1 Safety Instructions (continued)

1.2 Specific recommendations

• This product is intended for use in general factory automation systems. If other applications (especially the ones indicated in section 1.1) are used, please contact SMC before use.

• Use within specified voltage and temperature limits.

• Voltage out of specification may cause malfunction, damage, electric shock and/or fire.

• Use clean, compressed air for fluid.

• Do not use flammable or explosive gas for fluid as it may cause fire or explosion. When fluids other than compressed air are used, please contact SMC service representative.

• This product does not have an explosion-proof construction.

• Do not use this product in areas where dust explosions may be triggered, or where flammable or explosive gas is present as this too may cause explosions and/or fire.

DANGER

DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

2 Intended Conditions of Use (continued)

2.1 Specifications

<table>
<thead>
<tr>
<th>Ionizer model</th>
<th>MN20-1 (1)</th>
<th>MN20-3 (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input rated</td>
<td>240 VDC</td>
<td>240 VDC</td>
</tr>
<tr>
<td>Discharge output</td>
<td>3000 V</td>
<td>3000 V</td>
</tr>
<tr>
<td>Output current</td>
<td>0.5 A</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Ozone generation (1)</td>
<td>0.3 ppm (0.1 ppm for energy saving charge elimination nozzle)</td>
<td></td>
</tr>
<tr>
<td>Air purger</td>
<td>Fluid Air purger and dry</td>
<td></td>
</tr>
<tr>
<td>Operating pressure</td>
<td>0.05 MPa ~ 0.2 MPa</td>
<td></td>
</tr>
<tr>
<td>Grounded tube ratio</td>
<td>4 mm and 141 mm</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>400 VAC ± 10 %</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>80 mA (when input and output signals are not used)</td>
<td></td>
</tr>
<tr>
<td>Maintenance stop input signal</td>
<td>SPM to connection Current consumption: 5 mA or less</td>
<td></td>
</tr>
<tr>
<td>Maintenance signal</td>
<td>24 V to connection Current consumption: 5 mA or less</td>
<td></td>
</tr>
<tr>
<td>Output signal</td>
<td>Maintenance signal</td>
<td>24 V to</td>
</tr>
<tr>
<td>Effectiveness elimination distance</td>
<td>80 mm</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>5 °C ~ 40 °C</td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>30 % ~ 85 % (Non condensing)</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Brass, ABS, Stainless steel, Electrode: Tungsten</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>EEC: A, L: 3 Grilipal 1000h at 1500 rpm with 2 hours to X, Y, Z each direction of vibration</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>100 g</td>
<td></td>
</tr>
<tr>
<td>Specifications and dimensions</td>
<td>CE marking</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Measurement probe: 1000 MΩ, 5 pf.

Note 2: Distance between the charged object and ionizer: 100 mm, air purge: 0.3 MPa, medical equipment, food and beverage, corrosion equipment, emergency stop circuits, press applications or safety equipment.

2.2 Outline

IZN10-01 / IZN10-02
Energy-saving nozzle / Large-flow nozzle

2 off M3 x 5. thread depth 4 mm

( Ground point )

2 off M3 x 5. thread depth 10 mm

( Mounting points )

3 How to order (continued)

3.1 Environment

1. Use within operating fluid and ambient temperature.

This operating fluid and ambient temperature range for the ionizer is 0 to 55 °C. In areas where sudden temperature changes occur, even when these changes are within the specified temperature range, condensation may form. The ionizer should not be used in such conditions.

Do not use this product in an enclosed space.

This product utilizes the corona discharge method of operation and as this process generates small amounts of ozone and NOx, the ionizer must only be used in open, well-ventilated areas.

3.1 Environment to avoid

Do not use or store under the following conditions, as these may cause equipment failure:

• Ambient temperatures outside the range 0 to 55 °C.

• Ambient humidity outside the range 35 to 65 % RH.

• Areas where rapid temperature changes may cause condensation.

• Areas where corrosive gas, flammable gas or other volatile flammable substances are stored.

• Areas where this product is to be used outdoors.

2) Installation on equipment in conjunction with atomic energy, railway, air navigation, ... that has the possibility of having negative effects on people, property or animals requires a special safety analysis.

• Read this manual before using the product, to ensure correct handling and immediate access to the important safety information.

This manual contains essential information for the protection of users and operators.

The compatibility of equipment is the responsibility of the person who designs the systems or decides the specifications.

Since the products specified here can be used in various operating conditions, their compatibility with the specific system must be based on specifications or after analysis and/or tests to meet the specific requirements. Those who decide the compatibility of equipment shall take the responsibility to guarantee the initial system performance and safety. Construct the system after reviewing all the specifications in the latest catalogue or documentation, as well as considering the implications of the failure of any piece of equipment.

• Only trained personnel should operate machinery and equipment.

This product generates high voltages; therefore it can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of systems should be performed by trained and experienced personnel only.

• Do not service machinery/equipment or attempt to remove components until safety is ensured.

1) Inspection and maintenance of the machinery and equipment should be performed after confirmation of safety, considering such areas as earthing, prevention of electric shock and other types of injury.

2) When equipment is to be removed, confirm the safety process as mentioned above. Cut air pressure and electrical power supplies which are the energy sources for the equipment and exhaust all residual compressed air in the system.

3) Before machinery/equipment is re-started, take measures to prevent short circuit, etc.

Do not use the product under the following conditions or environments. If it is unavoidable, take appropriate measures and contact SMC.

1) Conditions and environments beyond the given specifications if product is to be used outdoors.

2) Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, corrosion equipment, emergency stop circuits, press applications or safety equipment.

3) An application that has the possibility of having negative effects on people, property or animals requires a special safety analysis.

4 Installation

1. Use within operating fluid and ambient temperature.

2. Do not use this product in an enclosed space.

This product utilizes the corona discharge method of operation and as this process generates small amounts of ozone and NOx, the ionizer must only be used in open, well-ventilated areas.

3. Environments to avoid

Do not use or store under the following conditions, as these may cause equipment failure:

• Ambient temperatures outside the range 0 to 55 °C.

• Ambient humidity outside the range 35 to 65 % RH.

• Areas where rapid temperature changes may cause condensation.

• Areas where corrosive gas, flammable gas or other volatile flammable substances are stored.

• Areas where the product may be exposed to conductive powder such as iron powder or dust, oil mist, salt, organic solvent, machining chips, particles or cutting oil.

• Directly in the path of air conditioners.

• In enclosed, poorly ventilated areas.

• Exposed to direct sunlight and/or radiant heat.

• Areas where strong electromagnetic noise is generated, such as strong electrical and magnetic fields or supply voltage spikes.

• Areas where the product may be subject to electro-static discharge.

• Areas where RF noise is generated.

• Areas prone to lightning strikes.

• Areas where the product may receive direct impact or vibration.

• Areas where the product may be subject to forces or weight that could cause physical deformation.

If any of these conditions are unavoidable, take appropriate protection measures.
4. Installation (continued)

3. Wiring Tables

<table>
<thead>
<tr>
<th>No.</th>
<th>Cable colour</th>
<th>Signal name</th>
<th>I/O Connection</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>Power supply +24V</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Blue</td>
<td>Power supply +24V</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Orange</td>
<td>Discharge stop signal</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pink</td>
<td>Reset signal</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>White</td>
<td>Discharging signal</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Purple</td>
<td>Stop signal</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Yellow</td>
<td>Maintenance signal</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
<td>External switch signal 1</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Grey</td>
<td>External switch signal 2</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Do not apply tape or seal to the product.

If conductive adhesive or reflective paint is contained in the tape or seal, it is possible that due to the dielectric effect, charge could build up causing an electro-static discharge or electrical leakage.

7. Install or adjust the product only after power supply is removed.

1. Keep the minimum free space of 100 mm, around the ionizer for correct operation, installation and maintenance.

Walls or other objects that are present within the minimum free space area can interfere with the operation of the ionizer, reducing the efficiency of static charge removal.

2. Be sure to check the effect of static charge removal after installation.

The effectiveness of static charge removal varies depending on the installation and operating conditions.

4.4.1 Installation of ionizer

Investigate the places where static problems occur, or places where processes and parts generate ESD (electro-static discharge), and carefully consider the required conditions to ensure appropriate static charge removal before installation.

When mounting the product, use M3 hexagon socket head bolts. Tightening torque is 0.61 to 0.63 Nm.

1. Body mounting: Tap or through hole.

Refer to the figure below, affix the product using hexagon socket head bolts with optimum length.

2. Adjust angle of the ionizer body to ensure proper static charge removal

This includes plugging in or removing connectors as the product may be damaged.

6. Check wiring is correct and confirm safety, before powering up the product. Incorrect wiring may cause product damage or malfunction.

7. Do not route product wires and cables together with power or high-voltage cables to prevent malfunction due to noise.

8. Flush pneumatic piping before installation. Ensure that all dust, water droplets, oil, etc. are removed before piping.
4 Installation (continued)

3. The mounting angle of the product can be adjusted within the following range.

(4) Inward mounting of L-bracket

1. Before mounting the product, mount the L-shaped bracket where the product will be installed. The mounting angle of the bracket can be adjusted in the following range. Hexagon socket head bolts are not included with the product and need to be provided separately.

2. Affix the product with the hexagon socket head bolts (M3 X 6) and washers that are supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.

(5) Pivoting bracket

1. Mount the pivoting bracket to the product with the hexagon socket head bolts and washers that are supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.

2. Affix the product with the hexagon socket head bolts (M3 X 6) and washers that are supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.

2. Mount the L-bracket to the product with the hexagon socket head bolts (M3 X 6) and washers that are supplied attached to the product.

3. Mount the product to the DIN rail and tighten the socket head bolts to secure.

(6) DIN rail mounting bracket

1. Adjust the L-bracket to the desired angle and fix in position.

4 Installation (continued)

(7) Mounting of multiple ionizers

1. Insert the spacers between the counter bores of the body. 2. Hold the product by L-shaped brackets from both ends and tighten the hexagon socket head bolts. Tightening torque is 0.61 to 0.63 N•m. The composition of parts to connect 3 ionizers is shown below.

(8) Make certain the lead wire [blue] of the power supply cable is connected to protective ground.

If the lead wire is not grounded, the ion balance will be unstable, and there will be the possibility of electric shock, also the ionizer and connected power supply may be damaged.

4. LED state

<table>
<thead>
<tr>
<th>Item</th>
<th>PWR</th>
<th>ION</th>
<th>HV</th>
<th>NDL</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal operation (Discharge stop signal OFF)</td>
<td>•</td>
<td>•</td>
<td></td>
<td></td>
<td>Ion emission</td>
</tr>
<tr>
<td>Detection of high voltage error</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
<td>Discharge stopped due to error detected</td>
</tr>
<tr>
<td>External switch signal 1</td>
<td></td>
<td>•</td>
<td></td>
<td></td>
<td>Discharge stopped due to signal input</td>
</tr>
<tr>
<td>External switch signal 2</td>
<td></td>
<td></td>
<td>•</td>
<td></td>
<td>Ions emitted continuously even when contamination on the electrode has been detected</td>
</tr>
</tbody>
</table>

5. Details of alarm

<table>
<thead>
<tr>
<th>Description</th>
<th>Content</th>
<th>How to reset</th>
</tr>
</thead>
<tbody>
<tr>
<td>High voltage error</td>
<td>Informs that excessive current (such as high voltage leakage) has occurred at the electrode. “HV” LED lights up and ion emission is stopped. The error signal is turned off when error occurs.</td>
<td>Turn off the power supply, find and solve the error, reset the power supply. If the error has been corrected, turn the reset signal on and off.</td>
</tr>
<tr>
<td>Electrode maintenance</td>
<td>Informs that maintenance of electrode is necessary. “NDL” LED lights up and maintenance signal is output.</td>
<td>Turn off the power supply, clean the electrode, and then restart the power supply.</td>
</tr>
</tbody>
</table>

5 Functional Explanation (continued)

5. Functional Explanation

1. Detection of contamination on electrode

During operation reduced charge elimination capability due to contamination or wear of the electrode is monitored continuously. If it becomes necessary to clean the electrode, the LED for maintenance lights up on the display of the product and maintenance output signal is generated.

2. Input of external switch signal

There are two ports for external switch signal inputs. If a pressure switch or electrostatic sensor is connected, discharge can be stopped for abnormal pressure or completion of charge elimination.

3. Name of display LEDs

[Diagram of LED states]
6 Maintenance

**WARNING**

1. Do not drop, hit an object or cause excessive impact (10 G or more) when handling. Although externally the ionizer may not appear to be broken, there may be internal damage causing malfunction.

2. When the cable is inserted or removed, pinch modular plug spring clip with finger and insert or remove the plug in a straight line. If inserted or removed in an inappropriate direction, the mounting part of the modular jack might be damaged leading to operational failure.

**CAUTION**

1. Keep electrode clean with regular maintenance.
   Make sure that the equipment is operating without any errors by regular maintenance. Only people with sufficient knowledge and experience should perform maintenance of the equipment. Contamination adhering to the electrode, due to long operating periods, reduces the ability of the ionizer to eliminate static electricity.
   If, after cleaning the electrode, the ionizer does not regain its correct performance, the electrode should be replaced. In order to maintain stable performance, regular maintenance and cleaning of the electrode is recommended.

2. The tube and fitting must be treated as consumable parts.
   The tube and fitting that are connected to the female piping port of the product can deteriorate due to ozone and need to be replaced regularly.

3. The power supply must be removed when cleaning the electrode, or changing the electrode cartridge.
   To avoid the risk of electric shock, do not touch the electrode whilst the ionizer has power connected.

4. To avoid electric shock, failure, fire etc. do not service or modify the product.
   Non-SMC serviced or modified products are not guaranteed to meet the published specification.

5. Do not operate the product with wet hands.
   There is a danger of electric shock.

1. How to maintain the electrode.
   Cleaning of the electrode.
   1. Disconnect the power supply cable.
   2. Rotate the locking knob and pull down the cartridge.
   3. Clean electrode.
   4. Mount the cartridge and power supply cable in the reverse order to complete the cleaning.

---

7 Limitations of Use

**WARNING**

Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.