

High speed spindles HFS 60, HFS 80, HFS 100



Properties/quality

The heart of the high speed spindle of Lehmann Präzision GmbH is its air bearing. Its excellent bearing rigidity, maximum radial run-out and vibration-free run result in best surface qualities and longest tool lives in use.

The high speeds, combined with the maintenance-free air bearing, are the best prerequisites for successful high-speed cutting (HSC).

The high speed spindles are designed for speeds of up to 96,000 rpm.

Employment

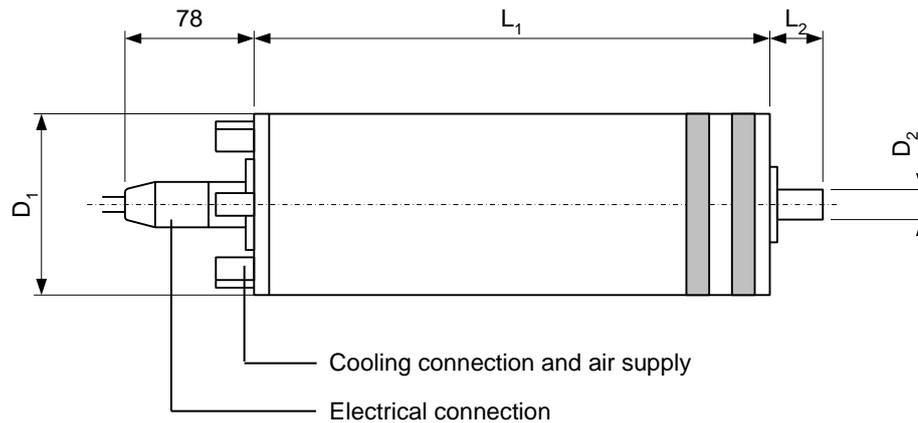
The high speed spindles are employed in medical engineering, in optical industry and watch and clock making industry, or in circuit board making for drilling, milling, graving and grinding.

Accessories

Various additional devices complement the high speed spindle to form a complete system. Details are given on the additional sheet "Accessories of high speed spindles".

Technical data

Dimensions	HFS 60-KM	HFS 60-LM	HFS 80	HFS 100
D ₁	60	60	80	100
D ₂	depending on tool holder			
L ₁	172	195	238	277
L ₂	depending on tool holder			

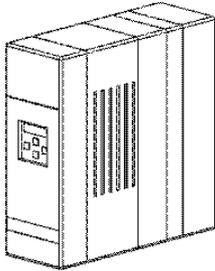


	HFS 60-KM	HFS 60-LM	HFS 80	HFS 100
Speed range [rpm]	10.000 – 96.000	20.000 – 96.000	12.000 – 60.000	8.000 – 30.000
Frequency range [Hz]	162 – 1.600	330 – 1.600	200 – 1.000	133 – 500
Voltage range	21 – 176	50 – 230	60 – 280	30 – 110
El. power at n _{max} [kW]	0,6	0,7	1,4	0,9
Drive	Asynchronous motor 3-phase			
Bearing	Air bearing, maintenance-free			
Air consumption [m ³ /h]	0,41	0,41	0,52	0,61
Operational air pressure [bar]	min. 5			
Bearing capacity				
axial [N]	100	100	280	300
radial [N]	40	40	60	130
Bearing rigidity axial [N/μm]	4	4	5	
radial [N/μm]	10	10	7	
at a distance of 10 mm ¹⁾				
Weight [kg]	3,4	3,8	8,4	15,4
Electrical connection	axial jumper			
Controller	Frequency converter Type LFU 4 as wall-fastening device, plug-in device or in a 19" 4 HE table housing			
Cooling connection and air supply	axial plug-in connections Ø 4 mm			
Cooling	Motor and bearing cooling by coolant circulation (return condenser)			
Temperature control	Posistor			
Tool change	manual		manual automatic	
Tool holder	Collet ER 11 or ER 16 shrink-fit toolholder Ø 3 or Ø 4 mm or custom-designed		Collet ER 11 or ER 16 HSK 25 shrink-fit toolholder Ø 3 or Ø 4 mm or custom-designed	
Radial run-out of tool holder	< 0,001 mm			
Air quality	Particle size < 0.001 mm, dried -40°C			

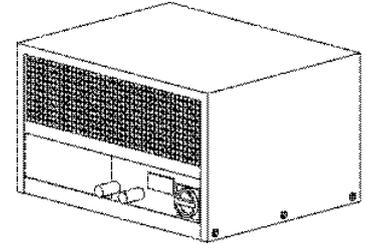
¹⁾ Distance from the measuring point to the front lid of the spindle

Accessories of high speed spindles HFS 60, HFS 80, HFS 100

**Frequency converter
LFU 5**



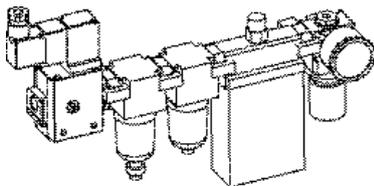
Cooler



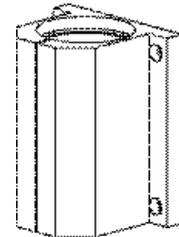
High speed spindle



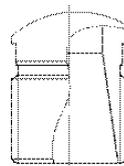
Air treatment



**Spindle holder
LSH**



**Var. tool holders
e.g. ER 16**



Everything from one source

The integration of the high speed spindles of Lehman Präzision GmbH is essentially facilitated thanks to the extensive offer of additional devices.

The following components form a complete system solution together with the spindle:

Frequency converter LFU 5

The high speed spindles HFS 60, HFS 80 and HFS 100 form a coordinated machining system

together with the frequency converter developed for this. The all-digitalised converter is adapted to the optimal operating conditions by means of a software program.

The frequency converter is available either for wall fastening in a switch cabinet, as compact plug-in device or as table device in 19" 4HE design.

The plug-in and table devices are assembled ready to plug-in and contain complete monitoring of air supplies, air treatment and cooling.

Air treatment

The high speed spindles HFS 60, HFS 80 and HFS 100 may only be operated with treated compressed air. The required dust particle size of maximally 1 µm is achieved by a treatment unit which consists of:

- micro filter (degree of filtration 0.3 µm)
- submicro filter (degree of filtration 0.01 µm)
- membrane air drier (pressure dew point -40°C)
- pressure controller.

Dimensions w x h x d = 250 x 140 x 85 mm

Cooler

In normal operation of the high speed spindles, spindle cooling is necessary for heat dissipation. The device having dimensions of 560 x 445 x 355 mm works as return condenser.

Tool holders

Besides the standard holders ER 8 or ER 16, high speed spindles with special holders, such as holders for saw blades and special milling cut-

ters, shrink-fit tool holders for highest radial run-out, etc., are available on request.

Interfaces to the machine

We supply all accessory parts for your machine, such as spindle holders or adapter plates, as well as the complete cabling for the drive, air bearing and water cooling.

Automatic tool change

The spindles HFS 80 and HFS 100 are also available for automatic tool change with HSK-E 25.

Custom-designed solutions

If existing machines must be retrofitted or special applications are used, custom-designed solutions are necessary. Thanks to our flexibility in development and our in-house production, we are in a position to quickly and efficiently realise our customers' desires, such as special dimensions or connections. Just ask us!

Examples of use



HFS 60 on CNC axle and height adjustable coordinate table for horizontal application in a transfer machine



Special spindle
Speed: 3.000 – 72.000 rpm
Speed accuracy: ±60 rpm

Subject to technical modifications.

PR0007_02

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