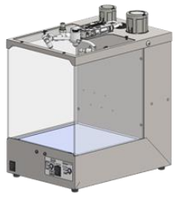
ORIGINAL INSTRUCTIONS

Instruction Manual
Desktop Duster Box
ZVB20 / ZVB40 series



The intended use of this product is to neutralize electrostatic charge and remove dust from a part or workpiece.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.”
They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) *1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power — General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power — General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robotics ─ Safety requirements ─ Part 1: Industrial robots

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

⚠ **Caution**	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning**	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger**	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

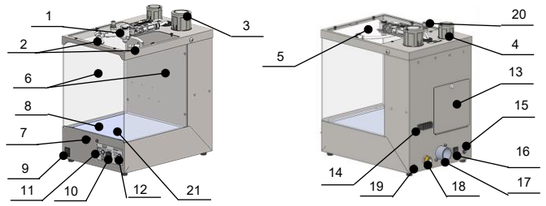
⚠ Warning

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

Ionizer	Ion generating	Corona discharge
	Voltage supply	High frequency AC
	Discharge output	2500 V
	Amount of ozone generated	0.03 ppm
	Offset Voltage	Within +/-10 V
	Discharge time	0.3 seconds (1000 V → 100 V)
Dust collection	Supply pressure range	0.1 to 0.7 MPa
	Exhaust flow rate	ZVB20 - 890 to 2,880 L/min (ANR) ZVB40 - 1,780 to 5,760 L/min (ANR)
Product	Fluid	Clean Dry Air
	Operating pressure range	0.2 to 0.8 MPa
	Tube O.D.	ZVB20 - ø8 mm / ZVB40 - ø10 mm
	Power	24 VDC +/-10% 1A
	Operating time setting	Continuous/timer [2, 5, 10 sec]
	Additional air flow setting	Continuous blow / pulse blow [50/100 ms intervals]
	Ambient/Fluid temperature	0 to 55ºC
	Ambient humidity	35 to 65 %RH (No condensation)
	Air consumption	ZVB20 - 420L/min (ANR) ZVB40 - 800L/min (ANR)
	Weight	ZVB20 - 4.8 kg / ZVB40 - 9.1 kg

3 Name and function of individual parts



No.	Description	Remarks
1	Ionizer	With diffusion nozzle
2	Additional air flow nozzle	Nozzle diameter 1.0
3	Regulator for adjusting supply pressure to the dust collector	With pressure gauge
4	Regulator for adjusting supply pressure for additional air flow	With pressure gauge
5	Top cover assembly	Static electricity restriction grade (PET)
6	Side cover	Static electricity restriction grade (PET)
7	Photoelectronic sensor	
8	Mesh	Detachable
9	Power supply switch	
10	Timer change-over switch	
11	Operation time set switch	Operating time can be set
12	Additional air flow pulse operation time set switch	Pulse selection
13	Cover for valve maintenance	
14	Terminal block	
15	AC adapter (DC plug) entry	
16	ON/OFF switch for dust collector	
17	Exhaust port of the dust collector	
18	Compressed air supply port	ZVB20: ø8, ZVB40: ø10
19	Ground screw	
20	Restrictor (optional)	With flow adjusting restrictor for use with additional air flow option
21	Suction slope	

4 Installation

4.1 Installation

⚠ Warning

- **Do not install the product unless the safety instructions have been read and understood.**
- **Avoid using in a place where noise (electromagnetic wave and surge) is generated.**
  It may cause failure or damage to the product. Take measures to prevent noise at source and avoid power and signal lines from coming into close contact.
- **Do not allow foreign matter, workpiece or tool to enter the ionizer nozzle.**
  There is an emitter inside the nozzle. If the emitter comes into contact with metallic workpieces or tools, electric shock may result. If the emitter is damaged, it may interfere with the specified function and performance, and may also cause operation failure or an accident.
- **When the dust collector is operating, air is discharged vigorously from the exhaust port.**
  Prevent exhausted air from contacting people or objects. Piping (I.D. 32 mm) or a dust collection bag must be connected to the exhaust port.
- Do not drop, hit or apply excessive shock to the product.
  Even if the body is not damaged, the internal components may be damaged, leading to a malfunction.

4.2 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product’s specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product’s specifications.

4 Installation (continued)

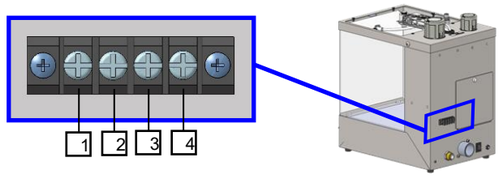
- Operate in an environment within the specified ambient and fluid temperature range (0 to 55ºC).
  Avoid sudden temperature changes even within the specified temperature range, as it may cause condensation.
- Do not use this product in an enclosed space. This product utilizes the corona discharge phenomenon.
  Although the amount is very small, Ozone and NOx are generated. Ozone condensation can increase if used in an enclosed space, which can affect the human body, so ventilation is necessary. Even when the room is ventilated, operating more than one product in a small space may increase the ozone density.

4.3 Wiring

⚠ Warning

- Power supply required to the product is 24 VDC and 1 A.
  When power is supplied to the product without using the exclusive AC adapter, make sure to use a stabilization power supply and connect wiring to the DC plug provided with the product.
- D-class ground connection (ground with a resistance of less than 100 Ω) MUST be used for the product.
  Without grounding, the product will not provide the performance specified.

- **I/O Terminal Block**

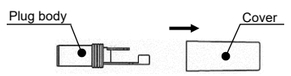


No	Terminal	Input / Output specifications	Remarks
1	Operation signal output	Transistor output: 5 to 24 VDC, 0.1 A	
2	External input	+24 VDC	Connect an external switch when an external signal is to be used for a starting operation instead of a photoelectric sensor.
3	COM＋		1: Connect the cable (prepared by the user) when the operation signal output is to be used.
4	COM−		2: Connect the cable (prepared by the user) when an external input is to be used.

- **Wiring of the DC plug**

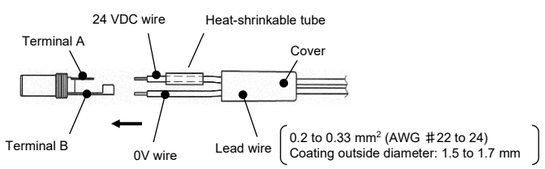
If the AC adapter is not selected as an option, wire the attached DC plug following the procedure below.

(1) Unscrew the cover from the DC plug body.



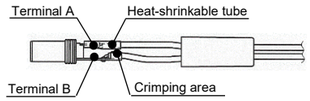
(2) Strip the end of the lead wires 3 to 4 mm, and insert the lead wires into the cover, then wire to the terminals. Mount a heat-shrinkable tube on to the lead wire on terminal A to prevent short-circuit.

-Terminal A (shorter side): Connect the 24 VDC wire.
-Terminal B (longer side): Connect the 0V wire.

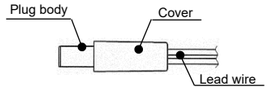


4 Installation (continued)

(3) Solder the wires and bend the clamp in the crimping area of terminal B with pliers.
Protect the terminal A side with a heat-shrinkable tube.



(4) Mount the cover on to the body and confirm that the lead wires are correctly connected.



4.4 Piping

⚠ Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.
- For air piping, use SMC tubing of diameter 8 mm (ZVB20), 10 mm (ZVB40) or equivalent.
- It is recommended to use an air supply of purity class 2:4:3, 2:5:3 2:6:3 to ISO08573-1:2010 (JIS B8392-1:2012) or higher. The air containing mist or dust will cause the performance to decrease and shorten the maintenance cycle. Install a dryer (IDF series), air filter (AF/AFF series), and/or mist separator (AFM/AM series) to the upstream of the product to maintain clean compressed air.
- Air connections should only be made with the air supply turned off. Flush the system before piping to prevent foreign matter from entering inside the product.

4.5 Lubrication

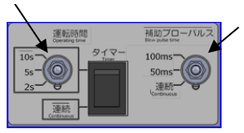
⚠ Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, refer to catalogue for details.

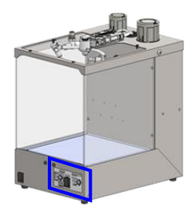
5 Operation method

1. Turn ON the main power supply switch and the dust collector switch after confirming that the safety guidelines are met.
   Make sure the exhaust port is directed away from objects or operators. The dust collector discharges adsorbed substances from the exhaust port at a high speed.
2. Supply air pressure of 0.4 to 0.8 MPa (recommended values) to the connected piping (by opening the valve or regulator prepared by the user). Adjust the pressure of the regulator connected to the air flow to within the range of 0.1 to 0.3 MPa. Adjust the pressure of the regulator connected to the dust collector to within the range 0.2 to 0.4 MPa (ZVB20) or 0.3 to 0.5 MPa (ZVB40).
3. Set the operation time of the desktop duster box using the operation time set switch. The operation time can be selected from continuous, 2 seconds, 5 seconds, or 10 seconds.

Operation time set switch



Additional air flow pulse operation time set switch



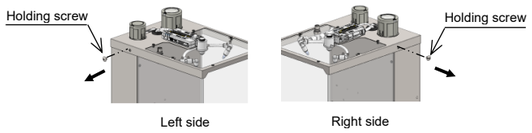
4. Set the additional air flow pulse operation time with the additional air flow pulse operation time set switch. The operation time can be selected from continuous (no pulse), 50 ms, or 100 ms.

5 Operation method (continued)

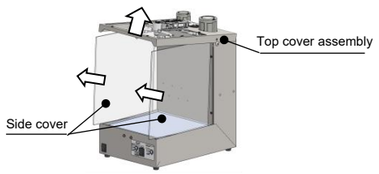
5. Check the actual static and dust eliminating condition of the workpiece.
   When the additional air flow is too strong, adjust the pressure or air flow rate by rotating the handle of the regulator connected to the air flow adjustment or the additional air flow adjusting restrictor (option).
6. When not using the dust collector, turn the ON/OFF switch for dust collector off.

6 Removal of side covers

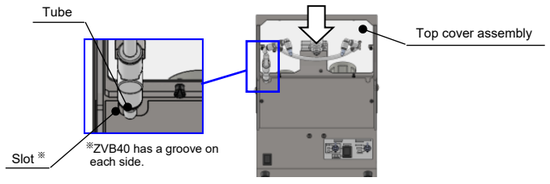
- One or both of the side covers can be removed from the desktop duster box. By removing the side cover(s), it is possible to mount the desktop duster box on a conveyor line and introduce workpieces from the side. However, the amount of dust scattered outside will be larger than usual due to an increase in the open area.
  1. Remove the holding screws (2pcs.) on the side of the desktop duster box.



  2. Slide the side covers while lifting the top cover assembly as shown in the figure below.
     The piping and wiring of the top cover assembly and body are connected, so do not lift the top cover more than required.

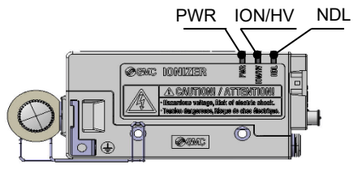


  3. Return the top cover assembly to the original position while placing the tube in the slot in the body. Tighten the top cover holding screws with 1.50 +/-0.15 Nm tightening torque while holding the top cover assembly horizontal.



7 LED Indication

7.1 Ionizer Function LED's



LED	Colour	Description	Contents
PWR	Green	Power supply indicator	LED is ON when the power supply is ON; LED flashes when the power supply or CPU is abnormal.
ION / HV	Green/ Red	Ion discharge / Incorrect High Voltage LED	Green LED is ON: discharge in progress Red LED is ON: high voltage error Red LED flashing: CPU error
NDL	Green	Emitter maintenance indicator	LED is ON: ion generation decreased LED flashing: CPU error

8 Troubleshooting

Alarm	Description	Countermeasure
Power supply failure	Power supply connected to the product is not within the range of 24 V +/-10%. The abnormal signal will be turned OFF (ON when it is normal) and discharge signal will be turned OFF, and the PWR LED (green) will flash to indicate the error. When the failure occurs, ion generation will be stopped.	To resolve the error, reset the product automatically by connecting a power supply which provides a power supply voltage of 24 V +/-10%.
Incorrect High Voltage	When an incorrect electric discharge is generated during operation, the abnormal signal will be turned OFF (ON when it is normal) and discharge signal will be turned OFF, and the ION/HV LED (red) will turn ON to indicate the error. When the failure occurs, ion generation will be stopped.	The incorrect electric discharge could be caused by condensation or dust on the emitters. To resolve the error, input the reset signal or supply power again after remedying the cause of the incorrect electric discharge.
CPU / ALM	When the CPU makes an abnormal operation due to noise or other reasons, the abnormal signal will be turned OFF (ON when it is normal), and the PWR (green), ION-HV (red) and NDL (green) LED will flash to indicate the error. When the failure occurs, ion generation will be stopped.	To prevent noise, perform the following actions and take countermeasures. 1. Keep the product away from sources of noise. 2. Route the power line and cable to the product separately. 3. Install a noise filter on the power supply to the product. To resolve the error, supply power again after fixing the cause of the error.
Maint-enance warning	The maintenance signal is ON when static electricity neutralization performance has decreased due to contamination, wear or damage to the emitters. The NDL LED (green) will turn ON to indicate that cleaning or replacement of the emitters needs to be performed. The product continues operation even when the maintenance warning has been generated.	When emitters are contaminated, the error can be solved by cleaning them. However, when they are worn out or damaged, it is necessary to replace the emitter assembly. To resolve the error, input the discharge stop signal or supply power again after remedying the cause of the error.

9 How to Order

Refer to the Operation manual on the SMC website (URL https://www.smcworld.com) for How to Order information.

10 Outline Dimensions (mm)

Refer to the Operation manual on the SMC website (URL https://www.smcworld.com) for Outline Dimensions.

11 Maintenance

11.1 General Maintenance

⚠ Caution

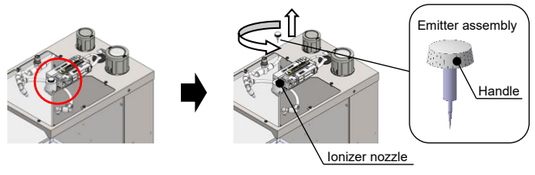
- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Perform maintenance and clean the emitters regularly (every 2 weeks is recommended).
  If the ionizer is used for a long time and there is dust on the electrodes, performance of the product will be reduced.
- When the NDL LED (maintenance signal LED) is ON, the emitter must be cleaned. If the becomes worn and static electricity elimination ability does not recover even after cleaning, replace the.
  If the is touched while the product is energized, this may cause an electric shock or accident.

11.2 Ionizer Maintenance

(1) Emitter cleaning
1. Rotate the handle of the emitter assembly anti-clockwise by hand and remove it.
2. Clean the emitter using the Ionizer emitter cleaning kit (part.No. IZS30-M2).
3. Insert the emitter assembly into the port using caution not to damage the end of the emitter, and screw it in. Note)

(2) Replacement of Emitter
1. Rotate the handle of the emitter assembly anti-clockwise by hand and remove it.
2. Replace it with a new emitter assembly (part No. IZN10-NT-X325).
3. Insert the emitter assembly into the port using caution not to damage the end of the emitter, and screw it in. Note)

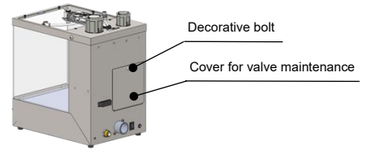
Notes:
- Screw the emitter assembly in completely until the handle of the emitter assembly is in close contact with the mounting surface of the body.
- If the ionizer nozzle touches the inner surface of the hole on the desktop duster box body after mounting the electrode assembly, adjust the angle of the ionizer nozzle so that there is no contact.
- Use caution not to cause injury by touching the end of the emitter.



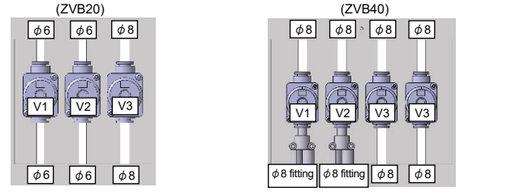
11 Maintenance (continued)

11.3 Valve Maintenance

1. Rotate the decorative bolt which holds the valve maintenance cover in the counter-clockwise direction by hand to remove the cover.



2. Layout of the valves and the piping are shown below.

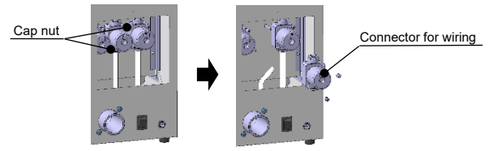


V1: VXJ1120-C6-5MO-X3 (for ionizer)
V2: VXJ1120-C6-5MO-X3 (for additional air blow)
V3: VXJ1120-C6-5MO-X3 (for dust collection)

V1: VXJ1120-C8-5MO-X3 (for ionizer)
V2: VXJ1120-C8-5MO-X3 (for additional air blow)
V3: VXJ1120-C8-5MO-X3 (for dust collection, 2pcs.)

3. Remove the cap nut that holds the valve to be replaced (it is recommend to uses head screwdriver with magnet). at the top and bottom of the valves and remove the wiring connector. Replace the valves. Note)

Notes:
- Mounting orientation of the valves is specified. Make sure that the wiring connector is on the upper side of the valve.
- Use a magnetic screwdriver for the valve replacement so that the cap nut does not fall into the product.



4. Reassemble the parts such as the valve and cover in the reverse order of the removal, in steps "1" to "3".

12 Limitations of Use

12.1 Limited warranty and Disclaimer/Compliance Requirements
Refer to Handling Precautions for SMC Products.

13 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

14 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL : https://www.smcworld.com (Global) https://www.smc.eu (Europe)
SMC Corporation, 1-5-5, Kyobashi, Chuo-ku, Tokyo 104-0031, JAPAN
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