

# TOKAI HIT<sup>®</sup>

for Leica Microsystems



[www.tokaihit.com](http://www.tokaihit.com)



*Incubation System for microscopes*  
**Stage Top Incubator<sup>®</sup>**



*Glass/Metal Heater for microscopes*  
**Thermo Plate<sup>®</sup>**



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

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TOKAI HIT will ...

Pursue the joy of inspiring our customers.

Manufacture products conscientiously.

Contribute to our community and society.

All for living cells  
for your imaging

*Temp., Humidity and CO<sub>2</sub> control instrument for Time-Lapse Imaging*

## Incubation System for microscopes

### Stage Top Incubator<sup>®</sup>

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



■ **STX**

Happiness for Cells, Success for Researchers.

■ **Add-on Options**

Solutions for variety of experiments.

*Control temperature around a microscope*

## ThermoBox for microscopes

### ThermoBox

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

*Automatic Thermo-control System (For IVF and basic research)*

## Glass/Metal Heater for microscopes

### ThermoPlate<sup>®</sup>

Ensures more accurate and reliable thermal control of the specimens during the observation under a microscope. Wide product range supports Biotechnology Science and Industry. 10 year free-repair service for glass breakage is adopted.



# Incubation System for microscopes Stage Top Incubator®

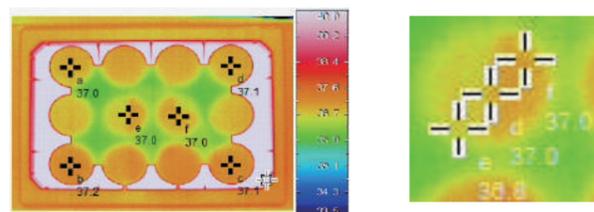
Offer precision temperature, humidity and CO<sub>2</sub> control for cell culture on a microscope. Enables to conduct short and long term (more than 2 weeks) Time-Lapse Imaging.

## Features

### 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.  
\* In our measurement environment

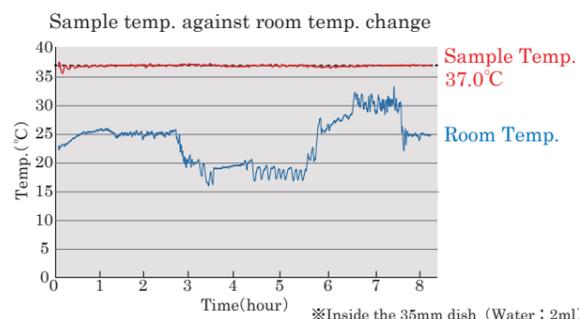
#### No interference by objective

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



#### Real-time Sample Feedback Regulation

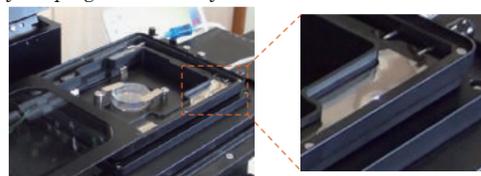
Sterilized temperature sensor and magnetic lids make it easy to measure the temp. of culture media upon research needs. The controller regulates the heater based on the sensor signal to keep sample at the target temp. accurately.



Measure the actual temp. of culture media with a attached Sensor sterilized sensor.

### HUM. Keeps high-humidity over 95%

Keep the humidity level inside the chamber more than 95% by heating the distilled water in the Bath Unit. The internal humidifier minimizes the change in concentration of media by keeping the humidity inside the chamber.



Internal humidifier by Bath Heater

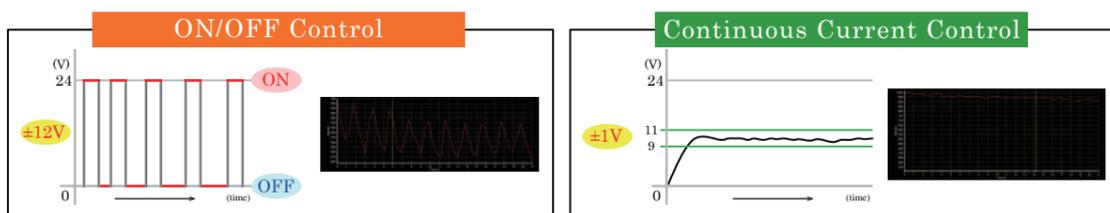
### CO<sub>2</sub> Stable CO<sub>2</sub> environment

The controller mixes 100%CO<sub>2</sub> gas and the surrounding air automatically. Stable gas concentration inside the Chamber is obtained by keep sending the mixed gas to the Chamber. (※In case of controller with a built-in digital gas mixer)



### REG. 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.



## Chamber Components

### Top Heater

Main heater which heats the specimen from the upper surface. The transparent glass heater prevents condensation and supports clear visibility.

#### Strengthen glass applied

Minimize the risk of glass breakage.



### Dish Fixing Lid

Easy setting of vessels with magnetic lid.



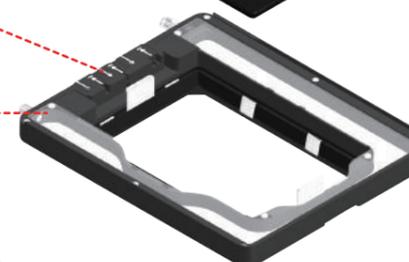
### Dish Attachment

Supports 35mm dish, 50/60mm dish, chamber slide, slide glass and chambered coverglass by changing one-touch magnetic holder.



### Access Ports

For temperature sensor and tubing for media exchange and drug delivery.



### Bath Unit

Keeps distilled water and embedded Bath Heater heats it directly from beneath to generate high-humidity inside the Chamber unit.

### Lens Heater

Prevents heat escaping from the sample to the objective. Especially effective under high magnification, oil/water immersion observation.  
\* Can accommodate objectives up to φ 40mm.  
Thin type and longer type are optional.



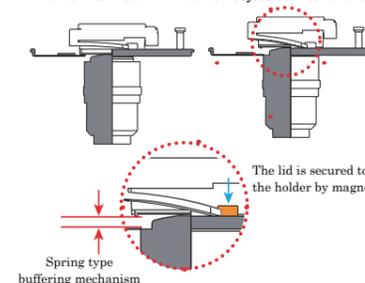
### Easy Dish Fixing

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.

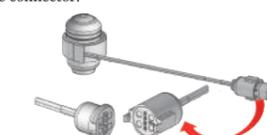
<Normal use> <When objective interference>



The lid is secured to the holder by magnets.  
Spring type buffering mechanism

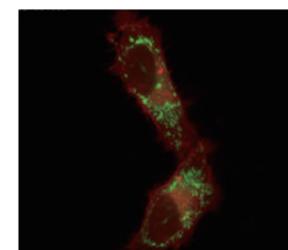
### Wreck Proof Lens Heater Cord

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

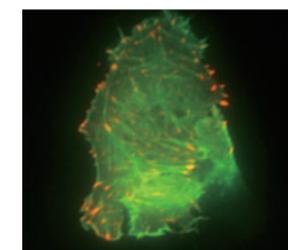


## Stage Top Incubator Culture Results

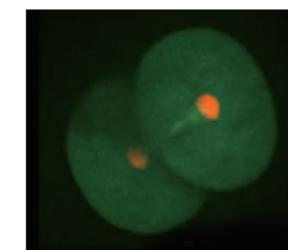
Attribute	Name	Details	Period
Cultured Cell	STO	Embryo; fibroblast, mouse	Over 5 days
Cultured Cell	PC12	Pheochromocytoma; adrenal gland, rat (male)	Over 5 days
Cultured Cell	Hela	Adenocarcinoma; crvix, human (female, 31 years)	Over 5 days
Primary	Human Embryo	Human embryo in vitro; form fertilization to hatching blastocyst over 7 days	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 <sub>2</sub> incubator for the first day	Over 3 days
Primary	Cardiac Myocyte	Neonatal rat heart, fetal mouse, heart beat synchronization	Over 3 days



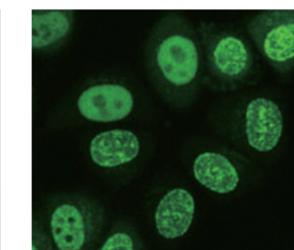
Courtesy of Dr. Takeharu Nagai  
The Institute of Scientific and Industrial Research, Osaka University



Paxillin actin tirlf  
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



Visit <http://www.tokaihit.com> for more details regarding our products. (Accessible from the QR code)

# STX

## Standard Model Stage Top Incubator®

25 years of our technical know-how is here.

## Happiness for Cells, Success for Researchers

To support successful cell culturing with new features,  
“STX” is our answer to the optimized incubating environment.



### Line-up

#### WSKMX series

- For Leica manual/motorized stage
- Sample temperature : 30~40°C



- For well-plate and small vessels use

With built-in digital gas mixer  
\* for 100%CO<sub>2</sub> gas cylinder use  
With built-in analog flow meter  
\* for premixed gas cylinder use



Model **STXG-WSKMX-SET**  
Model **STXF-WSKMX-SET**

#### DMIWX series

- For Leica manual/motorized stage (with condenser cover)
- Sample temperature : 30~40°C



- For well-plate and small vessels use

With built-in digital gas mixer  
\* for 100%CO<sub>2</sub> gas cylinder use  
With built-in analog flow meter  
\* for premixed gas cylinder use



Model **STXG-DMIWX-SET**  
Model **STXF-DMIWX-SET**

#### GSI2X series

- For Leica SP8/SP5 Super Z Galvo stage
- Sample temperature : 30~40°C
- For small vessels use



With built-in digital gas mixer  
\* for 100%CO<sub>2</sub> gas cylinder use  
With built-in analog flow meter  
\* for premixed gas cylinder use



Model **STXG-GSI2X-SET**  
Model **STXF-GSI2X-SET**

#### PLAMX series

- For Andor Dragonfly, ASI PZ-2000, Ludl 99A602, MCL Nano-Z500
- Sample temperature : 30~40°C



- For well-plate and small vessels use

With built-in digital gas mixer  
\* for 100%CO<sub>2</sub> gas cylinder use  
With built-in analog flow meter  
\* for premixed gas cylinder use



Model **STXG-PLAMX-SET**  
Model **STXF-PLAMX-SET**

### Cooling/Heating Chamber

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



#### KRiX series

- For XY manual/motorized stage
- With Chiller Unit
- Sample Feedback regulation
- For small vessels use

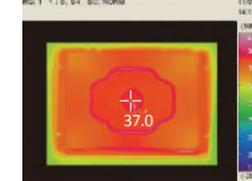


With built-in digital gas mixer Model **STXGC-KRiX-SET**  
With built-in analog flow meter Model **STXFC-KRiX-SET**

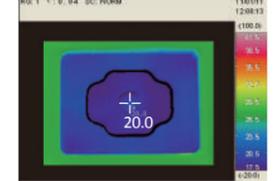
#### Uniform Temperature Distribution

Normally, it is difficult to control around room temp. because there is not big difference between room temp. and sample temp.. Since KRi series has both cooling and heating function independently, it can control around room temp. precisely.

Heating (Sample : 37°C)



Cooling (Sample : 20°C)



#### Dish Attachment



For 35mm dish  
Cooling/Heating Model **KRiX-D35**  
Heating only Model **ATX-D**  
For slide glass, chamber slide, and chambered coverglass  
Cooling/Heating Model **KRiX-CSG**  
Heating only Model **ATX-CSG**

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

#### Exclusive Sensor Lid



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**

### For upright microscope

Sample temp. : 37°C

#### UKX series

- For XY mechanical stage of upright microscope
- For small vessels use



With built-in digital gas mixer Model **STXG-UKX-SET**  
With built-in analog flow meter Model **STXF-UKX-SET**

#### Opening/Closing Top Heater

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



#### Dish Attachment

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

#### Bracket

For manual stage **UKX-STD**  
For Narishige fixed stage **UKX-FNS**  
For Prior Z-deck **UKX-ZD**  
For stages with 100\*110mm opening **UKX-SPC-3**  
\* One-set is included as standard

#### Lens Heater

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

#### Lens Heater Options

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



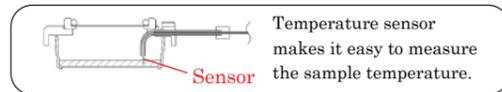
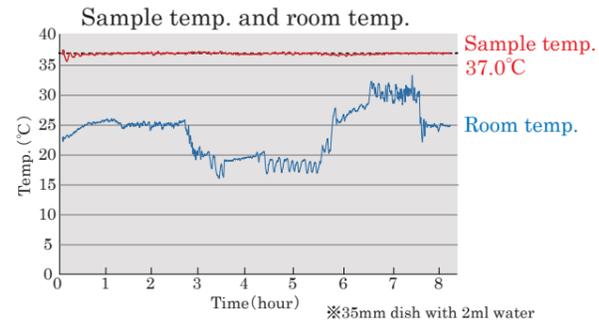
## Features

### A fail-proof Incubation

Provides an easy, cleaver and accurate cellular environment.

#### Sample Feedback Mode

Sterilized temperature sensor makes it easy to measure the sample temperature. The controller regulates the Top Heater setting value automatically based on the feedback from the sensor to keep sample at setting value accurately.



Feedback mode can be used to determine the suitable setting value of Top Heater in your actual room temperature/environment.

### Stress-Free Quality

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

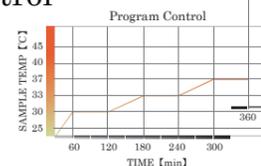
#### STX-APP (Software)

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



#### Programmable Control

The system includes the software to program temp. and CO<sub>2</sub>/O<sub>2</sub> concentration as this function allows to expand the variety of experiment.



#### 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.



### Simple Selections

Easy add-on and expand the application. Now available with common accessories as standard.

#### SET model

All Dish Attachment and Dish Fixing Lid are included as standard. No more complicated selection.

<SET components>

##### Controller



Model **STXG**  
With built-in digital gas mixer  
or  
Model **STXF**  
With built-in analog flow meter

##### Chamber



Model **WSKMX**

##### Feedback Sensor



Model **TSU-200F**

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

##### Dish Attachment



Model <b>ATX-W</b>	For well-plate
<b>ATX-A</b>	For ATX-D, ATX-CSG
<b>ATX-D</b>	For 35/50/60mm dish
<b>ATX-CSG</b>	For slide glass, chamber slide and chambered coverglass

##### Dish Fixing Lid



Model <b>LX-W</b>	For well-plate
<b>LX-D35</b>	For 35mm dish
<b>LX-D56</b>	For 50/60mm dish
<b>LX-CSG</b>	For slide glass, chamber slide and chambered coverglass

#### Options

##### Dish Attachment



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



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

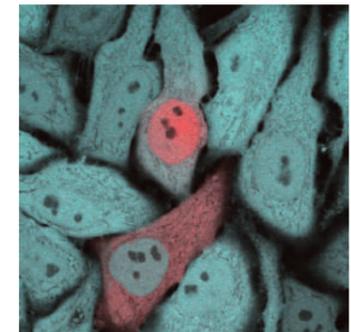


Model **UNIV2-D35-4**  
For 35mm dish ×4



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

※The dish attachment for 35mm dish ×5 is also available.



Courtesy of Dr. Takeharu Nagai  
The Institute of Scientific and Industrial Research, Osaka University

## Add-on options

### Digital Thermometer for research



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

Model **MC1000**  
Indicate temp. by 1 degree C/0.1 degree C units  
K-type thermocouple

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



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

### IN/OUT Pipe for Media Exchange/Drug Delivery



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)

### 35 mm Dish Spacer

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



Model **35DI-BS** (left)  
For 35mm dish from IWAKI  
Model **35DGN-BS** (right)  
For 35mm dish from Greiner and Nunc

### Reusable 35 mm 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

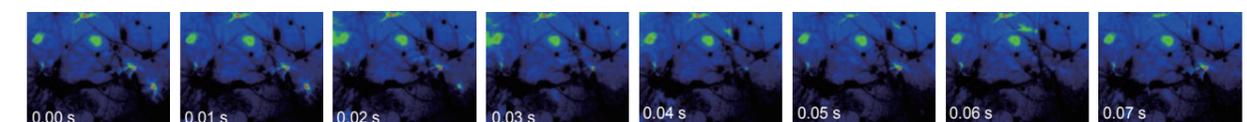
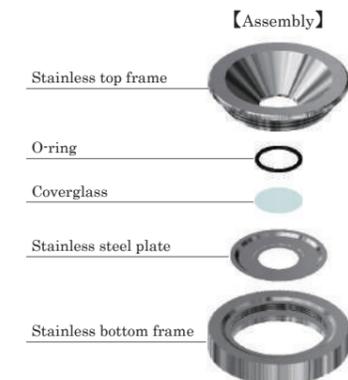


Model **SCC12-D35-SET**  
Cover glass size : φ 25.0 mm  
Observation area : φ 21.0 mm

#### 【Features】

1. Whole bottom observation is possible.  
No interferes with an objective even under high magnification.
2. Running costs can be reduced.  
By changing the consumable parts, the dish can be reused repeatedly.
3. 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

# STX ECO

ECO Model  
Stage Top Incubator®

We wish to introduce great cost performance system with 25 years of our technical know-how.

## Deliver High-Quality system to everyone!

### Features

#### Simple ECO model

Start time-lapsing without a hassle with our simple product selection and function.

##### Components

###### Controller



Model **STXG**  
With built-in digital gas mixer  
or  
Model **STXF**  
With built-in analog flow meter

###### Chamber



Model **WELSX**

###### Temperature Sensor



• Extension Wire  
• Gas tube

###### Dish Attachment



Model **ATX-D**  
For 35/50/60mm dish

###### Dish Fixing Lid



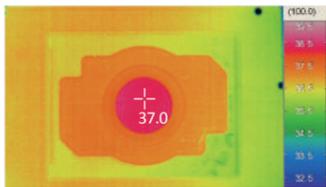
Model **LX-D35** For 35mm dish  
**LX-D56** For 50/60mm dish

#### Simple and high cell culture performance

Maintains a high-capability of cell culturing environment without complicated functions.

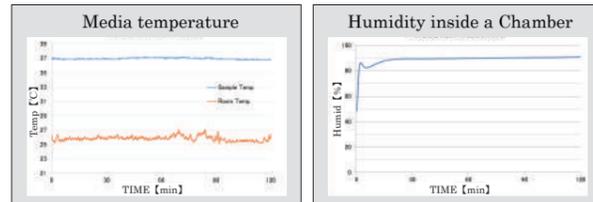
##### Heating Quality

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



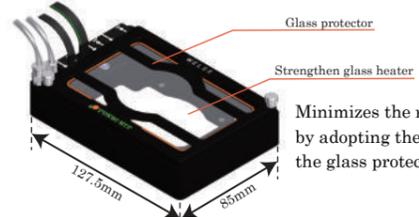
##### Temperature & Humidity

Saves complicated function but keeps a stable thermal environment under a determinate room environment. The built-in Bath Unit keeps the humidity level inside the Chamber more than 95%.



##### Universal Design

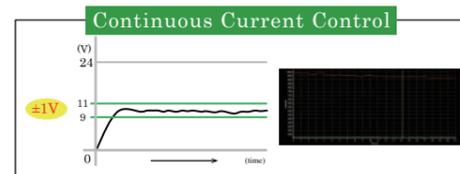
The external dimensions of the WELSX Chamber are 127.5x85mm, which are same size as well-plates. It could be used on all stage that fits a well-plate.



Minimizes the risk of glass breakage by adopting the strengthen glass and the glass protector.

##### 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.



#### Various upgrade options

Various functions can be upgraded by adding on to STX-ECO model depending on your requirements.

**STX-ECO model (-E)** e.g. **STXG-WELSX-E**

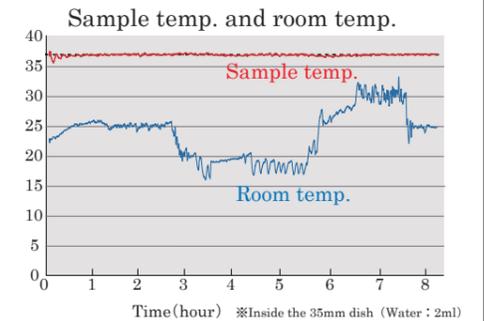
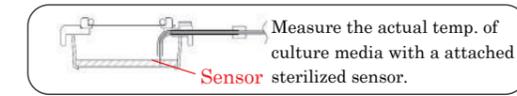
##### ADD Dish Attachment & Fixing Lid (-C)



For slide glass, chamber slide and chambered coverglass use  
Dish Attachment (Model **ATX-CSG**) + Fixing Lid (Model **LX-CSG**)

##### ADD Real-time Sample Feedback Regulation (-F)

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.



##### ADD Software Control & compatible with LAS-X (-A)

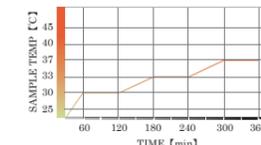
STX-APP (Tokai Hit original software) has intuitive operation and varieties of functions.

###### <Data Logging>



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

###### <Program Control>



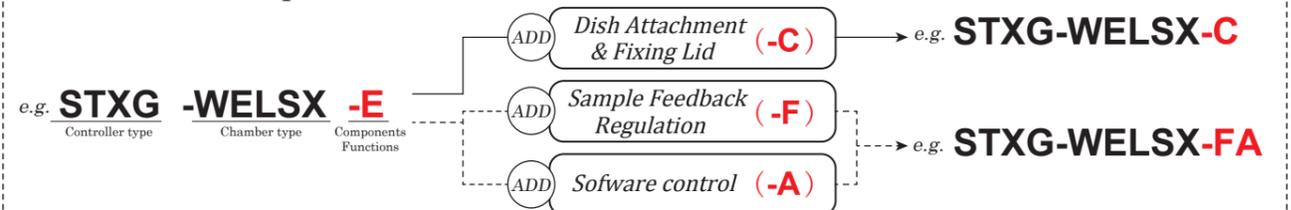
The system includes the software to program temp. and CO<sub>2</sub>/O<sub>2</sub> concentration as this function allows to expand the variety of experiment.

###### <Screen Capture>



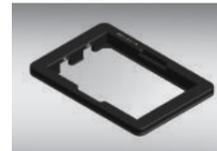
Captures the PC screen to transfer images to smart-phones and tablets. Enables to see the image at home. \* PC must be connected with internet.

##### Selection example

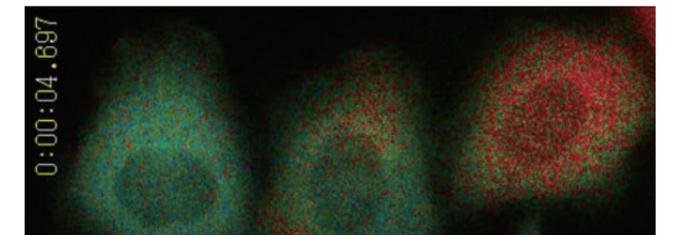


##### Options

###### Stage Adapter



Model **WELSX-K**  
For XY motorized stage  
(160x110mm opening)



Courtesy of Dr. Takeharu Nagai, The Institute of Scientific and Industrial Research, Osaka University

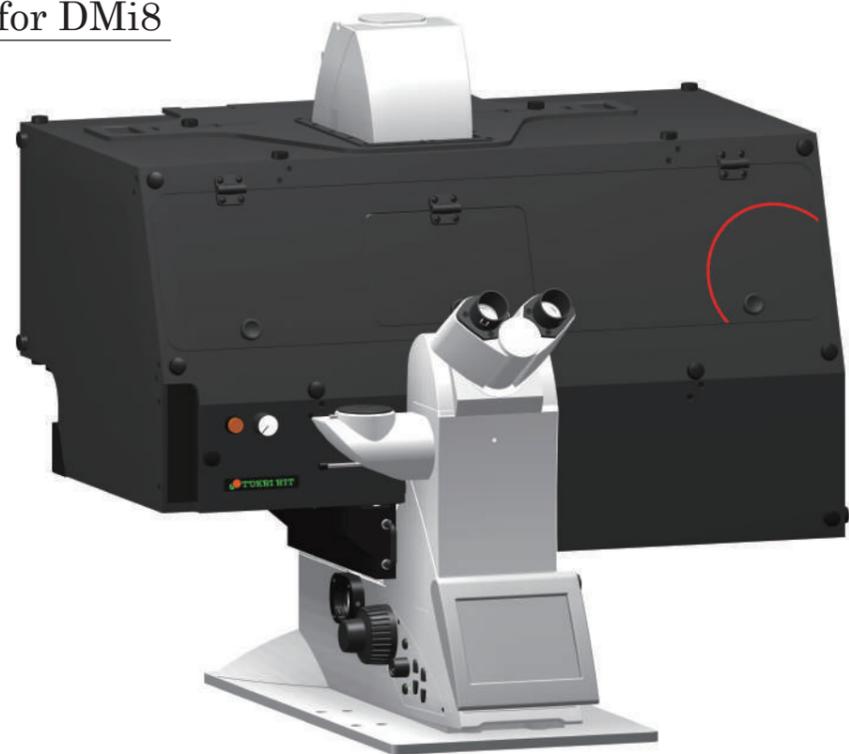
# ThermoBox for microscopes

## 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.

### Features

#### ThermoBox for DMI8



#### No duct required

Saves your working and setting space with built-in fan heaters. No air-duct is required for heating.

#### Available as a simple dark box

The black type is light shielding property and can be used as a simple dark box.

#### Anti-vibration heater

With anti-vibration design, the system can be used under confocal without image drift.



Anti-vibration  
test movie



### Line-up

Microscope	Stage	Color	Heater	Model
DMi8	Motorized stage	Black type with LED	With heater	Model <b>DMi8TB-BK</b>
			No heater	Model <b>DMi8TB-BK-NH</b>
	3 plate stage (motorized)	Black type with LED	With heater	Model <b>DMi8TB-3E-BK</b>
			No heater	Model <b>DMi8TB-3E-BK-NH</b>

\* Depending on the accessories (camera, stage etc.), the model may be a customized model. Please contact us for details.

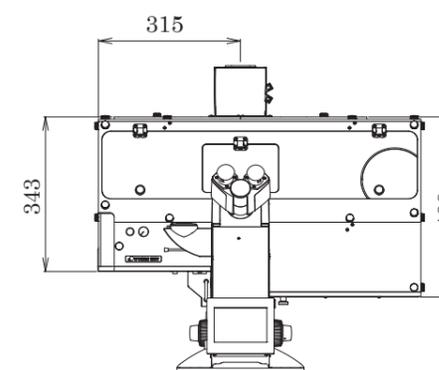
\* Clear type is available as a customized model.

### Specifications

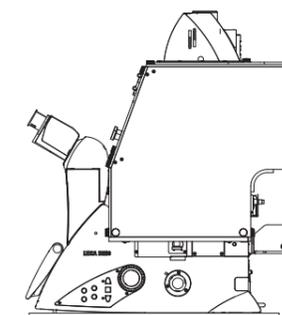
#### Easy setup

The panels are not separated one by one. It can be setup very easily by covering the box from the top.

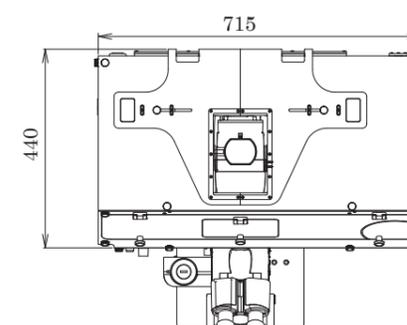
<Front>



<Side>



<Top>



- Dimensions of box : W715×D440×H400 (mm)
- Dimensions of controller : W81×D305×H211 (mm)
- Temp. setting range : Ambient ~ 45°C (With Heater)

# Add-on options

We offer the suitable solutions depending on your experiments.

## Program fluidic control system

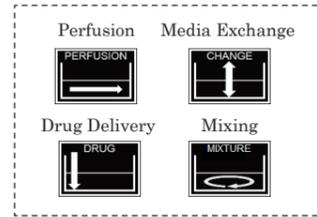
Perfusion, Media Exchange, Drug Delivery and Mixing can be easily programmed and done without disturbing your sample.

Model **PMD-D35**

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

【Specification】

Continuous Perfusion : 40μL/min~100μL/min  
Media Exchange volume : 0.6ml~5.0ml  
Media Exchange Number : Maximum 10 times  
Drug Delivery : 20μL~  
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
  - Tube Heater
  - Tubes (IN/OUT, with drug delivery fitting)
  - Media containers (For perfusion, Media Exchange)
- ※Media waste bottle is not included

- Enables to mix the media and drug to be uniformly after the drug delivery.
- Setting of suction / supply liquid volume at a finer flow rate is possible.
- Regulates the system with TTL IN/OUT.
- High-repeatability experiments are possible by keeping the media level evenly.
- With a built-in tube heater, one fluidic control system can be completed with one system.
- Supports general 35mm dish.
- Manages each user's program individually by using USB memory.

## Perfusion/Media exchange system

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

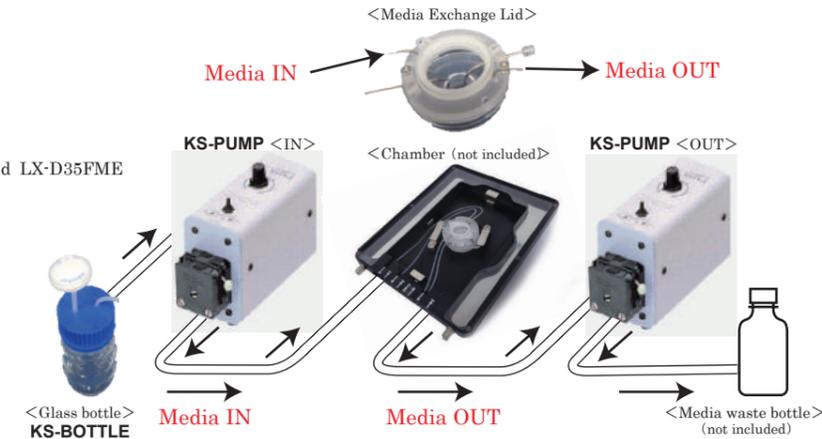
Model **KSX-Type1** \*For STX/STR Chamber  
**KS-Type1** \*For INU Chamber

【Components】

- Peristaltic pumps ×2 KS-PUMP
  - Media Exchange Lid LX-D35FME
  - Diamond Insert KS-DIA
  - Tube
  - Glass bottle with air filter KS-BOTTLE
- \*Media waste bottle is not included

【Specification】

Pump flow rate : 0.05~0.145ml/min  
(by using the attached tube)  
Pump dimensions : W73×D208×H144 (mm)  
Silicon tube : OD 3.0mm, ID 1.0mm (disposable)



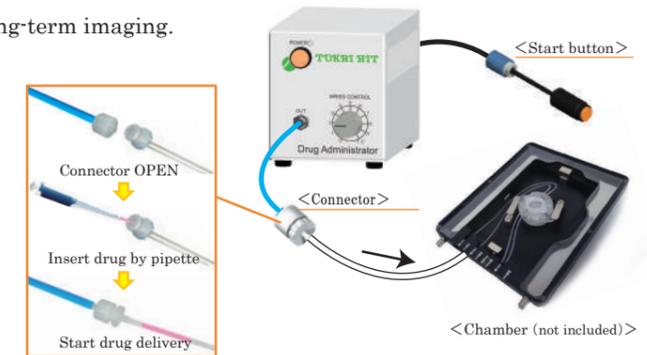
## One-push drug delivery system

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

【Specification】

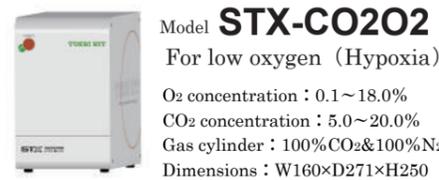
Dosage : 20μL~100μL  
(Contact us if different dosage needed)  
Controller dimensions : W100×D165×H116 (mm)  
Silicon tube : OD 3.0mm, ID 1.0mm  
(Tube of the Dish side is disposable)



## Digital Gas Mixer

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

For **STX** series



Model **STX-CO2O2**  
For low oxygen (Hypoxia)  
O<sub>2</sub> concentration : 0.1~18.0%  
CO<sub>2</sub> concentration : 5.0~20.0%  
Gas cylinder : 100%CO<sub>2</sub>&100%N<sub>2</sub>  
Dimensions : W160×D271×H250



Model **STX-CO2**  
For CO<sub>2</sub> concentration  
CO<sub>2</sub> concentration : 5.0~20.0%  
Gas cylinder : 100%CO<sub>2</sub>  
Dimensions : W115×D271×H250  
\* For STXF Controller



Model **STX-O2**  
For O<sub>2</sub> concentration  
O<sub>2</sub> concentration : 0.1~18.0%  
Gas cylinder : 100%N<sub>2</sub>  
Dimensions : W115×D271×H250  
\* Must use with STX-CO2

For **STX** series



Model **GM-8000**  
For low oxygen (Hypoxia)  
O<sub>2</sub> concentration : 0.1~18.0%  
CO<sub>2</sub> concentration : 5.0~20.0%  
Gas cylinder : 100%CO<sub>2</sub>&100%N<sub>2</sub>  
Dimensions : W160×D260×H187



Model **GM-4000**  
For CO<sub>2</sub> conc. & flow rate  
CO<sub>2</sub> concentration : 5.0~20.0%  
CO<sub>2</sub> flow rate : 50~200ml/min  
Gas cylinder : 100%CO<sub>2</sub>  
Dimensions : W120×D175×H156



Model **GM-2000**  
For supplying fixed 5%CO<sub>2</sub>  
CO<sub>2</sub> concentration : Fixed 5.0%  
Gas cylinder : 100%CO<sub>2</sub>  
Dimensions : W120×D175×H156

## Media leakage detector

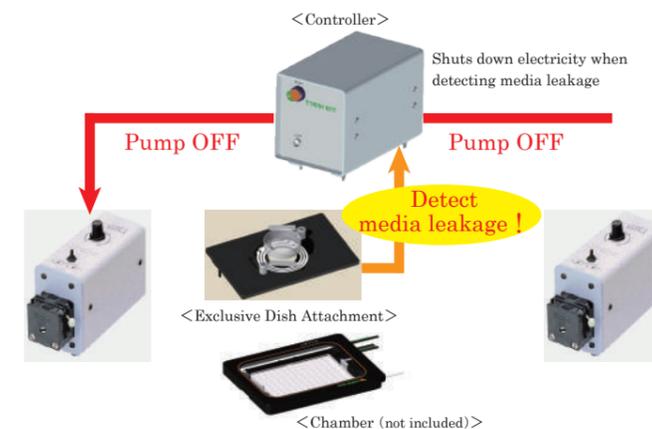
Detects the media leakage and stop the media pumps to prevent overflow of media and damage to microscope.

<Chamber for well-plate use>  
Model **LM-UNIV2-D35**

<Chamber for small vessels use>  
Model **LM-UNIV-D35**

【Specification】

Sensored Dish Attachment  
Controller dimensions : W120×D175×H156 (mm)



# 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.



### TPi SERIES New Intelligent ThermoPlate

Realized downsizing and weight saving of controller compared to TP/TPX series.  
Multi-function system supports temperature management in various fields such as biological science.

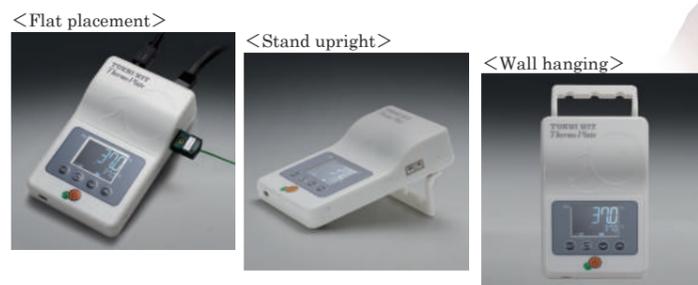
#### Features

#### Compact Controller

Miniaturize the controller to as same size as smart-phone  
It is very useful for space saving in the clean bench.

Controller dimensions : W85×D135×H30 (mm)  
Size : 232 (cm<sup>3</sup>) \* 82% decreased  
Weight : 170 (g) \* 62% decreased

In addition to flat placement (left), stand upright (center) and wall hanging (right) are available with attached mounting hook depending on the location of use. The mounting hook is durable design with a load capacity of 2 kg and thin.



#### 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.



#### 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±2°C prior to the shipping.

#### 10 year free-repair service for glass breakage

Applied strengthen glass for the glass heater and with 10 year free-repair service for glass breakage.\*1  
No more glass breakage and no more stopping your experiment.

\*1. Depending on the model



Reference movie :  
Glass strength test  
(Drop ball)



#### Plate LED Indicator

Plate LED Indicator visualizes the plate condition by not seeing the controller.  
Green LED lights up when the glass heater is ready.

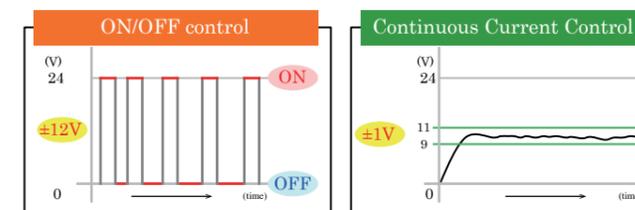


Statement of LED	Condition of the plate
Lights up	The plate surface temp. is stable at the setting temp..
Blinks slowly (1.0 sec. period)	Calibration is running.
Blinks fast (0.2 sec. period)	An error occurred.

\*Plate LED is attached to some major models.

#### 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.



## Line-up

### Glass Plate

Tokai Hit's Glass Heater Standards

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

Original clear glass heater maintains stable temperature. Support the needs in different various fields such as Time-Lapse in low magnification and/or IVF field.



<Components>

Glass Plate	○
Controller	○
External Sensor	○
Extension Wire	○
Logging Software TEM	○



Microscope : **DMi8**

Applicable stage : XY manual/motorized stage with 160×110mm opening



Model **TPi-SQFTLX**

Glass thickness : 0.5 (mm)  
Plate dimensions : W160×D110 (mm)  
Heating area : W135×D95 (mm)

Microscope : **DMI6000B/4000B/3000B**

Applicable stage : XY manual/motorized stage with 160×110mm opening

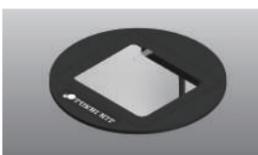


Model **TPi-SQX**

Glass thickness : 0.5 (mm)  
Plate dimensions : W160×D110 (mm)  
Heating area : W128×D84 (mm)

Microscope : **DMi8, DMI6000B/4000B/3000B**

Applicable stage : Slim stage with 88mm round opening

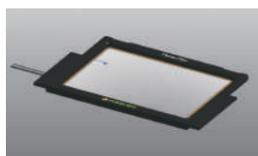


Model **TPi-RSRX**

Glass thickness : 0.5 (mm)  
Plate dimension : φ 88 (mm)  
Heating area : W60×D54 (mm)

Microscope : **DMi8, DMI6000B/4000B/3000B**

Applicable stage : Mechanical stage

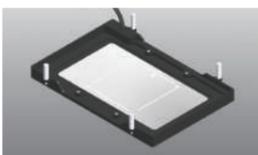


Model **TPi-SQMx**

Glass thickness : 0.5 (mm)  
Plate dimensions : W165×D105 (mm)  
Heating area : W129×D86 (mm)

Microscope : **Leica SP5/SP8**

Applicable stage : Super Z Galvo stage



Model **TPi-GSIGX**

Glass thickness : 0.5 (mm)  
Plate dimensions : W129×D87 (mm)  
Heating area : W111×D62 (mm)

Microscope : **DMIRB**

Applicable stage : XY manual stage with 150×150mm opening



Model **TPi-RSLTX**

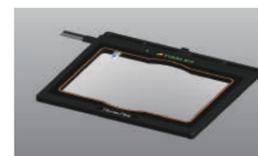
Glass thickness : 0.5 (mm)  
Plate dimensions : W150×D150 (mm)  
Heating area : W130×D130 (mm)

Applied strengthen glass and with 10 year free-repair service for glass breakage



Microscope : **For upright microscopes**

Applicable stage : XY mechanical stage



Model **TPi-SX**

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



Microscope : **For stereo microscopes**

Illumination base : Transmitted Light Base TL RCI/RC etc.

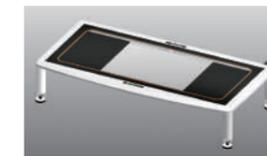


Model **TPi-TLBaseX**

Glass thickness : 1.0 (mm)  
Plate dimensions : W219.5×D169.5 (mm)  
Heating area : W190×D134 (mm)

**UNIVERSAL**

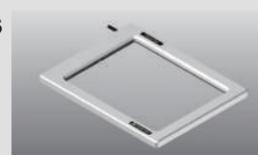
For various types of illumination bases



Model **TPi-UNIX**

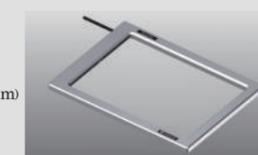
Glass thickness : 1.5 (mm)  
Plate dimensions : W435×D220 (mm)  
Heating area : W400×D175 (mm)  
Leg adjustment : 75~100 (mm)  
\*Temp. setting : Ambient~50°C

**Large Glass Type**



Model **TPi-W**

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



Model **TPi-WL**

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



Reference movie : ICSI

## 📷 Metal Plate

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.



<Components>

Metal Plate with a hole	○
Controller	○
External Sensor	○
Extension Wire	○
Logging Software TEM	○



INVERTED

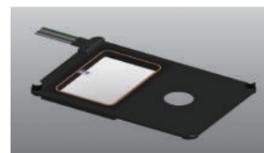
Microscope : **DMi8**

Applicable stage : XY manual/motorized stage with 160×110mm opening



Model **TPi-SQH26FT**

Plate dimensions : W160×D110 (mm)  
With a hole (φ 26mm)  
\*Surface flat type



Model **TPiD-I2X**

Plate dimensions : W160×D110 (mm)  
\*2 in 1 type

Microscope : **DMI6000B/4000B/3000B**

Applicable stage : XY manual/motorized stage with 160×110mm opening

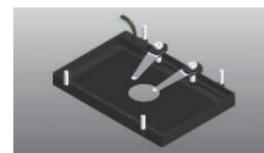


Model **TPi-SQH26**

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

Microscope : **Leica SP5/SP8**

Applicable stage : Super Z Galvo stage



Model **TPi-GSIH26**

Plate dimensions : W129×D87 (mm)  
With a hole (φ 26mm)

## 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.

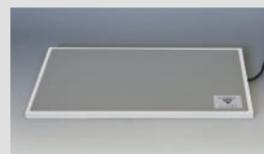


**Tube Heater**

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)

## 📷 Ultra Low-noise Plate

Suitable to maintain sample temp. during potential measurement in life science field

Temp. setting range : Ambient - 60°C

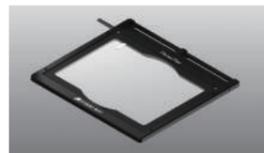
Incorporate shield mechanism to reduce noise. Minimize noise from surface of the plate because the whole surface of the glass heater is connected to the earth.



UPRIGHT

Microscope : **Upright microscope**

Applicable stage : XY mechanical stage



Model **TPiN-NLS**

Glass thickness : 0.7 (mm)  
Plate dimensions : W142×D115 (mm)  
Heating area : W128×D95 (mm)

Metal Plate with a hole	○
Controller	○
External Sensor	×
Extension Wire	×
Logging Software TEM	×



Noiseless type controller

## 🧊 Cooling/Heating Plate

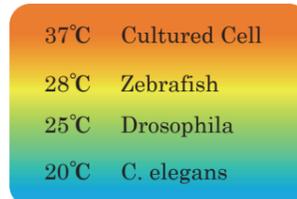
Best for observing yeast, plants, marine samples, cultured cell, C. elegans and/or Planarian, etc.

Temp. setting range : 4°C - 60°C

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

<Components>

Metal Plate with a hole	○
Controller	○
External Sensor	×
Extension Wire	×
Logging Software TEM	×
Chiller Unit	○



Effective for controlling the sample temp. around room temp.

Usually, it is difficult to control the temperature around room temperature because of the small temperature difference between the room temperature and the sample temperature. However, Tokai Hit Cooling/Heating Plate has both cooling and heating functions and can control the temperature around the room temperature accurately without any change-over switch.

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



INVERTED

Microscope : **DMI6000B/4000B/3000B**

Applicable stage : XY manual/motorized stage with 160×110mm opening



<With Chiller Unit>

Model **TP-CHSQ-C**

Plate dimensions : W160×D110 (mm)  
With a hole (φ 20mm)

Microscope : **DMi8, DMI6000B/4000B/3000B**

Applicable stage : Slim stage with 88mm round opening



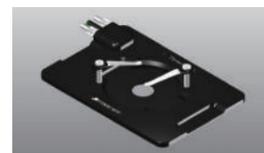
<With Chiller Unit>

Model **TP-CHSL-C**

Plate dimension : φ 88 (mm)  
With a hole (φ 20mm)

Microscope : **DMi8, DMI6000B/4000B/3000B**

Applicable stage : XY manual/motorized stage with 160×110mm opening



<With Chiller Unit>

Model **TP-CHSQM-C**

Plate dimensions : W165×D105 (mm)  
With a hole (φ 20mm)



UPRIGHT

Microscope : **Upright microscope**

Applicable stage : XY mechanical stage



<With Chiller Unit>

Model **TP-CHS-C**

Plate dimensions : W110×D110 (mm)  
With a hole (φ 20mm)



**Exclusive Chiller Unit**

Cool circulating water with sealed water. Effective for long-term use.

**Plate**

Cooling element (Peltier module) and a circulation flow path for taking heat of the Peltier module are built in.

**Controller**

Temperature controller and pump for circulating water are built in.

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

## 2-channel controller (Option)

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



Ex1 : Glass (for inverted)+ Glass (for stereo)



Ex2 : Glass (for stereo) + Glass (for stereo)



Ex3 : Metal (for inverted)+ Lens Heater



Ex4 : Glass (for inverted)+ Hot Plate



## Entire Surface Heating Plate

Temp. control before/after observation  
Temp. setting range : Ambient - 50°C



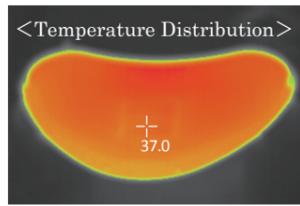
Since the entire surface of the plate is heated, it can manage the temp. of the sample under observation as well as the sample before/after observation. It is very useful when dealing with many samples.

### For stereo microscopes

Illumination base : Transmitted light base  
TL RCI/RC etc.

Model **TPiD-TLDX**

Glass thickness : 0.5 (mm)  
Plate dimensions : W380×D206 (mm)  
Heating area : <Glass part> W128×D95 (mm)



Enables to keep the vessels warm before and after observation.



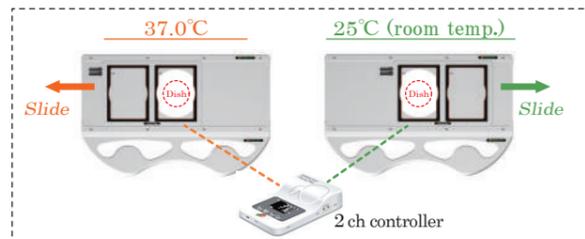
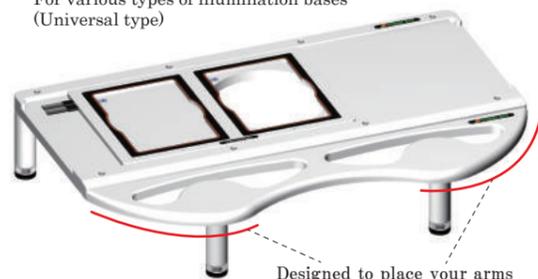
## ThermoPlate for Vitrification

For thawing process of frozen embryo  
Temp. setting range : Ambient - 60°C



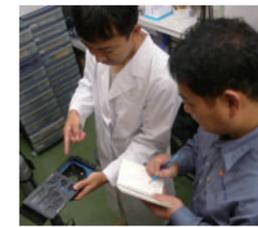
Model **TPiD-VITX**  
For various types of illumination bases  
(Universal type)

Base dimensions : W435×D280 (mm) Glass thickness : 0.5 (mm)  
Plate dimensions : W230×D148 (mm) Leg adjustment : 75~100 (mm)  
Heating area : W95×D128 (mm)×2



## Abundant experiences more than 100 products per year

Our experienced staff and engineers will accommodate your requests.



Hearing



Design



Machining



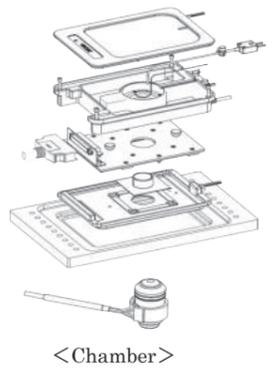
Assembly

## Customization reference

### • Incubation system for MED64

This device has been designed on the assumptions of an experiment of electrophysiology. Enable the low noise attribution under the cell culturing environment.

With built-in digital gas mixer	Model	<b>INUG2M-MED</b>
With built-in analog flow meter	Model	<b>INUM-MED-F1</b>
Temperature Controller only	Model	<b>INUM-MED</b>



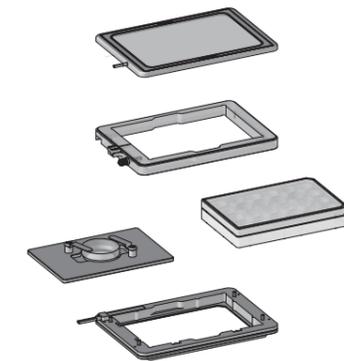
<Chamber>

### • KW / KD series

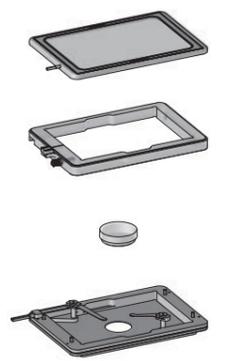
BOX-type ThermoPlate with a gas port.

- 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.

For well-plate use	Model	<b>TPiD-KW</b>
For 35mm dish use	Model	<b>TPiD-KD</b>



<TPiD-KW>



<TPiD-KD>

### • Chamber for MEMS

Customized attachments or spacers are available for your usage vessels.  
In addition, attachments for patch clamp are also available.

### • Built-in Heater

It is possible to customize heater for your system. We can manage the length of cable, corresponding temperature etc..

\* We have designed multiple attachments and/or fixing holders for various vessels like original PDMS, marketed dish etc. Please feel free to contact Tokai Hit.