X, Y and Z axis are formed by linear rails with rollers. The size and placing of the linear rails not only allow for high loading of the column, spindle head and rotary table support while maintaining high dimensional accuracy and surface quality of the workpiece even during interrupted cutting, but also guarantee higher service life of the machine. The Y-axis feed motor is always equipped with a brake to prevent unwanted spindle sliding-down in the event of a power failure. Measurement of positions in X, Y, Z axes is performed directly by means of linear optoelectric incremental measuring units. Filtered air is supplied to the housings of the linear measuring units, which creates an overpressure in the units' housings to prevent the ingress of impurities. The B-axis position measurement is direct by means of a rotary encoder. Chips generated during machining are flushed from the workpiece and pallet by means of a workzone wash-out into two spiral conveyors, which carry them out of the workzone to a central rake-type chip conveyor.

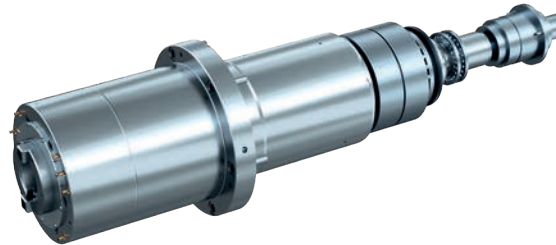
TECHNOLOGICAL POSSIBILITIES OF THE MACHINE

This horizontal machining centre is a highly productive machine for complex chip machining of moulds, dies and flat or box-shaped components made of steel, grey cast iron and light metal alloys clamped on a pallet. It is characterized by high dynamic and thermal stability and high machining precision. It enables milling operations in three mutually perpendicular coordinate axes X, Y, Z, drilling, boring, reaming and tapping operations even when using tapping heads without a floating tap holder (RIGID TAPPING) in the Z axis. The rotary table (B axis) and rotary tilting tables (A and C axes) allow machining of parts from multiple sides in one clamping operation. It is optimally suited for almost any kind of production, from mass production in lines to small batch production. It can be used in the foundry, plastics, automotive and aerospace industries.



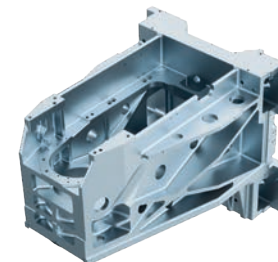
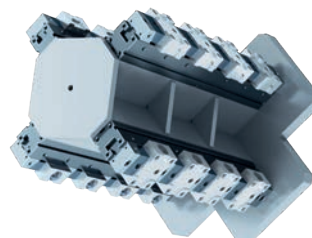
SPINDLE UNITS

ISO 50	8,000 rpm	20 / 30 kW	306 / 458 Nm
ISO 50	8,000 rpm	28 / 43 kW	342 / 526 Nm
ISO 50	4,500 rpm	17 / 25 kW	893 / 1,313 Nm
ISO 50	4,500 rpm	33 / 46 kW	990 / 1,387 Nm
HSK-A63	18,000 rpm	25 / 31 kW	160 / 200 Nm
HSK-A100	14,000 rpm	25 / 37 kW	160 / 236 Nm



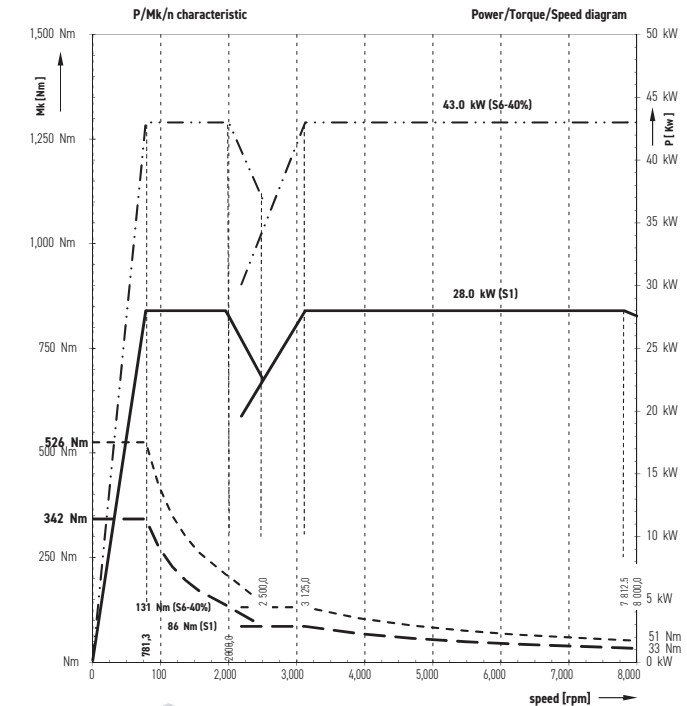
ECO FRIENDLY

The machine enclosure prevents coolant, lubricants and machining fumes from escaping outside the workzone and minimises negative environmental impacts. The machine design complies with the requirements of the Machinery Directive 2006/42/EC and meets all safety standards for CE marking. The lubrication of the moving parts of the machine (linear axes) is ensured by means of the automatic grease lubrication system, thus preventing from contamination of the cutting fluid and machine components.



SPINDLE POWER AND TORQUE

ISO 50 spindle power and torque



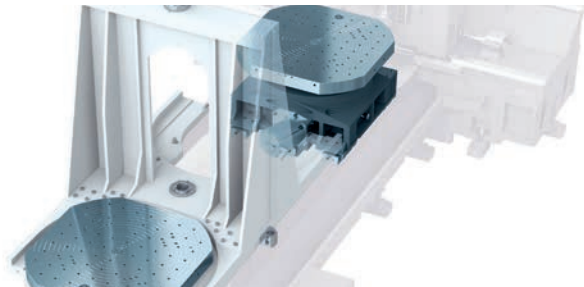
AUTOMATIC PALLET CHANGER

The automatic pallet changer for two pallets allows clamping, unclamping and measuring of the workpiece on the pallet in the clamping station, while the workpiece clamped on the second pallet on the rotary table is being machined. This significantly increases work productivity. The pallets are transferred by means of a hydraulic turntable. The pallets are exchanged in an automatic cycle after the operator closes the door of the clamping station and confirms the readiness of the pallet for exchange by pressing a button.

ZPS MACHINE TYPE		MCH630i	MCH800i	MCH800i FA	MCH1000i	MCH1000i FA
Number of pallets	pc	2	2	2	2	2
Pallet change time	s	10	22	22	22	28
PALLET						
Working area (pallet / plate)	mm	630 × 630	800 × 800	630 × 630 / ø 800	1,000 × 1,000	800 × 800 / ø 940
Max. load (with clamping fixture) - pallet / clamping plate	kg	800	2,500	700 / 1,000	2,500	700 / 1,000
Max. dimensions of workpiece (dia × height) - pallet / clamping plate	mm	ø 750 × 800	ø 1,100 × 1,300	ø 800 × 800 / ø 800 × 950	ø 1,400 × 1,300	ø 1,000 × 800 / ø 940 × 950
Rotary table locking torque	Nm	4,000	5,800	4,000	5,800	4,000

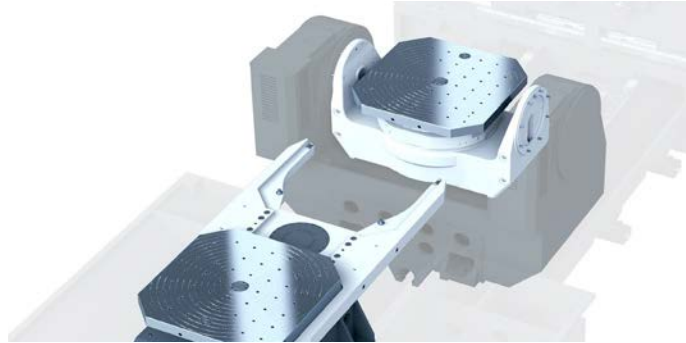
ROTARY TABLE WITH PALLET

ZPS MACHINE TYPE	MCH630i	MCH800i	MCH1000i
Pallet working surface to floor	1,100 mm	1,250 mm	1,250 mm
Max. pallet height deviation	0.01 mm	0.01 mm	0.01 mm
Max. deviation of the pallet position in the X, Z plane	0.01 mm	0.01 mm	0.01 mm
Max. torque of B-axis - worm transmission	2,160 Nm	2,250 Nm	2,250 Nm
Max. torque of B-axis - torque motor	1,310 Nm	2,440 Nm	2,440 Nm



TILTING ROTARY TABLE WITH PALLET

ZPS MACHINE TYPE	MCH800i	MCH1000i
Working area (pallet / plate)	630 × 630 mm / ø 800 mm	800 × 800 mm / ø 940 mm
Max. load (including clamping fixture)	700 kg	700 kg
Max. dimensions of workpiece (dia × height)	ø 800 × 800 mm	ø 1,000 × 800 mm



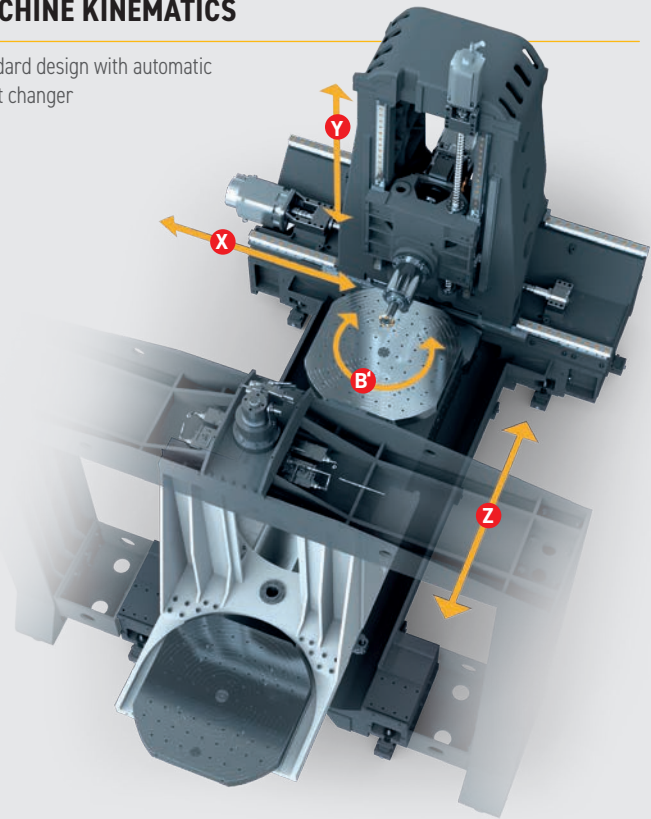
CASSETTE-TYPE TOOL MAGAZINE

The magazine is designed for ZPS MCH630i, MCH800i, MCH1000i machines. The tools are stored in horizontally oriented pockets (cassettes) mounted on carriages. The carriages are moved along the magazine guide to the position required for changing the selected tool. The pocket in the exchange position is then rotated 90° horizontally towards the two-arm exchange arm. The arm with a cam mechanism then performs the tool change between the magazine and the spindle. The loading of the tool magazine is carried out outside the machining area.

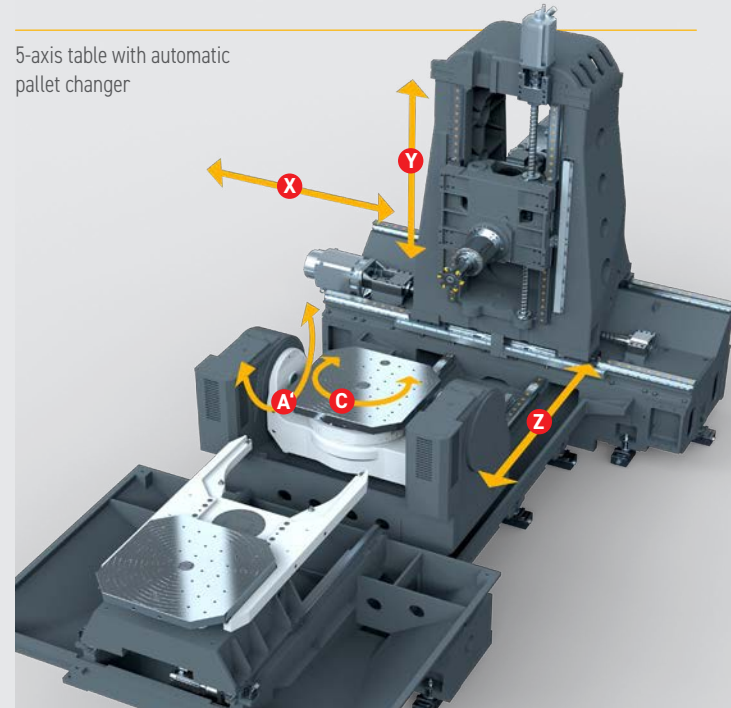
ZPS MACHINE TYPE		MCH630i	MCH800i	MCH800i FA	MCH1000i	MCH1000i FA
Number of tools (* optional)	pc	60 (80, 100, 120)*	60 (80, 100, 120)*	60 (80, 100, 120)*	60 (80, 100, 120)*	60 (80, 100, 120)*
Tool change time (tool to tool)						
Standard speed (tool weight > 8 kg)	s	3.5	3.5	3.5	3.5	3.5
High speed (tool weight < 8 kg)	s	-	2	2	2	2
Max. diameter of tool						
With adjacent tools in magazine	mm	125	125	125	125	125
Without adjacent tools in magazine	mm	250	250	250	250	250
Max. length of tool	mm	450	650	650	650	650
Max. weight of tool including holder SK50&HSK100 / SK40&HSK63	kg	25 / 8	30 / 8	30 / 8	30 / 8	30 / 8
Max. weight of all tools in magazine incl. holders	kg	850	850	850	850	850
Max. moment of tool inertia	kg.m ²	0.5	0.5	0.5	0.5	0.5

MACHINE KINEMATICS

Standard design with automatic pallet changer



5-axis table with automatic pallet changer



SPECIFICATION

ZPS MACHINE TYPE TRAVELS

	MCH630i	MCH800i	MCH800i FA	MCH1000i	MCH1000i FA
X-axis – column	750 mm	1,000 mm	1,000 mm	1,400 mm	1,400 mm
Y-axis – spindle head	700 mm	1,050 mm	1,050 mm	1,050 mm	1,050 mm
Z-axis – rotary table support	770 mm	1,200 mm	1,200 mm	1,200 mm	1,200 mm
A-axis – table tilting range	-	-	210 ° (±105 °)	-	210 ° (±105 °)
B-axis – table rotation range	360 °	360 °	-	360 °	-
C-axis – table rotation range	-	-	360 °	-	360 °

FEEDS

Working feed in X, Y, Z axes	50 m/min	50 m/min	50 m/min	50 m/min	50 m/min
Rapid traverse in X, Y, Z axes	50 m/min	50 m/min	50 m/min	50 m/min	50 m/min
Acceleration in X, Y, Z axes	5 m/s ²	5 m/s ²	5 m/s ²	5 m/s ²	5 m/s ²
Maximal speed in B-axis (worm gear)	8 rpm	11.1 rpm	-	11.1 min ⁻¹	-
Maximal speed in B-axis (SIEMENS torque motor)	38 rpm	43 rpm	-	43 min ⁻¹	-
Maximal speed in C-axis	-	-	42 rpm	-	42 min ⁻¹
Maximal speed in A-axis	-	-	8,3 rpm	-	8,3 min ⁻¹

DISTANCES

Spindle nose to rotary table axis	130 - 900 mm	100 - 1,300 mm	-	200 - 1,400 mm	-
Spindle axis to pallet (rotary table) clamping surface	50 - 750 mm	70 - 1,120 mm	-	70 - 1,120 mm	-
Working pallet (rotary table clamping surface) to floor	1,100 mm	1,250 mm	-	1,250 mm	-
Working area of pallet /plate (in horizontal position) to floor	-	-	1,670 / 1,520 mm	-	1,670 / 1,520 mm
Tilting axis to floor	-	-	1,570 mm	-	1,570 mm
Spindle nose to A-axis (plate/pallet)	-	-	250 / 100 mm	-	250 / 100 mm

DRIVE – DRIVE MOTORS

Axial force in X-axis	15 kN	20 kN	20 kN	20 kN	20 kN
Axial force in Y-axis	8 kN	10.5 kN	10.5 kN	10.5 kN	10.5 kN
Axial force in Z-axis	10 kN	20 kN	20 kN	20 kN	20 kN

ACCURACY ACC. TO ISO 230-2 2014

Measuring system in X, Y, Z, A, B, C axes	přímý	přímý	přímý	přímý	přímý
Bidirectional positioning error A in X, Y, Z axes	0.008 mm	0.008 mm	0.008 mm	0.008 mm	0.008 mm
Bidirectional positioning error A in B-axis	6 arc sec	6 arc sec	-	6 arc sec	-
Bidirectional positioning error A in A-axis	-	-	12 arc sec	-	12 arc sec
Bidirectional positioning error A in C-axis	-	-	6 arc sec	-	6 arc sec
Bidirectional repeatability of R position setting in X, Y, Z axes	0.0034 mm	0.0034 mm	0.0034 mm	0.0034 mm	0.0034 mm
Bidirectional repeatability of R position setting in B-axis	2 arc sec	2 arc sec	-	2 arc sec	-
Bidirectional repeatability of R position setting in A-axis	-	-	4 arc sec	-	4 arc sec
Bidirectional repeatability of R position setting in C-axis	-	-	2 arc sec	-	2 arc sec

ZPS MACHINE TYPE

	MCH630i	MCH800i	MCH800i FA	MCH1000i	MCH1000i FA
Machine layout (l × w × h)	5,800 × 3,140 × 3,260 mm	9,600 × 4,350 × 3,650 mm	9,000 × 4,350 × 3,650 mm	9,800 × 4,520 × 3,650 mm	9,200 × 4,520 × 3,650 mm
Transporting dimensions (l × w × h)	4,850 / 2,570 / 2,760 mm	7,200 / 3,400 / 3,340 mm	7,200 / 3,400 / 3,340 mm	7,400 / 3,800 / 3,340 mm	7,400 / 3,800 / 3,340 mm
Weight (transporting)	17,000 (14,000) kg	31,000 (27,000) kg	26,000 (25,000) kg	33,500 (28,000) kg	29,000 (28,000) kg

STANDARD EQUIPMENT

- Direct measuring system in all axes (X, Y, Z, A, B, C)
- Electronic compensation of thermal dilatations
- Coolant tank
- Tool outer cooling system
- Spindle taper air blasting during tool change
- Rotary table (B-axis) worm gear
- Spiral chip conveyors (2 pcs)
- Central rake-type chip conveyor
- Tool magazine – 60 tools
- Automatic pallet changer
- 2 pallets 630 × 630 / 800 × 800 / 1,000 × 1,000 mm
- Complete machine enclosure with internal LED lighting of the workzone and pallet changer

OPTIONAL EQUIPMENT

- Spindle for BIG-PLUS tools
- Chip bin
- Workzone wash-out
- Axial cooling with filtration unit
- Oil-mist cooling
- Tool checking probe
- Workpiece measuring probe
- Rotary table – 5-axis
- Tool magazine – 80, 100, 120, 246 tools
- Supply of hydraulics / pneumatics into pallet – max. 3 channels – 200 bar
- Vapour exhaustion from workzone
- Manual wash-out gun
- Collector of oil from coolant
- Electrical cabinet air conditioning
- Tool management
- Window rotary cleaner
- Rotary table with torque motor
- Remote diagnostics
- Vibrodiagnostics
- Platform for workzone
- Platform for pallet changer
- Pallet changer door automatic opening
- Pallet clamping surface according to customer requirements – threads, T-slots, centering and positioning sleeves

CONTACT

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Specifications may not always correspond with the machine latest version. 3/2024

