



NGB-R is a new generation, multimodal and high-end, 4D bioprinting system developed and designed specifically for tissue engineers, researchers and biologists.

Combining laser-assisted, micro-valve and extrusion bioprinting, it enables true versatility of bioprinting (from single cell to spheroids) and offers the possibility of using a large number of biomaterials and hydrogels.

NGB-R includes an embedded microscope for in-line cell printing monitoring and relies on a complete software suite for managing bioprinting protocols, from biological CAD to data analysis of manufacturing.

MAIN STRUCTURE SIZE

Footprint Bioprinter	L : 1376 mm x W : 900 mm x H : 2271 mm
Workspace dimensions	L : 1300 mm x W : 670 mm x H : 700 mm
Main structure weight	400 - 450 kg
Electronic cabinet dimensions	L : 800 mm x W : 800 mm x H : 1800 mm
Bioprinter - Electronic cabinet distance	Maximum 5 m
Electronic cabinet weight	Approx. 100 kg

PRINTING MODULES

- 1 Laser Assisted Bioprinting head (NIR laser, fast galvanometric mirrors, large field objective)
 - Laser donor slides (round shape and metalized glass substrates - lot of 100 slides in basic version)
 - 2 sizes available : 15 mm \varnothing or 30 mm \varnothing
- Up to 3 nozzle based printing heads based on micro-valve bioprinting or bioextrusion:
 - Luer lock syringe connection
 - 3cc and 5cc syringes
 - \varnothing 0.10mm or 0.25mm needles

OTHER FEATURES

- 6-axis robotic arm for substrate positioning
- System for measuring Donor-Receiver Distance (needed for laser printing)
- Machine control by a PLC
- Internet connection for remote maintenance
- CCD camera for machine vision
- Touchscreen
- Separated electronic cabinet



SOFTWARE SUITE

3 softwares available:

1. CAD : to design 3D patterns of tissue components
2. GUI : for handling CAD files and controlling NGB-R parameters
(printing features, system calibration, printing datas backup, traceability, imaging, etc.)
3. Bioprinting Image Analysis : for image processing
(droplet size, cell detection, printing homogeneity, 3D reconstruction, etc.)

PERFORMANCES

Deposition speed: from 1 mm/s to 20 mm/s (for extrusion)

Robotic positioning accuracy: +/- 20 µm

Printing capability on large working area (standard: 6-well and 12-well plates)

Printing resolution:

- tens of picoliters by laser
- tens of nanoliters by micro-valve
- hundreds of nanoliters to several microliters by extrusion

ENVIRONMENT - SAFETY

Class II Safety cabinet

Made of inox for easy cleaning

IR laser protection film

General safety systems (for electrical and mechanical features)

OPTIONS

High Resolution imaging (microscopic imaging capability with cellular resolution)

UV Diode 365 nm (for photo-polymerisation)

Low temperature microvalve module (4 – 8°C)

High temperature microvalve module (30 – 50°C)

Thermo regulated microvalve module (4 – 50°C)

Low temperature extrusion module (4 – 8°C)

High temperature extrusion module (30 – 50°C)

Thermo regulated extrusion module (4 – 50°C)

Custom size area if > 6 well plate dimension (new robot effector)

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