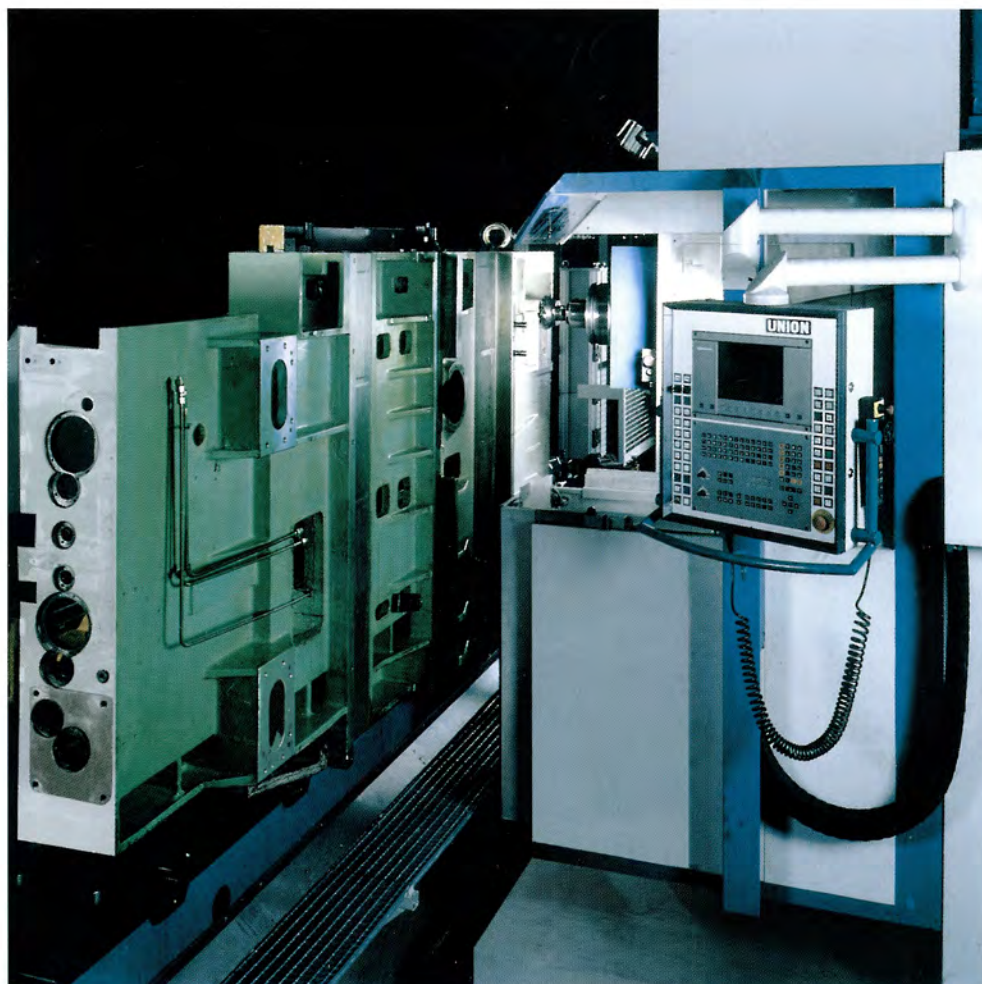


UNION

***Horizontal Boring and Milling Machine
Floor-type
Machining Center***



***UNION P 130 - P 150
UNION PC 130 - PC 150***

UNION P 130 / PC 130 · P 150 / PC 150

A floor-type horizontal boring and milling machine with a high cutting performance

The UNION P- and PC-Series – the boring-mill concept of a new generation sets remarkable standards for an efficient machining of large components

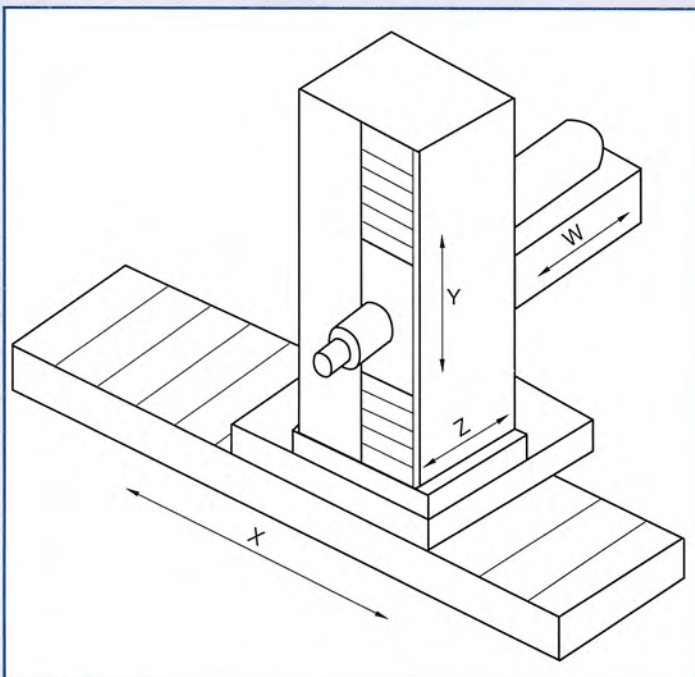
A travelling column type (also called floor boring mill or 3 D-machine) which can be tailor made for your machining requirements and which reduces the run through times of your parts because of complete machining in one set-up.

You can machine with the CNC horizontal boring mill or with the machining centre components up to a size of 3.5 × 20 m. This machine in conjunction with a field of floor plates, with rotary tables, with pick-up station for accessories and large tools, with or without an ATC cover the most versatile production unit in your workshop for the machining of large and bulky parts. With the integration of most modern designs and construction elements in the mechanical engineering and control technique we will take care that you can machine your range of components even more efficiently, precisely and faster.

Main features

- Machine can be supplied in milling spindle version or with built-in facing head
- Facing head version with NC-controlled facing slide (U-axis)
- 4 axes shopfloor-orientated contouring control. In conjunction with rotary tables also with 6 resp. 8 controlled axes
- Infinitely variable AC-main and feed drives
- High main spindle power
- Wide speed and feed ranges
- Nitrided axially traversing boring spindle
- Crosswise traversing column
- Precise guiding of all slides guarantees highest machining accuracy
- Horizontal and vertical-adjustable operator stand (optional)
- 5-side machining possible with special accessories such as angular milling heads mounted on the headstock

Take advantage of the know-how of a machine tool manufacturer which sets new standards in the machining of large components



General Specification

Boring spindle diameter 130 or 150 mm
 $X = 4000 \text{ mm} + n \cdot 1000 \text{ mm}$
 $Y = 2000; 2500; 3000 \text{ or } 3500 \text{ mm}$
 $Z = 800 \text{ mm}$
 $W = 750 \text{ mm}$
Main drive power 50 kW
TNC 426 or 430 in conjunction with NC rotary tables
Size of the floor plate field according to the X-traverse of the machine

UNION

nce for machining of large components up to 20 m length



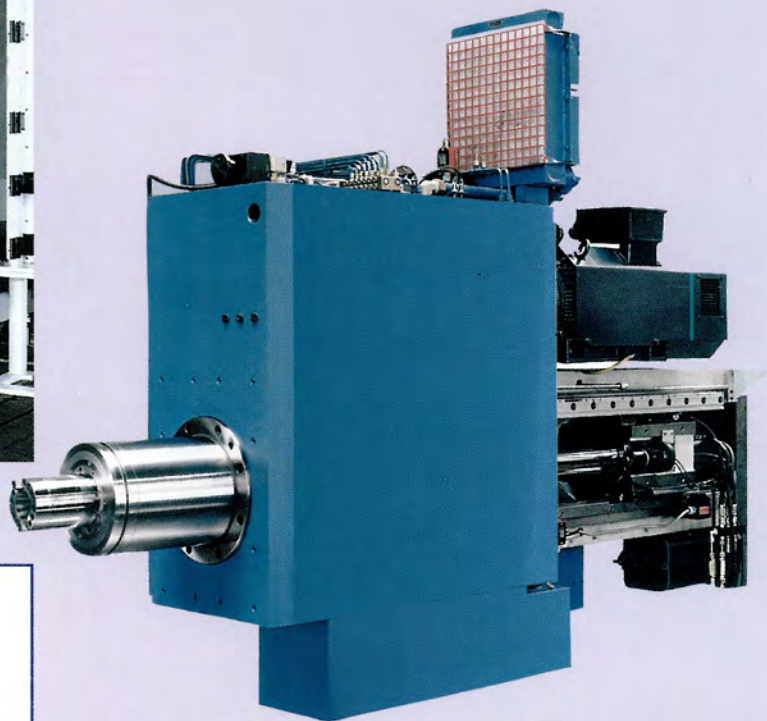
A machine with a life time of accuracy

UNION PC 130 – a Machining Center which moves 3-dimensional to your work piece



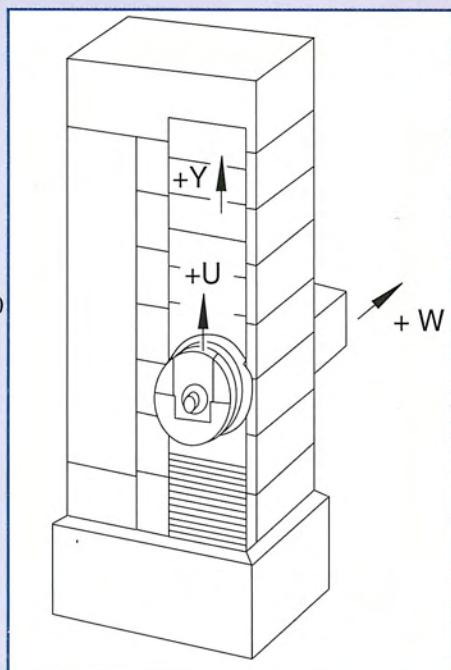
Technical Features

- Crosswise traversing column
- Vibration resistance sturdy box-type column with a several times higher bending stiffness as a frame type version
- Full enclosure around the headstock
- Compact roller guides for all slides, backlash- and stick-slip-free
- Precision ball-screws for the linear traverses
- AC servo-motors for the feed motions
- High rapid traverses – short positioning times
- Operator stand with enclosure - CE approved
- Automatic tool changer with magazine for 40, 60, 80 or more tools



Column unit with headstock of the P 130 with integrated facing head. This version will only be supplied with boring spindle diameter of 130 mm

Type:
PU 130 oder PCU 130



Headstock

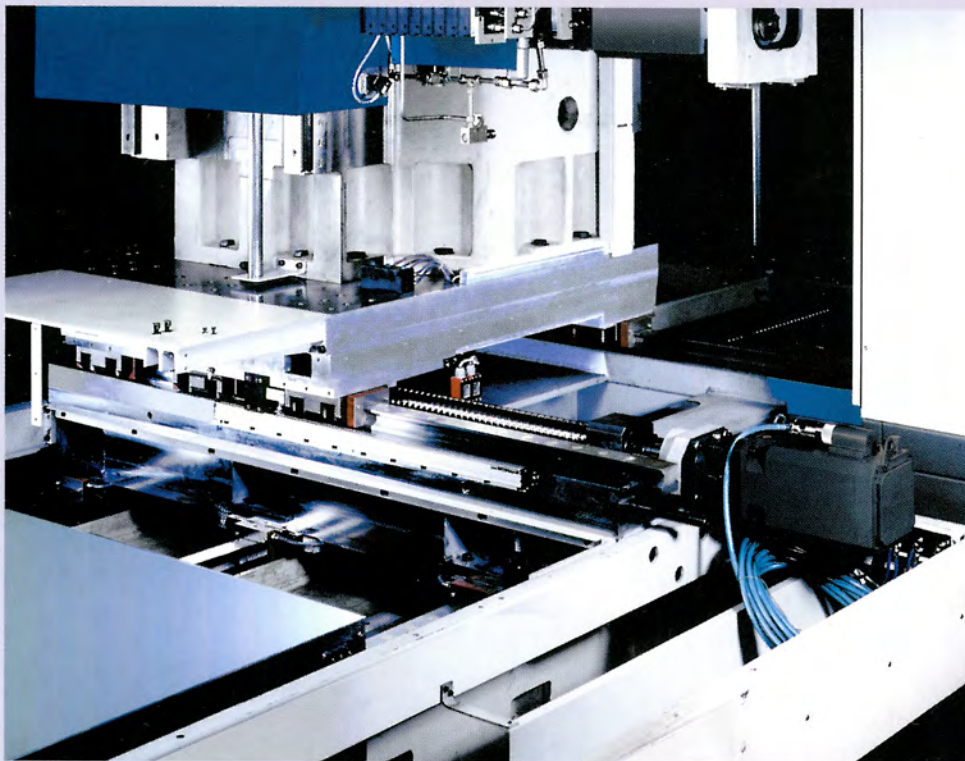
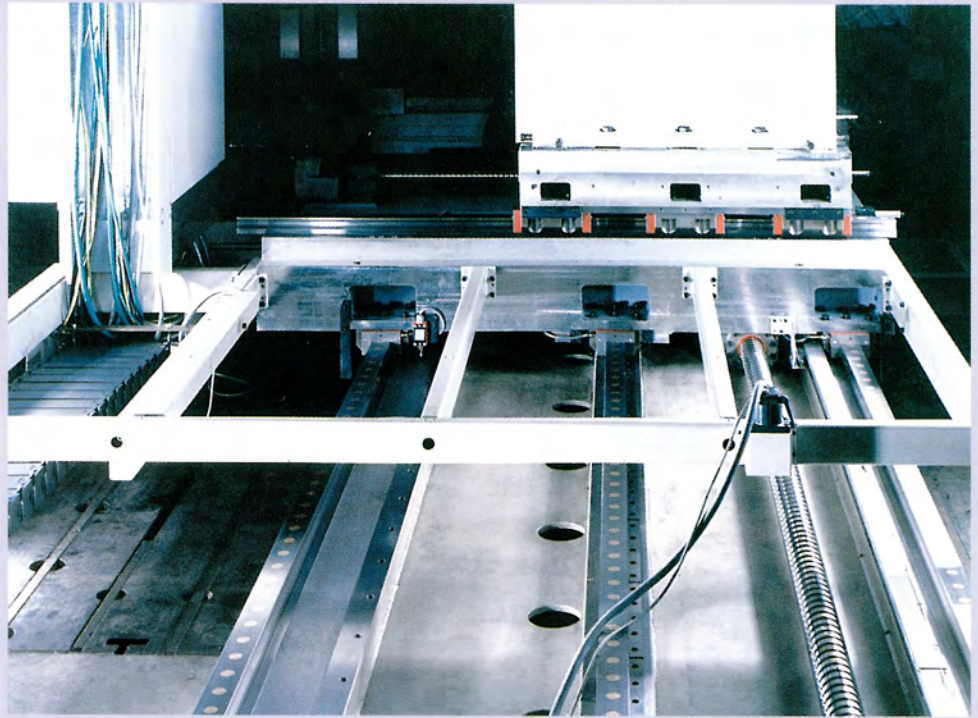
- Projected main bearing with high stability for demanding milling jobs
- Version with built-in NC-facing head on request
- Precision spindle bearings sealed for life
- Nitrided, axially adjustable boring spindle with orientated spindle stop and internal coolant supply (optional)
- NC controlled thread cutting
- Infinitely variable AC spindle motor for high machining performance
- Automatic hydro-mechanical quick clamping of the tools
- Oil cooler for temperature stabilisation

Main Components



Machine bed

Wide 3-way bed supported by adjusting wedges in three rows. The traverses 4000 and 5000 mm will be achieved by a one piece bed of 6 resp. 7 m. - Ball screw spindle for column traverses up to 5000 mm. Backlash-free double pinion / rack drive for larger traverses. The X-traverse of the machine can be enlarged with bed extensions of different length in steps of 1 m up to a total length of 20 m.

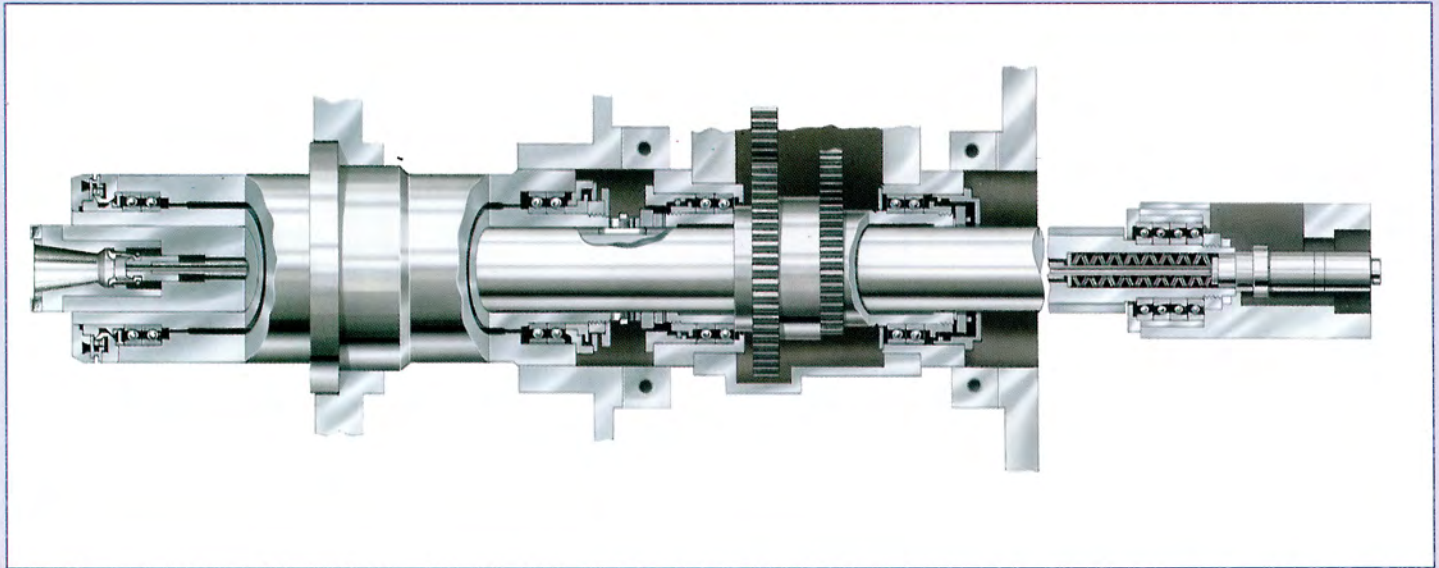


Cross slide

This unit is necessary for the machine-typical cross-motion of the column in the X- and Z-axes. Sturdy components and large dimensioned guiding- and drive elements are the warrant for a high power transmission and vibration-free operation. A high machining accuracy especially on circular milling is guaranteed by means of preloaded linear-compact-roller-guides for all traverses.

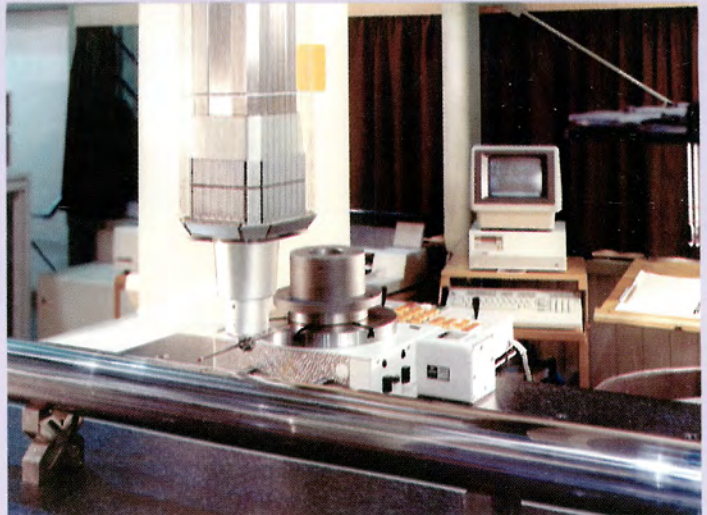
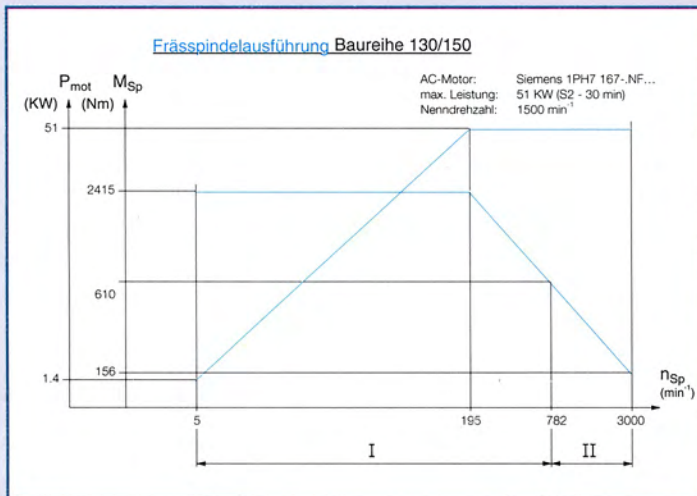
**Precision and Reliability – Made in Germany –
the typical features of a UNION Horizontal Borer**

The UNION P 130 / 150 range – a new generation of machining centers and CNC boring mills – proof of continual technical development



Main Bearing

Because of its projected main bearing system, the spindle bearing offers maximum power transfer to the cutting area of the tool. The precision spindle bearings used in the boring and milling version are your guarantee for high machining accuracy. The system is prepared for coolant through the spindle (available as an option).

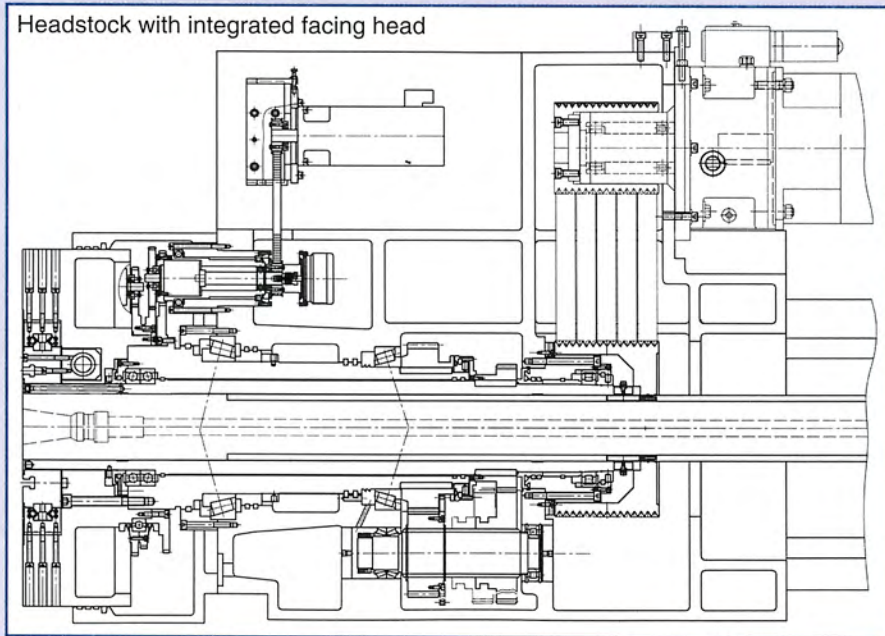


Measuring center of UNION KMZ from Mauser

Technological parameters - accuracies

- Operating modes
drilling, boring, reaming, precision boring, broaching, counter-sink boring, tapping, surface milling, circular milling, thread cutting
- Deviation from a straight line (reference traverse 630 mm) $\leq 20 \mu\text{m}$
- Diameter accuracy (internal boring)
up to 125 mm dia IT 7
from 125 mm dia up IT 6
- Deviation from true circle (internal boring)
spindle output 160 mm diameter 160 mm $\leq 8 \mu\text{m}$
- Deviation from true circle (external milling, circular)
up to 300 mm diameter $\leq 20 \mu\text{m}$
- Coaxiality of both previously mentioned circles $\leq 20 \mu\text{m}$

Headstock with integrated facing head

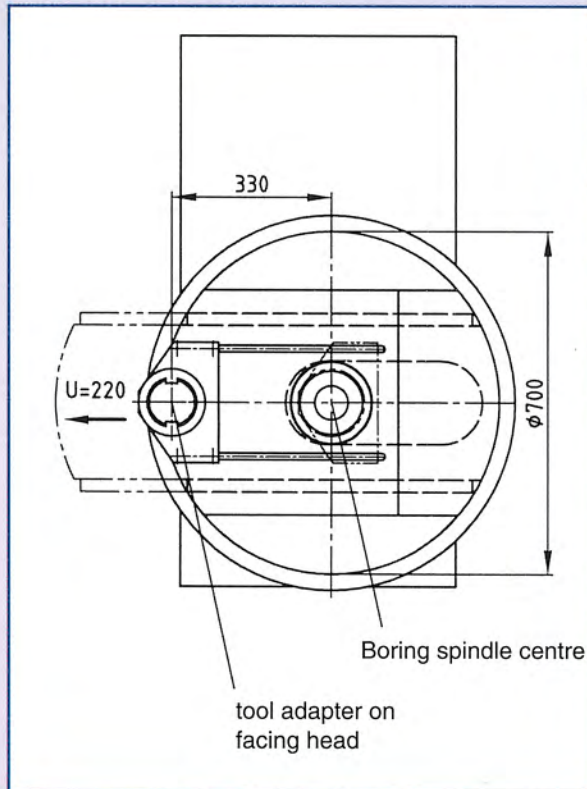
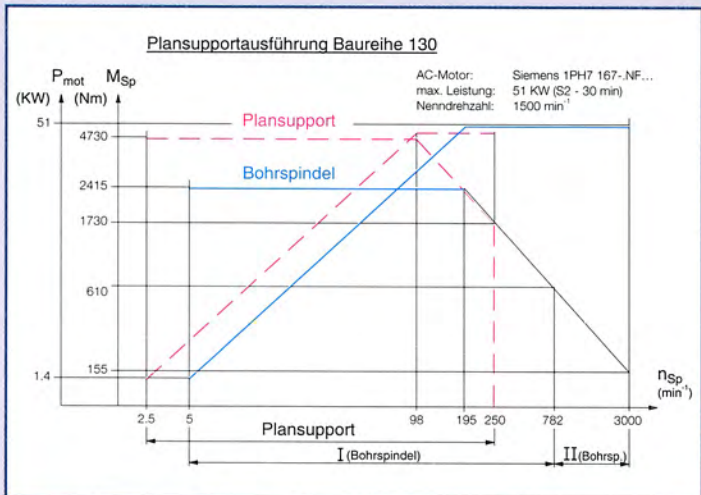


Facing head version PU 130 with boring spindle

The NC-facing head integrated in the spindle system allows the machining of large external diameters, bores, flange faces, ring slots, tapers and other contours.

In the automatic mode, the NC facing slide, combined with other axes offers an extensive technical application range.

The boring spindle is independent from the facing head and can be operated with the full speed range.



Quality test

The manufacturing and machining quality inspection and the acceptance test of all machines are based upon UNION's quality assurance system which, in turn, is based upon DIN and ISO standards: Accuracy and performance tests of the boring and milling operations are made using a test component.

You will get written proof of your machine's accuracy in the form of a test protocol.



Positioning accuracy according VDI/DGQ 3441

axes X, Y, Z

	Traverses ≤ 5000 mm	Traverses > 5000 mm
Positioning uncertainty P	0.025 mm	0.040 mm
Positional scatter P _{s max}	0.016 mm	0.016 mm
Reversal error U _{max}	0.008 mm	0.008 mm
Positional deviation P _a	0.010 mm	0.010 mm

4 resp. 6 or more axes shopfloor-orientated CNC contouring control Heidenhain TNC 426 / 430 with integrated motor control

- Digital interface for the drives
- Controlled axes X, Y, Z, W (with NC table +Z' and B)
- Linear, circular and helical interpolation
- Colour monitor 10" TFT flat screen
- Input increments 0.001 mm / 0.0001" and 0.001°
- Conversational programming, internal or external with data transfer
- Display of the actual program
- Operator guidance, test run with graphic simulation
- Program memory on hard disc with 900 M Byte
- Cutter length and radius compensation
- Operating modes
 - manual operation
 - positioning with MDI
 - single block and automatic operation
- background programming and editing during automatic part program run
- Feed and speed-override
- Canned cycles: machine cycles for pecking, thread cutting, groove milling, pocket milling, frame milling, mirror image, co-ordinate system shift and rotating
- Polar co-ordinate- and parameter programming
- Tangential contour approach and departure
- FK-free contour programming with graphic support
- Datum point shift for all axes
- Serial data interface V 24/RS-232-C as well as V.11/RS-422
- Failure diagnosis for control, measuring systems and machine
- Portable electronic hand wheel



Optional: Siemens 840 D or FANUC controls

Portable Rotary Tables



Table positioning 0.001 degree – 360,000 positions
and distortion-free clamping

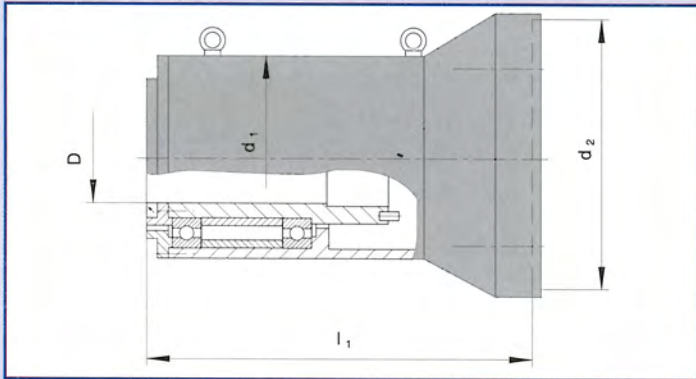
For an increased versatility the boring mill resp. the machining center can be operated with different rotary and traversing tables. UNION offers you portable tables with own controls and DRO measuring system as well as NC tables controlled from the CNC of the machine.

Size of tables:

- 1400 × 1600 and 1600 × 2000 mm
- 55 × 63 and 63 × 78 inch
- longitudinal traverse 1250 mm (49")
- max. loading 12 tons
- 1800 × 2000 and 2000 × 2500 mm
- 71 × 79 and 79 × 98 inch
- longitudinal traverse 1600 mm (63")
- max. loading 25 tons

Special accessories

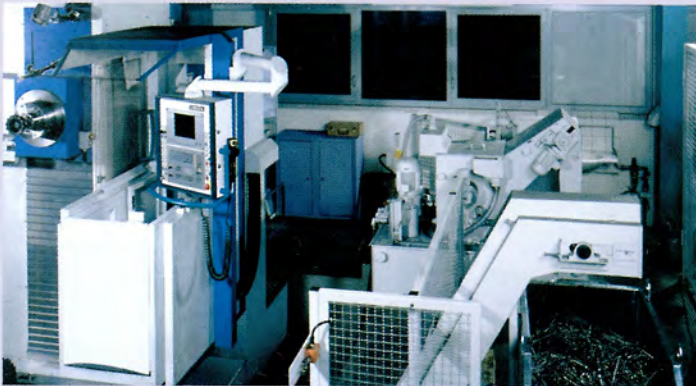
Special versions / options



Support bearing

For heavy-duty operations with extended boring spindle

D ^{H5}	d ₁	d ₂ ^{F7}	l ₁
130	330	440	560
130	330	440	315



Chip conveyor

A conveyor takes away the cutted chips.
The coolant circulation is ensured by means of collector trays.

Compact coolant unit

The coolant is supplied through a separately controlled jet pipe.
The drained coolant is cleaned over a filter unit and re-applied the system.

Flow volume 25 l/min or 50 l/min with adjustable pump and 3 jet-pipes at 3 bar.

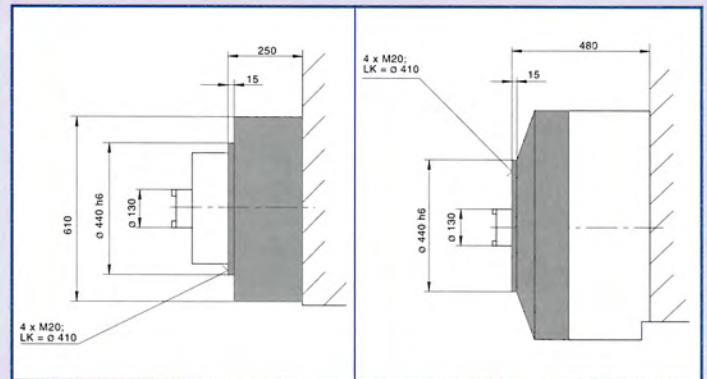
Coolant through the boring spindle

An additional high-pressure coolant circuit together with a fine filter unit and compact coolant attachment ensures coolant supply to the cutter tool.

Flow volume 30 l/min at 22 bar.

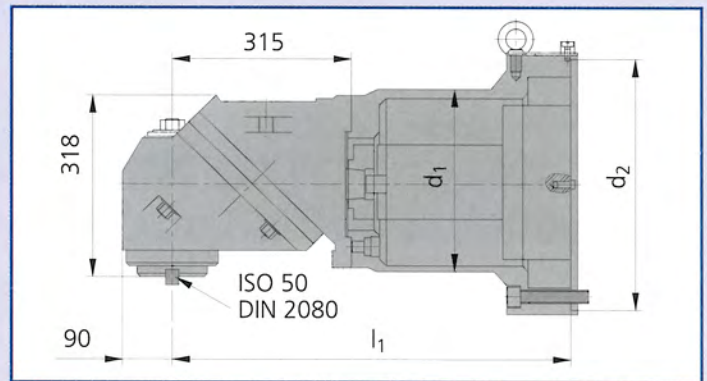
Pick-up station

for heavy and long tools as well as other special accessory.



Adapter for milling spindle and facing head version

To accommodate support bearings, as well as vertical and universal milling attachments.



Universal milling attachment V3

d ₁	d ₂ ^{F7}	l ₁
322	440	700

Universal milling head KFU-D3

Automatic positioning in 2 axes with automatic tool clamping.
Swivelling range 2 × 360° in steps of 2,5° or 1° (hirth coupling).
Also in the program as two-axes-NC milling head with continuous swivelling axes for contouring operations.

3D measuring probe

Touch trigger probe with infrared transmission to the machine control incl. software and 6 measuring cycles.

Safety precautions

The machine will be supplied with a CE approved operator stand including enclosure, safety door and windows – electrical interlocked.

Further necessary safety equipment has to be defined in line with the local conditions at the customers site and the legislation of the country and has to be installed before commissioning.
An access to the working area of the machine for setting-up is ensured.

Technical Data P/PC 130/150

		metric		inch	
Boring spindle					
Diameter	mm	130 (150)	inch	5.12 (9.91)	
Drive power	kW	50	HP	67	
Internal taper accord. to DIN 69871	ISO	50	ISO	50	
Spindle speeds	min ⁻¹	5 ... 3000	rpm	5 ... 3000	
Traverses					
Column transverse traverse	X mm	4000	inch	157,5	
Extensions in steps of (max. 20000 mm, 65 feet)	X mm	1000	inch	39,4	
Headstock vertical	Y mm	2000	inch	78,7	
Extensions in steps of (max. 3500 mm, 138 inch)	Y mm	500	inch	19,7	
Column longitudinal	Z mm	800	inch	31,5	
Boring spindle axial	W mm	750	inch	29,5	
Feeds/rapid transverses					
Feeds on all axes	mm/min	1 ... 6000	ipm	0.04 ... 236	
rapid traverse	mm/min	15000	ipm	590	
Max. feed force on main axes	N	25000	N	25000	
Automatic tool changer					
Number of tools in magazine		40 (60, 80)		40 (60, 80)	
Max. tool diameter	mm	250	inch	9,8	
Max. tool length	mm	500	inch	19,7	
Max. tool weight	kg	30	lbs	66	
Net weight of the basic machine	kg	24500	lbs	54000	

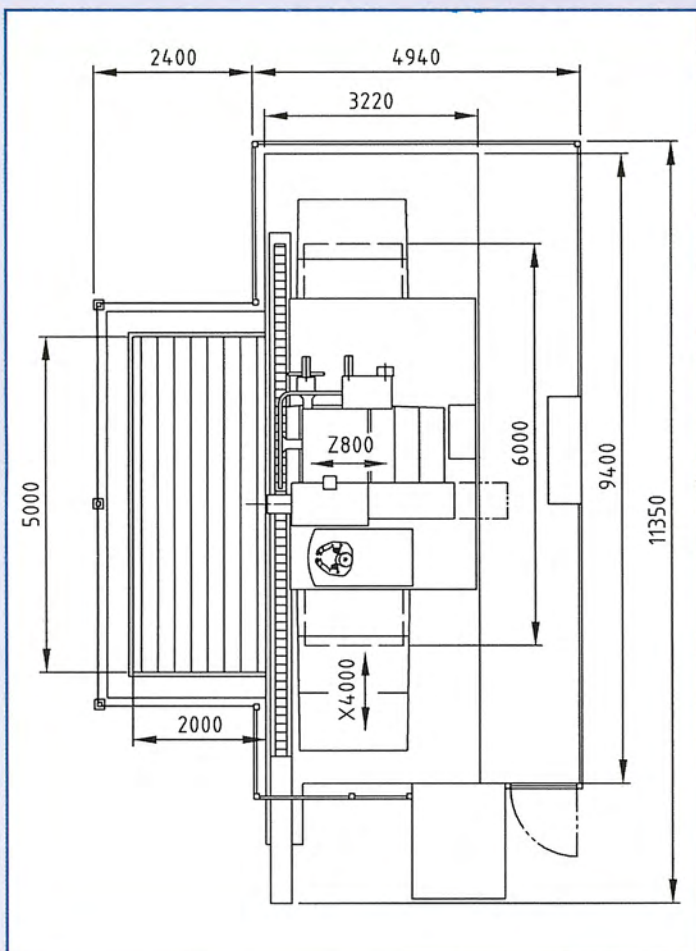
Facing head version PU 130 / PCU 130

The NC-facing head integrated in the spindle system greatly extends the technological application of the machine.

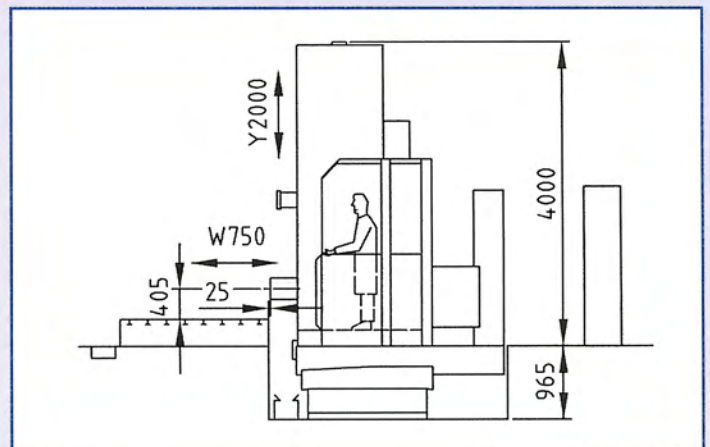
The facing head can be controlled fully numerically as well as manually

Facing head diameter	mm	700	(27.6")
Facing slide traverse	mm	220	(8.7")
Speed rate, infinitely variable	rpm	2.5-250	
Facing slide feed	mm/min	1 - 1000	(up to 40"/min)

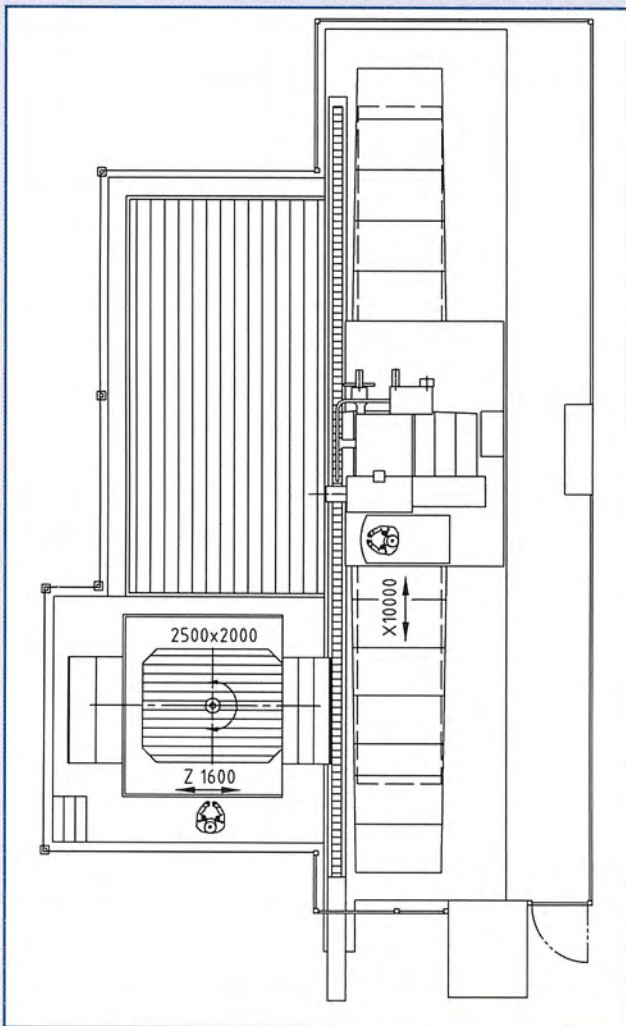
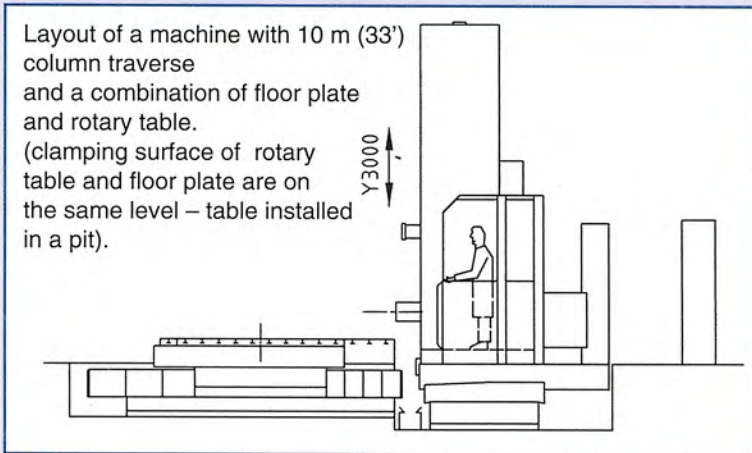
Max. boring diameter using facing head	mm	1250	(50")
Tool adapter on facing slide	ISO	50	
Setting range of the tool adapter on the facing slide	mm	280	(11")
Max. distance boring spindle center to center of tool adapter on U = 220 mm	mm	550	(21.7")



Layout of a P / PC 130 / 150 in basic version with one floor plate 5000 x 2000 mm (197 x 78") and chip conveyor.



Advantages of a travelling column machine – flexible adaptation to the machining task



Further set-ups with pick-up station, two bed-ways opposite to each other with a floor plate field in between and many more layouts can be supplied.

UNION comes out with general recommendations for the height of the machine in relation to the floor plates. The exact figures of floor plates height to floor level and the lowest boring spindle position to the top of the floor plates can be modified according your machining task and has to be defined with the order.

