

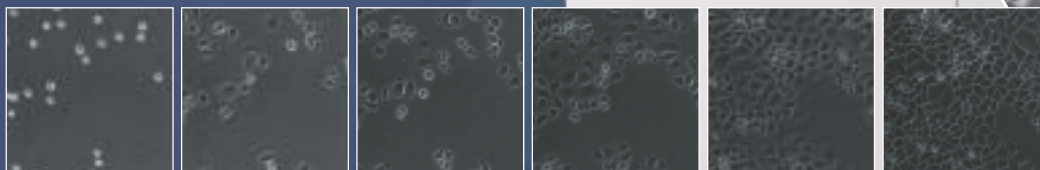


Cell Culture Observation System

BioStation CT

New!

*Perfect solution for automated
cell culture data acquisition*



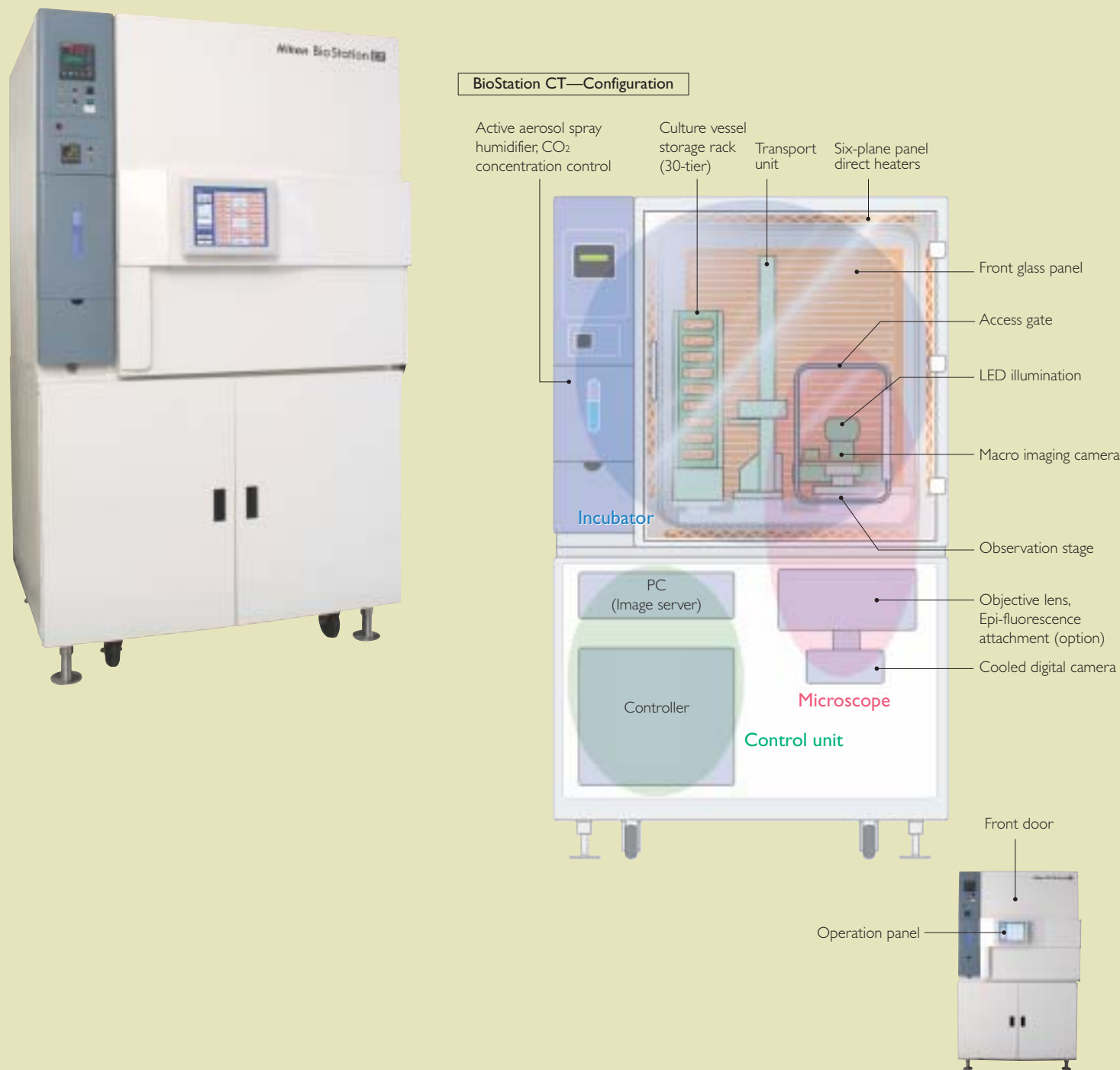
Imaging Solutions for your Cells' Environment

Microscope and camera built into the incubator

Cell culture images automatically captured over time

A breakthrough in cell culture automation and imaging!

BioStation CT houses a microscope and camera within the incubator. It automatically captures the images of cells being cultured; there is no need to remove the vessel from the incubator and move it to the microscope. This minimizes stress on the cells due to environment changes and vibration, and prevents contamination while ensuring safety for the researcher. Images of the cells are automatically captured from inside the incubator according to the easy instruction set for programming. The captured images are saved sequentially along with environment data from the initial time of image capture. BioStation CT provides complete traceability for cultured cells since it maintains the cells in perfect conditions and maintains a precise culture history.





Automatic image capture

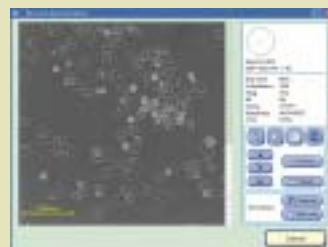
- Specified vessels are automatically imaged according to the pre-set schedule
- Active auto-focus is provided
- Time lapse multi-channel image sequences are captured under multiple magnifications, z-axis depths, wavelengths, or various observation points
- Captured images are automatically displayed on the PC monitor sequentially

Variable magnification

Magnifications are changeable to 2x, 4x, 10x, 20x, and 40x.

Macro/micro image capture

Both the micro (microscopic) image of a cell and the macro image (Bird's-eye view) of the whole vessel are captured and saved together.



Microscopic image (micro image)



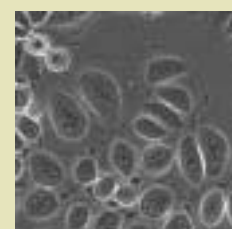
Bird's-eye view image (macro image)
Enables you to confirm handwritten vessel notes, change in culture medium color, mold generation, etc.

Clear phase contrast observation

Nikon proprietary ADL 10x objective minimizes halo and enables images of intracellular fine structure to be observed clearly.



Conventional DL 10x objective



ADL 10x objective

Fluorescence observation

Epi-fluorescence illumination is available as an option. Illumination techniques and fluorescence filters can be automatically switched during the time-lapse imaging sequence.

History management screen

Micro and macro images, together with the incubator environmental data from the initial time of image capture, are displayed sequentially.



Fully automated cell culture imaging on a controlled schedule

1

Simple program setting

Designation of the vessels to be imaged, with the capture points, camera settings, and imaging time lapse schedule are easily set via the touch panel on the front door of the BioStation CT.

2

Culture environment control

Temperature, humidity and CO₂ concentration within the incubator are automatically controlled to the set values.

3

Automatic vessel transport

The vessel to be observed and imaged is robotically removed from the storage rack and moved onto the system's observation stage executing contamination and vibration free transport.

4

Automatic image capture

Both the micro (microscopic) image of the cells and the macro image of the whole vessel are automatically captured.

5

Image and environment data saved together

Captured images are sequentially saved over time, along with data for temperature, humidity and CO₂ concentration from the initial time of image capture sequence. BioStation CT achieves highly reliable data acquisition that offers complete traceability for the history of all cells being cultured.

Easy operation

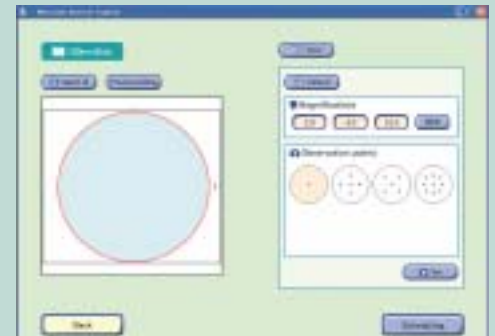
My-vessel list display

The system shows the location of only the vessels that you are eligible to handle. Transfer of vessels and confirmation of data require the entry of an ID and password, ensuring security and confidentiality.



Easy-to-use GUI menu

Multiple observation points, magnifications, wavelengths and image capture intervals can be easily set in the touch panel software menu sample by sample.



Quick data retrieval

Images can be quickly retrieved by cell type, vessel type, capture time and other data or by keywords.



Remote control from distant PC

Images can be viewed and capture conditions set from a remote PC over the network. Imaging cells in a vessel remotely from home or on a trip away from the lab is available.

Precise control of culture environments

Temperature control

Interior temperature of the incubator is precisely maintained at 37°C with panel heaters embedded in the six sides of the incubator.



Humidity control

The air-flow type active aerosol spray humidifier maintains interior humidity (saturated vapor pressure) at 95% or higher, eliminating worries about contamination that can occur in the water bath type.

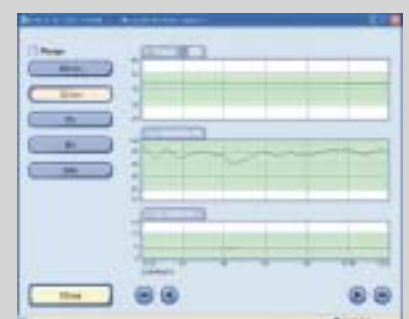


CO₂ concentration control

CO₂ gas is automatically supplied so that concentration is maintained at 5%.

CO₂ incubator environmental graph screen

The internal environment of the incubator during cell culture is constantly monitored and recorded, allowing the user to confirm cell culture conditions later.



Minimum stress on the cells

Small access gate

The vessels are placed into the incubator from a small door on the front glass panel, minimizing the environmental change of the incubator interior.



Stable transport

Vibration that may occur during the transport of the vessels from storage rack to observation stage has been minimized. This reduces the chance of the medium being jiggled, minimizing stress or abnormal conditions on the cells.



Wide choice of vessel types

The system accepts a variety of vessels—from various cell culture flasks, Petri dishes, and well plates. Up to five 35mm Petri dishes can be placed in a tray holder, and up to 30 tiers can be stocked in the storage rack for a maximum total of 150 35mm dishes.



Tray holder



Culture dish trays for various vessel types are available.



75cm² culture flask



25cm² culture flask



24-hole well plate



12-hole well plate



6-hole well plate



100mm culture dish



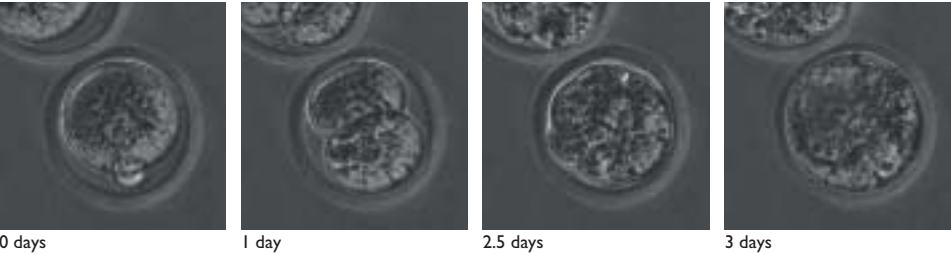
60mm culture dish



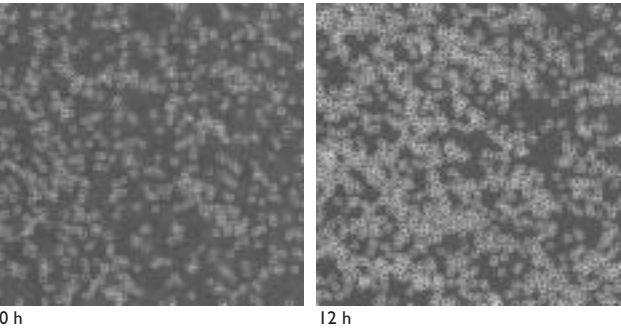
35mm culture dish

Imaging examples

Fertilized mouse eggs (prenuclear period)

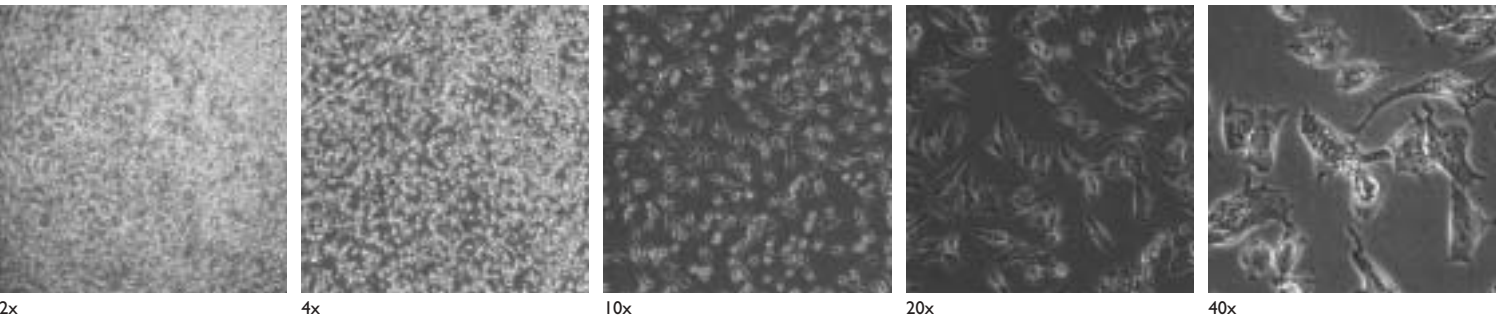


Human B lymphoblastoid cell



Courtesy of Dr. Hiroharu Kawahara,
Kitakyushu National College of Technology

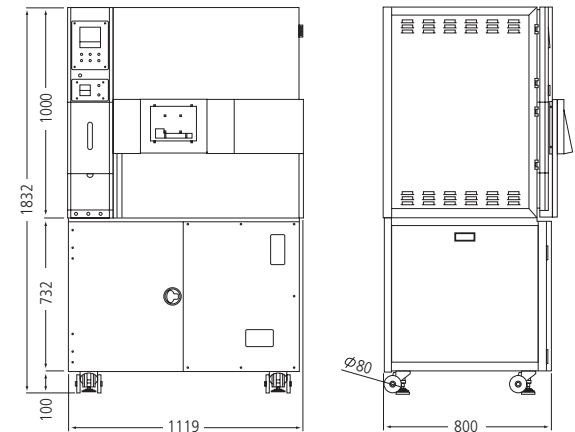
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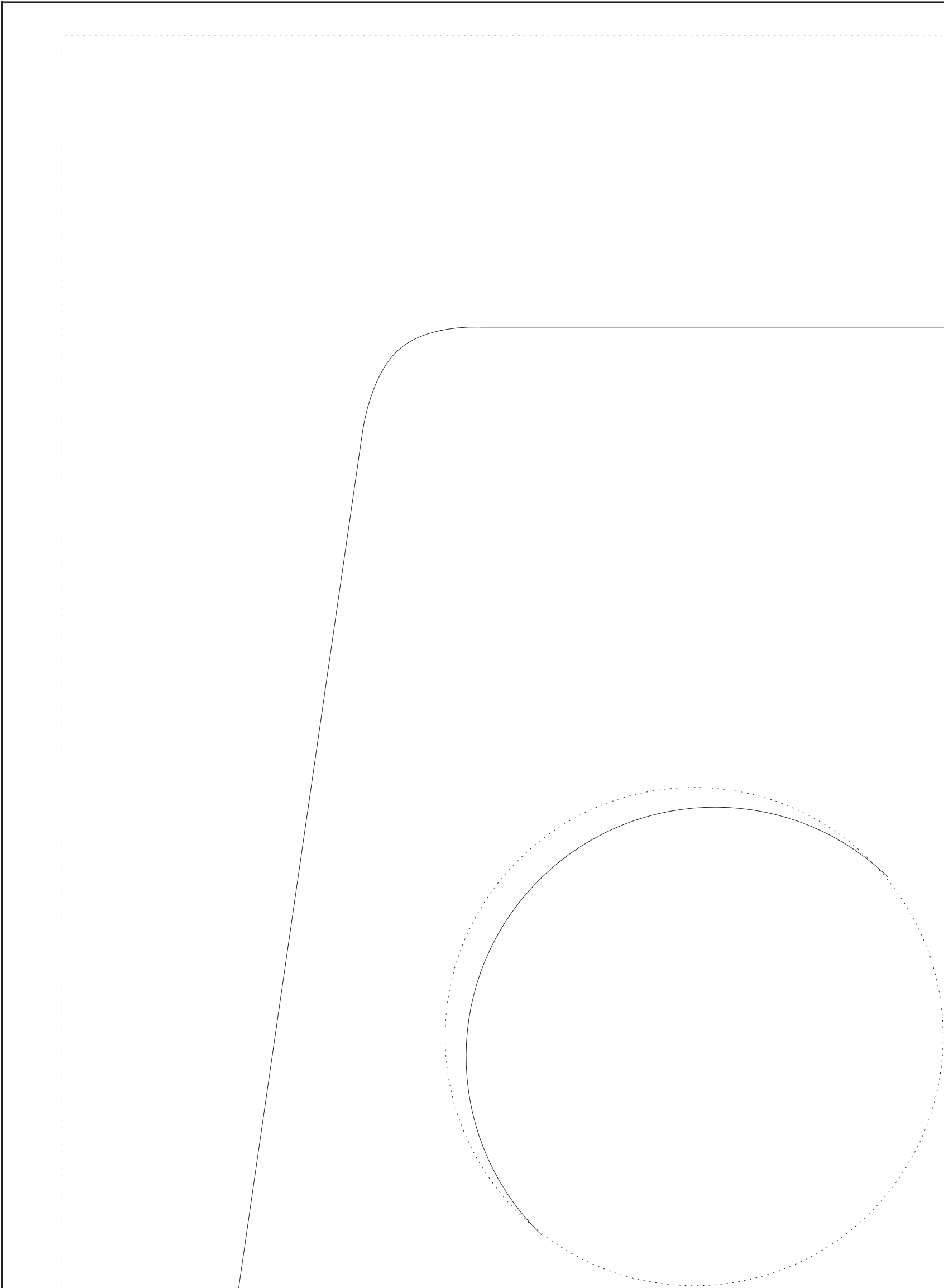


Specifications

Operation	With touch panel LCD Controllable via network (with IE6 web browser)
Incubator volume	460L
Temperature control	Direct control via heater panel Range: room temperature +5°C to 40°C (max.), 0.1°C increments
Humidity control	Via aerosol spray humidifier Range: 70% to 95%, 1% increments
CO ₂ intensity control	CO ₂ supply: by external CO ₂ gas cylinder connection Range: 0% to 20%, 0.1% increments
Number of vessels mountable on each tier (max.)	Flask: 25cm ² x 2, 75cm ² x 1 Dish: ø35mm x 5, ø60mm x 2, ø100mm x 1 Well plate: 6-hole x 1, 12-hole x 1, 24-hole x 1
Specimen supply	With dedicated carrier via access gate
Specimen storage rack	3 rows x 10 tiers
Macro observation	Image capture of whole vessel with dedicated camera (bird's-eye view) Camera head: color CCD camera (1280 x 960 pixels) Brightfield: backlight illumination
Micro observation	Magnification: 2x, 4x, 10x, 20x, 40x Objective: Plan Fluor DL/Plan Fluor ADL series Camera head: 2/3-inch cooled CCD camera (1M pixels, 15fps) Phase contrast: high-intensity red LED illumination, automatic phase ring changeover Epi-fluorescence (option): LED V/B/G illumination, 3 filter blocks mountable
Stage travel	XY: 120 x 120mm (max. resolution: 8µm) Z: 6mm (max. resolution: 0.03125µm)
Sample focusing	AF focus point automatic detection 15 consecutive Z-axis scans manually possible both above and below focus point
Observation	Via PC monitor
Power source	Power capacity: 100, 115, 230VAC ±10% 1300VA 50/60Hz Frequency: 50/60Hz
Weight	Approx. 470kg
Operating environment	Temperature: 15°C to 28°C Humidity: Max. 60% relative humidity (noncondensing)

Dimensional diagram





Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. March 2007 ©2007 NIKON CORPORATION



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