

**AREA OF APPLICATION:**

The **UNICOM 6000** is ideally suited for applications where large and complex, ring-, cone- or cylindrically shaped components require machining to highest accuracy standards.

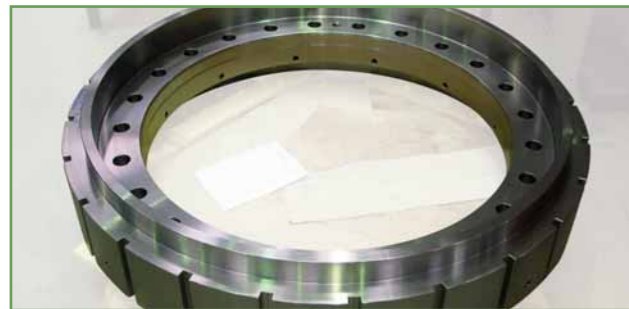
Typical products are wind turbine components, components for power generation equipment, engine parts for the aviation industry, pump housings, compressors, turbo chargers, centrifugal separators, etc.



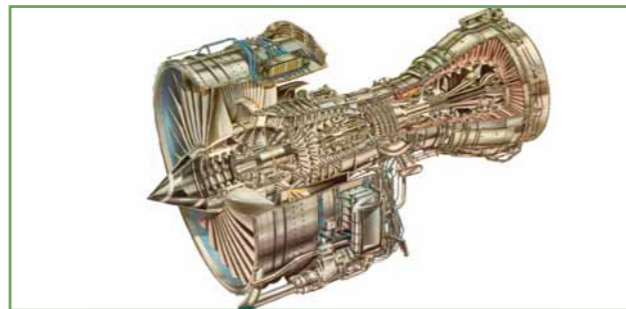
Housing for centrifugal pump



Turbo charger for ship engine



Steel spring coupling



Jet engine casing



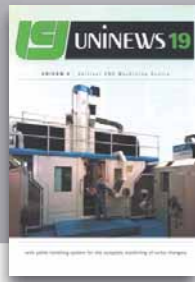
Butterfly valve



Valve component for oil wells

**ALSO AVAILABLE**

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Two **UNICOM 8** machines integrated into a fully automated flexible manufacturing system



Two **UNICOM 6** machines integrated into a fully automated flexible manufacturing system



**UNIPORT 7** travelling bridge machining centre with integrated carousel turning station



Industrieterrein 36  
P.O. Box 7047  
NL-5980 AA PANNINGEN  
The Netherlands  
Tel: +31 (0) 77 - 307 37 77  
Fax: +31 (0) 77 - 307 54 36  
E-mail: info@unisign.nl  
www.unisign.nl

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## UNICOM 6000

### Vertical Turning & Milling Machining Centre



**UNICOM 6000**  
Vertical Turning & Milling Machining Centre

## GENERAL

The **UNICOM 6000** from this publication offers a modern turning & milling platform with large working envelope and excellent price/quality ratio. The vertical turning station in combination with the main spindle enables complete machining of complex components.

## POWERFUL MAIN DRIVE

The milling and drilling spindle of the **UNICOM 6000** is configured as a cartridge type spindle that is integrated in the lower end of the spindle carrier. The spindle drive unit consists of a water cooled main drive motor with 2-stage gearbox that is installed in the upper end of the spindle carrier. The drive unit is connected to the spindle via a central drive shaft.

The standard, automatic shifting, 2-stage gearbox driven spindle is water cooled with powerful characteristics (36 kW / 720 Nm / 6.000 min<sup>-1</sup>). Optional is a spindle with increased power (54 kW / 720 Nm / 6.000 min<sup>-1</sup>).



Photo: Vertical turning

## POWERFUL VERTICAL TURNING CAPABILITIES

The carousel turning station is powered by two drive units; each one consisting of an integrated water cooled main drive motor with two-stage gearbox. The individual drive units are mounted on either end of the moving table, underneath the Y-axis steel telescope covers.

The carousel turning station offers 70 kW of power and 25.000 Nm of torque with a maximum speed of 450 min<sup>-1</sup>. Optionally, the power can be increased to 95 kW and 38.000 Nm maximum available torque. Also available is a "heavy load transport package" which allows component weight of up to 6.000 kg.

In addition to turning operations, the carousel turning station may also be utilized as a C-axis rotary table. C-axis operation is activated by disabling the electronic synchronization of the two drive units and having one of the drive units act as a constant counter pressure to the other one, thus resulting in an accurate, backlash free C-axis drive.

## AUTOMATIC PALLET CHANGER

With traditional pallet changing machines, the pallet changer is located at the front of the machine where it partially blocks the operator's view on the machining processes. This set-up leaves very little room for the operator to comfortably operate the machine.

With the **UNICOM 6000**, the pallet changer is located close to the operator platform sideways at the rear of the machine. With this set-up the front face of the machine is available for the operator. The operator access door with large window is located close to the spindle to ensure an undisturbed view on the machining process. The control panel can swing to the pallet loading station which enables comfortable loading of new components.

The pallet loading station is, in relation to positioning and clamping of pallets, identical to the carousel turning station. Alignment of new components can therefore take place during loading which eliminates time consuming measurements inside the machine. For this purpose the pallet loading station can be equipped with a stationary, two-axes measuring system. Another optional feature of this station is the vacuum swarf collector to clean the pallet and product.

The actual pallet change is performed via a revolving transfer unit. This transfer unit delivers the pallet to the (un)loading station, a holding area or into the machine via an automatic sliding door in the rear guarding section. The standard configuration consists of two pallets, however **UNISIGN** has built the **UNICOM 6000** also with 6 pallets, requiring a (un)loading position, 5 holding areas and two revolving transfer units. If required, it is possible to even increase this number of pallets.



Photo: Palletsystem

## PALLETS

The **UNICOM 6000** can be equipped with cast iron pallets, dimensions  $\varnothing$  1.250 mm,  $\varnothing$  1.600 mm and  $\varnothing$  1.800 mm. The top face can be configured with pitch serration for four clamping jaws and T-slots. Alternative pallet configurations are special cast iron pallets with four integrated, independent jaws or adapter pallets with integrated actuating cylinder for hydraulic chucks. Hydraulic couplings on the pallet for a hydraulically actuated fixture are also possible.



Photo: Spindle attachment pickup station with 6 positions

## EXCHANGEABLE MACHINING HEADS

In addition to vertical operations, the **UNICOM 6000** offers a variety of machining heads. For operations in the vertical plane, the UNISIGN right angle head is available. This right angle head offers the same power and torque as the vertical main spindle and can be positioned in 72 x 5° increments (option 144 x 2,5°). In combination with the C-axis rotary table, it allows milling and drilling operations at any angle to the X-Z plane.

A universal angular head can be supplied with the machine to allow positioning of the spindle in two axes (A- and C-axis) in 72 x 5°.

For turning operations, a fully automatic spindle loaded turning tool adaptor is automatically mounted to the spindle nose of the ram. This turning tool adaptor can be automatically indexed in the horizontal plane in 90° intervals. Automatic tool change is standard for all machining heads.

Standard the pickup station for machining heads is located on the vertical column of the machine and offers space for the Hirth gear cover, turning tool adaptor and right angle or universal angular head. Option is a 6 fold-pickup station where in addition to the Hirth gear cover, right angle and universal head, three other machining heads, such as an extended turning tool adaptor, can be stored.

## TOOLING SYSTEM

The chain type tool magazine offers space to 80 milling, drilling and turning tools with HSK 100 or Capto C8 interface. This number can be increased with 61 or 122 to more than 200 tools. The automatic tool change into the vertical spindle, the right angle head or any other machining head always takes place from two designated tool pockets. A pick-and-place unit pre-selects the next required tool and positions it into the proper tool pocket for fastest tool change times.

Tools are loaded into the tool magazine via a tool loading bay at the front side of the machine.

## CHARACTERISTIC FEATURES

- Complete machining of large and complex components requiring a combination of turning and milling, drilling and tapping operations
- Large working envelope: X-axis 1.950 mm  
Y-axis 1.425 mm  
Z-axis 800 or 1.000 mm
- Clearance under the cross rail 1.100 mm or 1.300 mm
- Maximum swing circle  $\varnothing$  2.000 mm
- Rapid traverse and feed rate of 30.000 mm/min in all linear axis
- Pallet changer with two pallets of  $\varnothing$  1.250 mm ( $\varnothing$  1.600 mm and  $\varnothing$  1.800 mm as option), pallet loading station and pallet parking station
- Full automatic spindle loaded turning tool adaptor
- Taper size HSK 100 (DIN 69893 Form A) or Capto C8 for turning, milling and drilling tools
- Integrated vertical spindle with 36 kW, 720 Nm and 6.000 min<sup>-1</sup>
- Carousel turning station with 70 kW, 25.000 Nm and 450 min<sup>-1</sup>
- C-axis operation with 360.000 positions
- Tool magazine for automatic tool change with tool pre-selection and 80 tool pockets (option for up to 202 tools)
- Spindle loaded right angular head for milling and drilling applications in the vertical plane (option)
- Closed loop cooling system for main spindle drive unit, carousel turning station and electrical cabinet
- Position feedback with linear scales for highest accuracy requirements
- Full enclosure guarding with operator access door for highest operating comfort
- Integrated chip conveyor

## GUARDING SECTION

For highest operating comfort and safety, the machine is equipped with a fully enclosed guarding section. Sandwich plating is used to dramatically reduce the noise of heavy chips that hit the guarding section during turning operations. The operator access door is located close to the spindle and the large window offers excellent view on the machining process.

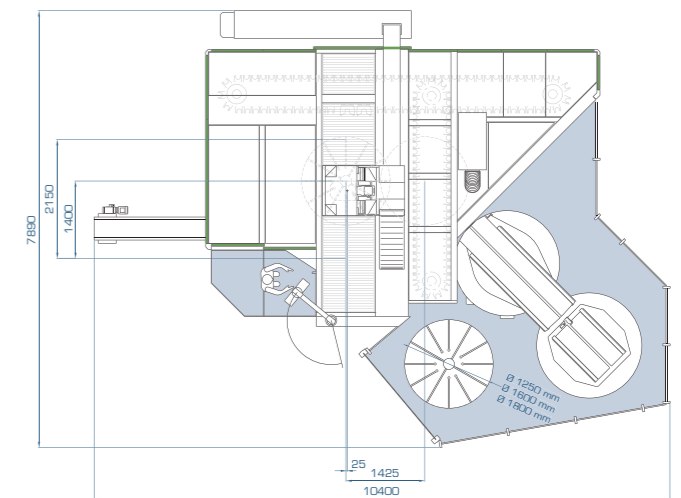
Optionally, the enclosure guarding may be completed with a dust and mist collection system. An integrated filter unit removes oil and coolant mist as well as dust and solid particles from the machine work area.

A chip conveyor is located sideways of the moving table in the lower half of the guarding section. Inclinations in the sheet metal as well as the Y-axis steel telescopic covers facilitate chip and coolant flow into the chip conveyor. Chip conveyor discharge is above floor level at the front side of the machine.

## ACCURACY

The **UNICOM 6000** performs to the highest quality standards and is equipped with linear scales in all axes. The main drive, gearbox, spindle bearings, spindle carrier and the carousel turning station are integrated in a closed loop cooling system. The positioning accuracy of the **UNICOM 6000** is 12  $\mu$ m while repeatability is 8  $\mu$ m.

For product accuracy, the machine can be equipped with a radiographic part probe and an integrated measuring probe on a separate slide for in-process measuring during turning operations.



Layout drawing: UNICOM 6000