

# Chamlide TC

## User's Guide



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## What is Chamlide TC?



**Chamlide TC™** is the top-stage incubation system which allows to observe the living cells for a long time, and to use diverse kinds of chambers since it provides various types of adaptors to fit the TC incubator main body. Moreover, it makes the best condition to image live-cell, preserving temperature, humidify, and pH as well as inhibiting evaporation with using incubator and humidifier. You can use not only disposable culture wears on sale nowadays, but also magnetic Chamlide™ chamber or Well-slide™.

**The list of constructing units**

Component		Quantity
TC-L-Z101	TC incubator cover	1
TC-L-Z102	TC incubator main body	1
TC-L-Z003	Controller (CU-109)	1
TC-L-Z004	Lens warmer	1
TC-L-Z005	Humidifier	1
TC-L-Z006	Gas control speed valve for 4ø tubing	1
TC-L-Z007	RS232/485 converter	1
TC-L-Z008	2ø(O.D) tubing	3m
TC-L-Z009	4ø(O.D) tubing (from gas tank to gas-in fitting of controller)	3m
TC-L-Z010	6ø(O.D) tubing (from gas-out fitting to incubator–via humidifier)	1
TC-L-Z011	Adaptor for Nunc Lab-Tek™ II Chamber Slides	1
TC-L-Z012	Adaptor for Nunc Lab-Tek™ II Chambered Coverglass	1
TC-L-Z013	Adaptor for 35mm dish type magnetic chamber or dishe	1
TC-L-Z014	Adaptor for well-slide & Chamlide MB (2-hole bottom plate)	1
TC-L-Z015	(Optional) Adaptor for two 35mm dish type chamber or dishes	-
CM-B-30	Chamlide CMB for 18mm coverslips (Including extra o-rings)	1 (3)
CM-B-40	Chamlide CMB for 25mm coverslips (Including extra o-rings)	1 (3)
MB-R-20	Chamlide MB (2-hole bottom plate for 25mm round coverslip)	1
SG-C-10	Special glass cover for 35mm culture dish	1
SG-C-30	Special glass cover for disposable chamber slides	1
	220V fuse	2
	AC power cable	1
	CCP ver 3.7 (CD)	1

## Specification

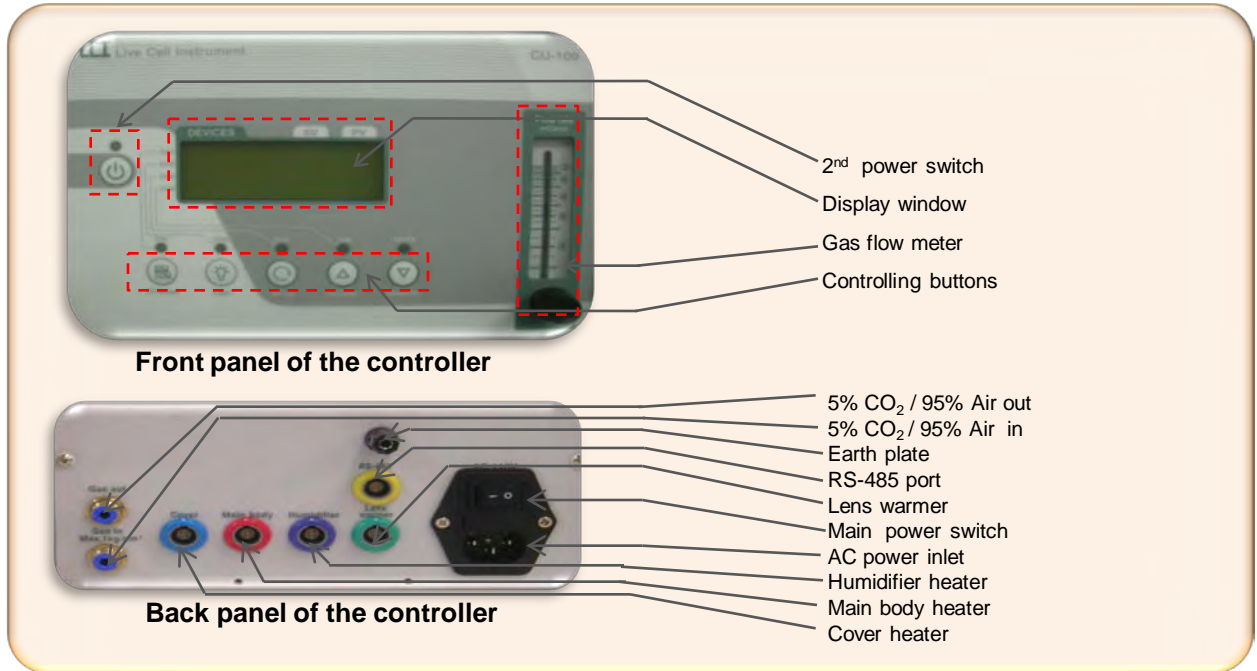
Temperature range	Ambient +3°C ~ 45°C	
Recommended 5% CO <sub>2</sub> / 95% Air flow rate	40~50 ml/ min	
Incubator physical dimension (mm)	Cover	164.9 (W) x 134 (D) x 11 (H)
	Main body	160.0 (W) x 130 (D) x 14 (H) (Insert size 160 (W) x 110 (D))
	Adaptor	110.0 (W) x 62 (D) x 7 (H)
	Heating method	Cover                      built-in heater glass
	Main body	thin layer heater
	Humidifier	cartridge heater
	Lens warmer	thin layer heater
Humidifier bottle volume for humidity	Maximum 100 ml	
Sensor	Thermo-couple	
Incubator material	Black anodized aluminum alloy	

## Caution befor using Chamlide TC

- Do not locate Chamlide TC™ in the direct sun light, in room which the temperature is not controlled, or in room vibration is generated. Chamlide TC™ is running at optimum efficiency to use in air-conditioned room where the temperature is kept room temperature (around 25°C).
- Avoid any tension to the wires and tubes connect to the incubator because such tensioned-wires and tubes may move the position of observing specimen.
- When the cover slip in Chamlide™ chamber is broken, the chamber separates form the microscope stage and wipes a solution immediately because it may cause damage to microscope lenses or Chamlide TC™ system due to leaking the medium and its fragments.
- In the event of any other unexpected problems such as equipment malfunctioning, report them immediately to the LCI coordinator.

## Instruction and a name of the parts

### 1. Controller (CU-109)



### How to set the temperature

- 1) Turn the main power switch on.
- 2) If the 2<sup>nd</sup> power switch turn on while the main power switch turn on, the lamp of 2<sup>nd</sup> power switch indicates the green color. If the lamp is shown orange color, the 2<sup>nd</sup> power switch is turn off. So, please press the button during 2~3 seconds.)
- 3) Press the “CH.Select” button and choose the heater you want using this button. (The selected heater (channel) is flickered.)
- 4) Press the “set up” button. The display window is changed like “SV DATA = \_\_\_\_\_”



- 5) Using the arrow keys, please change SV to the temperature you want. (The limits of temperature ; ambient +3 °C ~ 45 °C )

**NOTE**

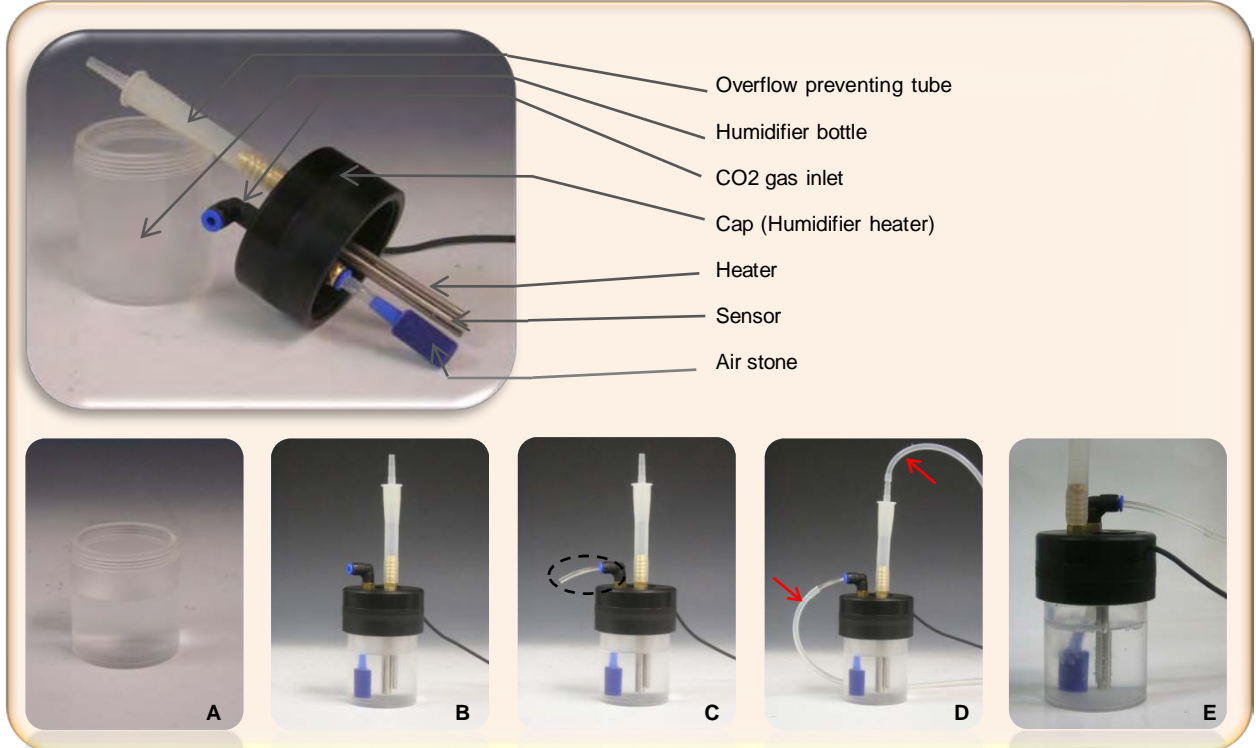
- SV (Set Value) indicates on the set temperature.
- PV (Process value) shows the actual temperature

- 6) If you want to return the temperature mode, please press the “set up” button again.
- 7) Until not to show the flicker on the display window, press the “CH.Select” button several times.



## 2. Humidifier

► This is available to maintain the humidity inside incubator.



- 1) Fill the Humidifier bottle with deionized warm water (Max. 100ml) (A).
- 2) Screw the cap down tight on the bottle (B).
- 3) Put the short 4Ø poly urethane tubes (about 5 cm) into the CO2 inlet (elbow coupler) which are the one-touch system to join easily (C).

**NOTE** ▪ When tubes are taken off the tubes, pull the tubes while pressing the blue part of the coupler

- 4) Connect the 6Ø silicone tubes with the short poly urethane tubes and the overflow preventing tube (D).
- 5) Connect the humidifier cable to its hole in the back panel of the controller.

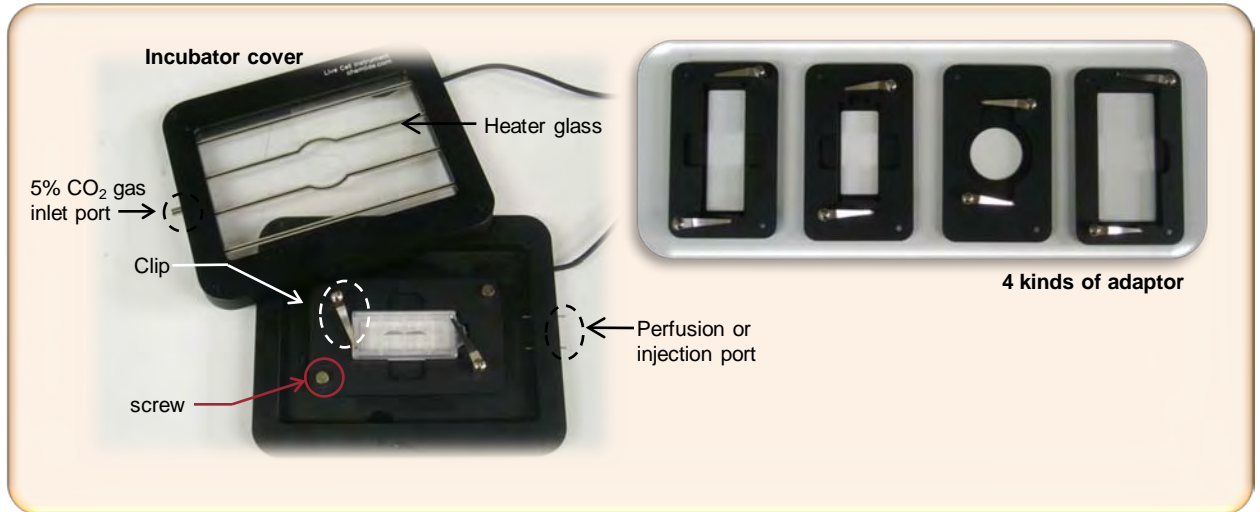
**NOTE** ▪ The limits of temperature : Ambient +3°C ~ 70°C

A. When you observe the cells during less than 48 hour, recommend to set the temperature of the humidifier to 45~50 degree.

B. When use the incubator system more than 48 hour or the chamber without the cover, recommend to set its temperature to 70 degree for preventing the evaporation of the medium.

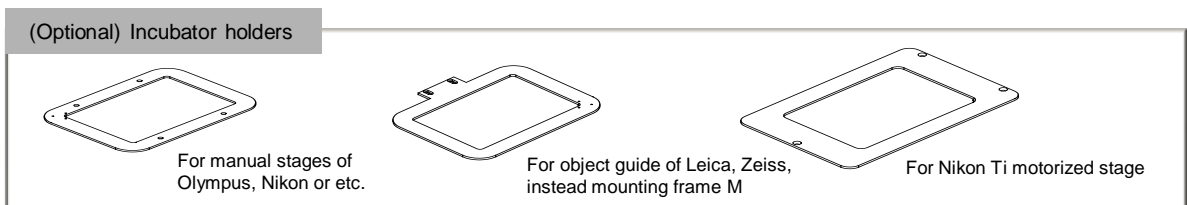
## 3. Incubator

- It offer cells the best condition because it regulates the temperature, the humidity and density of CO<sub>2</sub>. Incubator main body is a heating plate which controls the temperature of incubator inside. Incubator cover containing a built-in heater glass which uses small reflecting glass to get perfect transmission images can also control the temperature and prevent fog forming.

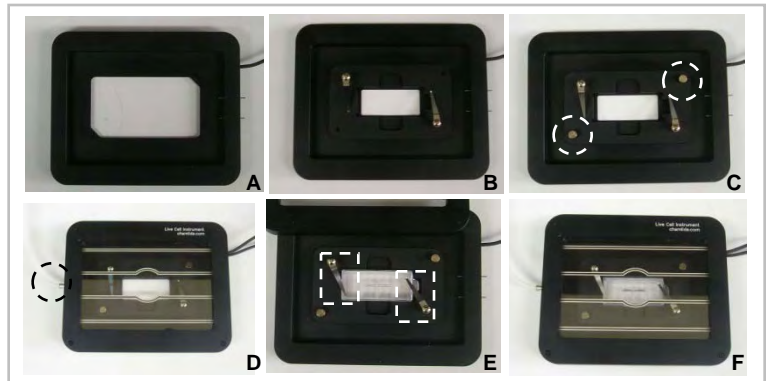


- 1) Install the incubator main body into the opening of microscope stage.  
If the insert is not the mounting frame K, it need a incubator holder according to kinds of stages.

Stage type	XY-motorized stage, (Mounting frame K insert)	Mechanical stage (Mounting frame K)	Object guide (Mounting frame M)	Other manual stages
Microscope	All type of microscopes	Zeiss or Leica	Zeiss or Leica	Olympus, Nikon, etc.
Incubator holder	Not required	Not required	Required	Required

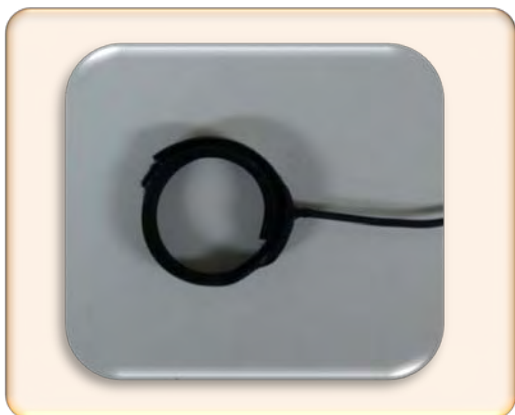


- 2) Put the adaptor you want into the incubator (B).
- 3) Fix the adaptor on the main body by tightening screws (C).
- 4) Close the Incubator cover and connect 6Ø silicone tubes to CO<sub>2</sub> inlet and connect the cables with the controller (D).
- 5) Warm up the incubator before starting a experiment. (Pre-warming time is minimum 20 min.)
- 6) Put the adaptor-fitting chamber into the adaptor and fasten it with clips (E).
- 7) Close the incubator cover (F).



## 4. Lens warmer

► When live-cell imaging requires the use of high numeric aperture lenses, it is necessary to control the temperature of the objective as well. This problem exists because the optical coupling medium (oil, glycerin or water) acts as a thermal coupling medium and draws heat away from the specimen. To eliminate the problem, Chamlide IC use lens warmer with an heating band to maintain the temperature of a high N.A. lens and it fit any kind of objectives in the market.



- 1) Connect the cable of Lens warmer to hole in the back panel of the controller.
- 2) Wind Lens warmer around a high N.A. objective.

## 5. Chamlide CMB (35mm dish type magnetic chambers)

- 1) Culture the cells on a cover slip.

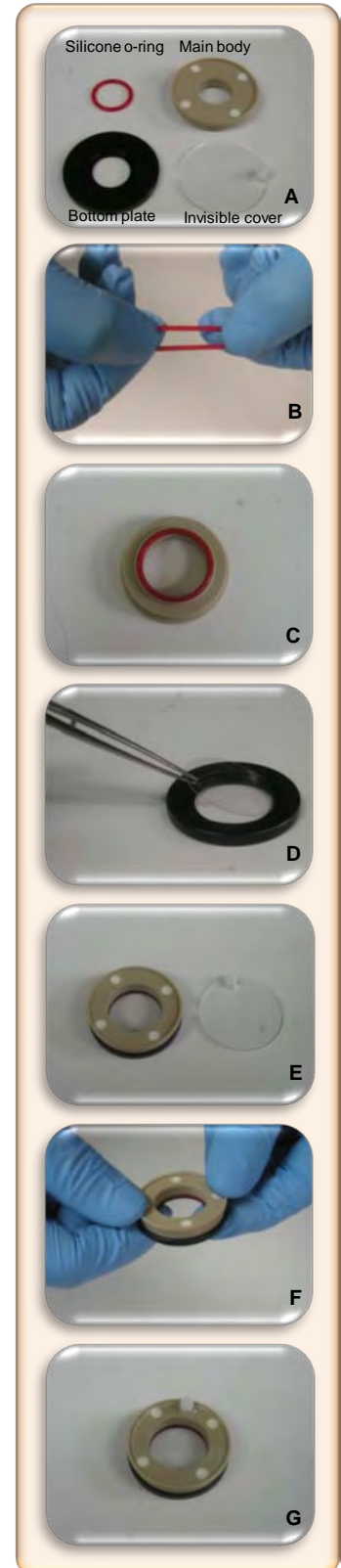
**NOTE** ▪ If you want to sterilize the chamber, you have to autoclave the main body, the bottom plate, and the silicone o-ring (It is better that the bottom plate and the silicone o-ring sterilize by UV in order to use for a long time) Before using it, it must be thoroughly dry on their surfaces and install it with gloves on.

- 2) Insert silicone o-ring into bottom of the main body (C). If it does not fit, extend both sides of silicone o-ring twice (B)
- 3) Using forceps, transfer the cover slip to the bottom plate (D).

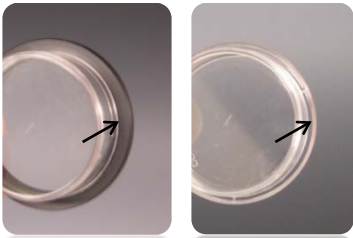
**Caution** You should give attention to break or overturn the cover slip.

- 4) Install the main body (E). The main body will automatically attach to the bottom plate due to the **magnetic force**.
- 5) Grip the above and below of the chamber and press it in order to confirm the installation of it (F).
- 6) Fill the chamber with an observation medium.
- 7) Clean the bottom of the cover slip with paper tissue for improving condition of observation.
- 8) Put the invisible cover on the chamber (G).
- 9) Use with Chamlide incubator system such as Chamlide TC, IC or WP for live cell imaging.
- 10) After using the chamber, Clean it with wet (water or alcohol) paper tissue or a soft cloth. (If you want, it can be cleaned with mild laboratory soap and water, rinsed and dried. However, Do not use a scrubbing brush.)

**NOTE** ▪ You can also use pre-assembled chamber to directly seed the cells.



## 6. Special glass cover



Special glass cover    35mm culture dish lid

► The commercial culture ware are easy to evaporate medium because their chamber and cover do not fit. Therefore, we provide special glass covers which fit on disposable chamber slide and 35mm culture dish for humidity maintenance and good transmission image.

- 1) Remove the lid of disposable culture dish.
- 2) Fit the special glass cover into the culture dish (B).
- 3) Put the invisible cover on it (C).



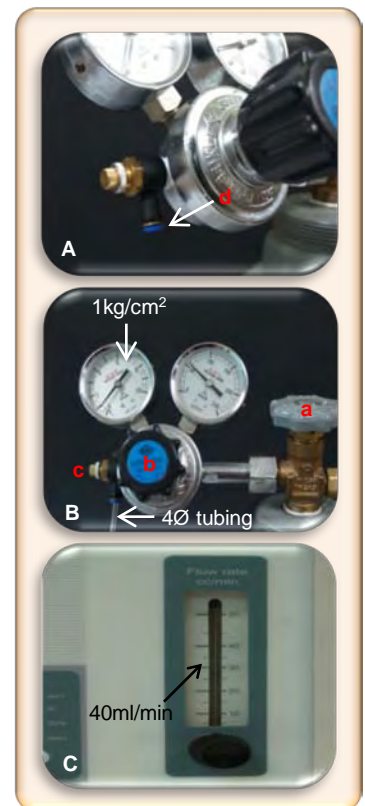
## 7. Gas control speed valve



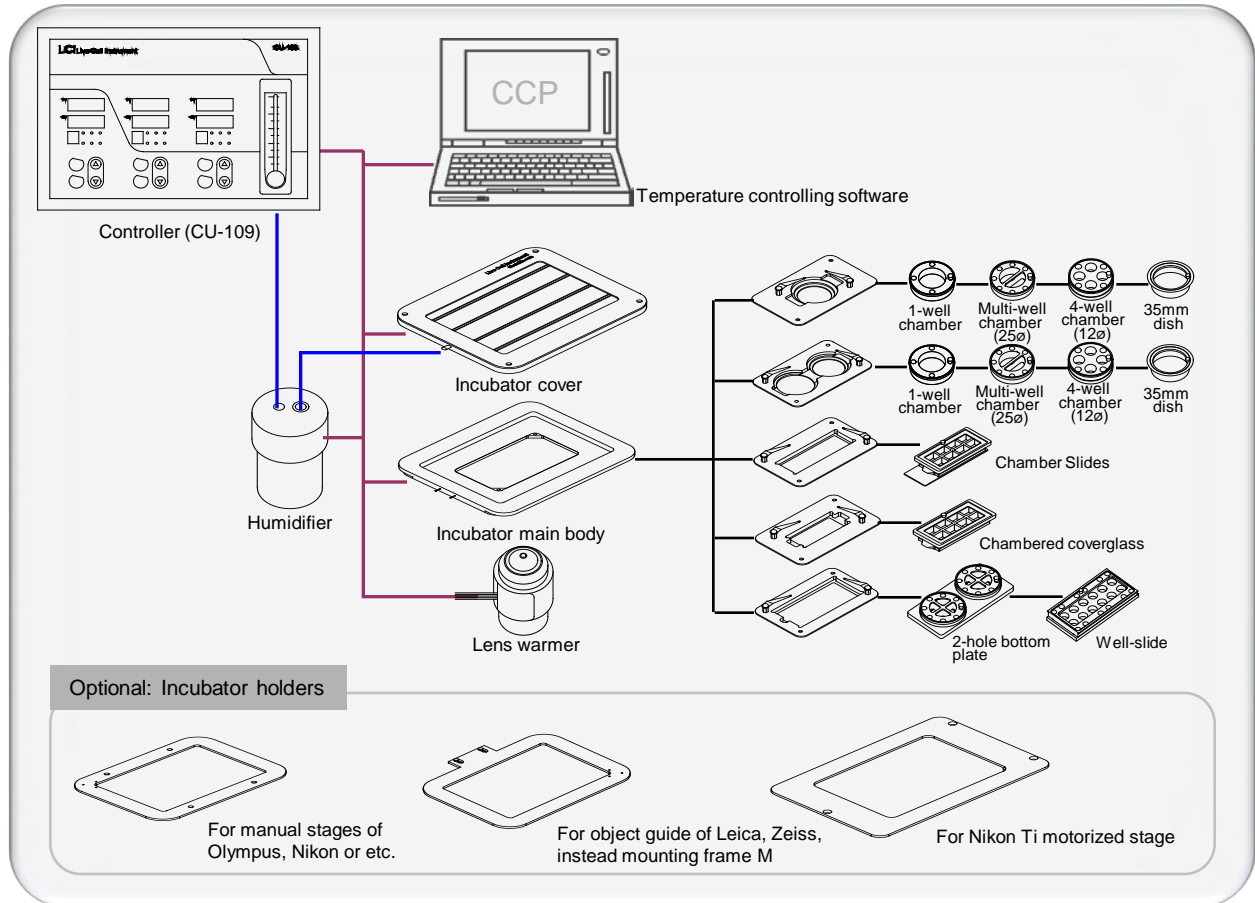
- ▶ The gas control speed valve can be possible to connect the tubing into the gas regulator vary easily.
  - To connect the 4Ø polyurethane tubing, push end of the tubing into the female port of the gas control speed valve.
  - To remove tubing, pull the tubing while pushing the blue surrounding of the gas control speed valve.

### How to set CO2 gas

- 1) Connect a gas regulator to the gas tank.
- 2) Remove the outlet fitting from the regulator and connect provided “gas control speed valve” to the regulator instead of it (A).
- 3) Connect the one end of 4Ø polyurethane tubing to the gas control speed valve(d) and then connect the other end of tubing to “gas in” hole of the controller.
- 4) When the installation of Chamlide IC™ is finished, open the main valve (a) of the gas tank and set the gas pressure around 1 kg/cm<sup>2</sup> using the valve (b) of the regulator (B).
- 5) Open the “one-touch fitting” valve (c) about a turn.
- 6) Using the flow meter of the controller, set gas flow around **40~50 ml/min** (D).



## Installation



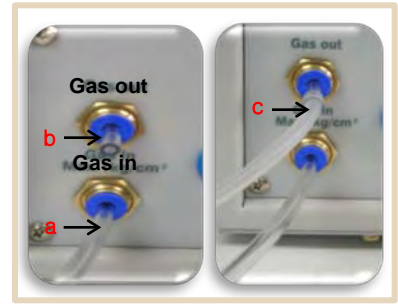
- 1) Install an incubator main body into the stage of microscope. If you have an optional incubator holder, fix it on the stage before putting the incubator main body.
- 2) Put the TC adaptor your want into the incubator, and then fasten it by screws.
- 3) Locate a controller (CU-109) and a humidifier around the microscope.
- 4) Connect a gas regulator to a gas tank.

**NOTE** ▪ You can use a mixed gas (5% CO<sub>2</sub>/ 95% air) or 100% CO<sub>2</sub> gas with FC-5 gas mixer (Cat. No. FC-R-10)

- 5) Remove the outlet fitting from the gas regulator and connect provided “gas control speed valve” to the regulator instead of the outlet fitting.

5) Connect the one end of 4Ø polyurethane tubing to the gas control speed valve and then connect the other end of tubing to “gas in” hole of the controller (a).

6) Insert the another short 4Ø poly urethane tubes (Cut off the 4Ø tubing about 5 cm) into “gas out” hole of the controller (b) and then connect the 6Ø silicone tube with the short tubes (c).



7) Connect the other end of silicone tubes to the CO<sub>2</sub> inlet (the coupler) of the humidifier heater.

8) Connect the overflow preventing tube of humidifier heater with the incubator cover by using silicone tubes. (Silicone tubes is facilitated movement of humidifier and incubator.)

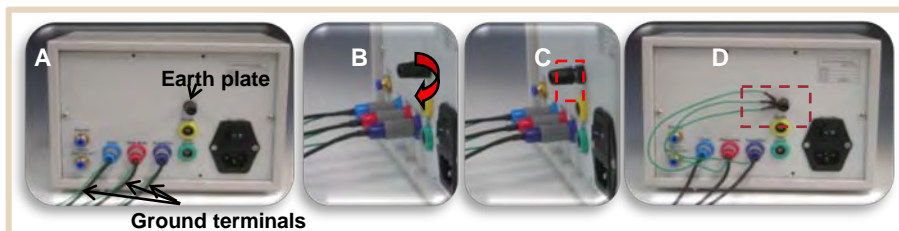
9) Make sure to close the gas control speed valve and the flow meter of the controller.

10) Connect the RS232/485 converter into the serial port of the computer.

11) Connect the cables for the incubator cover, the main body, a lens warmer, a humidifier heater, and a converter to holes in the back panel of a controller (A). (Match colors of a male and a female connectors)

12) Loosen the earth plate (B). (Turn counterclockwise it a little.)

13) Insert the ground terminals (Y terminals) in the space (C) and Fasten the earth plate (D) (Turn clockwise it). Turn on the controller.



14) Set the temperature as needed and CO<sub>2</sub> gas as mentioned above.

15) Pre-warming the incubator for about 20 min.

16) Put the chamber which is seed the cells on the incubator main body and fasten it with clips.

17) When complete your work, turn off the controller, lock the gas tank, and clean the incubator inside, used chamber and humidifier bottle.