for OLYMPUS

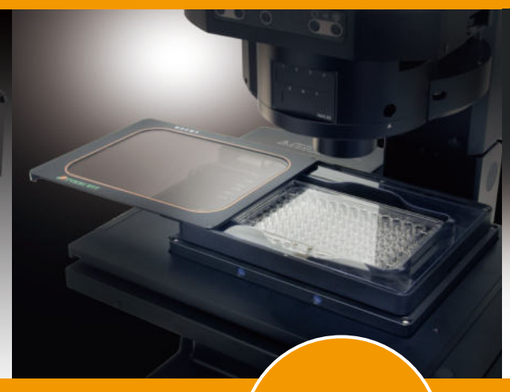
www.tokaihit.com

From the foot of Mt. Fuji to the WORLD

TOKAI HIT®

All for Living cells for your imaging®

TOKAI HIT®



ThermoBox

Stage Top Incubator®

ThermoPlate®

TOKAI HIT®

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

for OLYMPUS

CA-OLGEN-EN-04

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_2 control instrument for Time-Lapse Imaging

Incubation System for microscopes

Stage Top Incubator®

Offers precision temperature, humidity and CO_2 control for cell culture on a microscope. Enables to conduct short and long term (more than 2 weeks) Time-Lapse Imaging.

Control temperature around a microscope

Enclosure for microscopes

ThermoBox

Maintains a stable cell culturing environment. By enclosing the microscope, it also prevents the focus drift caused by the thermal expansion of the microscope itself.

Cleanness for microscopes

Clean Enclosure for microscopes

PureBox SHIRAITO®

Realizes the same cleanliness level as a clean bench. The system also maintains uniform temperature inside the box. Similar operation of a clean bench can be done on a microscope.

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

Glass/Metal Heater for microscopes

ThermoPlate®

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 grass breakage* is adopted. * Depending on the models.

Incubation System for microscopes

STX

Standard Model

Stage Top Incubator®

Happiness for Cells, Success for Researchers

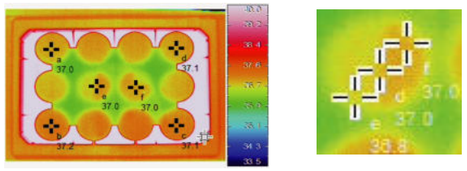
Offers precision temperature, humidity and CO_2 control for cell culture on a microscope.
Enables to conduct short and long term (more than 2 weeks) Time-Lapse Imaging.

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.

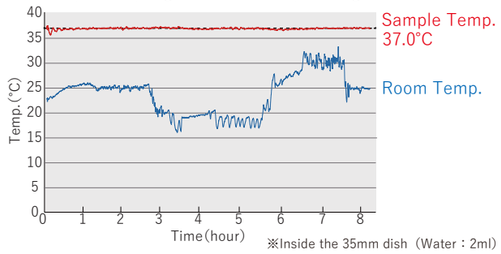


Uniform temperature distribution between wells and within a well.
* In our measurement environment

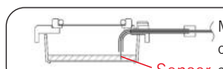
Real-time Sample Feedback Regulation

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.

Sample temp. against room temp. change



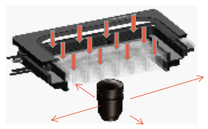
※Inside the 35mm dish (Water : 2ml)



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

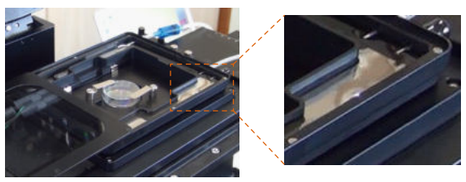
No interference by objective

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



HUM. Keeps high-humidity over 95%

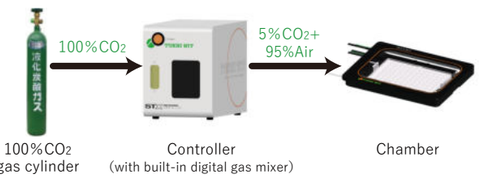
Keeps the humidity level inside the chamber more than 95% by heating the distilled water in the Bath Unit. The internal humidifier minimizes the change of concentration of the media by keeping the humidity inside the chamber.



Internal humidifier by Bath Heater

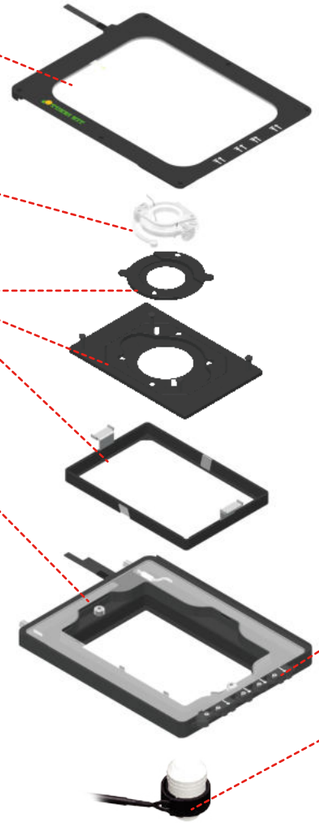
CO_2 Stable CO_2 environment

The controller mixes 100%CO_2 gas and the surrounding air automatically. Stable gas concentration inside the Chamber is kept by sending the mixed gas continuously to the Chamber. (※A case of controller with a built-in digital gas mixer)



※CO_2 concentration can be adjusted from 5.0～20.0%.

Chamber Components



Top Heater

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

Dish Fixing Lid

Easy setting of vessels with magnetic lid.

Dish Attachment

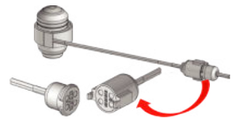
Supports 35mm dish, 50/60mm dish, chamber slide, slide glass, chambered coverglass and wellplate by changing one-touch mangetic holder.

Bath Unit

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

■ Wreck Proof Lens Heater Cord

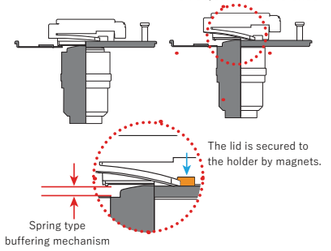
Easy attachment and detachment with magnet relay connector prevents breakage of objective revolver and lens heater. It is also possible to lock by twisting the connector.



■ 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.



Access Ports

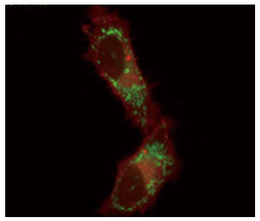
For temperature sensor and tubing for media exchange and drug delivery.

Lens Heater

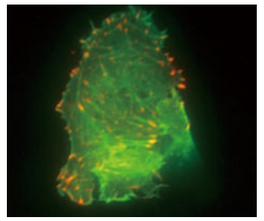
Prevents heat escaping from the sample to the objective. Especially effective under high magnification, oil/water immersion observation.
* Can accommodate objectives up to ϕ40mm. Thin type and longer type are optional.

Stage Top Incubator Culture Results

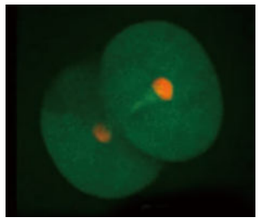
Attribute	Name	Details	Period
Cultured Cell	STO	Embryo; fibroblast, mouse	Over 5 days
Cultured Cell	PC12	Pheochromocytoma; adrenal gland, rat (male)	Over 5 days
Cultured Cell	Hela	Adenocarcinoma; crvix, human (female, 31 years)	Over 5 days
Primary	Human Embryo	Human embryo in vitro; form fertilization 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_2 incubator for the first day	Over 3 days
Primary	Cardiac Myocite	Neonatal rat heart, fetal mouse, heart beat synchronization	Over 3 days



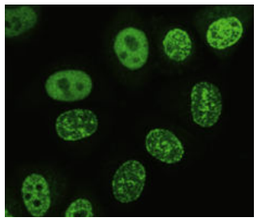
Courtesy of Dr. Takeharu Nagai
The institute of Scientific and Industrial Research, Osaka University



Paxillin actin 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

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

Stage Top Incubator® STX

All for Living cells for your imaging®

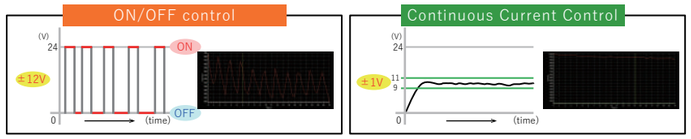
Features

Stress-Free Quality

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.

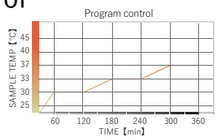


■ STX-APP (Software)

Simple operation of GUI will assist to visualize the preparation to setting 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.

All in one package incubator

Including the following accessories as standard.

■ SET model

・Temperature Controller

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

・Chamber

Model
IX3WX

・Feedback Sensor

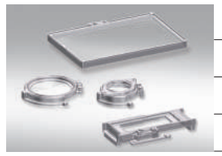
Model
TSU-200F

・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 35/50/60mm dish
ATX-CSG	For slide glass, chamber slide and chambered coverglass

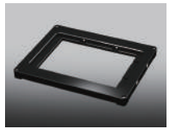
・Dish Fixing Lids



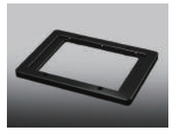
Model	
LX-W	For well-plate
LX-D35	For 35mm dish
LX-D56	For 50/60mm dish
LX-CSG	For slide glass, chamber slide and chambered coverglass

■ Options

・Stage Adapter



Model
MK-IX3
For IX3-SVR, IX3-SSU



Model
MK-SIG
For BX3-SSU, IX2-SFR/SVL2

・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.

Line-up

IX3WX series

■ For Olympus manual/motorized stage
■ Sample temperature：30 - 40°C
■ For well-plate and small vessels use

Multi Well Plate | 35mm dish | 50mm dish | 60mm dish | Slide Glass | Chamber Slide | Chambered Coverglass

100%CO2 gas cylinder use Model **STXG-IX3WX-SET**
Premixed gas cylinder use Model **STXF-IX3WX-SET**

IXZWX series

■ MCL Nano-ZL100-OSSU/ Nano-ZL400-OSSU
■ Sample temperature：30 - 40°C
■ For well-plate and small vessels use

Multi Well Plate | 35mm dish | 50mm dish | 60mm dish | Slide Glass | Chamber Slide | Chambered Coverglass

100%CO2 gas cylinder use Model **STXG-IXZWX-SET**
Premixed gas cylinder use Model **STXF-IXZWX-SET**

PLAMX series

■ For ASI PZ-2000, Ludl 99A602, MCL Nano-Z500
■ Sample temperature：30 - 40°C
■ For well-plate and small vessels use

Multi Well Plate | 35mm dish | 50mm dish | 60mm dish | Slide Glass | Chamber Slide | Chambered Coverglass

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

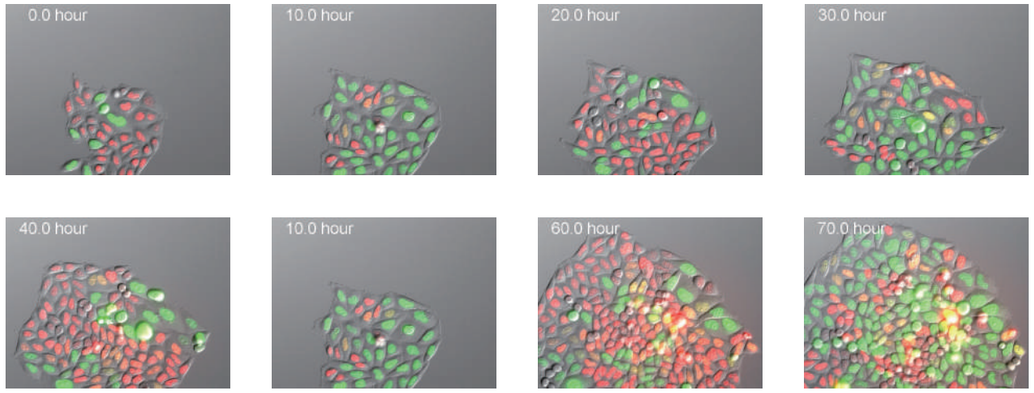
WELSX series

■ For Olympus manual/motorized stage
■ Chamber size is the same as wellplates
■ For small vessels use
■ Sample temperature：30 - 40°C

35mm dish | 50mm dish | 60mm dish | Slide Glass | Chamber Slide | Chambered Coverglass

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

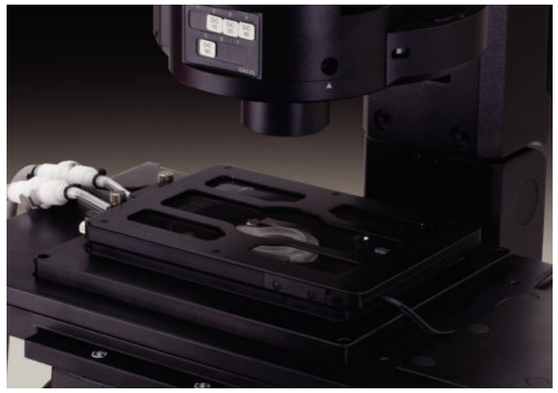
Depending on the stage, a stage adapter might be required.
Please contact Tokai Hit.



Courtesy of：Tetushi Hoshida, Asako Sakaue-Sawano, Atsushi Miyawaki, RIKEN

Cooling/Heating Chamber * Cooling/Heating Chamber is not compliance with CE

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



KRiX series

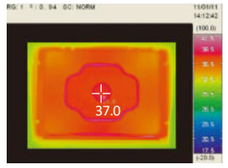
- For XY manual/motorized stage
- With Chiller Unit
- Sample Feedback regulation
- For small vessels use (35mm dish / Slide Glass / Chamber Slide / Chambered Coverglass)

100%CO_2 gas cylinder use	Model	**STXGC-KRiX-SET**
Premixed gas cylinder use	Model	**STXFC-KRiX-SET**

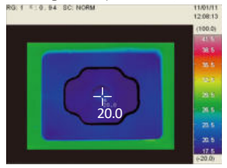
■ Uniform Temperature Distribution

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 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**

For upright microscopes

Sample temp.：37°C

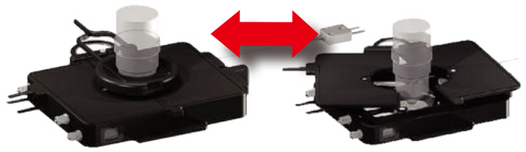
UKX series

- For XY mechanical stages of upright microscopes
- For small vessels use (35mm dish / 50mm dish / 60mm dish / Slide Glass)

100%CO_2 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.



・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 cross stage For Narishige fixed stage	**UKX-FNS**
For Prior Z-deck	**UKX-ZD**
For stages with 160×110mm 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

External Humidifier

Eliminates the need 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.

Temp. Controller　　Bottle Heater

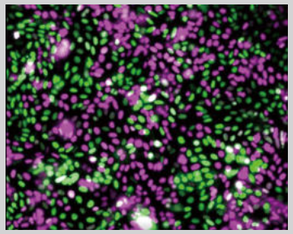
- STABLE cell culturing from short to long-term imaging
- SIMPLE add-on system for all Tokai Hit incubators

Model **TPiDE-HUMID**

Specifications

Temp. setting range：Ambient＋5°C - 60.0°C
Bottle capacity：500ml
Heater dimensions：W100×D110×H110 (mm)
Controller dimensions：W85×D135×H30 (mm)
Components：Temp. Controller, Bottle Heater, Water Bottle, Gas Tube set

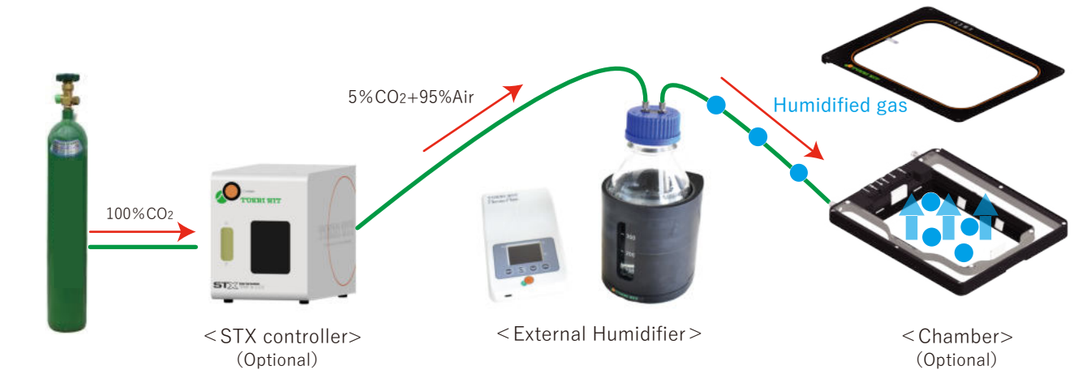
Time Lapse movies



96-well plate　　35mm dish

Pictures are courtesy of N.Komatsu, A.Sakaue-Sawano and A.Miyawaki
RIKEN Center for Brain Science, Saitama, Japan
Cell cycle progression in Hela cells

【System image】



Enclosure for microscopes

ThermoBox

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

Features

ThermoBox for IX83

Front panel transparent model is also available.

No duct required

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

Anti-vibration heater

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

Anti-vibration test movie

Available as a simple dark box

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

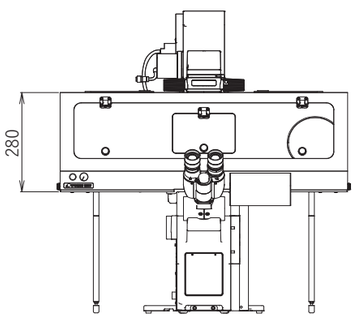
Easy setup

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

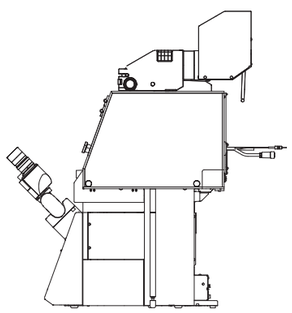
Specifications

- Dimensions of box : W790 × D403 × H280 (mm)
- Dimensions of controller : W81 × D305 × H211 (mm)
- Temp. setting range : Ambient - 40°C (With heater)

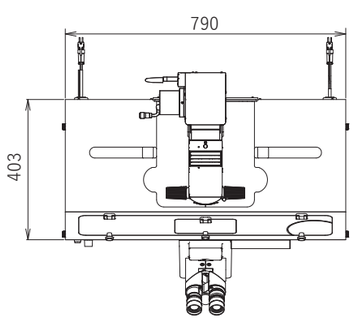
＜Front＞



＜Side＞



＜Top＞



Line-up

Live cell package

■ SET model

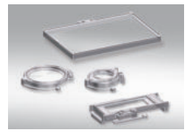
All the items are included for cell culture.

ThermoBox
Temperature

Non-heater chamber
Internal humidifier

CO_2 regulation
CO_2

Dish Attachments



＊Dish attachments for wellplate, 35mm, 50/60mm dish, slide glass, chamber slide and chambered cover glass are included.

Microscope	Color type	CO_2 gas cylinder	Model
IX83	Black	100%CO_2	Model **IX83TB-WSKM-G**
		Premixed	Model **IX83TB-WSKM-F**
	Front panel transparent	100%CO_2	Model **IX83TB-WSKM-G-CL**
		Premixed	Model **IX83TB-WSKM-F-CL**

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

ThermoBox only

Microscope	Color type	Heater	Model
IX83	Black	With heater	Model **IX83TB-BK-LED**
		No heater	Model **IX83TB-BK-NH-LED**
	Front panel transparent	With heater	Model **IX83TB**
		No heater	Model **IX83TB-NH**

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

Options

Model **IX83TB-CSU**	Special legs for Yokogawa CSU-W1
Model **MK-IX3**	Stage Adapter for Olympus motorized stage
Model **TPiDE-HUMID**	External humidifier system (refer to page 8)

Clean Enclosure for microscopes

PureBox SHIRAITO®

For clean operation during imaging

PBS series for Olympus IX83

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.

Line-up

1 deck Model **IX83PBS-D1**

2 deck Model **IX83PBS-D2**

Applications

iPS cells | Organoid | Pharmaceuticals | Food research | Fertile ovum

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

Features

The same cleanness level as a clean bench

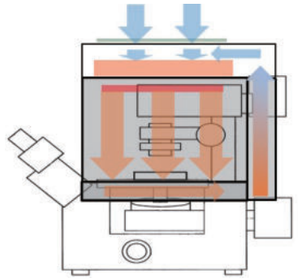
Equivalent performance as ISO 14644-1 Level 5 (Unit: Particle/m). Supports clean operation during imaging.

Air curtain function

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

Laminar flow temperature regulation

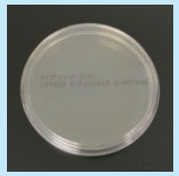
With laminar flow regulation and forced circulation of the environment inside PureBox, it keeps the optimal and uniform condition of environment.

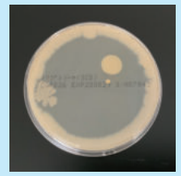


＜Minimizes the contamination＞

Comparison

Dish with agar media left at:
Ⓐ Inside PureBox SHIRAITO Ⓑ Outside PureBox SHIRAITO
for 30 minutes without lid on and cultured for 48 hours


Ⓐ Inside PureBox SHIRAITO
(No contamination)


Ⓑ Outside PureBox SHIRAITO
(Contamination)

Large working space

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

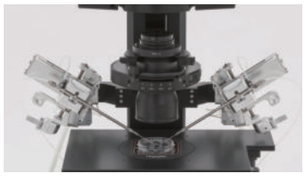
Right: 460×257 mm
Left: 187×460 mm
Height: 379 mm (Right), 354 mm (Left)

Can be used as a simple dark box

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

Great Expandability

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

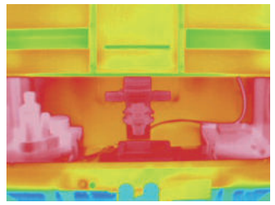


Compatible with:
<Micromanipulator>
- Eppendorf TransferMan/InjectMan
- Narishige SETAGAYA, TAKANOME

<Confocal unit>
- Yokogawa CSU-W1

37°C temperature uniformity

Applied unique heating regulation of Tokai Hit. It allows to maintain uniform temperature inside the box optimally.



＜Thermo image inside the box＞

Add-on options

We offer the suitable solutions depending on your experiments.

Program fluidic control system

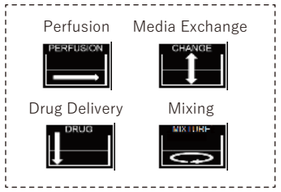
Perfusion, Media Exchange, Drug Delivery and Mixing can be easily programmed and done without disturbing your sample.

Model **PMD-D35**

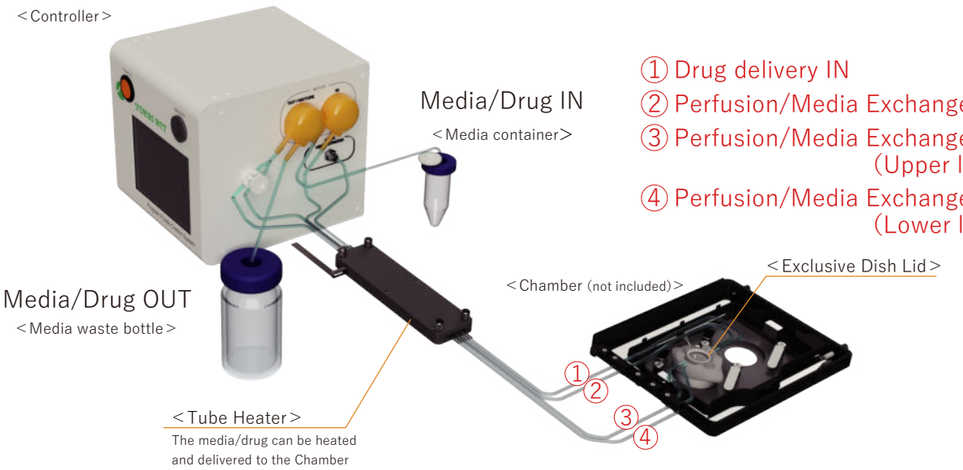
※For STX/STR/INU Chamber

※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



【Components】
- Controller
- Tube Heater
- Tubes (IN/OUT, with drug delivery fitting)
- Media containers (For perfusion, Media Exchange)
- Multi Fluidic Lid (PMD-D35FME) for 35mm dish
- Diamond Insert (KS-DIA) for 35mm dish (100 µl 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.

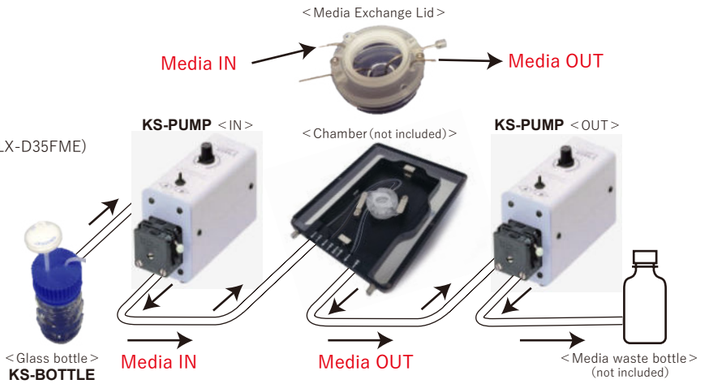
Perfusion/Media exchange system

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)・Tubes
・Glass bottle with air filter KS-BOTTLE
＊Media waste bottle is not included

【Specification】
Pump flow rate：0 - 2.86ml/min
(by using the attached tube)
Pump dimensions：W73×D208×H144 (mm)
Silicon tube：OD 3.0mm, ID 1.0mm (disposable)

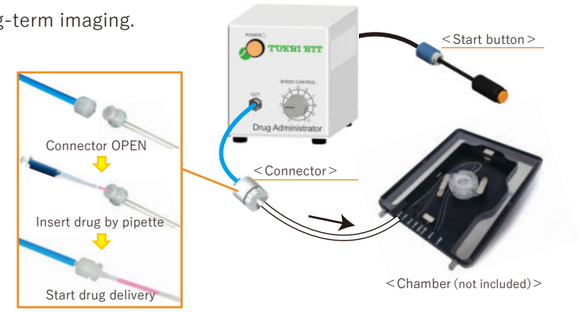


One-push drug delivery system

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_2 concentration ：0.1 - 18.0%
CO_2 concentration ：5.0 - 20.0%
Gas cylinder：100%CO_2 & 100%N_2
Dimensions ：W160×D271×H250 (mm)

Model **STX-CO2**
For CO_2 concentration
CO_2 concentration：5.0 - 20.0%
Gas cylinder：100%CO_2
Dimensions ：W115×D271×H250 (mm)
＊For STXF Controller

Model **STX-O2**
For O_2 concentration
O_2 concentration：0.1 - 18.0%
Gas cylinder：100%N_2
Dimensions ：W115×D271×H250 (mm)
＊Must use with STX-CO2

Stand alone

Model **GM-8000**
For low oxygen (Hypoxia)
O_2 concentration ：0.1 - 18.0%
CO_2 concentration ：5.0 - 20.0%
Gas cylinder：100%CO_2 & 100%N_2
Dimensions ：W160×D260×H187 (mm)

Model **GM-3000**
CO_2 concentration & flow rate
CO_2 concentration：1.0 - 20.0%
Flow rate ：50 - 200 ml/min
Gas cylinder：100%CO_2
Dimensions ：W121×D174×H157 (mm)

Mini CO_2 regulator ＊MG1 is only available in the 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 with one push.

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

LELAND web site

Add-on options

We offer the suitable solutions depending on your experiments.

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：ϕ12.0 mm
Observation area：ϕ9.6 mm

For wide range observation

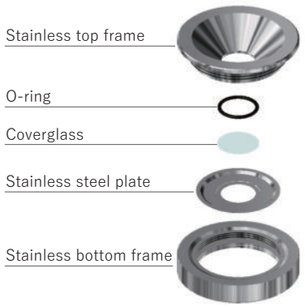
Model **SCC25-D35-SET**
Cover glass size：ϕ25.0 mm
Observation area：ϕ21.0 mm

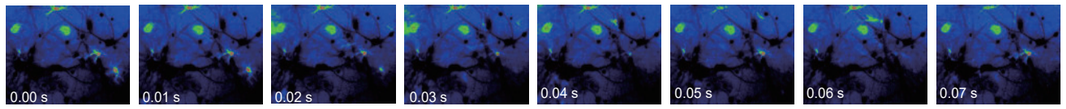
【Features】

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.

【Assembly】





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

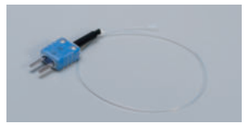
Courtesy of：Prof. Takafumi Inoue,
Department of Life Science and Medical Bioscience,
Faculty of Science and Engineering, Waseda University

Digital Thermometer for research

Precise temperature measurement is possible by using a thin sensor with Teflon covering 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 Prove (Sensor type) Model **TSU-200F**
■ Extension Wire (1.5m) Model **HD1500**

IN/OUT Pipe for Media Exchange/Drug Delivery

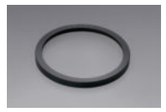
For media exchange and drug delivery with incubation system for upright microscopes etc..

Model
PSBD1 Pipe OD 1.1mm
PSBD1H Pipe OD 1.1mm (with side holes)

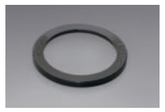
Model
PSBD2 Pipe OD 2.1mm
PSBD2H Pipe OD 2.1mm (with side holes)

35mm Dish Spacer

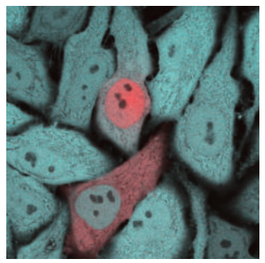
When using the 35mm dish from IWAKI, Greiner and Nunc, recommended to use Dish Spacer at the bottom of the dish.



Model **35DI-BS**
For 35mm dish from IWAKI



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



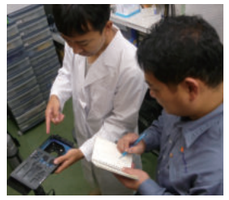
Courtesy of Dr. Takeharu Nagai
The Institute of Scientific and Industrial Research, Osaka University

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.


Hearing ▶▶


Design ▶▶


Machining ▶▶

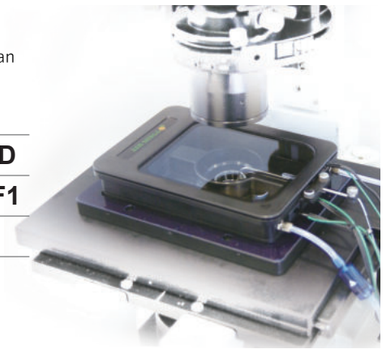

Assembly

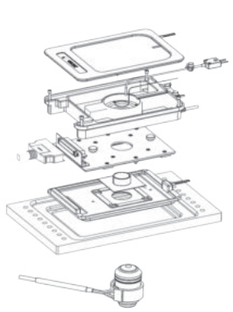
Customization reference

・Incubation system for MED64

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

With built-in digital gas mixer	Model **INUG2M-MED**
With built-in analog flow meter	Model **INUM-MED-F1**
Temperature Controller only	Model **INUM-MED**



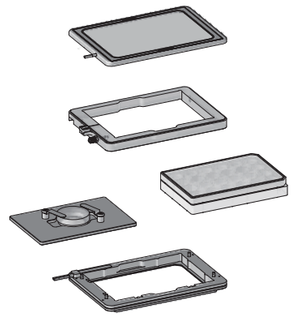

＜Chamber＞

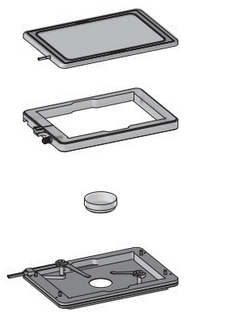
・KW / KD series

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 **TPiD-KW**
For 35mm dish use	Model **TPiD-KD**


＜TPiD-KW＞


＜TPiD-KD＞

・Integration/Customization

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 designed 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.

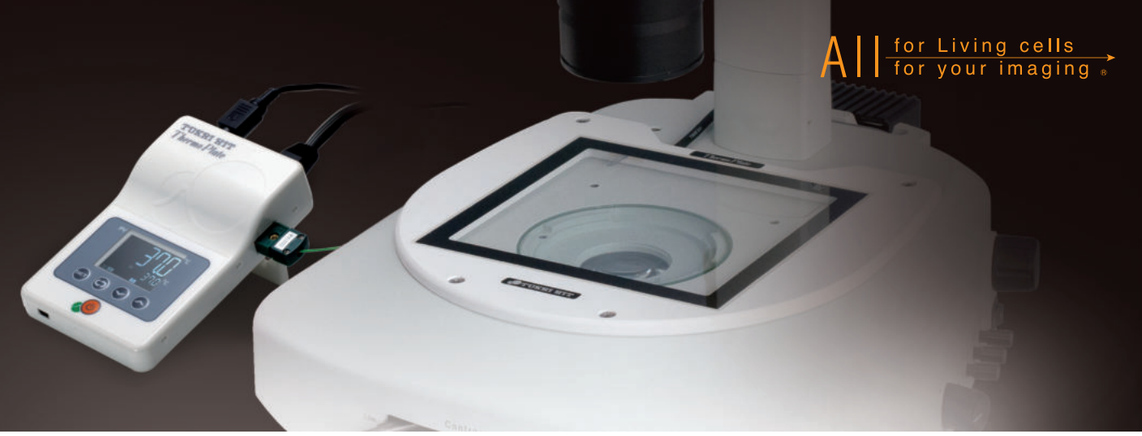
We value your needs and requirements. If you have any questions or concerns, please feel free to contact us.

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.



All for Living cells for your imaging®

TPi SERIES
New Intelligent ThermoPlate

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

Features

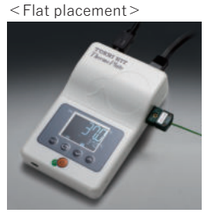
Compact Controller

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 (cm^3)　＊82% decreased
Weight：170 (g)　＊62% decreased

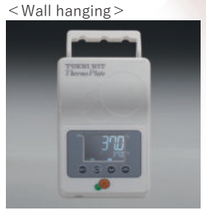
In addition to flat placement (left), stand upright (center) and wall hanging (right) are available with attached mounting hook depending on the location of use. The mounting hook is thin but durable design with a load capacity of 2 kg.

＜Flat placement＞



＜Stand upright＞

＜Wall hanging＞

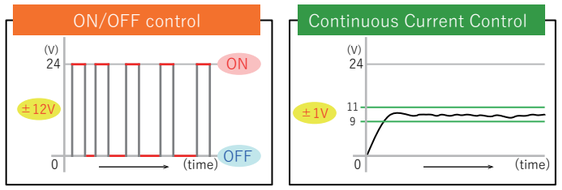


Simple temp. measurement

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

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.



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.[*1]
No more glass breakage and no more stopping your experiment.

*1. Depending on the model

10year warranty
Stress-Free from glass breakage

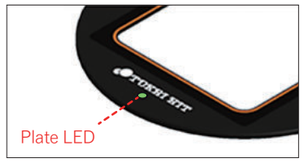
One-touch calibration

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.

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.

Reference movie：ICSI

Glass Heater Line-up

Tokai Hit's Glass Heaters

Temp. setting range：Ambient - 60°C (* Depenging 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.

Inverted
Microscope： **IX83/73/81/71/51/70/50, IMT2**
Applicable stage：Cross stage with 110 mm round opening

Model **TPi-110RX** (10) LED
Glass thickness：0.5 (mm)
Plate dimension：ϕ110 (mm)
Heating area：W70×D70 (mm)

Inverted
Microscope： **IX83/73/81/71/51/70/50, IMT2**
Applicable stage：Cross stage with 110 mm round opening

Model **TPi-110R13**
Glass thickness：1.3 (mm)
Plate dimension：ϕ110 (mm)
Heating area：W70×D70 (mm)
＊Ideal for relief contrast observation with a glass bottom dish

Inverted
Microscope： **IX83/73**
Applicable stage：XY manual (IX3-SVR)/motorized (IX3-SSU) stage

Model **TPi-IX3X** (10) LED
Glass thickness：0.5 (mm)
Plate dimensions：W189.5×D155.5 (mm)
Heating area：W174×D127 (mm)

Inverted
Microscope： **IX83/73**
Applicable stage：XY manual (IX3-SVR)/motorized (IX3-SSU) stage

Model **TPi-IX3-13**
Glass thickness：1.3 (mm)
Plate dimensions：W189.5×D155.5 (mm)
Heating area：W155×D130 (mm)
＊Ideal for relief contrast observation with a glass bottom dish

Inverted
Microscope： **IX series**
Applicable stage：XY motorized stage with 160×110 mm opening

Model **TPi-SQX** (10) LED
Glass thickness：0.5 (mm)
Plate dimensions：W160×D110 (mm)
Heating area：W128×D84 (mm)

Inverted
Microscope： **IX series**
Applicable stage：Prior XY motorized stage H117 series

Model **TPi-SQPX** (10)
Glass thickness：0.5 (mm)
Plate dimensions：W160×D110 (mm)
Heating area：W128×D84 (mm)

Inverted
Microscope： **CKX41/31, CK40/30/2**
Applicable stage：XY mechanical stage

Model **TPi-CKX** (10)
Glass thickness：0.5 (mm)
Plate dimensions：W127×D85 (mm)
Heating area：W103×D63 (mm)

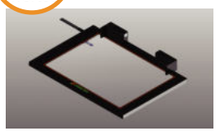
Inverted
Microscope： **CKX41/31, CK40/30/2**
Applicable stage：XY mechanical stage

Model **TPi-CKTS**
Glass thickness：0.5 (mm)
Plate dimensions：W150×D117 (mm)
Heating area：W131×D95 (mm)

Upright
Microscope： **BX, BH2, CX40, CH40/30**
Applicable stage：XY mechanical stage

Model **TPi-SX** (10) LED
Glass thickness：0.5 (mm)
Plate dimensions：W142×D115 (mm)
Heating area：W128×D95 (mm)

Inverted
Microscope： **CKX53X**
Applicable stage：XY mechanical stage



Model **TPi-CKX53X** (10)
Glass thickness：0.5 (mm)
Plate dimensions：W190×D138 (mm)
Heating area：W174×D127 (mm)

Stereo
UNIVERSAL
For various types of illumination bases

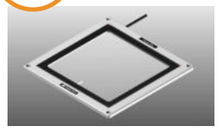
Model **TPi-UNIX** (10) LED
Glass thickness：1.5 (mm)
Plate dimensions：W435×D220 (mm)
Heating area：W400×D175 (mm)
Leg adjustment：75 - 100 (mm)
＊Temp. setting：Ambient - 50°C

Stereo
Microscope： **SZX16/10**
Applicable illumination base：SZX2-ILLB/ILLD/ILLK/ILLT/ILLTQ/ILLTS

Model **TPi-SZX2X** (10) LED
Glass thickness：1.0 (mm)
Plate dimensions：W238×D227 (mm)
Heating area：W162×D152 (mm)

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

Stereo
Microscope： **MVX10, SZX12/9/7**
Applicable illumination base：SZX-ILLK/ILLB2/ILLD2



Model **TPi-SZX1**
Glass thickness：1.0 (mm)
Plate dimensions：W205×D205 (mm)
Heating area：W170×D170 (mm)

Stereo
Microscope： **SZX7, SZ61**
Applicable illumination base：SZ2-ST + SZ2-ILA

Model **TPi-SZ2**
Glass thickness：1.0 (mm)
Plate dimensions：W278×D175 (mm)
Heating area：W230×D146 (mm)

Stereo
Large Glass Type
For various types of illumination bases

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)

Stereo
Microscope： **SZ60/40/11**
For illumination bases of SZ60/40/11

Model **TPi-OZX** (10)
Glass thickness：1.0 (mm)
Plate dimensions：W180×D230 (mm)
Heating area：W162×D152 (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.

Inverted
Microscope： **IX83/73/81/71/51/70/50, IMT2**
Applicable stage：Cross stage with 110 mm round opening

Model **TPi-110RH26**
Plate dimension：ϕ110 (mm)
With a hole (ϕ26 mm)

Inverted
Microscope： **IX83/73**
Applicable stage：XY manual (IX3-SVR)/motorized (IX3-SSU) stage

Model **TPi-IX3H26**
Plate dimensions：W189.5×D155.5 (mm)
With a hole (ϕ26 mm)

Inverted
Microscope： **IX series**
Applicable stage：XY motorized stage with 160×110 mm opening

Model **TPi-SQH26**
Plate dimensions：W160×D110 (mm)
With a hole (ϕ26 mm)

Inverted
Microscope： **IX series**
Applicable stage：Prior XY motorized stage H117 series

Model **TPi-SQH26P**
Plate dimensions：W160×D110 (mm)
With a hole (ϕ26 mm)

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）

TPiD SERIES

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

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

Model **TPiD-110RX-SZX2X**

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

Model **TPiD-UNIX-UNIX**

Ex 3：Metal (for inverted) + Lens Heater

Model **TPiD-110RH26-LH**

Ex 4：Glass (for inverted) + Hot Plate

Model **TPiD-110RX-SP**

Entire Surface Heating Plate

Temp. control before/after observation

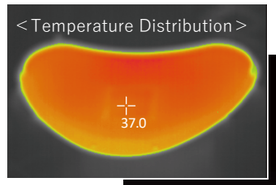
Temp. setting range：Ambient - 50°C

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.

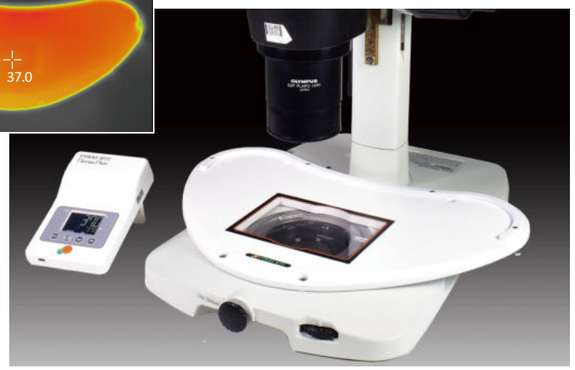
Microscope : **SZX16/10**
Illumination base : SZX2-ILLB/ILLD/ILLK/ILLT/ILLTQ/ILLTS

Model **TPiD-SZX2DX** (10) LED

Glass thickness：0.5 (mm)
Plate dimensions：W357×D243 (mm)
Heating area：＜Glass part＞ W128×D95 (mm)



Enables to keep the vessels warm before and after observation.



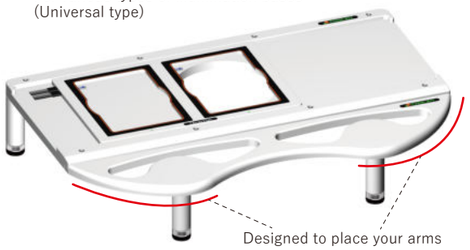
ThermoPlate for Vitrification warming

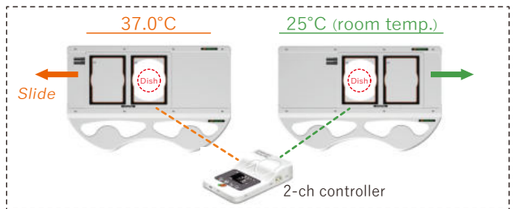
For thawing process of frozen embryo

Temp. setting range：Ambient - 60°C

Model **TPiD-VITX** (10) LED

For various types of illumination bases (Universal type)





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

Cooling/Heating Plate * Cooling/Heating Plate is not compliance with CE

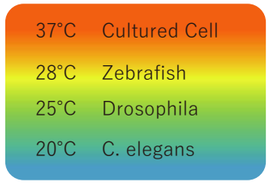
TP SERIES

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.

* 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
- Rooms with high humidity



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 normally cultured at 37.0 degree C by lowering the temperature or observe expressions of samples at each temperature.

Inverted

Microscope : **IX83/73/81/71/51/70/50, IMT2**
Applicable stage : Cross stage with 110 mm round opening

＜With Chiller Unit＞

Model **TP-CH110RBF-C**

Plate dimension：ϕ110 (mm)
With a hole (ϕ20mm)
＊Bottom flat type

Inverted

＜With Chiller Unit＞

Model **TP-CH110R-C**

Plate dimension：ϕ110 (mm)
With a hole (ϕ20mm)
＊Surface flat type

Inverted

Microscope : **IX series**
Applicable stage : XY motorized stage with 160×110 mm opening

＜With Chiller Unit＞

Model **TP-CHSQ-C**

Plate dimensions：W160×D110 (mm)
With a hole (ϕ20mm)

Upright

Microscope : **BX series**
Applicable stage : XY mechanical stage

＜With Chiller Unit＞

Model **TP-CHS-C**

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