

CE RoHS

STAT·CLEAN N-1

SUPER SLIM NOZZLE

Thank you for purchasing our Stat Clean No. N-1.

Read this instruction manual before use. Keep it for your ready reference.

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Safety Instructions

- * Read the Safety Instructions carefully before use. Observe the instructions indicated herein to ensure safety.
- * Safety instructions in this manual are categorized into two types by the degree of danger associated with each action or condition. Based on analyses conducted by Vessel, all instructions mentioned in this manual are of the CAUTION level.
- * If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

	WARNING	Indicates that improper handling can lead to serious injury or even death.
	CAUTION	Indicates that improper handling can lead to minor injury and property damage.
		This symbol indicates a WARNING or CAUTION.
		This symbol indicates a prohibited action.
		This symbol indicates a mandatory required action

 CAUTIONS	
 PROHIBITED	Do not use N-1 in environments that require explosion-proofing. N-1 is not of explosion-proof construction, therefore explosion or fire may occur.
 PROHIBITED	Do not use N-1 in flammable atmospheres. The corona discharge can act as an ignition source and cause an explosion or fire.
 PROHIBITED	Do not use N-1 in environments subjected to sharp temperature fluctuations or dewing. This kind of environment can lead to breakdown.
 DO NOT WET	Do not use N-1 in highly damp places or anywhere it may be exposed to water, oil, solvent or other liquids. Contact with moisture can result in electric shock or breakdown.
 PROHIBITED	Do not use N-1 for any other purposes than static erasure or dust removal.
 PROHIBITED	Do not use N-1 with power supplies of ratings not specified in the specifications. Inappropriate power supplies can result in fire and electric shock.
 PROHIBITED	Do not install, use or service N-1 until having understood the information in this instruction manual.
 REMEMBER	Keep this instruction manual in a safe handy place for future reference.
 CAUTION	Vessel assumes no responsibility whatsoever for consequences arising from the use of this product.

Features

* AC Corona Discharge System

AC corona discharge system secures reliable ion balance, not to be affected by the contamination of electrode needles. Its high frequency piezoelectric transformer generates ion efficiently by minimizing ion loss due to initial recombination.

* Super slim air nozzle–type ionizer

N-1 is designed to be very compact with a built-in high voltage power supply.

N-1 neutralizes static charge and removes dust by powerful blow of compressed air.

Nitrogen gas can be used as a substitution for compressed clean air.

* Designed for Safety

Automatic Shut-off function against abnormally high voltage. Warning signals can be sent externally by the open collector output.

A current-dependent fuse is incorporated to protect its circuit board.(0.5A /60VDC)

* LED light makes it easy to see its operating status

Features an LED light on the top, which glows blue while in normal operation and turns red after N-1 shuts off due to abnormal operating conditions.

* Maintenance

Electrode Needle can be easily replaced by an electrode needle replacement screwdriver, G-7DR (option).

* Daisy chain

N-1 is provided with a 6-terminal connector, by which multiple units can be connected (4units max).

* Environmentally Friendly

Compliant with RoHS standards.

* CE Compliance

N-1 has been tested and approved under CE directive, EN61000--6-4, 6-2.

Applications

N-1 is designed to blow away dust and remove static electricity to prevent dust accumulation.

■ Specifications

Super slim nozzle

Model	: N-1
Ion generation method	: High voltage AC corona discharge
Applied voltage	: AC 5.0 KV (p-p)
Input voltage	: DC24V ± 5% ripple (p-p) 10% max.
Power consumption	: 100mA (typ.)
Applied fluid	: Clean air (0.1~0.6 MPa), Nitrogen gas (0.1~0.6 MPa)
Air consumption	: 160 Liter/min (0.2 MPa)
Ozone generation	: 0.05 ppm or less (Measured at 50 mm)
Vibration resistance	: 10 to 55 Hz, 60mins in each of X,Y and Z axis directions
Working temperature / humidity	: 5~40°C 35~65%RH (No dewing or freezing)
Storage temperature / humidity	: 0~60°C 35~85%RH (No dewing or freezing)
Decay time	: ±1000V to ±100V, within 0.7sec, 0.3MPa / 150mm (measured value)
Ion balance	: Within±10V (0.3 MPa / 150 mm) (measured value)
Weight	: 62g with Standard nozzle
Dimensions	: L109.6×W27.5×H28mm with Standard nozzle
Material	: Casing and Nozzles: Frame retardant ABS (UL94-V-0) : Electrode Needle: tungsten
Accessories	: Instruction Manual, Standard Nozzle

Replacement part

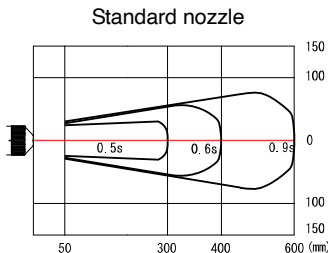
Electrode Needle :GN-H



Air consumption

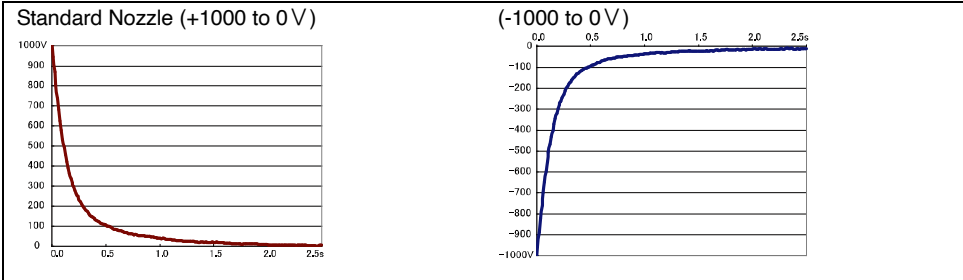
Air Pressure At the tool end (MPa)	0.1	0.2	0.3	0.4	0.5	0.6
Air consumption w/ Standard Nozzle (Liter/min)	93	160	219	280	334	389

Discharging area



The discharging area are based on the decay time from +/-1000 to +/-100V at 0.3MPa.

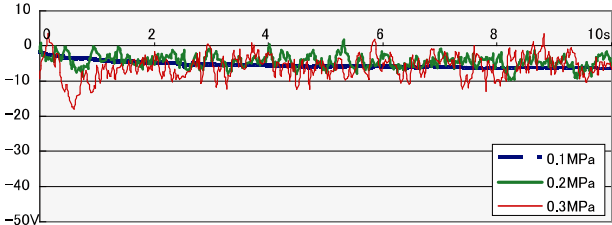
Decay Time



The data shown above was measured with initially charged voltage of $\pm 1000V$.
(Air Pressure: 0.3 MPa Temperature: 25.0°C Humidity: 50.0% CPM: 20pF-150mm)

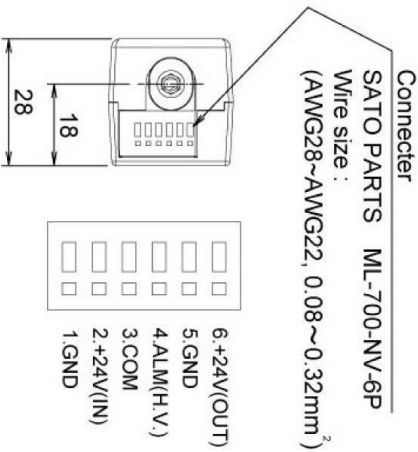
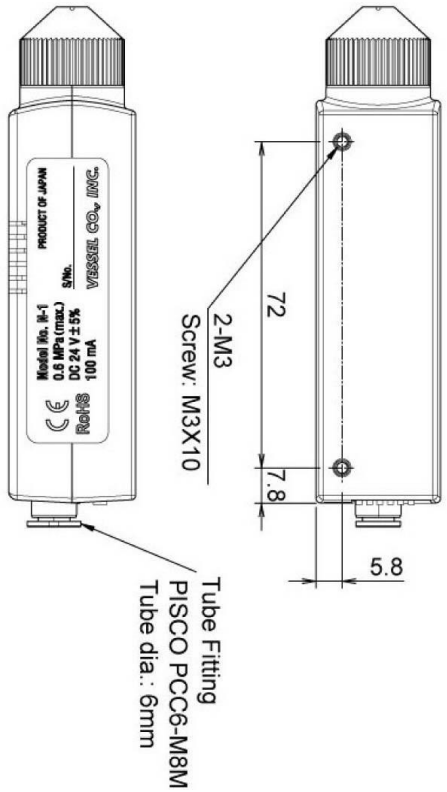
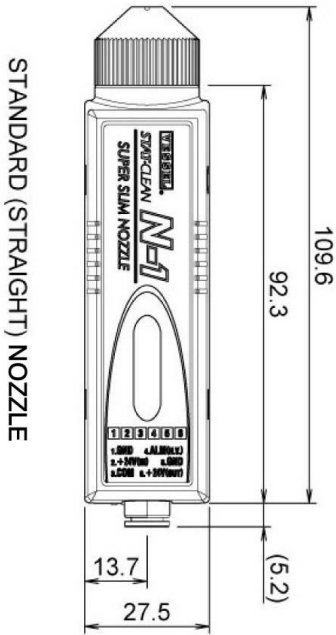
Reference : Ion balance






Standard Nozzle



(Air Pressure: 0.1, 0.2, 0.3 MPa Temperature: 25.0°C Humidity: 50.0% CPM: 20pF-150mm)
* ION BALANCE LEVEL VARIES DEPENDING ON APPLIED AIR PRESSURE AND VOLUME.

■ External View



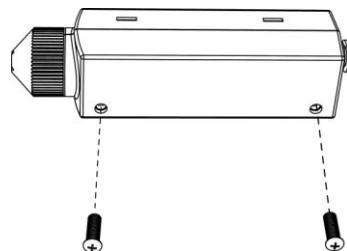
 CAUTIONS FOR INSTALLATION	
 REMEMBER	Use an air hose appropriate for required pressure resistance. Air hoses of insufficient pressure resistance will rupture and leak air.
 REMEMBER	Ground N-1 before use. Using this unit without proper grounding runs the risk of electric shock.
 REMEMBER	Use N-1 only in the environment specified as follows: Adverse environments cause product deterioration and breakdown. Humidity: 35~65%RH (No dewing or freezing) Temperature: 5~40°C
 PROHIBITED	Do not use N-1 in the following environments. Adverse environments cause product damage and breakdown as well as personal accidents; Where explosion-proofing is required; where found flammable atmospheres, high temperature and high humidity; or sharp temperature fluctuations; where dewing occurs; where possibly wet by water, oil or solvent.

Installation

Take account of the static erasing range before setting the installation height.

The N-1 can be locked down using the screw holes (M3) on the bottom. See page 20.

- * Don't make installation screws into the screw hole at where is deeper than 10mm from the body surface.
- * Do not install N-1 in a place where it is possibly exposed to water or oil, dust or dirt, or to high temperature or humidity.
- * Prevent obstructions between N-1 and the object.
- * Select a supporting structure of sufficient strength to hold the N-1.



Air hose

Uses an air hose (OD6 mm x ID4 mm) of sufficient pressure resistance.

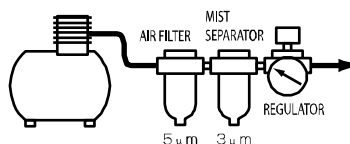
Air supply

Remove all impurities with a mist separator (0.3μm).

Remove all moisture with an air filter(dew-point below -15°C).

Supply air at a temperature in the range of 0~40°C.

Note: When oil is attached to the surface of electrode needle, Corona discharge will not function.



Grounding

Provide N-1 with proper grounding.

■ Installation

Power supply

Make sure that N-1 can be supplied with stable 24V DC power.

Note: Do not apply a reverse voltage.

Wrong wiring connection may cause a breakdown.

Make sure all the wires are connected according to their polarity before turning on the unit.

Since this is a high-voltage equipment, please supply a separate power source.

Wire

Please use wire AWG28 ~ AWG22 ($0.08 \sim 0.32 \text{mm}^2$) for wiring.

Check before use










Before use, check the unit, tube and power harness in order to make sure there is no damage, screw looseness, disconnected hosing, connectors looseness, etc.

Note for automated control of the sequencer

N-1 should provide power to the high voltage transformer while supplying air.

For automatic control, please make a control to supply power after opening the solenoid valve or simultaneously.

It may cause failure when the air is shut off while supplying power.

 CAUTIONS IN OPERATION	
 PROHIBITED	Do not use N-1 for anything other than static erasure or dust removal.
 REMEMBER	If you notice any abnormalities, stop using N-1 immediately.
 REMEMBER	Supply clean dry air. Improper air quality can lead to N-1 deterioration and contamination of the object.
 PROHIBITED	Do not remodel or disassemble N-1 as the unit contains high voltage parts.
 PROHIBITED	Do not drop N-1 nor subject it to any shock / vibration.
 PROHIBITED	Do not pull the tube. Inappropriate handling can damage N-1 and internally disconnect the power cable and air hose.
 PROHIBITED	Do not damage the hose or wiring. Keep the hose and wiring away from any heat source.
 PROHIBITED	Do not use N-1 if it has a defect.

Instructions for wiring

Power Source

- 1) Connect the 24V DC power to No.2 connection pin, and the grounding wire to the No.1 connection pin. Please refer to the figure at the right.
* Connection pins No.2 and No.1 are connected in parallel with No.6 and No.5 respectively.
For the multiple connection of N-1, power supply to next unit can be done by No.6 pin for DC24V and No.5 pin for the grounding. Up to four units of N-1 can be connected. Please refer to the figure at the below right.



1.GND 4.ALM(H.V.)
2.+24V(IN) 5.GND
3.COM 6.+24V(OUT)

- 2) Make sure to ground N-1 by the appropriate wiring.
- 3) Supply 24V DC power.
* N-1 does not have a power switch.
Switching on/off should be done by external equipment.
- 4) When N-1 is activated, the top part will glow in blue and ion will be generated.

Note: Please turn off the power when air supply is stopped.

Air Control

Air output has to be controlled by external equipment like a solenoid-controlled valve or a foot valve, as the N-1 is not incorporated with open / close switch of air.

Please connect the air hose of $\Phi 6 \times \Phi 4$ mm with the inlet.

- 1) Connect an air hose ($\Phi 6 \times \Phi 4$ mm) to the air inlet of N-1.
- 2) Air pressure should be adjusted within the range between 0.1 and 0.6 MPa with an appropriate air regulator.
 - * Ion balance fluctuates according to air pressure and volume in use.
See page.19.
- 3) Supply dry clean air without moisture in the air.
 - * Moisture interferes with corona discharge on the electrode needle.
- 4) Supply power and direct the ionized air toward the work piece.
- 5) When static elimination is completed, turn off the power and air supply.

Replacing nozzles

N-1 can be adjusted, according to its installation site and target object, by changing its nozzles.

* A nozzle should be attached firmly.

* Tighten too much may damage the product. Also tighten insufficiently may let the nozzle go out from the body.

High Voltage Alarm and Automatic Shut-off

When the incorporated high-voltage transformer detects electrical overload, corona discharge stops and the LED light on the top turns red.

Please switch off the unit as soon as the alarm has been activated.

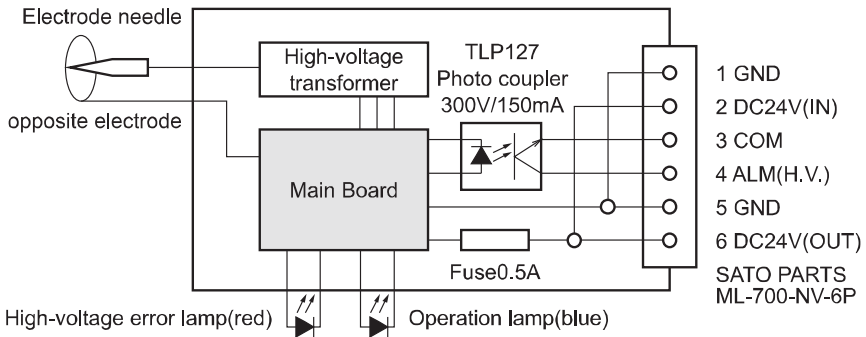
If the electrode needle is contaminated with dust or other substances, clean it and confirm whether or not the unit can be turned on properly.

If the LED light still glows red after cleaning the needle, please contact the local distributor for repairing or maintenance service. Do not attempt to repair the unit on your own.

External Output of Alarms

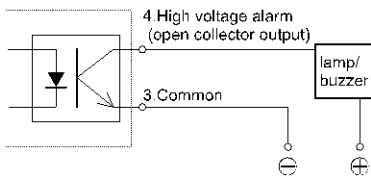
N-1 can be connected to warning device like patrol lamp through its external pin.

Circuit diagram

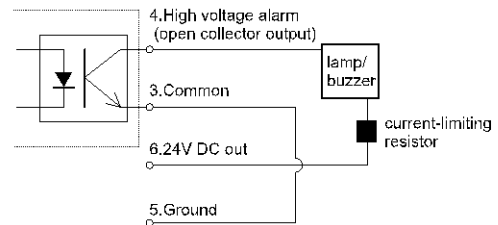


Connection Example

Use a separate power supply



Use the DC output of N-1



■ Maintenance

⚠ CAUTIONS IN MAINTENANCE AND CHECKS

⊘ DO NOT DISASSEMBLE	Do not perform any maintenance on the N-1 except for maintenance and replacement of the electrode needle.
● REMEMBER	Before cleaning the electrode needle, shut off power and air supply at the source and disconnect the air hose.
⊘ PROHIBITED	Do not wipe the ionizer with detergent or solvent. Substances of the sort can cause cracking and result in electric shock or breakdown.
⊘ DO NOT WET	Do not wet the N-1. Exposure to moisture can result in electric shock or breakdown.

■ Maintenance

Dirt and wear in the electrode pole area can deteriorate the performance of this ionizer. Clean the electrode pole every 56 hours of use. If the electrode pole is not kept in an optimum condition, the performance will drop and product life might shorten as well. If the unit is used for a long period of time, the tip of its electrode pole may wear out and consequently static erasing efficiency will decrease. In such case, replace the electrode pole with a new one. It is recommended that the electrode pole be replaced every 1,200 hours of operation. Keep the unit in good working condition by measuring its ion balance and ion output regularly as a means for checking for a drop in capacity.

How to Clean the Casing

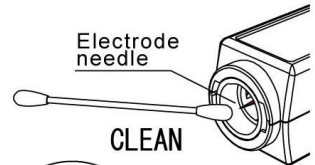
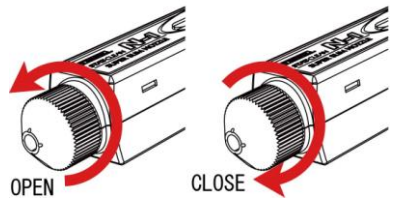
Remove the dirt over the casing with dry, soft cloth.
Never apply alcohol / thinner solvent / detergent.

How to Clean the Electrode Needle

Power supply to N-1 should be shut off before cleaning the Electrode Needle. Cleaning Order:

- 1) Remove the nozzle.
- 2) Clean the tip of the needle with a cotton stick. If it is especially dirty, use a few drops of alcohol-wet cloth.
- 3) Place the nozzle back in place.

Attach the nozzle firmly. If it is fastened too tightly, it may be damaged or break, but if it is fastened too lightly, the nozzle may come off while in use.



How to Replace the Electrode Needle

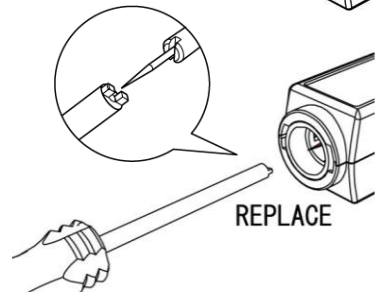
Electrode needle must be replaced with the needle replacement driver (separately sold). Make sure to shut off power supply before the cleaning of Electrode needle.

Replacement Order:

- * Remove the nozzle.
- * Release the screw with the driver.
- * Replace it with a new electrode needle and fasten it firmly.
- * Put the nozzle back in place.

Make sure that the nozzle is mounted firmly. Otherwise, it might come off while in use.





On the contrary, it may be broken or damaged if it is fastened too tightly.



Checking Ionizer's Performance

Measure ion balance and decay time regularly by a charge plate monitor.



Reference: IEC61340-5-1-2, EOS/ESD S3.1

 CAUTIONS IN TROUBLESHOOTING	
 PROHIBITED	Do not use N-1 in the following situations. It can result in fire or electric shock. * If the power cable is damaged or hot * If the N-1 has been damaged because of dropping or shock.
 SHUT POWER OFF	Unplug power cable if N-1 has a defect.
 DO NOT DISASSEMBLE	Do not disassemble the N-1.

Using N-1 when in anything but proper working condition can cause product damage or personal accident.

Therefore, request servicing promptly if such trouble occurs. For servicing, contact your local distributor.

■ Storage

 CAUTIONS IN STORAGE	
 PROHIBITED	Do not store the N-1 in the following places; Adverse environments can cause product breakdown; * Where it may be exposed to vibrations or shock; * Where temperature and humidity are outside specified ranges; * Where dewing occurs; * Where temperature fluctuates sharply; * Where there is the possibility of ignition or explosion of flammable solvents, dust, etc; * Where there is heavy dust or smoke; * Where it may be wet by water, oil , chemicals, etc; * Where strong electric or magnetic fields are generated.

LIMITED WARRANTY:

VESSEL expressly warrants that for a period of one (1) year from the date of purchase, VESSEL static erasers will be free of defects in material (parts) and workmanship (labour). Within the warranty period, Defects occurring will be repaired or products will be replaced at VESSEL's option and expense, if VESSEL receives notice during the warranty period. Defective products must be returned to VESSEL Osaka Japan with proof of purchase date. And if your unit is out of warranty, VESSEL will quote repair charges necessary to ship your unit freight prepaid to where you have originally purchased.

WARRANTY EXCLUSIONS:

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING FITNESS AND MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED.

The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean, or repair products.

LIMIT OF LIABILITY:

This electronic static eraser use high voltage corona discharge and should not be used in or near flammable or explosive environments. In no event will VESSEL or any seller is responsible or liable for any injury, loss or damage, direct or consequential, whether based in tort or contract arising out of the use of or the inability to use the product. Fulfillment of VESSEL's warranty obligations will be Customer's exclusive remedy and VESSEL's and Seller's limit of liability for any breach of warranty or otherwise. Before using this unit, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.

Model	N-1	
Warranty	(1) year from the date of purchase	
Customer	Name	
	Address	
	Tel. No.	
Dealer	Name/Address/Tel. No.	



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