

TECHNICAL PRODUCT SPECIFICATIONS

IL300 / ILCENTRIC

MADE
IN
GERMANY



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General	Description
System Configuration	Ultra Precision 3 axis CNC high dynamic turning lathe for centering of mounted lenses or ultraprecision diamond turning
Machine Base	Natural granite base for superb accuracy
Vibration Isolation	Self leveling pneumatic isolation system (either passive or electronically controlled active leveling, option)
Control System	Beckhoff CNC industrial standard high performance machine controller, Intel® Core™ i7, 4 Cores, operating @ Windows 7, 21" color flat panel touch screen display, EtherCAT Bus communication technology. Digital Servo drives with 100 kHz current control loop frequency.
Programming resolution	1 nm linear, (0.01 nanometer optional) , 0.0000001 ° rotary
File Transfer	USB, Ethernet
Turning Performance	Form accuracy < 0.2 µm, surface roughness (Ra) < 3 nanometers Linear

Linear Axis	X Axis	Z Axis
Travel	300 mm (Innolite Hydroline 300)	300 mm (Innolite Hydroline 300)
Accuracy over Full Travel/ Feedback Type	+/- 1 µm, resolution 0,03125 nm (better if needed on request); Noncontact Linear Encoder	+/- 1 µm, resolution 0,03125 nm (better if needed on request); Noncontact Linear Encoder
Straightness	+/-0.2 µm +/- 2 arcsec for all	+/-0.2 µm +/- 2 arcsec for all
Pitch, Roll, Yaw	10 m/min	25 m/min
Max. Speed	Brushless linear motor	Brushless linear motor
Drive System	420 N/µm horizontal	420 N/µm horizontal
Load Capacity / Stiffness	210 N/µm side	210 N/µm side
Media Supply	Compact integrated hydrostatic supply unit ISO VG 10, closed loop servo control, low pulsation	Compact integrated hydrostatic supply unit ISO VG 10, closed loop servo control, low pulsation

Workholding Spindle	High Performance PI ISO	B-Axis (Optional)
Type	Professional Instruments groove compensated air bearing	Oil hydrostatic axis 360° continuous
Swing Capacity	70 kg @ 6.9 bar	Direct drive torque motor
Axial/Radial Stiffness	228 N/µm / 98 N/µm @ 6.9 bar	420 N/µm
Motion Accuracy	Axial < 20 nm, radial < 20 nm	< 80 nm
Max. Speed	50 to 10.000 rpm, bidirectional	20 RPM
Feedback Resolution	0.07 arcsec.	0,02 arcsec
Thermal Control	Integrated water cooling with chiller	Integrated oil and motor cooling



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Integrated Metrology Optional Systems	Description	Description
Measurement of Optical Axis	Autocollimator with ILCentric Software; integrated optics exchange system for focusing optics, fully integrated in Beckhoff control system of ILCENTRIC and operational	Optoalignment Laser Alignment Technology LAS, fully integrated in Beckhoff control system of ILCENTRIC and operational
Accuracy of Eccentricity / Centering Error Measured Wavelength	0.1 µm eccentricity Visible, IR λ 0.4-0.7 µm, 0.9-1.8 µm, 3.3-4.7 µm, 8-11 µm Renishaw Tactile Probe OMP 400	0.2 µm eccentricity Visible, IR λ 532nm, 650nm, 2.94µm, or 10.6µm Confocal Sensor Micro-Epsilon confocalDT
Measurement of geometrical dimensions Measuring Principle Coordinate Directions of Measurement Resolution of Sensor	Tactile, contact force down to 0.06 N X, Y, Z direction (3 orientation measurement) +/-0,25 µm in all three directions	Optical, non contact Z direction (single orientation), range 0.3 mm or 1 mm 0.01 µm

Optional Accessoires	IL Sonic Diamond Turning of Steel	Optional Accessories	NanoGrip, Ultraprecise Clamping Interface
System	Transversal ultrasonic unit for diamond turning of steel	System	Ultra precise clamping system for workpiece
Working frequency	100 khz	Clamping mechanism	Spring loaded mechanical clamping, pneumatic unclamping
Length of Swinging Shaft, Accessibility Interface to Machine	50 mm NanoGrip adapter with integrated height adjustment, 1 µm height resolution (0.1 µm as high accuracy option)	Repeatability / Accuracy	< 0.5 µm repeatability radial and axial
Tool	Insert tip, monocrystalline diamond	Clamping force	> 20.000 N for superb stiffness and accuracy
Drive System	Brushless linear motor	Interfaces for workpiece	Vacuum chuck, 3 jaw chuck, individual mounting or blocking

Centering / Turning Performance	Description
Part Size Optical Assemblies Eccentricity Modes	Ø 250, length up to 100 mm Single lens assembly, Achromats, Multi lens assemblies < 1 µm based on machine accuracy, not considering influence of barrel Spheres optical measurement, non contact, Aspheres tactile measurement single surface
Angular Missalignment Achievable Surface Finish/ Average Cutting Force	< 0.1 arcmin, based on machine accuracy, not considering influence of barrel <5 nm Ra / < 10 N

