D6 Series
Installation manual

STERi⚛NIZER™
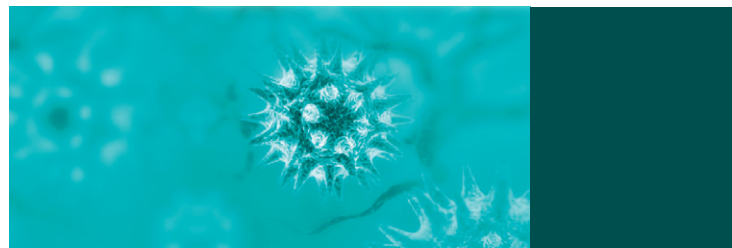
Table of content

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General information

Safety instructions

The Sterionizer™ must be installed by an accredited electrician or similar technical person, following all the safety instructions given here and in accordance with the country's legislation for installation of electrical equipment.

• Do not attempt to use this device in conditions that exceed permissible levels.
• To avoid damaging the system, do not connect/disconnect the device when power is on.
• If you want to move the device, turn off the power supply before moving.
• Do not attempt to use this device in areas where flammable or explosive vapours exist.

How to use this manual

Important notes
To emphasise important steps, to point out critical procedures and to simplify the use of this manual, the following icons have been used:

Whenever this icon appears, incorrect observance or non-observance of instructions or procedures may cause injury or death.

Whenever this icon appears, incorrect observance or non-observance of instructions, procedures or working steps may cause damage of equipment.

This icon is used to highlight special peculiarities.

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Sterionizer™ product overview

The Sterionizer™ is a patented air purification device based upon bipolar ionization technology, specifically developed to bring the health and quality of nature's air to indoor environments.

In natural habitats, solar and earth-based thermal energies create positive and negative ions that clean and renew outdoor air by removing harmful pollutants, such as bacteria, viruses, fungi, and spores.

The Sterionizer™ generates these same positive and negative ions — just like those found in nature — that purify and freshen indoor air by eliminating the harmful pollutants mentioned above.

The Sterionizer™ is a compact electronic module that can easily be integrated into various air treatment products, such as central air conditioners (duct systems), refrigerators, air purifiers, humidifiers and de-humidifiers, blowers, ventilators, cold stores and more.

Technology Highlights

- Inactivates airborne pollutants, such as viruses, bacteria, fungus, and mold spores
- Neutralizes odors
- Reduces the allergic effects of allergy sufferers
- Discharges static electricity and prevents electrostatic build-up
- Health benefits confirmed by leading international research institutions
- Compliant with the American standard for ozone generation
- Sterionizer™ – RoHS, EMC, CE & UL certified
- Self-cleaning emitters - maintenance free
- Communication Port - can be integrated into building management systems

Jcomp / Freepik

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Technical specifications

STERI+NIZER™

| Model	D6 Series
Ion output	$10^{10} \leq 10^{12}$ Ion/sec adjustable
Emitter cleaning	Self-cleaning – maintenance free
Emitter Points	Tungsten
Input voltage	12V AC/DC ± 10%, 200 mA, isolated
Input voltage	24V AC/DC ± 10%, 200 mA, isolated
Operating environment	Temp. (-10)-(+70)°C, Hum. 20-93% non-condensing
Ambient Airflow	Minimum 0.3 m/sec laminar
Ozone	< 0.003 ppm
EMI	Below background levels (rec. 80mm distance)
LED indicator	green: power "on" - orange: "working"
Connector power	12/24V - 0 - ground
Connector output	On/Off ; optional I/O ; optional I/O ; common
Connector interface	RS485 Modbus (up to 247 units)
Enclosure	PC-ABS plastic blend, color grey (black)
Dimensions	96x74x24.5mm (LxWxH)
Dimensions mounting	107x89x24.5mm with bracket and connector
Weight	146 gram
Certifications	CE, UL, RoHS 2 compliant
For Static Control	
Ion Balance	Inherently self-balancing system < ± 30V
Discharge time 1	1000V – 100V @ < 3 sec at 60cm with airflow 1m/sec
Discharge time 2	1000V – 100V @ < 6 sec at 60cm with airflow 1m/sec
Discharge voltage 1	< 30 V at 30cm
Discharge voltage 2	< 10 V at 60cm
Coverage Area	150x150mm at 30cm distance / 150x150mm at 60cm distance
Range	50-1000mm application / airflow dependent

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Applications

The Sterionizer™ can be integrated into a variety of systems:
- Air conditioners—home, public buildings, automotive and aviation systems
- Air purifiers
- Blowers and ventilation systems - duct systems
- Humidifiers and de-humidifiers
- Refrigeration systems - cold storage rooms
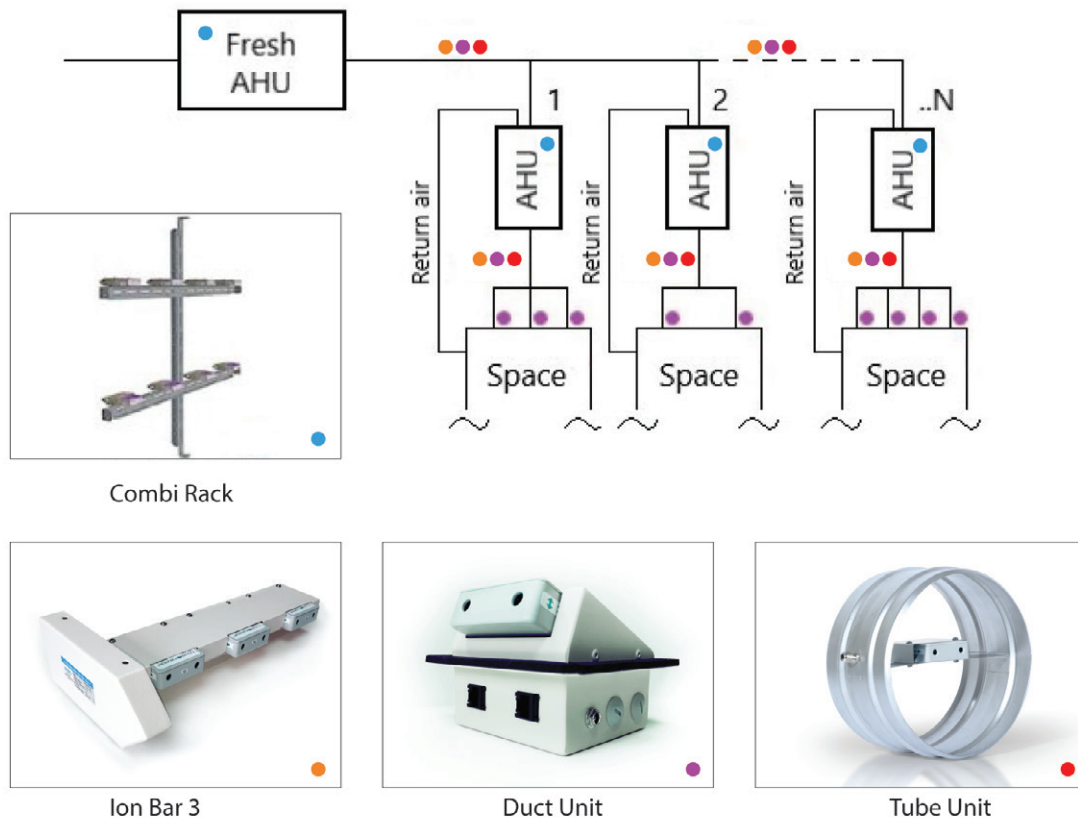- Elevators
- Static Control

Maintenance

Over time, a layer of dust accumulates on the emitters. Without cleaning the dust, the amount of ions emitted can decrease significantly.
For this purpose, the device has a self-cleaning mechanism for the emitters (programmable, default: one cleaning cycle per day), so you do not need to clean the emitters manually.


24.5mm / 0.96"
97mm / 3.82"
75mm / 2.9"
89mm / 3.5"

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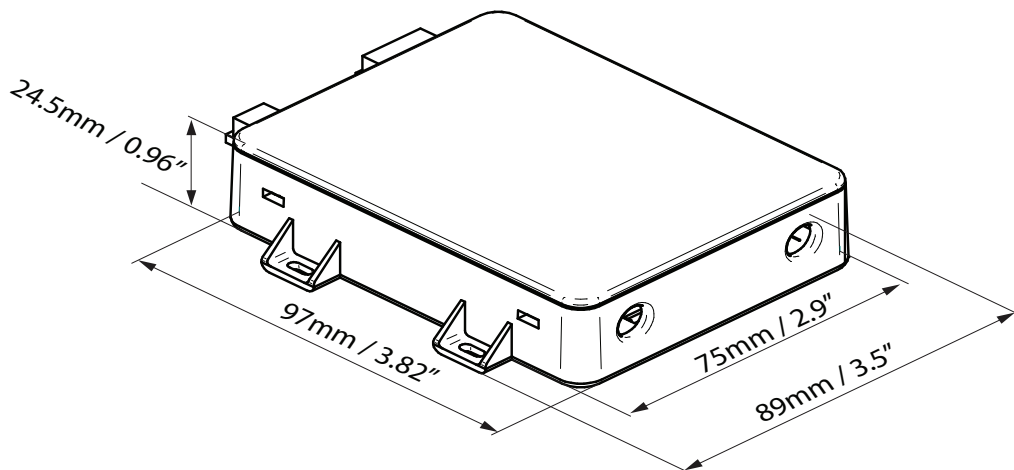
Installation in ventilation system

Combi Rack

Ion Bar 3

Duct Unit

Tube Unit

Central ventilation systems are probably the largest air distribution systems available. Installing Sterionizer™ ion technology within these systems is a simple way to enrich indoor areas with valuable ions, thus creating a similar environment to the natural state of nature outdoors.

The Sterionizer™ D6 series of generators has various types of accessories and includes professional solutions for installation, reducing installation time and ensuring optimal integration for ventilation systems.

Keep distance of 1-15 m from the air exit to the space of the room.

MIN **1m** - MAX **15m**

AIR EXIT

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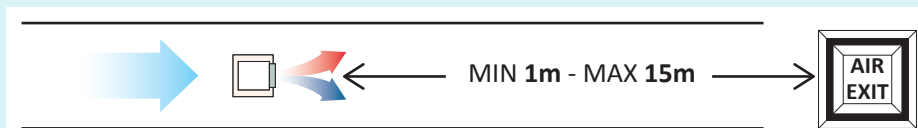
Duct Unit

The Sterionizer™ Duct Unit is designed for adding ionizing technology into air ducts and other closed areas with an airflow.

The unit is maintenance free with innovative-patented self-cleaning emitters.

In addition, the unit includes a Modbus communication port that can easily be connected to any building management system.
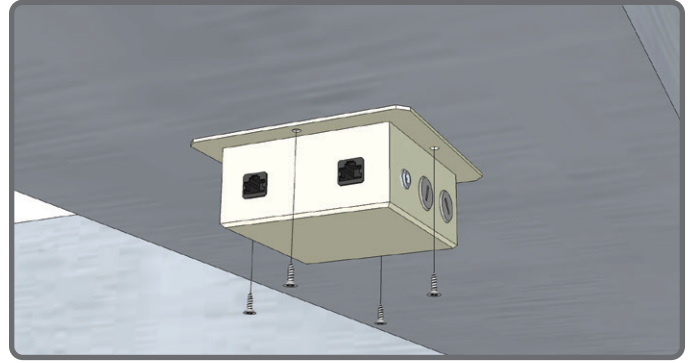
It is easy to install the unit in any duct utilizing the pre-drilled flange and factory applied gasket.

When installed at appropriate points, the unit keeps the duct system clean and ensures that the air supplied is ionized.
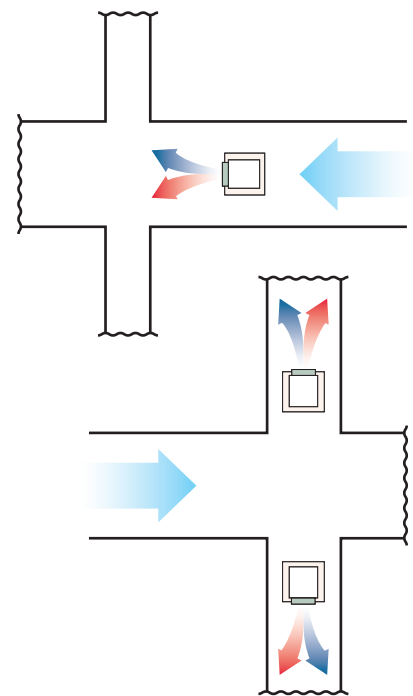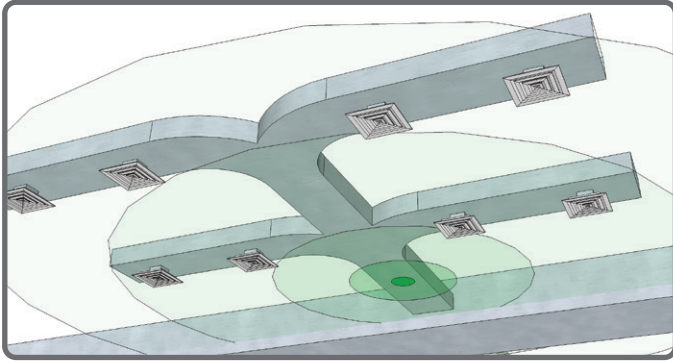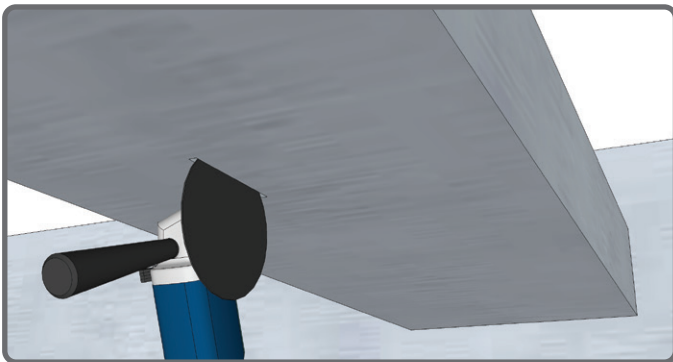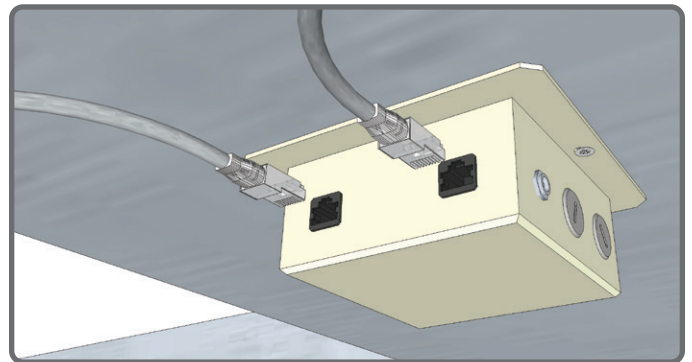
1. An example of installation in a ceiling duct system. It is recommended to use one Duct Unit for airflow of up to 6000m³/h
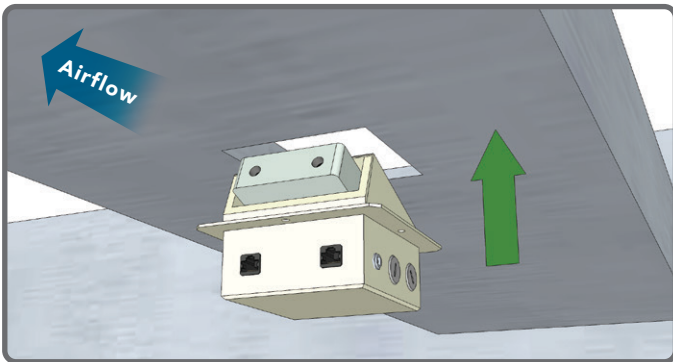

4. Attach the Duct Unit to the duct using 4 screws..

2. Create an opening as required for the device. Keep the edges smooth to avoid air bypass.

5. Connect the power source to the unit. If data networking is used connect also the data cables (you can connect several units together).

Airflow

3. Insert the Duct Unit. The emitters should be facing the airflow direction. Make sure there is a gasket between the device and the pipe.
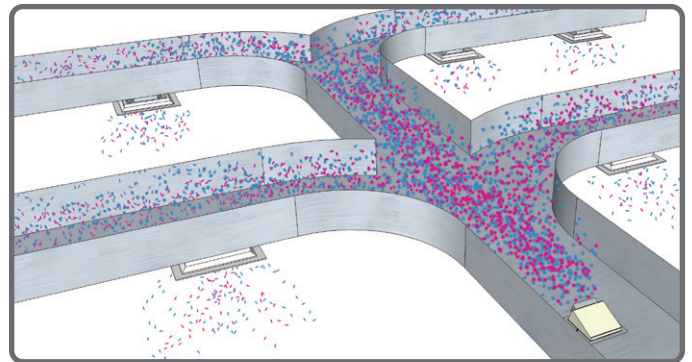
6. When the Duct Unit generates ions, they are distributed through the airflow and the sub-sections of the duct system out to the indoor area.
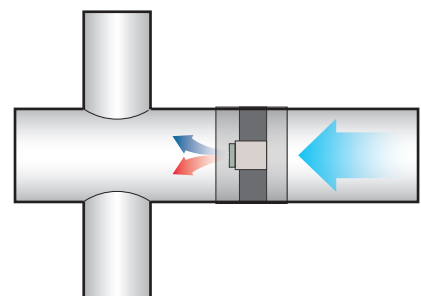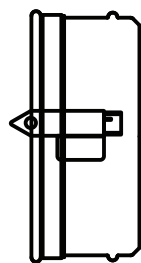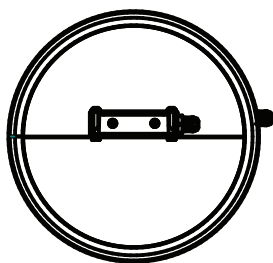
GENERION™
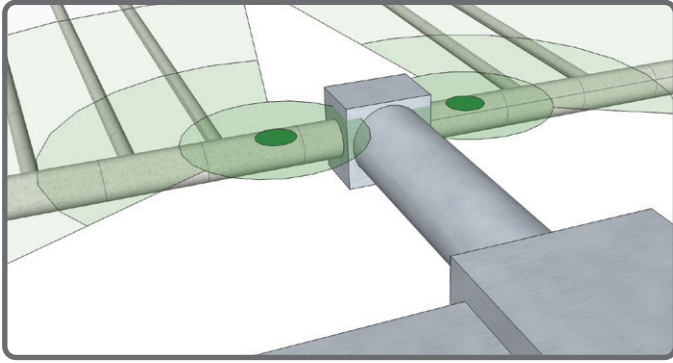BREATHE IN NATURE

Tube Unit

The Sterionizer™ Tube Unit is designed to add ionizing technology into round air duct systems.

One Sterionizer™ D6 unit is located in the center of the ring and generates ions.

Ring size is customized per order to customer requirments. The tube is made of steinless steel.

1. An example of an installation in a round air duct system. 2x Tube units are used to create ions in both directions.
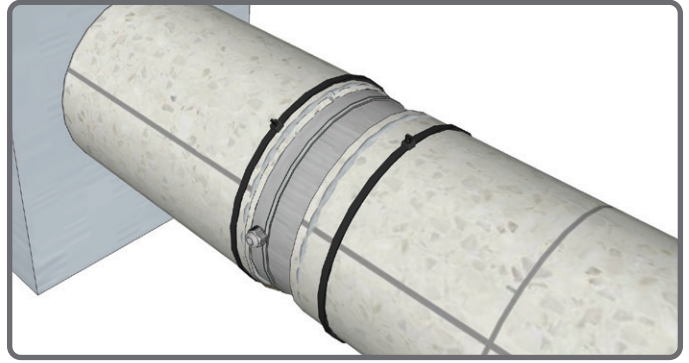
4. Lock the Tube Unit with metal ties.
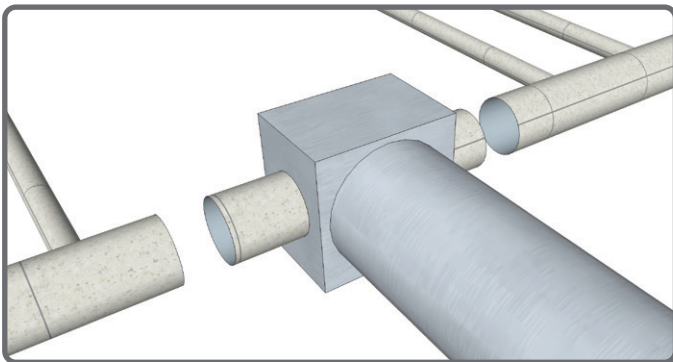
2. Create a straight cut in the pipe. Make sure you can insert the Tube Unit and close the pipe sides back together.
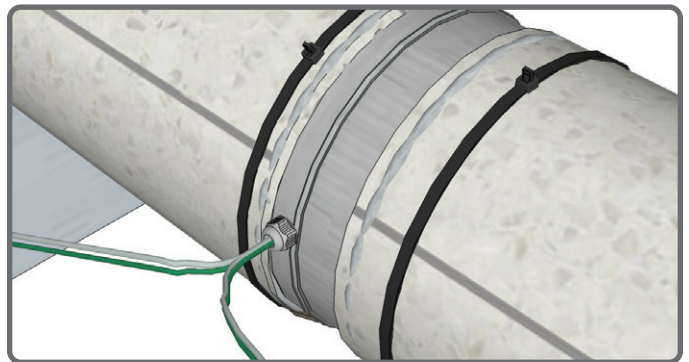
5. Connect power and data cords according to instructions on pages 16-18. * You may find it easier to do this before moving on to step 3.
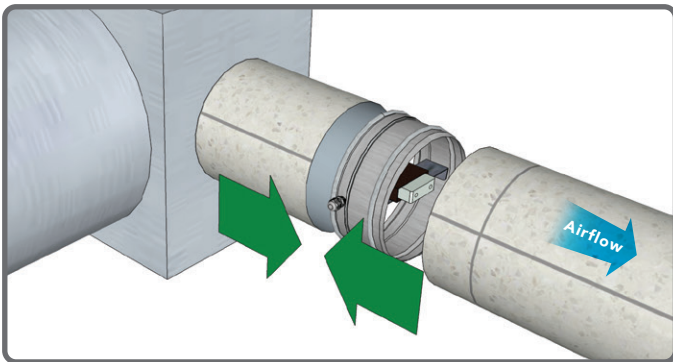
Airflow

3. Put the Tube Unit in place and tighten the pipe sides. Make sure the power and data connector are on the appropriate side.
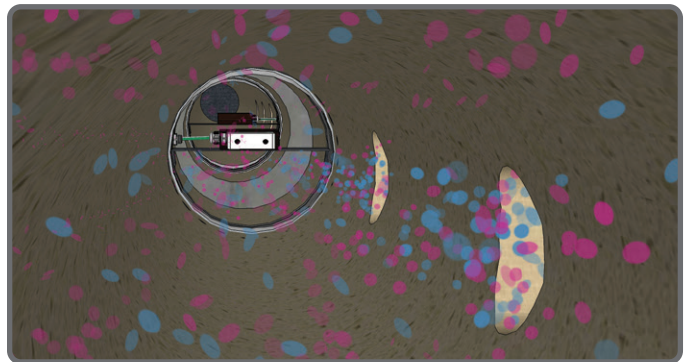
6. The Tube Unit generates ions, distributes them through the airflow and sub-sections then out to the indoor space.

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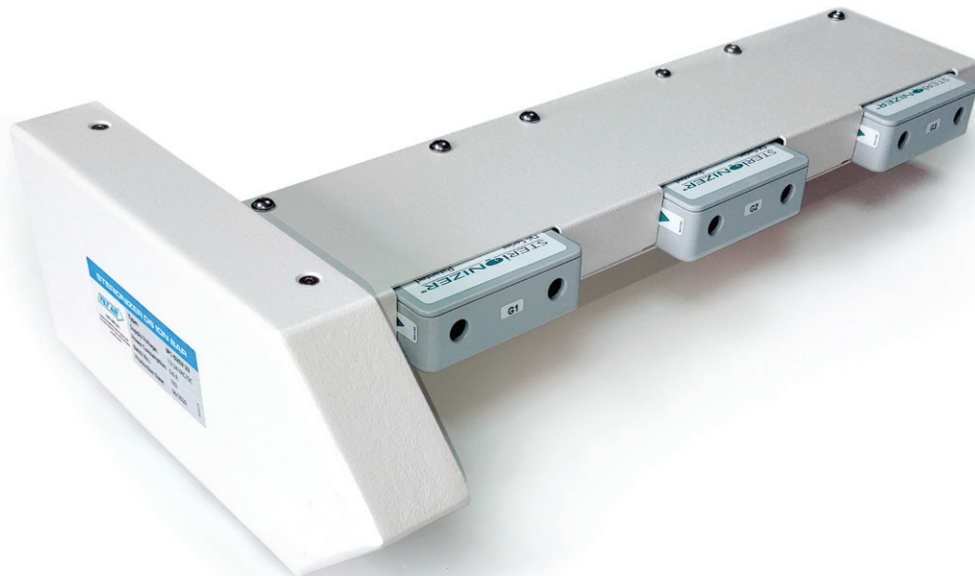
Ion Bar 3

The Sterionizer™ Ion Bar is designed for adding ionizing technology into large air duct installations and other closed areas with an airflow.

In order to treat air within a closed space, the Sterionizer™ Ion Bar must be located in front of an air outlet.

To keep the air duct or the heat exchanger in the air duct hygienic and germ free, the Ion Bar is installed at appropriate points.

For remote control each Sterionizer™ is equipped with a Modbus interface that can be connected to the Sterionizer™ system software or to a BMS (building management system).

Ion Bar 3 - includes 3 x SterionizerTM D6 units
** Recommended air flow 6,000-18,000 m3/h

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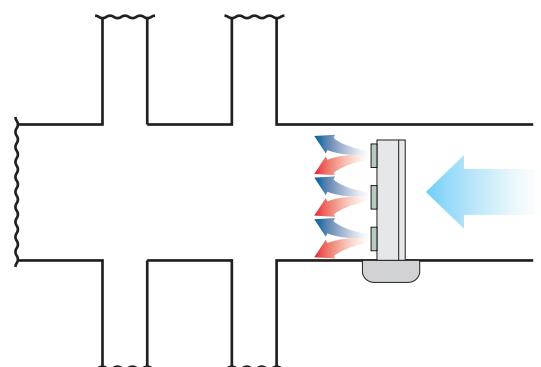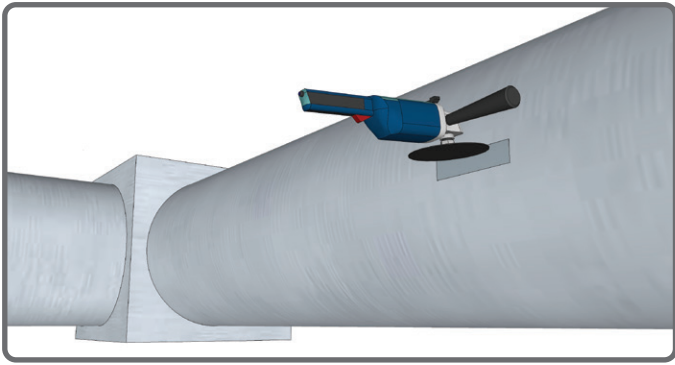
1. An example of an installation of an Ion Bar in the main pipe. Create an opening as required for your device. Keep edges smooth to avoid air bypass.
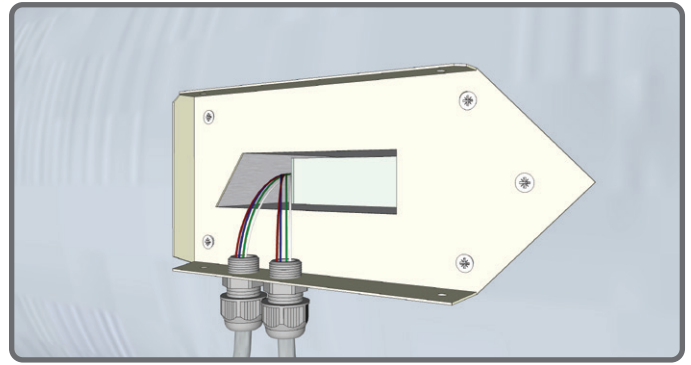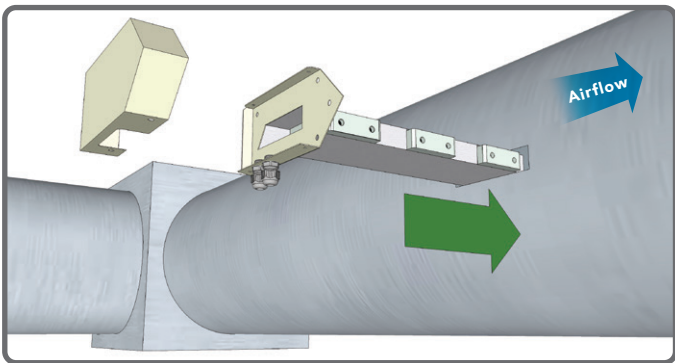
2. Open the outer cap and insert the Ion Bar into the pipe.
   * Keep emitters in the direction of the airflow.

3. Attach the Ion Bar to the pipe using screws.

4. Connect power and data cords according to instructions on pages 16-18.
   * You may find it easier to do this before moving on to step 2.

5. Close the outer cap with screws to the unit.
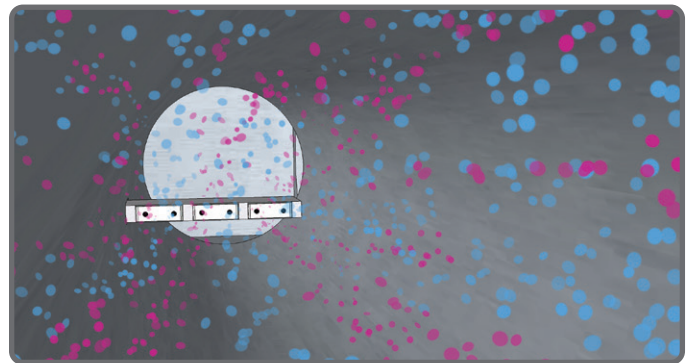
6. The Ion Bar generates ions and distributes them through the airflow and sub-sections out to the indoor space. Note that this unit generates 3×10^{12} ion/sec.

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Combi Rack

The Sterionizer™ Combi Rack is a modular mounting system for Sterionizer™ units designed for the placement of Sterionizer™ in Air Handling Units (AHU's) and similar spaces with an airflow.

In order to keep heat exchangers and other equipment hygienic and germ free the Sterionizer™ units must be placed at relevant points. Using the modular profiles, it is easy to build an individual structure.

Combi Rack - includes a number of Sterionizer™ D6 units as per customer requirement, starting from 2 units but can be adapted to hold many more.

** Recommended 1 unit per each 6,000 m3/h airflow.

Consider adding this device to your system as an initial ionization process rather than a primary process.

Filters | Combi Rack | Cooling Heating coil | Fan / Blower | Additional elements

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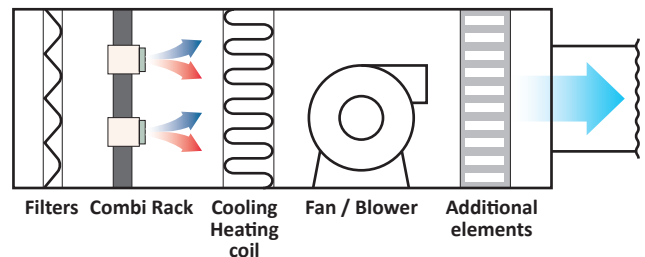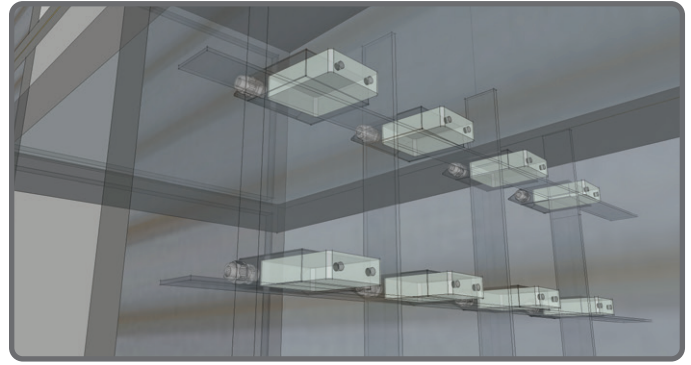
1. Example of assembly within AHU. Usually placed after initial filters in order to keep all components clean and provide ions to the duct system

2. Connect power and data cords according to instructions on pages 16-18.

Power and data connection
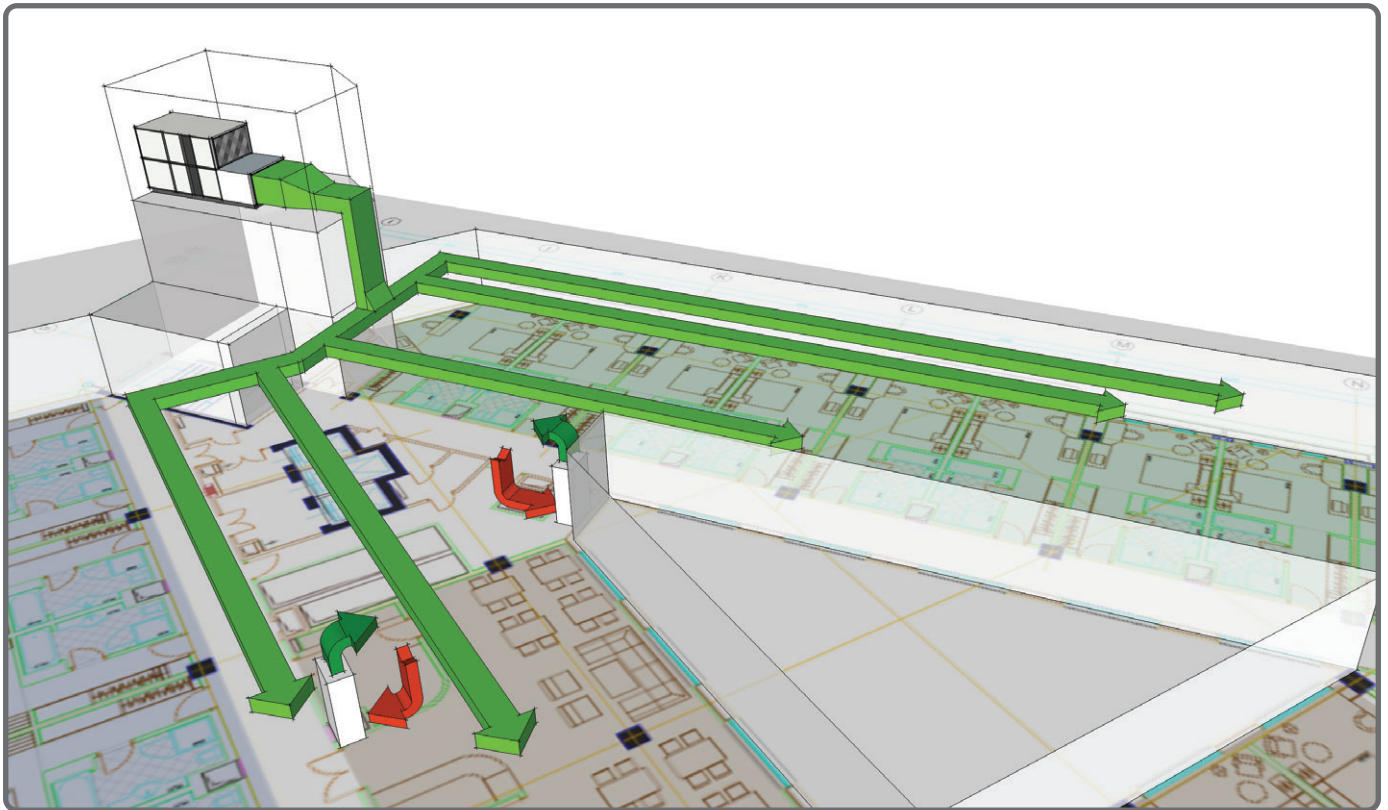
Data Connector
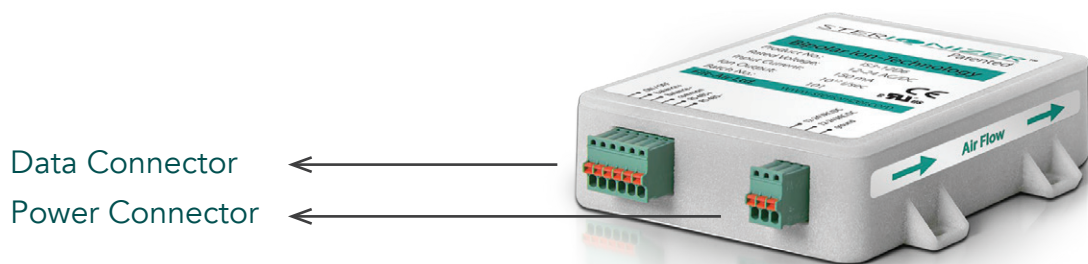
Power Connector

Power Connector

Power supply: 12-24VAC/DC
Max. current consumption: 200mA
Min. current of power supply: 24V – 1000mA
                                     12V – 1000mA

Ground: Intended for Static Control applications only with separate ESD ground system.

        Use a 1MΩ resistor in series to the ground terminals in this case.

Default I/O settings:
Terminal 1   Output: Unit in operation
Terminal 2   Input: Initiating a self-cleaning cycle of the emitters
Terminal 3   Input: Switching the unit On and Off (ON open, OFF closed)
Terminal 4   Common
Terminal 5   Modbus RS485 +
Terminal 6   Modbus RS485 -

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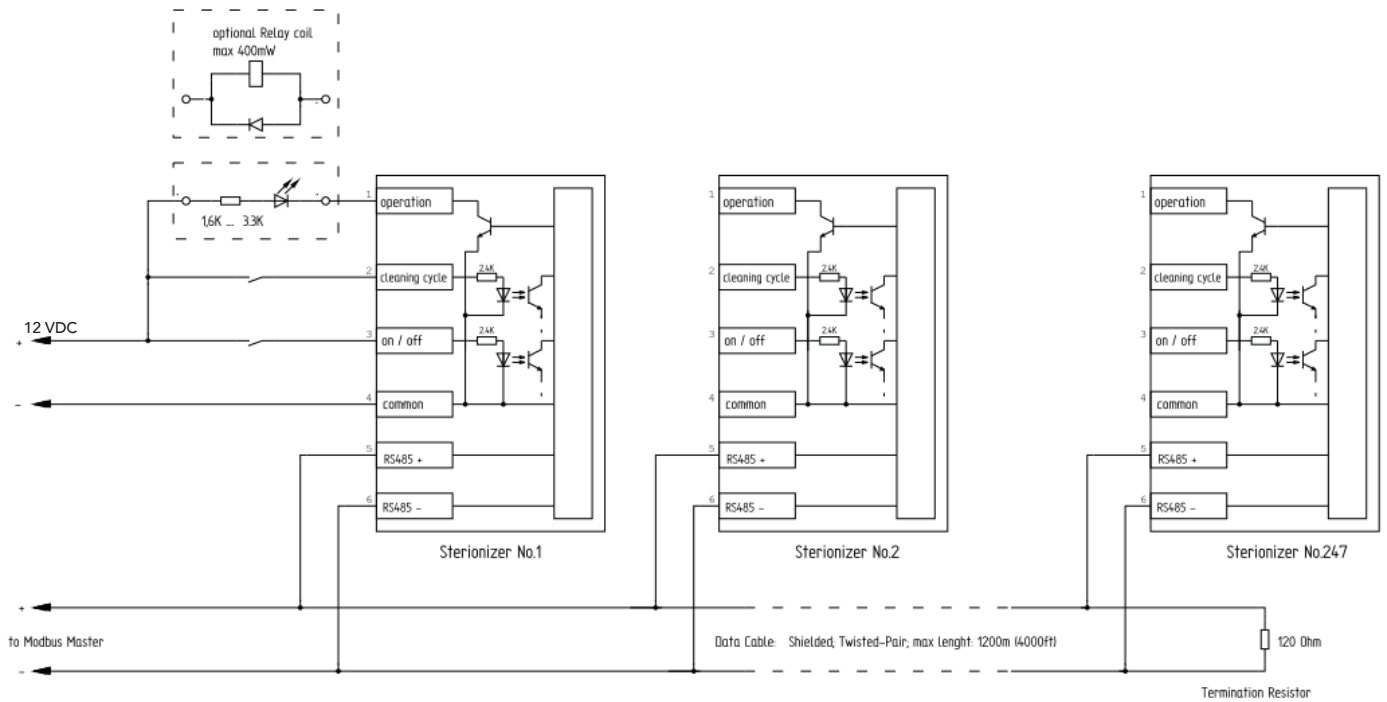
LED Indicator

Green   Power at unit
Orange   Unit in operation

MODBUS Output:

The Sterionizer™ has a MODBUS port that enables export of the data to an external system where it may be controlled.

The communication uses the RS-485 standard, which has two wires: A(+), B(-).

Pay attention to the polarity of the wires.

It is possible to connect a communication cable between Sterionizer™ units in order to control the units. Maximum: 247 units.

Maximum wire length: 1200 meters (if the length is longer than 500 meters, use a repeater).

At the last unit a resistor (120Ω) should be connected between the communication terminals (bus termination).

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Description MODBUS Communication for D6 Series

FILT AIR MODBUS

Introduction to MODBUS Register Description

Copyright

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RS-485 Connector

Pin 5 is A connection ('+') and pin 6 is B connection ('-')

Explanations

- The MODBUS RTU protocol implementation of the device complies with the standards
  as described in the Modbus Application Protocol Specification 1.1.
   Not all the function codes are implemented in the device.
- The device uses 6 holding registers and 6 input registers.
- The COMM parameters are: 19200 bps, 8 bit, even, address D6 (Default: 1).

Access options

The MODBUS access to application data is gained with the following MODBUS

functions for registers:

- Read Input register (function code 4)

- Read Holding register (function code 3)

- Write Single register (function code 6)

MODBUS Register Description

1 Holding Registers

1.1 MB Holding Register 2, Address: holding register 1

Cleaning of emitters

MB Holding Register 2, Address: holding register 1		
Cleaning of emitters		
Bit [0]	Cleaning of emitters	0: no function 1: start of cleaning function

1.2 MB Holding Register 3, Address: holding register 2

Start and stop of high voltage generator

MB Holding Register 3, Address: holding register 2		
Start and stop of high voltage generator		
Bit [0]	High voltage generator on	0: Off 1: On

1.3 MB Holding Register 4, Address: holding register 3

Duty Cycle PWM of High Voltage Generator

MB Holding Register 4, Address: holding register 3		
Pulse width of high voltage generator 5-100 % (in steps of 5%)		
Bit [6:0]		Minimum: 5 Maximum: 100 Default: 100

1.4 MB Holding Register 5, Address: holding register 4

Modbus Address

MB Holding Register 5 Address: holding register 4		
Modbus Address		
Bit [15:8]	Password for changing address	123
Bit [7:0]	Modbus Address	Minimum: 1 Maximum: 247

1.5 MB Holding Register 6, Address: holding register 5

Interval time for time scheduled cleaning function

MB Holding Register 6, Address: holding register 5		
Interval time for time scheduled cleaning function (1= every 1 hour; 2=every 2 hours)		
Bit [10:0]		Minimum: 0 (0: without cleaning) Maximum: 1680 (10 weeks) Default: 24 (1 day)

1.6 MB Holding Register 7, Address: holding register 6

Imbalance Cleaning Function

MB Holding Register 7, Address: holding register 6		
Imbalance Cleaning Function		
Bit [0]		0: Off 1: On

2 Input Registers

2.1 MB Input Register 1 , Address input register 0

Firmware version number

MB Input Register 1 , Address input register 0		
Firmware version number (x.y)		
Bit [1]	x	
Bit [0]	y	

2.2 MB Input Register 2 , Address input register 1

Indication of Ion Output Balance

MB Input Register 2, Address input register 1		
Indication of Ion Output Balance		
Bit [0]	Imbalance	0: balanced 1: not balanced

2.3 MB Input Register 3 , Address input register 2

Input Voltage of Generator Indication

MB Input Register 3, Address input register 2		
Input Voltage of Generator Indication		
Bit [0]	Voltage of transformer	0: No voltage 1: There is voltage

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2.4 MB Input Register 4 , Address input register 3

Counter of Cleaning Cycles

MB Input Register 3 , Address input register 3		
Counter of Cleaning Cycles		
Bit [15:0]		

2.6 MB Input Register 6 , Address input register 5

Counter of Working Hours

MB Input Register 6, Address input register 5		
Counter of Working Hours		
Bit [15:0]		

2.7 MB Input Register 7 , Address input register 6

Flash Memory Error

MB Input Register 7, Address input register 6		
Flash Memory Error		
Bit [0]	Error in Flash memory	0: No error 1: Error

Sterionizer Software
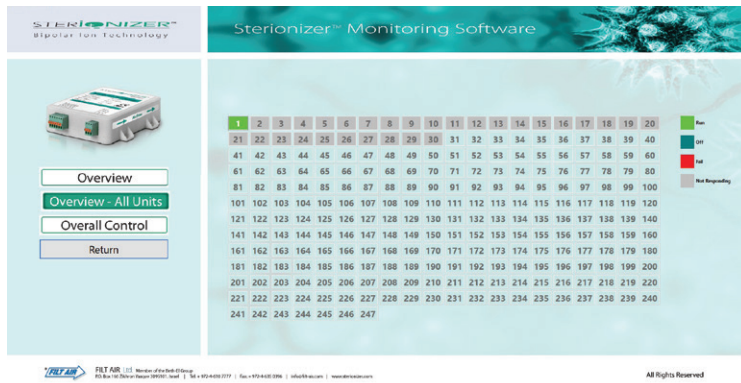
Selecting a specific unit - allows you to monitor and control it:

- Turn unit on/off
- Manually perform a cleaning procedure.
- Set output power (Default password: 1234)
- Set cleaning schedule

After connecting the Sterionizer™ D6 units of your system with a data cable -
1. Connect the last unit to a serial (RS485) converter and to the computer. (NI0-5611)
2. Install the **Sterionizer™ Software**.
3. Set the right connection port and press "Connect"
4. Please wait until you see the "Overview All Units" and you all your connected units are green.
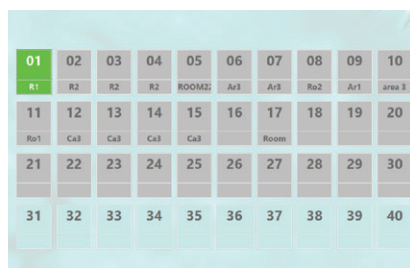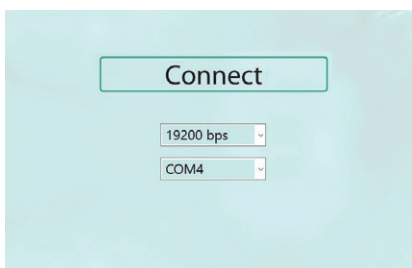
Manual setting the address of each unit
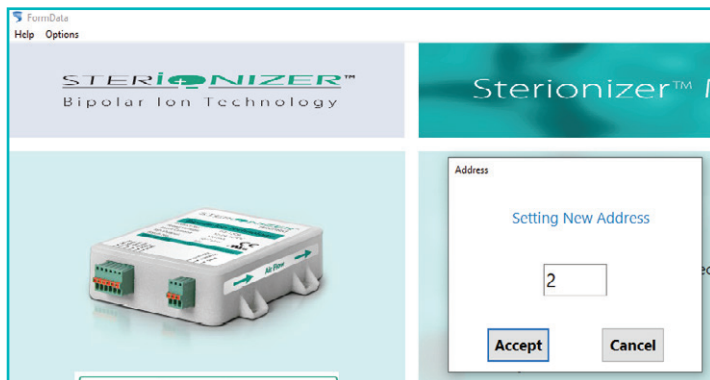
Technical overview and recommendations

	D6 device
Ion output	$10^{10} \leq 10^{12}$ Ion/sec adjustable
Emitter cleaning	Self-cleaning – maintenance free
Emitter Points	Tungsten
Input voltage	12V AC/DC ± 10%, 200 mA, isolated
Input voltage	24V AC/DC ± 10%, 200 mA, isolated
Operating environment	Temp. (-10)-(+70)°C, Hum. 20-93% non-condensing
Ambient Airflow	Minimum 0.3 m/sec laminar
Recommended area	up to 200m^2 (per one device, at a ceiling height of approx. 3m)
Recommended airflow	up to 6000m^3/h (per one device)
Recommended distance	up to 15m from the air outlet in a duct system

Recommended ion concentration in populated areas
1500 to 30000 ion/cm^3

Connected unit

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GENERION Ltd. Limited Warranty

GENERION Ltd. warrants this product against failure to comply with GENERION Ltd. published specifications for the product and against defects in materials and workmanship for the period specified in the contract after date of purchase. Within that period, GENERION Ltd. will, at its option, repair or replace the product or refund your purchase price, if GENERION Ltd. ascertains that the product does not conform to GENERION Ltd. specifications or is defective in material or workmanship. This warranty does not apply to any damages, connected with the system, apart from the system itself, its function and material. If the failure occurs in a part delivered by a subcontractor, GENERION Ltd. will transfer the claim to the respective party.

To make a warranty claim, contact your authorized GENERION Ltd. distributor or GENERION Ltd. directly. For telephone inquiries, please have your product invoice or other proof of purchase available. If you write, include proof of purchase and a written explanation of the problem. Warranty servicing will be provided on-site or at one of GENERION Ltd. authorized service facilities, at GENERION Ltd. discretion. If shipment to an authorized service facility is required, shipping instructions will be provided by GENERION Ltd. or your authorized GENERION distributor. Do not ship any product without shipping authorization. All shipping charges to GENERION Ltd. service facility must be prepaid by the customer.

This limited warranty does not apply if the product:
a. Has been involved in an accident or subjected to misuse, improper maintenance or negligence or use which was not according to the instructions given by the manufacturer.
b. Has been altered or repaired in any way that has, in GENERION Ltd. judgment, adversely affected its performance or reliability.
c. Has been used in an application or for a purpose for which the product was not designed or under stresses or conditions exceeding those specified for the product.
d. Has been damaged after leaving GENERION Ltd. facility.

e. Has been serviced by unauthorized personnel or if parts in the system were found or exchanged, which were not original parts from the manufacturer.
This limited warranty does not apply either in the following cases:
f. If maintenance was not performed or was not in accordance with the maintenance instructions specified by the manufacturer
g. In case of fire, lightning or other disasters.
h. If the system has been used in improper conditions

In addition, GENERION Ltd. disclaims any responsibility for any advertisement or publicity in any form (oral, printed, video, digital media etc.), which may be publicized by any person about our products, except for that which is written in this manual and supplied together with the system.
This limited warranty is valid only for the original purchaser and is not transferable.
GENERION Ltd. shall not be responsible for any consequential damage caused by malfunction of the system or misprint and typographical errors of this manual. Users assume sole responsibility for all damage or injury, including death, which may arise during the use of these products in any manner or under any conditions.

Important!
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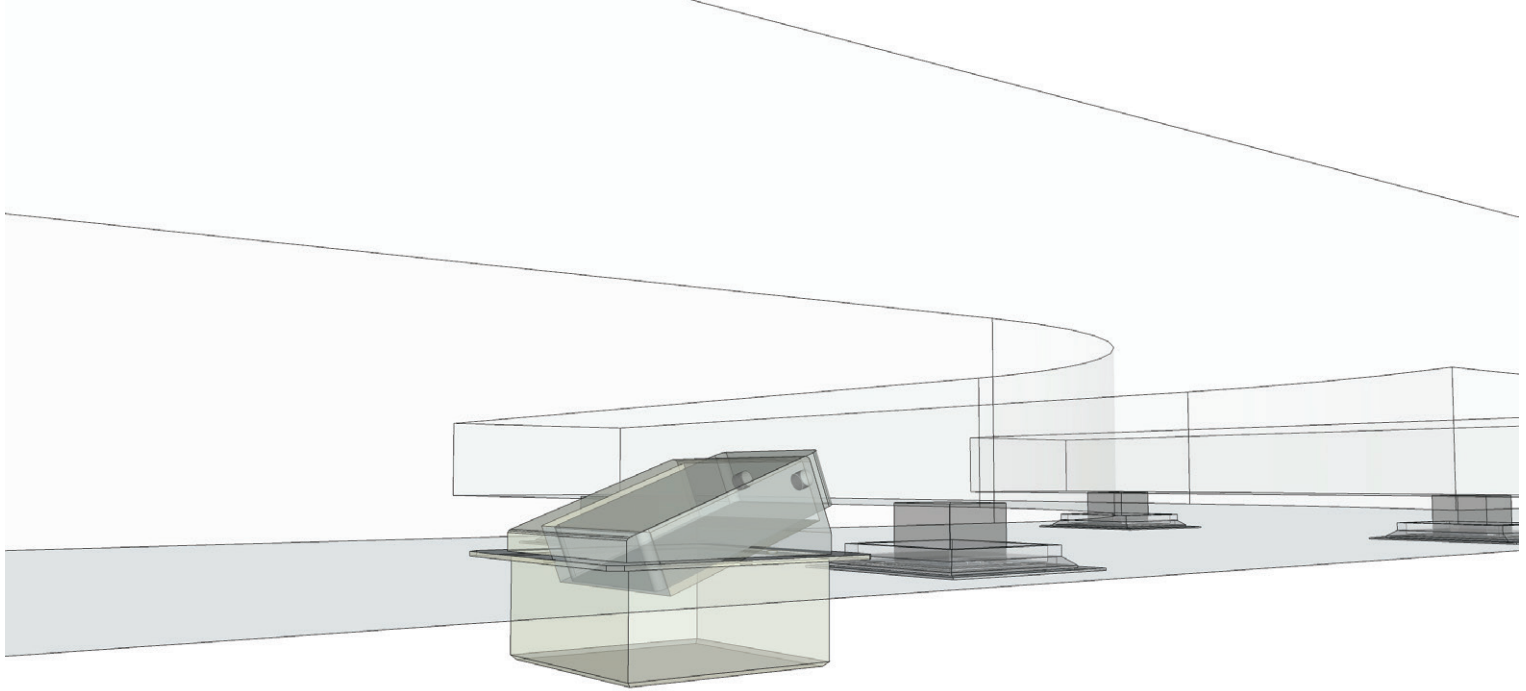
Questions and Answers

How to calculate number of devices required for specific areas?
We recommend calculating according to airflow rate up to 6000 m3/h. Each environment has a unique shape, airflow, contaminants, conditions and more, so it is very complicated to base your calculation on area size only.

How can I monitor and control these units?
First, you can purchase our SterionizerTM Software which can monitor and control the entire ionization system.
Secondly, you can connect these devices to the BMS (Building Management System).

What concentrations of ions should be in the room?
We suggest you keep values close to nature, that means 1,500-30,000 ions/cm^3

> ⚠️ Keep ion concentration values below 1 million ions/cm^3. Higher values can cause harmful health effects.

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Can the Sterionizer™ operate at low temperature or high humidity environments?

Low temperature is not a problem, however at low humidity the effectiveness decreases. It is important that the Sterionizer™ is operated in a non-condensing environment

How do we know that the Sterionizer™ is working efficiently or not?

You can measure ion concentration using an ion-meter (ion-counter). Both polarities should be measured.

Can the Sterionizer™ work 24/7?

Yes it can as long as there is an airflow of at least 0.3m/s.

Will there be any impact on the Sterionizer™ life span due to a corrosive environment?

The emitter needles can become corroded, which would influence the life span. It is recommended not to use the unit in a corrosive environment.

Can I use the Sterionizer™ D6 module without any mounting accessories?

It is possible to use without mounting accessories, however the accessories were designed to provide very simple and professional installation processes on the one hand and a cost effective solution without looking for tailor made accessories on the other.

How to mount multiple devices in the duct?

In the event that multiple devices are to be mounted in the duct, it is recommended to keep a distance of 1 m between each of them

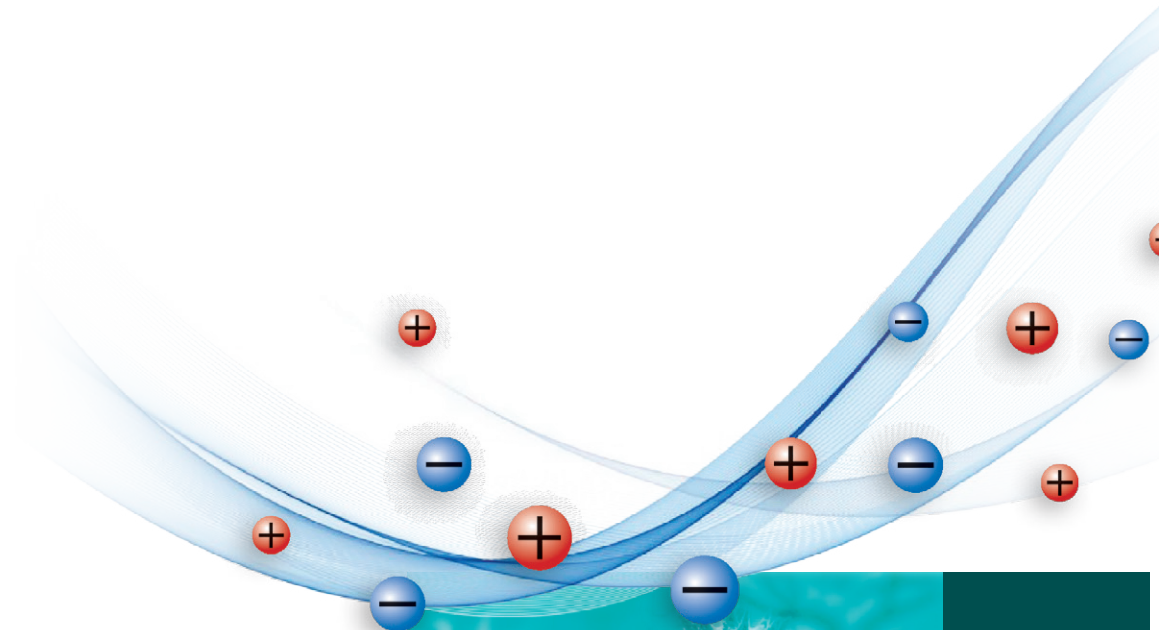⚠️ Populated areas should maintain a distance of 1 meter from the ion source

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