

**axolotl**  
BIOSYSTEMS

PRODUCT  
**CATALOGUE**

2021



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NEXT GENERATION OF  
**3D BIOPRINTING**

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# CONTENT

INTRODUCTION TO BIOPRINTING

AXO A3

AXO A6

AXO MEW

AXO SUITE

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## BIOPRINTING SYSTEMS: **REDEFINED**

Axolotl Biosystems engineers and designs high technology 3D bioprinters and equipments for researchers and life science companies.

# NEXT GENERATION OF 3D BIOPRINTING

Axolotl Biosystems Bioprinters are the pinnacle of bioprinting. Bioprinting is creating solid models or cell scaffolds according to computer generated 3D models with the usage of biocompatible polymers, bioinks and cell suspensions.

## Innovative & Unique

Axolotl Biosystems offers the new and reliable tools for the bioprinting. Our advanced movement structures provides high precision bioprinting. Our printers have printbeds that can operate in wide range of temperature levels. Unique printhead we provide will give user high control over bioprinting process. Our printers is capable of soft tissue and bone production.

## Support & Supply

Our dedicated technical engineering team are available with support via their hotline, from initial installation and beyond. Ever accessible support system can also provides you with hardware replacements and software updates .



**Bone and Cartilage Productions**



**Soft Tissue Productions**



**Controlled Dispensation of Drugs**



**3D Organ Bioprinting**



**BIOPRINTING SYSTEMS:  
AXO A3**

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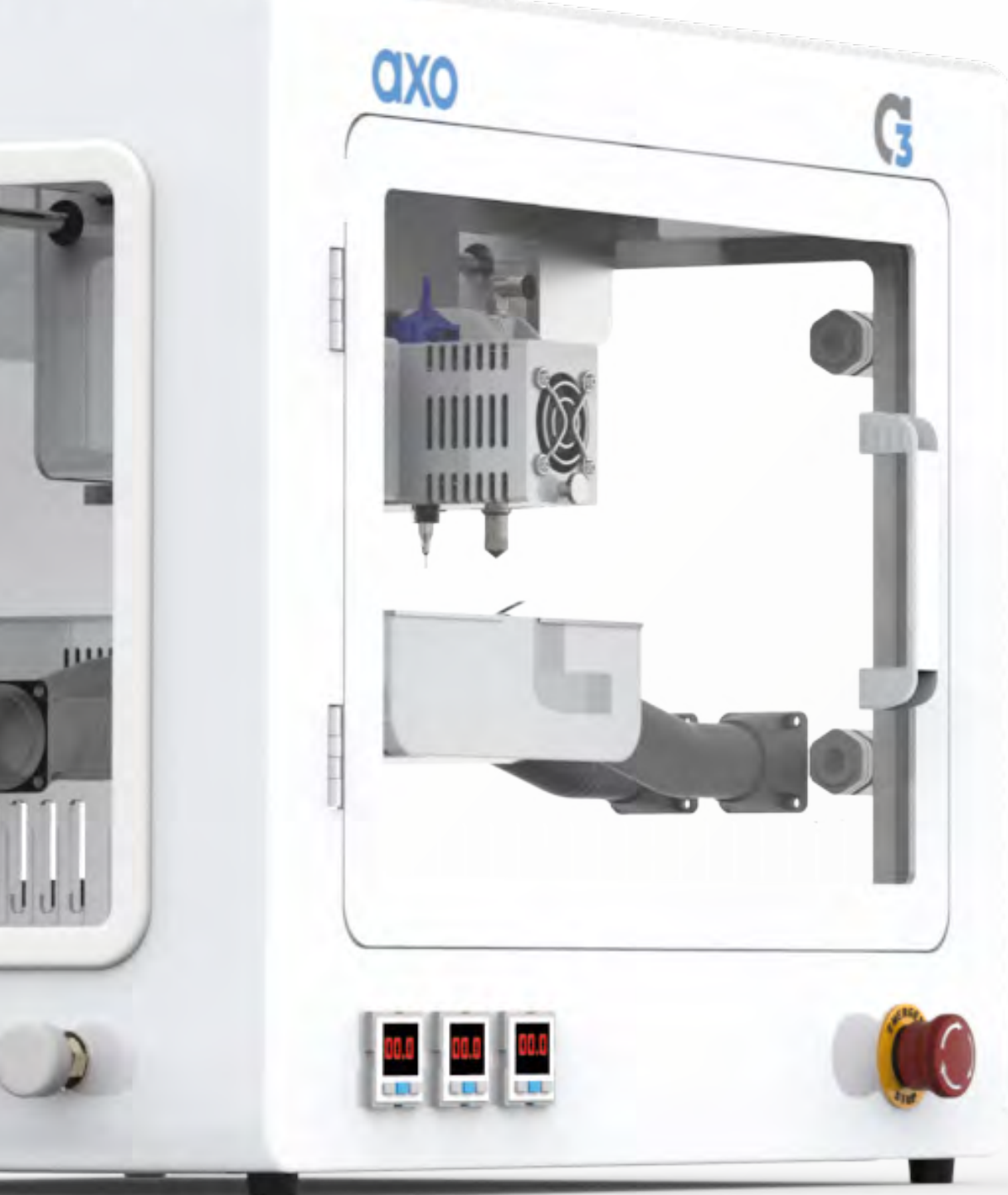


## Printheads

- 3 Printhead Attachment Slots
- Independent Temperature Control for 3 Different Printhead
- Printheads Can Access Everywhere in Printbed.
- Easy to Attach Printheads.

## Printbed

- Printbed Is Compatible for Bioprinting
- There Are 2 Additional Collectors Melt Electrowriting and Melt Electrospinning.
- Precise Calibration System Embedded Inside Printbed.
- Allow the Usage of Variety of Print Surfaces ( Wellplate, Petri Dish , ...)



## VARIETY OF EQUIPMENT FOR PERFECTION

Axo A3 has modular structure. It has versatile printhead socket which enables A3 to function with different printheads which have unique purpose and capabilities. These printheads are designed to be perfect at their designated tasks. Printheads can be switched manually with ease.

## FUNCTIONALITY

AXO A3 is the pinnacle of bioprinting. AXO A3 is the perfect tool for bioprinting with its high precision movement capability in 3-Axis.

## SAFETY & RELIABILITY

Versatility of A3 has no diminishing effect on its anti-contamination and safety capabilities. Protection of user and process is the ever-deciding factor in the designing process of AXO A3. There is a 0.22 µm filter between the syringe and airways to prevent contamination of the biomaterial in the syringe.



# DATA SHEET

## BIOPRINTING

<b>Build Volume:</b>	130x90x80 mm
<b>Printhead Slots:</b>	3 Printhead Slots Available
<b>XY Resolution Per Microstep:</b>	1.25 $\mu\text{m}$
<b>Z Resolution Per Microstep:</b>	1.25 $\mu\text{m}$
<b>Layer Resolution:</b>	<10 $\mu\text{m}$
<b>Calibration:</b>	Automatic
<b>Printbed Temperature:</b>	5°C to 60°C, Peltier Controlled
<b>Melt Electrowriting Technology:</b>	Available
<b>Filtering:</b>	High Efficiency Particulate Air Filter & Prefilter with 0.2 Micron Membranes
<b>Bioprinting Nozzles:</b>	Different Sizes and Types Available
<b>Photocuring:</b>	365nm, 395nm, 405nm
<b>Extruder Air Pressure Range:</b>	0 kPa - 800 kPa
<b>Printing Pressure Resolution:</b>	0.1 psi
<b>Build Structure:</b>	Petri Dish, Culture Plates, PE Isolated Plate

# DATA SHEET

## NEEDLES

Axolotl Biosystems offers you different type of needles, dispensing tips and stainless steel nozzles depending on your needs. With these kinds of inner diameters, researchers can print microfluidic chips with high precision.

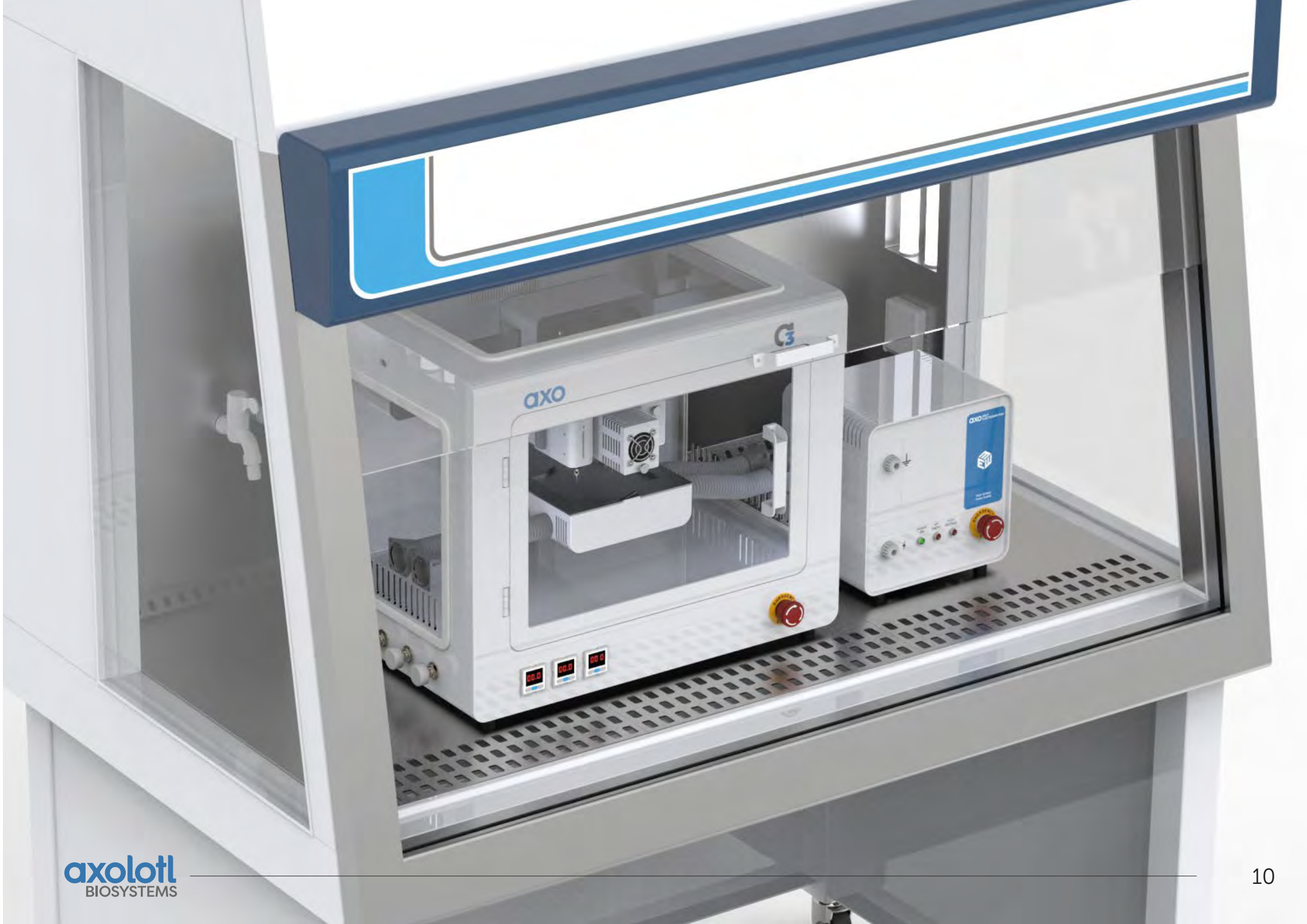
**Inner diameter of bioprinting needles:** 14G to 34 G

**Length option of bioprinting needles:** 0,5 inch, 1 inch

**Stainless Steel nozzles for printing scaffold:** 5100 micron, 200 micron, 250 micron, 300 micron, 400 micron

**Brass nozzles for printing scaffold:** 100 micron, 200 micron, 250 micron, 300 micron, 400 micron







## BIOPRINTING SYSTEMS: AXO A6

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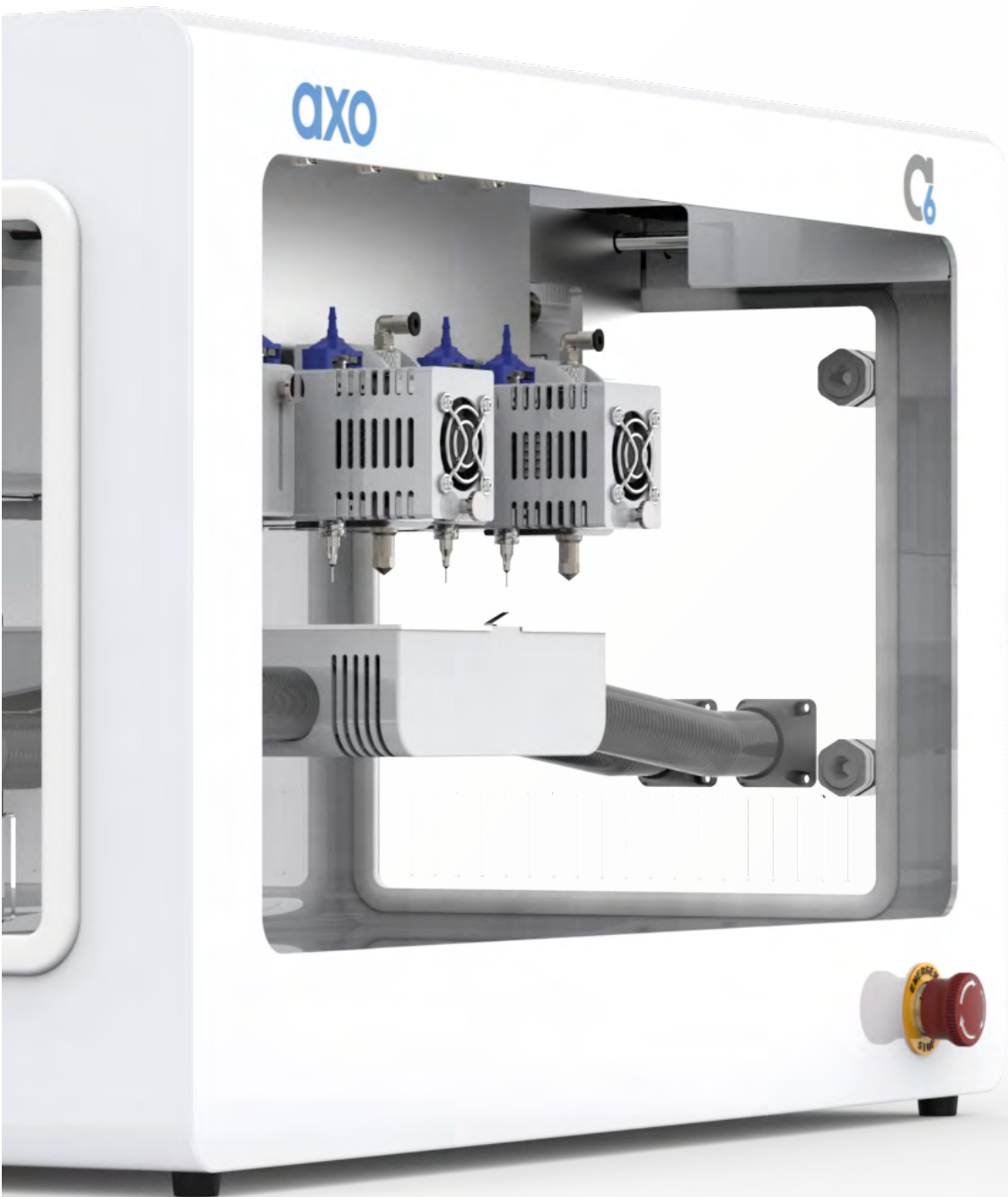


## Printheads

- 6 Printhead Attachment Slots
- Independent Temperature Control for 6 Different Printhead
- Printheads Can Access Everywhere in Printbed.
- Easy to Attach Printheads.

## Printbed

- Printbed Is Compatible for Bioprinting
- There Are 2 Additional Tools to Melt Electrowriting and Melt Electrospinning.
- Precise Calibration System Embedded Inside Printbed.
- Allow the Usage of Variety of Print Surfaces ( Wellplate, Petri Dish , ...)



## LABORATORY IN A BOX

Axo A6 can be described as a multitasking biofabrication station. With its 6 independent printhead slots A6 can perform multiphased bioprinting. Multiple printheads enables researchers use multiple materials without pausing the process. Axo A6 is a machine where all lab compressed into small box. Our printheads have large range of temperature levels. this opens up new path for reseachers for greater variety of materials can be used. Many of these materials are delicate and prone to contamination. Our printheads and printbed can move with grace and speed to prevent any damage to materials while keeping the bioprinting speed at maximum. Hepafilters that is integrated in A6 protects materials from contamination While AXO A6 is a complex device it is competible with MEW.

## HIGH FLEXIBILITY

AXO A6 can bioprint very complicated and detailed 3D models. Models that are generated from DICOM files. Presicion is not effected if the bioprinting model requires more than one print-head during it.

# DATA SHEET

## BIOPRINTING

<b>Build Volume:</b>	130x90x80 mm
<b>Printhead Slots:</b>	6 Printhead Slots Available
<b>XY Resolution Per Microstep:</b>	1.25 $\mu\text{m}$
<b>Z Resolution Per Microstep:</b>	1.25 $\mu\text{m}$
<b>Layer Resolution:</b>	<10 $\mu\text{m}$
<b>Calibration:</b>	Automatic
<b>Printbed Temperature:</b>	5°C to 60°C, Peltier Controlled
<b>Melt Electrowriting Technology:</b>	Available
<b>Filtering:</b>	High Efficiency Particulate Air Filter & Prefilter with 0.2 Micron Membranes
<b>Bioprinting Nozzles:</b>	Different Sizes and Types Available
<b>Photocuring:</b>	365nm, 395nm, 405nm
<b>Extruder Air Pressure Range:</b>	0 kPa - 800 kPa
<b>Printing Pressure Resolution:</b>	0.1 psi
<b>Build Structure:</b>	Petri Dish, Culture Plates, PE Isolated Plate

# DATA SHEET

## NEEDLES

Axolotl Biosystems offers you different type of needles, dispensing tips and stainless steel nozzles depending on your needs

**Wide range of inner diameter of bioprinting needles:** Wide range of inner diameter of bioprinting needles: 14G to 34 G

**Lenght option of bioprinting needles:** Lenght option of bioprinting needles: 0,5 inch, 1 inch

**Stainless Steel nozzles for printing scaffold:** Stainless Steel nozzles for printing scaffold: 100 micron, 200 micron, 250 micron, 300 micron, 400 micron

**Brass nozzles for printing scaffold:** Brass nozzles for printing scaffold: 100 micron, 200 micron, 250 micron, 300 micron, 400 micron

With these kinds of inner diameters researchers, can print microfluidic chips with high precision.









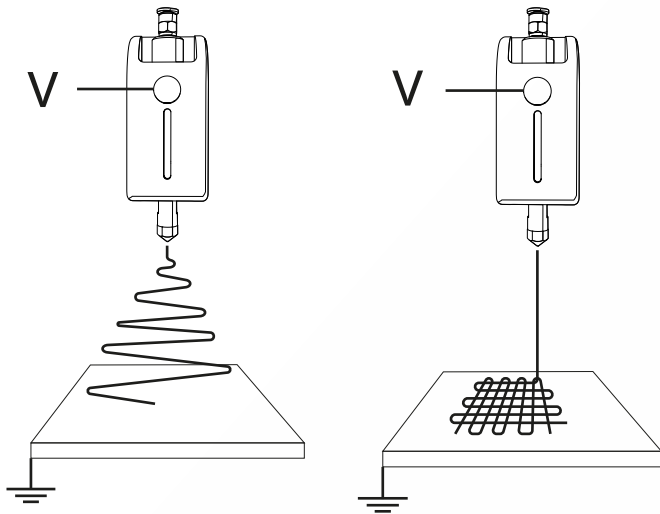
## BIOPRINTING SYSTEMS: AXO MEW

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# axo MELT ELECTROWRITING

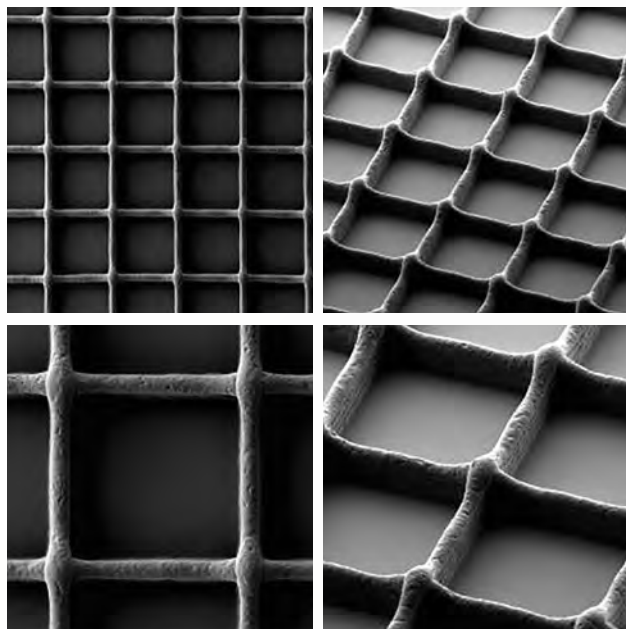


AXO Melt Electrowriting (MEW) grants the researchers the ability to execute electro-spinning and writing processes. These processes are resulted with creation of micro- and nano-fibers. With different collector options, Axo MEW becomes the tool of choice for your research. Flat Collector and Rotary Collector can be integrated to meet your specific research needs.



Electrospinning

Electrowriting



# DATA SHEET

## COLLECTORS



### FLAT COLLECTOR

Axolotl Biosystems provide you flat collector to be used in MEW. Made out of aluminum and teflon it can endure voltages as high as 20.000 V. Basic and complicated scaffold models can be produced on the flat collector. Available printsurface is 130x90 mm<sup>2</sup> on the flat collector.



### ROTATIONARY COLLECTOR

In the certain areas like vascular research, there is a highly rising demand of tubular scaffolds. AXO Rotary Collector is design for answering these demands. Researchers can produce tubular scaffold as long as 83 mm.

# DATA SHEET

## MELT ELECTROWRITING

Layer Resolution:	<10 Microns
Calibration:	Automatic,
XY Resolution Per Microstep:	1.25 $\mu\text{m}$
Z Resolution Per Microstep:	1.25 $\mu\text{m}$
Melt Electrowriting High Voltage Range:	0 kV - 15kV DC
Melt Electrowriting Current Range:	0 $\mu\text{A}$ - 150 $\mu\text{A}$
Photocuring:	365nm, 395nm, 405nm
Extruder Air Pressure Range:	0 kPA - 800 kPA
Printing Pressure Resolution	0.1 psi
Collector Rotation Speed Range:	<5000 rpm



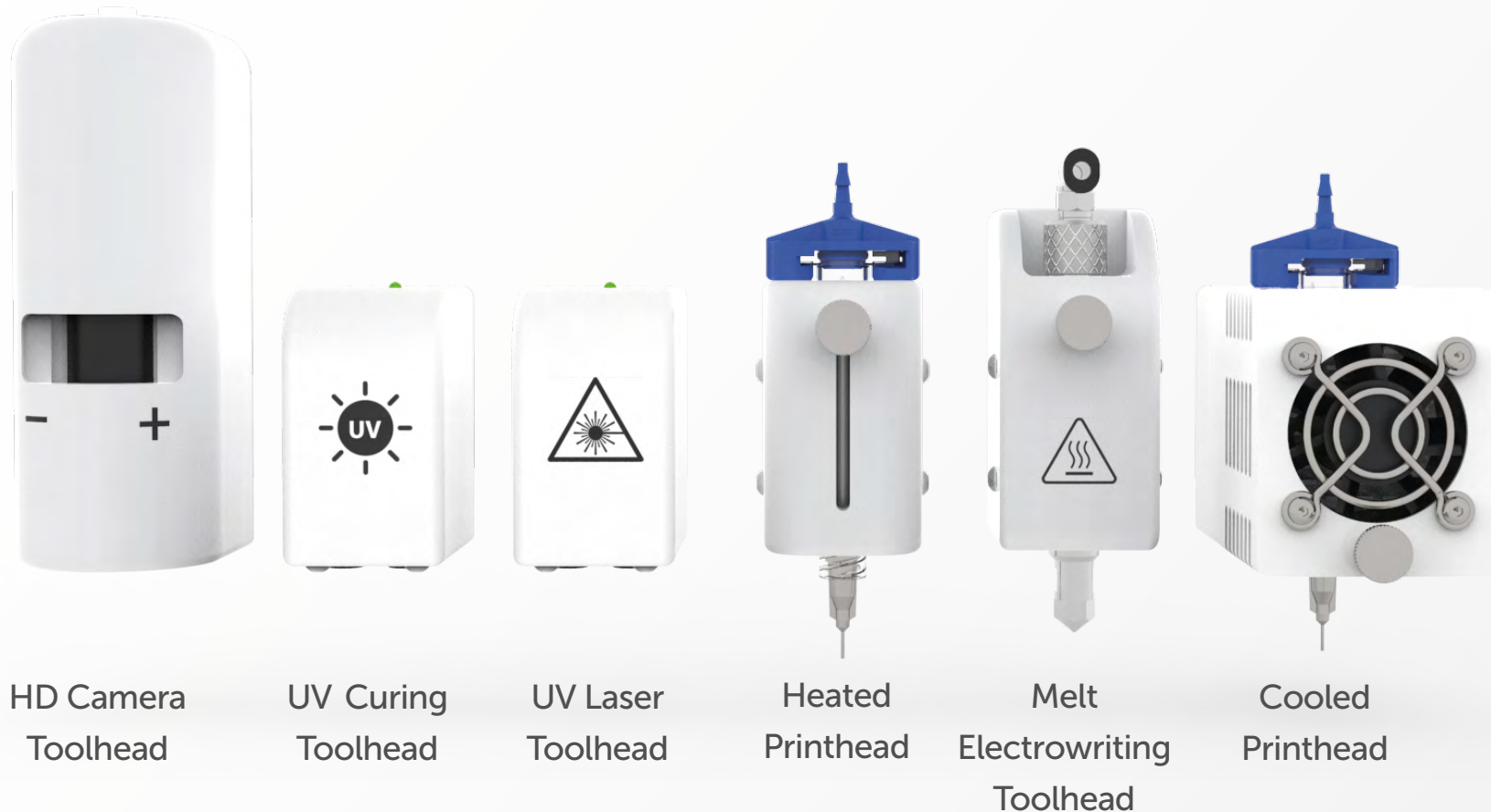
## PRINTHEADS: VARIABLE OPTIONS

Axolotl Biosystems engineers and designs high technology 3D bioprinters and equipments for researchers and life science companies.

# DATA SHEET

## PRINTHEADS

Bioprinting is a delicate process with many small details to be considered. Researchers might feel overwhelmed by these sheer number of variables that can effect bioprinting. This won't be a case for the users of Axolotl Biosystems Bioprinters. We provide carefully designed printheads and toolheads which are specilized for small details in bioprinting and tissue production.



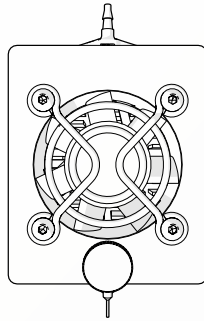
# DATA SHEET

## PRINTHEADS

### COOLED PRINTHEAD

Heat Range: Down to 3°C

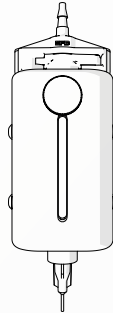
Descriptions: With its adaptive peltier control system the printhead can cool down to 3 celcius. You can print "collagen" for bioprint stroma (a part of cornea) or "matrigel" for advance tissue engineering applications.



### HEATED PRINTHEAD

Heat Range: Up to 265°C

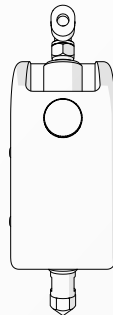
Descriptions: For working with bioresorbable polymers and biocompatible polymers, room temperature to 250°C. Temperature range enables researchers to work with many different polymer types



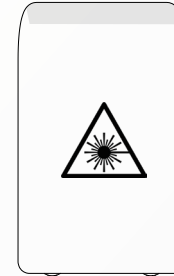
### MELT ELECTROWRITING PRINTHEAD

Voltage: Up to 30 kV

Descriptions: It allows to print your meltable polymers on submicron level in a real 3D shape without any harmful solutions. It is the best way to create 3D fiber scaffolds that is usable in medical applications.



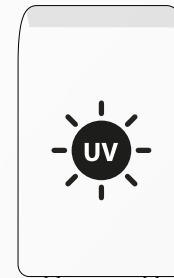
### UV CROSSLINK TOOLHEAD



Wave Length: 405nm

Descriptions: With our UV-Laser Modules researchs work with different type of photoinitiators. Depends on the application users choose different power values.

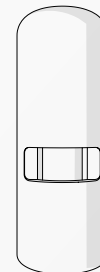
### UV CURING TOOLHEAD



Wave Length: 365nm, 395nm, 405nm

Descriptions: With our UV-Laser Modules researchs work with different type of photoinitiators. Depends on the application users choose different power values.

### HD CAMERA TOOLHEAD



HD Camera Toolhead with image resolution up to 1920\*1080. Can record or photograph the bioprinting process.





# USER FRIENDLY NEW INTERFACE

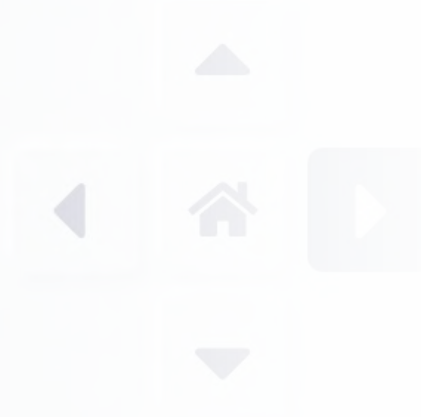


Axolotl Biosystems bioprinters comes with a high quality software to control, Axo Suite. Axo Suite revolutionize the process of bioprinting by enabling the control and monitor of multiple printhead slots individually without diminishing the capability of all heads working in unison.

# EASY TO USE MODULAR

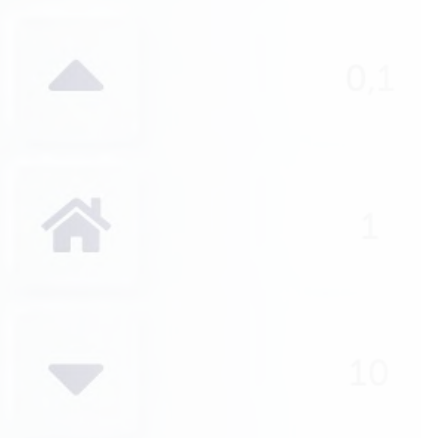
Axo Suite is new software developed by Axolotl Biosystems. Axo Suite is an modular multifunctional software. Preperation for bioprinting was complicated. Making a 3D model ready to be used in bioprinting requires multiple software. Now, Axo Suite unites features of these softwares in one place. Researcher can draw basic models in Desing Module. These 3D models can be sliced in Slicer Module. In Control and Monitoring module reseachers can determinate printing temperature speed and air pressure. In Control Module, speed and position of axes can be determinated. This software can be downloaded from website and addition to that it will be pre-installed on the tables that are provided with bioprinters.

## X-Y Axis



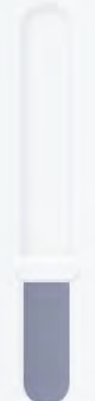
## Z Axis

## Step Distance



## High-Temp Printhead

Voltage Heat Pressure



Current

0

80

43

Set

0

150

50

Volt

Celsius

Psi

Auto Calibrate

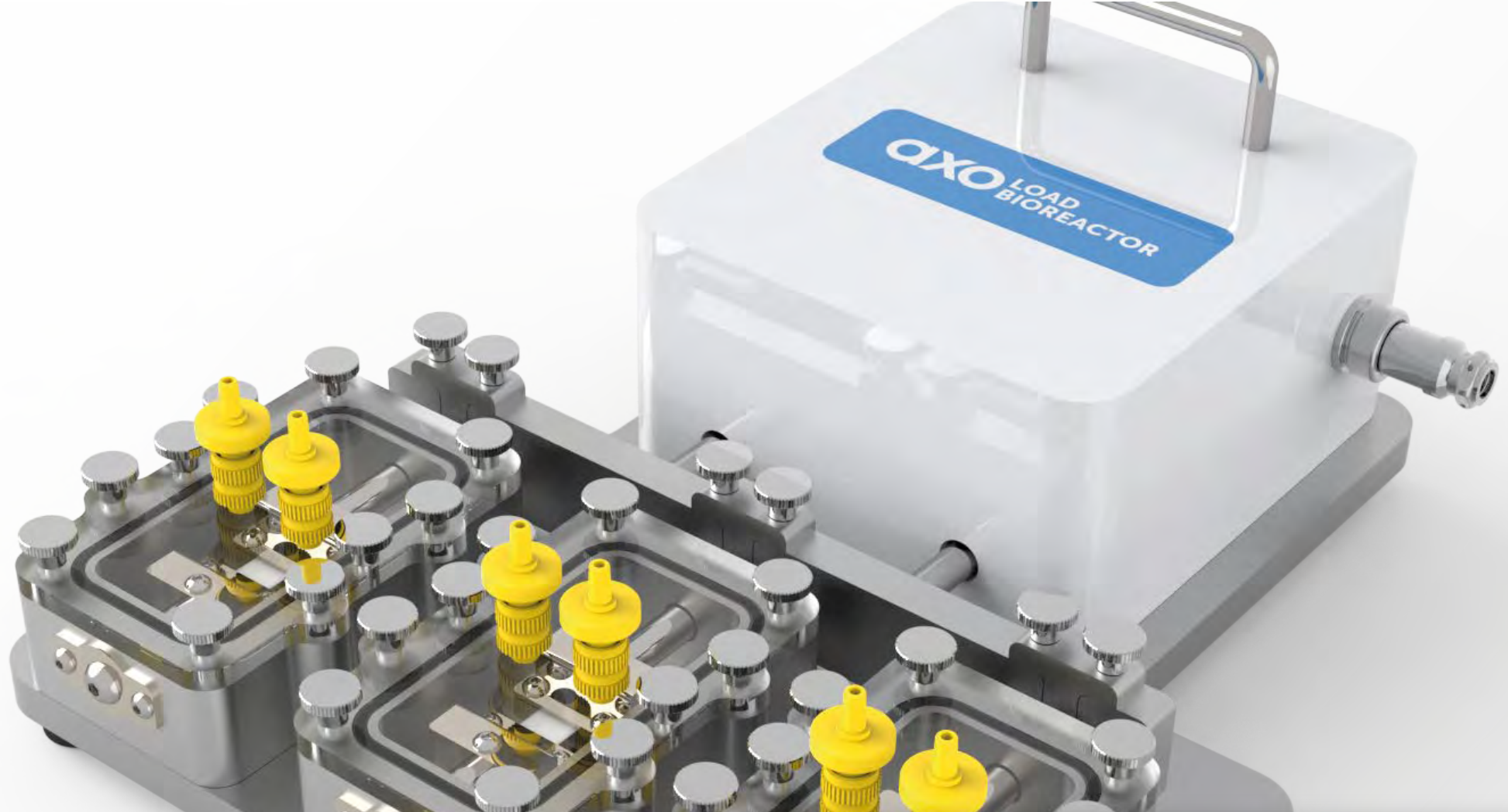


## Print Chamber

HEPA Filter

UV-C Lights

Cabin LED



**axo** LOAD  
BIOREACTOR

# axo LOAD BIOREACTOR



Power Unit

Chambers

Control Unit





## BIOREACTOR

Axo Load Bioreactor is a precision instrument developed for deforming scaffolds, flexible membranes, and 3D matrices in a sterile fluid environment. This device is capable of uniaxial deformations on flexible cell-seeded substrates or scaffolds. It has an onboard actuator and control board to enable it to run independently of a computer in an environment-controlled incubator.

## AUTOCLAVABLE LOAD STIMULATION CHAMBER

The load bioreactor chamber is made entirely of autoclavable materials such as stainless steel and coated aluminum.

## STAND-ALONE CONTROLLING SYSTEM

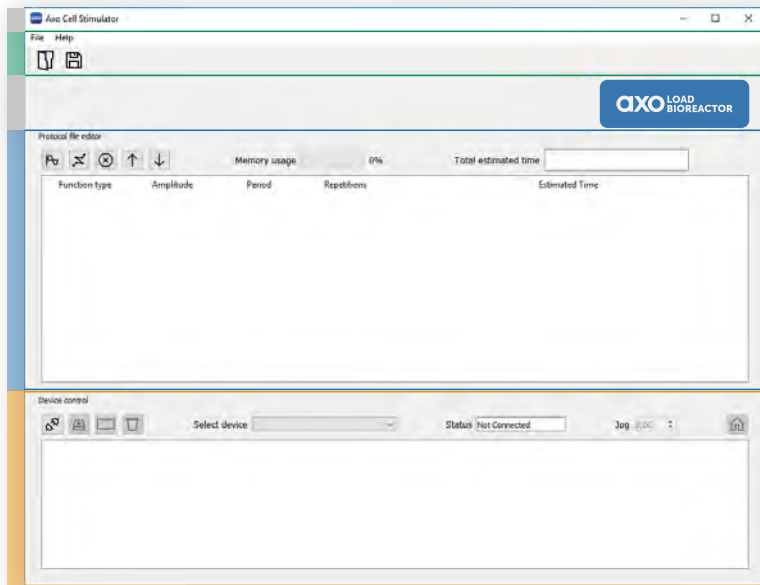
Axo Load Bioreactor especially designs to fit inside incubators. Thanks to our tailor-made software it can operate without any USB cable connection.

DATA SHEET

# LOAD BIOREACTOR

Stimulation:	Uniaxial
Cell Culture Chamber:	to 3
Cell Contacting Component:	Autoclavable Materials
Maximum Velocity:	<10 mm/s
Loading Capacity:	<200 N
Media Volume:	<100 mL
Cell-Contacting Components:	Stainless Steel
Product Construction:	Available
Standalone Working:	USB
ConnectionElectrical Stimulation:	Available
Output Voltage Range:	0 - 30 V
Output Current Range:	0 - 5 A

# LOAD BIOREACTOR SOFTWARE AND FUNCTIONS



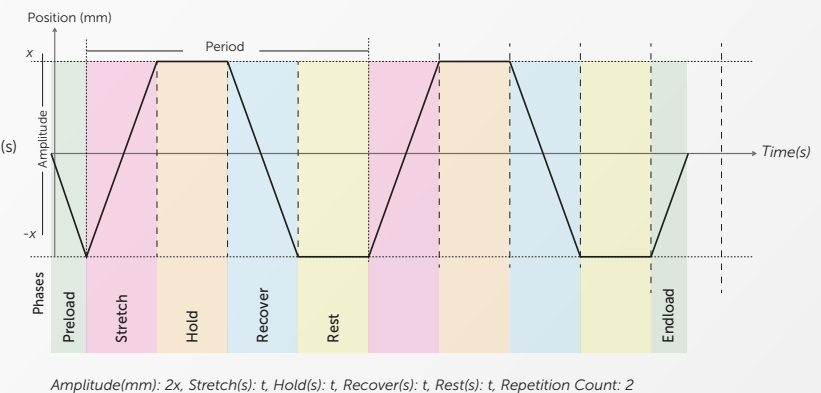
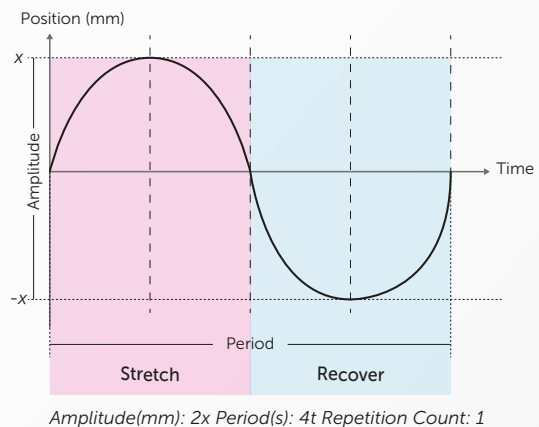
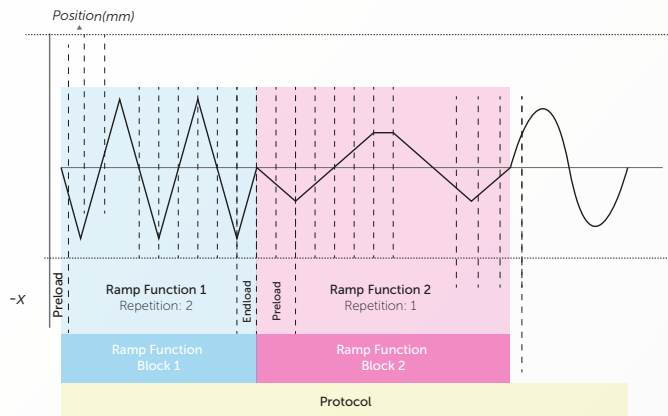
■ File Tab     
 ■ Protocol File Editor     
 ■ Device Control

Axo Load Bioreactor has a unique software that enables have total control over the machine. You can have clear graphs of your work by using this easy to to navigate software.

Block: Block is the repeating function on a protocol.

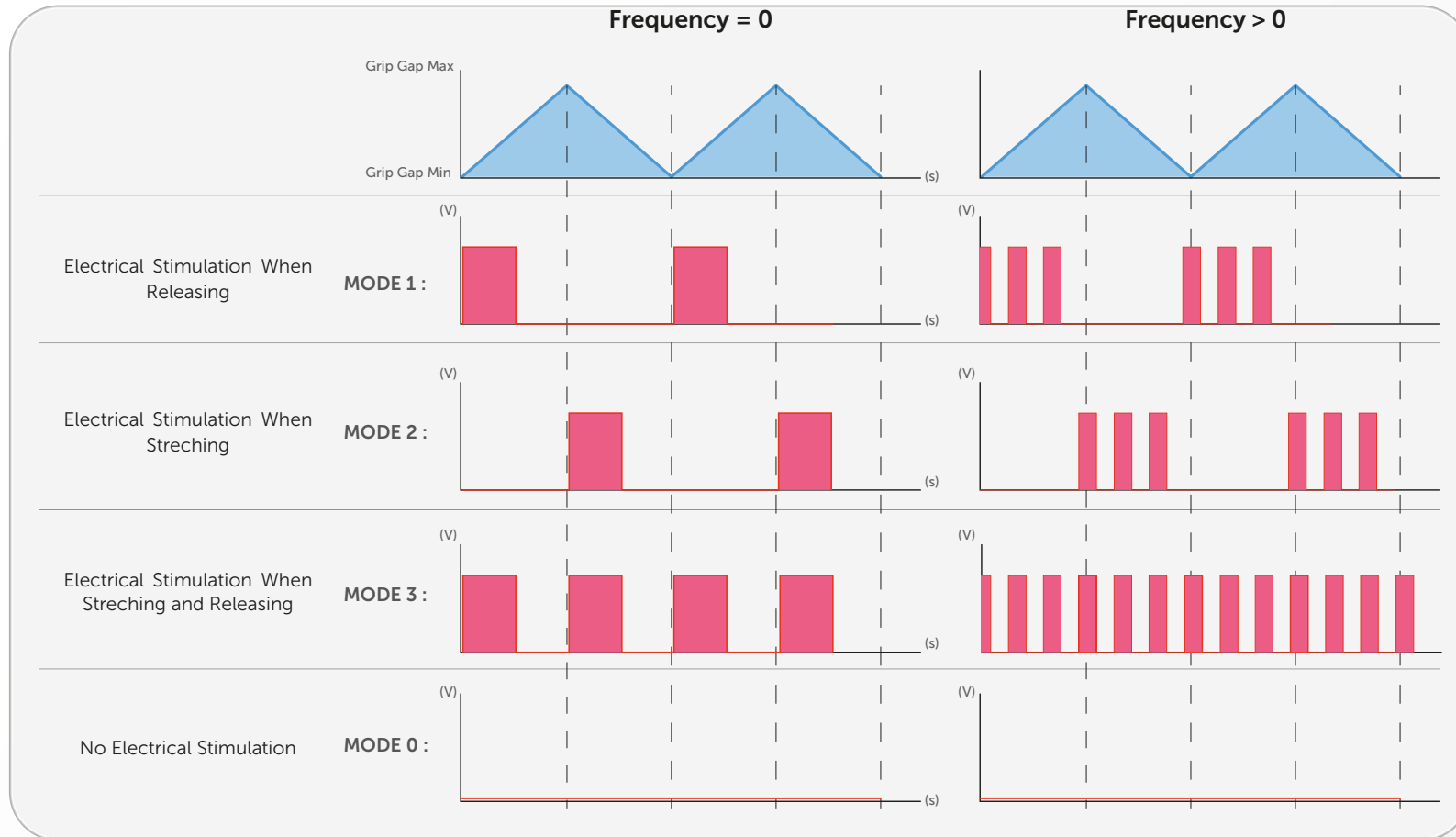
Protocol: Protocol is the array of test blocks.

The ramp function applies the displacement at a constant velocity. The sine function applies the displacement according to a sinusoid with the desired displacement magnitude and duration.





# LOAD BIOREACTOR SOFTWARE AND FUNCTIONS



# axolotl

BIOSYSTEMS



This investment is partly financed by European Union.