

ECO force

High pressure units

The modular solution for optimal and demand-oriented supply, monitoring and documentation of hydrostatic tools of the HG series

How hydrostatic tools work



Following system

3-D deep rolling of free-form surface

Influence on subsurface area

Hydrostatic tools (HG) for roller burnishing and deep rolling are characterized by a hydrostatic bearing of the rolling ball. The rolling ball is pressed onto the surface in a force-controlled manner via a following system in order to ensure uniform and reliable processing. The tools are used on lathes or milling machines and are able to machine any geometry. These tools are supplied by a high pressure unit. The cooling lubricant of the machine or a hydraulic oil can be used. Roughness values of $R_z < 1 \ \mu m$ or $R_a < 0.1 \ \mu m$ can be achieved during machining. At the same time the force control reproducibly introduces residual compressive stresses and hardens the surface. This system can be used for a component hardness of max. 65 HRC, whereby coolant pressure of up to 400 (600) bar is required.



External pressure supply with ECOforce HPU

Activation by high pressure can be carried out with an externally connected hydraulic unit or with an integrated highpressure pump. Depending on the component geometry, different combinations of ball insert and following system are available, so that smaller sectors and radii can be reached in addition to larger component sections.





SK | HSK | Capto | KM

HG system, modularly combinable with roller elements in different sizes

Pressure supply of HG tools with HPU & HPU.s units

Our special hydraulic high pressure units HPU are used for hydraulic supply of HG-type tools. The unit is located next to the machine tool and is connected either to the turret via a hose/pipe package or directly to the tool at the tool spindle.



HPU

For CNC-controlled machine tools with a medium to high degree of automation and large batch sizes

Modular design for optimum adaptation to customer requirments, e.g. fine filtration, process monitoring

Pressure stage I 400 bar for use with HFA (cooling lubricants) Pressure stage II 600 bar for use with HLP (hydraulic oils 20-68cSt)

Conveying volume of 1.4 - 4 l/min

Fine filtration for optimized tool life and particularly high surface requirements

Temperature control of the medium for optimal process results

Fully automatic operation, also for refilling the tank

Process monitoring and documentation



HPU.s (small)

For conventional applications on cycle-controlled or conventional machines with small batch sizes

Pressure stage I 400 bar for use with HFA (cooling lubricants)

Conveying volume 1.4 l/min

Filtration for optimized tool life





Function modules HPU

Module no.	Module name	Function	Necessary modules/dependencies							
			0	1	2	3	4	5	6	7
0	Basic module	Pressure generation of 400 bar and a flow rate of 1.4 I/min with connection to the machine tool via an M-function. Rolling pressure can be set via control system or machine tool (proportional technology)								
1	Increased flow rate	Increase the flow rate to 4 I/min for the use of HGx-11 tools.	•							
2	Increased pressure	Increase the rolling pressure to 600 bar. Only for use with oil as pressure medium.								
3	Fine filtration	Filtering of the medium via duplex filter/switching filter to 10 $\mu\text{m}.$								
4	Cooling	Adaptive cooling of the medium for use in continuous operation or for very long duty cycles.								
5	Series production	Automatic filling of the tank via external supply with pre-filtering of the medium. Cooling of the medium for continuous operation. Fine filtering of the medium to increase tool service life.								
6	Monitoring	Monitoring of set values for pressure and flow rate.								
7	Documentation	Documentation of each individual process with regard to pressure and flow.					1		•	1



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