Precitech

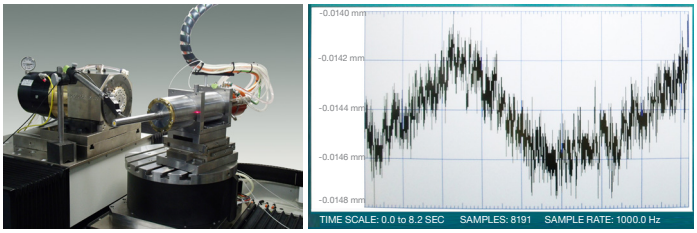
Global Manufacturer of Innovative Ultra Precision Machining Solutions

LEVICRON non-contact precision motion

HIGH SPEED SPINDLE
ASD-H25, ASD-Cx

High Speed Air-Bearing Tooling Spindles

If you're looking for product quality improvements that only an ultra precision tooling spindle can provide, and also require the robustness of an industrial grade design, you no longer need to compromise. Precitech's ASD-H25 and ASD-Cx high speed air-bearing ultra precision tooling spindles by Levicron are precisely what you need.

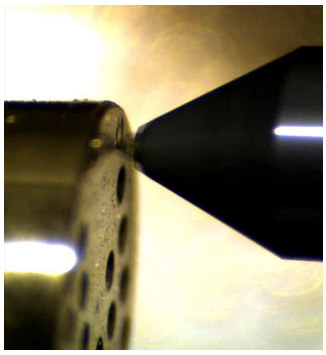


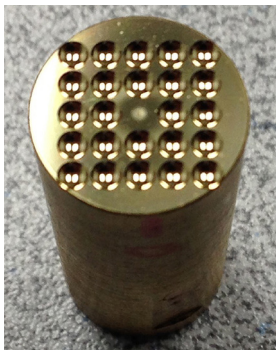
HSK25 quick change tool interface test at 180 mm from the spindle nose showing 0.5 µm of runout

These spindles are available in two configurations: ASD-Cx features a pneumatically operated collet system, and, the ASD-H25 features an industry standard, HSK25 interface, enabling the use of an off-the-shelf
ultra precision solution for quick tool changes, saving time and money.

Available in 60k, 80k, 90k, and 100k rpm models, Levicron spindles permit faster manufacturing and a higher levels of quality than other spindles on the market. The low error motions, long and light shaft design, thermal stability, accurate quick tool changes, and robust bearing system allow for the quick chip-to-chip time and material removal rates required by highly productive industrial processes.

Since 1962, Precitech has delivered complete ultra precision solutions and maintains an installed base of over 1,500 systems worldwide. We continue to define the state-of-the-art, enhancing accuracy, productivity, and ease of use.



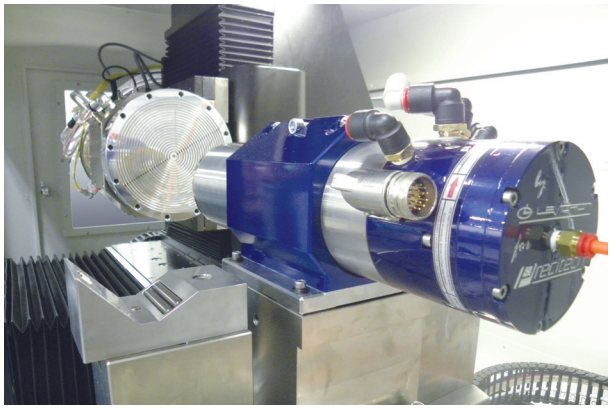


Results: 80k rpm
t/r 0.5 mm
constant surface speed
= 400 mm/min
5 µm/rev

Roughness,
Gaussian Filter,
0.08 mm

Sa = 1.494 nm
Sq = 1.861 nm
St = 11.72 nm

(taken on a Taylor Hobson CCI)



- ***Increase your productivity and reduce your tool expense up to 100,000 rpm and optional HSK25 quick change tool interface***
  - ***— quickly and repeatedly center a tool within 1 um and no balancing for small tools minimizes chip-to-chip time***
  - ***— excels at rapid material removal due to high power and robust bearing design***
- ***Improve your surface finish asynchronous error motion less than 30 nm***
- ***Reduce your spindle soak time reaches thermal stability in under 5 minutes***
  - ***— radial growth limited by integrated symmetrical thin film cooling system***
  - ***— axial growth limited by self compensating design (bearing cartridge growth in +Z offset by shaft growth in -Z)***
- ***Accurately run at any speed shaft design ensure all natural frequencies are outside operating speed range – no sweet spots***

Key Specifications

Speed	60K, 80K, 90K, and 100K RPM options
Max shaft power (configuration dependent)	2.1 - 4.2 kW (2.8 - 5.6 hp)
Axial stiffness	up to 60 N/µm
Axial load capacity	up to 550 N
Radial stiffness	up to 40 N/µm
Radial load capacity	up to 330 N
Error motion	Asynchronous error motions less than 30 nm axial

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ULTRA PRECISION TECHNOLOGIES

Configurations or Options		ASD-080/100-Cx	ASD-060/080/090100-H25
Permanent magnet Synchronous Motor	200 V max., air gap winding, 0.35 Nm S1/100%	•	• *)
	400 V max., air gap winding, 0.35 Nm S1/100%	•	•
	400 V max., 0.6 Nm S1/100%	•	•
Commutation and positioning	Fully encoder controlled, resolution 0.002˚ (12 bit interp.)	•	•
	Sensorless controlled, no positioning, encoder monitoring	•	•
	Fully sensorless controlled, no positioning	•	•
Max. nom speed	60,000 rpm	• *)	•
	80,000 rpm	•	•
	90,000 rpm	• *)	• *)
	100,000 rpm	•	• *)
Tool Clamping system**	Spring-less HSK-E25, no rotating draw bar		•
	Custom collet system for 1/4 inch tool shank	• *)	
	Custom collet system for 6 mm tool shank	•	
	Custom collet system for 4 mm tool shank	• *)	
	Custom collet system for 1/8 inch tool shank	•	
	Custom collet system for 3 mm tool shank	• *)	
Tool changing system	Pneumatically actuated	•	•
	Tool clamping status monitoring	••	•
	Taper cleaning air	•	•
Bearing system	Quick change bearing cartridge	•	•
	Thin film liquid cooling	•	•
Feedthrough	Lubricant nozzles at spindle front	2X	2X

ASD-Cx / ASD-H25				ASD-080Cx	ASD-100Cx	ASD-060H25	ASD-080H25
Operating Parameters	Speed range		U/min	0 (with encoder) -80,000	0 (with encoder) -100,000	0 (with encoder) -60,000	0 (with encoder) -80,000
	Permanent motor torque, S1 100%		N-m	0.35 [1,2] / 0.55 [3]	0.35 [2]	0.35 [1,2] / 0.55 [3]	0.35 [1,2] / 0.55 [3]
	Max. shaft power, S1 100%		kW (hp)	2.7 (3.6) [1,2] / 4.2 (5.6)[3]	3 (4) [3]	2.1(2.8)[1,2] / 3.2 (4.3) [3]	2.7 (3.6) [1,2] / 4.2 (5.2)[3]
	Bearing supply gauge pressure		bar	6 - 10	6 - 10	6 - 10	6 - 10
	Air consumption		NL/min	65	70	55	65
	Bearing air cleanliness class		-/-	3	3	3	3
	Coolant type		-/-	water/oil	water	water/oil	water/oil
	Coolant supply gauge pressure		bar	3 - 5	3 - 5	3 - 5	3 - 5
	Coolant inlet temperature		˚C	20 6 1	20 6 1	20 6 1	20 6 1
	Nom. coolant flow, 3/5 bar		l/min	6/10	6/10	6/10	6/10
Tool Clamping	Tool Interface		-/-	collet system	collet system	HSK-E25	HSK-E25
	Tool shank diameter (x)		mm	3mm, 6mm 1/8" or 1/4"	3mm, 6mm 1/8" or 1/4"	-/-	-/-
	Tool change activation		-/-	pneumatic	pneumatic	pneumatic	pneumatic
	Tool clamping status monitoring			n.a	n.a	yes	yes
Motor	Motor type		-/-	DC 2-poles, 3 phase	DC 2-poles, 3 phase	DC 2-poles, 3 phase	DC 2-poles, 3 phase
	Motor commutation		-/-	rot.enc. or sensorless	rot.enc. or sensorless	rot.enc. or sensorless	rot.enc. or sensorless
	Motor protection		-/-	KTY 84-130, PTC 130	KTY 84-130, PTC 130	KTY 84-130, PTC 130	KTY 84-130, PTC 130
Vector position control	Shaft positioning measurement method		-/-	100 mm dia. + 0/-15 µm	100 mm dia. + 0/-15 µm	100 mm dia. + 0/-15 µm	100 mm dia. + 0/-15 µm
	Shaft positioning angular accuracy (12 bit interpol.)		-/-	6 0.002˚	6 0.002˚	6 0.002˚	6 0.002˚
(Optional sensorless drive operation)	Index		-/-	yes	yes	yes	yes
	Encoder	Encoder output signal	-/-	SinCos, 1 VSS	SinCos, 1 VSS	SinCos, 1 VSS	SinCos, 1 VSS
		Encoder supply voltage	V	5	5	5	5
		Encoder current draw	mA	30	30	30	30
Bearing System	Axial Bearing	Zero point stiffness	N/µm	> 40	> 30	> 60	> 40
		Load capacity	N	> 550	> 450	> 550	> 500
	Radial Bearing	Static radial zero point stiffness at spindle nose, warm	N/µm	> 30	> 25	> 40	> 30
		Static radial load capacity at spindle nose, warm	N	> 290	> 280	> 330	> 290
Measures and weights	Body diameter		mm	100 H5	100 H5	100 H5	100 H5
	Spindle total length		mm	388	388	454	454
	Spindle weight		kg	16	16	16	16

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