TECHNICAL PRODUCT SPECIFICATIONS

IL300

MADE
IN
GERMANY

INNOLITE
TAILORED MOLDS AND OPTICS

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Machine	General Description
System Configuration	Ultra precision 3-5 axes (XZC;B;W) CNC high dynamic machining center
Machine Base	Natural granite base for excellent accuracy
Vibration Isolation	Self leveling pneumatic isolation system (option: passive or electronically controlled active leveling)
Control System	Beckhoff TwinCAT 3 CNC high performance machine controller; Intel® Core™ i5 CPU, 4 Cores; operating system Windows 10; 21.5" color flat panel touch screen display and 22" color flat panel display; EtherCAT bus communication technology; Digital Servo drives with 100 kHz current & position control loop frequency
Programming Resolution	1 nm linear (0.01 nm optional), 0.0000001° rotary
Set Points (pts/sec)	Up to 2,000 in CNC mode; 10,000 in DirectDrive3D
File Transfer	USB, Ethernet
Requirements	Air: 7-10 bars, 300 l/min, 10 µm prefiltered; Electrical: 400 V, 16 A, 50/60 Hz; Water: 8-10 °C, 30 l / min; Connectivity: Ethernet
Machine Size	2000 * 1600 * 2100 mm (D * W * H)
Air Conditioner Size	510 * 1100 * 740 mm (D * W * H)
Standalone Panel Size	610 * 610 mm (D * W)

Linear Axes	X-Axis	Z-Axis
Travel	300 mm	300 mm
Feedback Type	Noncontact Linear Encoder	Noncontact Linear Encoder
Resolution	0.03125 nm	0.03125 nm
Straightness	< +/- 0.2 µm	< +/- 0.2 µm
Pitch, Roll, Yaw	< +/- 2 arcsec for all	< +/- 2 arcsec for all
Max. Speed	3,000 mm/min	6,000 mm/min
Drive System	Brushless linear motor	Brushless linear motor
Static Stiffness	420 N / µm vertical	420 N / µm vertical
Media Supply	Compact integrated hydrostatic supply unit, low pulsation	

Rotary Axes	C-Axis	B-Axis (Option)
Type	Workholding Spindle; groove compensated air bearing	Oil hydrostatic axis, 360° continuous
Load Capacity	70 kg at 6.9 bar (radial)	< 300 kg (axial)
Axial Stiffness	228 N/µm	370 N/µm
Radial Stiffness	98 N/µm at 6.9 bar	125 N/µm
Motion Accuracy Axial	< 15 nm	< 50 nm
Motion Accuracy Radial	< 15 nm	< 80 nm
Velocity Control	< 10,000 rpm	-
Position Control	0-3,000 rpm	20 rpm
Feedback Resolution	0.008 arcsec	0.005 arcsec
Thermal Control	Integrated cooling	Integrated cooling
Interface	NanoGrip	NanoGrip

Metrology | LVDT (Option)		Metrology | Confocal Probe (Option)	
2D Surface Line Scan	Air bearing LVDT probe for compensation	Measurement of Optical Surface	Scanning chromatic confocal probe
Working Distance / Range	0.5 mm	Working Distance / Range	6 mm / 0.3 mm
Resolution	< 10 nm	Resolution of Sensor	< 10 nm
Stylus Tip	Ruby, diamond	Data Acquisition	1,000 pts/sec in spiral or orbit scan, full surface

Automation | NanoGrip Interface	Automation | 3D Tactile Probe (Option)
Ultra-precise clamping system for workpiece & tool	X, Y, Z tactile probe system with strain gauge technology
Clamping mechanism: Spring loaded mechanical clamping, pneumatic unclamping	Stylus: Length up to 100 mm,ruby and diamond tips, fast exchange
Repeatability / Accuracy: < 0.5 µm radial & axial	Tactile Force: XY plane: 0.02 N; Z: 0.07 N
Clamping force: > 20,000 N for excellent stiffness and accuracy	Unidirectional Repeatability: Trigger level 1: 0.40 µm
Interfaces for workpiece: Vacuum chuck, three jaw chuck, individual mounting or blocking	Form Measurement Deviation: Trigger level 1: ± 0.80 µm

ILSONIC (Option)	Overdrive (Option)	Circulating Air Shower (Option)
Transversal ultrasonic unit for diamond turning of steel	High dynamic axis for freeform generation, hydrostatic bearing	Air conditioning unit with filtration system
Working Frequency: 100 kHz	Total travel: 20 mm	Air Flow Rate: 400 l/min
Max. Depth for Concave Parts: 70 mm	Max. acceleration: 20 G	Temperature Constancy < 0.1 °C
NanoGrip Interface to Machine	Drive: Linear Motor	Required Room Temperature < 3 °C
55° Insert tool, monocrystalline diamond	Feedback: encoder resolution 0.03125 nm	Machine external setup, integrated control
	CNC Standard Integration	
	DirectDrive3D	

Part	General Description
Size	Ø < 300 mm; length < 250 mm
Turning Performance	Form accuracy (PV) < 0.1 µm; Surface roughness (Ra) < 1 nm
Overdrive Tilted Plane	Ø < 100 mm; angle 3°; form accuracy (PV) < 0.2 µm
Overdrive Freeform HUD	250 * 200 mm; total stroke 2.1 mm; form accuracy (PV) < 0.5 µm; machining time 3.5 h