TECHNICAL PRODUCT SPECIFICATIONS

General	Description
Part Sizes	Ø<600mm; length <250mm; cranable part feeding
Turning Performance	form accuracy < 0.2 µm, surface roughness (Ra) < 3 nanometers
Overdrive Tilted Plane	Ø<100mm, angle 3°, shape < 0.2µm PV,
Overdrive FreeForm HUD	250mmx200mm; total stroke 2.1mm; shape < 0.6µm PV; machining time 3.5h

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TAILORED MOLDS AND OPTICS

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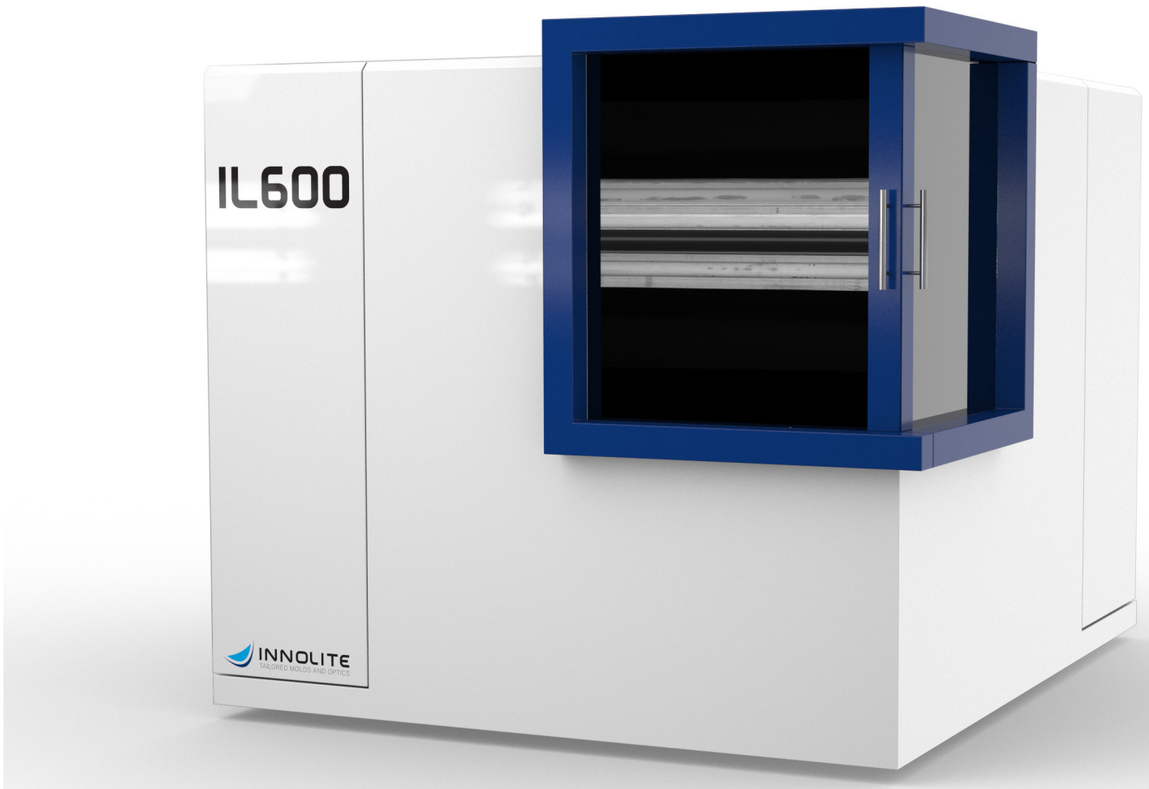
TECHNICAL PRODUCT SPECIFICATIONS

IL600

MADE
IN
GERMANY



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TECHNICAL PRODUCT SPECIFICATIONS

MACHINE l General	Description
System Configuration	Ultra Precision 4 axis CNC high dynamic machining center
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	Control System Beckhoff CNC industrial standard high performance machine controller, Intel® CoreTM i7, 4 Cores, operating @ Windows 10, 21" color flat panel touch screen display, EtherCAT Bus communication technology. Digital Servo drives with 100 kHz current & position control loop frequency.
Programming Resolution	1 nm linear, (0.01 nanometer optional) , 0.0000001 ° rotary
Set Points / Sec	Up to 2.000/sec in CNC mode, 10.000/sec DirectDrive 3D, 50.000/sec DirectDrive 3D Ultra
File Transfer	File Transfer USB, Ethernet
Requirments	Air: 7-10 bars, 500l/min, 10µm pre-filtered; Electrical: 400V, 32A, 50Hz; Water: 8°-10°C, chilling water, 30l/min; Connectivity: Ethernet RJ45

MOTION l Linear Axes	X-Axis	Y-Axis	Z-Axis
Travel	600 mm	250 mm	400 mm
Accuracy over Full Travel/ Feedback Type	+/- 1 µm, resolution 0,03125 nm Noncontact Linear Encoder	+/- 1 µm, resolution 0,03125 nm Noncontact Linear Encoder	+/- 1 µm, resolution 0,03125 nm Noncontact Linear Encoder
Straightness	<+/-0.2 µm	<+/-0.2 µm	<+/-0.2 µm
Pitch, Roll, Yaw	<+/- 2 arcsec for all	<+/- 2 arcsec for all	<+/- 2 arcsec for all
Max. Speed	6 m/min	4 m/min	2 m/min
Drive System	Brushless linear motor	Brushless linear motor	Brushless linear motor
Load Capacity /Stiffness	420 N/µm horizontal	420 N/µm horizontal	420 N/µm horizontal
Media Supply	Compact integrated hydro-static supply unit, closed loop servo control, low pulsation		

MOTION l Rotary Axes	Workholding Spindle	B-Axis	Milling Spindle
Type	Groove compensated air bearing	Oil hydrostatic axis, 360° continous	Aerostatic,
Load Capacity	70 kg @ 6.9 bar (radial)	< 300 kg (axial)	<30 Kg (radial)
Axial/Radial Stiffness	228 N/µm / 98 N/µm @ 6.9 bar	370 N/µm / 125 N/µm	65 N/µm / 40 N/µm
Motion Accuracy	Axial<20nm/ Radial<20nm	Axial< 50nm, radial < 80nm	<30 nm
Max. Speed (position control)	50-3.000 rpm	20 rpm	60.000; 80.000; 90.000 rpm
Feedback Resolution	0.07 arcsec	0,02 arcsec	-
Thermal Control	Integrated motor cooling (water)	Integrated oil and motor cooling	Integrated motor cooling (water)
Interface	NanoGrip	NanoGrip	HSK 25

AUTOMATION	NanoGrip Interface	AUTOMATION	3D Tactile Probe
System	Ultra precise clamping system for workpiece & tool	System	X, Y, Z tactile probe with strain gauge technology
Clamping mechanism	Spring loaded mechanical clamping, pneumatic unclamping	Stylus	Length up to 100mm, ruby and diamond tips, fast to exchange
Repeatability / Accuracy	< 0.5 µm repeatability radial & axial	Tactile Force	XY plane: 0.02N Z-axis: 0.07N
Clamping force	> 20.000 N for superb stiffness and accuracy	Unidirectional Repeatability	Trigger level 1: 0.40µm
Interfaces for workpiece	Vacuum chuck, 3 jaw chuck, individual mounting or blocking	Form Measurement Deviation	Trigger level 1:±0.80µm

METROLOGY	LVDT	METROLOGY	Confocal Probe
2D Surface Line Scan	Air bearing inductive LVDT probe for compensation	Measurment of Optical Surface	Scanning chromatic confocal probe
Working Distance /Range	5 mm	Working Distance/ Range	10 mm / 1 mm
Resolution	< 5nm	Resolution of Sensor	26 nm
Stylus Tip	Ruby, diamond	Data Acquisition	1.000 pts/sec in spiral or orbit scan, full surface

ACCESSORIES	ILSONIC Ultrasonic Unit	ACCESSORIES	Overdrive	ACCESSORIES	Circulating Air Shower
System	Transversal ultra-sonic unit for diamond turning of steel & glass	System	High dynamic axis for free form generating, hydrostatic bearing	System	Air condition-ing unit with integrated tank, circulating
Working Frequency	100 kHz, 120 kHz	Total travel	50mm	Air Flow Rate	400 l/min
Max. Depth for Concave Parts	up to 70mm	Max. acceleration	10G	Temperatur Constancy	< 0,25°C
Interface to Machine	NanoGrip	Drive / Feed back	Linear direct drive; encoder resolution 0,03125nm	Requimrents for Room Temperature	< 3°C
Tool	55° Insert tool, monocrystalline diamond	CNC Integration	CNC Standard DirectDrive3D DirectDrive3D Ultra	Installation	Machine external setup, Control integrated

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