# Instruction Manual
## Ionizer Blow Type [DTY-ELK01]

Thank you very much for your purchase of the DTY-ELK01. Although this product is not classified as a high-voltage device under any electrical equipment standards, it uses a 2000VAC high voltage. Please read this manual diligently in order to handle this unit carefully and correctly. Keep this manual in a safe place.

### 1. Safety Precautions

Because a high voltage is used in this product, improper use of the unit may cause an accident resulting in injury or death, or may lead to a malfunction of the product. Koganei will not be held liable for any usage outside the Product Specifications or for any accident caused by noncompliance with the Safety Precautions.

| | |
|---|---|
| ⚠ DANGER | Expresses situations that can be clearly predicted as dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets. |
| ⚠ WARNING | Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets. |
| ⚠ CAUTION | Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in light or semi-serious injury. It could also result in damage or destruction of assets. |
| ⚠ ATTENTION | While there is little chance of injury, this content refers to points that should be observed for appropriate use of the product. |

1.1 ⚠ DANGER

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| Do not use in locations where explosives, flammables, or other dangerous substances are present. This product is not an explosion-proof type unit. Explosion or ignition may occur. |
| When any wiring, installation, or inspection work is to be carried out, make sure that the unit is disconnected from the power supply, otherwise, an accident, an electrical shock or a malfunction may be caused. |
| Never attempt to remodel the product. It could result in abnormal operation leading to injury, electric shock, fire, etc. |
| Do not splash water on the product. Spraying it with water, washing it, or using it underwater could result in malfunction of the product leading to injury, electric shock, fire, etc. |
| A high voltage is applied to the discharge needle. Do not allow any conductive material, including fingers, any part of the body, wires or tools to come close to the needle. Otherwise, an electric shock or a malfunction of the unit may occur. |

1.2 ⚠ WARNING

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| Do not use the product in excess of its specification range. Such use could result in product breakdowns, function stop, damage or drastic reduction in the operating life. |
| The discharge needle has a sharp edge. Pay special attention to handling of the needle, or you may injure yourself. |
| Always make sure that the air supply is active before turning ON the unit. If the air supply is not active when the power supply is applied there may be a build-up of ozone inside the unit due to electrical discharge that could have an adverse effect on the equipment and the environment. |
| When using the nozzle, do not point it toward a person's body, and particularly not toward the face and eyes. You may injure yourself or other persons. |

1.3 ⚠ CAUTION

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| The ionizer generates ozone in the atmosphere. Although the concentration will become saturated and will not exceed a certain level when a single unit is used, if multiple units are used there may be a smell of ozone. In this case, increase ventilation. However, putting your face up against the ozone air emission port to check for an ozone smell is not recommended. It could cause injury to the nose or throat. |

1.4 ⚠ ATTENTION

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| When the product can no longer be used or is no longer needed, dispose of it appropriately as industrial waste. |

* For any other items of danger, warning, or caution, please refer to the "Safety Precautions" in the Catalog for the "Static Electricity Removing Unit: Ionizer" (Catalog No. BK-R0001). (Be sure to refer to the latest version of the Catalog.)

### 2. Product Overview

This product is a blow type ionizer (a device for eliminating static electricity). This product is helpful in quickly resolving problems with static electricity. Ionized air quickly and efficiently neutralizes the static electricity on charged objects, and removes dust attracted by the static electricity. This effectively controls static electricity problems and dust contamination problems.
You can also select an air-saving type of ionizer that reduces air consumption or a low-dust type that suppresses dust generation, depending on uses and needs.

### 3. Contents of the Package

On receipt of the product, please check the package for any missing parts or for any abnormality or damage that may have occurred during delivery before using the unit. In case any damage should be found or any abnormal operation should be observed, please contact the outlet (the agency) at which you purchased the product, or the nearest Koganei service station.

3.1 Content of Package

・Main unit: 1 ・Discharge needle unit*1: 1 ・Mounting bracket: 1
・Mounting bracket screws: 2 ・Power and signal cable (2 m): 1
・Instruction Manual (this booklet): 1 ・Air-saving nozzle*1,2 (DTY-ELK01-S only)

* 1. Attached to main unit at time of shipping.
2. For products other than DTY-ELK01-S, the nozzle is not included. Please purchase the nozzle separately.

### 4. Specifications

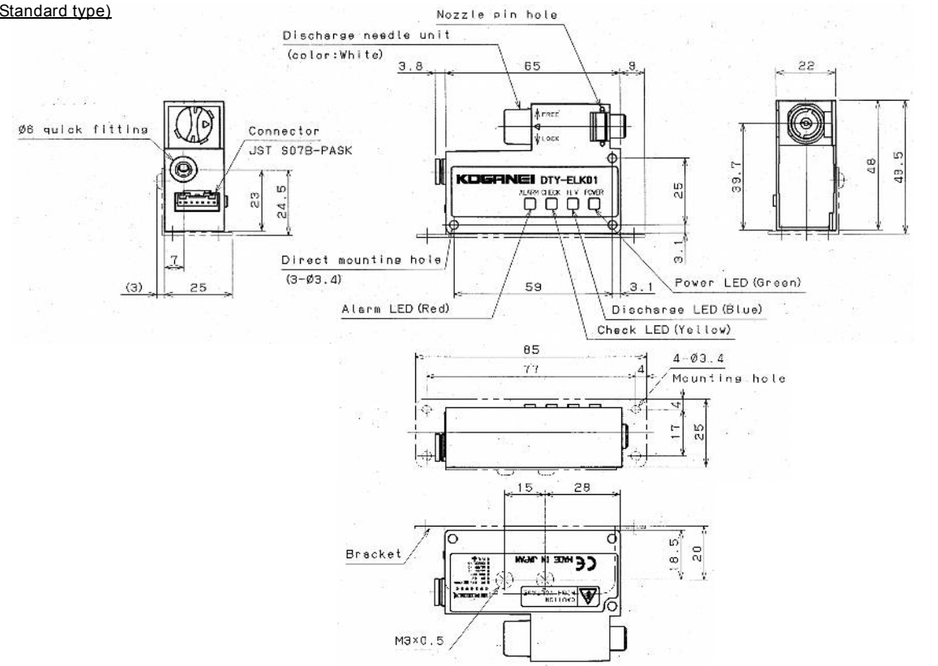
4.1 List of Specifications

| Type | | DTY-ELK01 (Standard) | DTY-ELK01-S (Air-saving) | DTY-ELK01-L (Low-dust) |
|---|---|---|---|---|
| Input power source | | 24VDC ± 5% | | |
| Current consumption | | 70 mA | | |
| Output voltage | | Approx. 2 kV (High frequency type) | | |
| Displays | POWER LED (Green) | When the power is ON | | |
| | H.V LED (Blue) | When discharge is in operation | | |
| | CHECK LED (Yellow) | When abnormal discharge occurs (H.V LED goes OFF) | | |
| | ALARM LED (Red) | When abnormal function occurs (H.V LED goes OFF) | | |
| Output | | Contact point output when CHECK LED and ALARM LED are ON (24V 50 mA MAX Open Drain) | | |
| Ionizer ON/OFF control input | | At 0V, discharge stops with short-circuited (No-voltage input, internal drop voltage 0.5V or less) | | |
| Ion balance*1 | | ±15V or less (at a distance of 50 mm and air pressure of 0.3 MPa) | | |
| Static elimination time*1,2 | | 0.5 sec or less | 0.8 sec or less | 0.5 sec or less |
| Generated ozone volume | | 0.03 ppm or less (at a distance of 300 mm and air pressure of 0.3 MPa) | | |
| Dust volume | | - | - | 50 particles or less*1,3 |
| Air tube connection diameter | | ϕ6 quick fitting | | Rc1/8 |
| Range of air pressure used | | 0.05 MPa to 0.5 MPa | | |
| Air supply flow volume*4 (ANR) | | 280 ℓ/min | 60 ℓ/min | 280 ℓ/min |
| Media | | Air (Clean air devoid of moisture and oil) | | |
| Mass | | 60 g*5 | 75 g*6 | 66 g*5 |
| Operating environment | Temperature Humidity Altitude | 0 to 40°C (indoor) 15% to 65% RH (with no condensation) 2000 m or less | | |
| Safety approvals | | IEC61010-1 (Over voltage category I, Pollution degree 2) | | |

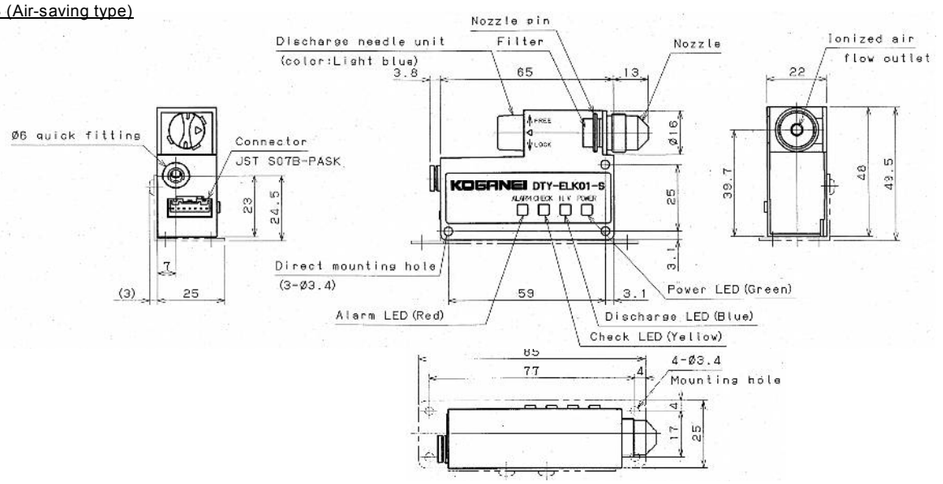
*1. Measured under the measuring conditions specified by Koganei
2. Measurement distance 50 mm, air supply pressure 0.1 MPa, standard nozzle in use
3. 0.3 μm or more, 1 cf/min
4. Air supply pressure of 0.5 MPa
5. When the bracket and nozzle are not attached.
6. When the standard nozzle and bracket are not attached.

### 5. Appearance

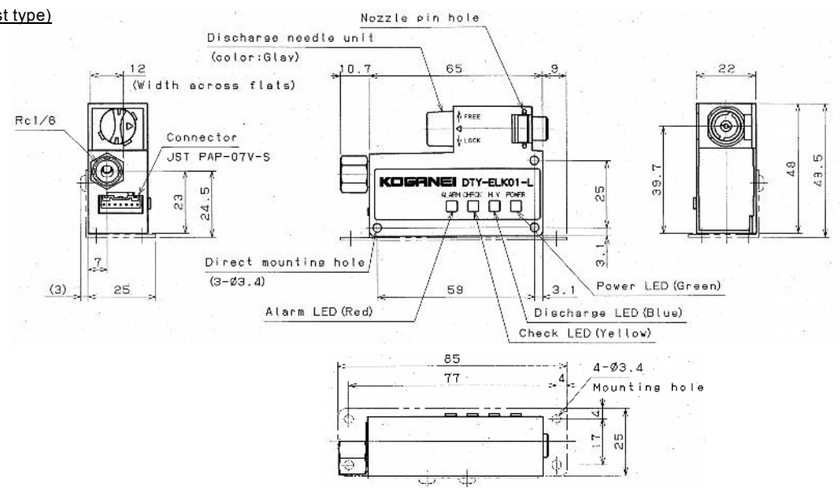
DTY-ELK01 (Standard type)




DTY-ELK01-S (Air-saving type)




DTY-ELK01-L (Low-dust type)



## 6. Installation, Wiring and Tubing

### 6.1 Installation

**⚠ CAUTION**

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| DTY-ELK01-L (low-dust type) uses clean room packaging. Always open the packaging in a clean room environment. |
| A nozzle is not included with the product (exception: installed in the air-saving type). Separately purchase a nozzle matching your utilization. |
| Nozzles are made specifically for each type. Always use the right nozzle for each type. |

1) Attach the nozzle to the main unit, and use the pin provided with the nozzle to fix it to the main unit.

* To replace the nozzle, pull out the pin and then remove the nozzle.

**⚠ WARNING**

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| Check that the nozzle is securely inserted and securely held in place by the pin. If not perfectly set, the nozzle could come loose during use, damaging the product and equipment. |

**⚠ CAUTION**

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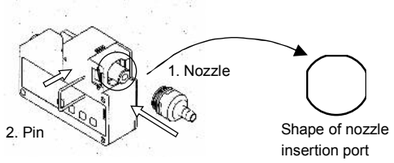
| The nozzle insertion part is made in a D-shaped cut to prevent rotation. When attaching, align the main unit nozzle insertion port with the nozzle insertion part. |




2) When using the mounting bracket for installation, use the two mounting bracket screws (enclosed with the packaging) to mount the mounting bracket to the main unit.

**⚠ CAUTION**

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| Tightening torque for mounting the bracket to the main body should be 50 N·cm or less. |

3) Use the mounting holes on the side of the main unit (3-ϕ3.4) or the mounting holes in the mounting bracket (4-ϕ3.4) to fix the product in place.

* Provide the mounting screws separately.

4) If using a tube, insert the tube firmly all the way to the base of the nozzle.

5) If using a nozzle and tube capable of adjusting the ionized air blow direction, fix the nozzle so that the ionized air blow port is pointed toward the static charge removal target.

6) If using a tube-tip nozzle, firmly insert the tube-tip nozzle into the tube, and use the bracket provided to fix it in place.

* For details, refer to the Instruction Manual provided with the tube-tip nozzle.

**⚠ CAUTION**

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| As piezoelectric ceramic is built into the main unit, do not apply shocks due to dropping or vibration, etc. Such action could result in product malfunction. |
| The various tubes used for the standard nozzle are consumable items that require periodic replacement. |
| When bending the bender nozzle, maintain the base of the bender nozzle in place. The main body could be damaged. |
| Do not use nozzles not specifically designed for the unit. Also, do not make modifications to the nozzle. Such action could be the cause of product malfunctions, function shutdown, or damage. |
| Do not install in locations prone to condensation, or subject to large humidity and temperature swings. The product could be subjected to damage. |

<When using the nozzle unit for the bender nozzle>

1) Remove the tip of the bender nozzle.

2) Always tighten the various nozzle units securely to the bender nozzle.

**⚠ CAUTION**

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| Hold the pipe portion securely when removing the tip of the bender nozzle. |
| The recommended tightening torque for the nozzle unit used for the bender nozzle is 30 N·cm. |

3) To adjust the direction of the bar nozzle unit (DTRY-ADN-□00B) ionized air blow port, loosen nut B.
To adjust the direction of the flat nozzle unit (DTRY-ADN-FT01) attach the ionized air blow port at the tip, and use the lock nut to fix in place.

**⚠ CAUTION**

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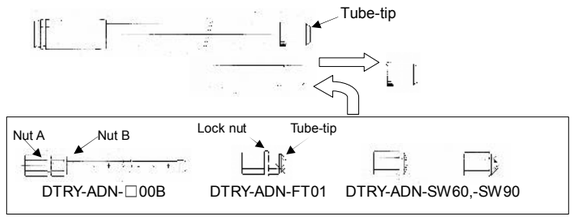
| When loosening nut B, be sure that nut A is fixed in place, and check that no force is being applied to the bender nozzle. |




### 6.2 Wiring

1) Use the power signal cable provided, and connect as shown in the figure below.
If taking power from input 100VAC, use the AC adaptor (DTY-ZKPS), sold separately.

**⚠ CAUTION**

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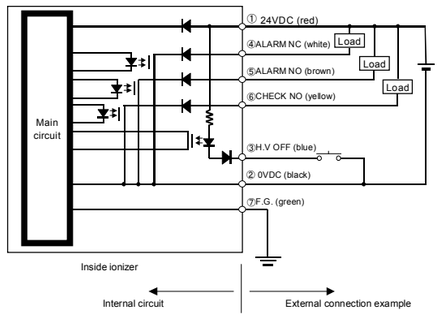
| Securely connect the ground wire (with a grounding resistance of 100Ω or less). Otherwise, ionizer performance may not be adequate. |
| Securely insert the connector. |
| Contact capacity for each output is 24V 50 mA MAX. Check the capacity of the connected equipment before use. |
| When selecting a power supply for use with this product, always use one that has been certified by the EU Notified Body (as a limited power source defined in IEC/EN60950-1 or IEC/EN61010-1), or the optional AC adapter. |
| 0VDC, F.G, nozzle and mounting bracket are connected to the internal circuit. |
| Use a mechanical switch, photo coupler, or relay for external input. If the grounding potential of the external device to be used and the grounding potential of this product are different, the external device should have an insulated on/off procedure for the 0V line. |




I/O Circuit Diagram

*①-⑦ show the main unit pin number.

* Note in parentheses ( ) shows the lead wire color in the power signal cable.

* Use a no-voltage contact point or NPN open collector to connect ③H.V OFF. (when ② 0VDC shorted, discharge OFF)

* When discharge OFF (when ③ H.V OFF and ② 0VDC shorted), H.V LED goes OFF.

| No. | Signal | Function |
|---|---|---|
| ① | 24VDC | Power input 24VDC±5% |
| ② | 0VDC | Power 0V and output 0V |
| ③ | H.V OFF | Discharge OFF when shorted at ② |
| ④ | ALARM NC | Contact point output when performance malfunction occurs (b contact point 24VDC 50 mA MAX) |
| ⑤ | ALARM NO | Contact point output when performance malfunction occurs (a contact point 24VDC 50 mA MAX) |
| ⑥ | CHECK NO | Contact point output when abnormal discharge occurs (a contact point 24VDC 50 mA MAX) |
| ⑦ | F.G. | Functional earth (with a grounding resistance of 100Ω or less) |

**⚠ CAUTION**

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| The abnormality output circuit of this product will be active about one second after the power is switched on. Sufficient care should be taken to design an error detection circuit during installation. |
| When the power to the main unit of the ionizer is switched ON immediately after being switched OFF, an abnormality output may occur. When performing such an operation, be sure to wait for a period of at least one second after switching off. |
| When the ionizer main unit is switched OFF, an abnormality output may occur. Pay careful attention to the design of the error detection circuit not to detect the ionizer's abnormality output for a one-second period after the power supply to the ionizer main unit is switched OFF. |

### 6.3 Air Tubing

1) Connect air tubes (outer diameter ϕ6 mm) to the DTY-ELK01 and DTY-ELK01-S main unit air fittings.
For DTY-ELK01-L, use fittings that match the tubing used (port size: Rc1/8).

2) Use a regulator to connect the air tube to the air source.

**⚠ WARNING**

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| Always supply air before switching ON the power, and use within the specified pressure range. |

**⚠ CAUTION**

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| Although the DTY-ELK01-L (low-dust type) is subjected to clean-room cleaning and packaging using clean air at time of shipping, the effects of vibration, etc., during transport can generate particles. Flush out the unit and clean it thoroughly before commencing initial use. |
| For connection to or replacement of a DTY-ELK01-L (low-dust type) fitting, proceed by holding the female screw (Rc1/8) hexagonal part in position. Application of excessive force to the main unit could cause damage to the main unit. |

## 7. Operating

### 7.1 Steps When Starting Operation

1) Check that the nozzle and discharge needle unit are correctly connected to the ionizer.

2) Check the ionizer wiring and air tubing.

3) Supply air to the unit from the air equipment that is being used.

4) Supply 24VDC power to the unit. The POWER LED and H.V LED on the unit light up and electrostatic elimination begins.

* If the optional power adapter is used, supply 100-240VAC, 50/60 Hz.

* When using external controls (H.V OFF) to control the unit, the H.V LED goes OFF when discharge is OFF.

* Use the input power side (24VDC side) to switch power ON/OFF.

**⚠ WARNING**

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| Take soundproof measures, such as wearing earplugs, when working at close proximity to the unit. |

### 7.2 Steps When Stopping Operation

1) Stop the supply of power to the unit.

2) Stop the supply of air.

**⚠ CAUTION**

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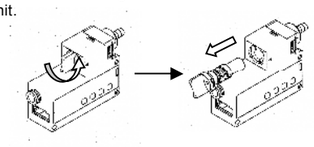
| If the POWER LED is not illuminated or if the CHECK LED or ALARM LED lights up, immediately shut off the power and air, and see "6. Installation, Wiring and Tubing" in this manual. If problems still do not resolve, see "8. Maintenance" and "9. Troubleshooting" in this manual. |

## 8. Maintenance

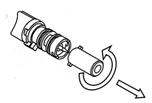
If the discharge needle is soiled, the electrostatic elimination effects will be reduced. Periodically clean the discharge needle and surrounding area to maintain performance.

<Discharge needle unit cleaning method>

1) Rotate the discharge needle unit counterclockwise, and pull it from the main unit.



2) Rotate the discharge needle unit bushing counterclockwise, and remove the bushing.



**⚠ CAUTION**

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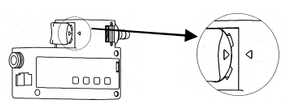
| Do not apply excessive force when removing the bushing from the discharge needle unit. The discharge needle unit could be damaged. |
| When replacing the discharge needle unit, use the specified discharge needle unit. Discharge needle units are specifically designed for each type. You can determine the correct discharge needle unit by its color. |

3) When the discharge needle unit has been removed, use a cotton swab soaked in anhydrous alcohol (IPA) to clean the discharge needle and bushing.

4) After drying the unit carefully with anhydrous alcohol, reassemble the discharge needle unit onto the main unit in reverse sequence to removal.
At this time, rotate until the Δ mark on the side of the main unit is aligned with the Δ mark on the discharge needle unit.



**⚠ WARNING**

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| As the tip of the discharge needle is very sharp, care is needed when removing the discharge needle and during cleaning. The needle tip can cause injury. In addition, be extremely careful to avoid bending or breaking the discharge needle. Performance will be affected. |
| Securely attach the bushing and the discharge needle unit. If not securely fixed in place, performance will be affected, and the discharge needle unit may become loose during use, causing damage to the product and equipment. |

**⚠ CAUTION**

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| To maintain performance, be sure to perform cleaning of the discharge needle and the surrounding area periodically. Performance will be affected, and lack of cleaning may cause damage to equipment and workpieces. |
| When performing maintenance, always disconnect the connection cables before proceeding. |
| When using alcohol or similar substances, make sure that there is adequate ventilation. In addition, always thoroughly dry off the alcohol after using it for cleaning, and check that none has spilled on to the main unit. |
| Because it can result in damage to the main unit, absolutely never use a wire brush for cleaning. |

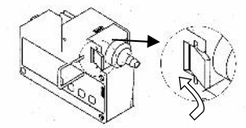
<Main unit filter replacement method>

For DTY-ELK01-S, a filter is installed on the outside air intake port.
A dirty filter will result in reduced outside air intake efficiency, and static charge removal performance will become inadequate.
Replace the filter if it has become dirty.

1) Remove the pin fixing the nozzle in place.

2) Pull out the filter in the nozzle direction.
If difficult to remove, use a precision screwdriver or tweezers.

3) Insert the new filter so that it slips in from the nozzle direction, and then remount the pin.



## 9. Troubleshooting

If product operation appears to be abnormal, immediately shut off the power to the main unit, disconnect the connection cable from the main unit's power connection terminal, and check the items in this section. If the abnormal situation continues, it may mean that a breakdown has occurred. Contact the outlet (the agency) at which you purchased the product, or the nearest Koganei service station.

**The POWER LED does not light up.**

→ Verify that the wiring and power source are connected correctly.

**The POWER LED lights up but the H.V LED does not.**

→ Verify that the H.V OFF terminal is not shorted.

**CHECK LED and ALARM LED are illuminated.**

→ Verify that the unit is securely grounded.

→ Verify whether the discharge needle is soiled or damaged, and whether the surrounding area is soiled. If it is soiled, see "8. Maintenance" in this manual, and perform maintenance or replacement of the discharge needle unit.

**No electrostatic elimination effect**

→ Verify that ionized air is blown to the object eliminating static electricity.

→ Verify whether the discharge needle is soiled or damaged, and whether the surrounding area is soiled. If it is soiled, see "8. Maintenance" in this manual, and perform maintenance or replacement of the discharge needle unit.

**Any other abnormal condition**

If any other abnormal condition has been observed, immediately turn off the power from the product, and please contact the outlet (the agency) at which you purchased the product, or the nearest Koganei service station.

## 10. Consumables and Optional Parts

・Discharge needle unit: DTY-ZKEM (standard type: White)
DTY-ZKEMS (air-saving type: Light blue)
DTY-ZKEML (low-dust type: Gray)

・Air-saving type replacement filter: DTY-ZKFS (5 filters/set)

・AC adapter: DTY-ZKPS

・Controller: DTY-ZKCR

・Controller unit: DTY-ZKCRU (Unit with solenoid valve)

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