

## Ultra-High Accuracy Hydrostatic Spindles



- For a perfect finishing surface
- For the best precision
- For a faster production process
- For an eternal lifetime

Parameter		120k	140k	250k
Maximal speed	<i>rpm</i>	120'000	140'000	250'000
Tool Interface, Pilot diameter	<i>mm-thread</i>	7.5-M7x1	7.5-M7x1	5.5-M5x0.8
Continuous power at maximal speed	<i>kW</i>	6	3.5	1.2
Supply pressure	<i>bars</i>	60	60	60
Radial error motion	$\mu$	<0.08	<0.08	<0.10
Axial error motion	$\mu$	<0.10	<0.10	<0.10
Oil pumping power	<i>kW</i>	0.31	0.24	0.23
Axial stiffness	<i>N/<math>\mu</math>m</i>	24	25	12
Radial stiffness at the shaft front end	<i>N/<math>\mu</math>m</i>	22	10	4.5

**TDM** present new generation of Ultra-High Speed Internal Grinding Hydrostatic Spindles with extremely high speed: 120'000 rpm, 140'000 rpm and 250'000 rpm.

## Work Heads Grinding Spindles

- For a perfect roundness
- For a high extremely rigidity
- For a vibration less rotation

Parameter		
Maximal speed	<i>rpm</i>	6'000
Constant continuous torque	<i>Nm</i>	10
Maximal continuous power	<i>kW</i>	6
Supply pressure	<i>bars</i>	60
Radial error motion	$\mu$	< 0.04
Axial error motion	$\mu$	< 0.10
Oil pumping power	<i>kW</i>	0.31
Axial stiffness	<i>N/<math>\mu</math>m</i>	350
Axial load capacity	<i>N</i>	3'200
Radial stiffness at the shaft front end	<i>N/<math>\mu</math>m</i>	200
Radial load capacity at the shaft front end	<i>N</i>	2'400



Ultra-high precision work head hydrostatic spindle was developed and manufactured with maximal speed of 6'000 rpm and load capacity of over 0.5 tons in both radial and axial directions. Spindle has an optional coolant supply through the rotating shaft.



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## Hydrostatic bearing spindles

Hydrostatic bearings are contactless bearings with rotating shaft and non-rotating housing separated by a thin layer of oil. Rotating shaft is surrounded by a number of recesses uniformly distributed in circumferential direction over internal surface of the spindle housing.

High pressure oil is directed from external power supply unit through the inlet restrictors to the recesses. From bearing recesses, the oil leaves to chambers directly connected to the hydraulic unit return line.

Designed and manufactured for extremely precise machining application a TDM's hydrostatic spindles uniquely combine:

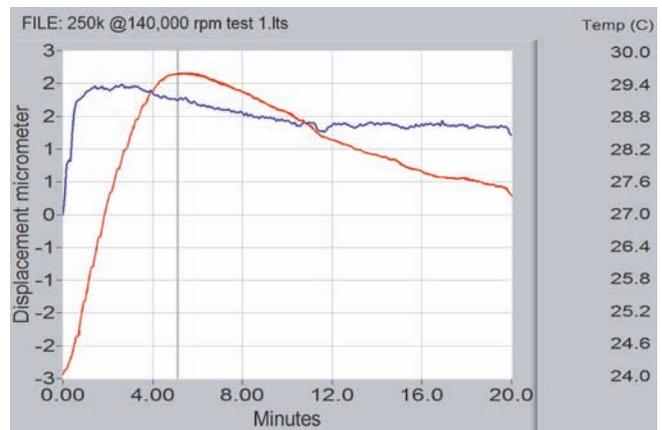
- **very high rotational accuracy**
- **high stiffness & load capacity**
- **extremely high resistance to vibration**
- **very high thermal stability**
- **are virtually free of wear**

We offer ultra-high-speed hydrostatic spindles with maximum speed capability up to 250'000 rpm.

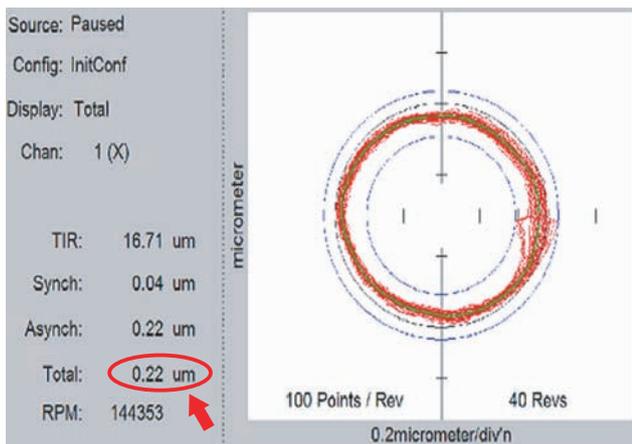
### Set-Up to Measure Rotational Accuracy



### 250'000 rpm Spindle. Thermal expansion at 140'000 rpm

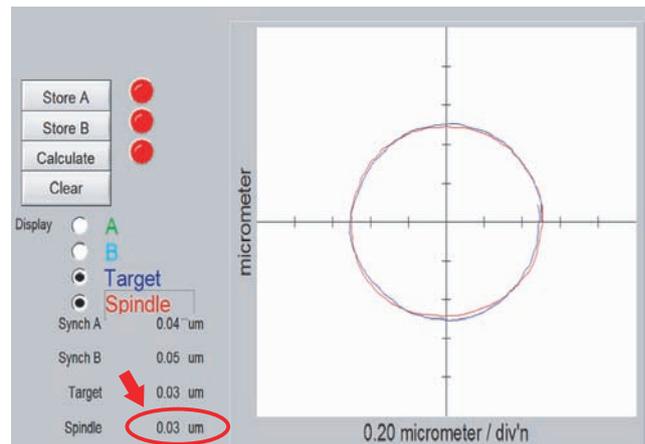


### Ultra-High precision internal Grinding Spindle



Rotational accuracy for 250'000 rpm, spindle at 145'000 rpm speed

### Ultra-High precision Work Head Grinding Spindle



Rotational accuracy at 6'000 rpm

Our innovative grinding products combine a high-speed work head grinding spindle a high-speed grinding spindle to improve grinding performance.

This combination significantly improves the effectiveness of grinding operations, and has proven to be extremely valuable in the manufacture of small-size components which require extreme precision including:

- **fuel injectors**
- **small bearing rings**
- **hard disk drives**
- **fiber-optic connectors**



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