

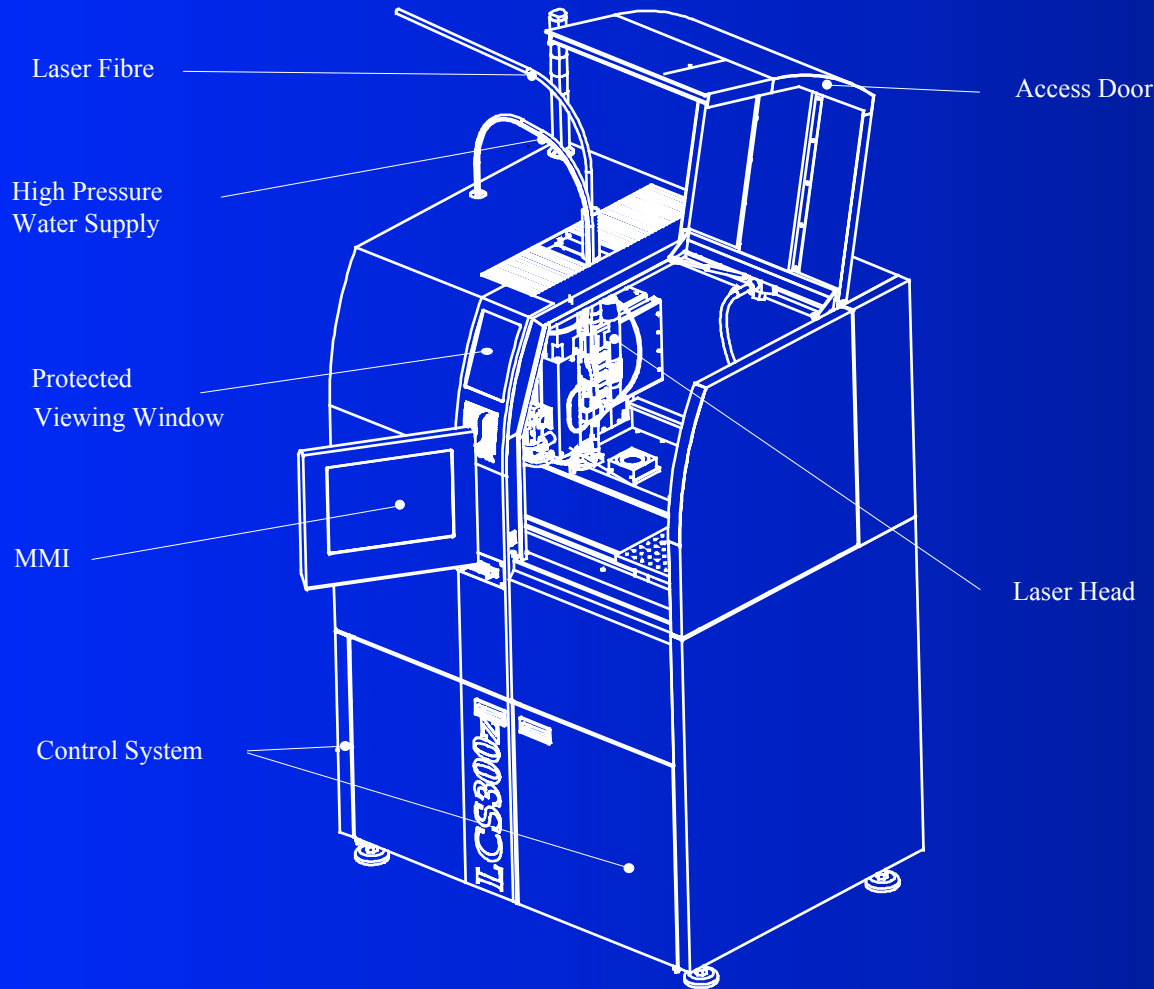
Laser Cutting System
LCS 300 Series



SYNOVA

Innovative Laser Systems

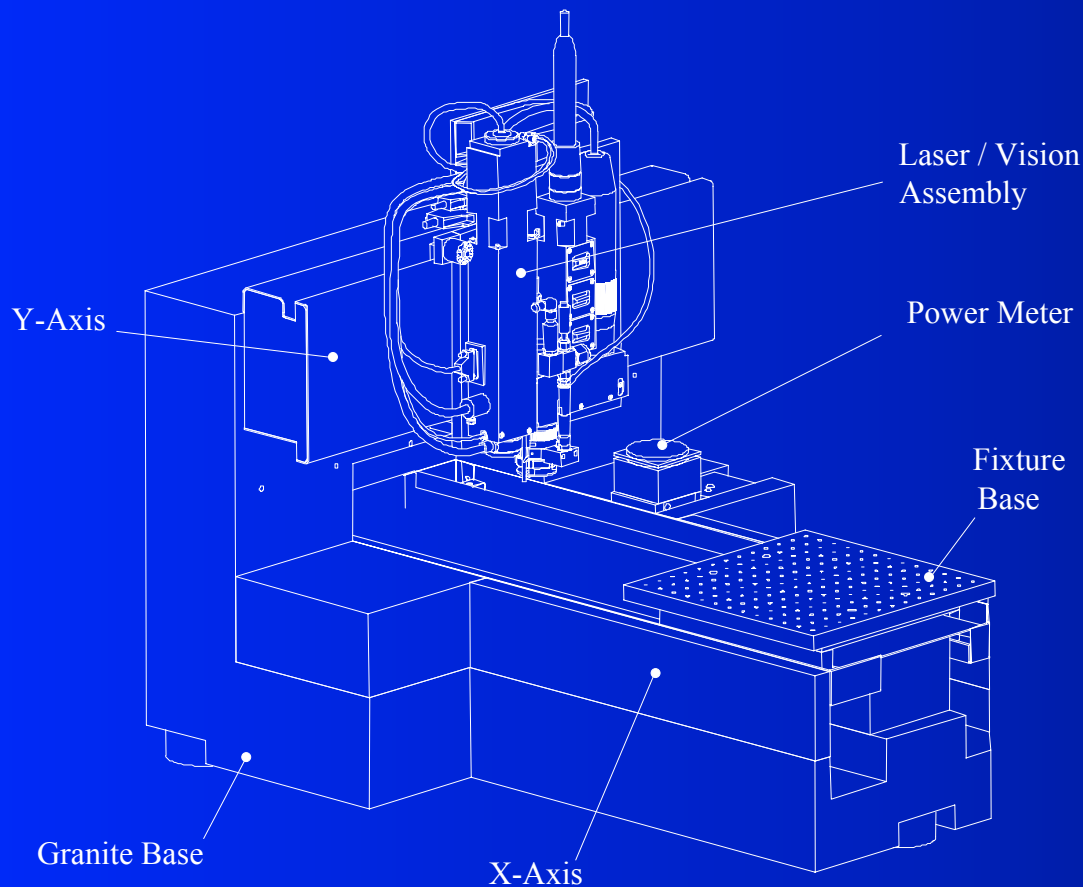
The LCS 300



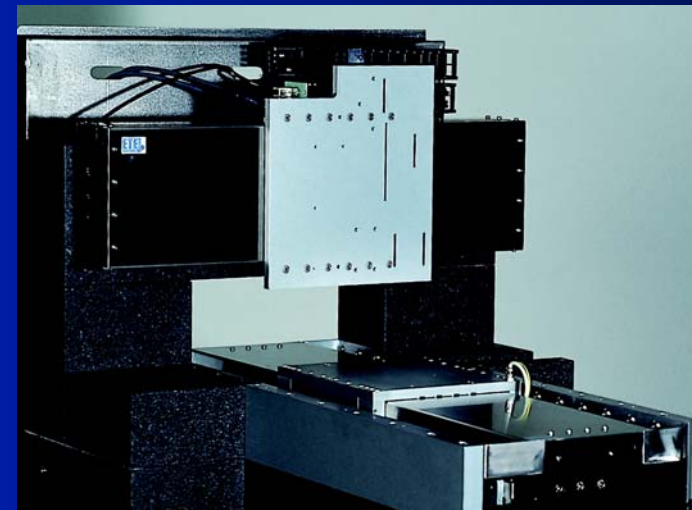
The CNC axis system, the laser head and the machine control constitute the heart of the LCS 300.



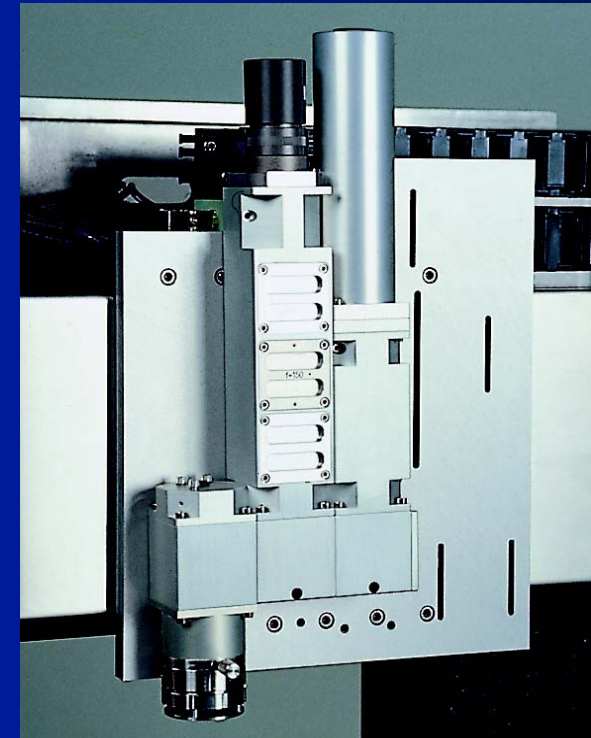
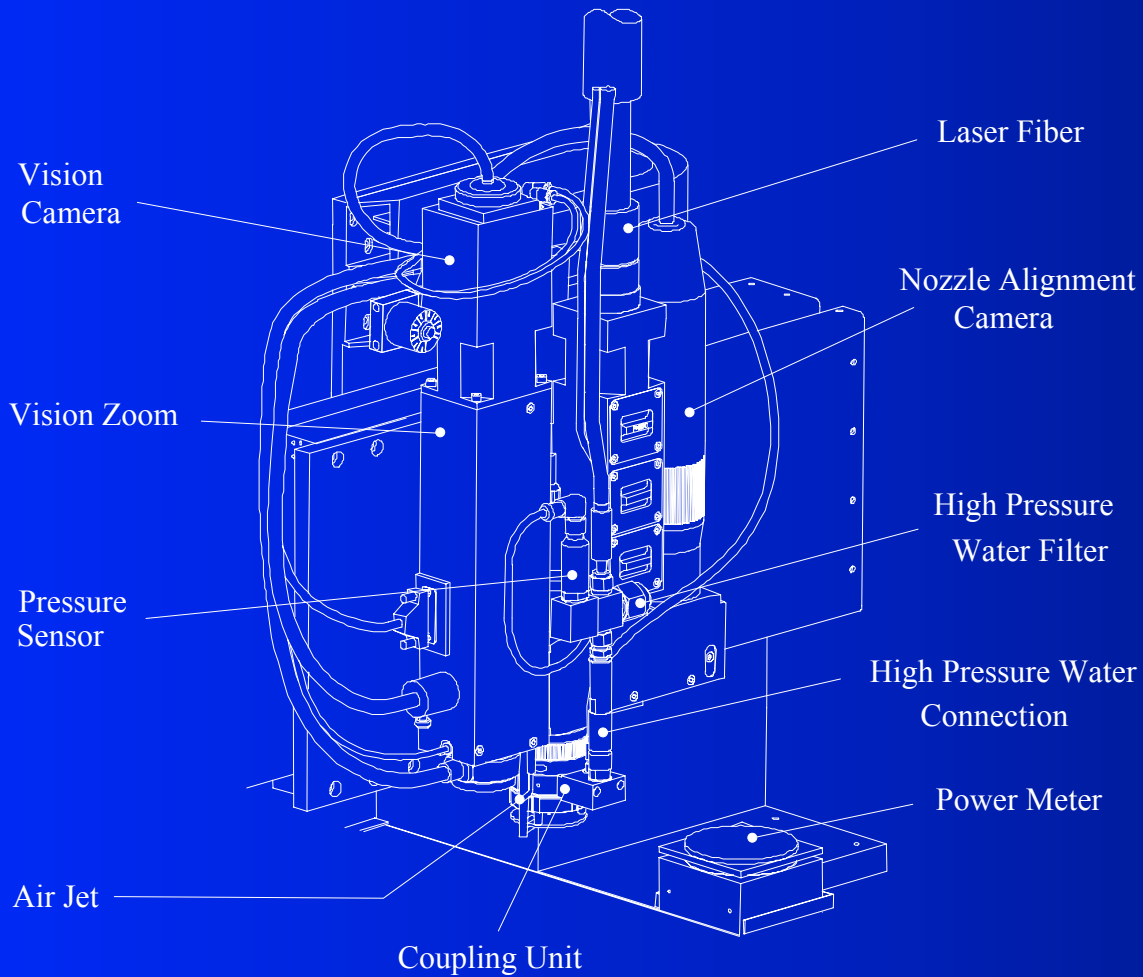
Direct Drive Axis System



A stable structure made of granite is the key to high precision, ensuring an out-standing, dynamic response. Linear motors are used in achieving high speed and accuracy. Furthermore, the system is designed for higher cutting speeds made possible by new laser sources.

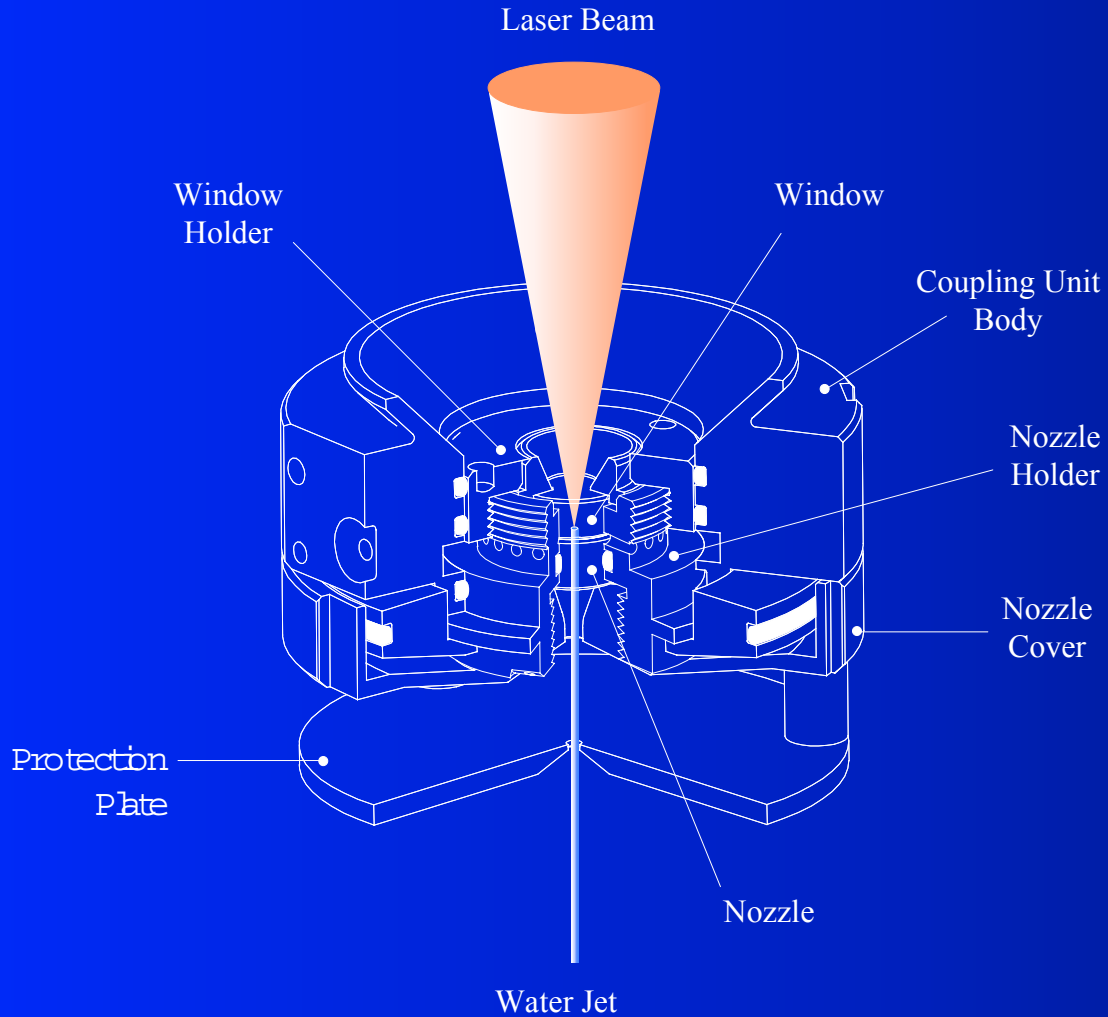


Laser Head



The Laser head collimates the laser beam at the exit of the fiber cable and focuses it into the nozzle. A CCD camera allows accurate alignment of the focal point.

Coupling Unit



In the coupling unit, the laser beam is focused through a window into the center of a nozzle. The windows and the nozzles are easily replaceable.

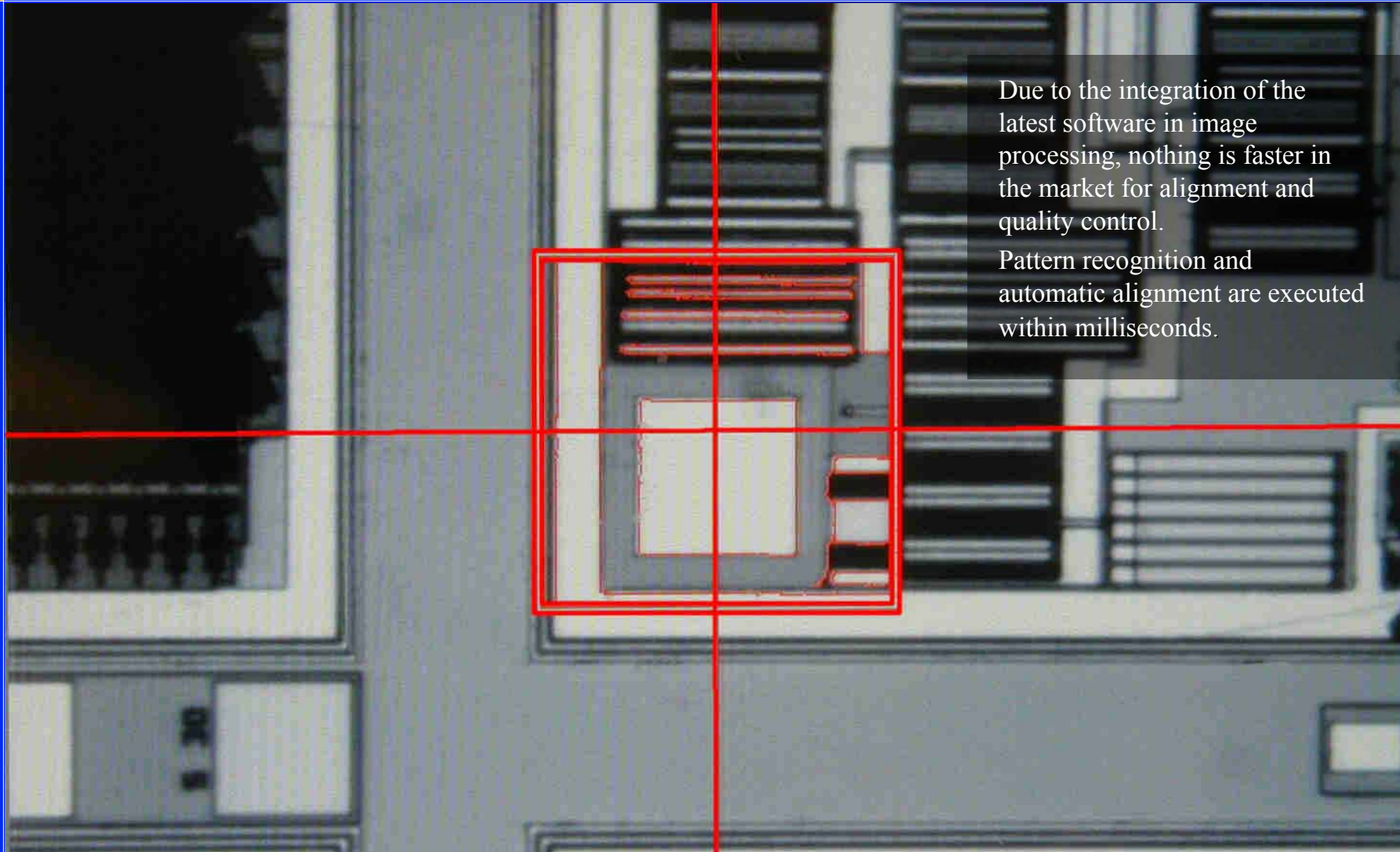


Operation Interface



A large, color, TFT flat screen with touch panel allows comfortable operation of all machine functions. Using the latest generation of real-time processors creates an entirely new concept in CNC control and man-machine communication.

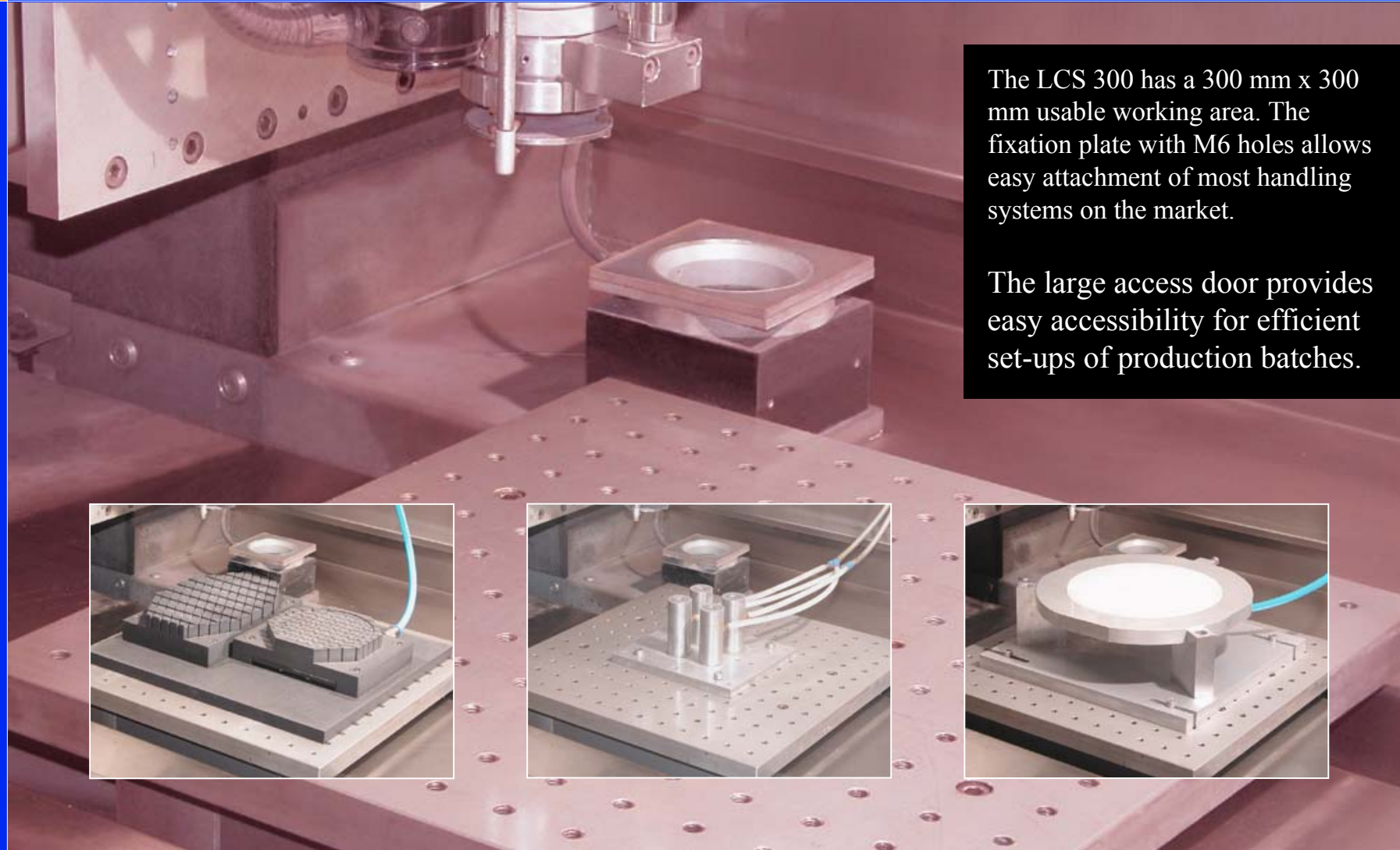
Alignment



Due to the integration of the latest software in image processing, nothing is faster in the market for alignment and quality control.

Pattern recognition and automatic alignment are executed within milliseconds.

Loading



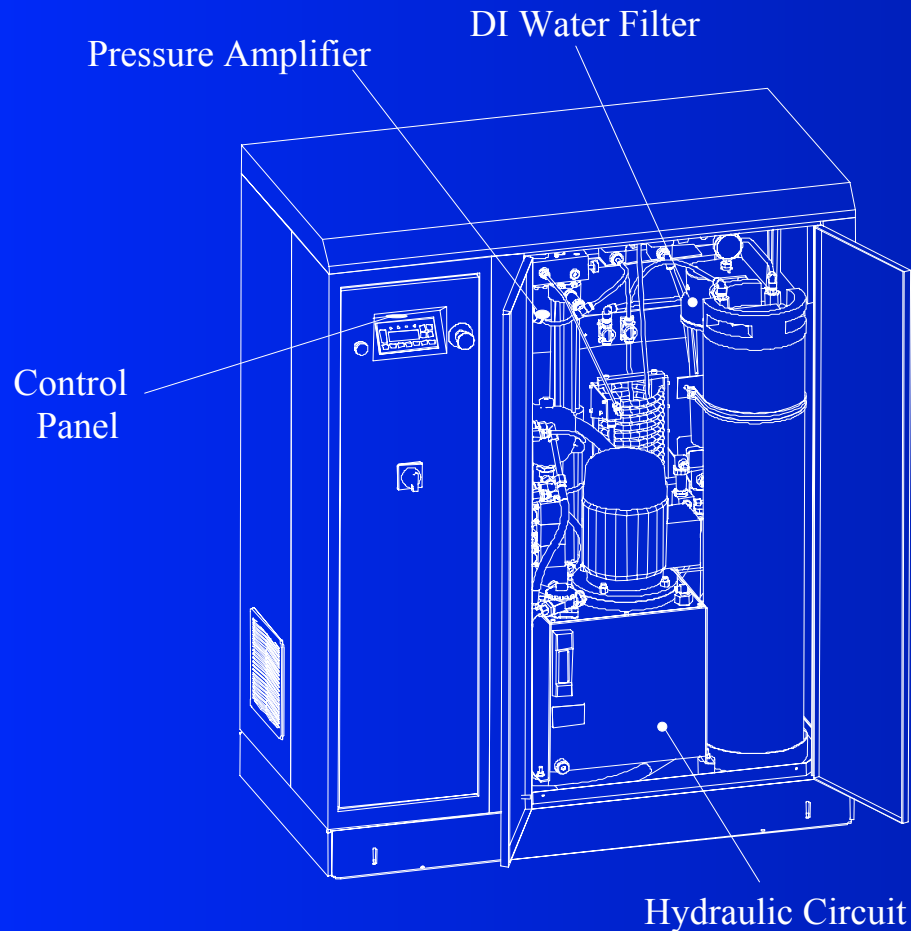
The LCS 300 has a 300 mm x 300 mm usable working area. The fixation plate with M6 holes allows easy attachment of most handling systems on the market.

The large access door provides easy accessibility for efficient set-ups of production batches.

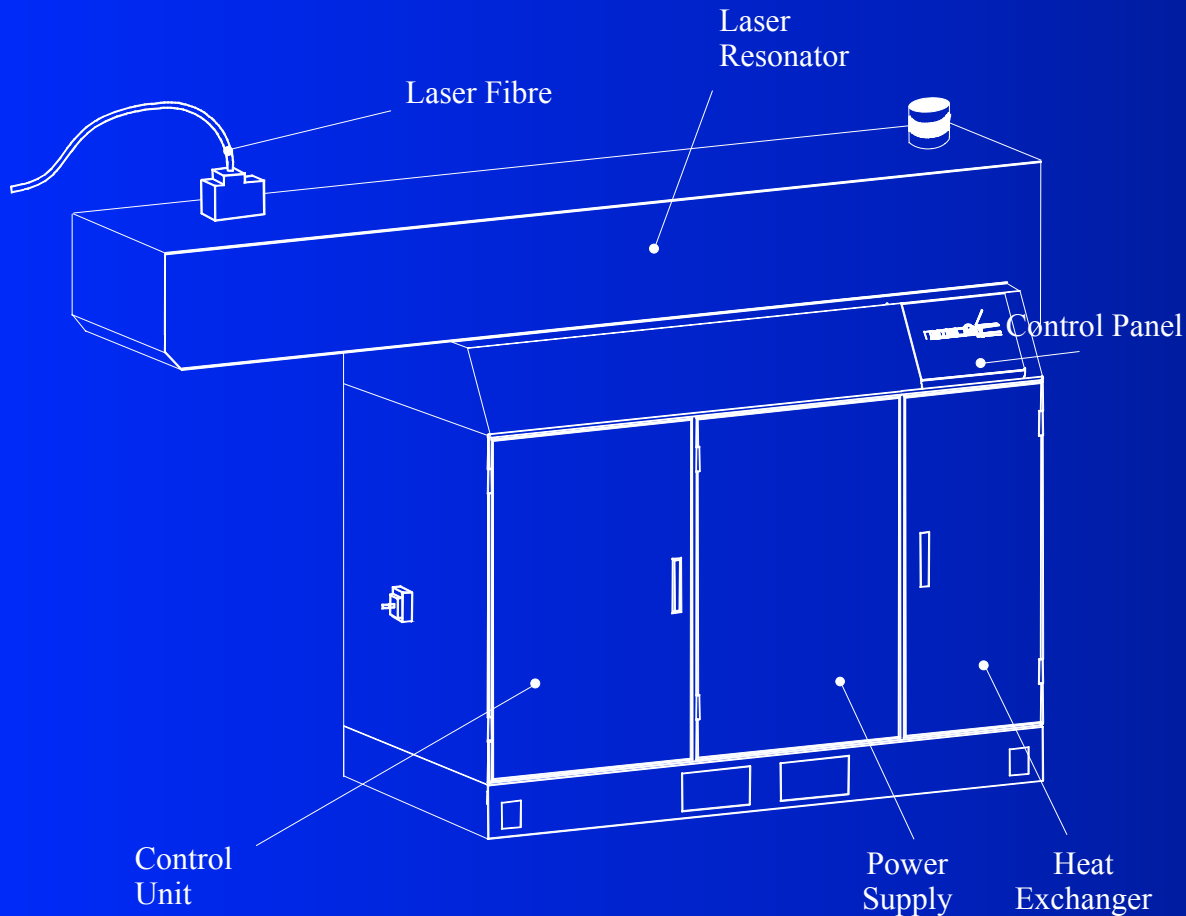
Water Pump

The hydraulic pump, based on the amplifier principle with two separated circuits, generates the water pressure which is needed to produce the water jet.

Pressure range: 0-500 bar
Flowrate: 5-100 ml/min



Laser



The Laser Source generates the laser beam, which is transmitted to the LCS 300 via an optical fibre.

Wavelength: 1064 nm or 532 nm
Average power: 100 W to 200 W



Installation

Advantages of the separation

- Small footprint of cutting station, low occupation of expensive clean room space
- No noise in the clean room, because laser and pump are outside of clean room
- No need for water cooling in the clean room
- No heat source in the clean room
- Easy access to laser source and water pump
- Upgradable: Simple and fast exchange of laser source for new, more powerful, better performing generations
- Energy sharing: 1 water pump can supply up to 10 cutting stations
- Easy exchange in case of failure

Multiple machine usage is possible, and machines can be separated from the laser and water sources.

Only the cutting stations are located in the clean room; the laser sources and pump are installed in the supply room.

Specifications

AXES

Type	XY-Table with separate axes Drive Linear motors
Useable working area	300 x 300 mm
Maximum stroke (X x Y)	600 x 400 mm
Accuracy	< 3 µm
Repeatability	< 1 µm
Maximum axis speed	600 mm/s
Maximum acceleration	20 m/s ²
Index	0.1 µm

LASER

Type	Solid state Nd:YAG, pulsed
Available Wavelengths	1064 nm, 532 nm
Average power	100 W, optional 200 W
Laser beam transmission	Optical fibre 200 µm, length 10m

WATER PUMP

Type	Two-cylinder pressure amplifier
Average Water flow	0.05 l/min
Water pressure	50 to 500 bars (5 to 50 Mpa)
Pressure transmission	Flexible water hose

OPTICAL HEAD

Type	Projection of fiber exit into water jet nozzle
Image ratio	4:1, 6:1 or 8:1
Nozzle diameter	50 µm, 75 µm or 100 µm
Alignment	Vision controlled

VISION SYSTEM

Type	Image matching
Magnification	Two-level (high/low magnification) x 0.5 to x 5.0
Optical magnification	x 0.5 to x 5.0
Illumination	Coaxial and ring light, fiber-coupled
Automatic alignment method	Image processing, align. time < 5 s
Quality control	Kerf check by image analysis

UTILITIES

Electrical power	3 x 400 V or 3 x 200 V, 50/60 Hz
Total power consumption	20 kVA
Air pressure	5 - 6 bars, oil free
Laser cooling water	Max. 25 l/min, max 16°C, industrial water
Average DI-Water flow for cutting:	0.05 l/min, < 0.3 mm, degasified
DI-Water flow for cleaning	Max. 1 l/min, DI-water, particles < 0.3 µm

DIMENSIONS/WEIGHT

Basic machine	(W x D) 1100 x 900 mm, 1100 kg
Laser	(W x D) 2550 x 650 mm, 900 kg
Water pump	(W x D) 1300 x 700 mm, 350 kg

The above specifications are subject to change without notice due to technical improvement.

The Laser Cutting System incorporates the worldwide patented technology of water jet guided laser, invented at the Swiss Federal Institute of Technology Lausanne, Switzerland.

This machine conforms to CE and CDRH regulations.

Options

- 200V/400V Transformer
- 2D-Reference scale, +/- 1 micron precision
- Water treatment system: De-ionization, filtering, de-gazing
- Uninterruptable power supply for basic machine
- CAM system with NC-editor for CAD data converting
- Laser Source Chiller
- Fibre length > 10 m
- Z-axis
- Rotary axis

Telemaintenance

Analogue modem connection allows remote assistance and remote maintenance all over the world.

- Software upgrades can be downloaded
- Assistance in programming can be given
- Tele-diagnostics is possible in case of machine failure



LCS 300



“Expanding your Product & Production Processing Capabilities ”