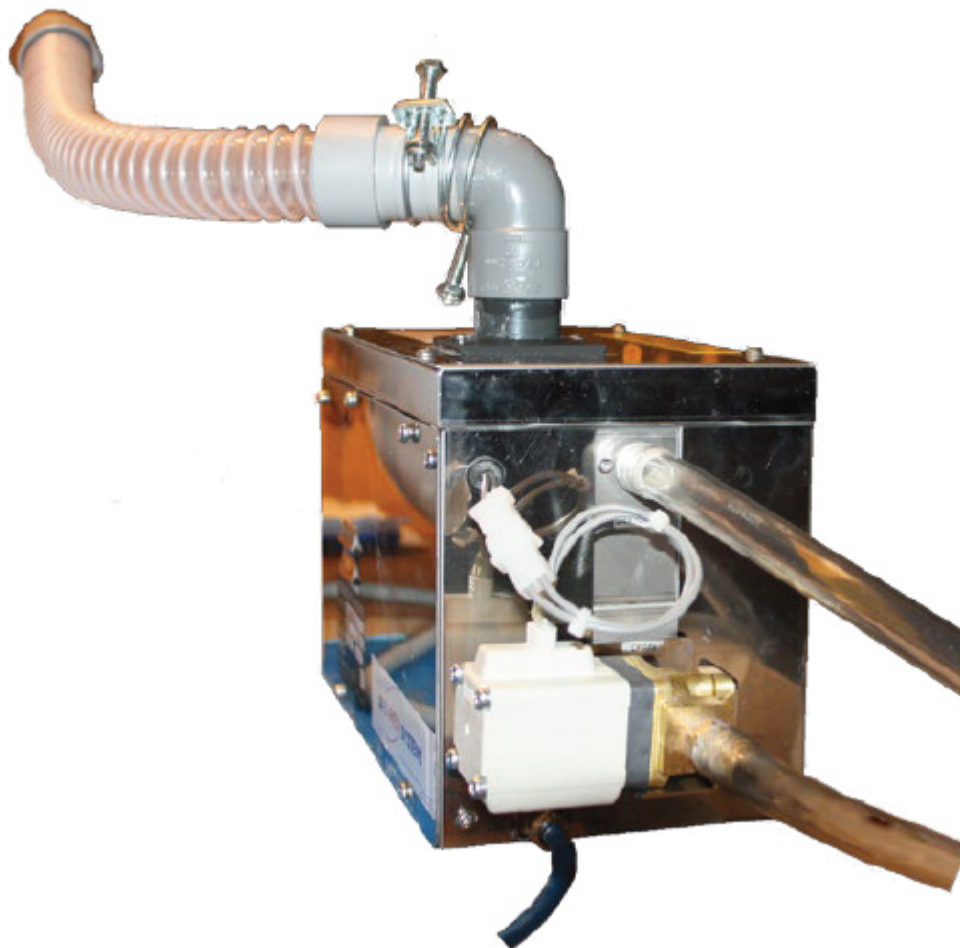


9124654

## Service manual Ultra Sonic Humidifier FT-N serie



### - NOTICE -

This service manual is prepared to be used by trained Service Technicians and should not be used by those not properly qualified. If you have attended a training for this product, you may be qualified to perform all repair procedures, replacements and adjustments described in this service manual.

The information presented in this document is only valid for standard Custom Convenience Counters, configurations and is not intended to be all encompassing. The individual specifications may differ.

Procedures for which you do not have the necessary tools, instruments or skills should not be performed by you.

Technical data and specifications mentioned in this manual are subject to amendment without prior notice.

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is prohibited.**

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# 1. Introduction

## 1.1 General

This manual is intended for trained technicians, performing repairs on the Misting system used in the Custom Counter.

The features and controls are being described, along with directions for the safest and most efficient way to service these units.

All pictograms, symbols and drawings in this manual apply to all available models.

## 1.2 Identification of the unit

The identification plate can be found on the outside of the machine, and contains the following data:

- Name of the supplier or the manufacturer
- Model
- Serial number
- Year of construction
- Voltage
- Frequency
- Power consumption

## 1. Introduction

### 1.3 Pictograms and symbols

In this manual, the following pictograms and symbols are used:



#### **WARNING**

Possible physical injury or serious damage to the unit, if the instructions are not carefully followed.



#### **WARNING**

Risk of Fire.



#### **WARNING**

Hazardous electrical voltage.



#### **WARNING**

Danger of getting injured by hot surfaces.



#### **SAFETY**

Wear safety gloves for installation and dismantling.



#### **SAFETY**

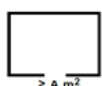
Wear eye protection when working on the refrigeration system.



Suggestions and recommendations to simplify indicated actions.



Recycling symbol.




Minimum room floor area.

## 1. Introduction

### 1.4 WARNING



- Do not see the light of the UV lamp, It may cause loss of visual power.
- Do not touch any electric circuit during power on especially by wet hands. It will get electric shock.
- All of electric cable/wire should not damage, processing, pulling or forcibly bending.  
It will cause electric leakage and make fire or electric shock. 
- All of electric cable/wire should not bind or tie not to cause electric leakage or firing
- When you have noted smoking or abnormal smell, shut off electric power source immediately and also off the power switch of the unit. And manual valve for water supply should be closed. If you keep running the unit it may cause fire or electric shock. Then please report it to your supplier immediately.
- Do not disassemble the unit except cleaning purpose and also do not modify the unit. It may cause fire or electric shock.
- Do not splash any water on the unit. It may cause short circuit or electric shock.
- Be careful not to expose the light of UV lamp to the skin too long. It will cause skin inflammation.



- Do not move or shake the unit during the operation. It may cause electric shock or leakage.
- Do not install or locate the unit where such as unstable or vibrating places. It may cause fall down the unit and hurt the people around there.
- Do not install or locate the unit where dusty place , sun shine light exposing directly, high temperature, close to fire.  
All are very risky for the fire of the unit.

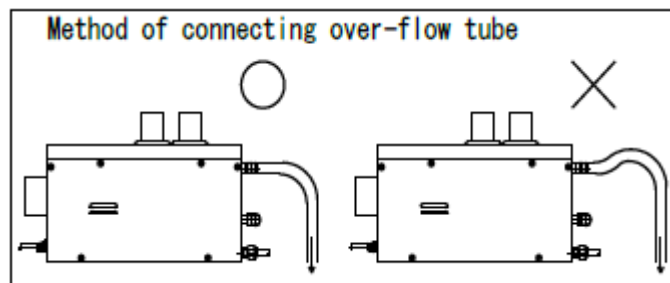
## 1. Introduction

- Keep open through around the electric safety breaker to shut down the power easily at any emergency cases.
- Use only specified electric power source and no other voltage required.
- Connect Ground without fail.
- Do not use megger tester for the electric circuit check.  
It may cause out of order of the electric parts due to the high voltage.
- In case of using the unit at cold weather location, such as lower than freezing point, all of water pipe lines should be protected from freezing. Otherwise, pipes may break due to the freezing.
- The life of the oscillator is about 5,000 hours. The life sometimes become shorter because of the using conditions such as water itself, or cleaning of the scale etc.  
Timely replacement of the oscillator required.
- To keep clean inside of the water tank and inside of the blow off duct hose, Clean up every three days. It may happen, the miscellaneous germs or bacteria become breeding.
- Cut off the power source when you do the cleaning. Otherwise, It may have Electric shock.
- Drain off all water of the water tank if you stop the running for a while. Otherwise, it cause the offensive odor created by some bacteria and it may affect health.
- Use only clean water for the unit. Other liquid may cause trouble of the unit and make fire or electric shock.

## 2. Installation

### 2.1 Water Supply

- Use 1/2 inch pipe for water supply. Install a water supply valve and a strainer (80 mesh or finer) near the humidifier unit to remove impurities in water.
- Connect to the main unit the black pressure-tight tube and half union that are supplied along with the unit.  
Before connecting, be sure to flush out any oil and dirt that may be inside the pipe work with running water.
- Insert the vinyl hose into the overflow port to connect with the drain pipe.



- Leave the black cap on the drain port as is. (It is to be used for draining at the time of repair or inspection.)



#### **CAUTION:**

Install a water shock absorbing device in the water supply line where water hammering is likely to occur.



### 3. Operation

#### Before Operating:

- Be sure the voltage of the power supply before starting the running.
- If you use the unit with humidistat, set the dial of the humidistat at your expecting level.

Then switch **ON** the power of the unit.

- Open the valve of the water supply.

#### Operation:

The running order of the unit after switch on.

- Open the water supply valve and turn the power on to begin water supply.
- When the water level reaches at the first specified level, the float switch to prevent waterless operation is released and humidification will start.
- When the water level raise to reach the second specified level, the float switch for water supply is activated to stop the supply of water. After that, as the water level lowers due to water consumption for humidification, the water supply is resumed and this process repeats itself automatically.
- When the water supply is cut off, the float switch to prevent waterless operation becomes activated and the humidification stops automatically.
- If the water pressure becomes abnormally high, it activates the float switch for water supply and it may start emitting a tic-tic noise, in which case turn the valve own to adjust.
- Ensure there is no leak in any part of the pipe work.

#### CAUTION:

- Do not lift or move the unit while operating.
- Do not lay the unit on its side or upside-down. (This will cause a waterless operation and damage the ultrasonic oscillator circuit.)
- Do not use a megger tester to check the circuit. (This may damage the transistors)

### 3. Operation

#### WORKING AND ADJUSTMENT ULTRASONIC HUMIDIFIER

If you switch on the humidifier the UV lamp turns on and the water tank automatically fills up to the first level with filtered water.

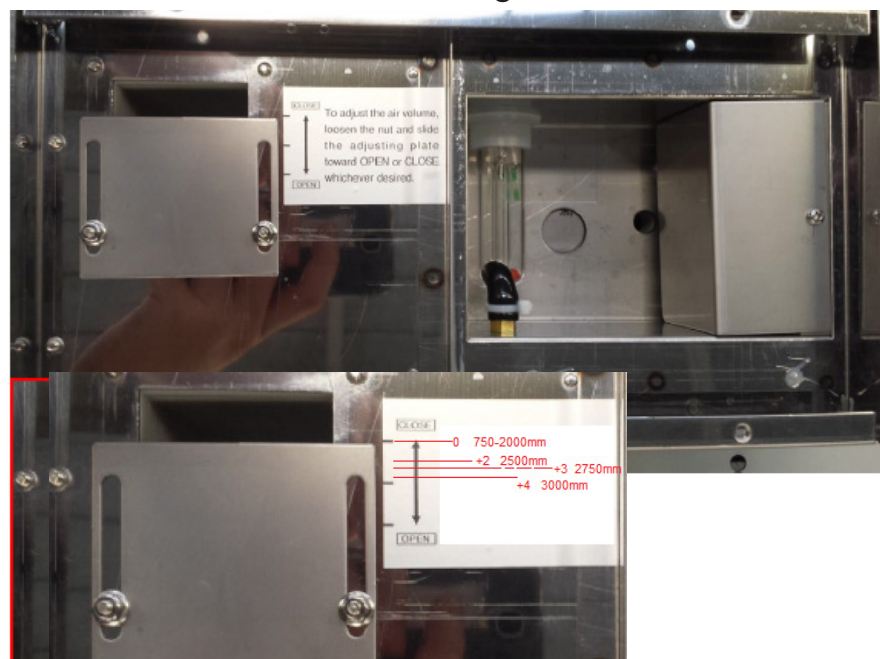
Now the oscillator starts to vibrate and the water molecules are blown out of the unit, by means of the blower, as a very fine mist and this mist is spread over the products.

The water tanks is filled up to the second level and then stops.

Now the water level drops to the first level and is filled up again, and so on.

#### Points of attention:

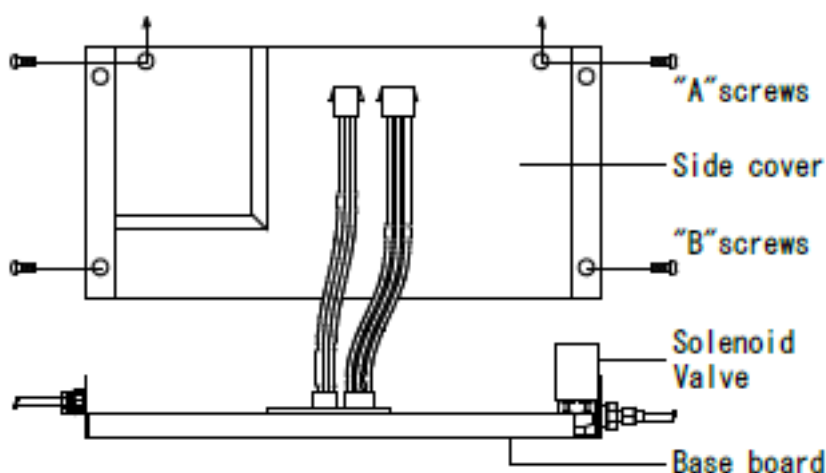
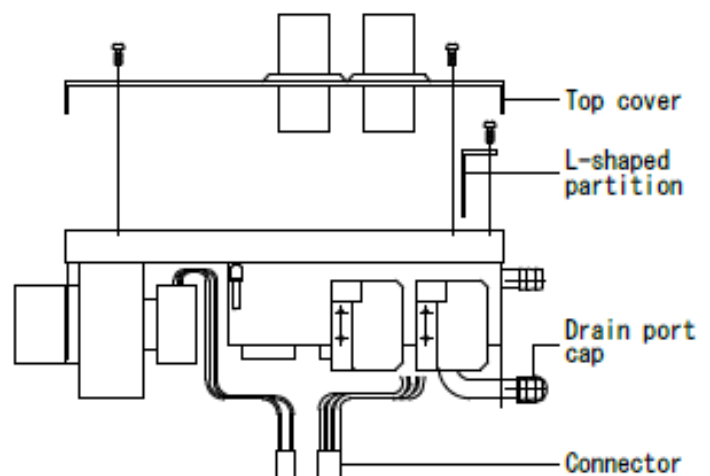
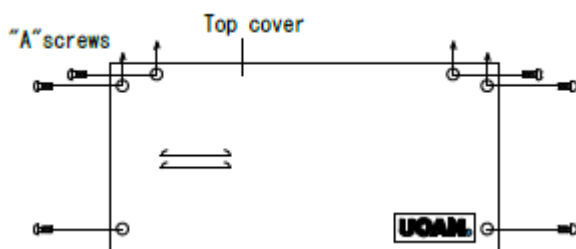
- Inside the UV lamp there is a measuring cell.  
If UV lamp is worn out the red indication lamp on the transformer is lit.
- UV lamp and oscillator have to be replaced every year.
- Outside on the water tank a clixon is placed as a safety. Set on 55°C.
- Clean the air filter under the water tap.
- Check the position of the adjusting plate slide on top of the humidifier.
  - length of unit 750 - 2000 mm: first marking. (Close side)
  - Length of unit 2500 mm: first marking + 2 mm.
  - Length of unit 2750 mm: first marking + 3 mm.
  - Length of unit 3000 mm: first marking + 4



## 4. Maintenance

### 4.1 Disassembling the humidifier for replacement of parts, inspection and maintenance

- Remove the top cover by unfastening the four screws holding it (then you can see the inside of the water tank.)
- Take L-shapes partition out of the water tank by loosening the screws holding it. ( then you can see the float switches.)
- Pull out the water tank by unfastening the eight “A” screws used to fix the water tank to the side cover of the unit as well as the front cover.
- Disconnect the water supply tube by prying with a flat blade screw driver and also disconnect the connector wired to the unit.
- Remove the four “B” screws to disengage the base board. Now the main unit is disassembled for replacement of parts, maintenance and inspection of various parts.



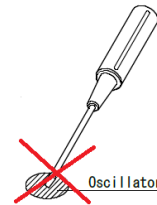
## 4. Maintenance

### 4.2 Water tank and oscillator

- Turn off the power supply switch.
- Remove the spray port assembly and water tank top cover from the water tank.
- Drain the water. Wipe off smudge and dirt with a soft rag.
- Wipe off any dirt from the surface of the oscillator (a round metal plate) with a soft cloth.



Do not try to scrape or strike the surface with a screw driver or any hard objects.



- After clean up the inside of the water tank and reassembled the unit, turn on the switch to supply the water tank. Once again drain

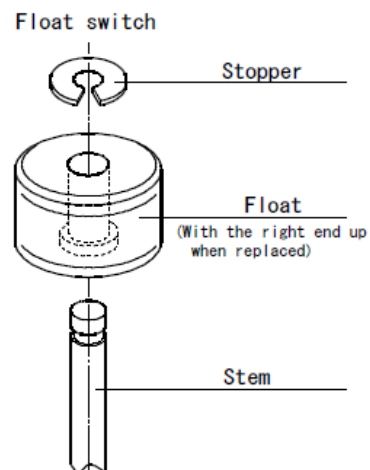


#### **CAUTION:**

The inside of the water tank become soiled with impurity in the water and dust in the air. Then periodical (at least once a week) cleaning is recommended for hygiene and sanitation.

### 4.3 Float switch

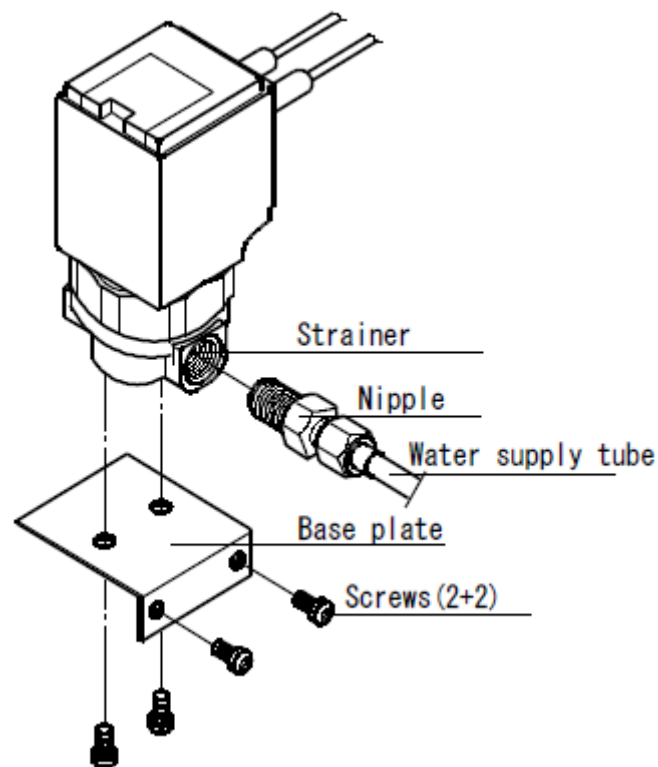
- To check the function of the float switch, move the float up and down by finger. And then clean up the stem and the float carefully.
- Remove the stopper and pull out the float for the above.
- When taking out the float, be sure to see which end is up. It must be reassembled in the right direction. (The magnetic end comes to the bottom side.)



## 4. Maintenance

### 4.4 Solenoid valve

- Close the water supply valve and turn off the electric power switch of the transformer box and power supply main switch.
- Use two wrenches (two spanners) to unscrew the water supply tube and nipples.
- Remove the solenoid valve by unscrewing the two screws.
- Remove any dirt remained in the strainer.
- If the solenoid valve is out of order, replace it to the new one.
- Reassemble all parts in order same as before disassemble.  
Be careful not to have any dirt in the solenoid valve.



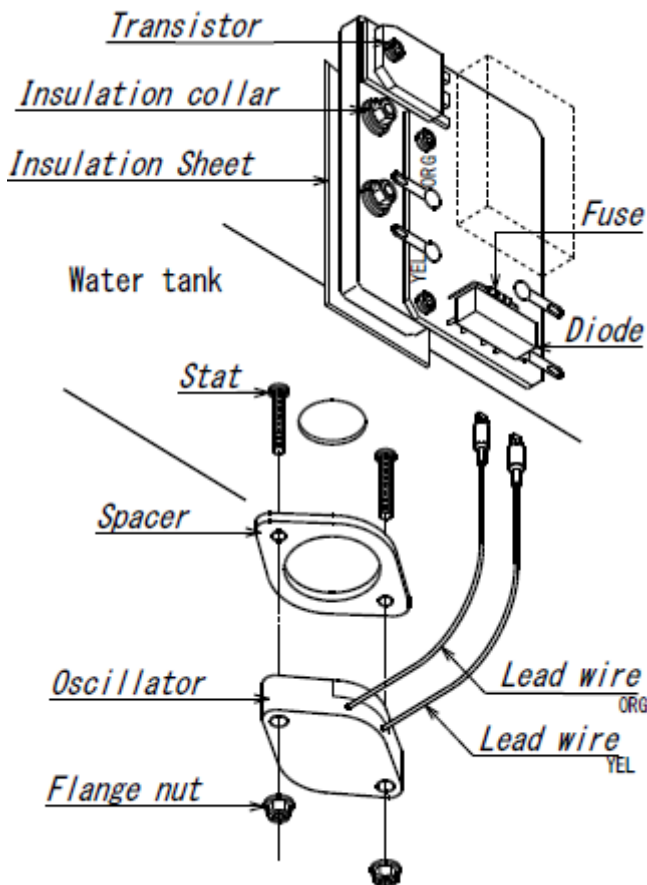
## 4. Maintenance

### 4.5 Ultrasonic oscillator

The oscillator placed at the bottom of the water tank (a round metal) ages and deteriorates after many hours use, resulting in decreased mist output.

The humidification capability is restored with the oscillator replaced by a new one.

- Shut the water supply valve and switch of the electric power supply.
- Unscrew two flange nuts fixing the oscillator at the bottom of the water tank from the outside. (Use box type screw driver for 3mm- nut)
- Unplug two wires, yellow and orange colored one from PCB (printed circuit board) and remove the oscillator from the water tank.
- Put the new one and fix it using the same 3mm-nuts. Keep the balance of the tightening for two nuts.
- Connect/plug in the two wires to the PCB according to the color indication. (YEL: Yellow color, ORG: Orange color)



The safety fuse will burn out if switch on the unit without connecting the oscillators.

Remark:

The life of the oscillator is around 5,000 running hours in total.

We recommend you to change the oscillator for new one a little earlier than 5,000 hours.

## 4. Maintenance

### 4.6 Strainer

Strainer must be set between the water line and the water inlet pipe to protect the unit by eliminating the dirt or the dust.

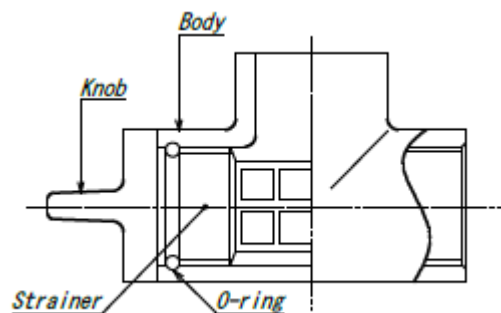
- Turn the knob of the strainer holder counter clockwise to remove the knob/cap.
- Take out the strainer from the holder and clean up if there are dirt or dust.
- Return the strainer to the right place and shut it by knob/cap.



#### CAUTION:

Close the knob/cap firmly and tightly before test running or after maintenance and checking.

Be sure not to have water inside of the strainer holder when close the knob/cap. Otherwise, the water pressure may twist the O-ring and it may cause water leakage.



### 4.7 Ultraviolet Lamp

- Remove the mist outlet part.
- Drain the water from the tank. Wipe out the glass tube of the lamp with soft cloth to clean up.



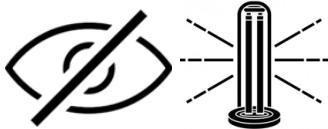
Do not shave it by the hard thing like driver or do not hit the glass tube not to damage or break.

- After clean up, open the water line valve and switch on the electric power to full the water in the tank and drain off so that the tank will be clean.
- Reassemble the mist outlet part on the water tank.

## 4. Maintenance



### CAUTION:

- The UV lamp has glass tube and very fragile. Then handle it very carefully.
- Also, be sure to switch off the electric power when you clean the lamp.
- Do not see the light of UV lamp. It may cause loss of visual power. 
- Change the UV lamp for new one after 10,000 hours of turning on in total, otherwise the function (sterilizing power) will be down.

### 4.8 Power Transformer

- Remove the transformer cover.
- Check the fuse. If it burn out, replace the spare one fastened to the switch base with the tape.
- Measure the insulation resistance by megger tester.



All of terminals which connect with the main unit should be removed before testing.

Connect one of measurement wire at the grand/earth terminal/screw and other measurement wire should connect terminal 1.

Reading must be 100M Ohm over.

Check the terminal 2 by same method.

- Turn on the switch of the main electric power and switch on transformer box.

Remove the terminal cover.

Check all the voltage of the terminal by the tester referring to the electric diagram.



## 4. Maintenance

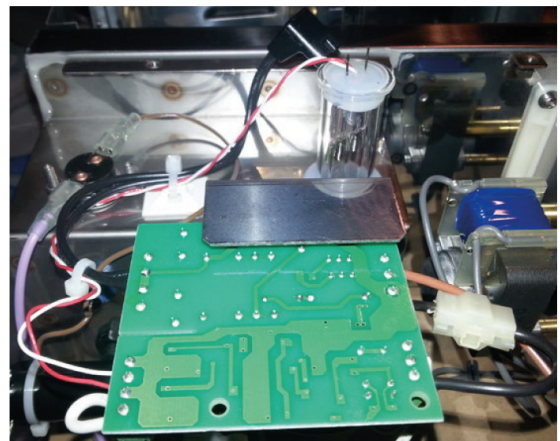
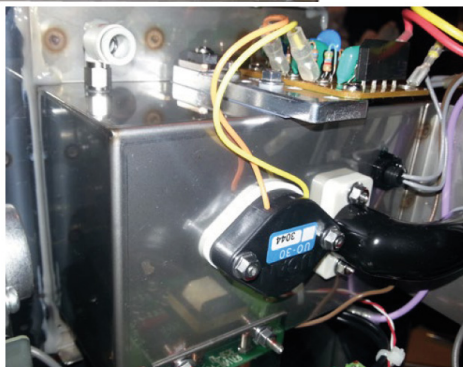
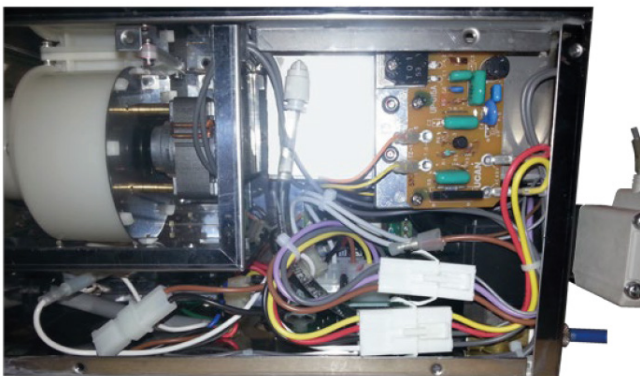
### ANNUAL MAINTENANCE ULTRASONIC HUMIDIFIER

Every year the UV lamp and the oscillator have to be replaced.  
Follow the instructions below to change these parts.

First switch the unit off.



1. Remove the Ultrasonic humidifier from the bottom frame of the Custom Counter.
2. Remove the top panel, the left side panel, the filter and filter holder and remove the clear drain tubes on the front side of the humidifier.
3. Remove the clear water supply tube and disconnect the 3 white connectors on the inside.  
Now lift the inside out of the casing.
4. Disconnect the wiring of the oscillator and remove the nuts that secure the oscillator.  
Now remove the oscillator and replace this by the new oscillator.
5. Remove the black connector on the UV lamp.  
Disconnect the wiring of the UV lamp.  
Slide the UV lamp outside and replace by a new UV lamp.
6. Reverse the procedure to install.



## 4. Maintenance

### UV lamp replacement procedure

The UV lamp malfunction indicator lamp (on the power switch panel) is turned on and the humidifier unit stops when shortage of the amount of light.

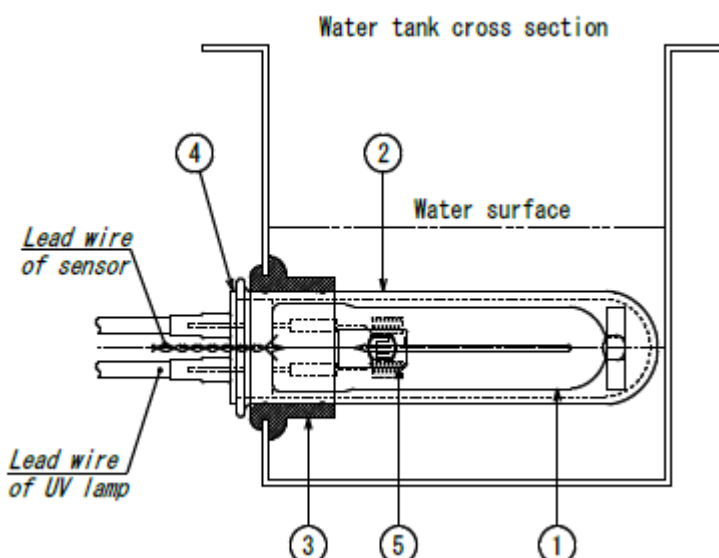
Replace the UV lamp immediately.

- Remove from the power cable and sensor cable of originally set UV lamp.
- Remove UV assy. all together with Ultraviolet lamp part 1 in the below picture from the water tank.
- Insert the new UV Lamp into the silicon packing part 3 below. Please note that the packing not to be twisted and/or taken out.
- When the silicon packing has the injury and/or the quality deterioration, please replace to the new one. It will cause the water leakage.
- Adjust UV lamp position to be parallel to the water tank bottom side.
- Connect UV Lamp cable with OUT1 or OUT2 of UV-INV PCB.  
Method:  
Please loosen the screw onto the terminal port, insert Cable and tighten the screw. UV lamp cable has No polarity (No +/- direction) please set cable from Sensor to CON1 or CON3 of UV-INV PCB.



Sensor has polarity (+/- direction).

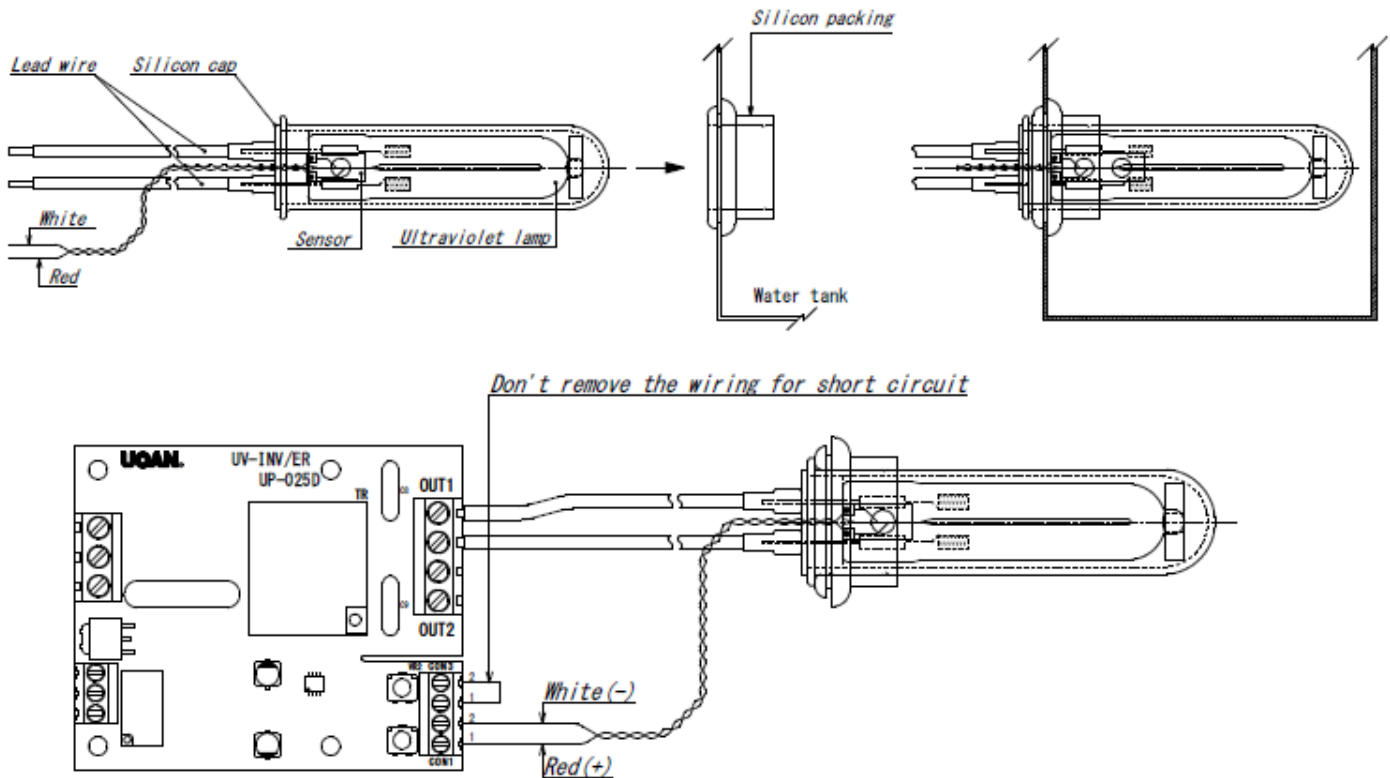
Please refer to the below picture, Properly set the red and white wire respectively. When there is jumper wiring, please leave as it is.



No.	Description	Part number
①	Ultraviolet lamp	GUL 1.2
②	Glass tube	φ 18, L=70mm
③	Silicon packing	UVP-001
④	Silicon cap	UVP-002
⑤	Sensor	UVS-cds

## 4. Maintenance

- Keep clean the surface of the protecting glass tube (quartz jacket) by rag and so on because the more it becomes dirty, the more sterilization ability declines.
- UV lamp sterilizes the inside of the water tank, but it isn't effective in the inside of the duct hoses and spray nozzles. So clean them regularly.



### CAUTION:

- The UV lamp has glass tube and very fragile. Handle it very carefully.
- Also, be sure to switch off the electric power when you clean the lamp.
- Change the UV lamp for new one after 10,000 hours of turning on in total, otherwise the function (sterilizing power) will be down.

### WARNING

- Do not see UV lamp. It may causes loss of visual power.
- Don't expose the light of UV lamp to the skin so long.



## 5. Trouble Shooting

### 5.1 First check:

Trouble	Possible reason	Solution
No water supply	Valve of waterline closed	Open the Valve
No Operation	No electrical power	Check with tester
	Power switch off	Switch on
	UV lamp malfunction indicator lights	Replace UV lamp
	Burn out fuse	Replace fuse
	Wrong setting of humidistat or higher humidity than setting level	Reset the humidity level of the humidistat (set higher level for test, then set to proper level)
Less output of mist	Water in the duct hose	Apply to declivity for the duct hose

### 5.2 Solutions

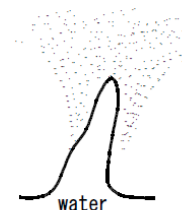
#### Volume of mist is declining

*In case of declining of mist output short after the installation*

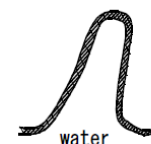
- If the water tank is contaminated with some oil or adhesive materials used in plumbing, the mist production will be declined. If it might be so, switch off the power and drain the water.

Take off the top cover and clean the tank with neutral detergent and soft sponge.

Supply the water and drain it until the bubble of the detergent will disappear to clean the tank.



A. Normal  
Mist generates around a water pillar



B. Abnormal  
No or little mist can be generated when the water surface is covered with oily film

*In case of declining of mist output after long hours running*

- Check the surface of the oscillator.  
If it is covered by some soil, clean up the surface with soft cloth.
- If the surface is damaged or the plating is peeled off, replace it with a new oscillator because the life has expired.

## 5. Trouble Shooting

*In case of no mist come out*

- Check the PCB as follows.

It might be burn out the fuse resistance, R6.

Check it by tester. Set the resistance range, X1 and if you see the indication Zero, the fuse is OK.

If it is showing over 5 ohm, the fuse is out of order.  
Replace the PCB.

- Check the transistor of the PCB as follows.

Set the resistance range, X 1 of the tester.

Connect the black probe, MINUS at B side (Base) and then Red probe, PLUS touch at C (Collector) or at E,(Emitter).

If the indication is showing under 10 ohm, the transistor is OK but if it shows close to ZERO, the transistor is out of order.

Replace the PCB.

- Then next step checking should be performed.

Touch red probe, Plus at B side (Base) and then black probe, MINUS at C (Collector) or at E, (Emitter).

If the indicator is showing infinity or big number of ohm, it is OK.

If the indicator is showing between Zero to 10 ohm, it is out of order.

If all transistors are in order, check the fuse for the PCB.

If it burn out, replace the PCB.



### **CAUTION:**

If you find out of order by the above checking, the PCB should be replaced immediately.

Otherwise, other components of the unit will be damaged.

## 5. Trouble Shooting

### 5.3 COUNTERMEASURE FOR MALFUNCTION

The unit operates automatically and gives humidification as long as the water is supplied normally and the power at normal AC 200 V.

Should it fail even under these normal conditions, check the following points and correct the problem.



#### CAUTION:

Be sure to cut off the power supply when there is a need to lift the unit or dismantle it.

- **Poor Spray**

Trouble	Possible reason	Solution
Oscillator failure	Deterioration with age	Replace
Pool of water building up in duct hose	No slope provided	Give the hose some incline
Overflow	Dirt caught in the solenoid valve	Dismantle the valve and clean

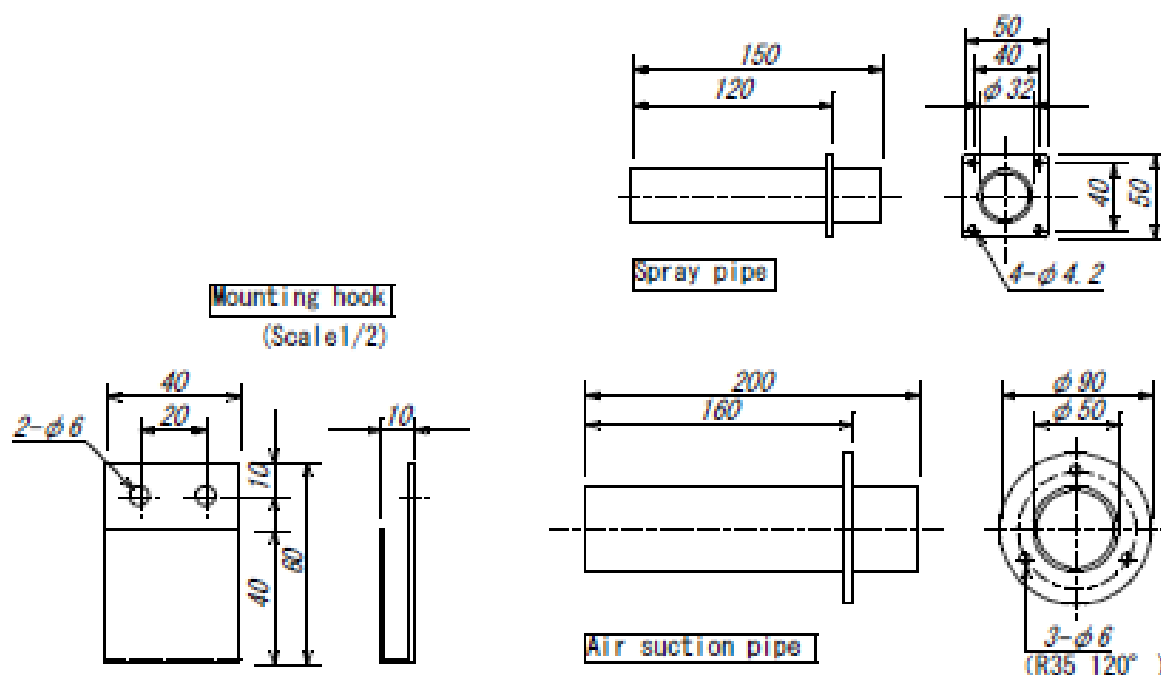
- **No spray output at all**

Trouble	Possible reason	Solution
No water in water tank	Faulty solenoid valve	Replace
	Float switch failure	Replace
	Poor connection of the connector	Repair
Water in tank, but still no spray output	Faulty transformer	Repair
	Ultrasonic unit	Repair
	PCB failure	Repair
	Fan failure	Repair
	Float switch failure	Repair
	Poor connections of connectors/soldered parts	Check with tester and repair faulty connections





## 6. Dimensions and Specifications



Accessories Model	Trans- former (VA)	Humidifying pipe	Air suction pipe	Duct hose		Hose band		Water supply tube	Drainage (Overflow) hose	Condensate Drain hose	Mounting hook	Mounting Screw
				Blow	suction	Blow	suction					
FT-10NUVSV-CE	0.5	1	1	1	1	2	2	φ6 L=1000 W/half union	φ12× φ16 L=1000 2pcs	φ10× φ12 L=1000	1 set W/trapping screws 2pcs	14pcs
	230V/48V	ABS tube φ32 L=120	ABS tube φ50 L=160	φ32 L=440	φ50 L=440	φ32	φ58					sus φ4×16

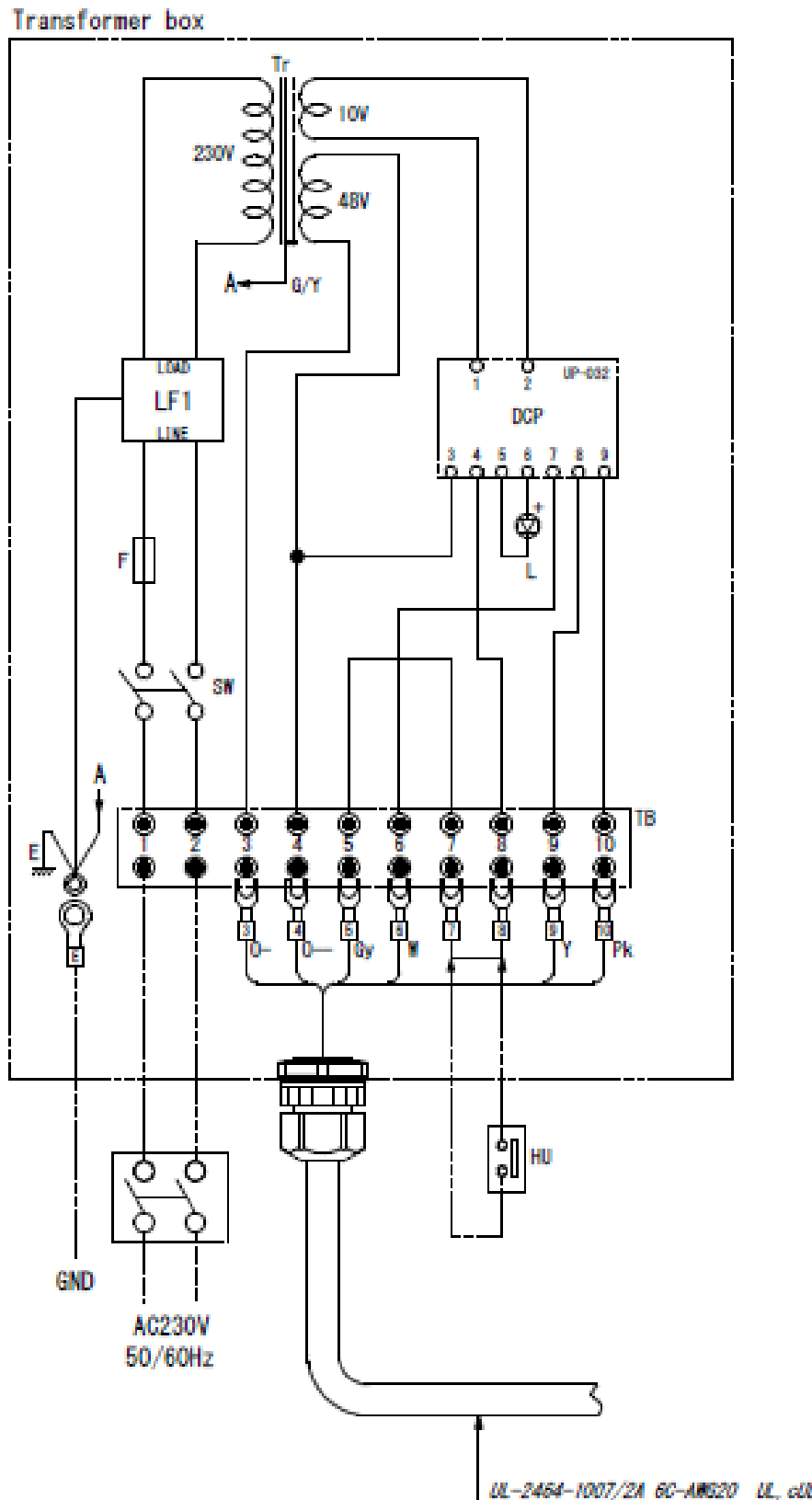
Ambient condition	Temperature to be maintained $\leq 40^{\circ}\text{C}$ and $\geq 5^{\circ}\text{C}$ No freezing Relative humidity < 90%RH
Water supply system	Automatic water supply system w/float switch and solenoid valve
Water supply pressure	0.03MPa~0.5MPa (0.3kgf/cm <sup>2</sup> ~5.0kgf/cm <sup>2</sup> )
Safety equipment	Device to prevent waterless operation, Fuse to prevent overcurrent, Surge filter, Thermostat to prevent water overheating(cutoff at 55°C)
Replacement of oscillator	At about every 5,000 cumulative hours of operation

specifications:

Model	Humidity output (L/h)	No. / Oscillators units	Primary power supply (single phase)	Power consumption (VA)	Air-volume (m <sup>3</sup> /min)		Dry weight (kg)	
					50Hz	60Hz	Hum. Unit	Transf. box
FT-10NUVSV-CE	0.5	1	AC230V	71	0.5	0.6	5.5	2.5



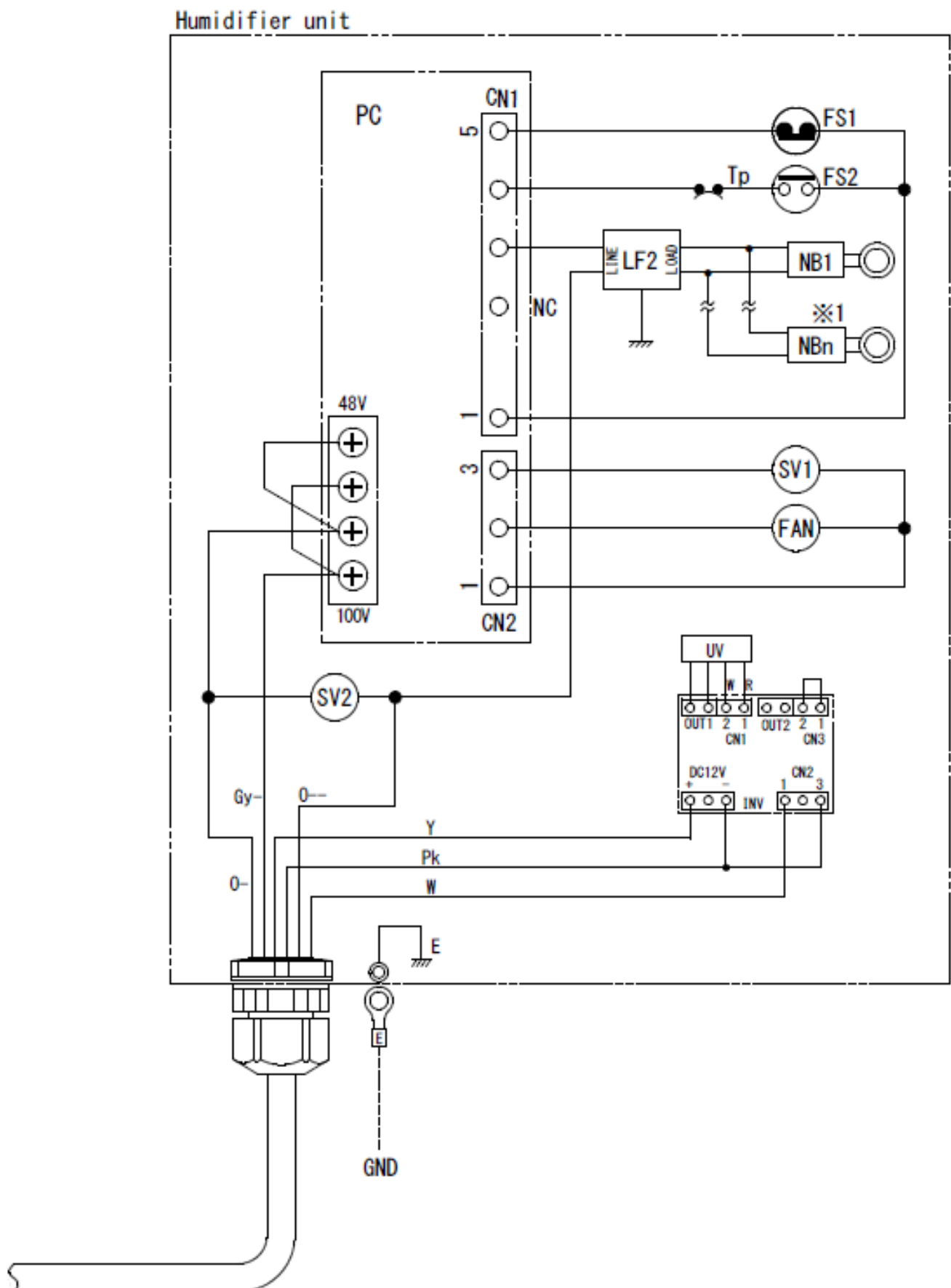
## 7. Wiring Diagram



### 6 Core

O-	Orange	No. 3
O-	Orange	No. 4
Gy	Gray	No. 5
W	White	No. 6
Y	Yellow	No. 9
Pk	Pink	No. 10

## 7. Wiring Diagram



## 7. Wiring Diagram

Code	Description	Specifications
FS1	Float sensor for water supply	FS-0684A
FS2	Float sensor to prevent waterless operation	FS-0683A
SW	Power Switch	CW-SB21NMKZEF
PC	Printed Circuit Board	UP-003E
FAN	Fan	SF6030JSR AC 48V
SV1	Water supply solenoid valve	VCW21-BG AC 48V
NB	Ultrasonic Humidifying unit	UP-015A
TB	Terminal block	10P
Tp	Thermal protector	55 degrees Celsius OFF
Tr	Transformer	230V / 48V / 10V
DCP	DC power supply	UP-032
INV	Invertor	UP-025
LF1, 2	EMC filter	FN2060-6-06
F	Fuse	1A
SV2	Drainage solenoid valve	VX252B AC 48V
UV	Ultraviolet lamp	Gul1.2
L	UV malfunction indicator lamp	LED
HU	Humidistat	By customer



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