

MINI LIQUID NITROGEN DOSER MANUAL

01. Precautions

1. Make sure the product does not fall over.
 - If the product falls, there is a risk of damage.
2. Avoid touching liquid nitrogen with your hands.
 - There is no harm from short term contact with liquid nitrogen, but there is a risk of burns from long term contact.
3. Do not wear gloves when injecting liquid nitrogen.
 - During the injection of liquid nitrogen, if it comes in contact with your hands, a phenomenon occurs and the liquid nitrogen will simply fall off your hands. However, if contact is made with liquid nitrogen while wearing gloves, the liquid nitrogen will seep into the gloves, freezing them; therefore presenting a risk of frostbite.
4. After filling the mini LN2 doser with liquid nitrogen, make sure to close the LN2 valve.
 - Nitrogen is consumed by vaporization of liquid nitrogen. Be sure to close the valve.
5. Make sure not to use the doser in an enclosed space.
 - Nitrogen is an inert gas that occupies 74% of the air and is safe. However, if nitrogen gas is released within an enclosed space, the oxygen concentration decreases, causing a risk of suffocation. Please use in a space with open windows or an open door.
6. Do not manually operate the heating box temperature in the inlet of the mini LN2 doser.
 - The heater of the mini LN2 doser inlet maintains a constant temperature. When liquid nitrogen is discharged at -196°C (-320.8°F) from the inlet, it helps to prevent icing and frost from clogging the nozzle inlet. Do not change the temperature as $40-50^{\circ}\text{C}$ ($104^{\circ}\text{F}-122^{\circ}\text{F}$) is what it should be at.
7. When opening and closing the valve of the liquid nitrogen container (LGC), make sure to wear gloves.
 - During the injection of the liquid nitrogen, when the -196°C (-320.8°F) liquid nitrogen is being supplied via the valve, it may freeze the valve due to its low temperature. Make sure your bare hands do not come in contact with the valve as your skin may stick to the valve.

02. Basic Information on Nitrogen

Liquid nitrogen maintains its liquid state only at -196°C (-320.8°F) and vaporizes immediately at room temperature. Therefore, liquid nitrogen can be maintained in its liquid state only when it is kept in a vacuum container.

Both the body of the mini LN2 doser and liquid nitrogen container (LGC) are in vacuum states so the external temperature cannot be internally transferred, which allows the liquid nitrogen to be maintained in its liquid state at -196°C (-320.8°F). However, even if liquid nitrogen is kept in a perfectly vacuumed container, natural vaporization is unavoidable. For this reason, within 17–20 days, complete vaporization of the liquid nitrogen occurs.

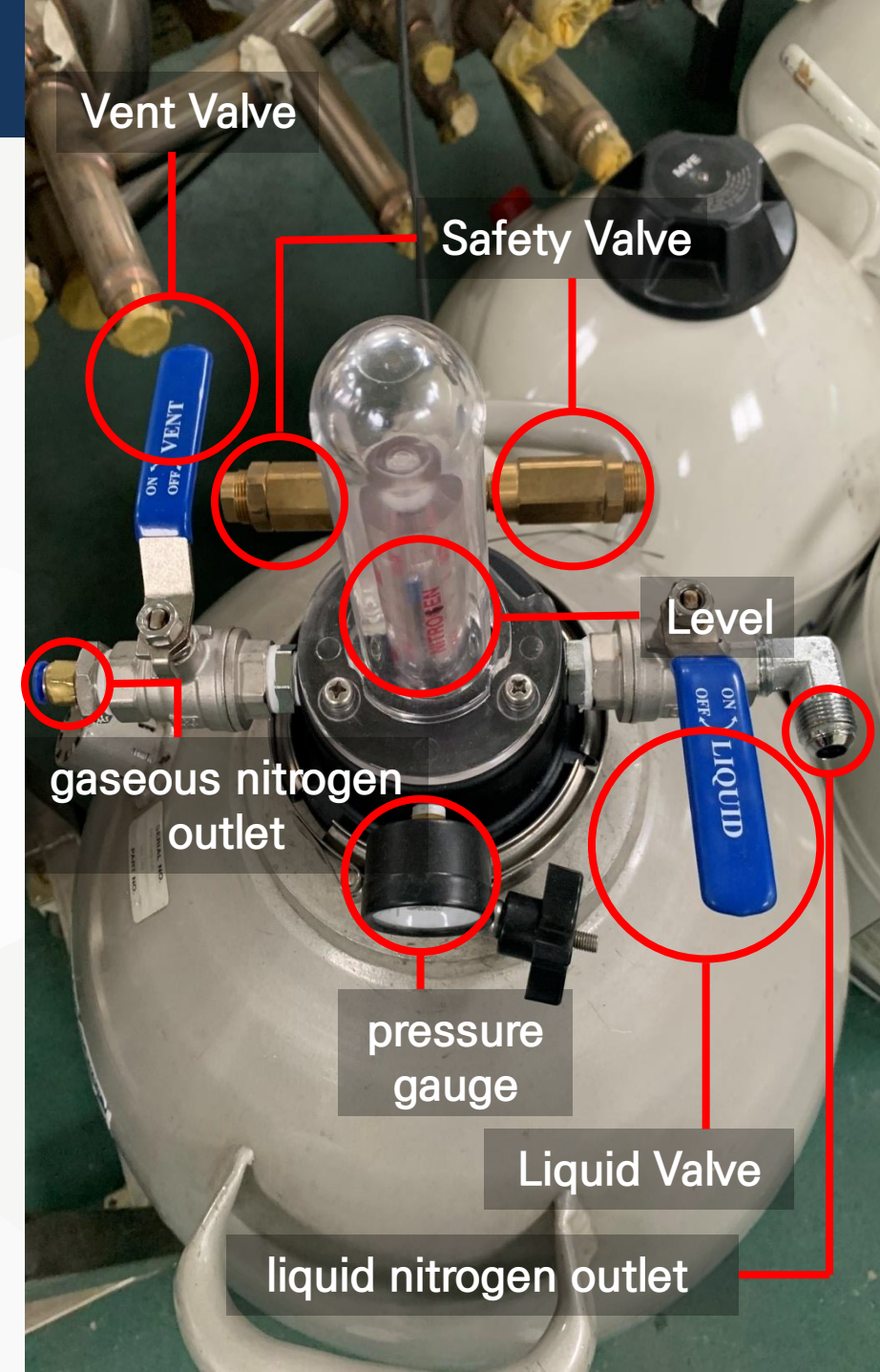
When liquid nitrogen is vaporized, it expands 700 times. Using this principle, a can may be filled with liquid nitrogen and sealed immediately, which results in the vaporization of liquid nitrogen as well as the creation of internal pressure. This process can prevent a can from denting.

Additionally, vaporized nitrogen gas externally discharges air and oxygen out of the top of the can. At this point, the nitrogen gas, which is an inert substance, takes the air's place and exhibits effects of microbial growth suppression.



03. LD35 Container Description

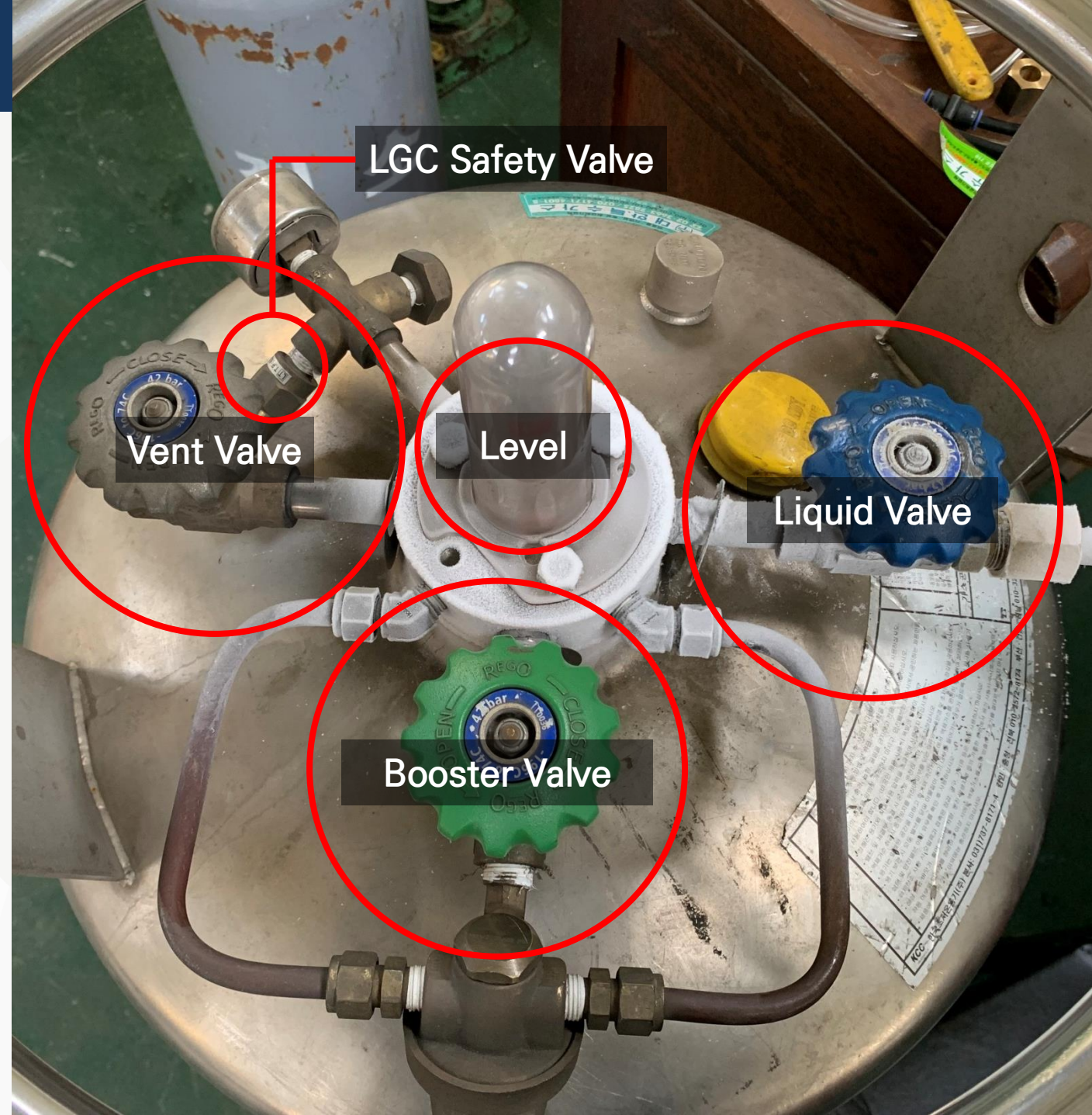
1. Vent Valve : This valve releases gaseous nitrogen. With the CVS silencer installed onto the safety valve, the silencer can reduce the noise created by the safety valve upon its opening.
2. Liquid Valve : This valve that is connected to the mini LN2 doser and the Insulation pipe, opens and closes when the liquid nitrogen is injected.
3. gaseous nitrogen outlet : The part that is discharged when the gaseous nitrogen vent valve is opened
4. liquid nitrogen outlet : The part that is discharged when the liquid nitrogen injection valve is opened (Open only when connected to the thermal insulation pipe.)
5. pressure gauge : Displays the current internal pressure of the vessel
6. Safety Valve : When internal pressure exceeds the set pressure, the safety valve automatically opens to release the pressure
7. Level : A floating rod is placed on top of the liquid nitrogen inside. As the liquid nitrogen is consumed, the level of the rod follows along with it, so users may check on the current amount of liquid nitrogen left in the storage tank.



04. Information of LGC Container

The LGC is composed of the liquid valve, vent valve, booster valve, safety valve and level.

1. Liquid Valve – This valve that is connected to the mini LN2 doser and the Insulation pipe, opens and closes when the liquid nitrogen is injected.
2. Vent Valve – This valve releases gaseous nitrogen. With the CVS silencer installed onto the safety valve, the silencer can reduce the noise created by the safety valve upon its opening.
3. Booster Valve – This valve raises internal pressure when there is none. When the pressure gauge is 0, the operator may keep the booster valve open for about 1 to 3 minutes to create pressure. The operator may close the valve after pressure is created.
4. Safety Valve – When internal pressure exceeds the set pressure, the safety valve automatically opens to release the pressure.
5. Level – A floating rod is placed on top of the liquid nitrogen inside. As the liquid nitrogen is consumed, the level of the rod follows along with it, so users may check on the current amount of liquid nitrogen left in the storage tank.



05. Mini LN2 Doser Composition



Mini LN2 Doser Body 1EA



Insulation Pipe 1EA



Monkey Spanner 1EA



L Wrench 1EA

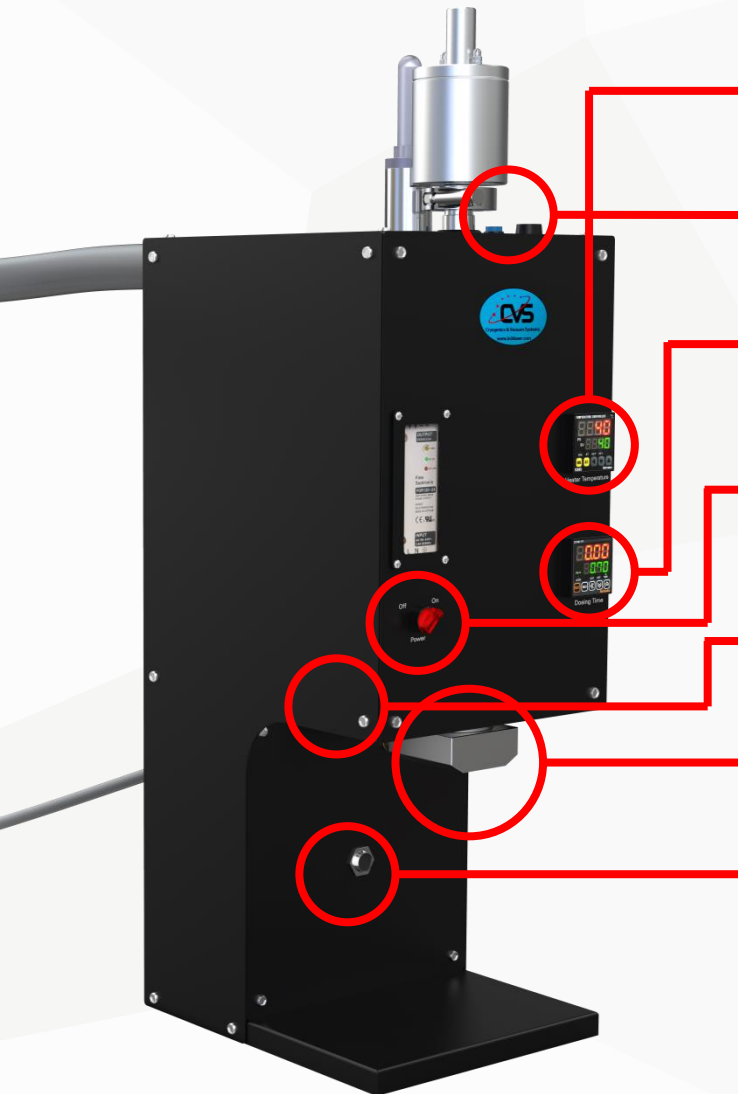


Teflon Tape 1EA



Relay Parts Consumables 1EA

06. How to Use the Mini LN2 Doser-01



Thermometer : Adjust the heater temperature. (Operation prohibited)

Buzzer button : The blue color is a buzzer, and you can turn off the buzzer sound with the front button.

Dosing time : You can set the injection time of liquid nitrogen. See the back page for how to set the injection time.

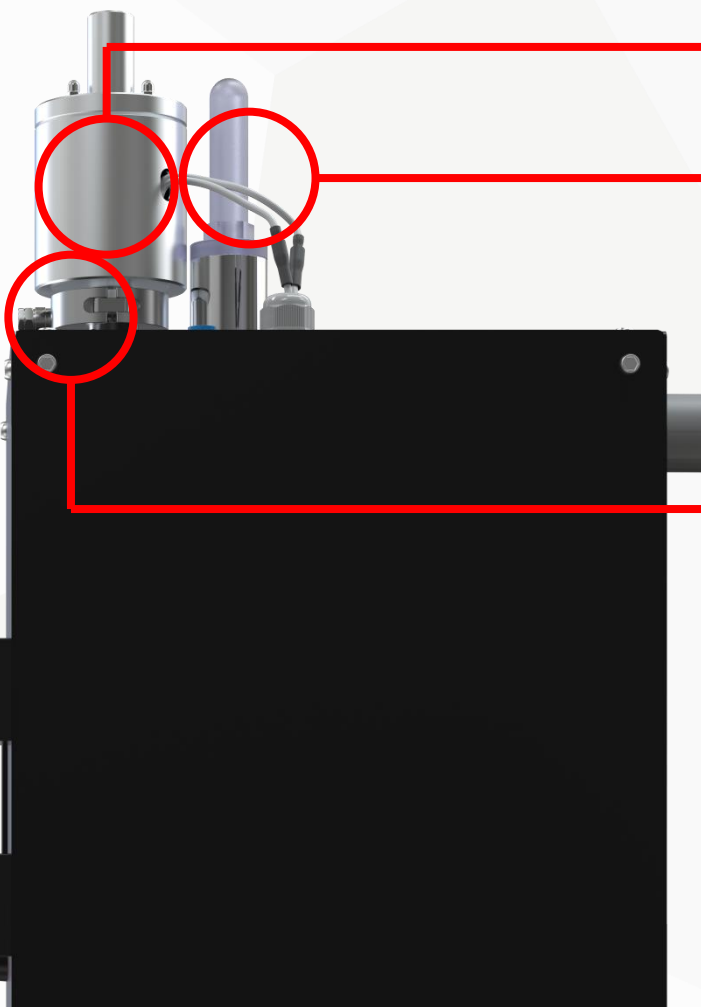
Power : You can turn the product on and off.

Main Power : Turn off the main power when you leave work and don't have to use it for two to three days.

Heater : The temperature displayed on the thermometer is the temperature of the heater.
You can remove the ice from the nozzle by loosening the left side of the heater with a wrench.

Sensor : After placing a drink in the can, if it is placed in front of the sensor, liquid nitrogen is injected for the set injection time.

06. How to Use the Mini LN2 Doser-02

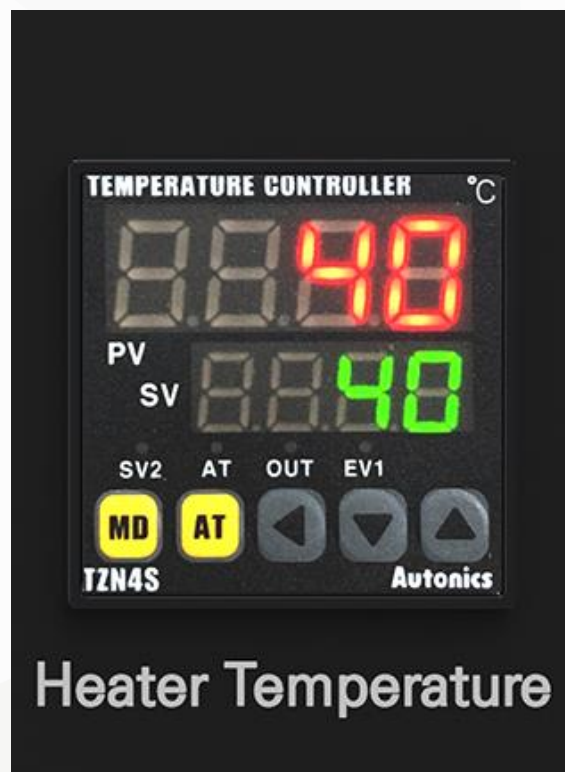


Electromagnet : When the stem inside is frozen, loosen the clamp, disconnect the wire, and put the electromagnet on it to remove the ice and reassemble.

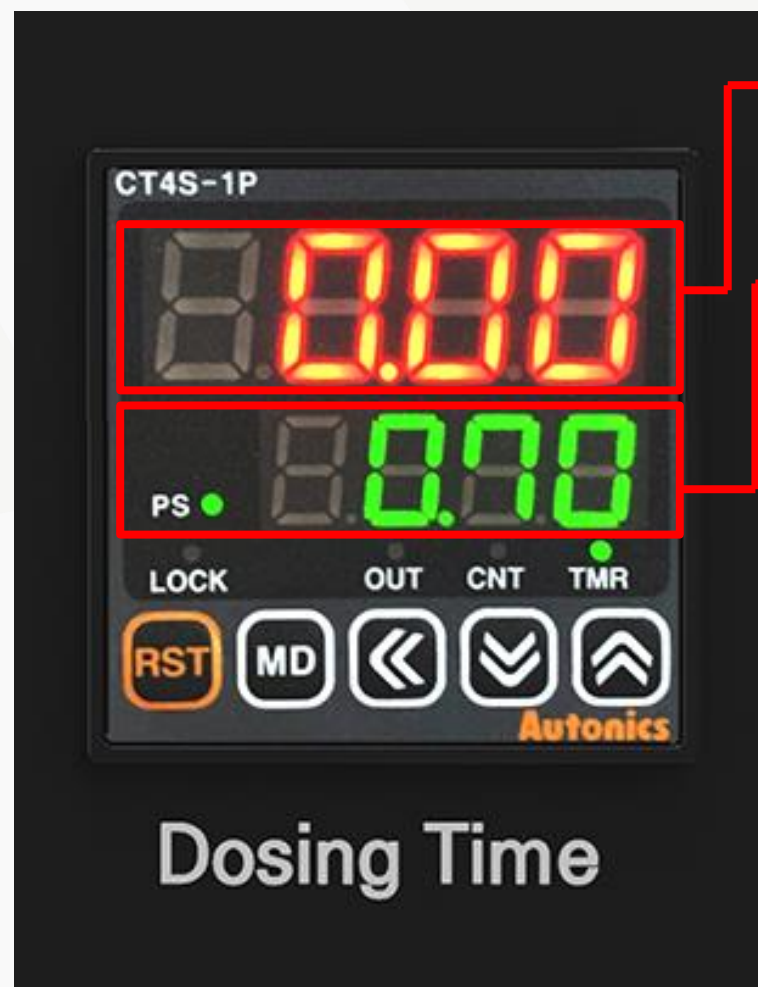
Level : You can visually check the amount of liquid nitrogen inside the mini liquid nitrogen doser. When the inner black bar rises, liquid nitrogen is filled, and when the black bar goes down, it indicates liquid nitrogen is consumed.

Clamp : The clamp can be opened and closed with a monkey spanner. When the stem is frozen due to moisture inside due to prolonged use, you can release the ice on the stem by loosening the clamp.

06. How to Use the Mini LN2 Doser-04 Timer Setting



The timer indicates the temperature of the heater.
The temperature is set to 40 °C (104°F).
Do not touch this.



– The injection time is displayed.



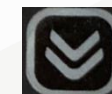
– The injection time setting is displayed.



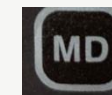
– Press OUT to make the cursor blink.
Press OUT several times to move the setting cursor.



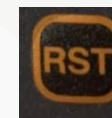
– Raise the time.



– Lower the time.



– Complete the setting.



– No reset button. Never manipulate it.
A/S may occur because the setting method is changed.

06. How to Use the Mini LN2 Doser-05 LN2 Injection



01. Turn on the Main Power.



02. Turn on the power.

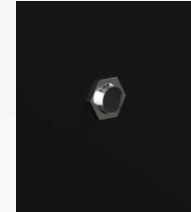


03. Open the liquid valve of the LGC.



04. If a certain amount of liquid nitrogen is injected through the level of the mini LN2 doser, close the liquid valve of the LGC.

After closing the valve, wait about 30 seconds for the residual pressure to be exhausted.



05. If a can is placed onto the sensor, liquid nitrogen is injected for the set amount of time.



06. When finished using, turn off the power.



07. Turn off the main power when you leave work and don't have to use it for two to three days.

08. Manual for Handling Any Abnormal Problems

01. When you open the LGC valve to replenish the liquid nitrogen yet you can only hear a sound and the liquid nitrogen isn't being refilled.

– If the level inside the LGC has risen to the top but only the sound of the liquid nitrogen being refilled is heard without any actually being refilled, the liquid nitrogen within the LGC has been exhausted. The LGC is an industrial container that has been used by many different companies, therefore, the level works with a certain margin of error. Identification of the remaining amount of liquid nitrogen in the LGC must be done by checking the level. If the level is dysfunctional, estimation of the weight can be done by slightly shaking the vessel container.

02. When liquid nitrogen is filled into the mini LN2 doser but drops of liquid nitrogen drip out.

– The part which injects the liquid nitrogen is known as a nozzle. It is normal that there be drops of liquid nitrogen dripping from the nozzle. However, if it leaks excessively, please call your supplier.

03. When the sensor is operated after liquid nitrogen injection, but there is no clicking sound and liquid nitrogen injection is not operational.

– Caused by the internal stem of the doser freezing. When the inside temperature drops to -196°C , the moisture inside is condensed and freezes, which in turn freezes the nozzle stem altogether. In this case, often times the nozzle does not move. After loosening the clamp on the top of the machine with a monkey spanner, move upwards and downwards gently by hand and then close the clamp again to operate normally. – The moisture inside should be dried after about 6 months to 1 year after purchase. If moisture enters the body of the machine, the moisture freezes upon injection of the liquid nitrogen, which may clog the inlet or freeze the stem. To prevent this, the internal drying process can be performed once every 6 months to a year to prevent the internal stem from freezing. However, this process may come at a price.

04. During injection, there is a beeping sound.

– The mini LN2 doser has a function of controlling the injection time. It has a device that produces a beeping sound when the injection duration exceeds a certain period of time. You may open the mini LN2 doser case and control the injection duration beeping sound by adjusting the timer located on the right. When the injection duration is longer than the set time and the beeping sound is raised after adjusting the injection time, you may press the button on the top of the panel to stop the beeping sound.

05. When liquid nitrogen leaks from the junction between the LGC and the insulation pipe.

– There is a possibility that the connection between the LGC and the insulation pipe is inadequate. Tighten once more using the monkey spanner.

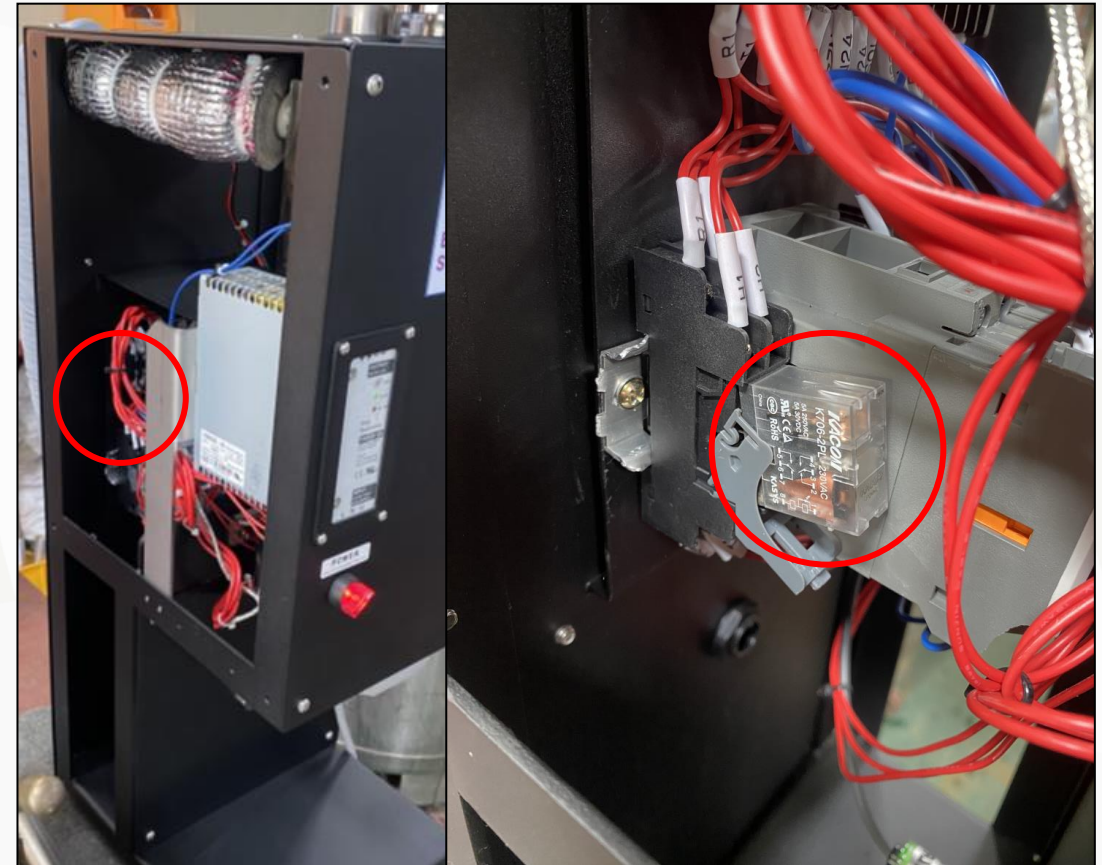
08. Manual for Handling Any Abnormal Problems

06. If the temperature of the heater suddenly rises too high, the OR liquid nitrogen inlet will smell a lot of burn

– It is normal that the temperature of the heater rises by about 20 (50°F) to 30 °C (86°F) from the set temperature. However, if it rises above 100 °C (212°F) or 200 °C (392°F), the relay inside the product must be replaced.

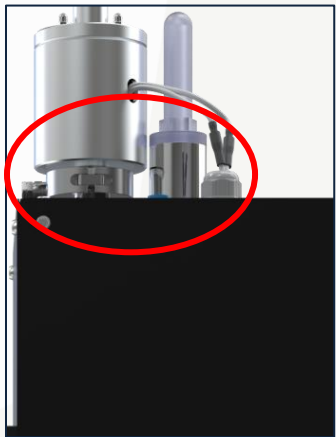
* How to replace relay parts

1. Disconnect all power from the product.
2. Face the front of the product and disconnect the left panel.
(Disconnect with an M3 L wrench)
3. Remove the relay part in the position shown and replace it with a new relay.
4. Reassemble in reverse order.
5. Use the product.



08. Manual for Handling Any Abnormal Problems

07. A phenomenon in which liquid nitrogen is not spilled or liquid nitrogen is not discharged
– Remove the electromagnet stem part, operate it as follows, and reassemble it.



1. Disconnect the electromagnet stem.
Disconnect the wire first, disconnect the clamp, and remove the electromagnet stem by pulling it upward and long.



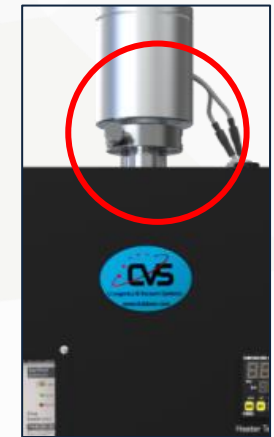
2. Place the electromagnet stem upside down and hold the PC rod to move up and down as if it were pumping.



3. Turn the PC rod clockwise 20–30 degrees and repeat pumping up and down.



4. Find the part where the pumping is smooth and finish the pumping.



5. Reassemble the electromagnet, assemble the wire, and fasten the clamp.

09. Mini LN2 Doser Specifications

Model	CVS-M2100
Size	350 X 420 X 830 (W x L x H)
Voltage	110V, 220V
Power Consumption	160W/h
Material	Stainless Steel(Inner) & SS Metal (Outer)

Weight	27kg
Color	BLACK
Injection Time	Intervals of 1/100 sec
Operation Mode	LN2 Supply – Manual LN2 Supply – Auto

10. Mini LN2 Doser Warranty

01. The product is manufactured by the Korean-based company CVS with its proprietary technology.

02. Keep the warranty card for prompt after-sales services.

03. Free after-sales service is available within 12 months from the issuance of the warranty with the product. (For areas inaccessible via land transport, travel expenses may be charged.) However, damages caused by external factors such as breakdowns and disasters are excluded from the warranty.

04. After-sales services will be charged starting at 12 months past the date of issuance.

05. For products suspected of being defective, please contact us for a replacement.

06. If the warranty card is misplaced or does not state the information completely, the warranty is based on the date the product was shipped from the importer to the seller.

Mini LN2 Doser Warranty

Product Name	CVS-M2100 Mini LN2 Doser		
Purchasing Date	Year	Month	Day
Company Name			
Tel.			
Person in Charge			

Thank You !



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