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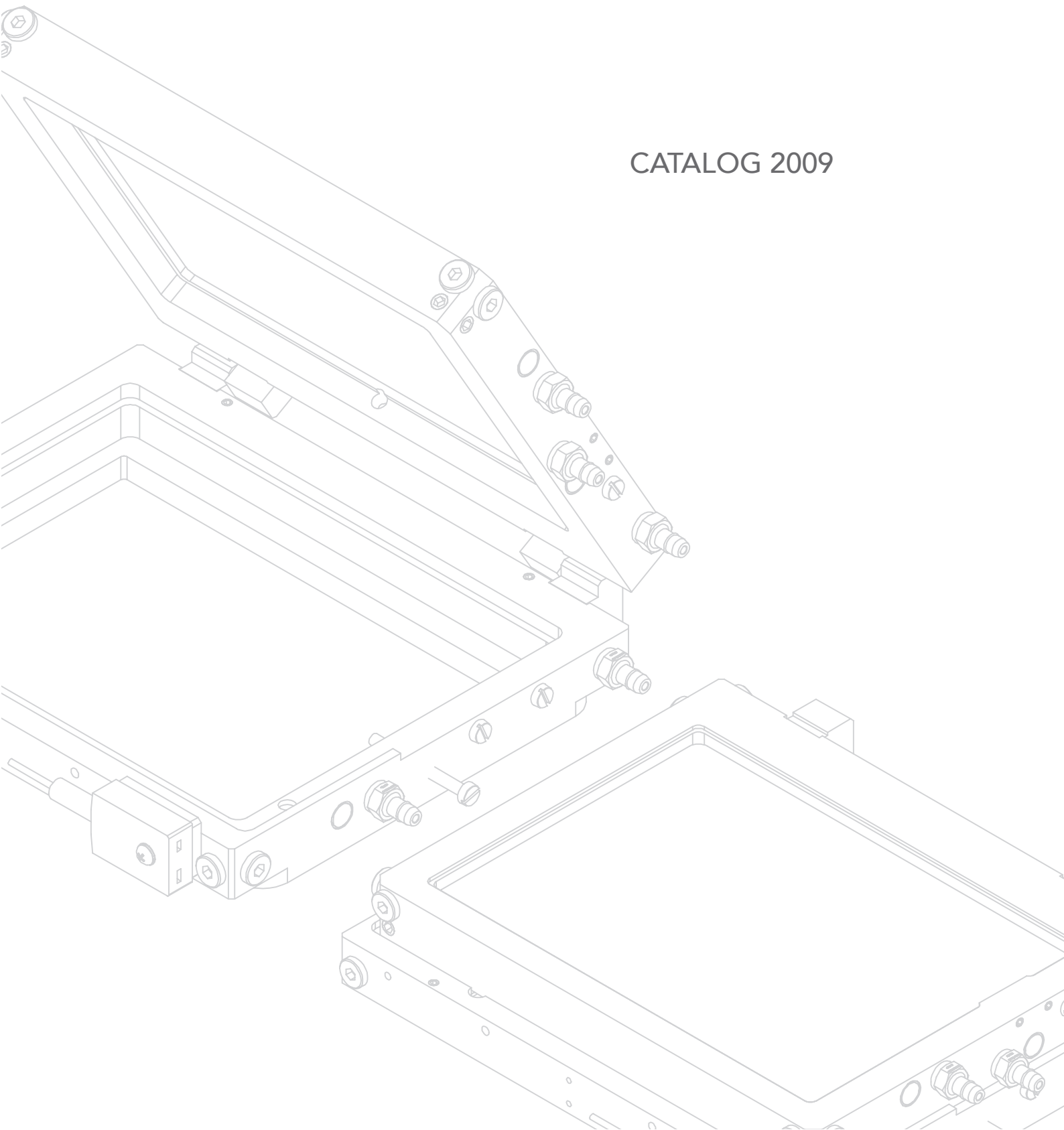
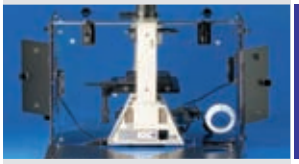


Water Jacket CO2 Microscope Stage Incubator

H101

CO2 Microscope Cage Incubator



H201

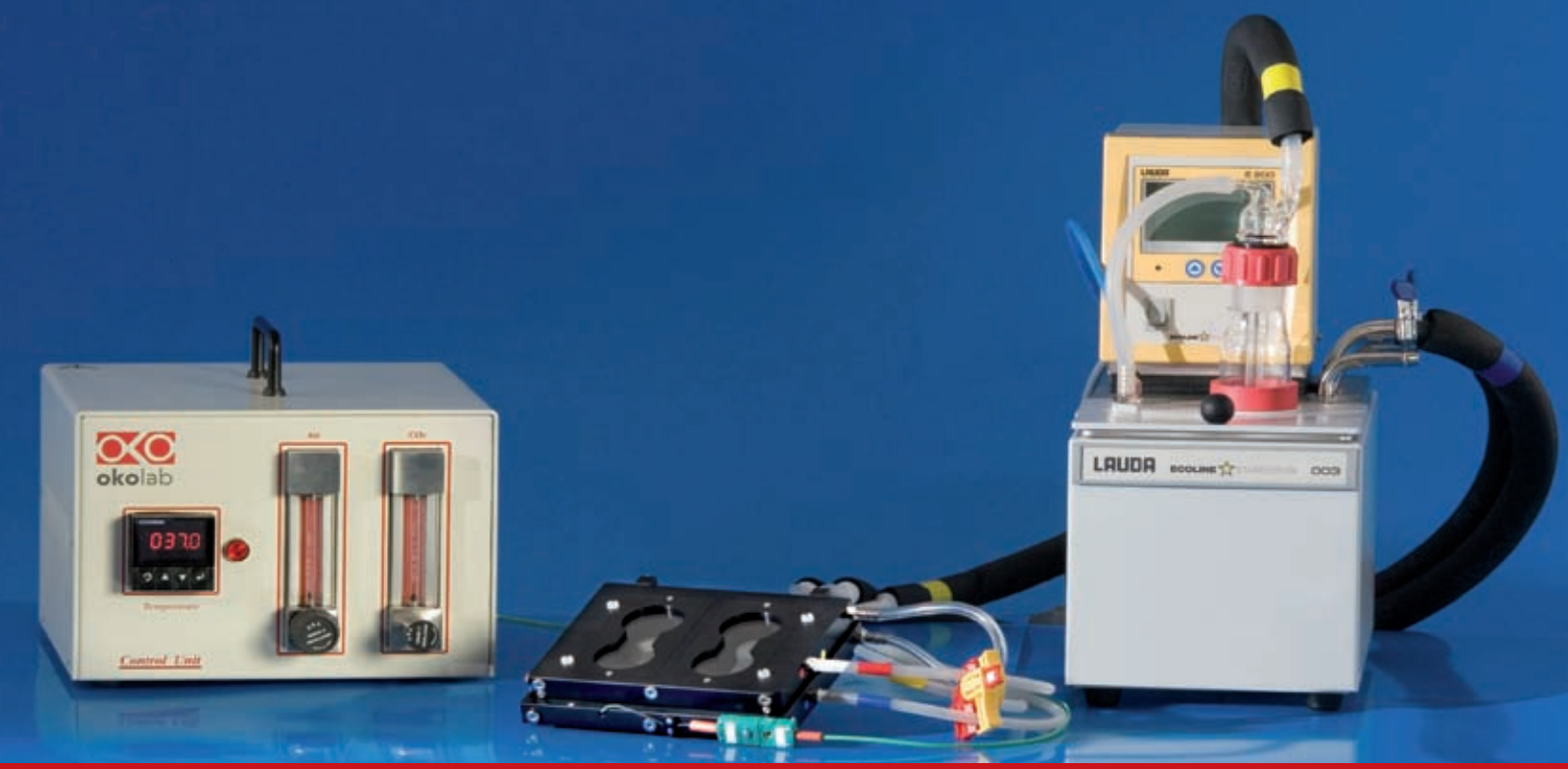
Electric CO2 Microscope Stage Incubator

H301

Warm Plate

H401

Codes



Water Jacket
CO_2 Microscope Stage Incubator

The ultimate solution for live cell imaging

WJ CO_2 Microscope Stage Incubator - Technical specifications	
Temperature range	BASIC: from 3°C above ambient T to 50°C CRYO: 5 - 50 °C
Temperature control accuracy	±0.1°C
Heating Technology	Water Jacket
Type of temperature controller	Software
Temperature feedback	Specimen temperature feedback
Humidification module	Heated
CO_2 range (Manual or digital)	0 to 20%

The Water Jacket CO_2 Microscope Stage Incubator is designed to maintain all the required environmental conditions for cell cultures right on the microscope stage, thus allowing prolonged observations of cell events.

Temperature is controlled by circulating water from a thermostatic bath into the incubating chamber. An accompanying software reads the temperature in a reference well and updates the set point temperature of the water bath, ensuring a specimen temperature stability of ± 0.1°C.

The Basic version allows to incubate in the temperature range from 3°C above ambient temperature to 50°C. The Cryo version allows to incubate in the temperature range 5 - 50°C and to perform temperature cycles and ramps.

A humidifying and a pre-heating module prevent medium evaporation and avoid water condensation on glass and plastic surfaces.

Compatible with manual and digital CO_2 / O_2 controllers from OKO-Gas Controllers series.

A wide choice of interchangeable inserts adds flexibility to the equipment and allows to accept any cell culture support (petri-dishes, glass slides, mutiwell plates, etc.).

SUPERIOR PERFORMANCE

OIL IMMERSION COMPENSATION

HEATING AND COOLING

TEMPERATURE AND HUMIDITY MODULES

Temperature Control Module

In this type of incubator, the chamber is a water jacket and temperature is controlled by circulating water in the base and in the lid of the incubating chamber. This guarantees superior temperature uniformity and stability, both required for long lasting experiments.

Temperature accuracy ± 0.1°C: A meter equipped with an external small gauge temperature sensor is used to measure the temperature of a reference well, placed into the incubating chamber, near the specimen.

Temperature uniformity: The most challenging task in incubation technology is to maintain a highly humid atmosphere without having water condensation in the chamber. The only way to prevent water condensation from a nearly saturated atmosphere is to achieve superior temperature uniformity throughout the incubator. In the Water Jacket CO_2 stage incubator, this is obtained by fluxing temperature controlled water into a precision-engineered channeling system embedded in the chamber.

Temperature stability: Temperature stability in time is essential to avoid temperature-driven focus drift. The Water Jacket CO_2 stage incubators have excellent temperature stability thanks to the thermal inertia of the water circulating in the system (4 liters), which shields the specimen from ambient temperature fluctuations.

The **Basic model** is equipped with a heating thermostat and operates in the temperature range 3°C above ambient to 50°C.

The **Cryo model** is equipped with a heating-cooling thermostat and operates in the temperature range 5 - 50°C.

Temperature meter

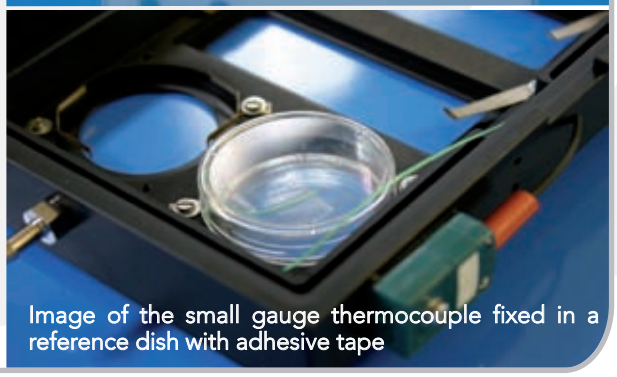


Image of the small gauge thermocouple fixed in a reference dish with adhesive tape

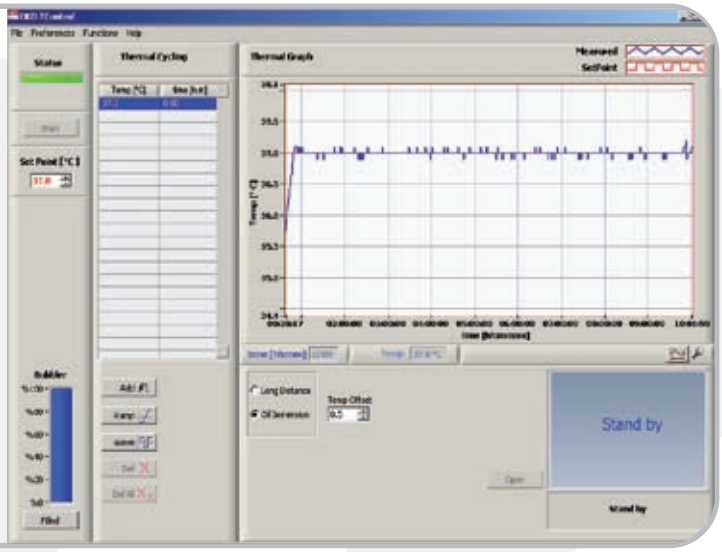
Software

The Temperature Control Software ensures a temperature stability of ± 0.1°C by periodically acquiring incubator temperature and giving feedback to the water bath to update water temperature. Data of temperature profile are stored in computer memory and displayed in a plot.

Thermal shock prevention: an intelligent software algorithm avoids thermal shock to the specimen when the CO_2 Microscope Stage Incubator is opened.

Oil immersion compensation: a software temperature offset compensates the heat sink caused by oil immersion objectives.

Thermal cycle module: this software module allows to perform thermal cycles, ramps, waves, etc. (Available for the Cryo model, only).



Humidity module

A **humidifying** and a pre-heating module prevent medium evaporation and avoid water condensation in the incubating chamber.

The gas stream is warmed up by flowing into a copper coil immersed into the water bath and then it is humidified by bubbling into a glass column filled with distilled water and immersed into the water bath.

To reach a nearly saturated atmosphere in the incubating chamber, without causing water condensation, the humid gas is equilibrated with the chamber by flowing into a tube embedded into the water jacket.

WATER JACKET CHAMBERS

H101-WJC

The Water Jacket Chamber is available in two models: Universal and Slim. They both require at least one plate adapter, chosen according to the type of cell culture support (Petri Dish, glass slide, multiwell plates, etc.). A one screw mechanism allows to change the plate adapters very easily, so that the same chamber can be conveniently used with different cell culture supports.

A variety of custom chambers is available (please, visit **www.oko-lab.com**).

UNIVERSAL

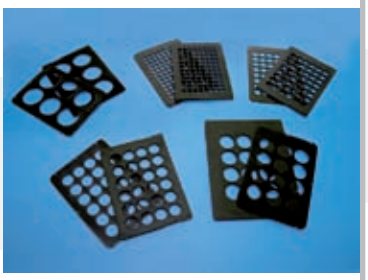
This chamber can accommodate any kind of cell culture support. It can be used both with Long Working Distance and oil-immersion objectives.

Typical applications: time-lapse observations of more than one field of view. To fully benefit from the multi accommodation design, this chamber should be mounted on a microscope equipped with motorized focus and motorized XY stage.

Perfusion: two holes on the chamber body allow the insertion of perfusion tubings.

It fits any 160x110mm sized stage (i.e. Ludl BioPrecison and BioPoint, Marzhauser SCAN IM 120x100, Prior H107 and H117) and all mechanical flat stages. It also fits into the Nikon TI-S-E motorised XY stage with stage insert TIPA.

A dedicated model is available for A.S.I. stages.



Interchangeable adapters allow to use any kind of multiwell plate (6-12-24-48-96), 35/60 mm Petri-dishes and chamber slides. This model is designed to increase reproducibility and versatility thus improving experimental efficiency.

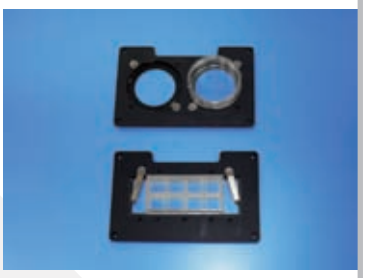
SLIM PROFILE

The slim model has been especially designed for high-magnification microscopy. Indeed, thanks to the slim profile, it can be used with high N.A. condensers (minimum working distance 24 mm), thus allowing to use the best optical condition necessary for 63x and 100x objectives. The use of glass-bottom metal dishes is recommended to minimize heat sink phenomena while using oil-immersion objectives.

Typical applications: time-lapse observations of a single field of view with high magnification.

Perfusion: Eight holes on the chamber body allow the insertion of perfusion tubings.

It fits any 160x110mm sized stage (i.e. Ludl BioPrecison and BioPoint, Marzhauser SCAN IM 120x100, Prior H107 and H117) and all mechanical flat stages. It also fits into the Nikon TI-S-E motorised XY stage with stage insert TIPA.



Interchangeable plate adapters allow to use two 35mm Petri-dishes or one chamber slide.

System Performace

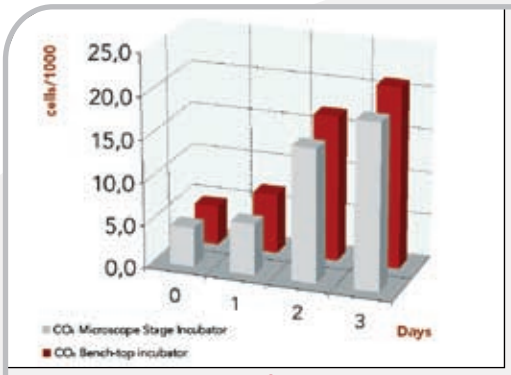


Figure 1. Cell proliferation vs. time.

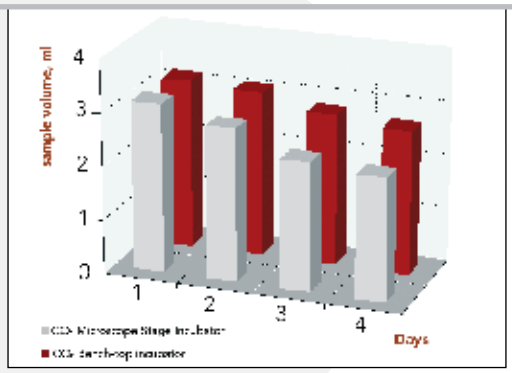


Figure 2. Medium evaporation vs. time.

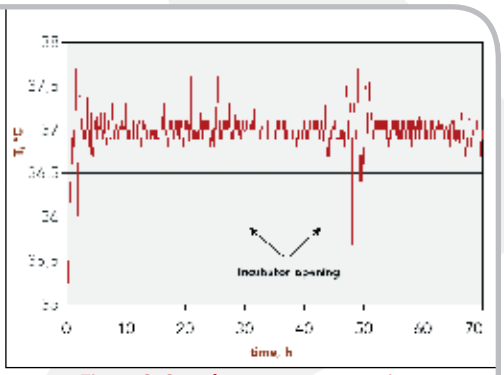


Figure 3. Sample temperature vs. time.

Data of cell proliferation in the CO_2 Microscope Stage Incubator and in a CO_2 bench-top incubator were compared for a period of three days. Cell line: Jurkat. As shown in figure 1, cells proliferate as well as in the CO_2 bench-top incubator.

As shown in figure 2, the combined action of the humidifying module and of the water reservoirs in the micro-environmental chamber allow to minimize medium evaporation. System design guarantees similar evaporation in all the wells. Low evaporation allows to perform long lasting experiments.

Figure 3 reports data of sample temperature as a function of time. Temperature stability and uniformity is guaranteed by water circulation in the lid and in the base of the incubating chamber. Temperature accuracy is obtained by controlling the temperature very close to the sample.

CO_2/O_2 CONTROLLERS

Okolab Microscope Incubators can be equipped with Manual or Digital CO_2 / O_2 controllers.

MANUAL CO_2 MIXER

It allows to generate CO_2 - Air mixtures with an adjustable CO_2 concentration in the range 0-15%. Air and CO_2 flows are regulated by two floating ball flow meters in the range 0.2 - 1.7 and 0.013 - 0.13 Nl/min, respectively.
A table allows to easily define the air and CO_2 flow values necessary to achieve the desired CO_2 concentration.

Also available integrated with the temperature controller in a single unit (as shown in the picture).

DIGITAL CO_2 CONTROLLER

It allows to generate a CO_2-Air mixture with an adjustable CO_2 concentration in the range 0-20%, with an accuracy of ± 5% of CO_2 concentration. For instance, if CO_2 set point is 5%, accuracy is ± 0.25%.
The air flow is regulated by a floating ball air flow meter in the range 0.2-0.8 Nl/min.

Sensing Technology
A CO_2 infrared sensor continuously measures CO_2 concentration in the mixed gas stream and a PID closed loop controller gives feedback to a fine valve regulating CO_2 flow. The measured value of CO_2 concentration is displayed in real time.

Data Storage
The serial RS-232 interface and the CO_2 Control Software allow the user to control the unit with a personal computer and to acquire and store concentration data in computer memory.

MANUAL CO_2 AND O_2 CONTROLLER

3 Gas Manual Mixer. It mixes three gas streams, for instance N2/CO_2/O_2, by means of floating ball flowmeters. The first gas can be regulated in the range 70 -100%, the second and third gas can be regulated in the range 0-15%. Also available integrated with the temperature controller in a single unit (as shown in the picture).

DIGITAL O_2 CONTROLLER

The DGTO2BX is a O_2 controller capable of measuring O_2 concentration in the range 0-25% with a resolution of 0.1%. It controls O_2 concetration by mixing Air with Nitrogen, O_2 oxygen. Air flow is set to 0.1 liter per minute by means of a floating ball flowmeter. Nitrogen consumption at 5% of Oxygen is 0.32 liter per minute. Therefore, a 200 liters Nitrogen tank will last approximately 3 months. Repeatability 0.05% of oxygen level.

Sensing Technology
Long life zirconium oxide sensor lasting up to 10 years if used continuosly and considerably longer if used intermittently.

Data Storage
The serial RS-232 interface and the O_2 Control Software allow the user to control the unit with a personal computer and to acquire and store concentration data in computer memory.

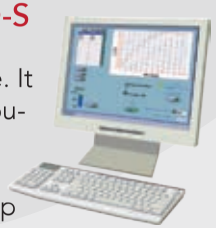
TEMPERATURE CONTROLLER

HEATING/COOLING ----HEATING----



H101-BASIC
Heating unit. From 3°C above ambient to 50°C. It comprises: water bath, temperature sensor, temperature meter, temperature control software.





H101-CRYO-S
Temperature cycles software. It provides computer control of temperature cycles and ramp rates.

H101-CRYO
Heating / Cooling unit. From 0° to 50 °C. It comprises: cryostatic water bath, temperature sensor, temperature meter, cryo-control temperature software.

CO2 CONTROLLER

2GF-MIXER
2 Gas Manual Mixer. It mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85 - 100%, the other one in the range 0 -15%.

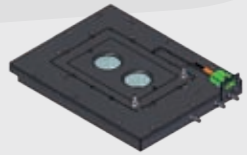
DGT-CO2BX
Digital CO_2 Controller. CO_2 can be regulated in the range 0-20%. Accuracy at 5% CO_2 is 0.25%.

DGT-CO2BX-PLUS
Same as + RS232.

DGT-CO2BX-PLUS-S
CO_2 control software.

WATER JACKET CHAMBERS

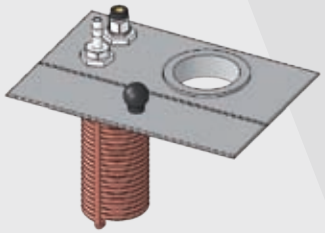
H101-WJC
Universal water jacket chamber. Fits on any Prior, Ludl, Marzhauser, Nikon motorized stages. It requires at least one plate adapter.



H101-WJC-SLIM
Slim water jacket chamber. Fits on any Prior, Ludl, Marzhauser, Nikon motorized stages.
Suitable for high N.A. condensers. It requires at least one plate adapter.

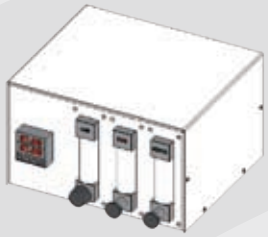
H101-WJC-ASI
Water jacket chamber for A.S.I. XY stage. It requires at least one plate adapter.

HUMIDITY MODULE

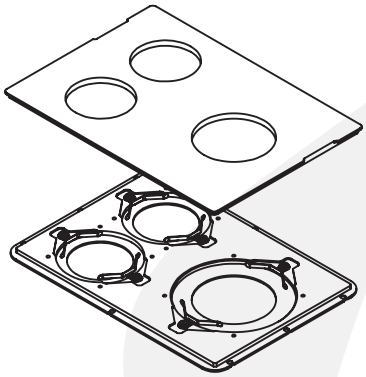



H101-HM
Humidity module. It comprises: gas preheating system and bubbling column.

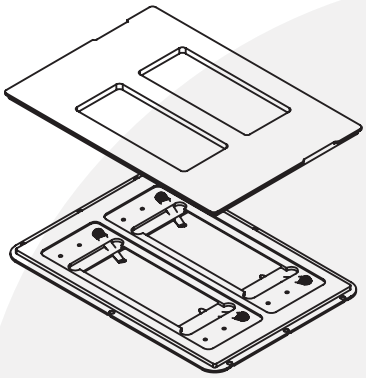
H101-BASIC (or CRYO) + 2GF-MIXER
Combines H101-BASIC (or CRYO) and 2GF-MIXER in one Unit.



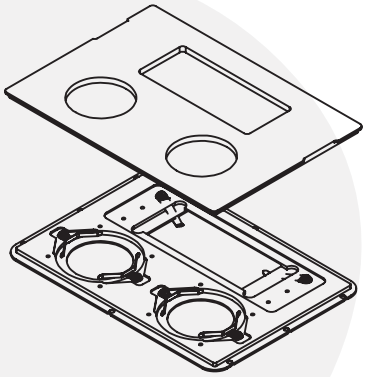
H101-BASIC (or CRYO) + 3GF-MIXER
Combines H101-BASIC (or CRYO) and 3GF-MIXER in one Unit.



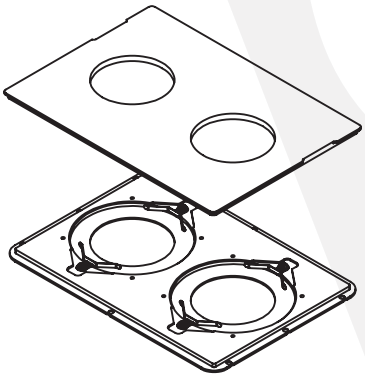
H101-WJC-6035PA
Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish.



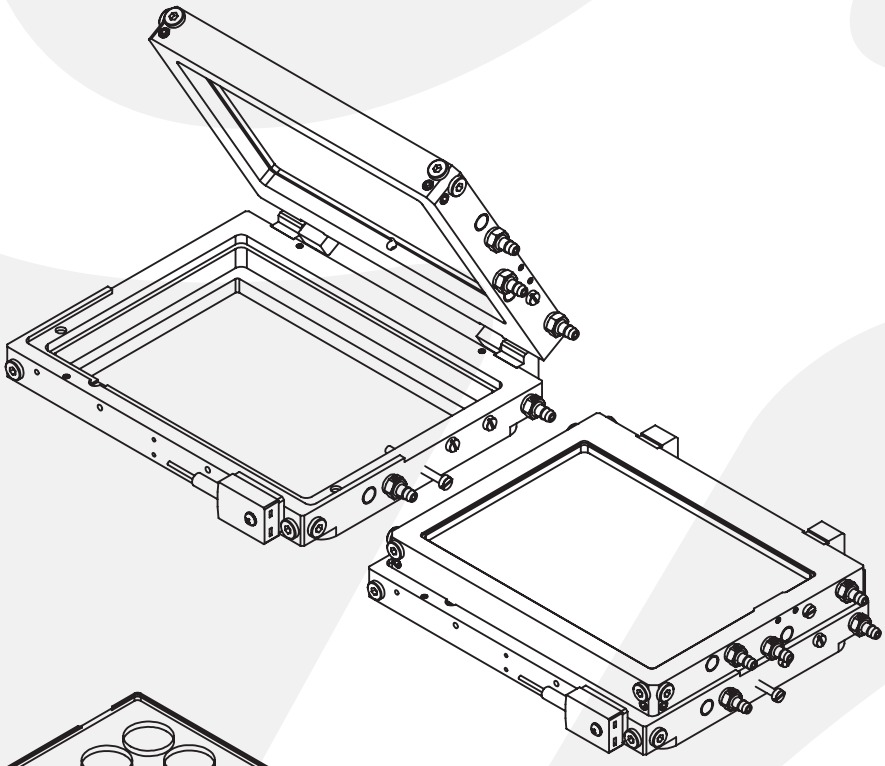
H101-WJC-GSPA
Plate adapters for #2 chamber slides.



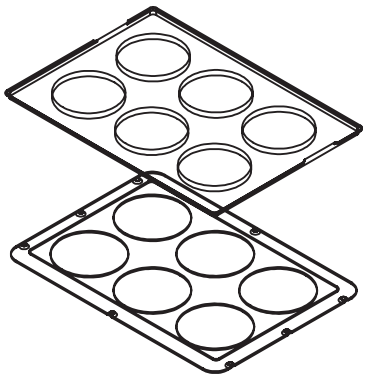
H101-WJC-GS35PA
Plate adapters for #2 35mm Petri-dish and #1 chamber slide.



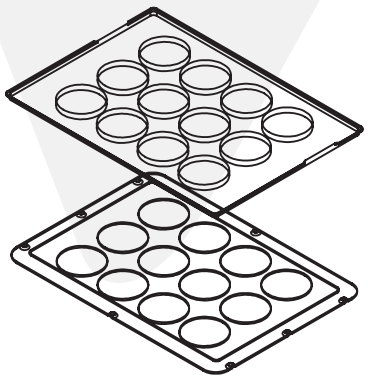
H101-WJC-60PA
Plate adapters for #2 60mm Petri-dish.



H101-WJC
Universal water jacket chamber. Fits on Prior, Ludl, Marzhauser XY Stages. It also fits Nikon motorized stage with adapter TIPA. It requires at least one plate adapter.



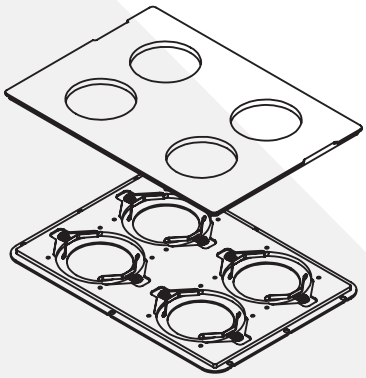
H101-WJC-6MWPA
Plate adapters for 6-well plates.



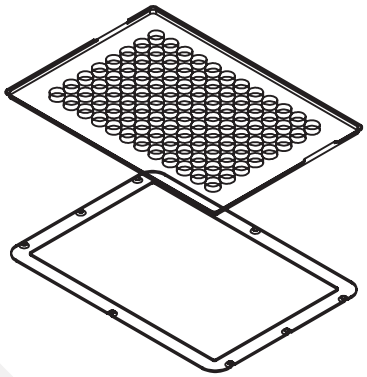
H101-WJC-12MWPA
Plate adapters for 12-well plates.

UNIVERSAL - WATER JACKET H101-WJC

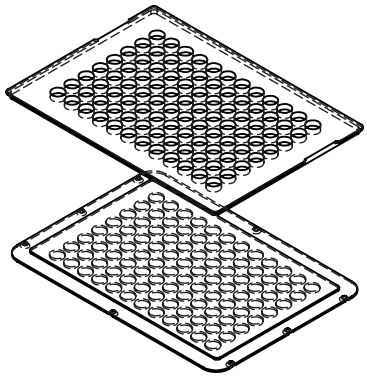
Dimensions are in mm.



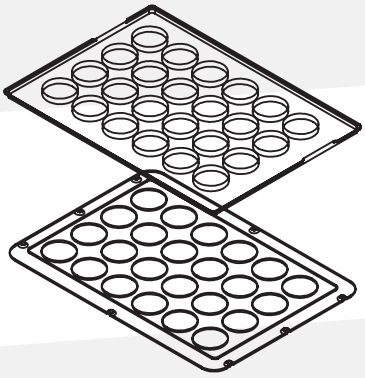
H101-WJC-35PA
Plate adapters for #4 35mm Petri-dish.



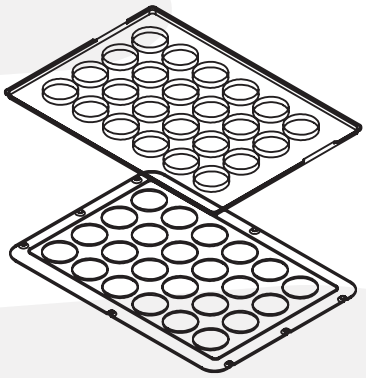
H101-WJC-96MWPA-OIL
Plate adapters for 96-well plates for oil immersion objectives.



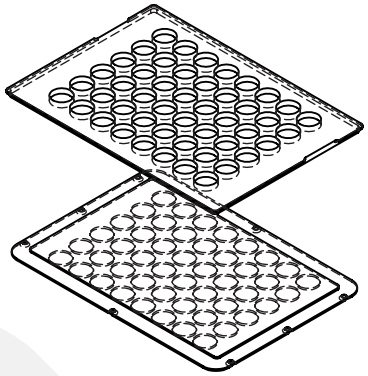
H101-WJC-96MWPA
Plate adapters for 96-well plates.



H101-WJC-24MWPA
Plate adapters for 24-well plates.

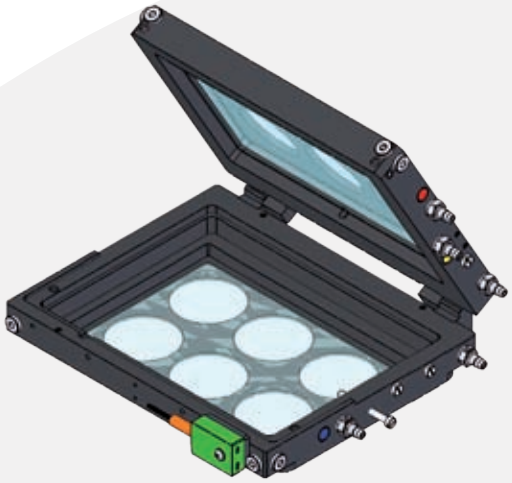


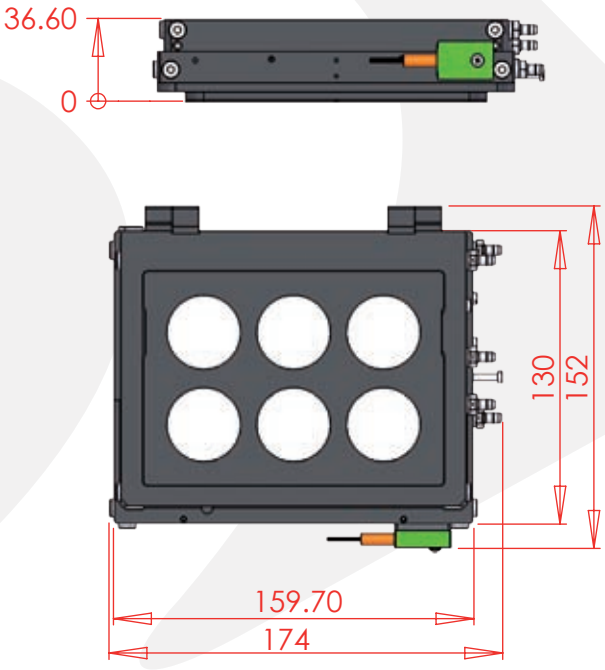
H101-WJC-24MWPA-NUNC
Plate adapters for 24-well Nunc plates.

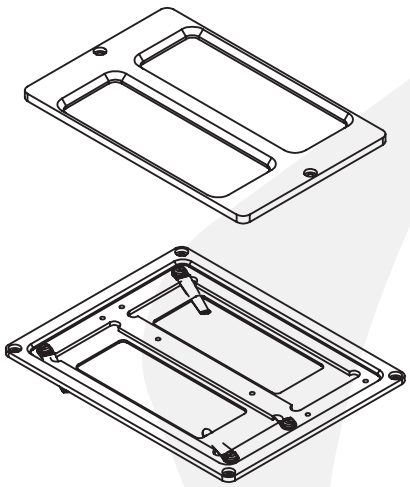


H101-WJC-48MWPA
Plate adapters for 48-well plates.

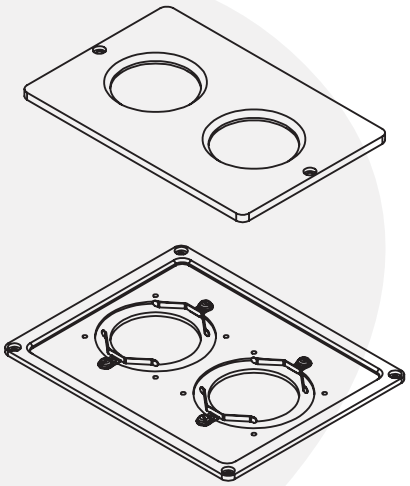
H101-WJC with H101-WJC-6MWPA





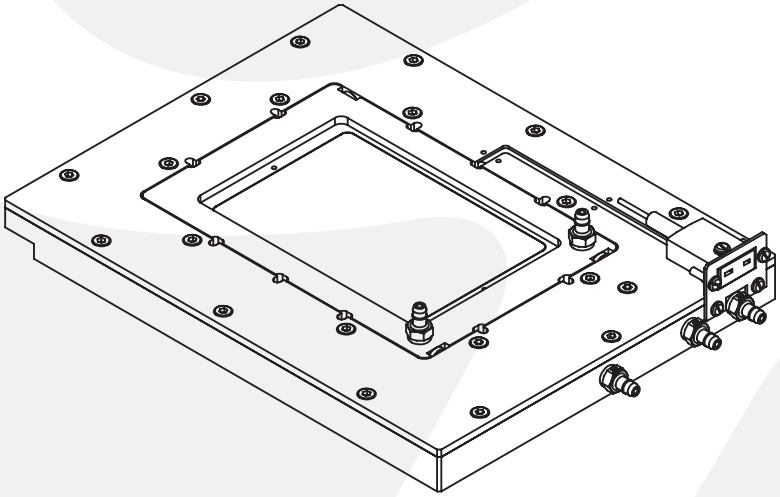


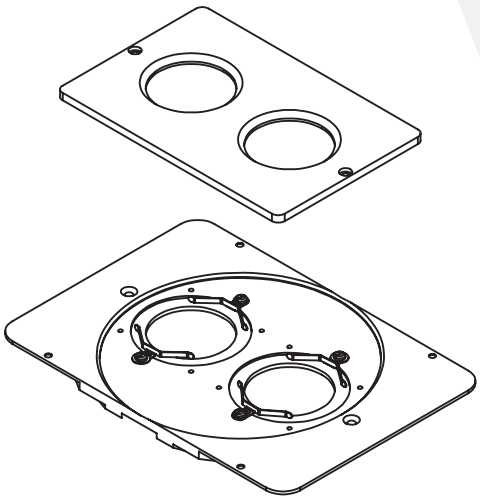
H101-WJC-SLIM-GSPA
Plate adapter for #2 chamber slide.



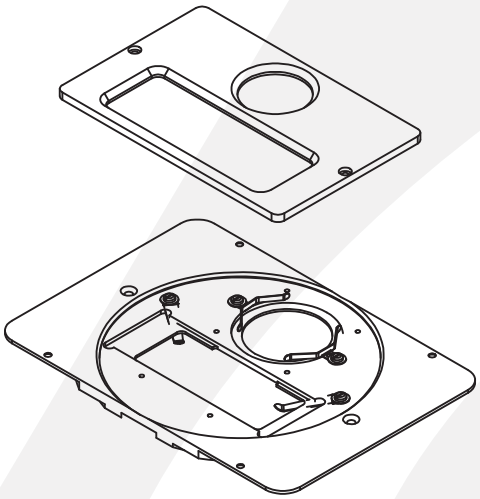
H101-WJC-SLIM-35PA
Plate adapter for #2 35mm Petri-dish.

H101-WJC-SLIM
Slim water jacket chamber. Fits on any flat mechanical XY stage and on any Prior, Ludl, Marzhauser motorized XY Stages. It also fits Nikon motorized stage with adapter TIPA. Suitable for high N.A. condensers. It requires at least one plate adapter.





H101-WJC-SLIM-35PA-FST
Plate adapter for #2 35mm Petri-dish for flat stages with circular insert.

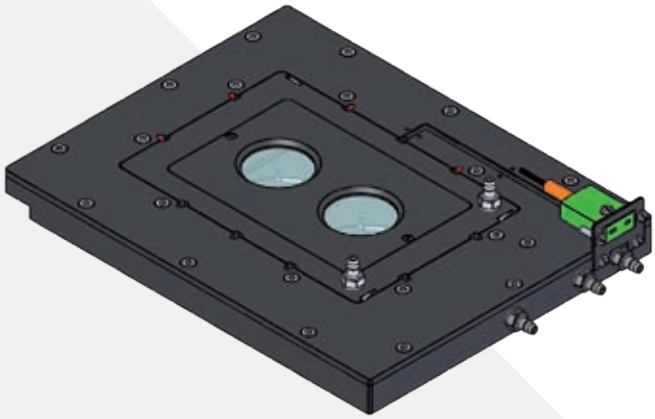


H101-WJC-SLIM-GS35PA-FST
Plate adapter for #1 chamber slide and #1 35mm Petri-dish for flat stages with circular insert.

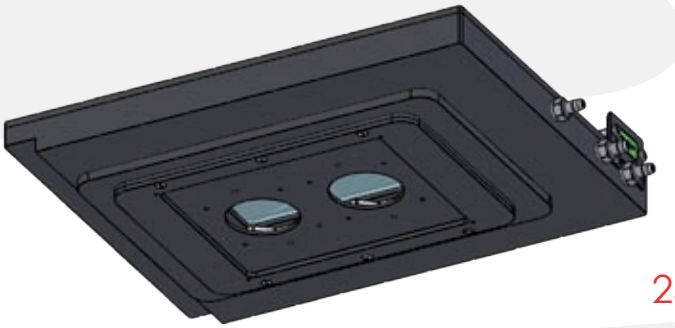
SLIM - WATER JACKET

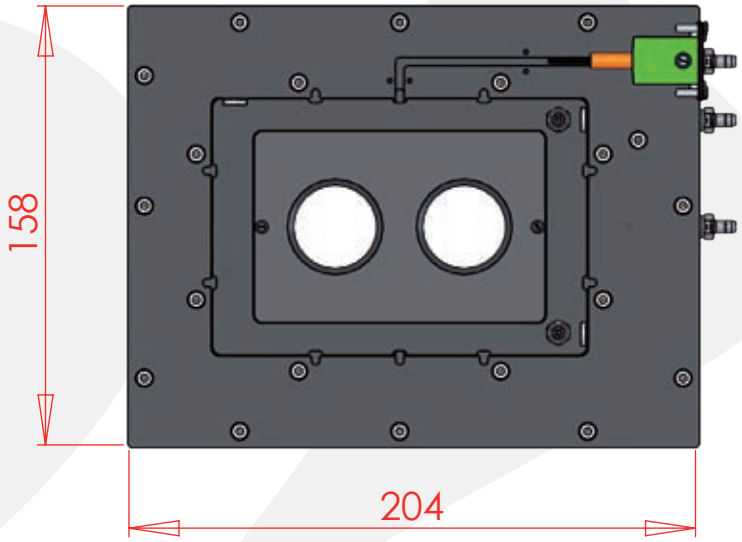
H101-WJC-SLIM

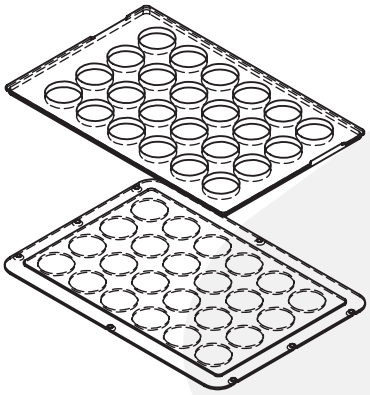
Dimensions are in mm.



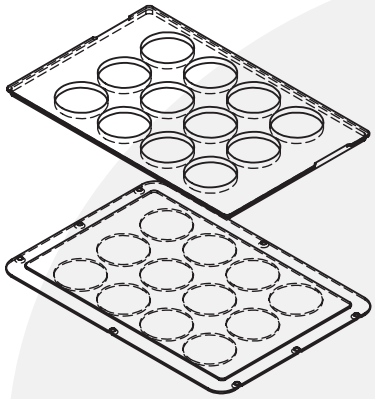
H101-WJC-SLIM with H101-WJC-SLIM-35PA



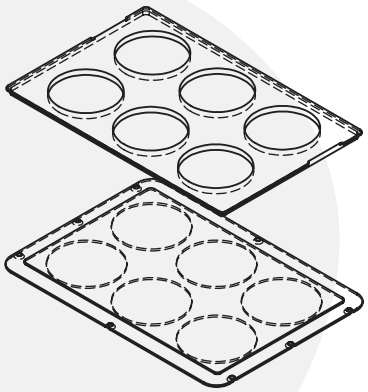




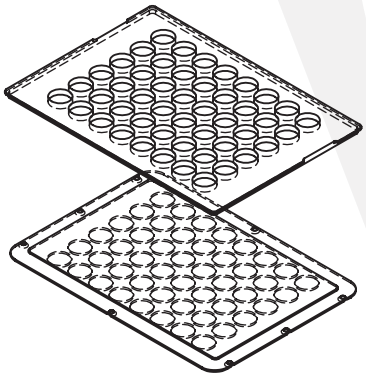
H101-WJC-ASI-24MWPA
Plate adapters for 24-well plates.



H101-WJC-ASI-12MWPA
Plate adapters for 12-well plates.

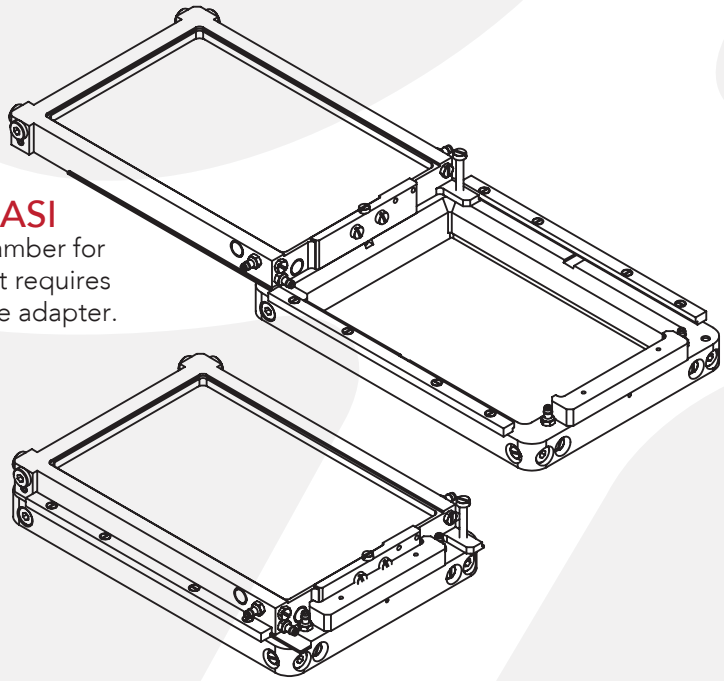


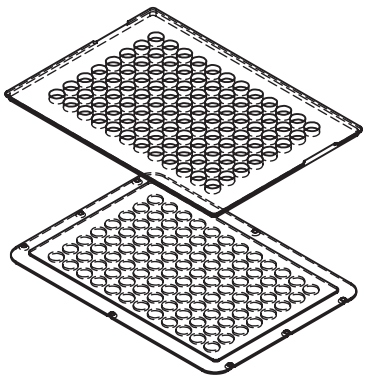
H101-WJC-ASI-6MWPA
Plate adapters for 6-well plates.



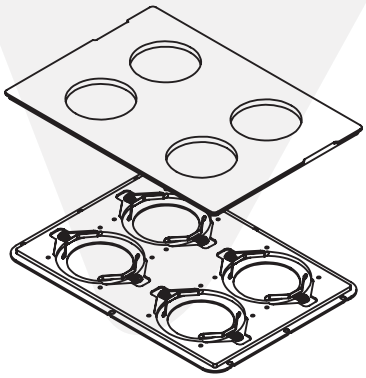
H101-WJC-ASI-48MWPA
Plate adapters for 48-well plates.

H101-WJC-ASI
Water jacket chamber for A.S.I. XY stage. It requires at least one plate adapter.

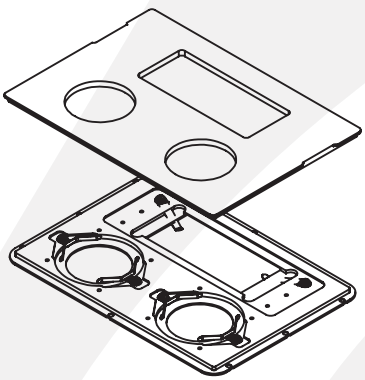




H101-WJC-ASI-96MWPA
Plate adapters for 96-well plates.



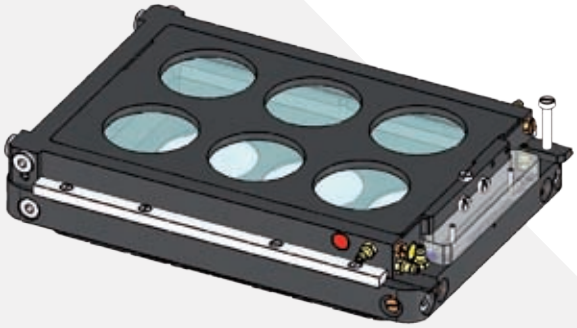
H101-WJC-ASI-4PD35-MWPA
Plate adapters for #4 35mm Petri-dish.

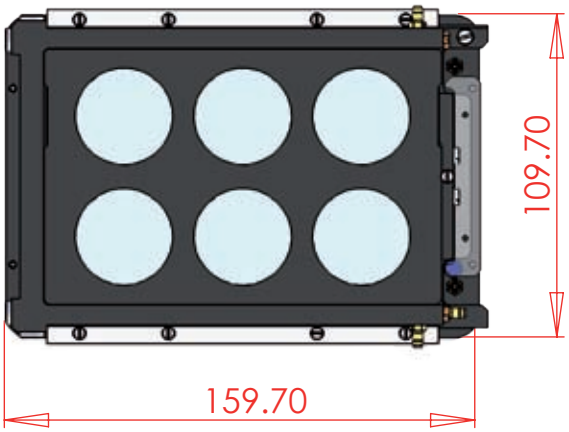


H101-WJC-ASI-2PD35-1GS-MWPA
Plate adapters for #2 35mm Petri-dish and #1 chamber slide.

WATER JACKET for A.S.I. H101-WJC-ASI

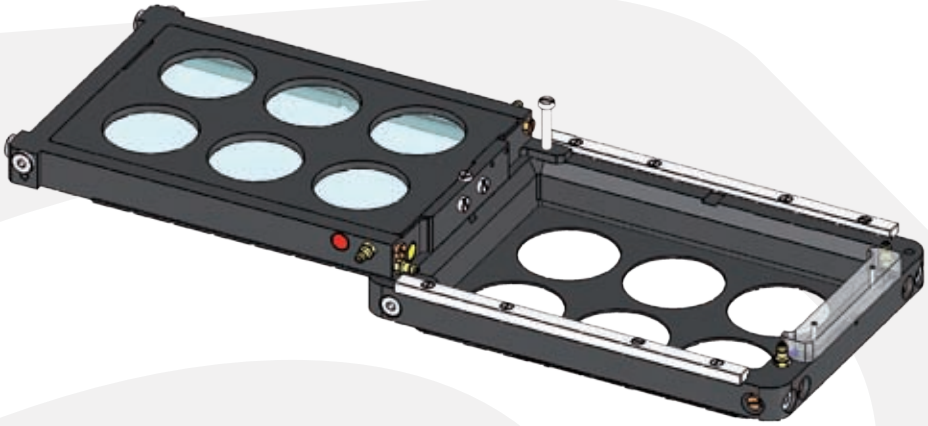
Dimensions are in mm.

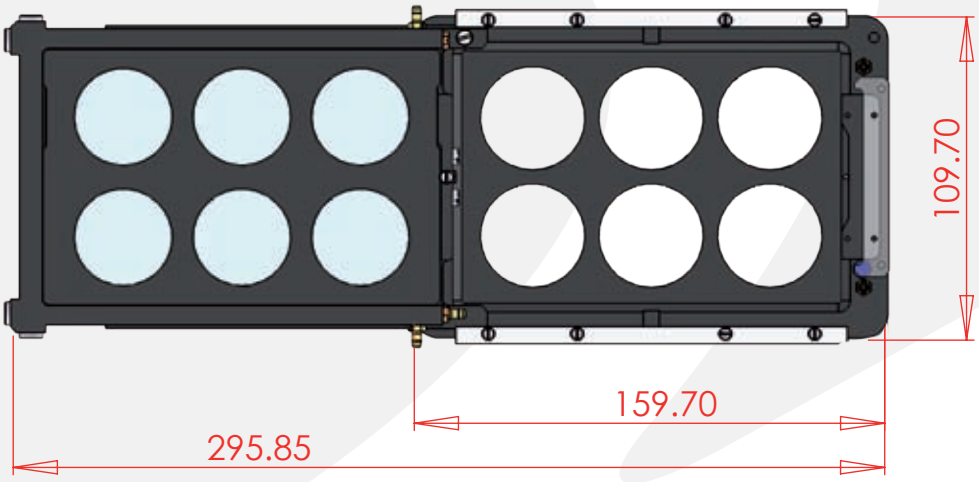




H101-WJC-ASI

Water jacket chamber for ASI XY stage.
It requires at least one plate adapter.

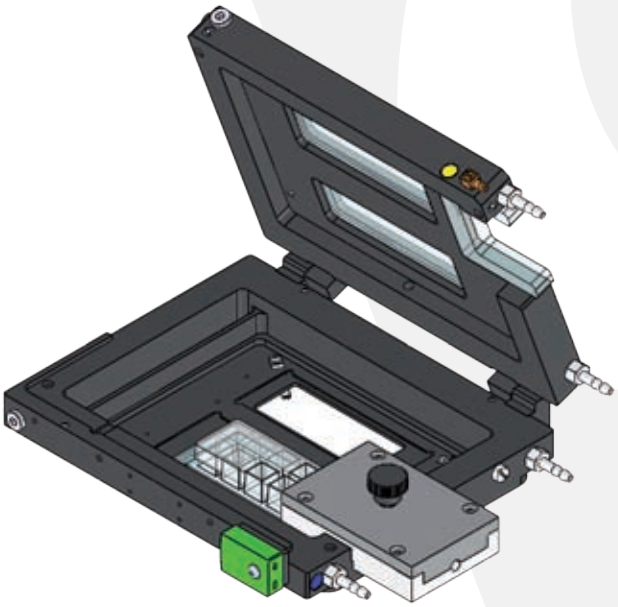


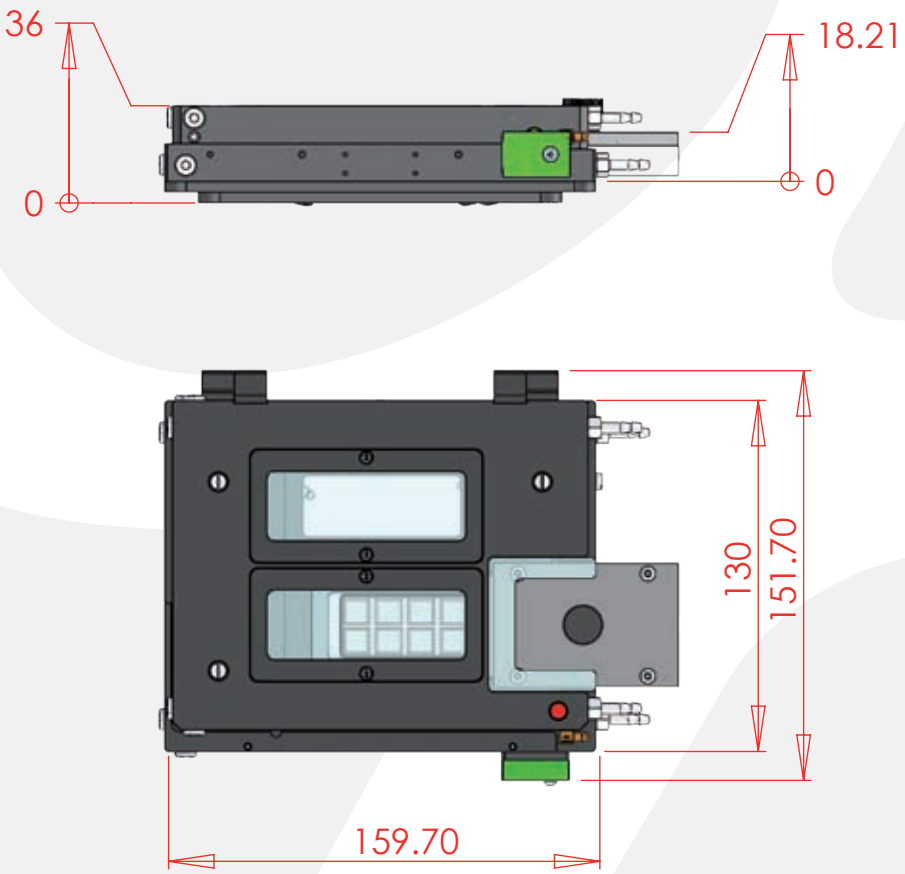


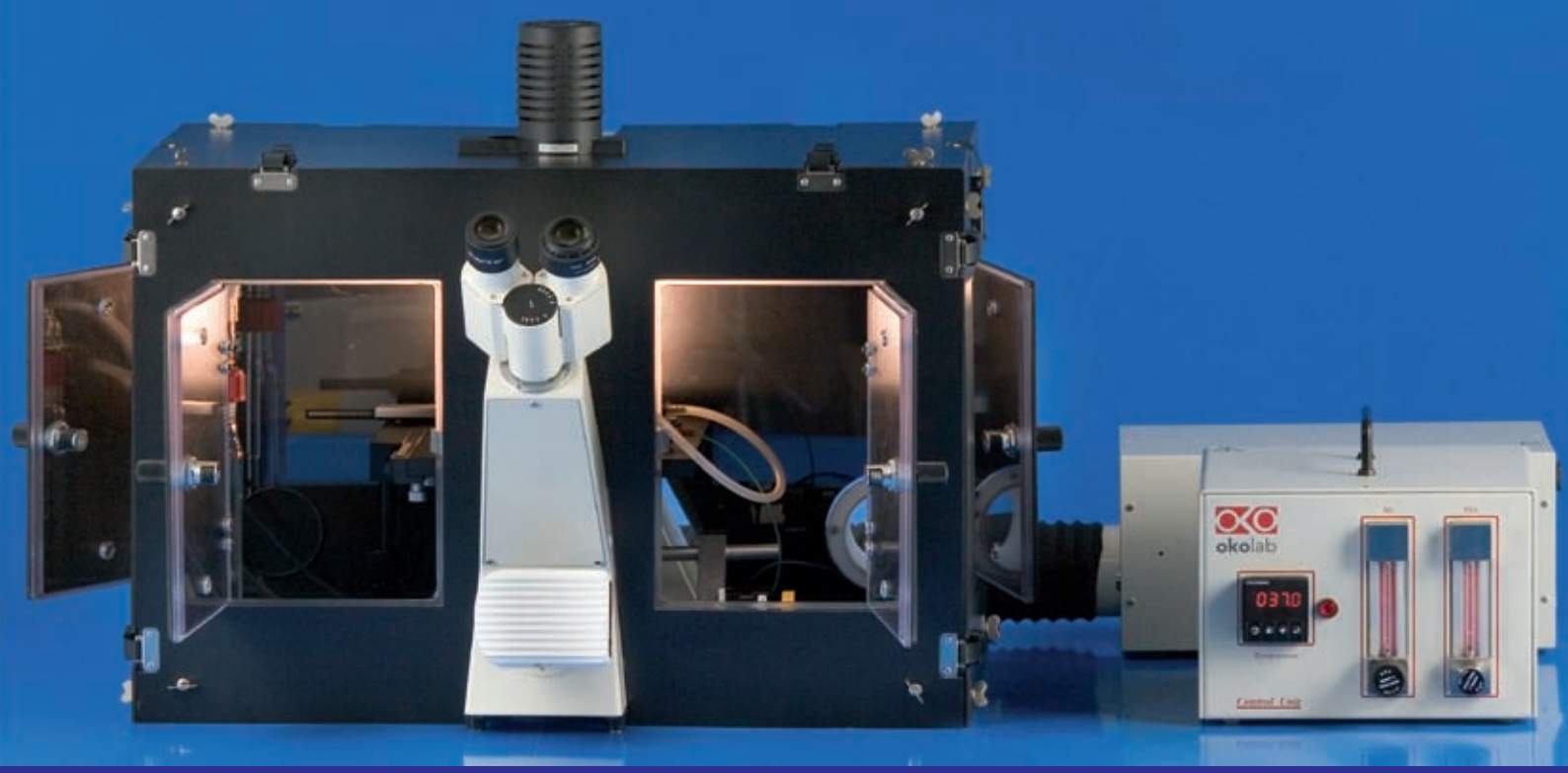
Dimensions are in mm.

H101-WJC-AB

Water jacket chamber for Applied Biophisics ECIS Culturewares. Fits on Prior, Ludl, Marzhauser XY Stages.







CO_2 Microscope Cage Incubator

Controlled environment all around your microscope

CO_2 Microscope Cage Incubator - Technical specifications	
Temperature range	From 3°C above ambient temperature to 50°C
Temperature control accuracy	±0.1°C
Heating Technology	Warm air
Type of temperature controller	Hardware
Temperature feedback	Specimen temperature feedback
Humidification module	Heated
CO_2 range (Manual or digital)	0 to 20%

The CO_2 Microscope Cage Incubator is designed to maintain all the required environmental conditions for cell culture all around your microscopy workstation, thus enabling to carry out prolonged observations on biological specimens and allowing at the same time enough space for other equipment.

Temperature is controlled by blowing warm air into the cage. A small thermocouple is inserted into a reference well to control the temperature as close as possible to the sample, ensuring a specimen temperature stability of ± 0.1°C.

A humidifying and a pre-heating module prevent medium evaporation and avoids water condensation on glass and plastic surfaces.

Obscuring panels can be added to the microscope enclosure to create a dark environment for fluorescence applications.

Compatible with manual and digital CO_2 / O_2 controllers from OKO-Gas Controllers series.

A wide choice of interchangeable inserts adds flexibility to the equipment and allows to accept any cell culture support (petri-dishes, glass slides, mutiwell plates, etc.)

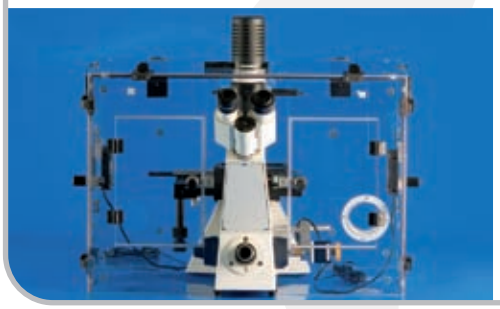
STABLE TEMPERATURE ALL AROUND

UPRIGHT AND INVERTED MICROSCOPES

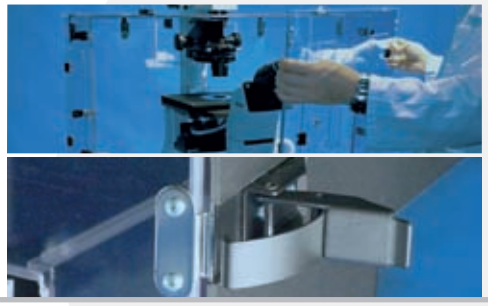
MADE OF REMOVABLE PANELS

Microscope enclosure

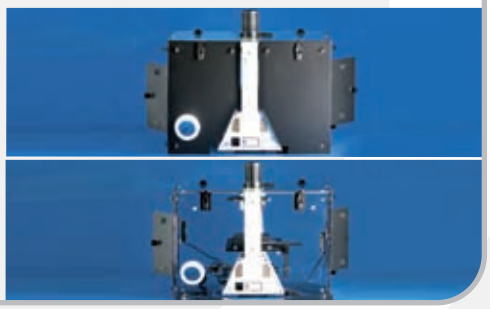
Full accessibility
Several windows on the front and side panels allow full and easy access to the microscope.
Additional windows can be realized upon request.



Easy "turn to open" assembly
Turn to open hinges allow instant removal both of the front and of the upper panel. Once the panels have been removed, the rest of the cage incubator can be easily moved backwards. When needed, the cage incubator can be reassembled and placed again around the microscope in a few minutes.

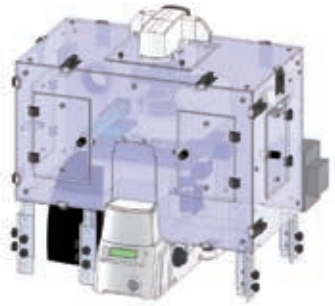


Obscuring panels for Fluorescence experiments
Obscuring panels can be assembled with the cage incubator by means of turn to open hinges.
They will create a dark environment for your fluorescence microscopy experiments.



Models for any inverted and upright microscope available.

Custom enclosure design



Our engineering team is ready to design custom microscope enclosures for the most demanding applications.

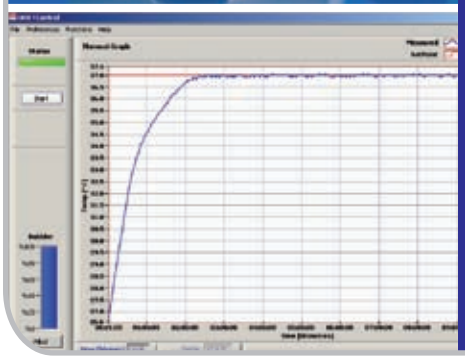
Humidity Module

A bubbling column placed into the cage incubator is used to humidify the air and CO_2 stream before entering into the micro-environmental chamber.

Some models of micro-environmental chambers have special water reservoirs to further prevent culture medium evaporation.

Temperature control module

Single air blower



Software screen

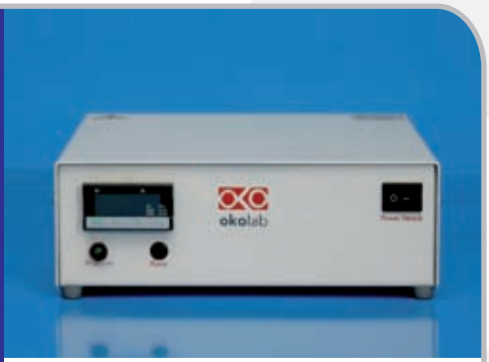
Temperature accuracy ± 0.1°C: Temperature is controlled inside a reference well, by controlling the power of the warm air blower. According to ambient temperature a single or double air blower is suggested.

Temperature uniformity: Guaranteed by the action of two vents placed into the microscope enclosure.

Temperature stability: The CO_2 Microscope Cage Incubator creates a stable temperature all around the microscope, thus reducing temperature-induced focus drift.

Read Temperature Software: It allows storage of the temperature profile during the experiment. Temperature graph can be visualized in real time, memorizing temperature fluctuation and the set point. Data can be reloaded off line, or exported to file. An useful reminder helps to predict the water consumption in the bubbler.
The software allows real time temperature monitoring through UDP transfer protocol, for third party software synchronization.

PID Temperature controller



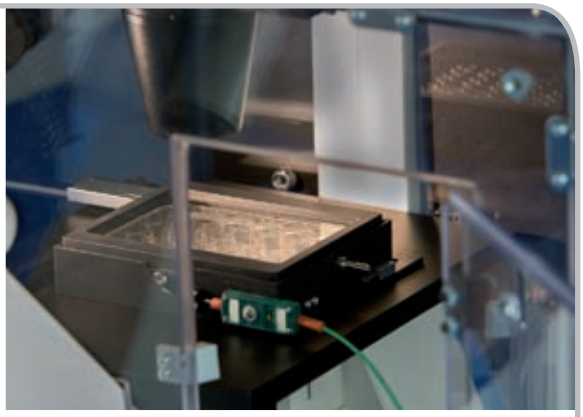
Temperature sensor

MICRO ENVIROMENTAL CHAMBERS

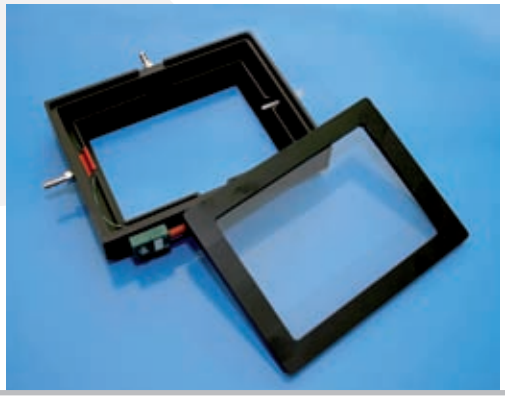
The micro environmental chamber fits into the microscope stage and hosts the sample. The pre-mixed and pre-humidified stream of air and CO2 is continuously fed into the chamber. It can be used both with Long Working Distance and oil-immersion objectives.

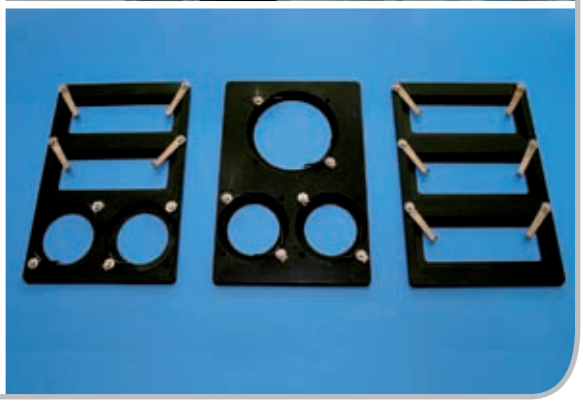
A one screw mechanism allows to change the plate adapters very easily, so that the same chamber can be conveniently used with different cell culture supports.

It fits any 160x110mm sized stage (i.e. Ludl BioPrecison and BioPoint, Marzhauser SCAN IM 120x100, Prior H107 and H117) and all mechanical flat stages. It also fits into the Nikon TI-S-E motorised XY stage with stage insert TIPA. Model fitting piezo stages are also available (please, visit **www.oko-lab.com**).

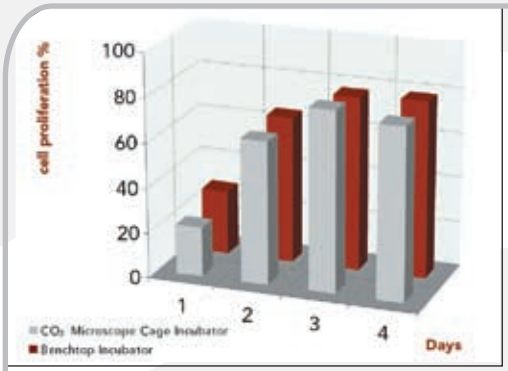


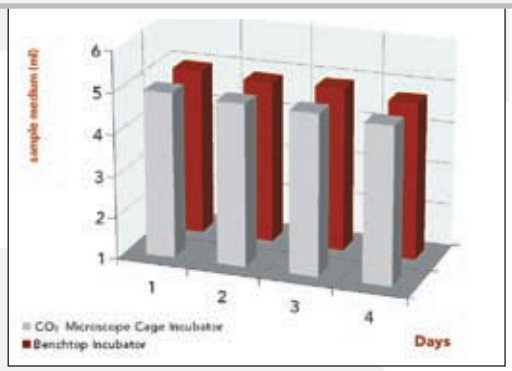
This chamber model accepts any kind of multiwell plate (6-12-24-48-96) and can be equipped with plate adapters to accept 35mm Petri-dishes, chamber slides and 60 mm Petri-dishes.





System Performace





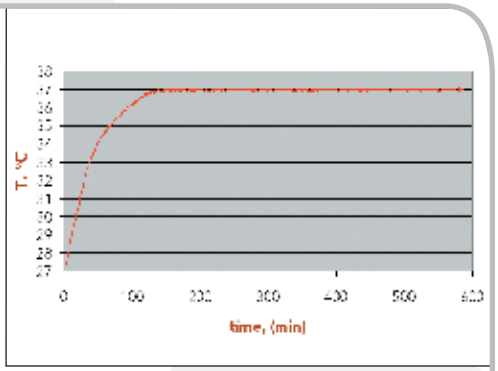


Figure 1. Cell proliferation vs. time.

Figure 2. Medium evaporation vs. time.

Figure 3. Sample temperature vs. time.

Data of cell proliferation in the CO_2 Microscope Cage Incubator and in a CO_2 bench-top incubator were compared for a period of four days. Cell line: Jurkat. As shown in figure 1 , cells proliferate as well as in the CO_2 bench-top incubator.

As shown in figure 2, the combined action of the humidifying module and of the water reservoirs in the micro-environmental chamber allows to minimize medium evaporation. System design guarantees similar evaporation in all the wells. Low evaporation allows to perform long lasting experiments.

Figure 3 reports data of sample temeprature duiting as a function of time. Temperature stability and uniformity is guaranteed by forced ventilation into the cage incubator. Temperature accuracy is obtained by controlling the temperature very close to the sample. Initial warm up requires ca. 2 hours.

CO_2/O_2 CONTROLLERS

Okolab Microscope Incubators can be equipped with Manual or Digital CO_2 / O_2 controllers.

MANUAL CO_2 MIXER

It allows to generate CO_2 - Air mixtures with an adjustable CO_2 concentration in the range 0-15%. Air and CO_2 flows are regulated by two floating ball flow meters in the range 0.2 - 1.7 and 0.013 - 0.13 Nl/min, respectively.
A table allows to easily define the air and CO_2 flow values necessary to achieve the desired CO_2 concentration.

Also available integrated with the temperature controller in a single unit (as shown in the picture).

DIGITAL CO_2 CONTROLLER

It allows to generate a CO_2-Air mixture with an adjustable CO_2 concentration in the range 0-20%, with an accuracy of ± 5% of CO_2 concentration. For instance, if CO_2 set point is 5%, accuracy is ± 0.25%.
The air flow is regulated by a floating ball air flow meter in the range 0.2-0.8 Nl/min.

Sensing Technology
A CO_2 infrared sensor continuously measures CO_2 concentration in the mixed gas stream and a PID closed loop controller gives feedback to a fine valve regulating CO_2 flow. The measured value of CO_2 concentration is displayed in real time.

Data Storage
The serial RS-232 interface and the CO_2 Control Software allow the user to control the unit with a personal computer and to acquire and store concentration data in computer memory.

MANUAL CO_2 AND O_2 CONTROLLER

3 Gas Manual Mixer. It mixes three gas streams, for instance $N_2/CO_2/O_2$, by means of floating ball flowmeters. The first gas can be regulated in the range 70 -100%, the second and third gas can be regulated in the range 0-15%. Also available integrated with the temperature controller in a single unit (as shown in the picture).

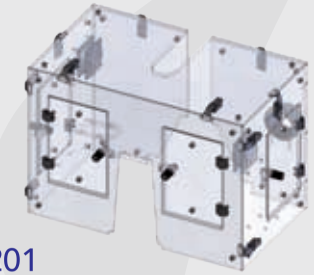
DIGITAL O_2 CONTROLLER

The DGTO2BX is a O_2 controller capable of measuring O_2 concentration in the range 0-25% with a resolution of 0.1%. It controls O_2 concetration by mixing Air with Nitrogen, O_2 oxygen. Air flow is set to 0.1 liter per minute by means of a floating ball flowmeter. Nitrogen consumption at 5% of Oxygen is 0.32 liter per minute. Therefore, a 200 liters Nitrogen tank will last approximately 3 months. Repeatability 0.05% of oxygen level.

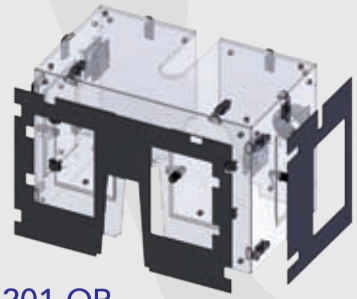
Sensing Technology
Long life zirconium oxide sensor lasting up to 10 years if used continuosly and considerably longer if used intermittently.

Data Storage
The serial RS-232 interface and the O_2 Control Software allow the user to control the unit with a personal computer and to acquire and store concentration data in computer memory.

MICROSCOPE ENCLOSURE



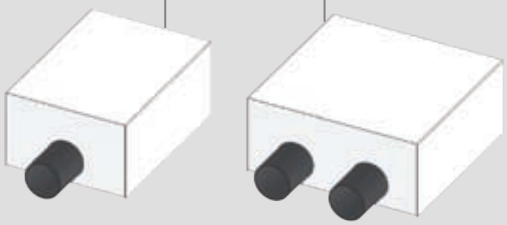
H201
Microscope lexan enclosure.



H201-OP
Obscuring panels. They can be added to the lexan enclosure to create a dark environment.

TEMPERATURE CONTROLLER

H201-T.
Temperature contol unit.



H201-T1
Single air heater.
For lab T >21°C

H201-T2
Double air heater.
For lab T <21°C

H201-TS
Read Temperature Software. It allows storage of the temperature profile during the experiment

CO2 CONTROLLER

2GF-MIXER
2 Gas Manual Mixer. It mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85-100%, the other one in the range 0-15%.

DGT-CO2BX
Digital CO2 Controller. CO2 can be regulated in the range 0-20%. Accuracy at 5% CO2 is 0.25%

DGT-CO2BX-PLUS
Same as + RS232.

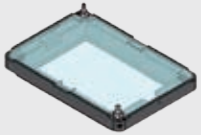
DGT-CO2BX-PLUS-S
CO_2 control software.

MICRO ENVIRONMENTAL CHAMBERS

H201-MEC
Universal MEC. It accomodates 6-12-24-48-96 multiwell plates. For other dishes and plates, add the corresponding plate adapter.

H201-MEC-PZ100
MEC for Prior PZ100 nanoscan z-stage.

H201-MEC-MAN
MEC for manual xy stage.

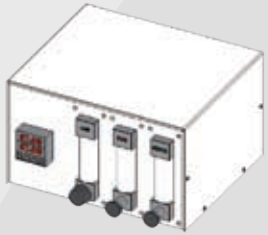


H201-MEC-ASI
MEC for ASI stage.

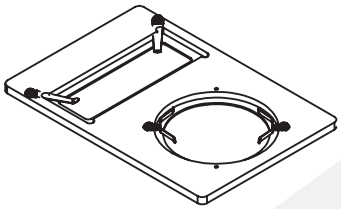
HUMIDITY MODULE

H201-BC
Bubbling column.
It humidifies the gas stream before the inlet into the micro environmental chamber.

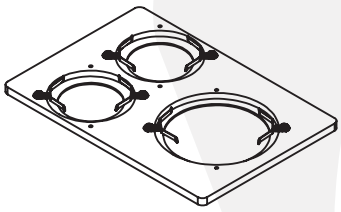
H201-T.+2GF-MIXER
Integrated Temperature control unit and manual 2 gas mixer. Available with single or double air heater.



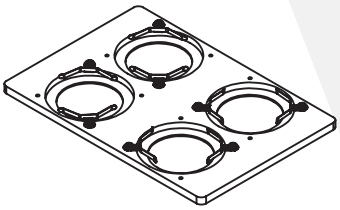
H201-T.-3GF-MIXER
Integrated Temperature control unit and 3 gas mixer. Available with single or double air hater.



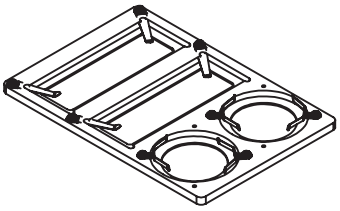
H201-MEC-GS60PA
Plate adapter for #1 chamber slide and #1 60mm Petri-dish.



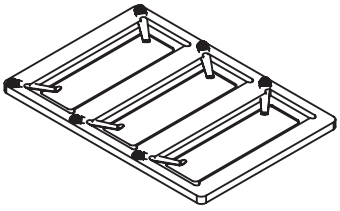
H201-MEC-6035PA
Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish.



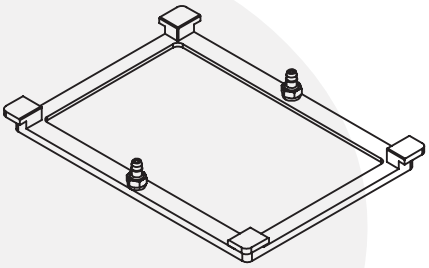
H201-MEC-35PA
Plate adapter for #4 35mm Petri-dish.



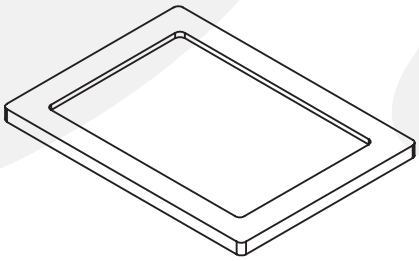
H201-MEC-GS35PA
Plate adapter for #2 chamber slides and #2 35mm Petri-dish.



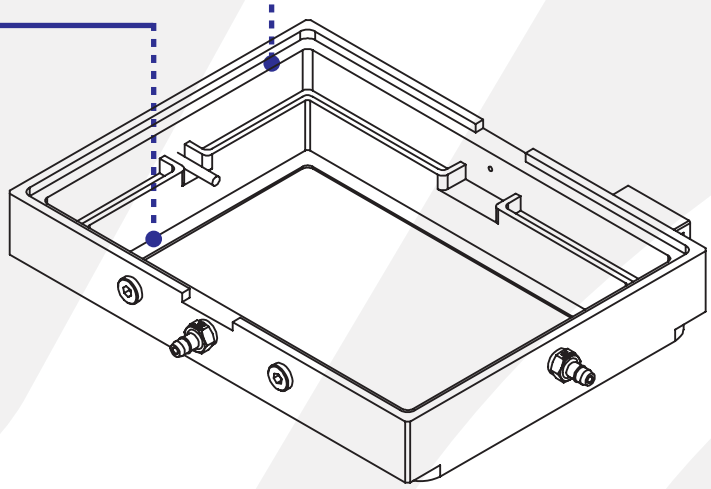
H201-MEC-3GSPA
Plate adapter for #3 chamber slides.



H201-MEC-LID2
Deep set Micro-Environmental H201-MEC Chamber's Lid for High numerical aperture condenser.



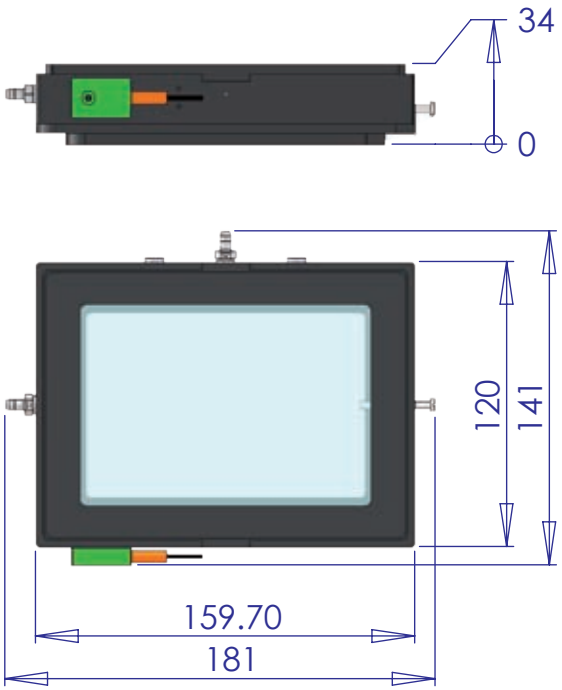
H201-MEC-LID
Lid of the Micro Environmental Chamber H201-MEC. Standard Version.

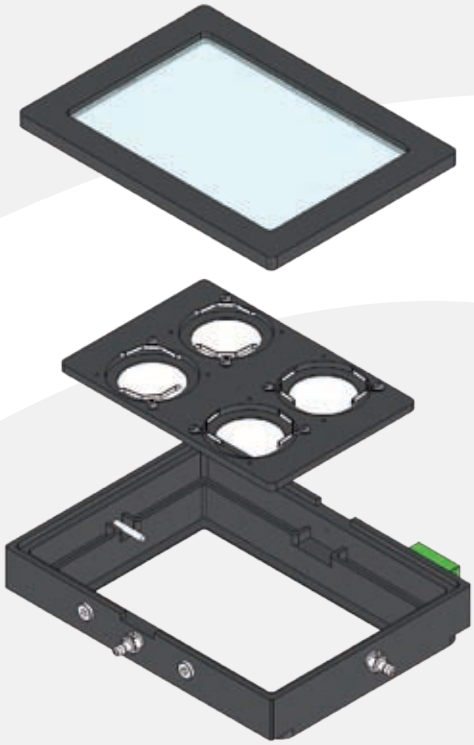


H201-MEC
Universal Micro environmental chamber. Fits on Prior, Ludl, Marzhauser XY Stages. It also fits Nikon motorized stage with adapter TIPA. It accomodates 6-12-24-48-96 multiwell plates. For other dishes and plates, add the corresponding plate adapter.

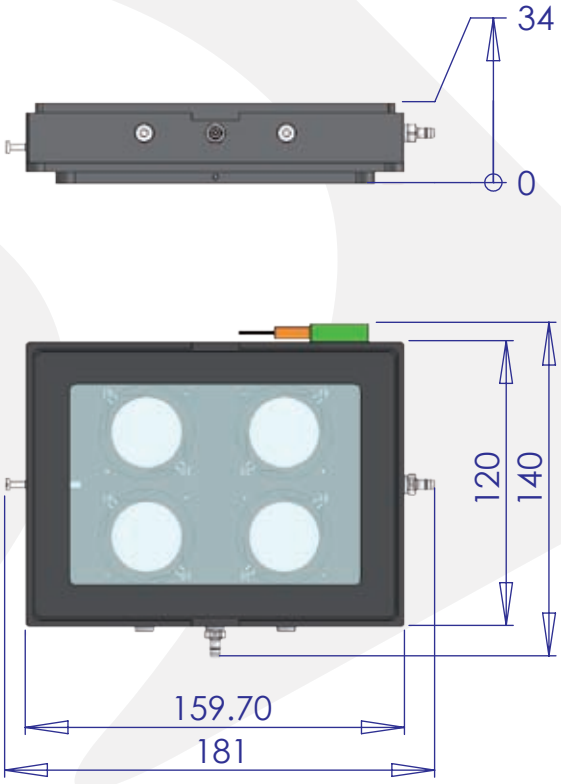
Dimensions are in mm.

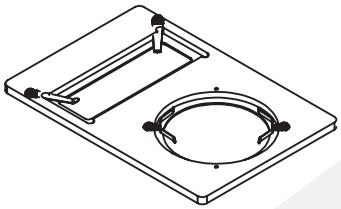
H201-MEC without Plate Adapter



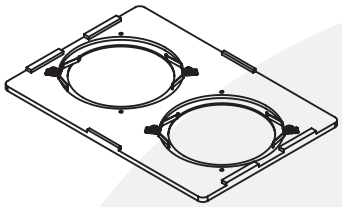


H201-MEC with H201-MEC-35PA

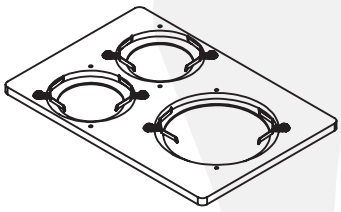




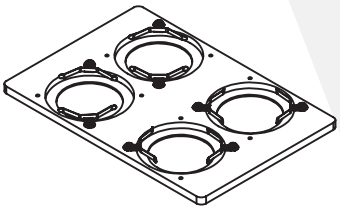
H201-MEC-GS60PA
Plate adapter for #1 chamber slide and #1 60mm Petri-dish.



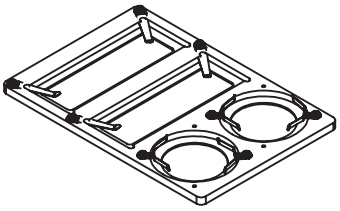
H201-MEC-GS60PA
Plate adapter for #2 60mm Petri-dish.



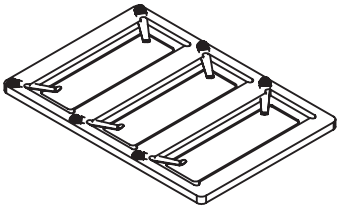
H201-MEC-6035PA
Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish.



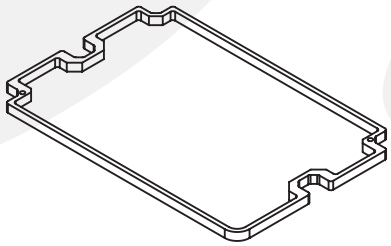
H201-MEC-35PA
Plate adapter for #4 35mm Petri-dish.



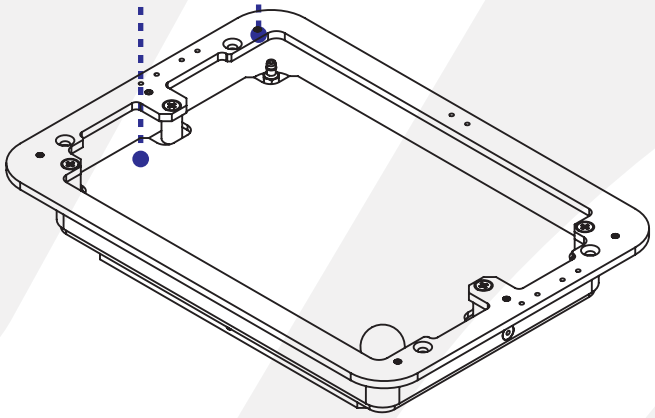
H201-MEC-GS35PA
Plate adapter for #2 chamber slides and #2 35mm Petri-dish.



H201-MEC-3GSPA
Plate adapter for #3 chamber slides.

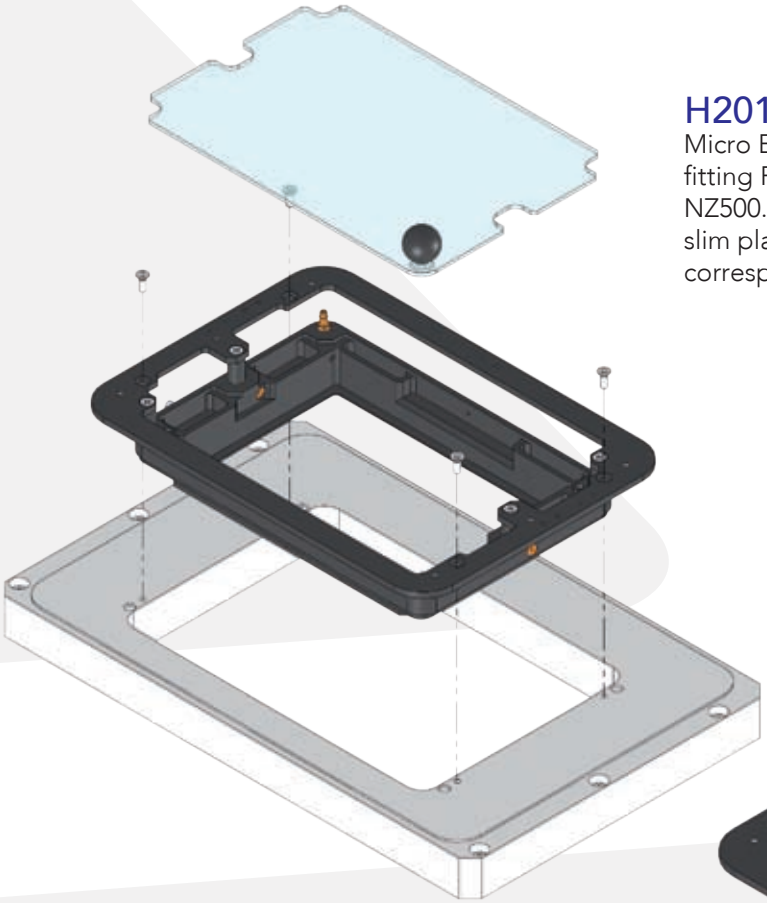


H201-MEC-NZ500-RISER
Riser of the Environmental Chamber H201-MEC-NZ500. For multiwell plates higher than 18mm.



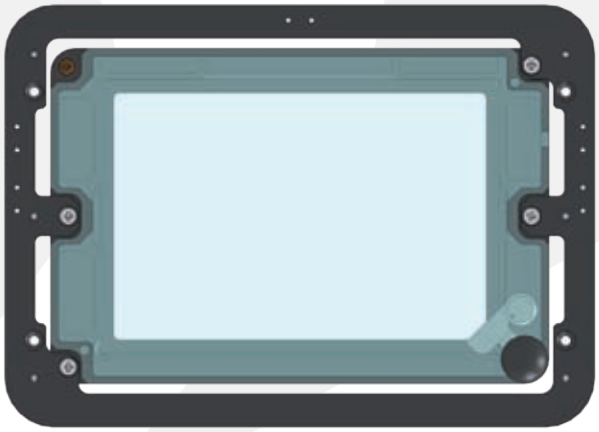
H201-MEC-NZ500
Micro Environmental Chamber H201-MEC-NZ500 fitting Prior Scientific Nano Scan Stage NZ250 and NZ500. It accomodates 6-12-24-48-96 multiwell slim plates. For other supports, add the corresponding plate adapter.

Dimensions are in mm.



H201-MEC-NZ500

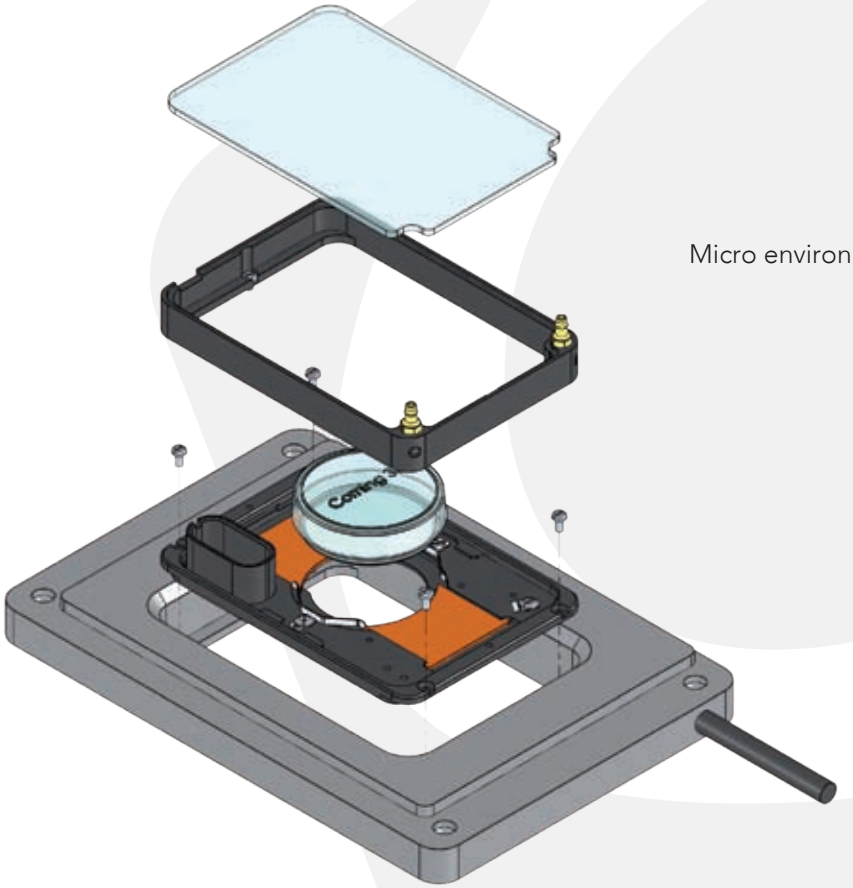
Micro Environmental Chamber H201-MEC-NZ500 fitting Prior Scientific Nano Scan Stage NZ250 and NZ500. It accomodates 6-12-24-48-96 multiwell slim plates. For other supports, add the corresponding plate adapter.



H201-MEC-NZ500

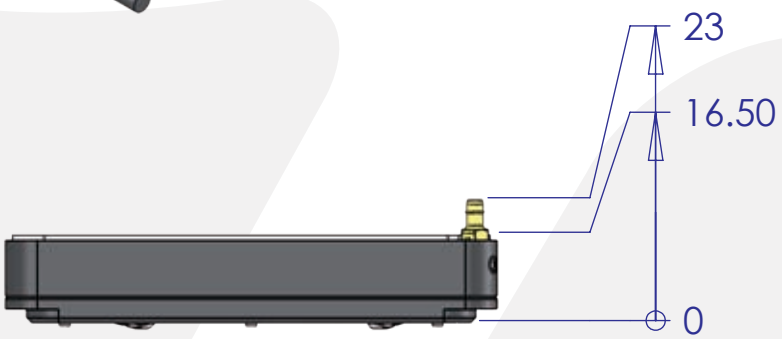
Micro Environmental Chamber H201-MEC-NZ500 fitting Prior Scientific Nano Scan Stage NZ250 and NZ500. It accomodates 6-12-24-48-96 multiwell slim plates. For other supports, add the corresponding plate adapter.

Dimensions are in mm.

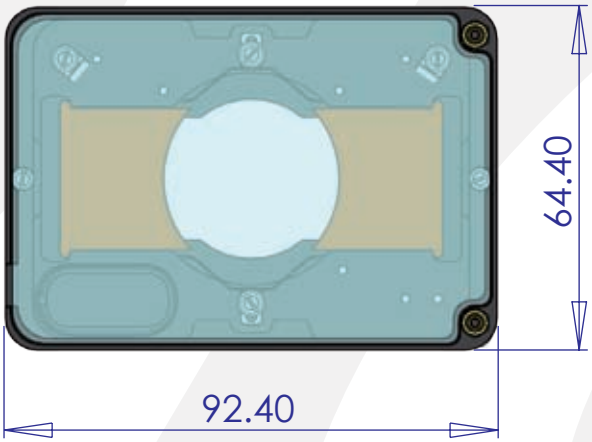


H201-MEC-PZ100

Micro environmental chamber for Prior PZ100 nanoscan z-stage.

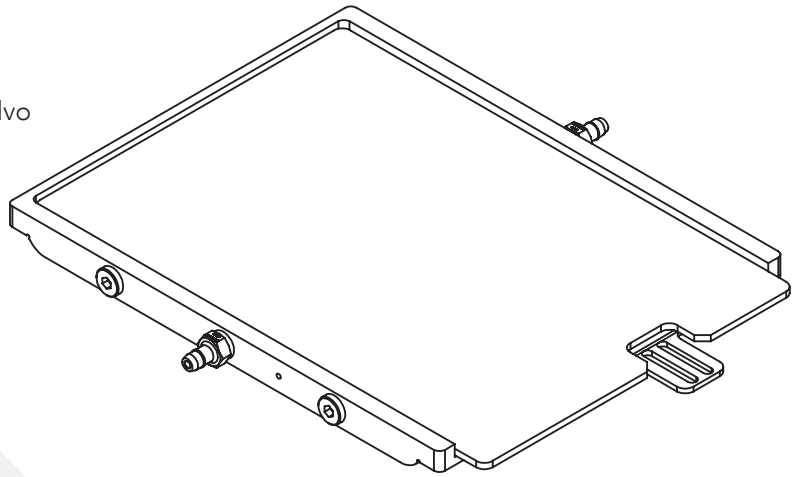


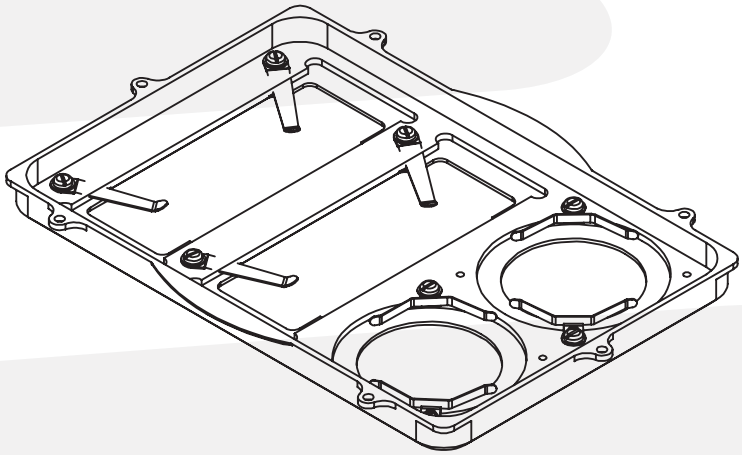
H201-MEC-PZ100 with
Prior NanoScanZ_Stage



H201-MEC-LG

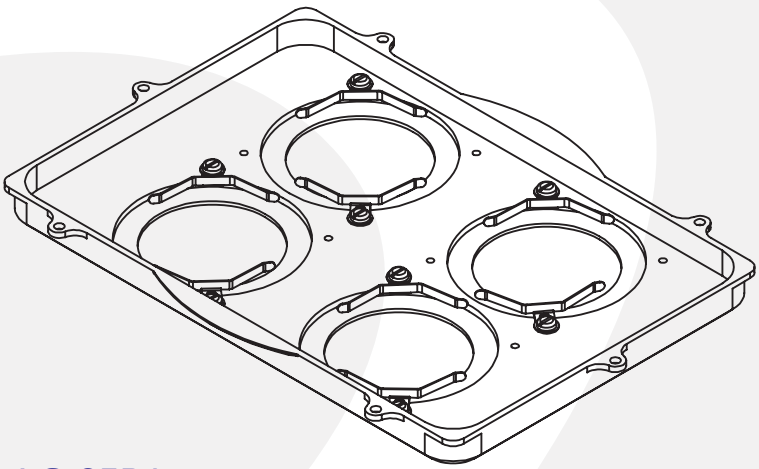
Micro environmental chamber for Leica Galvo Stage.





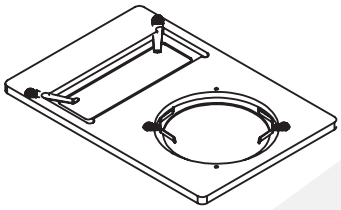
H201-MEC-LG-GS35PA

Plate adapter for #2 chamber slides and #2 35mm Petri-dish.

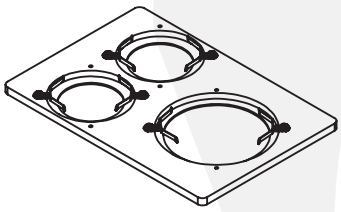


H201-MEC-LG-35PA

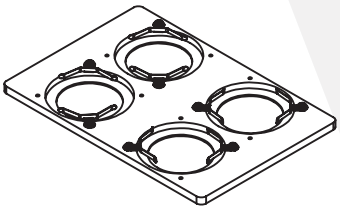
Plate adapter for #4 35mm Petri-dish.



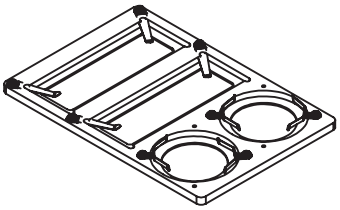
H201-MEC-GS60PA
Plate Adapter for 1 Chamber Slide and 1 60mm Petri.



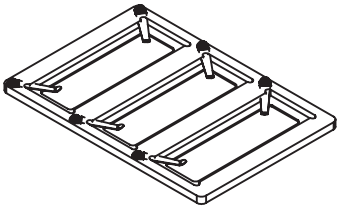
H201-MEC-6035PA
Plate Adapter for 2 35mm Petri Dishes and 1 60mm Petri Dish.



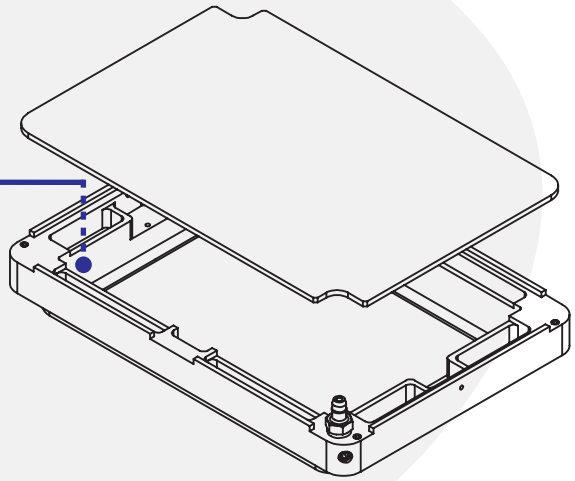
H201-MEC-35PA
Plate Adapter for 4 35mm Petri Dishes.



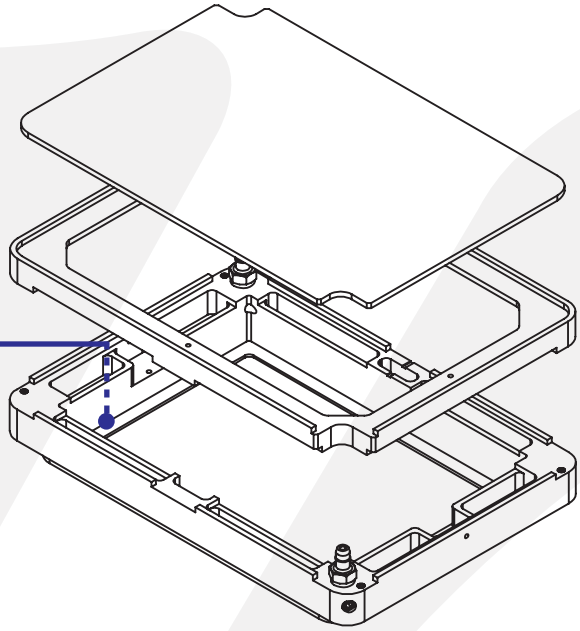
H201-MEC-GS35PA
Plate Adapter for 2 Chamber Slides and 2 35mm Petri.



H201-MEC-3GSPA
Plate Adapter for 3 Chamber Slides.



H201-MEC-ASI
Micro Environmental Chamber for Applied Scientific Z-Piezo Stage PZ2000.

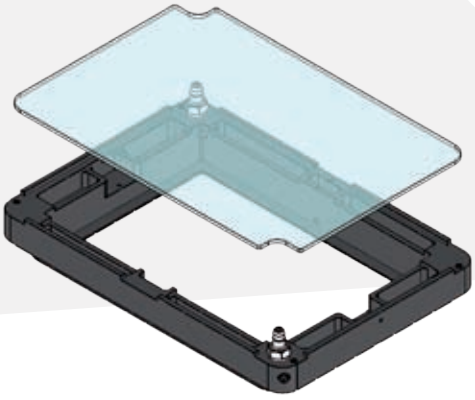


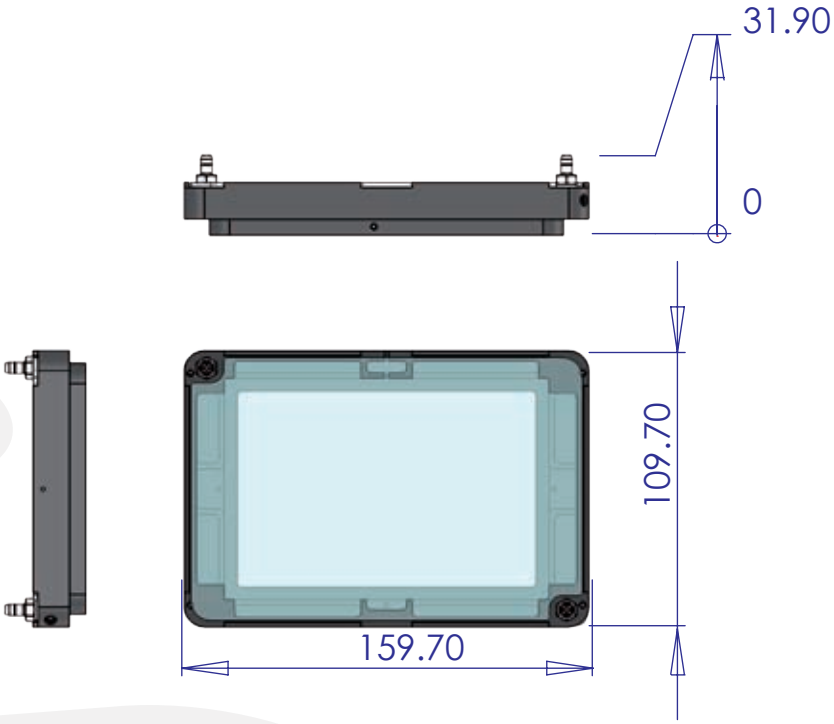
H201-MEC-ASI with H201-MEC-ASI-ICR
Micro Environmental Chamber for Applied Scientific Z-Piezo Stage PZ2000 with lid riser for multiwell plates higher than 18mm.

Dimensions are in mm.

H201-MEC-ASI

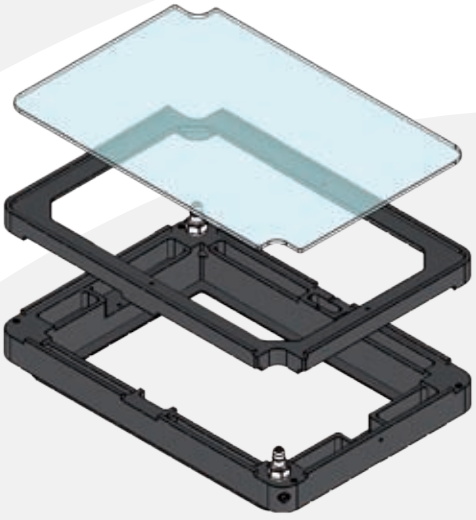
Micro Environmental Chamber for A.S.I. stage.

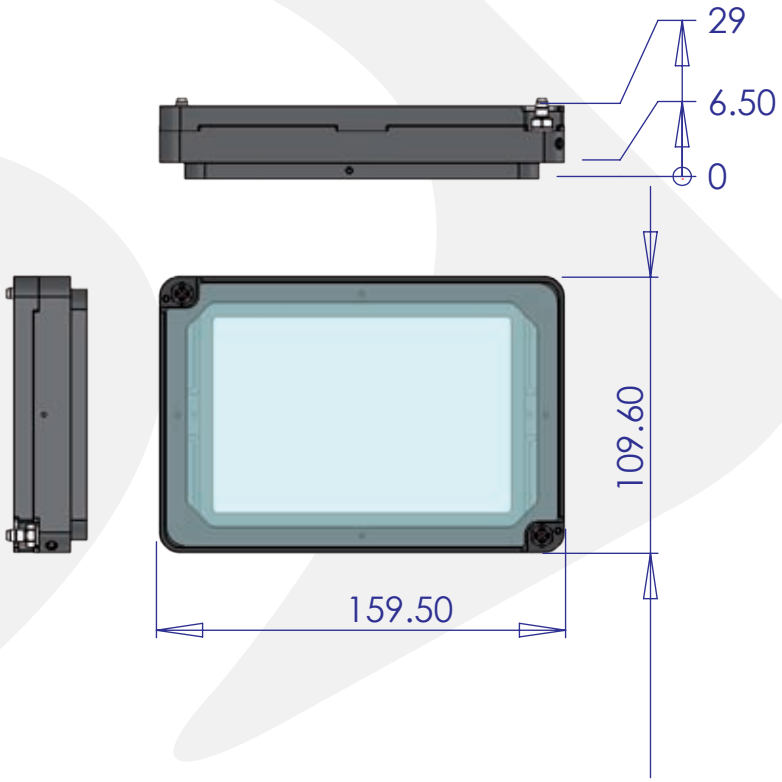




H201-MEC-ASI with H201-MEC-ASI-ICR

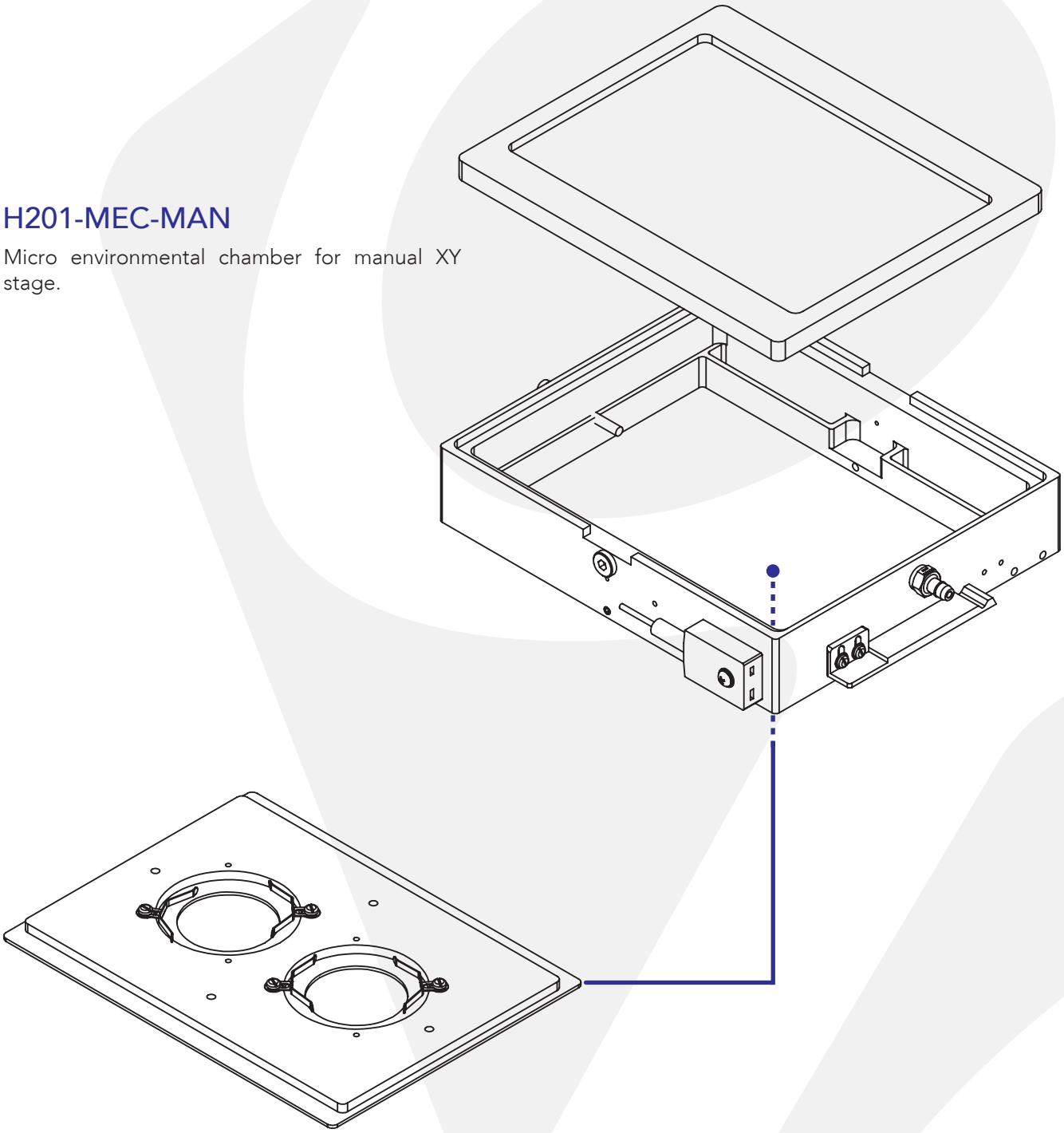
Micro Environmental Chamber for A.S.I. stage with lid riser for multiwell plates higher than 18mm





H201-MEC-MAN

Micro environmental chamber for manual XY stage.



H201-MEC-MAN-35PA

Plate adapter for #2 35mm Petri-dish.

Electric CO_2 Microscope Stage Incubator

One-button solution for long term experiments

Electric CO_2 Microscope Stage Incubator - Technical specifications	
Temperature range	From 3°C above ambient temperature to 50°C
Temperature control accuracy	0.3°C (Chamber temperature feedback) 0.2°C (Specimen temperature feedback)
Heating Technology	Electric
Type of temperature controller	Hardware
Temperature feedback	Chamber temperature feedback Specimen temperature feedback
Humidification module	Heated
CO_2 range (Manual or digital)	0 to 20%

The Electric CO_2 Microscope Stage Incubator is a one-button solution to maintain all the required environmental conditions for cell cultures right on the microscope stage. The same model fits all the XY stages on the market.

Specimen temperature is regulated by the combined action of two hardware controllers acting on the power dissipated by the heating elements, embedded both in the base and in the lid of the incubating chamber.

A humidifying and a pre-heating module prevent medium evaporation and avoid water condensation on glass and plastic surfaces.

Compatible with manual and digital CO_2 / O_2 controllers from OKO-Gas Controllers series.

A wide choice of interchangeable inserts adds flexibility to the equipment and allows to accept any cell culture support (Petri-dishes, glass slides, mutiwell plates, etc.)

COMPACT DESIGN | **STABLE AND UNIFORM** | **PLUG AND PLAY**

TEMPERATURE CONTROL

Temperature uniformity: The position of the heating elements, embedded both in the base and in the lid of the incubating chamber has been optimized to achieve the best temperature uniformity throughout the chamber. Two independent controllers regulate the temperature of the base and of the lid.

Temperature stability ±0.2°C: Temperature fluctuations are contained within ±0.2°C.

Temperature accuracy: With respect to temperature control, the Electric CO_2 Microscope Stage Incubator is available in two versions: Chamber feedback and Specimen feedback.

CHAMBER FEEDBACK ±0.3°C

Figure 1.

In this configuration, the temperature sensor is embedded into the incubating chamber. A careful calibration guarantees that specimen temperature is maintained at the desired value.

The advantage of this solution is its simplicity of use.

SPECIMEN FEEDBACK ±0.2°C

In this configuration, an external small gauge thermocouple is used to measure the temperature of a reference well, placed into the incubating chamber, near the specimen.

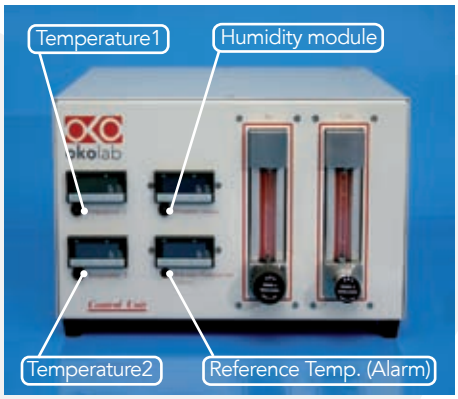
Figure 2.

The advantage of this configuration is the accuracy of temperature control. Simple manipulation is required to stick the thermocouple into the reference well with adhesive tape, as required for the use of Water Jacket and Cage incubators.

The temperature controller, shown integrated with the manual CO_2-Air mixer in the picture, can host up to four temperature displays, named as: Temperature 1, Temperature 2, Humidity Module, Reference Temperature (Alarm).

CONTROLLER CONFIGURATION

Chamber Feedback	
Display	Connected to
Temperature 1	Base Plate
Temperature 2	Lid
Humidity Module	Optional
Reference T	External Sensor (upon request)
T Stability	±0.2°C
T Accuracy	±0.3°C



Specimen Feedback	
Display	Connected to
Temperature 1	Specimen
Temperature 2	Lid
Humidity Module	Optional
Reference T	High temperature alarm
T Stability	±0.2°C
T Accuracy	±0.2°C

Temperature 1: is the temperature that gives feedback to all the temperature controllers of the system.
a) In the chamber feedback configuration, this display is connected to a temperature sensor embedded in the base of the incubating chamber. (See figure 1).
b) In the specimen feedback configuration, this display is connected to a flexible sensor, measuring the temperature of a reference well placed near the specimen. (See figure 2.)

Temperature 2: is the temperature of the lid of the incubating chamber It is set a few degrees above the set point temperature of the base. A simple temperature table is provided in the equipment manual.

Humidity Module: The humidity module (figure 3 a) can be inserted into a cilindrical heating element (figure 3 b), whose temperature is displayed and controlled by the control unit.
Suggested for long lasting experiments.

Reference Temperature (Alarm): a) In the chamber feedback configuration this display is not present. On request, a temperature meter connected to an external sensor can be added.
b) In the specimen feedback configuration, this display is connected to a temperature sensor embedded in the base of the incubating chamber.
An overheating alarm is active on this measurement and chamber heating is cut off above a user defined maximum temperature.

HUMIDITY MODULE

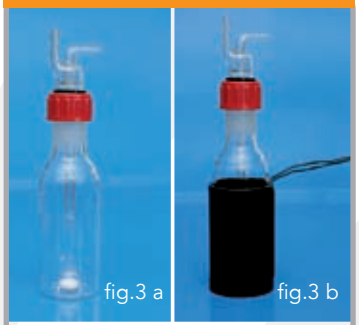


fig.3 a fig.3 b

The CO_2 enriched gas stream bubbles into the humidity module before entering into the incubating chamber. The humidity module can be heated up by a dedicated controller in order to increase gas absolute humidity

ELECTRIC CHAMBERS

The Electric Chamber can accommodate any kind of cell culture support. Interchangeable adapters allow to use any kind of multiwell plate (6-12-24-48-96), 35mm Petri-dishes and chamber slides.

This model is designed to increase reproducibility and versatility thus improving experimental efficiency. Typical applications are time-lapse observations of more than one field of view. To fully benefit from the multi accommodation design, this chamber should be mounted on a microscope equipped with motorized focus and motorized XY stage.

It can be used both with Long Working Distance and oil-immersion objectives.

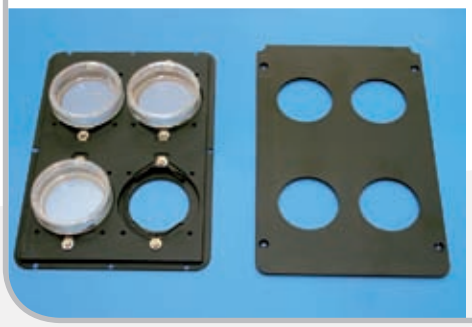
Perfusion: a special insert provides up to 8 holes for the introduction of perfusion tubings into the chamber. Each hole has a diameter of 4mm.

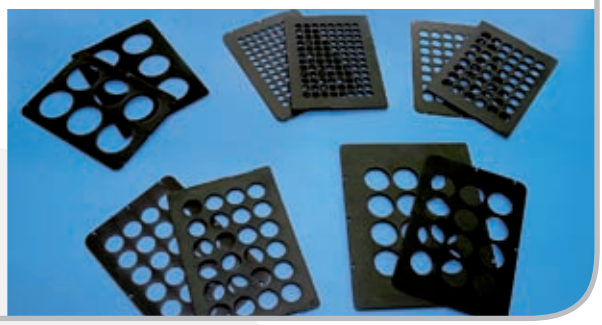
It fits any 160x110mm sized stage (i.e. Ludl BioPrecison and BioPoint, Marzhauser SCAN IM 120x100, Prior H107 and H117), A.S.I. stages and all mechanical flat stages. It also fits into the Nikon TI-S-E motorised XY stage with stage insert TIPA.

A dedicated model fitting piezo stages is available.

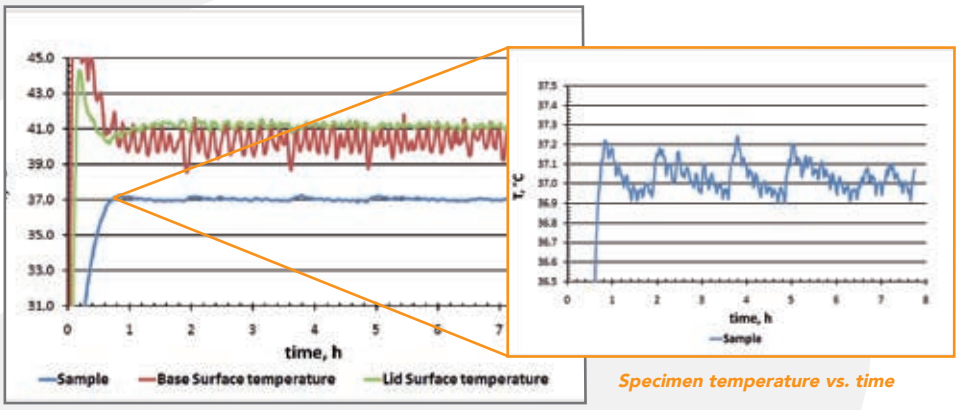
Dimensions: 159x110x18 mm.

A variety of custom chambers are available (please, visit **www.oko-lab.com**).





System Performance

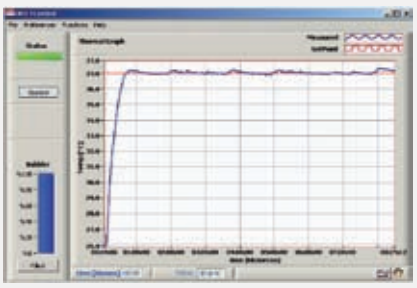


Ambient, metal and specimen temperature vs time.

Specimen temperature vs. time

The graph reports lid, base and specimen temperature as a function of time. The incubator was working with a specimen feedback configuration. As illustrated, specimen temperature is stable at 37±0.2 °C

Read Temperature Software



It allows storage of the temperature profile during the experiment.

Temperature graph can be visualized in real time, memorizing temperature fluctuation and the set point.

Data can be reloaded off line, or exported to file.

A useful reminder helps to predict water consumption in the bubbler.

The software allows real time temperature monitoring through UDP transfer protocol, for third party software synchronization.

CO_2/O_2 CONTROLLERS

Okolab Microscope Incubators can be equipped with Manual or Digital CO_2 / O_2 controllers.

MANUAL CO_2 MIXER

It allows to generate CO_2 - Air mixtures with an adjustable CO_2 concentration in the range 0-15%. Air and CO_2 flows are regulated by two floating ball flow meters in the range 0.2 - 1.7 and 0.013 - 0.13 Nl/min, respectively.
A table allows to easily define the air and CO_2 flow values necessary to achieve the desired CO_2 concentration.

Also available integrated with the temperature controller in a single unit (as shown in the picture).

DIGITAL CO_2 CONTROLLER

It allows to generate a CO_2-Air mixture with an adjustable CO_2 concentration in the range 0-20%, with an accuracy of ± 5% of CO_2 concentration. For instance, if CO_2 set point is 5%, accuracy is ± 0.25%.
The air flow is regulated by a floating ball air flow meter in the range 0.2-0.8 Nl/min.

Sensing Technology
A CO_2 infrared sensor continuously measures CO_2 concentration in the mixed gas stream and a PID closed loop controller gives feedback to a fine valve regulating CO_2 flow. The measured value of CO_2 concentration is displayed in real time.

Data Storage
The serial RS-232 interface and the CO_2 Control Software allow the user to control the unit with a personal computer and to acquire and store concentration data in computer memory.

MANUAL CO_2 AND O_2 CONTROLLER

3 Gas Manual Mixer. It mixes three gas streams, for instance N2/CO_2/O_2, by means of floating ball flowmeters. The first gas can be regulated in the range 70 -100%, the second and third gas can be regulated in the range 0-15%. Also available integrated with the temperature controller in a single unit (as shown in the picture).

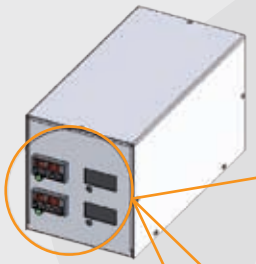
DIGITAL O_2 CONTROLLER

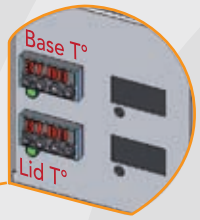
The DGTO2BX is a O_2 controller capable of measuring O_2 concentration in the range 0-25% with a resolution of 0.1%. It controls O_2 concetration by mixing Air with Nitrogen, O_2 oxygen. Air flow is set to 0.1 liter per minute by means of a floating ball flowmeter. Nitrogen consumption at 5% of Oxygen is 0.32 liter per minute. Therefore, a 200 liters Nitrogen tank will last approximately 3 months. Repeatability 0.05% of oxygen level.

Sensing Technology
Long life zirconium oxide sensor lasting up to 10 years if used continuosly and considerably longer if used intermittently.

Data Storage
The serial RS-232 interface and the O_2 Control Software allow the user to control the unit with a personal computer and to acquire and store concentration data in computer memory.

TEMPERATURE CONTROLLER





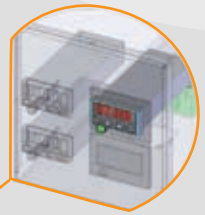
H301-TC1
This unit controls the temperature of the base and lid of the stage incubator. Specimen Temperature accuracy = ± 0.3°C.

H301-TC1+H301-TM
Addition of a temperature meter with external temperature probe. The probe can be positioned to measure ambient or specimen temperatures in different locations.

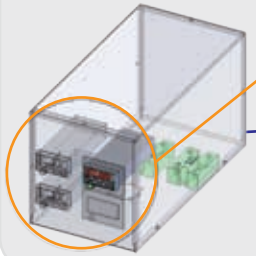
H301-TC2
This unit measures specimen temperature and gives feedback to the lid and base temperature controllers. It improves specimen temperature accuracy to ± 0.2°C.

H301-TS
Read Temperature software.

HUMIDITY MODULE



H301-HMTC
Humidifying Module Temperature Controller. It controls the temperature of the bubbling column, improving gas humidification.



H301-BC
Bubbling column.

CO2 CONTROLLER

2GF-MIXER
2 Gas Manual Mixer. It mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85-100%, the other one in the range 0-15%.

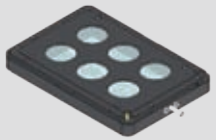
DGT-CO2BX
Digital CO_2 Controller. CO_2 can be regulated in the range 0-20%. Accuracy at 5% CO_2 is 0.25%.

DGT-CO2BX-PLUS
Same as + RS232.

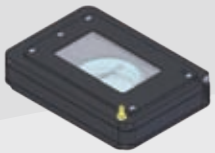
DGT-CO2BX-PLUS-S
CO_2 control software.

H301-TC2 +2GF-MIXER
Integrated Temperature Controller and manual 2 gas mixer.

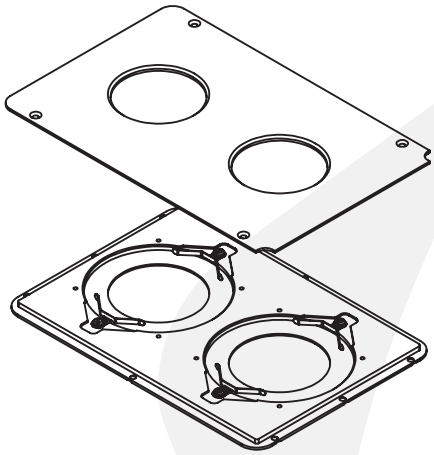
ELECTRICALLY HEATED CHAMBERS



H301-EC
Universal electric chamber. Fits on Prior, Ludl, Marzhauser, ASI and Nikon motorized stages. It requires at least one plate adapter.

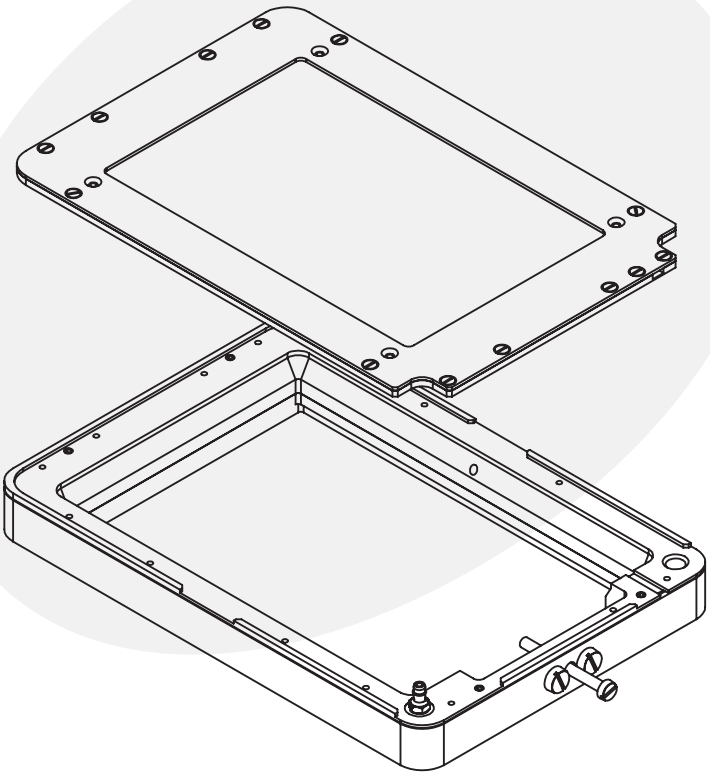


H301-EC-PZ100
MEC for Prior PZ100 nanoscan z-stage. It hosts #1 35mm Petri or #1 chamber slide.



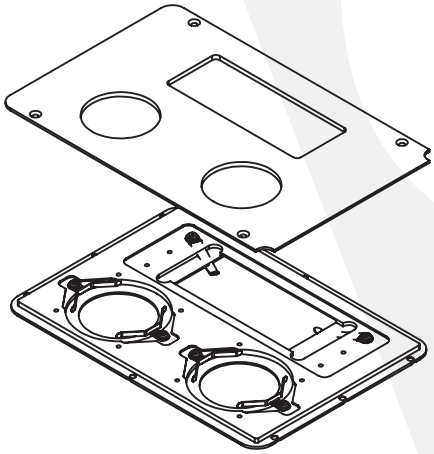
H301-EC-60PA

Plate adapters for #2 60mm Petri-dish. Maximum height 17mm.



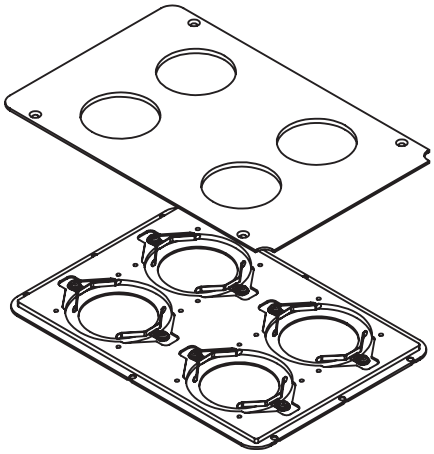
H301-EC

Universal electrically heated chamber. Fits on Prior, Ludl, Marzhauser, ASI XY Stages. It requires at least one plate adapter.



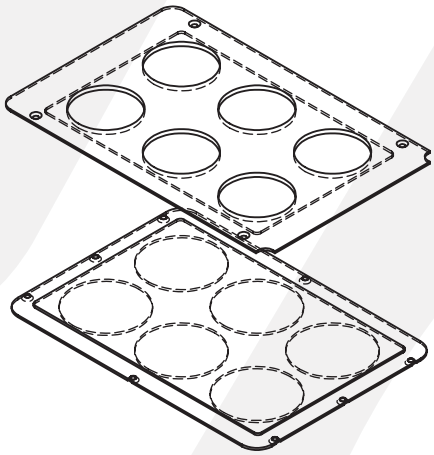
H301-EC-GS35-PA

Plate adapters for #2 35mm Petri-dish and #1 chamber slide.



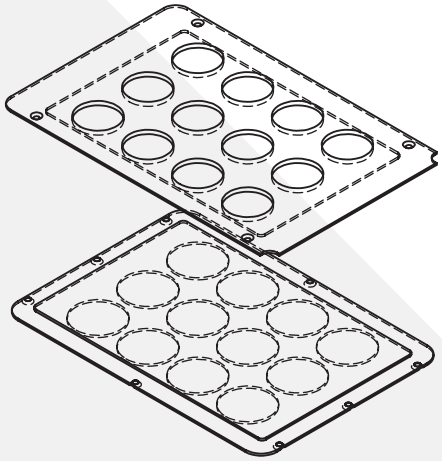
H301-EC-35PA

Plate adapters for #4 35mm Petri-dish. Maximum height 17mm.



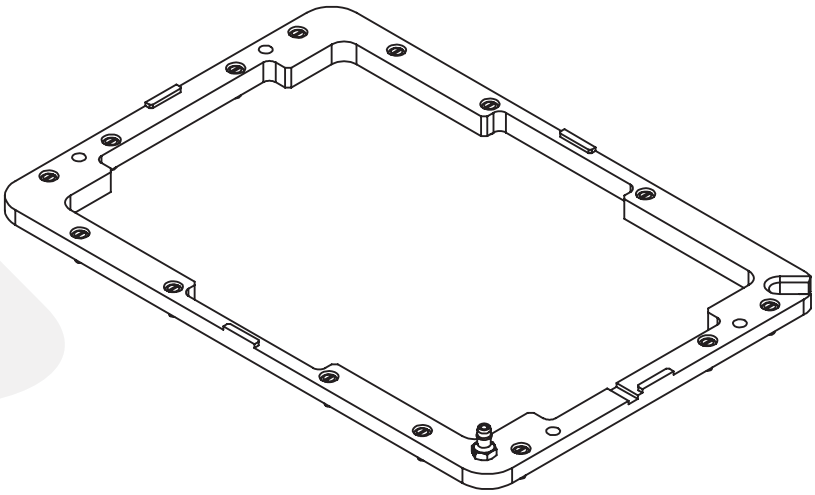
H301-EC-6MWPA

Plate adapters for 6-well plates. Maximum plate height 17mm.



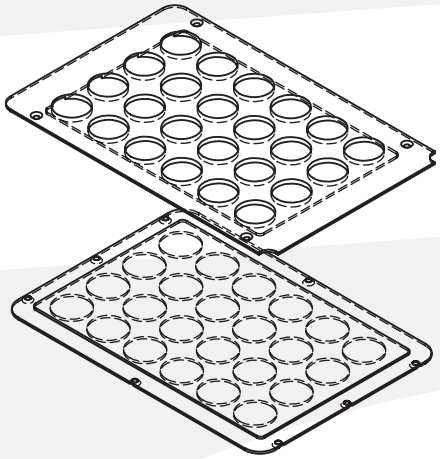
H301-EC-12MWPA

Plate adapters for 12-well plates.
Maximum plate height 17mm.



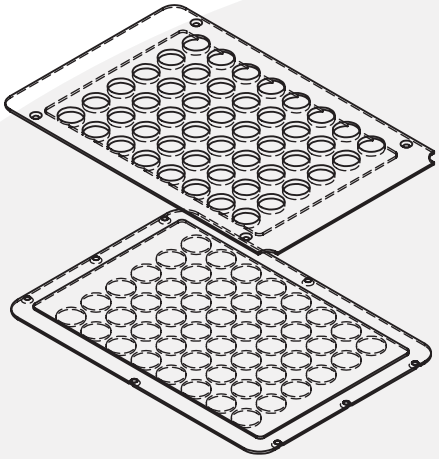
H301-EC-chamber riser

It is an insert raising the incubating chamber height.
Required if culture supports (i.e. multiwell plates) higher than 17mm have to be used.



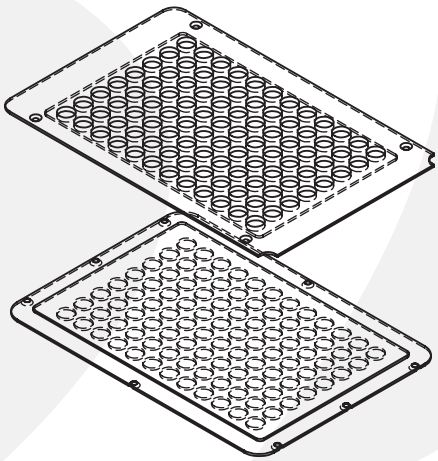
H301-EC-24MWPA

Plate adapters for 24-well plates.
Maximum plate height 17mm.



H301-EC-48MWPA

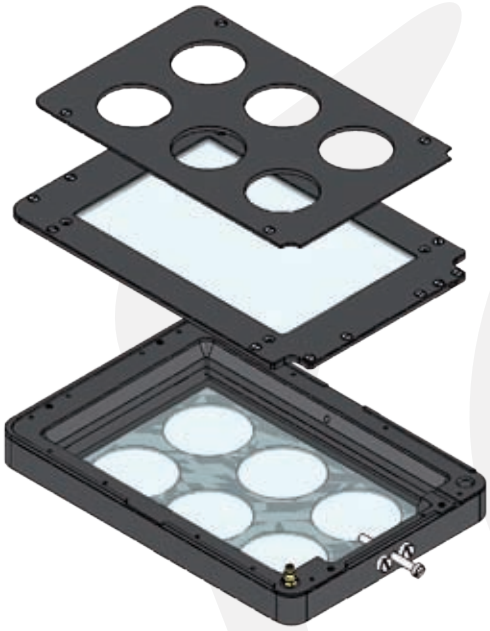
Plate adapters for 48-well plates.
Maximum plate height 17mm.

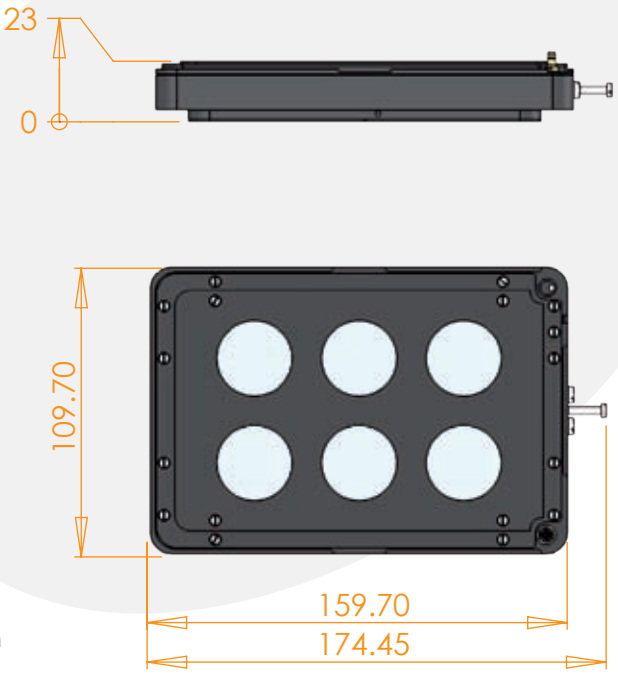


H301-EC-96MWPA

Plate adapters for 96-well plates.
Maximum plate height 17mm.

Dimensions are in mm.





H301-EC with H301-EC-6MWPA

ELECTRIC CO2 Microscope Stage Incubator with H301-EC-6MWPA plate adapter allowing to accomodate slim 6 well plate (maximum height 17mm).

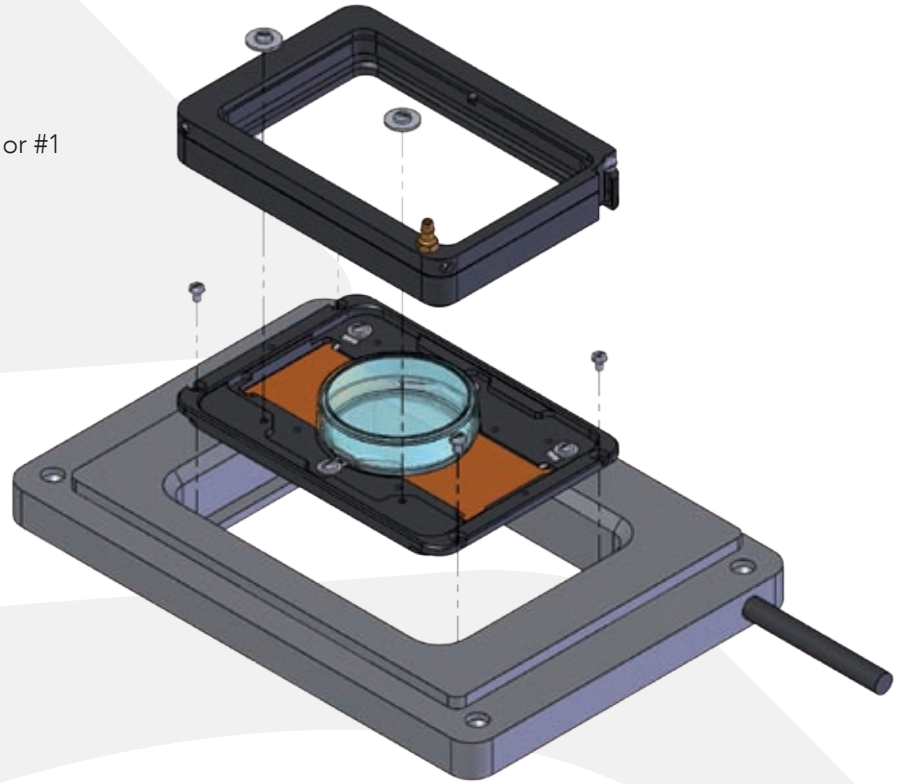
H301-EC with H301-EC-chamber riser

ELECTRIC CO2 Microscope Stage Incubator with H301-EC-chamber riser. Riser is required if culture supports (i.e.multiwell plates) higher than 17mm have to be used.

H301-HMTC

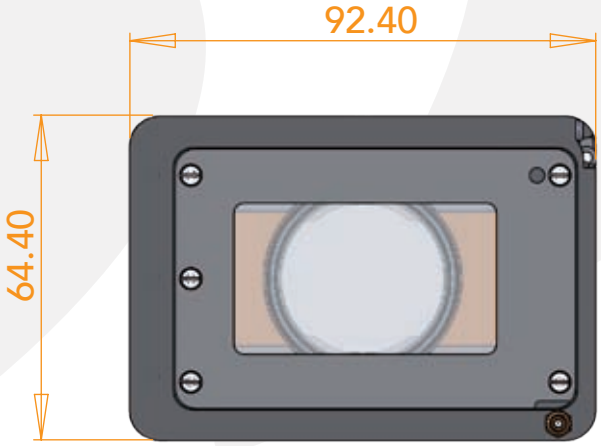
Humidifying Module Temperature Controller. It control the bubbling column, increasing its performance.

Dimensions are in mm.



H301-EC-PZ100

It hosts #1 35mm pertri or #1 chamber slide.



Warm Plate

One button Solution

Warm Plate - Technical specifications	
Temperature range	3°C above room temperature to 50°C
Temperature control accuracy	±0.4°C
Heating Technology	Electric
Type of temperature controller	Hardware
Temperature feedback	Plate temperature feedback

The Warm Plate represents a one-button solution for temperature control.

Ideal to warm up the specimen during experiments lasting from minutes to hours where humidity and CO_2 control are not required.

It replaces the microscope stage insert, heating the sample from the bottom.

Suitable for In Vitro Fertilization experiments.

The temperature is regulated by acting on the power dissipated by heating elements, embedded into the plate.

A careful calibration performed in our laboratories guarantees that specimen temperature is maintained at the desired value, within ±0.4°C.

A very easy procedure allows to change set point and offset value on the control unit.

Read Software available.

Upgradable to achieve also CO_2 and Humidity conditioning.

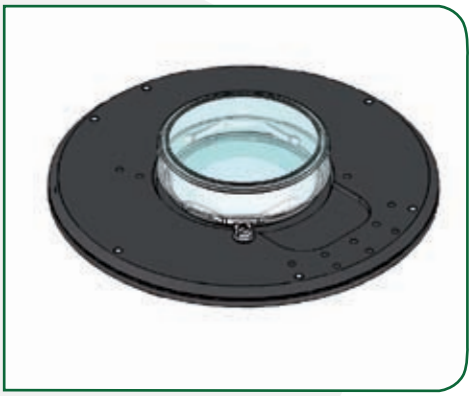
IN VITRO FERTILIZATION

UPRIGHT AND INVERTED MICROSCOPES

UPGRADABLE TO CO_2 CONTROL

TEMPERATURE CONTROL

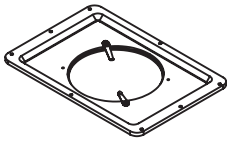
The Warm Plate is powered at 24V DC. This improves the thermal stability and avoids electro-magnetic interference with other electronic devices. An alarm warns the used if the temperature exceeds a maximum value.



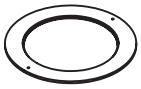
Universal Round Warm Plate

Shaped as a flat 80 mm diameter disk, it has an observation area of 20 mm in diameter and a maximum thickness of 3 mm.
Circular adapters allow to fit the Universal Round Warm Plate into circular XY stage inserts having diameters greater than 80mm, while a rectangular adapter allows to fit it in any 160x110mm sized stage (i.e. Ludl BioPrecison and BioPoint, Marzhauser SCAN IM 120x100, Prior H107 and H117), A.S.I. stages and all mechanical flat stages.
It also fits into the Nikon TI-S-E motorised XY stage, with a dedicated adapter.

Upgradable to CO_2 control.



H401-SA
Stage adapter to accommodate the Round Warm Plate in microscope stages with rectangular insert.

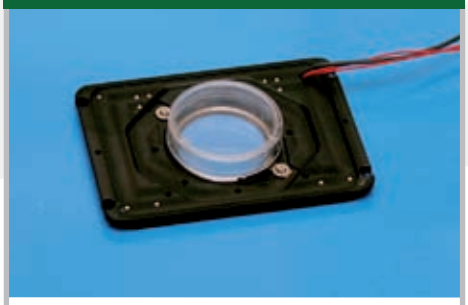


H401-CA110
Stage adapter to accommodate the Round Warm Plate in microscope stages with 110mm circular insert.

H401-CA108
Stage adapter to accommodate the Round Warm Plate in microscope stages with 108mm circular insert.

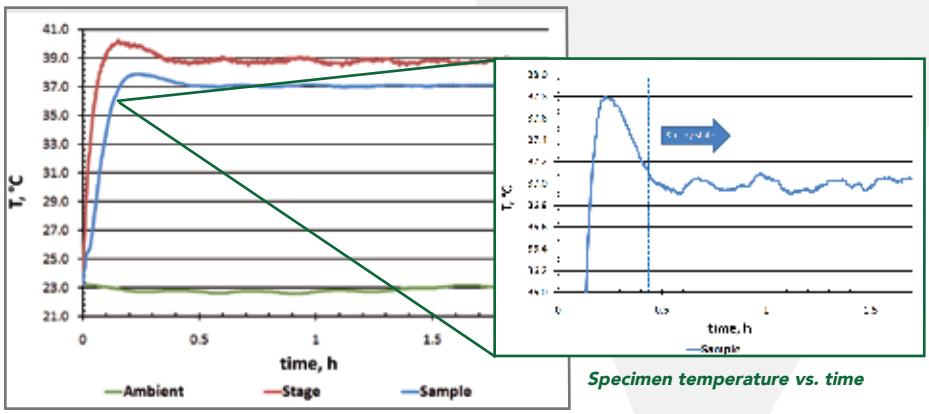
H401-CA88
Stage adapter to accommodate the Round Warm Plate in microscope stages with 88mm circular insert.

Warm Plate for Prior Piezo Stage



Designed to fit into Prior NanoScan Z Stage PZ100, it can accept one 35mm Petri-dish.
Observation area: 40 mm in diameter.
Weight: c.a. 50 g.
Plate dimensions: 64.4x92.4x2.5 mm.
Upgradable to CO2 and humidity conditioning.

System Performace

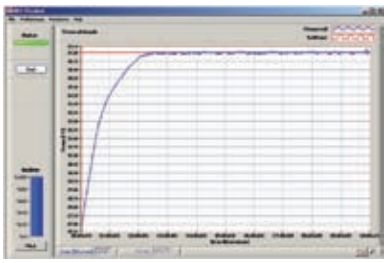


Ambient, metal and specimen temperature vs time.

Specimen temperature vs. time

The graph reports plate, ambient and specimen temperature as a function of time.
After the initial start up transient, the system finds a stable steady state with specimen temperature fluctuations of the order of ± 0.2°C.

Read Temperature Software



It allows storage of the temperature profile during the experiment. Temperature graph can be visualized in real time, memorizing temperature fluctuation and the set point.

Data can be reloaded off line, or exported to file. A useful reminder helps to predict water consumption in the bubbler.

The software allows real time temperature monitoring through UDP transfer protocol, for third party software synchronization

WATER JACKET CO2 MICROSCOPE STAGE INCUBATOR

Code	Description
TEMPERATURE CONTROLLER	
H101-BASIC	**Heating unit**. It comprises: water bath, temperature sensor, temperature meter, control temperature software.
H101-CRYO	**Heating / Cooling unit.** It comprises: cryostatic water bath, temperature sensor, temperature meter, cryo-control temperature software.
H101-CRYO-S	**Temperature cycles software.** It allows to perform temperature cycels and ramps.
CO2 / O2 CONTROLLER	
2GF-MIXER	**2 Gas Manual Mixer.** It mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85÷100%, the other in the range 0÷15%.
3GF-MIXER	**3 Gas Manual Mixer.** It mixes three gas streams by means of floating ball flowmeters. The first gas can be regulated in the range 70÷100%, the second and third gas can be regulated in the range 0÷15%.
DGT-CO2BX	**Digital CO_2 Controller.** CO2 can be regulated in the range 0-20% with great accuracy. Measured CO2 value is displayed in real time.
DGT-CO2BX-PLUS	**Digital CO_2 Controller Plus**. Same as DGT-CO2BOX + RS232 serial port to control and read CO2 levels via software. Measured CO2 and set point values are displayed in real time.
DGT-CO2BX-PLUS-S	**Software for Digital CO_2 Controller Plus.** It allows to control DGTCO2BX-D-RS232 from PC. You can impose CO2 set point value, program CO2 concentration time profiles. acquire and store measurements in time.
DGT-O2BX	**Digital O_2 Controller.** O2 can be regulated in the range 0-25% with great accuracy. Measured O2 value is displayed in real time.
DGT-O2BX-PLUS	**Digital O_2 Controller Plus**. Same as DGT-O2BOX + RS232 serial port to control and read O2 levels via software. Measured O2 and set point values are displayed in real time.
DGT-O2BX-PLUS-S	**Software for Digital O_2 Controller Plus.** It allows to control DGTO2BX-D-RS232 from PC. You can impose O2 set point value, program O2 concentration time profiles, acquire and store measurements in time.
TEMPERATURE AND CO2 CONTROLLERS INTEGRATED IN ONE BOX	
H101-BASIC+2GF-MIXER	**Integrated Temperature controller and manual 2 gas mixer**. **It combines item H101-BASIC and 2GF-MIXER.** It comprises: water bath, temperature sensor, temperature meter, control temperature software and 2 floating ball flowmeters for gas mixing.
H101-BASIC+3GF-MIXER	**Integrated Temperature controller and 3 gas mixer**. **It combines item H101-BASIC and 3GF-MIXER.** It comprises: water bath, temperature sensor, temperature meter, control temperature software and 3 floating ball flowmeters for 3 gas mixing.
H101-CRYO+2GF-MIXER	**Integrated Temperature controller and manual 2 gas mixer.** It combines item H101-CRYO and 2GF-MIXER. It comprises: cryostatic water bath, temperature sensor, temperature meter, cryo-control temperature software and 2 floating ball flowmeters for gas mixing.
H101-CRYO+3GF-MIXER	**Integrated Temperature controller and 3 gas mixer.** It combines item H101-CRYO and 3GF-MIXER. It comprises: cryostatic water bath, temperature sensor, temperature meter, cryo-control temperature software and 3 floating ball flowmeters for 3 gas
HUMIDITY MODULE	
H101-HM	**Humidity module.** It comprises: gas preheating system and bubbling column.
H101-BC	**Bubbling column.** Included in item H101-HM.

WATER JACKET CO2 MICROSCOPE STAGE INCUBATOR

Code	Description
CHAMBERS AND PLATE ADAPTERS	
H101-WJC	**Universal water jacket chamber.** Fits on Prior, Ludl, Marzhauser XY Stages. It requires at least one plate adapter.
H101-WJC-6MWPA	Plate adapters for 6-well plates
H101-WJC-12MWPA	Plate adapters for 12-well plates
H101-WJC-24MWPA	Plate adapters for 24-well plates
H101-WJC-24MWPA-NUNC	Plate adapters for 24-well Nunc plates
H101-WJC-48MWPA	Plate adapters for 48-well plates
H101-WJC-96MWPA	Plate adapters for 96-well plates
H101-WJC-96MWPA-OIL	Plate adapters for 96-well plates for oil immersion objectives
H101-WJC-GS35PA	Plate adapters for #2 35mm Petri-dish and #1 chamber slide
H101-WJC-35PA	Plate adapters for #4 35mm Petri-dish
H101-WJC-6035PA	Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish
H101-WJC-60PA	Plate adapters for #2 60mm Petri-dish
H101-WJC-GSPA	Plate adapters for #2 chamber slides
TIPA	Stage insert for Nikon Ti's Motorized xy stage
H101-WJC-SLIM	**Slim water jacket chamber.** Fits on Prior, Ludl, Marzhauser XY Stages. Suitable for high N.A. condensers. It requires at least one plate adapter.
H101-WJC-SLIM-35PA	Plate adapter for #2 35mm Petri-dish
H101-WJC-SLIM-GSPA	Plate adapter for #2 chamber slides
H101-WJC-SLIM-35PA-FST	Plate adapter for #2 35mm Petri-dish for flat stages with circular insert
H101-WJC-SLIM-GS35PA-FST	Plate adapter for #2 chamber slide for flat stages with circular insert
TIPA	Stage insert for Nikon Ti's Motorized xy stage
H101-WJC-ASI	**Water jacket chamber for ASI XY stage.** It requires at least one plate adapter.
H101-WJC-ASI-6MWPA	Plate adapters for 6-well plates. Maximum plate height 17mm
H101-WJC-ASI-12MWPA	Plate adapters for 12-well plates. Maximum plate height 17mm
H101-WJC-ASI-24MWPA	Plate adapters for 24-well plates. Maximum plate height 17mm
H101-WJC-ASI-48MWPA	Plate adapters for 48-well plates. Maximum plate height 17mm
H101-WJC-ASI-96MWPA	Plate adapters for 96-well plates. Maximum plate height 17mm
H101-WJC-ASI-GS35-PA	Plate adapters for #2 35mm Petri-dish and #1 chamber slide. Maximum plate height 17mm
H101-WJC-ASI-35PA	Plate adapters for #4 35mm Petri-dish. Maximum plate height 17mm
H101-WJC-AB	**Water jacket chamber for Applied Biophisics .** Fits on Prior, Ludl, Marzhauser XY Stages.

CO2 MICROSCOPE CAGE INCUBATOR

Code	Description
MICROSCOPE ENCLOSURE	
H201	**Microscope lexan enclosure.**
H201-custom	**Price surcharge for custom lexan enclosures.**
H201-OP	**Obscuring panels.** They can be added to the lexan enclosure to create a dark environment
H201-OP-custom	**Price surcharge for custom obscuring panels**
TEMPERATURE CONTROLLER	
H201-T1	**Temperature contol unit.** It comprises: PID Temperature control unit; air heater; auxiliary fans, temperature sensor.
H201-T2	**Temperature contol unit with two heaters.** It comprises: PID Temperature control unit; 2 air heaters; auxiliary fans, temperature sensor. Required if room temperature is less than 21°C
H201-TS	**Read Temperature Software.** It allows to store the temperature profile during the experiment.
CO2 / O2 CONTROLLER	
2GF-MIXER	**2 Gas Manual Mixer.** It mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85÷100%, the other in the range 0÷15%
3GF-MIXER	**3 Gas Manual Mixer.** It mixes three gas streams by means of floating ball flowmeters. The first gas can be regulated in the range 70÷100%, the second and third gas can be regulated in the range 0÷15%.
DGT-CO2BX	**Digital CO_2 Controller.** CO2 can be regulated in the range 0-20% with great accuracy. Measured CO2 value is displayed in real time.
DGT-CO2BX-PLUS	**Digital CO_2 Controller Plus**. Same as DGT-CO2BOX + RS232 serial port to control and read CO2 levels via software. Measured CO2 and set point values are displayed in real time.
DGT-CO2BX-PLUS-S	**Software for Digital CO_2 Controller Plus.** It allows to control DGTCO2BX-D-RS232 from PC. You can impose CO2 set point value, program CO2 concentration time profiles. acquire and store measurements in time.
DGT-O2BX	**Digital O_2 Controller.** O2 can be regulated in the range 0-25% with great accuracy. Measured O2 value is displayed in real time.
DGT-O2BX-PLUS	**Digital O_2 Controller Plus**. Same as DGT-O2BOX + RS232 serial port to control and read O2 levels via software. Measured O2 and set point values are displayed in real time.
DGT-O2BX-PLUS-S	**Software for Digital O_2 Controller Plus.** It allows to control DGTO2BX-D-RS232 from PC. You can impose O2 set point value, program O2 concentration time profiles, acquire and store measurements in time.
TEMPERATURE AND CO2 CONTROLLERS INTEGRATED IN ONE BOX	
H201-T1+2GF-MIXER	**Integrated Temperature control unit and manual 2 gas mixer**. **It combines item H201-T and 2GF-MIXER.** It comprises: PID Temperature control unit; air heater unit; auxiliary fans, temperature sensor, 2 floating ball flowmeters for gas mixing.
H201-T2+2GF-MIXER	**Integrated Temperature control unit with two heaters and manual 2 gas mixer. It combines item H201-T2 and 2GF-MIXER.** It comprises: PID Temperature control unit; air heater unit; auxiliary fans, temperature sensor, 2 floating ball flowmeters for 2 gas mixing.
H201-T1+3GF-MIXER	**Integrated Temperature control unit and 3 gas mixer.** It combines item H201-T and 3GF-MIXER. It comprises: PID Temperature control unit; air heater unit; auxiliary fans, temperature sensor, digital CO2 controller plus, 3 floating ball flowmeters for 3 gas mixing.
H201-T2+3GF-MIXER	**Integrated Temperature control unit with two heaters and 3 gas mixer. It combines item H201-T2 and 3GF-MIXER.** It comprises: PID Temperature control unit; air heater unit; auxiliary fans, temperature sensor and 3 floating ball flowmeters for 3 gas mixing.

CO2 MICROSCOPE CAGE INCUBATOR

Code	Description
HUMIDITY MODULE	
H201-BC	**Bubbling column.** It humidifies the gas stream before the inlet into the micro environmental chamber.
MICRO ENVIRONMENTAL CHAMBERS AND PLATE ADAPTERS	
H201-MEC	**Universal Micro environmental chamber.** It accomodates 6-12-24-48-96 multiwell plates. For other supports, add the corresponding plate adapter.
H201-MEC-35PA	Plate adapter for #4 35mm Petri-dish
H201-MEC-GS35PA	Plate adapter for #2 chamber slides and #2 35mm Petri-dish
H201-MEC-6035PA	Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish
H201-MEC-GS60PA	Plate adapter for #1 chamber slide and #1 60mm Petri-dish
H201-MEC-3GSPA	Plate adapter for #3 chamber slides
H201-MEC-LID2	Deep set micro environmental lid, for high N.A. condensers
H201-MEC-CUSTOM	Customized plate adapter
TIPA	Stage insert for Nikon Ti's Motorized xy stage
H201-MEC-PZ100	**Micro environmental chamber for Prior PZ100 nanoscan z-stage**
H201-MEC-NZ500	**Micro environmental chamber for Prior NanoScan Z-stage NZ250 and NZ500**
H201-MEC-35PA	Plate adapter for #4 35mm Petri-dish
H201-MEC-GS35PA	Plate adapter for #2 chamber slides and #2 35mm Petri-dish
H201-MEC-6035PA	Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish
H201-MEC-GS60PA	Plate adapter for #1 chamber slide and #1 60mm Petri-dish
H201-MEC-3GSPA	Plate adapter for #3 chamber slides
H201-MEC-NZ500-ICR	Chambr riser. For multiwell plates higher than 18mm
H201-MEC-MAN	**Micro environmental chamber for manual xy stage**
H201-MEC-MAN-35PA	Plate adapter for #2 35mm Petri-dish
H201-MEC-LG	**Micro environmental chamber Leica Galvo Stage**
H201-MEC-LG-35PA	Plate adapter for #4 35mm Petri-dish
H201-MEC-LG-GS35PA	Plate adapter for #2 chamber slides and #2 35mm Petri-dish
H201-MEC-DH	**Double micro environmental chamber**
H201-MEC-35PA	Plate adapter for #4 35mm Petri-dish
H201-MEC-GS35PA	Plate adapter for #2 chamber slides and #2 35mm Petri-dish
H201-MEC-6035PA	Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish
H201-MEC-GS60PA	Plate adapter for #1 chamber slide and #1 60mm Petri-dish
H201-MEC-3GSPA	Plate adapter for #3 chamber slides
H201-MEC-LID2	Deep set micro environmental lid, for high N.A. objectives
H201-MEC-ASI	**Micro environmental chamber for ASI stage.** It accomodates 6-12-24-48-96 multiwell plates. For other supports add the corresponding plate adapter.
H201-MEC-35PA	Plate adapter for #4 35mm Petri-dish
H201-MEC-GS35PA	Plate adapter for #2 chamber slides and #2 35mm Petri-dish
H201-MEC-6035PA	Plate adapter for #2 35mm Petri-dish and #1 60mm Petri-dish
H201-MEC-GS60PA	Plate adapter for #1 chamber slide and #1 60mm Petri-dish
H201-MEC-3GSPA	Plate adapter for #3 chamber slides
H201-MEC-ASI-ICR	Chambr riser. For multiwell plates higher than 18mm

ELECTRIC CO2 MICROSCOPE STAGE INCUBATOR

Code	Description
TEMPERATURE CONTROLLER	
H301-TC1	**Chamber Temperature Controller**. This unit controls the temperature of the base and lid of the stage incubator. With this controller specimen temperature accuracy is ± 0.3°C.
H301-TC2	**Specimen Temperature Controller.** This unit controls the temperature of the specimen and of the lid of the stage incubator. It improves temperature accuracy to ± 0.2°C.
H301-TM	**Temperature Meter.** Addition of a temperature meter with external temperature probe. It allows to measure ambient temperature or specimen temperature in different positions.
H301-TS	**Read Temperature Software.** It allows to store the temperature data measured during the experiment.
CO2 / O2 CONTROLLER	
2GF-MIXER	**2 Gas Manual Mixer.** It mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85÷100%, the other in the range 0÷15%
3GF-MIXER	**3 Gas Manual Mixer.** It mixes three gas streams by means of floating ball flowmeters. The first gas can be regulated in the range 70÷100%, the second and third gas can be regulated in the range 0÷15%.
DGT-CO2BX	**Digital CO_2 Controller.** CO2 can be regulated in the range 0-20% with great accuracy. Measured CO2 value is displayed in real time.
DGT-CO2BX-PLUS	**Digital CO_2 Controller Plus**. Same as DGT-CO2BOX + RS232 serial port to control and read CO2 levels via software. Measured CO2 and set point values are displayed in real time.
DGT-CO2BX-PLUS-S	**Software for Digital CO_2 Controller Plus.** It allows to control DGTCO2BX-D-RS232 from PC. You can impose CO2 set point value, program CO2 concentration time profiles. acquire and store measurements in time.
DGT-O2BX	**Digital O_2 Controller.** O2 can be regulated in the range 0-25% with great accuracy. Measured O2 value is displayed in real time.
DGT-O2BX-PLUS	**Digital O_2 Controller Plus**. Same as DGT-O2BOX + RS232 serial port to control and read O2 levels via software. Measured O2 and set point values are displayed in real time.
DGT-O2BX-PLUS-S	**Software for Digital O_2 Controller Plus.** It allows to control DGTO2BX-D-RS232 from PC. You can impose O2 set point value, program O2 concentration time profiles, acquire and store measurements in time.
TEMPERATURE AND CO2 CONTROLLERS INTEGRATED IN ONE BOX	
H301-TC1+2GF-MIXER	**Integrated Chamber Temperature Controller and manual 2 gas mixer.** It combines items H301-TC1 and 2GF-Mixer in one box.
H301-TC2+2GF-MIXER	**Integrated Specimen Temperature Controller and manual 2 gas mixer.** It combines items H301-TC1 and 2GF-Mixer in one box.
HUMIDITY MODULE	
H301-BC	**Bubbling column.** It humidifies the gas stream before the inlet into the chamber.
H301-HMTC	**Humidifying Module Temperature Controller.** It controls the bubbling column's temperature, increasing its performance. Suggested for experiments lasting more than 12hrs

ELECTRIC CO2 MICROSCOPE STAGE INCUBATOR

Code	Description
	CHAMBER
H301-EC	**Universal electrically heated chamber.** Fits on Prior, Ludl, Marzhauser, ASI XY Stages. It requires at least one plate adapter.
H301-EC-6MWPA	Plate adapters for 6-well plates. Maximum plate height 17mm.
H301-EC-12MWPA	Plate adapters for 12-well plates. Maximum plate height 17mm.
H301-EC-24MWPA	Plate adapters for 24-well plates. Maximum plate height 17mm.
H301-EC-48MWPA	Plate adapters for 48-well plates. Maximum plate height 17mm.
H301-EC-96MWPA	Plate adapters for 96-well plates. Maximum plate height 17mm.
H301-EC-GS35-PA	Plate adapters for #2 35mm Petri-dish and #1 chamber slide
H301-EC-35PA	Plate adapters for #4 35mm Petri-dish. Maximum height 17mm.
H301-EC-60PA	Plate adapters for #2 60mm Petri-dish. Maximum height 17mm.
H301-EC-chamber riser	Chamber riser. For multiwell plates higher than 18mm.
TIPA	Stage insert for Nikon Ti's Motorized xy stage
H301-EC-PZ100	**Electrically heated chamber for Prior PZ100 nanoscan z-stage.** It hosts #1 35mm pertri or #1 chamber slide.

WARM PLATES

Code	Description
TEMPERATURE CONTROLLER	
H401-T	**Warm Plate Temperature Controller**. This unit controls warm plate temperature. Operating range: 3°C above ambient to 50°C. 24 V DC.
WARM PLATES	
H401-R80	**Round Warm Plate.** It fits in microscope stages with 80mm circular central hole.
H401-SA	Stage adapter to accommodate H401-R80 in microscope stages with rectangular insert (160x110mm)
H401-CA88	Adapter to accommodate H401-R80 in stages with 108mm circular central hole.
H401-CA110	Adapter to accommodate H401-R80 in stages with 110mm circular central hole.
H401-R108	**Round Warm Plate.** It fits in microscope stages with 108mm circular central hole.
H401-PZ100	**Warm Plate for Prior Piezo Stage.** It fits in Prior Nanoscan PZ100 and PZ200. It hosts one 35mm Perti.
H401-CZPS	**Warm Plate for Zeiss Primo Star.** It fits on the manual stage of Zeiss Primo Star. It hosts one 35mm Perti or one glass slide.
H401-DMIL	**Warm Plate for Leica DMIL.** It fits into the Leica DMIL manual stage and hosts one 35mm Perti.

METAL DISHES

Code	Description
RA351804	**GLASS-BOTTOM METAL DISH - observation area: 18mm.** It allows to replace glass bottom plastic dishes, and they can be autoclaved and covered with any 35mm Petri dish cover. Minimise Heat Sink phenomena. Suitable for both LD and oil-immersion objectives. Observation window: 18mm
RA061806	**GLASS-BOTTOM METAL DISH - observation area: 06mm.** It allows to replace glass bottom plastic dishes, and they can be autoclaved and covered with any 35mm Petri dish cover. Minimise Heat Sink phenomena. Suitable for both LD and oil-immersion objectives. Observation window: 6mm

GAS MIXERS

Code	Description
2GF-MIXER	**2 Gas Manual Mixer. I**t mixes two gas streams by means of floating ball flowmeters. One gas can be regulated in the range 85÷100%, the other in the range 0÷15%
3GF-MIXER	**3 Gas Manual Mixer.** It mixes three gas streams by means of floating ball flowmeters. The first gas can be regulated in the range 70÷100%, the second and third gas can be regulated in the range 0÷15%.
DGT-CO2BX	**Digital CO_2 Controller.** CO2 can be regulated in the range 0-20% with great accuracy. Measured CO2 value is displayed in real time.
DGT-CO2BX-PLUS	**Digital CO_2 Controller Plus**. Same as DGT-CO2BOX + RS232 serial port to control and read CO2 levels via software. Measured CO2 and set point values are displayed in real time.
DGT-CO2BX-PLUS-S	**Software for Digital CO_2 Controller Plus.** It allows to control DGTCO2BX-D-RS232 from PC. You can impose CO2 set point value, program CO2 concentration time profiles. acquire and store measurements in time.
DGT-O2BX	**Digital O_2 Controller.** O2 can be regulated in the range 0-25% with great accuracy. Measured O2 value is displayed in real time.
DGT-O2BX-PLUS	**Digital O_2 Controller Plus**. Same as DGT-O2BOX + RS232 serial port to control and read O2 levels via software. Measured O2 and set point values are displayed in real time.
DGT-O2BX-PLUS-S	**Software for Digital O_2 Controller Plus.** It allows to control DGTO2BX-D-RS232 from PC. You can impose O2 set point value, program O2 concentration time profiles, acquire and store measurements in time.

CATALOG 2009

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