



www.tokaihit.com

From the foot of Mt. Fuji to the WORLD




Tokai Hit Official character
Tokai Twins Mikan & Charly

TOKAI HIT will...
Pursue the joy of inspiring our customers.
Manufacture products conscientiously.
Contribute to our community and society.

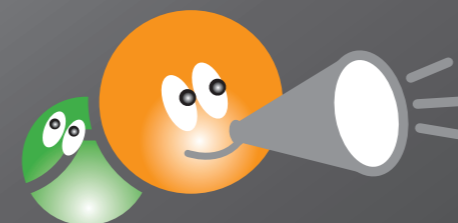


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 It is essential to read the instruction manual when using this device.

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TOKAI HIT



Incubation System for microscopes
Stage Top Incubator[®]

ThermoBox for microscopes
ThermoBox

Clean Box for microscopes
PureBox SHIRAITO[®]

Glass/Metal Heater for microscopes
ThermoPlate[®]

Regenerative Medicine Solution
Bioreactor / Perfusion Pumps

All for Living cells
for your imaging

Incubation System for microscopes

STX

Stage Top Incubator®

Offers precision temperature, humidity and CO₂ control for cell culture on a microscope.
Enables to conduct short and long term (more than 2 weeks) Time-Lapse Imaging.

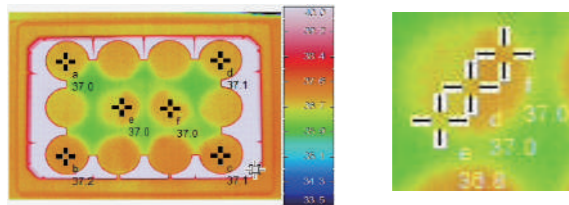
Happiness for Cells, Success for Researchers

TEMP.

Accurate and uniform temperature control

TOKAI HIT Heating Quality

Tokai Hit's original Top Heater is proven to distribute heat uniformly within the Chamber regardless of the type of vessels.



Uniform temperature distribution between wells and within a well.

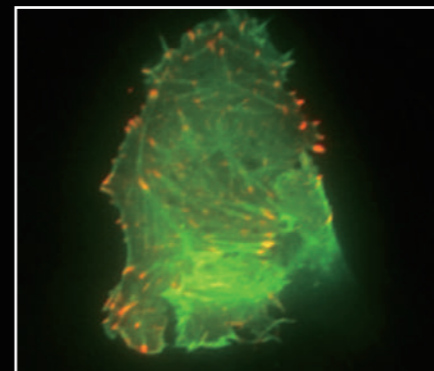
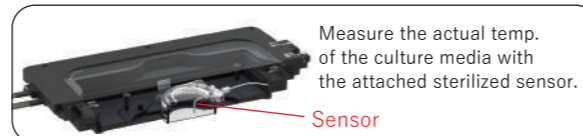
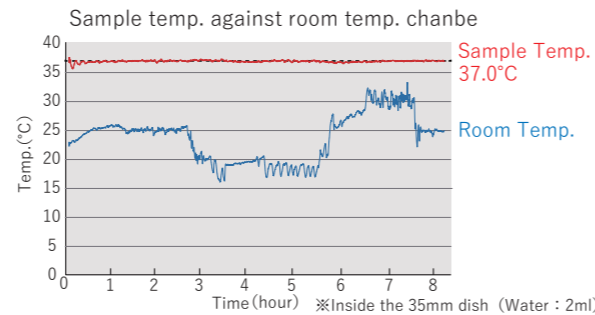
No interference by objective

With unique Top Heater Heating regulation, the bottom of Chamber is access-free for variety of objectives. (No metal plate on the bottom.)

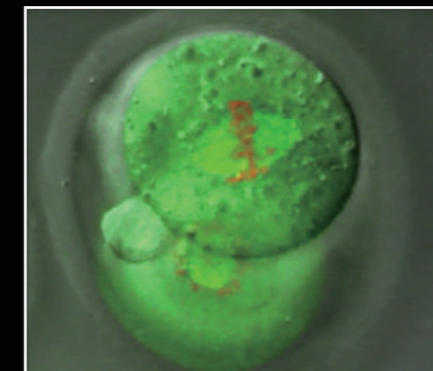


Real-time Sample Feedback Regulation

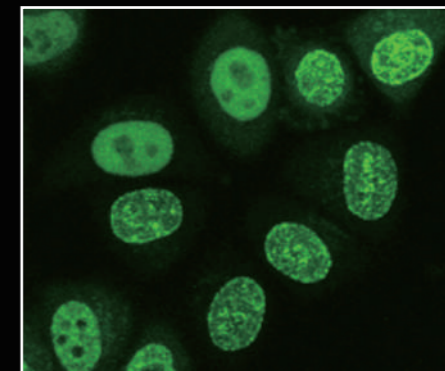
Sterilized temperature sensor and magnetic lids make it easy to measure the temp. of culture media upon research needs. The controller regulates the heater based on the sensor signal to keep sample at the target temp. accurately.



Paxillin actin tirf
Simon Watkins and Claudette St. Croix
Center for Biologic Imaging, University of Pittsburgh



Courtesy of Dr. Kazuo Yamagata
Department of Genetic Engineering,
Kindai University

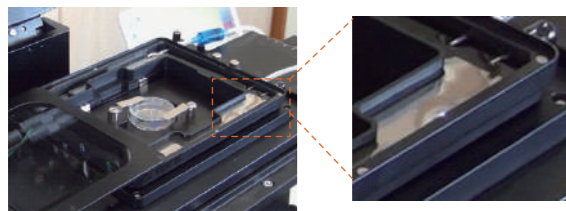


Courtesy of Dr. Hiroshi Kimura
Tokyo Institute of Technology

HUM.

Keeps high-humidity

Keeps high humidity level inside the chamber by heating the distilled water of the water reservoir. The internal humidifier minimizes the change of concentration of the media by keeping the humidity inside the chamber.



Internal humidifier by Bath Heater

CO₂

Stable CO₂ environment

The controller mixes 100%CO₂ gas and the surrounding air automatically. Stable gas concentration inside the Chamber is kept by sending the mixed gas continuously. (※example of controller with a built-in digital gas mixer)



Stage Top Incubator Culture Results

Attribute	Name	Details	Period
Cultured Cell	STO	Embryo; fibroblast, mouse	Over 5 days
Cultured Cell	PC12	Pheochromocytoma; adrenal gland, rat (male)	Over 5 days
Cultured Cell	Hela	Adenocarcinoma; crvix, human (female, 31 years)	Over 5 days
Primary	Human Embryo	Human embryo in vitro; form fertilization to hatching blastocyst	Over 7 days
Primary	Neurons	Development of rat cerebral cortical neurons	Over 4 days
Primary	Neural Stem Cells	Proliferation of neural stem cells of 14-day-old rat embryo	Over 7 days
Primary	Neural Stem Cells	Differentiation of rat neural stem cells to neurons and glial cells	Over 7 days
Primary	Hippocampal Neuron	E18 rat hippocampal neurons, cultured in CO ₂ incubator for the first day	Over 3 days
Primary	Cardiac Myocyte	Neonatal rat heart, fetal mouse, heart beat synchronization	Over 3 days

Chamber Components



■ **Stable and easy fixing**

Stable and easier "Magnetic" fixing

Even when the objective interferes with the bottom of the dish, a spring type buffering mechanism prevents breakage of the dish/objective.

< Normal use > < When objective interference >

The lid is secured to the holder by magnets.

Spring type buffering mechanism

■ **Detachable Lens Heater**

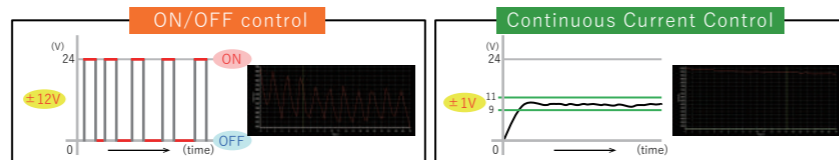
Easy attachment and detachment with magnet relay connector prevents tanglement of the objective revolver and lens heater. It is also possible to lock by twisting the connector.

Features

Intuitive operation and varieties of new functions are included to support cell culturing without stress.

■ Prevent the focus drift

In addition to PID control, Continuous Current Control minimizes the focus drift generated by thermal expansion and it also prevents light intensity change compared to the conventional ON/OFF control.



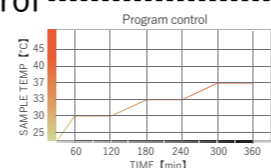
■ STX-APP (Software)

Simple operation of GUI will assist to visualize the system preparation and lead your cell culture to success.



■ Programmable Control

The system includes the software to program temp. and CO₂/O₂ concentration as this function allows to expand the variety of experiments.



■ Screen Capture

Captures the PC screen to transfer images to smart-phones and tablets. Enables to see the image at home.
* PC must be connected with internet.



■ Data Logging

Logs the temperature of each heaters, sample temperature and gas concentration and saves the data in CSV format.



Line-up

WSKMX series

- For Nikon manual/motorized stage
* Stage Adapter is required separately
- Sample temp. : 30 - 40°C
- For well-plate and small vessels use



100%CO₂ gas cylinder use
Model **STXG-WSKMX-SET**

Premixed gas cylinder use
Model **STXF-WSKMX-SET**

TIZWX series

- For Nikon Ti/Ti2 exclusive piezo stage
* In case piezo stage is not attached, Stage Adapter is required separately
- Sample temp. : 30 - 40°C
- For well-plate and small vessels use



100%CO₂ gas cylinder use
Model **STXG-TIZWX-SET**

Premixed gas cylinder use
Model **STXF-TIZWX-SET**

TIZBX series

- For Nikon Ti/Ti2 exclusive piezo stage
- Sample temp. : 30 - 40°C
- Small vessels use



100%CO₂ gas cylinder use Model **STXG-TIZBX-SET**

Premixed gas cylinder use Model **STXF-TIZBX-SET**

PLAMX series

- For ASI PZ-2000/2150/2300 MCL Nano-Z500
- Sample temp. : 30 - 40°C
- For well-plate and small vessels use



100%CO₂ gas cylinder use Model **STXG-PLAMX-SET**

Premixed gas cylinder use Model **STXF-PLAMX-SET**

TIZSHX series

- For Nikon super resolution N-SIM
- Sample temp. : 30 - 40°C
- With shading cover
- Small vessels use



100%CO₂ gas cylinder use Model **STXG-TIZSHX-SET**

Premixed gas cylinder use Model **STXF-TIZSHX-SET**

WELSX series

- For manual/motorized/mechanical stage
- Chamber size is the same as wellplates
- Sample temp. : 30 - 40°C
- Small vessels use



100%CO₂ gas cylinder use Model **STXG-WELSX-SET**

Premixed gas cylinder use Model **STXF-WELSX-SET**

SP400NX series

- For Prior/Queesgate piezo stage SP400/450/600
- Sample temp. : 30 - 40°C
- For well-plate and small vessels use



100%CO₂ gas cylinder use Model **STXG-SP400NX-SET**

Premixed gas cylinder use Model **STXF-SP400NX-SET**

* Compatible with/without WID (Water Immersion Dispenser)

Z500N2 series

- For MCL Nano-Z500-N/N2 piezo stage
- Sample temp. : 30 - 40°C
- For well-plate and small vessels use



100%CO₂ gas cylinder use Model **STXG-Z500N2-SET**

Premixed gas cylinder use Model **STXF-Z500N2-SET**

System Components

SET model

All Dish Attachments and Dish Fixing Lids are included as standard. No more complicated selection.

Controller

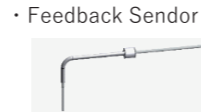


Model **STXG** (For 100%CO₂ gas use)
Size : W151×D263×H196 (mm)
or
Model **STXF** (For premixed gas use)
Size : W151×D298×H196 (mm)

Chamber



Model (Example) **WSKMX**



Model **TSU-200F**

Feedback Sensor

- Extension wire
- Software STX-APP
- USB cable
- Gas tube

Dish Attachments



Model **ATX-W** For well-plate
ATX-A For ATX-D, ATX-CSG
ATX-D For 35mm/60mm dish
ATX-CSG For slide glass, chamber slide, and chambered coverglass

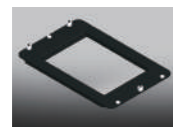
Dish Fixing Lids



Model **LX-W** For well-plate
LX-D35 For 35mm dish
LX-D56 For 60mm dish
LX-CSG For slide glass, chamber slide, and chambered coverglass

Options

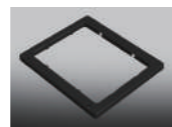
Stage Adapter



Model **TI2-ZILCS**
For WSKMX
TI2-S-SE-E, TI2-S-SS-E



Model **TI2-NA**
For TIZWX · TIZBX
TI2-S-SE-E, TI2-S-SS-E



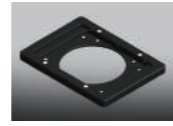
Model **TI2-RA**
For WSKMX
TC-S-SR/SRF



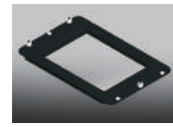
Model **TID-ZILCS**
For WSKMX
TI-S-E/ER



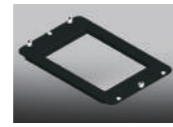
Model **TID-NA**
For TIZWX · TIZBX
TI-S-E/ER



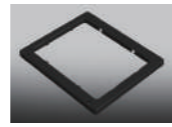
Model **MK-RA**
For WSKMX
TI-SR/SSR (with φ110mm)



Model **WELSX-RA**
For WELSX
TI-SR/SSR (with φ110mm)



Model **WELSX-TIM**
For WELSX
TI2-S-SE-E, TI2-S-SS-E



Model **WELSX-TIP**
For WELSX
Ti/Ti2 piezo stage

Dish Attachments



Model **UNIV2-D35-2**
For 35mm dish × 2



Model **UNIV2-D35-3**
For 35mm dish × 3



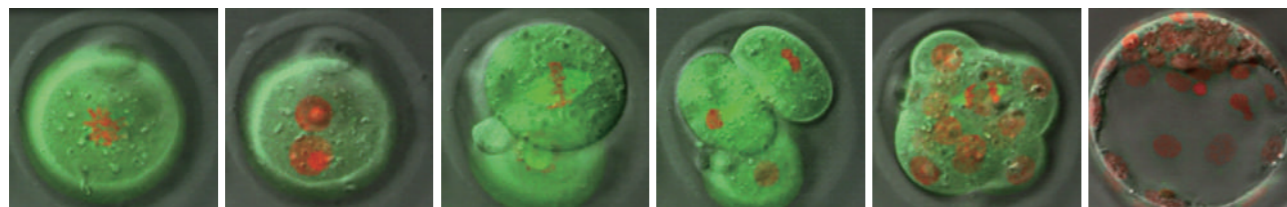
Model **UNIV2-D35-4**
For 35mm dish × 4



Model **UNIV2-D35-5**
For 35mm dish × 5



Model **UNIV2-D35-6**
For 35mm dish × 6

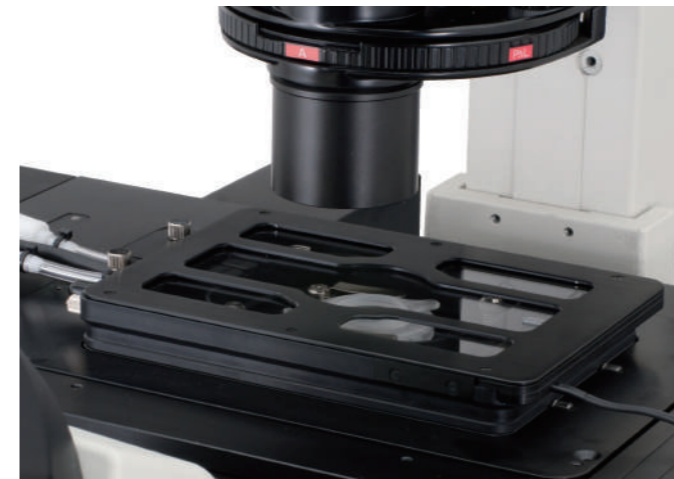


Courtesy of Dr. Kazuo Yamagata : Department of Genetic Engineering, Kinki University

Cooling/Heating Chamber

* Cooling/Heating Chamber is not complied with CE.

Sample temp.: 15 - 40°C (with dry lens) / 20 - 40°C (with oil/water immersion lens)



KRiX series

- For Nikon manual/motorized stage
* Stage Adapter is required separately
- With Chiller Unit
- Sample Feedback regulation
- For small vessels use



100%CO₂ gas cylinder use Model **STXGC-KRiX-SET**

Premixed gas cylinder use Model **STXFC-KRiX-SET**

For upright microscopes

Sample temp. : 37°C

UKX series

- For general XY stages and fixed stage
- For small vessels use

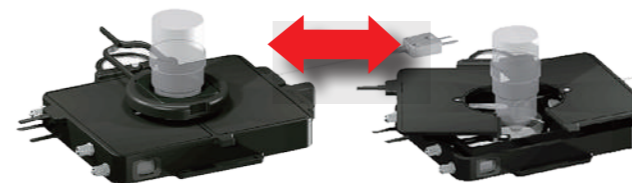


100%CO₂ gas cylinder use Model **STXG-UKX-SET**

Premixed gas cylinder use Model **STXF-UKX-SET**

Opening/Closing Top Heater

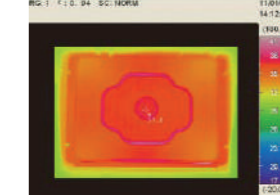
Metal Top Heater with this function make it easy to set the object positioning before imaging.



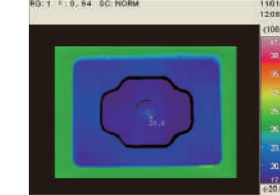
Uniform Temperature Distribution

Normally, it is difficult to control the sample around room temp. because the difference between room temp. and sample temp. is small. Since KRi series has both cooling and heating function independently, it can control temp. precisely.

Heating (Sample : 37°C)



Cooling (Sample : 20°C)



Dish Attachments



For 35mm dish
Cooling/Heating Model **KRiX-D35**
Heating only (optional) Model **ATX-D**

For slide glass, chamber slide, and chambered coverglass
Cooling/Heating Model **KRiX-CSG**
Heating only (optional) Model **ATX-CSG**

* One of Dish Attachment (For Cooling/Heating) is included as standard.

Dish Fixing Lids



For 35mm dish
(Included to the system as standard) Model **LX-D35**

For slide glass, chamber slide, and chambered coverglass
(Included to the system as standard) Model **LX-CSG**



Dish Attachment

For 35mm dish Model **UKX-D35**
For 50/60mm dish Model **UKX-D56**
For slide glass Model **UKX-SG**
* One Dish Attachment is included as standard

Bracket

For manual stage Model **UKX-STD**
For Narishige fixed stage Model **UKX-FNS**
For Prior Z-deck Model **UKX-ZD**
For stages with 160 × 110mm opening Model **UKX-SPC-3**
For Nikon NI-S-E Model **UKX-NI**
* One-set is included as standard

Lens Heater

Lens Heater Model **UKX-LHD**
* Lens Heater is included as standard

Lens Heater Options

Lens Heater Adapter Model **UKX-LHA-□□**
Seal Ring Model **TMU-□□**
* □□ contains the diameter of the objective
* One-set is included as standard

Add-on options

We offer the suitable solutions depending on your experiments.

Stage Top Incubator®

Stage Top Incubator®

Program fluidic control system

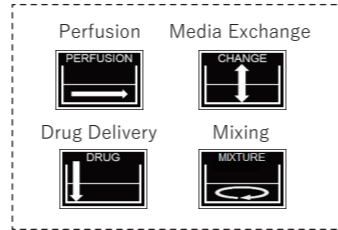
Perfusion, Media Exchange, Drug Delivery and Mixing can be easily programmed and done without disturbing your sample.

Model **PMD-D35**

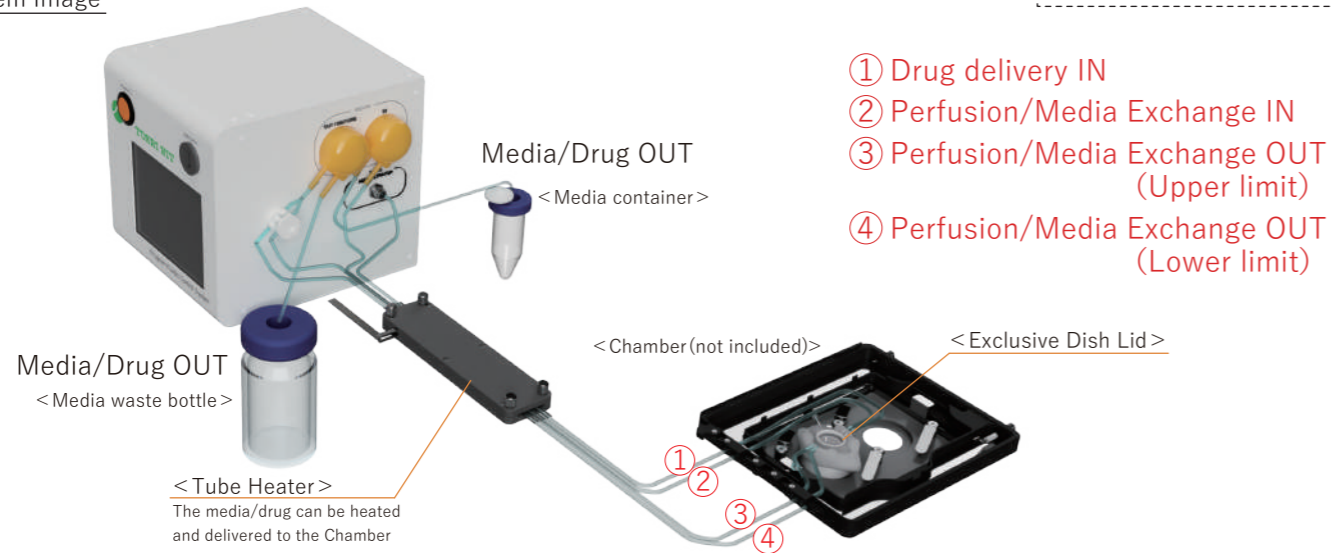
※For STX/STR/INU Chamber
※For 35mm dish

【Specification】

Continuous Perfusion : 40 - 100 μ L/min
Media Exchange volume : 0.6ml - 5.0ml
Media Exchange Number : Maximum 10 times
Drug Delivery : 20 μ L -
Controller size : W175 × D175 × H195 (mm)



System Image



- ① Drug delivery IN
- ② Perfusion/Media Exchange IN
- ③ Perfusion/Media Exchange OUT (Upper limit)
- ④ Perfusion/Media Exchange OUT (Lower limit)

【Components】

- Controller
- Exclusive Dish Lid (**PMD-D35FME**)
- Tube Heater
- Tubes
- Media containers
- PC software (for Windows10)
- ※Media waste bottle is not included

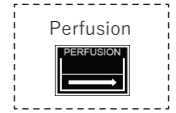
- Enables to mix the media and drug to be uniform after the drug delivery.
- Setting of suction / supply liquid volume at a precise flow rate is possible.
- Regulates the system with TTL IN/OUT.
- High-repeatability experiments are possible by keeping the media level evenly.
- Tube heater is included.
- Supports general 35mm dish.
- Manages each user's program individually by using USB memory.

Micro perfusion system

Allows μ -orders of perfusion incubation both on a microscope and inside the CO₂ conventional incubator.

Model **MKS8-SG** (FB : 0.5 - 8.0 μ L/min)

MKS40-SG (FB : 8.0 - 40.0 μ L/min)



【Key features】

- ① **Time-Lapse imaging with Stage Top Incubator**
Possible to accomplish time-lapse imaging, while cell-culturing with micro-flow application on the microscope.
- ② **Constant flow control and Monitoring**
The "flow-rate feedback" function maintains the perfusion flow-rate even under changes of states of channels
- ③ **Compatible with CO₂ conventional Incubator**
The system is designed moisture-proof and is possible to use inside the conventional CO₂ incubator

【Specifications】

Feedback mode Flow-rate range :
MKS8-SG : 0.5 - 8.0 μ L/min
MKS40-SG : 8.0 - 40.0 μ L/min

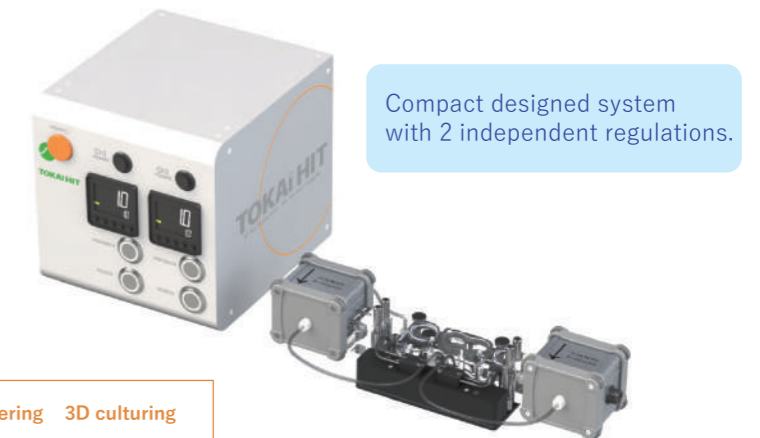
Manual mode Flow-rate range :
0.03 - 40.0 μ L/min

【Components】

- Pumping unit
- Controller
- Slide glass attachment
- Tubes

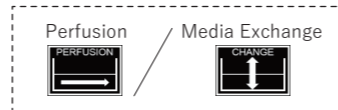
【Application】

Constant flow control Perfusion culturing Tissue-engineering 3D culturing
Organoid Biomimesis MPS Micro-flow Time-lapse imaging



Perfusion/Media exchange system

Perfusion/Media exchange without removing a dish lid is possible.
Prevents media evaporation and contamination during long-term imaging.



Model **KSX-Type1** *For STX/STR Chamber

KS-Type1 *For INU Chamber

【Components】

- Controller
- Media Exchange Lid (**LX-D35FME/D35-200FME**)
- Diamond Insert (**KS-DIA**)
- Glass bottle with air filter (**KS-BOTTLE**)
- Tubes
- * Media waste bottle is not included

【Specification】

Pump flow rate : 0 - 2.9 ml/min
(by using the attached tube)
Pump dimensions : W121 × D175 × H117 (mm)
Silicon tube : OD 3.0mm, ID 1.0mm (Consumable item)

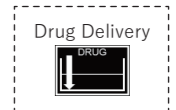
【Application】

- Medium Exchange for long-term time-lapse imaging
- For perfusion during calcium measurement or washing



One-push drug delivery system

Rapid and vibration-free drug delivery is possible.
Prevents media evaporation and contamination during long-term imaging.



Model **KSX-Type2** *For STX/STR Chamber

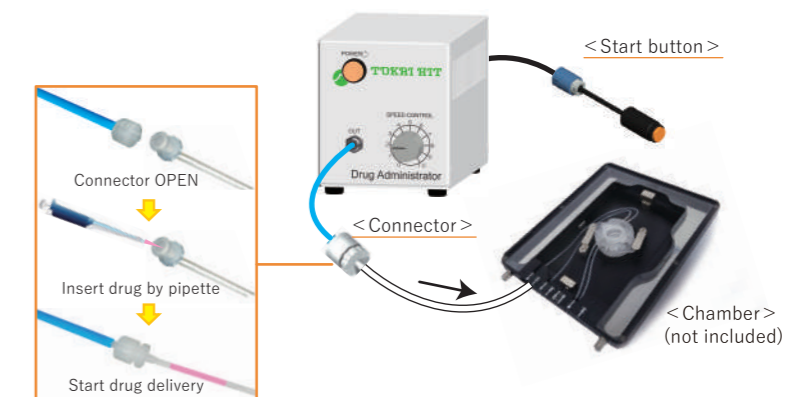
KS-Type2 *For INU Chamber

【Components】

- Controller
- Media Exchange Lid (**LX-D35FME/D35-200FME**)
- Cord with a drug administration start button
- Tubes

【Specification】

Dosage : 20 - 100 μ l
(Contact us if different dosage needed)
Controller dimensions : W100 × D165 × H116 (mm)
Silicon tube : OD 3.0mm, ID 1.0mm
(Tube of the dish side is consumable item)



Add-on options

We offer the suitable solutions depending on your experiments.

Stage Top Incubator

Digital Gas Mixer

Digital Gas Mixer for Stage Top Incubator. You can choose depending on the gas cylinder usage.

For **STX** series

Model **STX-CO2O2**
For low oxygen (Hypoxia)
O₂ concentration : 0.1 - 18.0%
CO₂ concentration : 5.0 - 20.0%
Gas cylinder : 100%CO₂ & 100%N₂
Dimensions : W160 × D271 × H250 (mm)

Model **STX-CO2**
For CO₂ concentration
CO₂ concentration : 5.0 - 20.0%
Gas cylinder : 100%CO₂
Dimensions : W115 × D271 × H250 (mm)
※For STXF controller

Model **STX-O2**
For O₂ concentration
O₂ concentration : 0.1 - 18.0%
Gas cylinder : 100%N₂
Dimensions : W115 × D271 × H250 (mm)
* For STX-CO2 controller only

Independent Controller

Model **GM-8000**
For low oxygen (Hypoxia)
O₂ concentration : 0.1~18.0%
CO₂ concentration : 5.0~20.0%
Gas cylinder : 100%CO₂ & 100%N₂
Dimensions : W160 × D260 × H187 (mm)

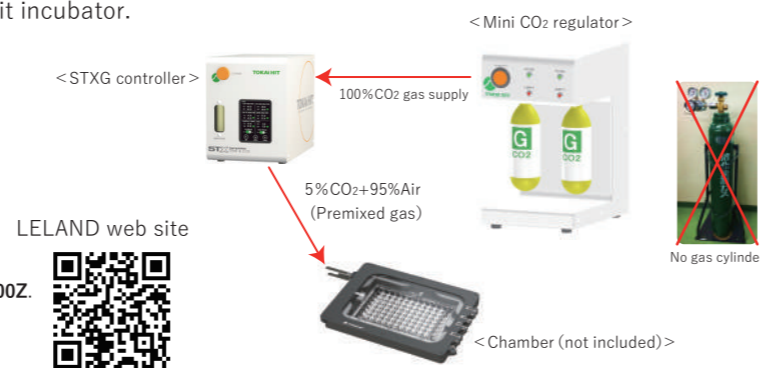
Model **GM-3000**
CO₂ concentration & flow rate
CO₂ concentration : 1.0 - 20.0%
Flow rate : 50 - 200 ml/min
Gas cylinder : 100%CO₂
Dimensions : W121 × D174 × H157 (mm)

Mini CO₂ regulator * MG1 is only available in US and Japan at this moment.

There is no need to prepare a large gas cylinder, and no regulator operation is required. The gas is supplied at the optimal flow rate for the Tokai Hit incubator.

Model **MG1** [Specification]
Output gas pressure: 0.1 MPa
Usable time: about 3 days / 1 cartridge
Dimensions: W135 x D182 x H237 (mm)
Weight: 2.5 kg

- Consumable gas cartridge
Consumable gas cartridge is available. Please contact LELAND with the part number: **88100Z**.
- Cartridge size: 74 g
- Thread design: 5/8 - 18UNF



External Humidifier

Possible to decrease the frequency of refilling internal/external water for more than 3 - 4 days. By using this system with internal humidifier, it covers edge to edge of 96-well plate with stable and high humidity throughout the experiment.

Model **TPIDE-HUMID**

[Components] Temp. Controller, Bottle Heater, Water Bottle, Gas tubes



Reusable 35mm dish * Cyto-cell Chamber (Auto-clavable)

< Collaborative development with Prof. Takafumi Inoue, Waseda Univ. >

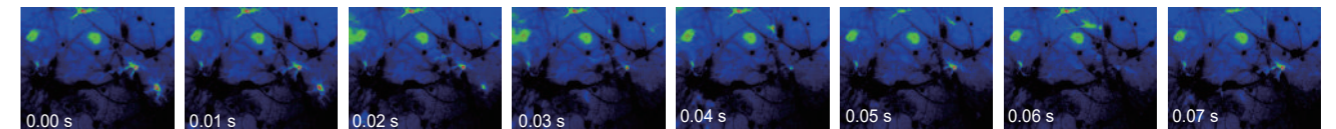
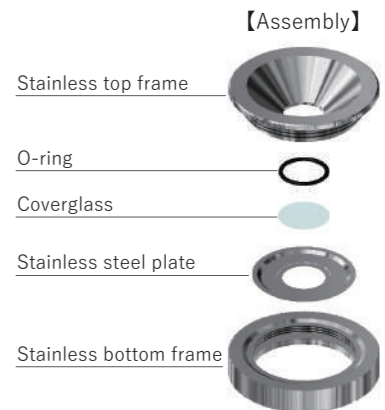
For a small amount of medium
Model **SCC12-D35-SET**
Cover glass size : φ 12.0 mm
Observation area : φ 9.6 mm

For wide range observation
Model **SCC25-D35-SET**
Cover glass size : φ 25.0 mm
Observation area : φ 21.0 mm

【Features】

- Whole bottom observation is possible. No interferes with an objective even under high magnification.
- Running costs can be reduced. By changing the coverglass, the dish can be reused repeatedly.
- Observe with small amount of media.

※Consumable parts (Stainless steel plate, cover glass etc.) are also available.



Calcium imaging captured with Cyto-cell chamber. (Fura-2 Fluorescent image)

Courtesy of : Prof. Takafumi Inoue, Department of Life Science and Medical Bioscience, Faculty of Science and Engineering, Waseda University

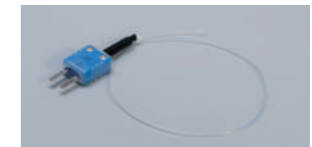
Digital Thermometer for research



Precise temperature measurement is possible by using a thin sensor with Teflon coating and excellent chemical resistance.

Model **MC1000**
Indicate temp. by 1°C or 0.1°C
K-type thermocouple

- < Components >
- Digital Thermometer
 - Thermo Probe (TSU-200F)



- Thermo Probe (sensor type) Model **TSU-200F**
- Extension Wire (1.5 m) Model **HD1500**

IN/OUT Pipe for Media Exchange/Drug Delivery 35mm Dish Spacer



For media exchange and drug delivery with incubation system for upright microscopes etc..

- Model
- PSBD1** Pipe OD 1.1mm
 - PSBD1H** Pipe OD 1.1mm (with side holes)
 - PSBD2** Pipe OD 2.1mm
 - PSBD2H** Pipe OD 2.1mm (with side holes)

When using the 35mm dish from Greiner and Nunc, recommended to use Dish Spacer at the bottom of the dish.



Model **35DI-BS**
For 35mm dish from Greiner and Nunc

Customization

We are accepting customization according to the application and conditions. Please feel free to contact us.

- We have experience more than 100 customized products per year.



We support and design the instruments for customer's requirement with over 20 years technology and knowledge. Please let us know your needs and requirements. We can design customized system for you. We are flexible to design different size, temperature regulation, setting range, etc. e.g. looking for a system for Patch clamp, system integration, unique design/size to installing to your system, etc. We value your needs and requirements. If you have any questions or concerns, please feel free to contact us.

Stage Top Incubator

Enclosure for microscopes

ThermoBox

Maintains a stable cell culturing environment at places where the temperature fluctuation occur. By isolating the microscope from the environment, it also prevents the focus drift caused by the thermal expansion of microscope itself.

ThermoBox for Ti2



- **Duct free design**
Compact design but keeps the temperature performance by using anti-vibration fan heaters.
- **As a simple dark box**
The black type has the property of light shielding and can be used as a simple dark box.
*Front panel transparent model is also available.
- **Anti-vibration heater**
With anti-vibration design, the system can be used under confocal without image drift.

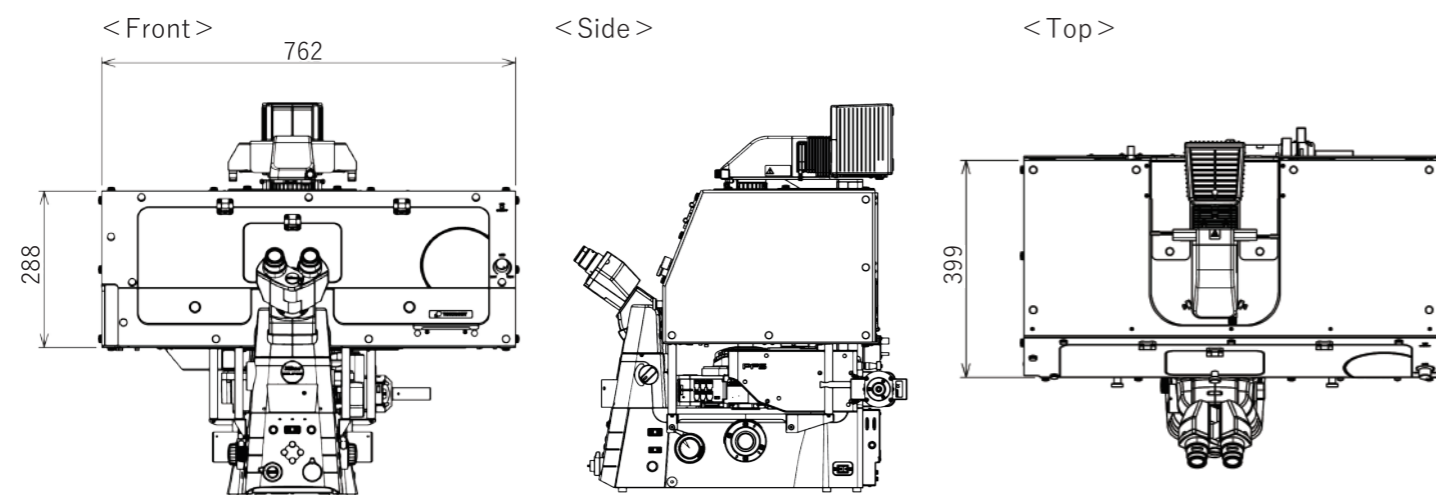
Anti-vibration test movie



- **Easy setup**
Special tool is not required during installation and most of fixing is done by thumb screws.

Specifications

- Dimensions of box : W774 × D427 × H572(mm)
- Dimensions of controller : W210 × D305 × H95 (mm)
- Temp. setting range : Ambient - 40°C (With heater)
- * Compatible with Stage up as standard.



Features

- **Switchable LED light**
Long-wavelength light is switchable depending on the sample and application.
- **IR motion sensor**
Easy to turn on/off LED switch.
- **Smart pillar tilting**
Possible to tilt down the pillar without opening the top panel of the enclosure.
- **Shelves for chamber and accessories**
Multiple shelves are equipped
- **Tube access**
Size : W90.0 × D4.0 (mm)

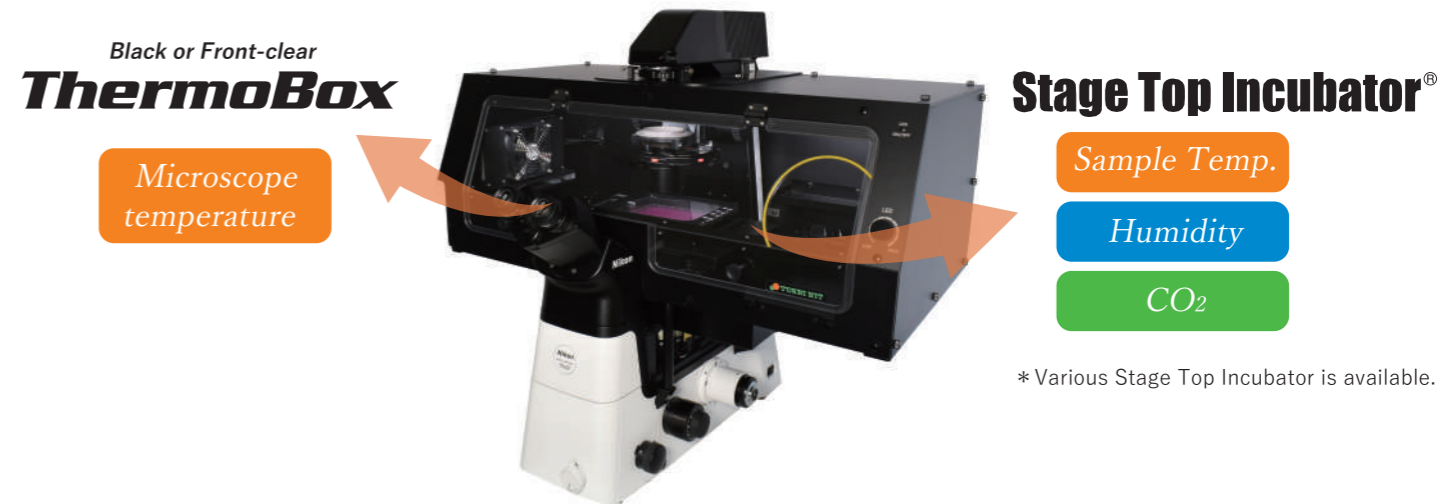


Line-up

Microscope	Stage	Color	Heater	Model
Ti2	Motorized stage <TI2-S-SE-E> <TI2-S-SS-E>	Black type with LED light	With heater	Model TI2TB-E-BK
			Without heater	Model TI2TB-E-BK-NH
		Front-clear type with LED light	With heater	Model TI2TB-E
			Without heater	Model TI2TB-E-NH

* Depending on the accessories (camera, stage etc.), the model may be a customized model. Please contact us for details.
* For manual stage, it is available as customized model.

Achieve the finest cell-culture environment with ThermoBox Incubator Package



* Various Stage Top Incubator is available.

Please contact Tokai Hit for system configuration and microscope set-up compatibility.

Clean Enclosure for microscopes

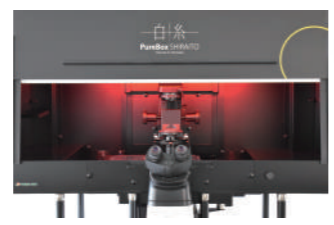
PureBox SHIRAITO®

For clean operation during imaging

PBS series for Nikon Ti2

CLOSE...Culturing

OPEN...Operation



Red LED light
Long-wavelength light is switchable depending on the sample and application.

Line-up

For Non Stage Up Model **TI2PBS-D1**

For Stage Up Model **TI2PBS-D2**

Application
iPS cells Organoid Pharmaceuticals
Food research Fertile ovum

As good cleanness as clean bench (ISO Class 5)

	Maximum particles/m ³			
	Size of the particles			
	0.3 μm	0.5 μm	1.0 μm	5.0 μm
ISO Class 5	10,200	3,520	832	29
PureBox SHIRAITO®	220	1	0	0

Tokai Hit Evaluation Condition:
Detective sensor: BM300C (from Sharp Life science)
Evaluation Time: 24 hours
*Measuring area: Around stage and shelves
*This data is just for reference. It is not assured of the same performance.

Suitable when...

- Image the sample after cell-manipulation at clean bench
- Wish to conduct contamination-free media exchange & drug delivery during the imaging
- Transplant the sample after the imaging
- Not satisfied with the cleanness of current microscope environment
- Run time-lapse imaging without antibiotics
- Image temperature sensitive samples



The same cleanness level as a clean bench

Equivalent performance as ISO 14644-1 Level 5 (Unit: Particle/m³). Supports clean operation during imaging.

Air curtain function

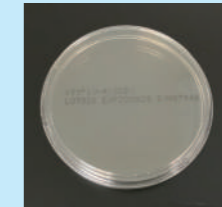
The air flow increases when the front door is open. It prevents foreign matter from getting into the box.



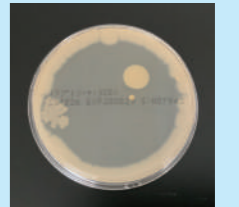
< Minimizes the contamination >

Comparison

Dish with agar media left for 30 minutes without lid on and cultured for 48 hours



Inside PureBox SHIRAITO®
No contamination



Outside PureBox SHIRAITO®
Contamination



Great Expandability

Optical devices (e.g. confocal unit) can be installed on PureBox.



Compatible models :
< Micromanipulator >
- Eppendorf TransferMan/InjectMan
- Narishige SETAGAYA, TAKANOME



< Confocal unit >
- Nikon AX/AX R
- Yokogawa CSU-W1



37°C temperature uniformity

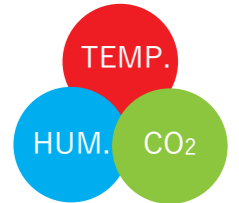
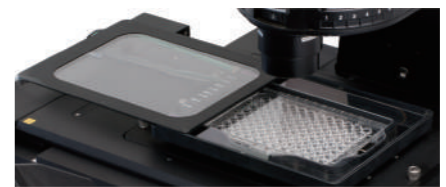
It allows to maintain uniform temperature inside the box optimally.



< Image of heating inside the box >

Combination with Stage Top Incubator®

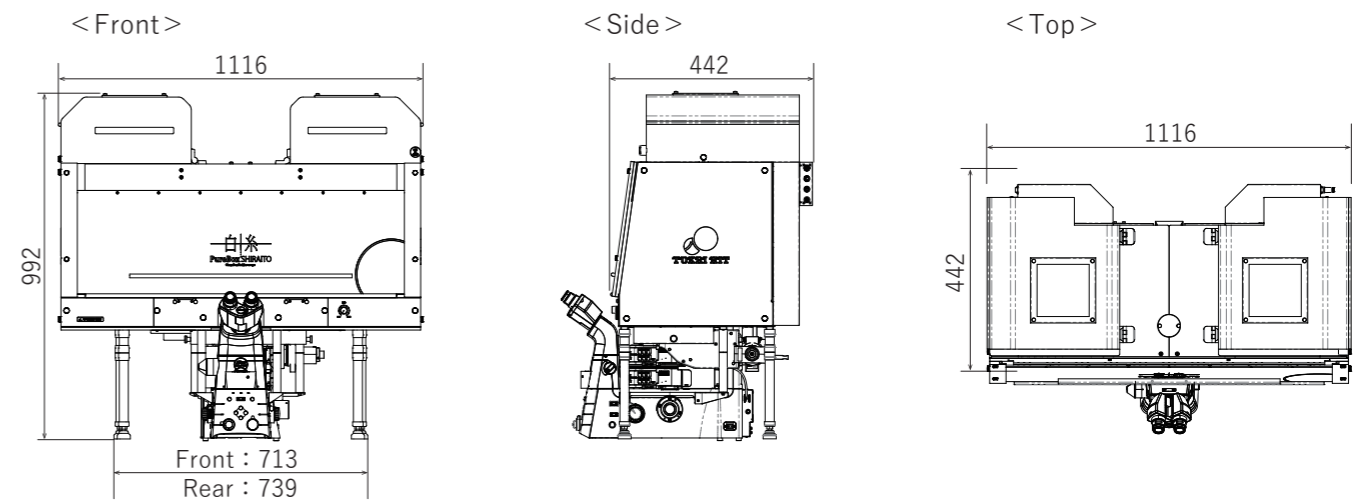
By using Stage Top Incubator® together, it can maintain optimal cell-culture condition under clean condition during live-cell application.



Large working space

Similar operation of a clean bench can be done on a microscope.

< Size > Right : 459 × 257 mm Left : 197 × 458 mm Height : (Right) 362 mm (Left) 354 mm



PureBox SHIRAITO®

PureBox SHIRAITO®

Glass/Metal Heater for microscope ThermoPlate®

Persues high-end “User-Friendliness”

Ensure more accurate and more reliable thermal control of the specimens during the observation under a microscope.
Wide product range supports Biotechnology Science and Industry.



More downsizing and weight saving of controller.
Multi-function system supports temperature management in various fields such as biological science.

● Compact Controller

Miniaturizes the controller to be as small as a smart-phone
It is very useful for space saving in the clean bench.

Controller dimensions : W85 × D135 × H30 (mm)
Size : 232 (cm³) Weight : 170 (g)



● One-touch calibration

Easy calibration to set the suitable PID value on your usage environment is available with just one-touch.

* Tokai Hit's ThermoPlate is calibrated with the controller and the plate as a set to make the center of the plate temp. to be at 37.0°C when the room temp. is 25°C prior to the shipping.



Reference movie : ICSI



● Simple temp. measurement

Attached sterilized sensor can measure the actual temperature and correct the plate surface temperature.
Enable to monitor and log the data of temperature which the sensor measures.



● 10 year free-repair service for glass breakage

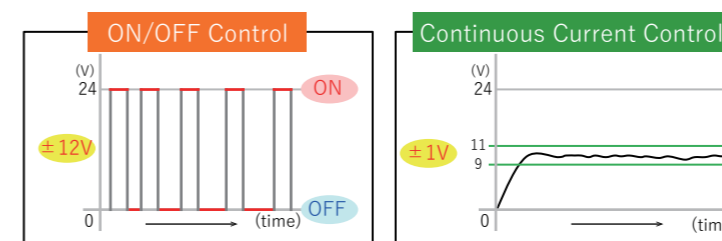
Applied strengthen glass or hard glass for the glass heater and with 10 year free-repair service for glass breakage.
No more glass breakage and no more stopping your experiment.

*1. Depending on the model



● Continuous Current Control

In addition to PID control, Continuous Current Control minimizes the focus drift generated by thermal expansion and it also prevents light intensity change compared to the conventional ON/OFF control.



● Plate LED Indicator

Plate LED Indicator visualizes the plate condition without looking at the controller.
Green LED lights up when the glass heater is ready.



Statement of LED	Condition of the plate
Lights up	The plate surface temp. is stable at the setting temp..
Blinks slowly (1.0 sec. period)	Running Calibration.
Blinks fast (0.2 sec. period)	An error occurred.

* Plate LED is attached to some major models.

Glass Heater Line-up

Tokai Hit's Glass Heaters

Temp. setting range : Ambient - 60°C (* Depending on the model)

Original clear glass heater maintains stable temperature.

Supports the needs in different various fields such as Time-Lapse in low magnification and/or IVF field.



Microscope : **Ti2 / TS2R**
Applicable stage : XY manual stage (TC-S-SR/SRF)

Model **TPI-TCSX**  


Glass thickness : 0.5 (mm)
Plate size : W127.5 × D85.5 (mm)
Heating area : W115 × D75 (mm)




Microscope : **Ti2 / Ti / TE2000**
Applicable stage : Rectangular stage with 108 mm round opening

Model **TPI-108RX**  


Glass thickness : 0.5 (mm)
Plate size : φ 108 (mm)
Heating area : W70 × D70 (mm)



Microscope : **Ti2 / Ti**
Applicable stage : Ti2 exclusive XY motorized stage (TI2-S-SE-E, TI2-S-SS-E), Ti exclusive XY motorized stage (TI-S-E/ER)

Model **TPI-TIZGX** 

Glass thickness : 0.5 (mm)
Plate size : W159.5 × D109.5 (mm)
Heating area : W129 × D87 (mm)



* In case the Nikon Piezo stage is not attached,
optional stage adapter **T12-NA** (for Ti2) / **TID-NA** (for Ti) is required.

Microscope : **TS2**
Applicable stage : XY manual stage (TS2-S-SM)

Model **TPI-TS2X** 

Glass thickness : 0.5 (mm)
Plate size : W238 × D122 (mm)
Heating area : W216 × D94 (mm)



Microscope : **TMS / TMS-F**
Applicable stage : XY mechanical stage

Model **TPI-TMSX** 

Glass thickness : 0.5 (mm)
Plate size : W130 × D90 (mm)
Heating area : W103 × D66 (mm)



Microscope : **TS / TS-100**
Applicable stage : XY mechanical stage

Model **TPI-TSX** 


Glass thickness : 0.5 (mm)
Plate size : W130 × D97.5 (mm)
Heating area : W101 × D71.5 (mm)





Microscope : **TS / TS-100**
Applicable stage : XY mechanical stage

Model **TPI-CKTS**


Glass thickness : 0.5 (mm)
Plate size : W150 × D117 (mm)
Heating area : W131 × D95 (mm)



Microscope : **Ni / Ci / 90i / 80i / 55i / 50i**
Applicable stage : XY mechanical stage

Model **TPI-SX**  

Glass thickness : 0.5 (mm)
Plate size : W142 × D115 (mm)
Heating area : W128 × D95 (mm)



Microscope : **SMZ25/18/1270**
Applicable illumination base : P2-PB/DBL/DBF, P-DSL32/DSF32

Model **TPI-SMZ25X**  

Glass thickness : 1.0 (mm)
Plate size : W251 × D238 (mm)
Heating area : W185 × D175 (mm)





Microscope : **UNIVERSAL**
For various types of illumination bases

Model **TPI-UNIX**  


Glass thickness : 1.5 (mm)
Plate size : W435 × D220 (mm)
Heating area : W400 × D175 (mm)
Leg adjustment : 75 - 100 (mm)
* Temp. setting : Ambient - 50°C





Microscope : **SMZ1500/1000/800**
Applicable illumination base : C-DSD/DSS/BD

Model **TPI-SMZSLX**  

Glass thickness : 1.0 (mm)
Plate size : W254 × D263 (mm)
Heating area : W175 × D185 (mm)



 With 10 year free-repair service for glass breakage.  With Plate LED Indicator.

Microscope : **SMZ1500/1000/800**
Applicable illumination base : C-PS, C-05

Model **TPI-SMZSSX** 

Glass thickness : 1.0 (mm)
Plate size : W198 × D269 (mm)
Heating area : W162 × D152 (mm)



Microscope : **SMZ1500/1000/800**
Applicable illumination base : C-PS, C-05

Model **TPI-SMZR**

Glass thickness : 1.0 (mm)
Plate size : φ 180 (mm)
Heating area : W120 × D120 (mm)



Microscope : **Large Glass Type**
For various types of illumination bases

Model **TPI-W**

Glass thickness : 1.5 (mm)
Plate size : W230 × D180 (mm)
Heating area : W180 × D140 (mm)



Model **TPI-WL**

Glass thickness : 1.5 (mm)
Plate size : W310 × D220 (mm)
Heating area : W250 × D170 (mm)

Metal Heater Line-up

For oil/water immersion objective and high-magnification objective imaging

Temp. setting range : Ambient - 60°C


Focus drift is caused by thermal expansion from the ordinary ON/OFF regulation.

Tokai Hit is applying Continuous Current Control regulation as standard to minimize focus drift.

Microscope : **Ti2 / TS2R**
Applicable stage : XY manual stage (TC-S-SR/SRF)

Model **TPI-TCSH26**


Plate size : W127.5 × D85 (mm)
With a hole (φ 26 mm)



Microscope : **Ti2 / Ti / TE2000**
Applicable stage : Rectangular stage with 108 mm round opening

Model **TPI-108RH26**


Plate size : φ 108 (mm)
With a hole (φ 26 mm)



Microscope : **Ti2 / Ti**
Applicable stage : Ti2 exclusive XY motorized stage (TI2-S-SE-E, TI2-S-SS-E), Ti exclusive XY motorized stage (TI-S-E/ER)

Model **TPI-TIZH26**

Plate size : W160 × D110 (mm)
With a hole (φ 26 mm)



* In case the Nikon Piezo stage is not attached,
optional stage adapter **T12-NA** (for Ti2) / **TID-NA** (for Ti) is required.

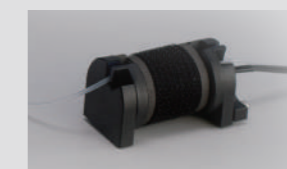
Options



Lens Heater

Model **TPIE-LH**

Temp. setting range : Ambient - 45°C
Prevents heat loss from the sample especially when using oil/water immersion objective and high-magnification objective.



Tube Heater

Model **TPIE-TH**

Temp. setting range : Ambient - 50°C
A compact barrel-type heater. Simply wrap the media tubing for heating the media before inserting it to Chamber Unit.



Hot Plate

Model **TPIE-SP/SPE**

Temp. setting range : Ambient - 45°C
Light-weight and thin aluminum thermal plate.
TPIE-SP : W482 × D282 (mm)
TPIE-SPE : W282 × D232 (mm)

2-channel controller (Option)

2 plates can be controlled by TPiD controller.
Every combination is possible.

Model **TPiD-○○○○-△△△△**
ThermoPlate 1 ThermoPlate 2

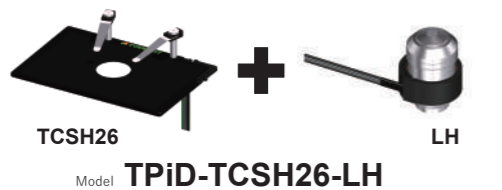
Ex 1 : Glass (for inverted) + Glass (for stereo)



Ex 2 : Glass (for stereo) + Glass (for stereo)



Ex 3 : Metal (for inverted) + Lens Heater



Ex 4 : Glass (for inverted) + Hot Plate



Entire Surface Heating Plate

Temp. control before/after observation

Temp. setting range : Ambient - 50°C

Since the entire surface of the plate is heated, it can manage the temp. of the sample under observation as well as the sample before/after observation. It is very useful when dealing with many samples.

Microscope : **SMZ25/18/1270**

Illumination base : P2-PB/DBL/DBF, P-DSL32/DSF32

Model **TPiD-SMZ25DX**

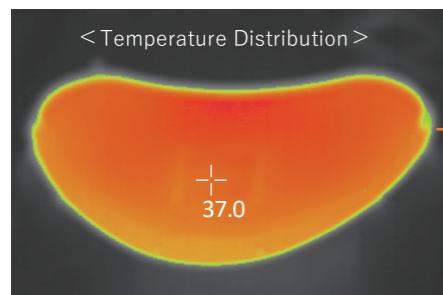
Glass thickness : 0.5 (mm)

Plate size : W370×D248 (mm)

Heating area : <Glass part> W128×D95 (mm)



Enables to keep the vessels warm before and after observation.



By using a glass heater and a metal heater together, the temperature can be controlled uniformly over a wide range.



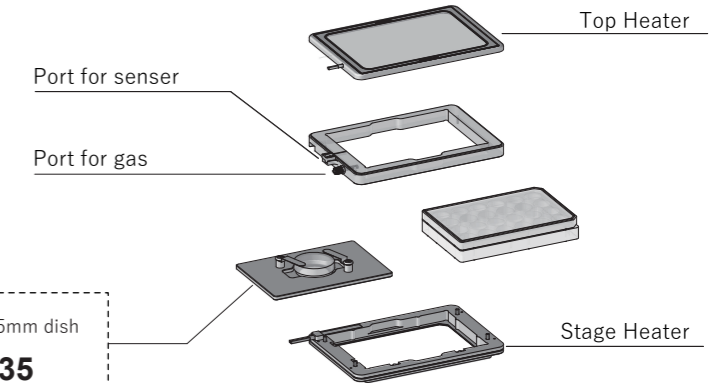
KW series

BOX-type ThermoPlate with a gas port.

Model **TPiD-KW** * Depending on the microscope stage, Stage Adapter may be required.

A box type thermo plate with a gas port that can hold CO₂ gas.

- For inverted microscope
- Setting temp. : Ambient~50°C (Plate temp.)
- Top Glass Heater prevents the condensation of the dish.
- Double Heater system (Top Heater/Stage Heater) keeps the suitable sample temp.
- Multi-well plate can be installed



Option
Dish Attachment for 35mm dish
Model **UNIV2-D35**
* The Dish attachment for 35mm dish × 2 - × 6 is also available.

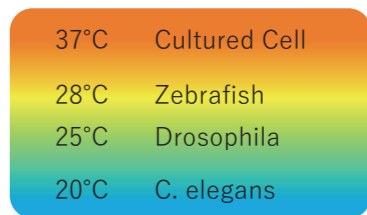
Cooling/Heating Plate

Best for observing yeast, plants, marine samples, cultured cell, C. elegans and/or Planarian, etc.

Temp. setting range (Plate surface) : 4 - 60°C

With electronic cooling element (Peltier module) and original control system, it allows responsive cooling and heating regulation.

It can be used for controlling activation of the common samples which normally cultured at 37.0 degree C by lowering the temperature or observe expressions of samples at each temperature.



Microscope : **Ti2 / TS2R**

Applicable stage : XY manual stage (TC-SR/SRF)



Model **TP-CHTCS-C**

Plate size : W127.5×D85 (mm)
With a hole (φ20mm)



Microscope : **Ni / Ci / 90i / 80i** Upright / Stereo microscopes

Applicable stage : XY mechanical stage



Model **TP-CHS-C**

Plate size : W110×D110 (mm)
With a hole (φ20mm)



Microscope : **Ti2 / Ti / TE2000**

Applicable stage : Rectangular stage with φ108 mm round opening



Model **TP-CH108RBF-C**

Plate size : φ108 (mm)
With a hole (φ20mm)
* Bottom flat type

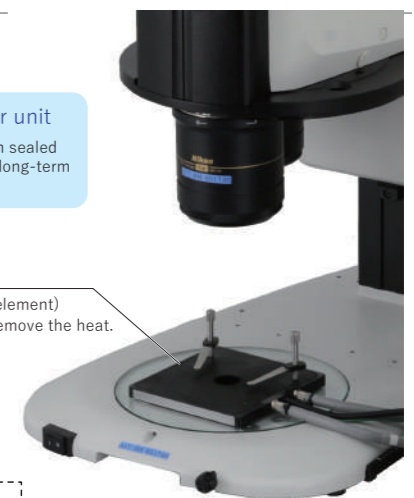


Model **TP-CH108R-C**

Plate size : φ108 (mm)
With a hole (φ20mm)
* Surface flat type

Built-in dedicated chiller unit
Cool the circulating water with sealed water. It can also be used for long-term observation.

Plate
Built-in cooling element (Pelche element) and the circulation of water will remove the heat.



* The plate may build the condensation at the bottom when the setting value (SV) of the controller set below 15.0°C (depending on the lab temperature).
The system may not be suitable for Long-term imaging and for rooms with high humidity.

— Bioreactor —

We design Bioreactor to support cell to organoid, tissue and organ.

Pressure Stimulation Unit

Main Unit

Enable to adjust the pressure in the culturing vessel inside the conventinal CO2 incubator.

Model **PSU**

[Components] Pump Unit, Sealing lid for 35mm dish
Dish Attachment

[Application]

Tissue-engineering, Vascularization, Perfusion culture, 3D culture, Organoid
Biomimesus, Decellularization, Organ culture, Organ preservation, Mechanobiology

[Features]

① Time, positive and/or negative pressure in the vessel can be programmed.

Support Intermittent and steady pressure modes.
The date logging function is integrated.

② The system for gas exchange.

Method to incorporate CO2 from the conventional CO2 incubator (inside) through sterilizing filter.
Possible to use together with Tokai Hit add-on Digital Gas mixer.

③ Possible to be placed inside the conventional CO2 incubator

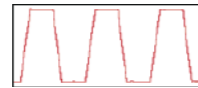
Moisture-proof design and shield technology.
Make it possible to place the system inside the conventional CO2 incubator.



[Basic Specification]

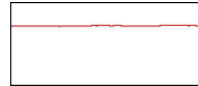
Intermittent pressure mode

Intermittent pressure range :
-100 - 300 mmHg
Time setting: Every second



Steady pressure mode

Pressure setting range :
-100 - 300 mmHg
Time setting: 1 mmHg



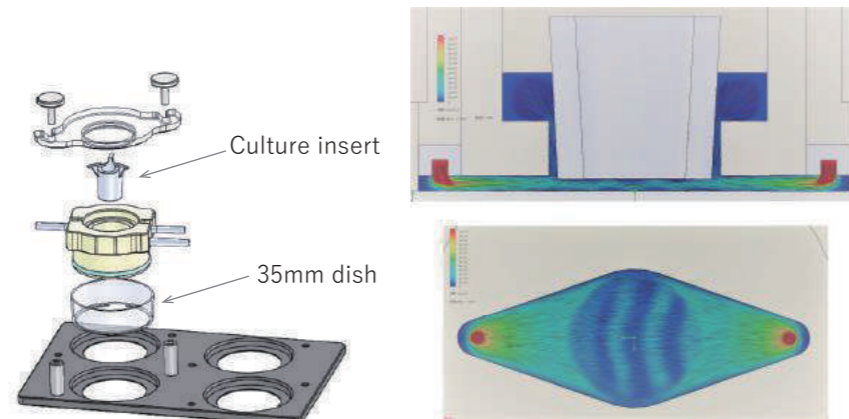
The sealed vessels can be custom-made upon request.
The system supports cells, tissue and organ study/reseaches.
Auto-clave is possible.

Capable of use with a culture insert

Develop a perfusion system for 35mm to be used with commercially available culture insert.
By using both sealed culture vessel and PSU, it can stimulate cells and/or organoid physically and perfusion culturing together

Model **ORC-D35-C01**

35mm dish and lid set for culture insert.



The simulation analysis of flow velocity

— Perfusion pump —

Possible to install a perfusion system including a pump in a conventional CO2 incubator.

Constant pressure perfusion & Pulsating constant pressure pump unit

Non-contact pressure measurement allows to measure the flow path pressure during perfusion under aseptic condition and by feedback to the pump, the constant pressure supply is possible.

Model **BPU**



[System]

The controller on the right hand side will regulate the system outside of conventional CO2 incubator

[Basic Specification]

Pulsating constant pressure mode

Pulsating pressure range : 0~200 mmHg
Time STEP : from 1 sec
* Suitable for vascular experiment

Constant pressure mode

Pressure setting range : 0~200 mmHg
Setting STEP : 1 mmHg

Constant flow mode

Flow rate setting range :
0.3~42.0 mL/min or 0.04~6.00 mL/min
Setting STEP : 0.1 mL/min or 0.01 mL/min

[Application]

Constant Pressure perfusion Tissue-engineering Vascularization
3D culturing Blood-pressure measurement Biomimesis
Pressure Transducer Organoid

[Features]

① Possible to run perfusion inside the conventional CO2 incubator.

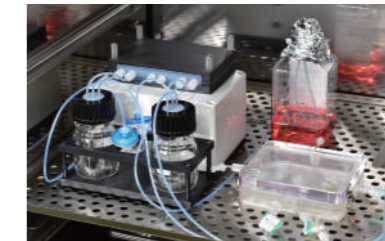
With the moisture-proof designed system, possible to install a perfusion system including 1 pump in a conventional CO2 incubator.

② Ideal pulsating constant pressure perfusion for vascular experiments and organ related experiments.

Change the perfusion mode between, Constant pressure, Pulsating Constant Pressure and Constant Flow + data logging function are integrated.

③ Non-contact pressure measurement allows to measure the flow path pressure during perfusion under asptically condition

Non-contact pressure measurement allows to monitor the flow path pressure during perfusion under aseptic condition and possible to regualte flow rate and pressure.



Three pumps are mounted on the unit in the conventional CO2 incubator

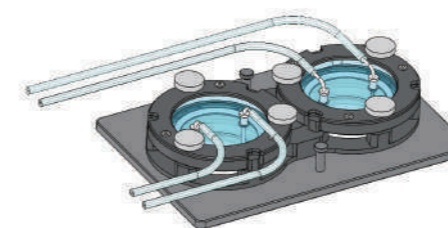


Sealed lid for 35mm dish & Dish Attachment

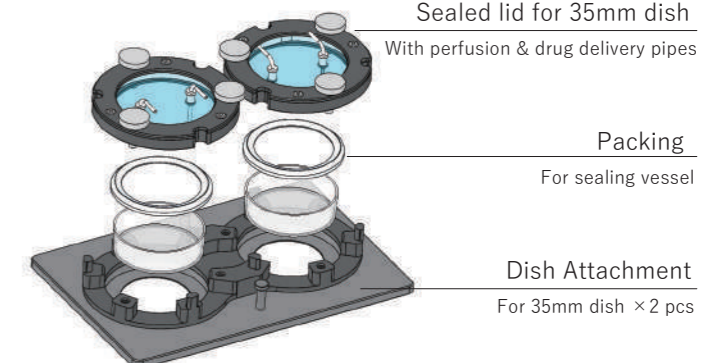
Model : **ORC-D35-2**

Sealed lid with perfusion & drug delivery pipes
Dish Attachment for 35mm dish × 2 pcs.

Applicable brand : Corning / MatTek / Eppendorf / IWAKI / Nunc / Greiner



[System image]



Sealed lid for 35mm dish
With perfusion & drug delivery pipes

Packing
For sealing vessel

Dish Attachment
For 35mm dish × 2 pcs