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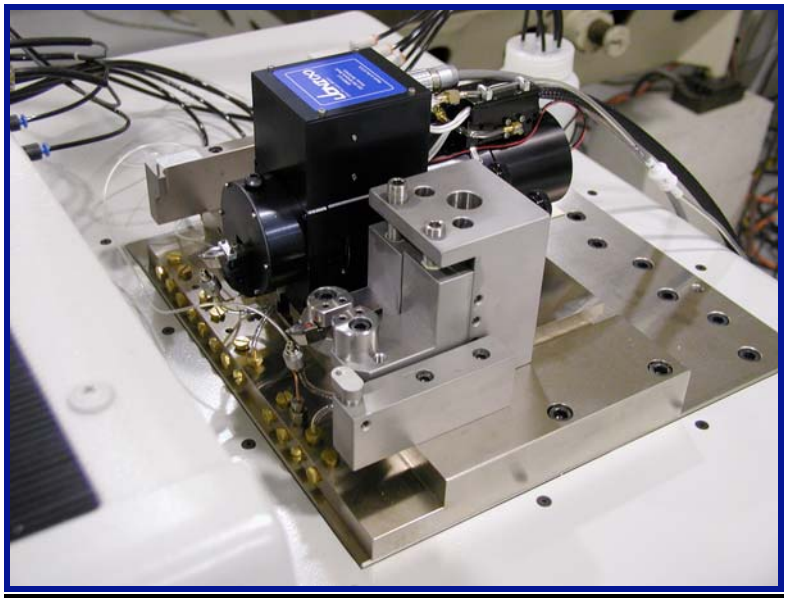
FTS-1000

Single or dual oscillating tool version available

(Dual tool version has independent height adjustment)



OVERVIEW AND DESCRIPTION:

The FTS-1000 is an oscillating tool attachment which is designed for OPTOFORM and NANOFORM ultra-precision lathes, and used for the production of high quality optical surfaces which are non-rotationally symmetrical ("freeform").

These non-rotationally symmetrical designs include toric surfaces, prism ballasted surfaces, slab-offs, wafer-shaped surfaces, and innumerable other non-standard custom surfaces.

The production of non-rotationally-symmetrical optics requires three separate components:

(1) the ultra-precision machine system (OPTOFORM, NANOFORM)

(2) the Fast Tool Servo (oscillating tool) attachment (FTS-1000 or FTS-500)

(3) Programming systems to describe the nature of the desired optical surface (MiniFile Path Editor (MPE), Soft Power Suite, GP Power Suite, Sterling Software Engines (custom).

The FTS-1000 attachment comprises:

(a) The tractor unit, which mounts to the gang tooling system on the lathe (replacing one of the 3 dual toolholders on the Optoform machines). This Tractor unit accommodates one or two oscillating tools. In the dual-tool version, height adjustment is independent.

(b) The floor standing Power Distribution Module;

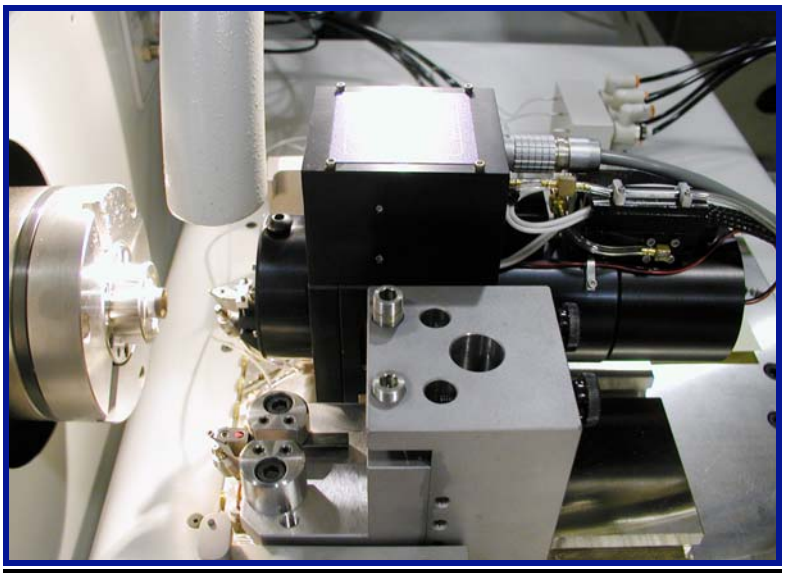
(c) Cables which connect the tractor unit, the power distribution module and the lathe.

The FTS-1000 is easily connected (or disconnected) from the lathe via 3 cables, much like its predecessors (the Variform and Varimax).

The FTS-1000 provides 250% of the W-motion provided by the Variform, as well as being significantly stiffer, and therefore yielding significantly superior surface finishes.

When the FTS-1000 is used with Optoform ultra precision lathes, together with the MCS control software, superior results are achieved by using 96/384 meridian programming formats, rather than the older 24 meridian formats.

File formats and programming systems are compatible across the FTS-1000, Varimax and Variform range.



SPECIFICATIONS: (Second Edition – January 2004)

FTS-1000: The attachment is a non-influencing Enhanced Servo-controlled Tool Positioning device (STPD).

Travel (FTS-1000):
Total Travel: 1.0mm or 0.04”

Typical Operational Sinusoidal Acceleration:

0.040 in (1000µm) @ ≈ 100 Hz
0.010 in (250µm) @ ≈ 200 Hz
0.004 in (110µm) @ ≈ 300 Hz

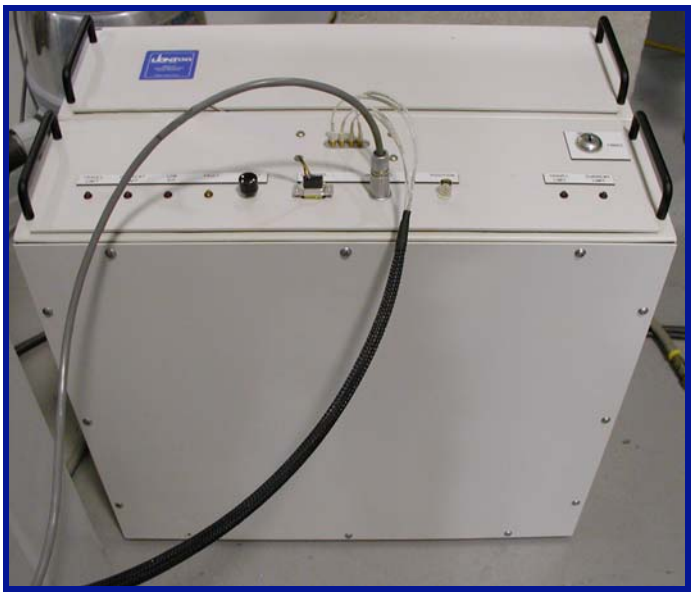
FTS-1000 Tractor Dimensions and Weight (without tool):

Length: 8.250 in (210.00mm)
Width: 2.500 in (63.50mm)
Height: 4.375 in (111.13mm)
5.5 lbs (2.5 kg)

FTS-1000 PDM (Power Distribution Module) and EM (Electronics Module) Dimensions:

(L x W x H) 20.00” x 12.00” x 18.00”
(510mm x 305mm x 457mm)

The Power Distribution Module normally stands on the floor near the lathe.



Maximum distance from FTS-1000 to PDM/EM: 54 inches (1372mm)

Pressurized Air Supply:

Air Supply Pressure: 80-100 psi (5.4-6.8 bar)
Air Consumption FTS-1000E: 1.0 – 2.0 SCFM (28.3-56.6 L/min)
Air Quality: ISO 8573.1 Quality Class 4
15µm particle size filtration
37.4°F (2.8°C) Pressure Dew point @100 psig (6.8 bar)

Electrical Supply:

230 VAC; 47-63 Hz; 300W (Power can be drawn through the Optoform Lathe or directly from the AC source.) If the FTS-1000 is powered via the lathe, then the in-build surge protection will offer some protection to the device. However, if the FTS-1000 is plugged directly to the AC outlet, then the use of surge protection and/or battery back-up is recommended.

Stiffness (FTS-1000):

Horizontal and Vertical: 225000 lb/in (44N/µm) @ 80 psi (5.4 bar)
Horizontal and Vertical: 300000 lb/in (53N/µm) @ 100 psi (6.8 bar)

Tool:
Capable of holding 0.25" (6.35mm) square shank tool

Tool Height Adjustment (Integral to tool nose): (subject to change)

Coarse: ± 0.09375 in (± 2.38mm)
Fine: ± 0.00500" (± 0.127mm)

FTS-1000 Hold-Down:

Standard M10-1.5 T-nuts on pivoting clamping arms (2 ea)
T-nuts of varying sizes can be accommodated (consult Sterling)

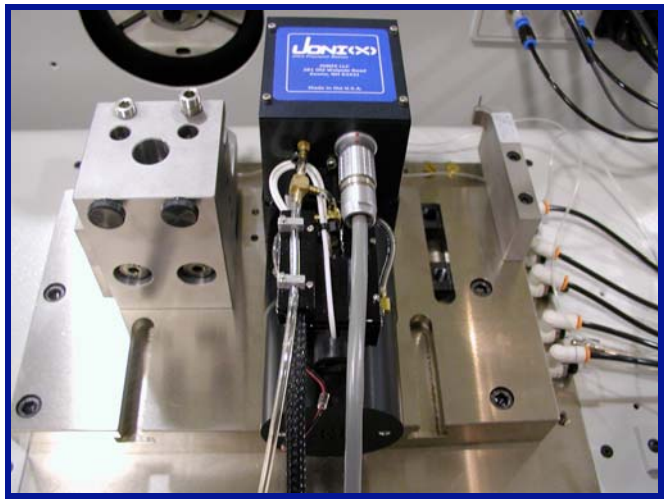
Fault Protection:

The FTS-1000 is fault protected in the following inherent circuitry:
Current limit fault
Travel limit fault
Low air pressure fault

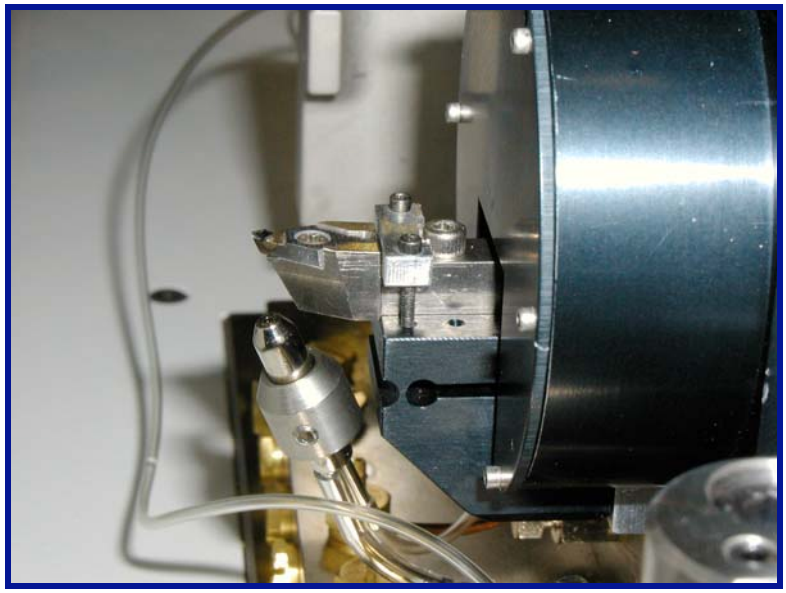
Photographic Explanation:

The "Tractor", which holds the oscillating tool, mounts directly to the sub-plate on the gang-tooling system (see picture below).

The "Tractor" occupies one of the three dual tool holder positions. In this picture the right hand dual tool post has been removed and the Tractor has replaced the middle dual tool holder.



The oscillating diamond tool protrudes from the front face of the Tractor (see picture below). The CNC controlled air-jet can be seen below the tool tip. These computer controlled nozzles supply cold, dry and clean air to the cutting zone, thereby dissipating heat and aiding with swarf removal.



FTS with dual tool nose