



# MoonBeam<sup>TM</sup> 3

DISINFECTION TECHNOLOGY<sup>®</sup>



## User's Manual





# MoonBeam3

DISINFECTION TECHNOLOGY

## User's Manual

**MANUFACTURED FOR:**

Diversey, Inc.  
1300 Altura Road  
Unit 125  
Fort Mill, SC 29708 USA

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## Purpose and Scope

Please read User Manual prior to installation or operation of MoonBeam™ 3 UV-C Disinfection device. This manual contains critical information to allow for the safe and effective setup, use and maintenance of this device.

MoonBeam3 UV-C Disinfection devices require occasional maintenance and replacement of parts. Instructions for the performance, maintenance and replacement operations are included in this manual.

Failure to adhere to the instructions and procedures in this User Manual may result in damage to the device and void the warranty.

## Contact Information

For technical assistance with the MoonBeam3 Disinfection Technology, call Technical Support at the following numbers:

**U.S. and Canada:**

Customer Service: 800-668-7171

Tech Support: 800-558-2332

Emergency Number: 800-851-7154

In the U.S. and Canada, Technical Support is available weekdays from 8:00 AM to 5:00 PM EST (U.S. holidays excluded).

Website: [www.sdfhc.com](http://www.sdfhc.com)

General product information can also be requested by sending an email to:

Email: [www.sdfhc.com/contact-us](mailto:www.sdfhc.com/contact-us)


Please include postal mailing address and telephone number in email message. Basic product information is returned via email unless otherwise requested.




## Warnings, Precautions and Limitations for Use

### Cautions and Warnings

Cautions alert you to actions or situations that could cause harm to equipment. For example:






 **PRECAUTION:** The product must be used in accordance with this User's Manual.

Warnings alert you to actions or situations that could result in personal injury. For example:


 **WARNING:** Ultraviolet bulbs contain mercury and therefore must be properly disposed of as a hazardous waste in accordance with local, state and federal regulations or the lamps should be recycled.

### Warnings and Precaution Symbols




#### Legend:

-  Alerts the user to the presence of important operating and maintenance instructions in the literature accompanying the device.
-  Alerts the user to the presence of uninsulated "dangerous voltage" within the device's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.
-  Alerts the user to the presence of components that may reach high temperatures that may be of sufficient temperature to cause a burn.
-  Alerts the user to the presence of ultraviolet light.
-  Alerts the user to refer to the User's Manual.



### Post-Disinfection Warnings

-  **WARNING:** The MoonBeam3 is intended to disinfect hard, non-porous surfaces and high-touch surfaces. The subsequent utilization of the surfaces disinfected by the MoonBeam3 is the sole responsibility of the user.


### Ultraviolet Light Bulb Warnings and Precautions












-  **WARNING:** Non-protected eyes or skin should never be exposed directly to UV-C.
-  **WARNING:** Ultraviolet bulbs contain mercury and therefore, must be properly disposed of as a hazardous waste in accordance with all applicable laws and regulations in effect at the locality or the lamps should be recycled.
-  **WARNING:** Take precaution with broken UV-C bulbs to avoid inhalation, ingestion or contact with skin or eyes. See Chapter 4 for information about *Procedures for Disposal of Bulbs* and *Special Handling Information for Broken Bulbs*.


### Safety Warnings and Precautions

-  **WARNING:** Do not intentionally bypass any of the safety precautions built into the device. Failure to comply may result in exposing skin to UV-C. Prolonged skin exposure may generate redness and an uncomfortable sunburn sensation.
-  **WARNING:** The MoonBeam3 should not be operated by children.

### Label on UV-C Heads Indicating High-Temperatures Surfaces

-  **WARNING:** High Temperature – UV-C bulbs and assembly may develop high temperatures. The UV-C bulb reflector heads can reach high temperatures during operation, but cool quickly upon completion of a disinfection cycle. If UV-C bulb reflector heads must be handled immediately after a disinfection cycle, the user should handle them by holding the rubberized end cap or foam heat tape.


-  **WARNING:** All assembly, adjustment, modification, maintenance and/or repair should be performed by qualified personnel authorized by Diversey, Inc.
-  **WARNING:** Only MoonBeam3 approved replacement parts should be used when maintaining the device.
-  **WARNING:** Do not remove any warnings, cautions or descriptive labeling from the MoonBeam3.
-  **WARNING:** Do not cover, paint or block any of the motion or proximity sensors.
-  **WARNING:** Take care when collapsing the disinfecting heads or replacing the Remote Cover on the Base Unit to avoid finger pinching.
-  **PRECAUTION:** The product must be used in accordance with this User's Manual.
-  **PRECAUTION:** Ensure that the Remote Cover is completely screwed onto the Base Unit prior to picking up MoonBeam3.
-  **PRECAUTION:** Avoid spilling fluids on any part of the MoonBeam3.
-  **PRECAUTION:** If spills do occur, immediately disconnect MoonBeam3 from the power source and contact Technical Support for guidance on cleaning the MoonBeam3.
-  **WARNING:** This device is intended for use on pre-cleaned, non-porous, hard surfaces and is not intended as a replacement for liquid chemical disinfectants, sanitizers or sterilizers. See intended use under Indications for Use section.
-  **PRECAUTION:** Do not use any attachments not recommended by Diversey, Inc.

 **WARNING:** Equipment is not to be used as a component of a life support system. Life support devices or systems are devices or systems that support or sustain life and whose failure to perform can be reasonably expected to result in a significant injury or death to a person. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety and effectiveness.


 **PRECAUTION:** Firmly grasp the handles of the MoonBeam3 while rolling it.

### Voltage Warnings and Precautions





 No user-serviceable parts inside. Servicing to be performed by factory-authorized personnel only. Removal of labels, covers or encasement fasteners voids the warranty.







 **WARNING:** The power cord connected to the MoonBeam3 is the main disconnect for the system.

 **PRECAUTION:** When positioning MoonBeam3 to ensure that the connection to the AC mains (wall outlet) is not obstructed, so that disconnection is not blocked in the case of emergency.




 **WARNING:** Disconnect the power cord from the wall outlet before servicing to avoid the possibility of electric shock.

 **WARNING:** The MoonBeam3 must be connected to a grounded electrical outlet to maintain grounding reliability.

 **PRECAUTION:** The electrical installation of the room in which MoonBeam3 will be operated must comply with the local electrical wiring standards.







-  **PRECAUTION:** Never operate MoonBeam3 if it has a damaged power cord, power supply or plug. If the power cord, power supply or plug is worn or damaged, contact Diversey, Inc.
-  **WARNING:** Any power extension cord used with MoonBeam3 must include a safety ground, meet ratings for the device and meet all pertinent regional and local safety codes.
-  **WARNING:** Failure to use a correctly rated fuse (see Maintenance section), may prevent the system from protecting the operator. Fuses are not covered under warranty.
-  **WARNING:** Explosion Hazard – Do not operate the MoonBeam3 in the presence of flammable vapors.
-  **WARNING:** To prevent fire or shock hazard, do not expose this device to rain or moisture.
-  **WARNING:** Always power off the system before cleaning. An electrical shock could occur if the system is powered on and liquid is spilled into it.

### Location Warnings and Precautions

-  **PRECAUTION:** When unpacking the MoonBeam3, hold under the front and rear of the system. Do not lift the system by the foam packaging.
-  **PRECAUTION:** Keep the MoonBeam3 away from heated surfaces.
-  **PRECAUTION:** MoonBeam3 is intended for use on a level floor. For additional stability prior to operation, the caster wheels may be positioned outwards and locked by depressing the foot pedal on each.



### Cleaning Precautions

-  PRECAUTION: Refer to the *Cleaning the Enclosure* section for recommended cleaning of the MoonBeam3.
-  PRECAUTION: Apply the cleaner to a clean, lint-free cloth first and then clean the device. Liquid applied directly to the device could possibly leak inside and cause damage. Use extra caution when cleaning around the front panel display.
-  PRECAUTION: Allow the device to completely dry before operating again.
-  PRECAUTION: Never use abrasive materials.
-  PRECAUTION: Never use any disinfecting agents that are corrosive.
-  WARNING: Diversey makes no claims regarding the efficacy of the listed chemicals or methods as a means of controlling infection. Consult your hospital's infection control officer or epidemiologist.



### Potential for Radio Frequency Interference on Device Operation

Both portable and mobile RF communications equipment can affect electrical equipment, including the MoonBeam3. The MoonBeam3 is intended for use in the electromagnetic environment specified in the *Guidance and Manufacturer's Declaration* section.

### Potential for Radio and Television Interference

The MoonBeam3 generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with Class A emission limits for a device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operating in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The MoonBeam3 is not intended for use in a residential Class B environment. The MoonBeam3 requires a grounded AC line cord. If your MoonBeam3 does cause interference to radio or television reception, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the MoonBeam3 with respect to the receiver.

If necessary, you should consult Technical Support or an experienced radio/television technician for additional suggestions. You may find the following booklet prepared by the Federal Communications Commission helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

### Guidance and Manufacturer's Declaration – Electromagnetic Emissions & Immunity

MoonBeam3 needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in this manual. The customer or the user of the MoonBeam3 should assure that it is used in such an environment.

Portable and mobile RF communications equipment can affect MoonBeam3.

The use of accessories, transducers and cables other than those specified by Diversey may result in increased EMISSIONS or decreased IMMUNITY of the MoonBeam3.



MoonBeam3 should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the

MoonBeam3 should be observed to verify normal operation in the configuration in which it will be used.

MoonBeam3 receives radio frequency energy in the following band: 2402.0 - 2480.0 MHz.

MoonBeam3 may be interfered with by other equipment, even if that other equipment complies with CISPR EMISSION requirements.


MoonBeam3 transmits radio frequency energy within the band of 2402.0 - 2480.0 MHz using GFSK modulation and produces an output power of 0.007 Watts.

MoonBeam3 is third-party tested and verified compliant with IEC 60601-1-2 Class A emissions and immunity for non-life supporting equipment.

Guidance and Manufacturer's Declaration – Electromagnetic Emissions		
The MoonBeam3 is intended for use in the electromagnetic environment specified below. The customer or the user of the MoonBeam3 should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic Environment – Guidance
RF emissions CISPR 11	Group 1	The MoonBeam3 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The MoonBeam3 is suitable for use in all establishments other than domestic. It may be used in domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded:
Harmonic emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker emissions IEC 61000-3-3	Complies	Warning: This equipment/ system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the MoonBeam3 or shielding the location.



Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The MoonBeam3 is intended for use in the electromagnetic environment specified below. The customer or the user of the MoonBeam3 should assure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical domestic, commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical domestic, commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % <i>UT</i> (>95 % dip in <i>UT</i> ) for 0,5 cycle 40 % <i>UT</i> (60 % dip in <i>UT</i> ) for 5 cycles 70 % <i>UT</i> (30 % dip in <i>UT</i> ) for 25 cycles <5 % <i>UT</i> (>95 % dip in <i>UT</i> ) for 5 sec	<5 % <i>UT</i> (>95 % dip in <i>UT</i> ) for 0,5 cycle 40 % <i>UT</i> (60 % dip in <i>UT</i> ) for 5 cycles 70 % <i>UT</i> (30 % dip in <i>UT</i> ) for 25 cycles <5 % <i>UT</i> (>95 % dip in <i>UT</i> ) for 5 sec	Mains power quality should be that of a typical domestic, commercial or hospital environment. If the user of the MoonBeam3 requires continued operation during power mains interruptions, it is recommended that the MoonBeam3 be powered from an uninterruptible power supply or a battery.
(50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical domestic, commercial or hospital environment.
NOTE <i>UT</i> is the a.c. mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
<p>The MoonBeam3 is intended for use in the electromagnetic environment specified below. The customer or the user of the MoonBeam3 should assure that it is used in such an environment.</p>			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 Vrms</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the MoonBeam3, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> <p><math>d = 1.2\sqrt{P}</math></p> <p><math>d = 1.2\sqrt{P}</math> 80 MHz to 800 MHz  <math>d = 2.3\sqrt{P}</math> 800 MHz to 2.5 GHz</p> <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a</sup>, should be less than the compliance level in each frequency range.<sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol: </p>
<p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p><sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the MoonBeam3 is used exceeds the applicable RF compliance level above, the MoonBeam3 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the MoonBeam3.</p> <p><sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			



### Portable and Mobile RF Communications Equipment and the MoonBeam3

The MoonBeam3 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the MoonBeam3 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the MoonBeam3 as recommended below, according to the maximum output power of the communications equipment.

Rated Maximum Output Power of Transmitter W	Separation Distance According to Frequency of Transmitter m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance  $d$  in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.



## Disposal Requirements

Disposal of this product and consumables shall be in accordance with all applicable laws and regulations in effect at the locality at the time of disposal. For additional information, refer to *Hazardous Material Information* section.

Lamps contain MERCURY. If lamps (bulbs) are broken, ventilate the area where the breakage occurred. Take the usual precautions for collecting broken glass. Clean up with a mercury vacuum cleaner or with other suitable means that avoids dust and mercury vapor generation. DO NOT USE A STANDARD VACUUM CLEANER. Place collected materials in a closed container to avoid generating dust. Additional guidance on cleaning up broken lamps may be obtained at [www.epa.gov/cfl](http://www.epa.gov/cfl) Recycle all spent mercury-containing bulbs and lamps. A list of lamp recyclers and state regulatory disposal information can be found at [www.lamprecycle.org](http://www.lamprecycle.org).

### Location of Safety and Compliance Labels

Diversey, Inc. is in compliance with various regulations, details of which are listed in the *Specifications* section. The MoonBeam3 safety and compliance label, shown below, is located on the Base Unit column below the user interface controls as well as the Remote Cover and Sentry units.



MoonBeam3 Base Unit



Location of MoonBeam3 Base Unit safety and compliance label



MoonBeam3 Remote Cover & Sentry safety and compliance label



Location of MoonBeam3 Remote Cover safety and compliance label

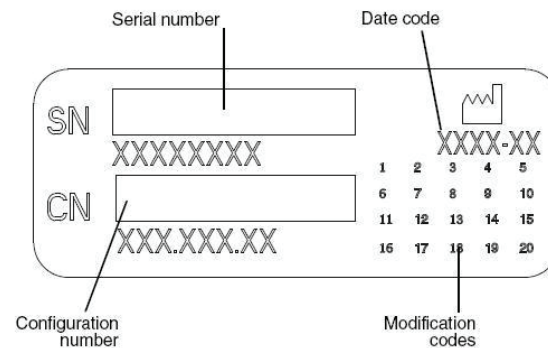


Location of MoonBeam3 Sentry safety and compliance label

### Serial Number, Configuration, Date Code and Modification Codes

The serial number label is placed onto the safety and compliance label. The serial number label includes the following information:

- The serial number (SN), which uniquely identifies the unit.
- The configuration number (CN), which details the build configuration.
- The modification codes, which are to the right of the CN number and are a series of 20 numbers. When any of these numbers are blocked out, that identifies a modification that was made to the unit.
- The date code in YYYY-MM format is located below the factory date code symbol.



*Serial number label*

### Limitations for Use

**Hard-surface Disinfection:** The MoonBeam3 UV-C Disinfection device is intended for the disinfection of pre-cleaned non-porous hard surfaces. This device should not be used on any other objects or surfaces and is not designed to disinfect semi-critical or critical medical devices.



## Indications for Use

### Intended Use

The MoonBeam3 disinfection system is intended to allow authorized trained personnel the ability to disinfect hard, non-porous surfaces and high-touch surfaces on demand. Following proper cleaning and disinfection/sanitizing of surfaces with MoonBeam3 UV-C provides the added assurance that surfaces have been thoroughly disinfected. UV-C disinfection is not intended as a replacement for liquid chemical disinfectants, sanitizers or sterilizers. MoonBeam3 is not intended to be used to pre-clean or decontaminate medical devices prior to terminal sterilization or high level disinfection.

### Device Indications for Use Statement

The MoonBeam3 disinfection function is achieved through the application of high intensity germicidal UV-C light applied at a known intensity and for a known duration. The intention is to allow the user to position the system and select a duration for disinfection of a surface. Operation of the system is to take place outside of sterile fields and by personnel performing their duties outside of sterile fields.

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## Chapter 1: Introduction

### Welcome

Thank you for your purchase of the Diversey MoonBeam3 Disinfection Technology.

We are pleased that you chose the MoonBeam3. We are confident that it will provide safe and effective additional reduction of contamination on pre-cleaned and disinfected surfaces to give additional assurance for your facility.

In accord with well-established infection prevention protocol for environmental services cleaning, surfaces should first be cleaned with liquid chemical disinfectants and/or sanitizers. MoonBeam3 has three ultraviolet-C (UV-C) heads that provide a broad umbrella of light to supplement environmental services cleaning and disinfection. MoonBeam3 is intended for use on pre-cleaned surfaces and should not be used as a replacement for liquid chemical disinfectants, sanitizers or sterilizers.



*MoonBeam3  
Disinfection Technology*

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## Chapter 2: Setting Up the System

### Shipped Components

The MoonBeam3 is shipped in cartons that contain the following system components:

#### MoonBeam3 System

- Base Unit
- Remote Cover
- Power Cord (maximum length of 16 feet – 4.8 meters)

#### User Documentation

- User Guide
- Quick Start / Reference Guide
- Warranty



**PRECAUTION:** When unpacking the MoonBeam3, hold under the front and rear of the system. Do not lift the system by the interior packaging.

### Inspection of System

- Inspect the cartons for damage that might have occurred during shipping. Report any damage to the shipping company. Save the cartons and packing materials in case you ever need to transport the MoonBeam3 later.
- Check the three bulbs to ensure they did not break in transport. If any bulb has broken, refer to procedure for "Special Handling Information for Broken UV-C Bulbs" in User Manual.

### Finding a Location for the System

Each operating location is variable and placing the system appropriately should be in accordance with the guidelines below. When finding a suitable location for the system, use the following guidelines (along with the information in the *Location Warnings and Precautions* section):

- Place the system in a location with adequate air circulation to prevent internal heat build up.
- Do not place the system near heat sources such as radiators or air ducts or in a location subject to direct sunlight, excessive dust, mechanical vibration or shock.

- Make sure that the floor supporting the system is level, can support the weight and will not vibrate or shake when the system is operating. MoonBeam3 is intended for use on a level floor. For additional stability prior to operation, the caster wheels may be positioned outwards and locked by depressing the foot pedal on each.
- Be careful when positioning MoonBeam3 to ensure that the connection to the AC mains (wall outlet) is not obstructed, so that disconnection is not blocked in the case of emergency.

### Initial Set Up

- Make sure you have read and understood all safety instructions before using the MoonBeam3 for the first time.
- Refer to the **Powering the System** section in this chapter for information on powering the unit.
- Refer to **Chapter 3: Operation of Device** in this manual for instructions on setting up the device and performing UV-C disinfection.

### Powering the System

- Make sure you have read and understood all safety instructions before using the MoonBeam3 for the first time.
- The MoonBeam3 includes a 16 foot ( 4.87 m) power cord and cord winders on the Base Unit. Unwrap the power cord from the Base Unit and plug it into an electrical wall socket.

*Note: An extension cord can be used (check your local code for appropriate gauge requirements).*

- Power is now activated in the MoonBeam3 and shown as solid green for the **Power** indicator on the front panel user interface.

*Note: The MoonBeam3 Base Unit does not have a power button.*



**WARNING:** Disconnect the power cord from the wall outlet before servicing to avoid the possibility of electric shock.

### Identifying the Components

#### MoonBeam3 Components



*MoonBeam3 Base Unit*



*MoonBeam3 Remote Cover*

## MoonBeam3 Accessory



*MoonBeam3 Sentry Assist Technology*  
The Sentry Assist Technology (SAT) module(s) are optional.

## Chapter 3: Operation of Device

Make sure you have read and understood all safety instructions before using the MoonBeam3 for the first time.

### System Placement

The MoonBeam3 can be transported easily by rolling it, carrying it with its built-in handle or transporting it on an environmental services cart to the intended location of use for targeted disinfection. Once in the intended location, place the MoonBeam3 in the specific zone that requires disinfection.

Lock wheel brakes. Open the unit by rotating the Remote Cover counter-clockwise about one rotation. Upon disengagement of the Remote Cover from the Base Unit, simply lift the Remote Cover straight up using the handle and set it aside momentarily.



*MoonBeam3 with Remote Cover Removed*

With the Remote Cover removed, the Base Unit can be further positioned by rolling into place or carrying as required with its built-in handle. MoonBeam3 is intended for use on a level floor. The base unit stability must be verified prior to leaving unattended for the disinfection cycle. For additional stability prior to operation, the caster wheels may be positioned outwards and locked by depressing the foot pedal on each.



*MoonBeam3 with Heads Positioned for Disinfection*

The UV-C disinfecting heads are now ready to be lifted and positioned for use. Vertically lift the first head by pulling up on the knuckle joint, which allows the head to telescope up to the desired height requirement.

*Note: A minimum of two inches (5 cm) is required for each head to be vertically lifted from the protective recess of the Base Unit.*

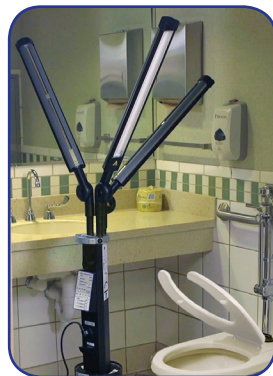
Upon lifting a head to its desired height, vertically raise and pivot the UV-C bulb into position. Each UV-C bulb can be optionally rotated horizontally as required. Repeat the head lifting and positioning for the other two heads.

*NOTE: It is recommended that all three heads are deployed for each disinfection process to ensure maximum efficacy. Additionally, each head should be positioned as to not block the motion sensors built into the Base Unit's carrying handle.*

For maximum disinfection efficiency and strength, it is recommended that all three heads are angled towards the target. However, the heads can also be positioned as needed to disinfect multiple targets simultaneously as shown below. The recommended distance from the surface to be disinfected is about 48 inches (120 cm). Each disinfecting head has a typical disinfecting range of about 77 square feet – 7 feet (180 cm) wide (side-to-side of UV-C bulb) by 11 feet (335 cm) deep (length-wise of UV-C bulb).

*NOTE: Only surfaces dosed by the UV-C light will be disinfected. When setting up the device, care needs to be taken to ensure that the direct sight of the device is not obstructed and that all affected angles of target surfaces are treated. This may require treating a target area more than once, repositioning the device between cycles to ensure all surfaces are irradiated.*

*NOTE: It is recommended that the Base Unit be positioned so the motion sensors are not blocked by any items in the room, e.g. tables, chairs, beds, etc., to ensure full range of motion sensing from the room's doors. Also, ensure that the Base Unit's handle (with its built-in motion sensors) is pointed towards the room's main door.*



*MoonBeam3 with Heads Positioned for Disinfection in a Patient's Bathroom*



*MoonBeam3 with Heads Positioned for Disinfection in a Patient's Room*





### MoonBeam3 Instructions

The following instructions may be used for utilizing your MoonBeam3:

1. **Set** the MoonBeam3 in the desired location. Lock wheel brakes.
2. **Remove** the Remote Cover from the Base Unit and set to the side.
3. **Unwind** the Base Unit's power cord and plug it into a wall outlet.
4. **Position** the three UV-C Heads toward the disinfection target area. For optimal results, the UV-C Lamp Arms should be within 48" (120 cm) of the surfaces to be disinfected.
5. **If desired, change** the **Run Time Seconds** on the Base by pressing the button to cycle through the available durations (90, 180, 300 or 600).
6. **Carry** the Remote Cover, exit the room and close the door.
7. **Position** the Remote Cover against door. Ensure that the **Point Toward Door** arrow on the Remote Cover's top panel is facing the door.
8. **Press** the Power button on the Remote Cover. The **Connect LED**, followed by the **Ready LED** will illuminate green when ready (~ 3 seconds).
9. **Press** the **Start** button on the Remote Cover.
10. **Upon** completion of the disinfection cycle, the **Process Complete LED** will illuminate green on the Remote Cover.
11. **Press** the **Power** button on the Remote Cover to turn it off. The cover will automatically turn off after 10 minutes of inactivity when always-on-mode is not active.
12. **Carry** the Remote Cover and enter the room. Unplug the power cord from the wall outlet and wind it on the Base Unit's cord winders.
13. **Replace** the Remote Cover on the Base Unit. Optionally, roll the Base Unit and carry the Remote Cover separately to the next disinfection location.

### System Power and Activation

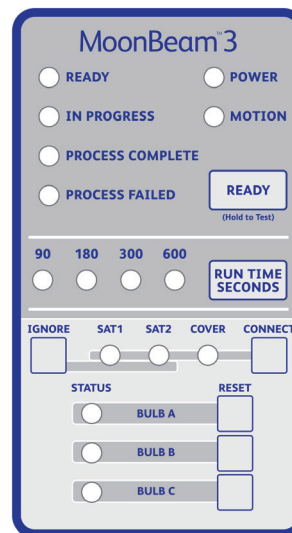
Make sure you have read and understood all safety instructions before using the MoonBeam3 for the first time.

The MoonBeam3 includes a 16 foot (4.87 m) power cord and cord winders on the Base Unit. Unwrap the power cord clockwise from the Base Unit and plug it into an electrical wall socket.

*Note: An extension cord can be used (check your local code for appropriate gauge requirements).*

Power is now activated in the MoonBeam3 and the **Power** indicator is shown as solid green on the front panel user interface.

*Note: The MoonBeam3 Base Unit does not have a power button.*



*MoonBeam3 Base Unit (Front Panel) User Interface*



*MoonBeam3 Remote Cover Placement*

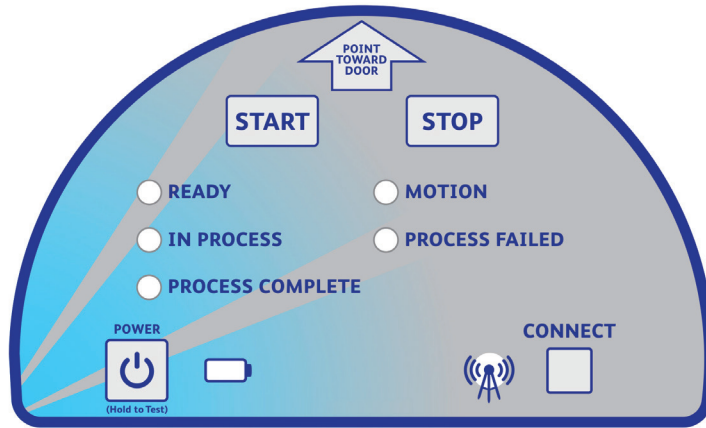
Press the **Run Time Seconds** button to change the duration of the cycle. The selected duration cycle will be shown as a solid green LED light. Available duration cycles are 90, 180, 300 and 600 seconds. The default duration cycle is 180 seconds. The run time duration selected will remain the same for the next cycle unless changed.

The recommended duration cycle is 180 seconds for a distance with 48 inches (120 cm) from the heads to the target surface. 90 second cycles are intended to be used as an add-on to a longer treatment cycle or touch up a surface. A 90 second cycle does not provide sufficient treatment to achieve notable disinfection.

As you are preparing the Base Unit for use, the **Motion** indicator on the front panel user interface will be shown as a yellow LED light. The Base Unit has onboard user safety mechanisms that terminate the disinfection process if motion is detected during a disinfection cycle. The **Motion** indicator will be shown in flashing yellow LED light when the Base Unit sensors detect human motion (with a range of 360 degrees of the Base Unit) and physical movement (e.g. rocking, wobbling, sliding) of the Base Unit.

The **Ready** indicator is not activated in solid green at this time, but will be after the Remote Cover is positioned outside of the disinfection area and connected to the Base Unit. Carry and place the Remote Cover outside of the room and place it against the closed door.

Ensure that the **Point Toward Door** arrow on the Remote Cover user interface is in the direction towards the closed door.



MoonBeam3 Remote Cover User Interface

If the Remote Cover is not against the closed door, activation of the system is not possible. The Remote Cover has onboard user safety mechanisms that disable the system from activating if the Remote Cover is not properly positioned.

Press the **Power** Button on the Remote Cover user interface and the **Battery** indicator will be shown as solid green.

Press and hold the **Power** button for nine seconds to enable always-on-mode to prevent automatic power down after 10 minutes of inactivity  
*Note: If the **Battery** indicator is shown in flashing yellow, this indicates a low battery condition. See **Battery Replacement** section.*

The **Connect** indicator will illuminate solid green when communication with the Base Unit is established. Once connected for communication, the **Ready** indicator will be shown in solid green on the Remote Cover (and the Base Unit). MoonBeam3 systems are connected at the factory and will remain connected (with no user interaction) by maintaining the Remote Cover and Base Unit set. If a Remote Cover needs to be verified with a Base Unit, press the **Connect** button on either the Remote Cover or Base Unit and the corresponding partner **Connect** indicator will flash green.

*Note: The **Ready LED** indicator on the Remote Cover will turn off if a button is pressed other than the **Start** button.*

If system components (Remote Covers and Base Units) are swapped after usage or are exchanged under warranty, a re-connecting of the system components (Remote Covers and Base Units) will be required to allow communication for continued utilization. If required, press and hold both **Connect** buttons on the Base Unit and the Remote Cover for 3 to 5 seconds (blinking green) and both will illuminate solid green when connected. Upon completion of powering the Remote Cover and connecting to the Base Unit, the MoonBeam3 is now ready for the targeted disinfection process to begin. To start the disinfection process, press the **Start** button on the Remote Cover user interface.

*Note: If the Cover no longer acknowledges the Base Unit, the **Cover LED** on the Base Unit will be illuminated solid yellow.*

To halt a disinfection cycle, press the **Stop** button. After a disinfection cycle has been stopped, the system will return to a ready status.

The In Process indicator will be shown in flashing blue while the disinfection cycle is underway for the time selected on the Base Unit. Upon completion of the disinfection cycle, the **Process Complete** indicator will be shown in solid green.

*Note: Disinfecting ultraviolet (UV-C) light cannot penetrate through glass and it is safe to view it through the glass.*



The **Motion LED** will be shown in yellow if the Remote Cover detects motion either with physical movement of the unit itself or opening (e.g. the door) of the room. If motion is detected by the Remote Cover, the disinfection cycle of the MoonBeam3 will be immediately terminated.

The **Reset** button is used after an in-room process failure on the Base Unit, e.g. motion sensing, to reset all fault conditions prior to re-starting a disinfection process cycle.

If the disinfection cycle is terminated, the **Process Failed** indicator will be shown in solid red on the Remote Cover as well as the Base Unit. The component (Remote Cover, Base Unit, Sentry 1 or Sentry 2) responsible for the process halt will be identified on the Base Unit with a flashing red indicator.

If a power loss or interruption is detected on the Base Unit, the **Process Failed** indicator will illuminate solid red. Pressing the **Reset** button will clear the failure indicator


After a complete disinfection cycle is performed, a second cycle can be started if desired. With the Base Unit's same position and duration, simply press the **Start** button to start a second disinfection cycle for the same targeted area.


*NOTE: Areas not directly dosed by the UV-C light will not be disinfected.*

If disinfection of a different location in the same target area is needed, open the door to access the room. Roll the Base Unit while grasping its handle to the new target area. Position the UV-C heads as required and adjust the run time seconds if needed. Exit the room, place the Remote Cover back in position and press the **Start** button on the Remote Cover user interface.


When the targeted disinfection is completed in the desired area, pick up the Remote Cover by its built-in handle and carry it to the Base Unit. To power off the Base Unit, simply unplug the power cord from the electrical wall outlet. Store the power cord safely by winding it on the Base Unit's cord winders and securing it with the plug clip. Fold down each of the disinfecting heads and lower each to stow into the recessed area of the Base Unit. Turn off the Remote Cover by pressing the **Power** Button and the **Battery** Indicator will flash yellow when powering down. Pick up and lower the Remote Cover onto the Base Unit and rotate clockwise to secure it.

*Note: If the Remote Cover is not powered off by the user, the **Battery** indicator and **Process Complete** indicator will remain illuminated until the Remote Cover powers off automatically after 10 minutes.*


 **PRECAUTION:** This device is intended for use on pre-cleaned, non-porous, hard surfaces and is not intended as a replacement for liquid chemical disinfectants, sanitizers or sterilizers. See intended use under Indications for Use section.


 **WARNING:** Subsequent use of disinfected surfaces and objects can lead to recontamination. MoonBeam3 cannot prevent or decrease the instances of recontamination.


### **Label on UV-C Heads Indicating High-Temperatures Surfaces**

 **WARNING:** High Temperature – UV-C bulbs and assembly may develop high temperatures. The UV-C bulb reflector heads can reach high temperatures during operation, but cool quickly upon completion of a disinfection cycle. If UV-C bulb reflector heads must be handled immediately after a disinfection cycle, the user should handle them by holding the rubberized end cap or foam heat tape.

 **WARNING:** Do not cover, paint or block any of the motion or proximity sensors.

 **PRECAUTION:** The product must be used in accordance with this User's Guide.

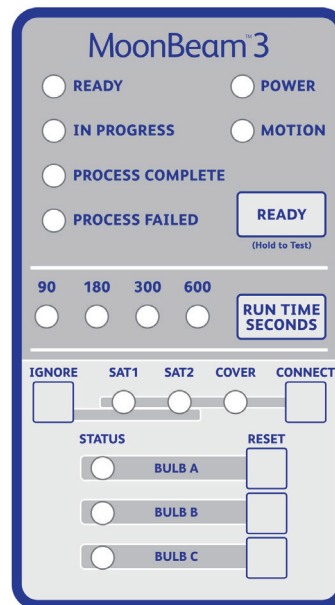
 **PRECAUTION:** Ensure that the Remote Cover is completely screwed onto the Base Unit prior to picking up MoonBeam3.

 **PRECAUTION:** Avoid spilling fluids on any part of the MoonBeam3. If spills do occur, immediately disconnect MoonBeam3 from the power source and contact technical support for guidance in cleaning the MoonBeam3.

 **PRECAUTION:** Do not use any attachments not recommended by Diversey, Inc.

### MoonBeam3 UV-C Bulb Status

The MoonBeam3 contains three UV-C bulbs and the status of each is displayed on the Base Unit front panel user interface. The status of each is represented by Bulb A, Bulb B and Bulb C.



*MoonBeam3 Base Unit (Front Panel) User Interface*

The first UV-C bulb head to the left side of the user interface is Bulb A, followed by the middle bulb head being Bulb B and the right bulb head as Bulb C. Each bulb head has an identifying indicator label to appropriately distinguish the bulb head. All bulb status indicators must be green or yellow for the system to operate. One red will not allow the system to activate.


**A bulb status of green** indicates that it is fully functional.

**A bulb status of yellow** indicates that it has less than 5% of its remaining life and needs to be replaced soon. The first indication of yellow equates to approximately 5 hours of remaining life.

**A bulb status of red** indicates that it is no longer functioning and must be replaced for continued operation.

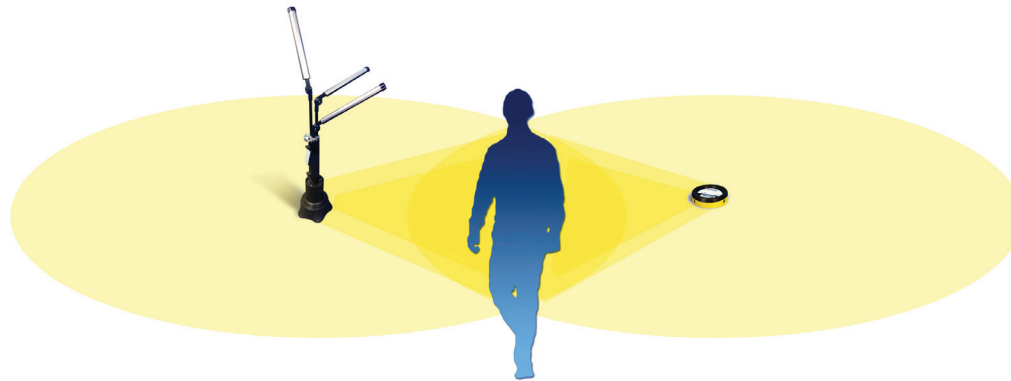
### System User Safety Controls

The MoonBeam3 has multiple safety controls and mechanisms to ensure that users are safe and protected during the UV-C disinfection operations.

 **WARNING:** Do not intentionally bypass any of the safety precautions built into the device. Failure to comply may result in exposing skin to UV-C. Prolonged skin exposure may generate redness and an uncomfortable sunburn sensation.

The following safety controls are built into the MoonBeam3:

The Base Unit includes a 360-degree motion sensor for human movement and an accelerometer for physical movement of the unit.



*MoonBeam3 with Sentry (optional) Illustrating the In-Room Motion Sensor User Protection*

The Remote Cover has a proximity sensor for positioning immediately adjacent to the room's closed door where disinfection will take place as well as an accelerometer for physical movement of the unit. Additionally, the Remote Cover is colored as high-visibility safety (caution) yellow and labeled with UV-C warning indications.

The (optional) Sentry Assist Technology (SAT) includes a 360-degree motion sensor for human movement and an accelerometer for physical movement of the unit. Up to two Sentry Assist Technology units can be utilized during disinfection processing. Additionally, the Sentry is colored as high-visibility safety (caution) yellow.

*Note: Sentry Assist Technology is available as an option for MoonBeam3.*



### Sentry Assist Technology

Sentry Assist Technology (SAT) is designed to be in the zone of disinfection as an additional user safety mechanism to terminate the disinfection cycle if human motion is detected. Each Sentry device includes a 360-degree motion sensor for human movement and an accelerometer for physical movement of the unit. Additionally, the Sentry is colored as high-visibility safety (caution) yellow.



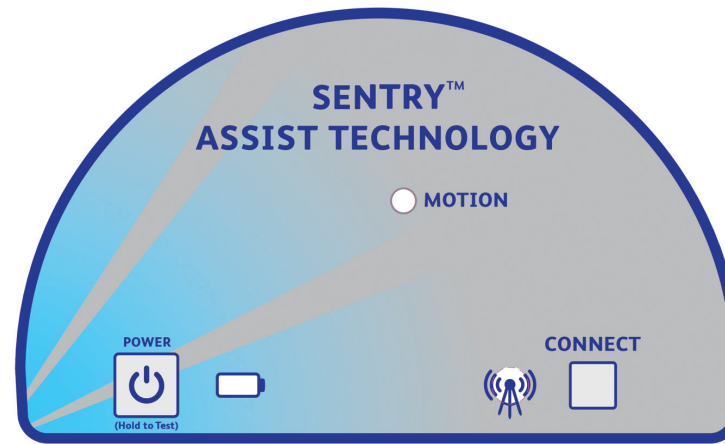
*MoonBeam3 Sentry Assist Technology*

Up to two Sentry units can be utilized during disinfection processing. Sentry units are available as an option for MoonBeam3.

The Sentry units can conveniently latch into the MoonBeam3 unit's Remote Cover for storage and transport.

**Press** the **Power** Button on the Sentry user interface and the Battery indicator will be shown as solid green.

*Note: If the **Battery** indicator is shown in flashing yellow, this indicates a low battery condition. See Battery Replacement section.*



*MoonBeam3 Sentry Assist Technology User Interface*

If the Sentry is already connected with the Base Unit, the **Connect LED** on the Sentry and Base Unit (e.g. SAT1, SAT2) will be illuminated solid green.

*Note: If the Sentry(s) no longer acknowledge the Base Unit, the **SAT1** and/or **SAT2 LEDs** on the Base Unit will be illuminated solid yellow.*

It is recommended to check and confirm the Sentry connection to a MoonBeam3 prior to each disinfection cycle. Simply press the **Connect** button on the Sentry or on the Base Unit and the connected partner Sentry will be displayed on the Base Unit's user interface.

### MoonBeam3 with Sentry Instructions

The following are instructions for a MoonBeam3 with a Sentry Assist Technology device may be used for utilizing your MoonBeam3:

1. **Set** the MoonBeam3 in the desired location.
2. **Remove** the Remote Cover from the Base Unit and set to the side.
3. **Unwind** the Base Unit's power cord and plug it into a wall outlet.
4. **Position** the three UV-C Heads toward the disinfection target area. For optimal results, the UV-C Lamp Arms should be within 48" (120 cm) of the surfaces to be disinfected.
5. **If desired, change** the **Run Time Seconds** on the Base by pressing the button to cycle through the available durations (90, 180, 300 or 600).



6. **Remove** the Sentry Assist Technology unit from the top of the Remote Cover.
7. **Place** the Sentry unit in the desired location.
8. **Press** the **Power** button on the Sentry unit. The **Connect LED** will illuminate green. Press and hold the **Power** button for nine seconds to enable always-on-mode to prevent automatic power down after 10 minutes of inactivity.
9. **Carry** the Remote Cover, exit the room and close the door.
10. **Position** the Remote Cover against the door. Ensure that the Point Toward Door arrow on the Remote Cover's top panel is facing the door.
11. **Press** the **Power** button on the Remote Cover. The **Connect LED**, followed by the **Ready LED** will illuminate green when ready.
12. **Press** the **Start** button on the Remote Cover.
13. **Upon** completion of the disinfection cycle, the **Process Complete LED** will illuminate green on the Remote Cover.
14. **Press** the **Power** Button on the Remote Cover to turn it off and the **Battery** Indicator will flash yellow when powering down. The cover will automatically turn off after 10 minutes of inactivity if always-on-mode is not activated.
15. **Carry** the Remote Cover and enter the room. Unplug the power cord from the wall outlet and wind it on the Base Unit's cord winders.
16. **Place** the Sentry unit on the Remote Cover's top panel.
17. **Replace** the Remote Cover on the Base Unit. Optionally, roll the Base Unit and carry the Remote Cover separately to the next disinfection location.

If a connection is required due to system component swapping (using a Sentry with another Base Unit or exchanged under warranty), a re-connecting of the system components (Sentry units and Base Units) will be required to allow communication for continued utilization. If required, press and hold both **Connect** buttons on the Base Unit and the Sentry for 3 to 5 seconds (blinking green) and both will illuminate solid green when connected.

*NOTE: If a Sentry needs to be disconnected from a Base Unit, press and hold the **Ignore** button on the Sentry. This function removes the connection of the Sentry to a Base Unit.*

*NOTE: A Sentry can be connected with only one Base Unit.*



Place the Sentry in a location where it has the best ability to detect the presence of a person entering where the disinfection process is taking place. Placement of the Sentry at an elevated height is recommended for the best possible detection with the 360-degree motion sensing. If two Sentry units are being used, placement of the second by a secondary door to the room is recommended. If the disinfection process is terminated because of detection by a Sentry, the Remote Cover and Base Unit will indicate that the process failed. The **Sentry Motion LED** will be yellow and the detecting Sentry indicator on the Base Unit will be flashing red.

Sentry units do not require to be reset between cycles.

*Note: If the Sentry is not powered off by the user, the **Battery** indicator will remain illuminated until the Sentry powers off automatically after 10 minutes if always-on-mode is not activated.*

The **Ignore** button on the Base Unit should be used with caution. The use of it will turn off motion sensing Sentry units. Extreme caution should be exercised when using this feature. Pressing the **Ignore** button performs the following:

- **One Press** – ignore Sentry unit 1
- **Two Presses** – ignore Sentry unit 2
- **Three Presses** – ignore Sentry unit 1 and 2
- **Four Presses** – re-start Sentry units
- **Press and hold** the **Ignore** button for three seconds to completely remove all Sentry connections.

The **Reset** button on the Base Unit may be used to turn off motion sensing, which should be used with caution. The use of it will turn off motion sensing for the Base Unit. Extreme caution should be exercised when using this feature. Pressing the **Reset** button to turn off motion sensing is performed by the following steps:

- **Press** the **Reset** button three times sequentially within 3 seconds to ignore all Base Unit motion sensing. The **Motion LED** on the Base Unit will be flashing yellow.
- **Press** the **Reset** button three times sequentially within 3 seconds to re-start Base Unit motion sensing.

Extreme caution should be exercised when using this feature. It is highly recommended that a Sentry be employed when ignoring the motion sensor on the base. Use of the **Ignore** button is beneficial when the disinfecting area has glass viewing access. While disinfecting ultraviolet (UV-C) light cannot penetrate through glass and it is safe to view it through the glass, the motion sensing system will detect body heat through the glass. Sentry should ideally be placed in a position to sense access to the room but not sensing personnel outside the room.



### System Test for User Safety Controls

The MoonBeam3 includes a sensor self test function, which can be exercised as required by the user to ensure that all of the user safety sensors are properly operating.

**To test** the sensors on the Base Unit:

- **Hold** the **Reset** button for three seconds to enter sensor test mode.
- **Release** the **Reset** button.
- **Wait** for the **Ready LED** to come on (30 seconds), indicating that the Base Unit is ready. This is necessary to allow the infrared (IR) sensors to stabilize.
- In any order:
  - **Jostle** the **Base** Unit to activate the accelerometer, which will light the **Motion LED**.
  - **Move** in front of the four infrared (IR) sensors to activate them, which will light the appropriate **Run Time LEDs** representing each of the motion sensors.
- **When all of the sensors** have been activated, the **Motion** and **Run Time LEDs** will all blink for 3 seconds and the Base Unit will exit sensor test mode and return to a normal operation.
- **You may also exit** sensor test mode at any time by pressing the **Reset** button.

**To test** the sensors on the Remote Cover:

- **Hold** the **Power** button until the green **Battery LED** starts to blink (3 seconds) when turning the Remote Cover on to enter sensor test mode.
- **Release** the **Power** button.
- The yellow **Battery LED** will come on immediately, indicating that the Remote Cover is ready.
- In any order:
  - **Jostle** the Remote Cover to activate the accelerometer, which will light the **Motion LED**.
  - **Move** in front of the distance sensor to activate it, which will light the **Ready LED**.
- **When both of the sensors** have been activated the **Motion** and **Ready LEDs** will both blink for 3 seconds and the Remote Cover will exit sensor test mode. You may also exit sensor test mode at any time by pressing the **Power** button.



**To test** the sensors on the Sentry:

- **Hold** the **Power** button until the green **Battery LED** starts to blink (3 seconds) when turning the Sentry on to enter sensor test mode.
- **Release** the **Power** button.
- **Wait** for the yellow **Battery LED** to come on (30 seconds), indicating that the Sentry is ready. This is necessary to allow the infrared (IR) sensors to stabilize.
- In any order:
  - **Jostle** the Sentry to activate the accelerometer, which will light and extinguish (1 second each) the **Motion LED**.
  - **Move** in front of the four infrared (IR) sensors to activate them, which will light and extinguish (1 second each) the **Motion LED**.
- **When all of the sensors** have been activated the **Motion LED** will blink for 3 seconds and the Sentry will exit sensor test mode
- **You may also exit** sensor test mode at any time by pressing the **Power** button.



## Chapter 4: Maintenance

### Ordering Supplies and Parts

The following table lists the supplies and parts that can be ordered from Diversey:

Parts	Catalog Number
MoonBeam3 UV-C Bulb Set (Quantity 1 – set of 3 bulbs) Includes quantity 1 of 3 sets of FEP Covers/Clip Set replacements.	MOON3-UVCBULBS
MoonBeam3 Remote Cover – Quantity 1	SP-00695
MoonBeam3 UV-C Head Reflector – Quantity 1	SP-00696
MoonBeam3 UV-C Head Endcap – Quantity 1	SP-00697
MoonBeam3 Fuse – Quantity 1 Type: 8A / 250VAC, 5x20mm, Slow Blow	SP-00700
MoonBeam3 Cable, Line Cord, North America – Quantity 1	SP-00720
MoonBeam3 Packaging – Quantity 1	SP-00701

To order supplies and parts, contact Diversey Customer Service at:

**In U.S. and Canada:**

Toll Free: 800-668-7171

Email: [www.sdfhc.com/contact-us](http://www.sdfhc.com/contact-us)

Web Site: [www.sdfhc.com](http://www.sdfhc.com)

*NOTE: The use of unapproved parts will void the Diversey warranty for the MoonBeam3 unit.*



No user-serviceable parts inside. Removal of labels, encasements or fasteners voids the warranty. Only replacement parts sold by Diversey, Inc. can be serviced by user.

### Procedures for Disposal of UV-C Bulbs

MoonBeam3 technology uses germicidal UV-C lamps (bulbs) and cleaning should follow the practices required by your facility and in accord with applicable regulations. If lamps (bulbs) are broken, ventilate the area where the breakage occurred. Take the usual precautions for collecting broken glass. Clean up with a mercury vacuum cleaner or other suitable means that avoid dust and mercury vapor generation. **DO NOT USE A STANDARD VACUUM CLEANER.** Clean up requires special care due to mercury droplet proliferation. Place collected materials in a closed container to avoid generating dust. Additional guidance on cleaning up broken lamps may be obtained at [www.epa.gov/cfl](http://www.epa.gov/cfl). Recycle all spent mercury-containing bulbs and lamps. A list of lamp recyclers and state regulatory disposal information can be found at [www.lamprecycle.org](http://www.lamprecycle.org).



**WARNING:** Ultraviolet bulbs contain mercury and therefore must be properly disposed of as a hazardous waste in accordance with local, state and federal regulations or the lamps should be recycled.

### Special Handling Information for Broken UV-C Bulbs

**Ventilation:** Use adequate general and local exhaust ventilation to maintain exposure levels below the permissible exposure limit (PEL) or threshold limit value (TLV) limits. If such ventilation is unavailable, use respirators as specified below.

**Respiratory Protection:** Use appropriate NIOSH (National Institute for Occupational Safety and Health) approved respirator if airborne dust concentrations exceed the PEL or TLV limits. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

**Eye Protection:** OSHA (Occupational Safety and Health Administration) specified safety glasses, goggles or face shield are recommended if bulbs are broken.

**Hygienic Practices:** After handling broken bulbs, wash thoroughly before eating, smoking or using toilet facilities.

In the event that a MoonBeam3 bulb arrives in a broken condition and is still inside the bag, keep the bag sealed and discard the MoonBeam3 bulb in accord with the practices required by your facility and with applicable regulations. Contact your carrier for procedures to file a damaged goods claim.

Check your local or regional specific occupational safety standards for any additional procedures or precautions required for the handling of broken UV-C bulbs.





### Bulb Replacement

If the bulb status for bulb A, B or C indicates yellow or red on the Base Unit's front panel interface, the bulb should be replaced. Bulb status is reported as the following:

*A bulb status of Green* indicates that it is fully functional.

*A bulb status of Yellow* indicates that it has less than 5% of its remaining life and needs to be replaced soon. The first indication of yellow equates to approximately 5 hours of remaining life.

*A bulb status of Red* indicates that it is no longer functioning and must be replaced for continued operation.

*Note: Use of any bulb other than that expressly and directly purchased from Diversey or a fully authorized source will cause failure in the disinfection cycle. This may result in electrical failure that is not covered under warranty and will cause premature device failure. Use of any bulbs other than those provided by the manufacturer is prohibited.*

The first UV-C bulb head to the left side of the user interface is Bulb A, followed by the middle bulb head being Bulb B and the right bulb head as Bulb C. Each bulb head has an identifying indicator label to appropriately distinguish the bulb head. All **Bulb Status** indicators must be green or yellow for the system to operate. One red will not allow the system to activate.

In order to replace a bulb, follow these instructions:

1. **Remove** and set aside the Remote Cover and ensure that the power is disconnected from the Base Unit.
2. **For the bulb to be replaced**, pull up the corresponding knuckle to release the lamp assembly from the base.
3. **Upon lifting a head to its desired height**, vertically raise and pivot the UV-C bulb and then rotate the head so the bulb is pointing towards the ceiling.
4. **Gently pull** (or rock) to remove the end cap from the outer edge of the lamp head and set aside.
5. **Carefully slide off** side clips from the lamp head reflector and set aside.
6. **Gently pull forward and upward** on the UV-C lamp bulb from the inner end to disengage from the bulb socket.
7. **Discard** old bulb and clear plastic lamp bulb protector – See *Procedures for Disposal of UV-C Bulbs* section.

8. **Handle** new bulbs with gloves to avoid getting oils or dirt on the bulbs.
9. **Insert** new UV-C lamp bulb until it engages in the bulb socket.
10. **Place** clear plastic cover on the encasement by inserting the side clips on each side.
11. **Push** end cap on the outer edge of the lamp head by carefully aligning the internal fingers to support the newly installed UV-C bulb.
12. **After replacing a bulb**, plug in the unit power cord, press and hold the appropriate bulb **Reset** button for 3 seconds on the Base Unit's user interface and the **Bulb** indicator will first flash green confirming the reset and then display as solid green. If not, contact Technical Support.

## Battery Replacement

If the Remote Cover or Sentry unit display **Battery** power in flashing yellow or there is no indication after pressing the **Power** button, the batteries should be replaced. The Remote Cover and Sentry unit each use four AA alkaline batteries. The batteries in each are located under the battery compartment cover.



*MoonBeam3 Remote Cover and Sentry Battery Compartment Cover*

Using a slotted screwdriver, loosen and remove the two screws in the battery compartment cover. Remove and discard the four used batteries. Replace with four new AA alkaline batteries. Replace battery compartment cover and insert and tighten the two screws to secure it in place. Batteries have local requirements for discarding.

### Fuse Replacement

In the event that power is applied to the system and no lights are activated on the Base Unit interface, the fuse may need to be replaced. Prior to replacement of the fuse, the Base Unit must be unplugged from the electrical wall socket. To replace the fuse, insert a flat-bladed screw driver in the fuse plug, rotate the fuse plug counter-clockwise one quarter turn and it will spring forward releasing the fuse. Pull the fuse plug out of the unit and discard the old fuse. Install a new fuse into the fuse plug. Reinsert the fuse plug into the unit with a flat-bladed screwdriver, gently press in the fuse plug and rotate one quarter turn clockwise until locked into position.

*NOTE: See Spare Parts list above. The fuse type is Type: 8A / 250VAC, 5x20mm, Slow Blow.*

### Cleaning the Enclosure



PRECAUTION: Avoid spilling fluids on any part of the MoonBeam3.



PRECAUTION: If spills do occur, immediately disconnect MoonBeam3 from the power source and contact technical support for guidance in cleaning the MoonBeam3.



WARNING: Always power off the system before cleaning. An electrical shock could occur if the system is powered on and liquid is spilled into it.

*NOTE: Refer to the Powering the System section.*

To clean the Base Unit, Remote Cover or Sentry without physical or cosmetic degradation, use a clean, lint-free cloth moistened with one of the following:

- Expose™ Disinfectant Cleaner (meets VII.d.4 of AORN recommendation)
- Avert® Sporidical Disinfectant Cleaner (meets VII.e.2. of AORN recommendation)
- Virex® II 256 Disinfectant
- Virex® Plus Disinfectant
- Alpha HP® Multi-Surface Disinfectant Cleaner
- Oxivir® Five 16 Disinfectant Cleaner and Oxivir® Plus Disinfectant Cleaner
- Accel® Prevention and Intervention Concentrates and RTU
- Oxivir® RTU products
- Isopropyl Alcohol, 70% solution








The following pre-moistened disposable cloths may also be used for cleaning the enclosure:

- Oxivir® Wipes
- Accel® Prevention and Intervention Wipes
- Avert® Sporicidal Disinfectant Wipes

The use of a second MoonBeam3 may also be used to disinfect other MoonBeam3 Base Units, Remote Covers and Sentry units.

### Cleaning Precautions

To avoid damage to the device, observe the following general precautions for cleaning the device:

-  **PRECAUTION:** Apply the cleaner to a clean, lint-free cloth first and then clean the device. Liquid applied directly to the device could possibly leak inside and cause damage. Use extra caution when cleaning around the front panel display.
-  **PRECAUTION:** Allow the device to completely dry before operating again.
-  **PRECAUTION:** Never use abrasive materials.
-  **PRECAUTION:** Never use any disinfecting agents that corrode.
-  **PRECAUTION:** Always dilute cleaning agents according to the manufacturer's instructions or use the lowest possible concentration.
-  **PRECAUTION:** Do not allow the cleaning agent to remain on the device surface. Wipe off immediately with a lint-free cloth moistened with water.
-  **WARNING:** Diversey makes no claims regarding the efficacy of the listed chemicals or methods as a means of controlling infection. Consult your hospital's infection control officer or epidemiologist.



## Chapter 5: Troubleshooting

### Status Indicators

The Base Unit's front panel includes LED indicator lights to provide overall status of the MoonBeam3.

The front panel LED lights will illuminate to signify the status of the system. Examples of the LED lights include proper operation in green, attention required in yellow and fault conditions in red.

The system will be inoperable if any of the lights are red and action must be taken to restore proper function.

### Troubleshooting Common Problems

The following table lists common problems, their possible causes and how to solve them.

Problem	Possible Cause(s)	Solution(s)
Base unit in fault state	Failed boot sequence or hardware fault	First Press the <b>Reset</b> Button to attempt clearing fault Disconnect and reconnect Power cord to cycle power Contact Technical Support
The Remote Cover won't turn on when the Power button is pressed.	The batteries no longer provide an electrical charge.	Replace the batteries. See Battery Replacement section in Chapter 4.
The Ready light will not illuminate on the Remote Cover.	The Base Unit is not powered. One of the UV-C bulbs is not fully seated in its socket. Burned out bulbs on Base Unit ( <b>Bulb Status</b> displayed as red). The Remote Cover is not placed against the closed door. The Sentry unit(s) which is connected with the Base Unit is not powered or configured to be ignored.	Plug the line cord of the Base Unit into an electrical outlet. Ensure all three UV-C bulbs are fully seated in their sockets. Replace bulb and reset <b>Bulb Status</b> on Base Unit. See Bulb Replacement section in Chapter 4. Place the Remote Cover against the closed door ensuring that the <b>Point Toward Door</b> arrow is directed to the door. Turn on the Sentry unit(s), which is connected with the Base Unit. If the Sentry is configured to be ignored, press the Base Unit's <b>Ignore</b> button four times for it to be acknowledged for use.



Problem	Possible Cause(s)	Solution(s)
The Remote Cover won't turn on when the Power button is pressed.	The batteries no longer provide an electrical charge.	Replace the batteries. See Battery Replacement section in Chapter 4.
The Sentry Assist Technology won't turn on when the Power button is pressed.	The batteries no longer provide an electrical charge.	Replace the batteries. See Battery Replacement section in Chapter 4.
The Remote Cover doesn't show as connected to the Base Unit.	Remote Covers may have been swapped between Base Units.	With power turned on for the Base Unit and Remote Cover, press and hold both <b>Connect</b> buttons on the Base Unit and the Remote Cover for 3 to 5 seconds (blinking green) and both will illuminate solid green when connected.
The Sentry doesn't show as connected to the Base Unit.	Sentry units may have been swapped between Base Units or a new Sentry unit is to be deployed for use.	With power turned on for the Base Unit and the Sentry unit, press and hold both <b>Connect</b> buttons on the Base Unit and the Remote Cover for 3 to 5 seconds (blinking green) and both will illuminate solid green when connected.
The Base Unit will not power on.	The line cord may not be fully seated in the Base Unit or the electrical wall outlet.  The fuse may be blown.	Check each end of the line cord and fully seat each connector.  Replace the fuse. See Fuse Replacement section in Chapter 4.
The Sensor Self Test fails on the Base Unit, Remote Cover or Sentry.	A malfunctioning sensor.	Contact Technical Support.
The Base Unit will not enter ready state	Stuck button on control panel	Contact Technical Support



## Appendix A: Hazardous Material Information

### Materials of Construction

We do not intentionally add, nor are we aware, that the products or packaging contain the following materials:

- Mercury, except as used in lamp applications (for example, UV-C lamps, backlit LCDs).
- Cadmium, except as used as thick film inks on printed circuit boards.
- Hexavalent Chromium, except as used as thick film inks on printed circuit boards, as chromate conversion coatings on metal surfaces and as a photoresist on glass panels of cathode ray tubes.
- Polybrominated diphenyl ethers and polybrominated biphenyls.
- Bioavailable arsenic (small amounts of arsenic used in glass, LEDs and semiconductors are not considered to be bioavailable).
- Bioavailable crystalline silica (small amounts of crystalline silica are used in certain paints, coatings and filler materials).
- Polychlorinated biphenyls (PCBs).
- Asbestos.
- Organic tin (not used in tin lead solder applications).
- Ozone-depleting substances such as chlorofluorocarbons, methyl chloroform and carbon tetrachloride.

### Manufacturing

During manufacturing operations that produce Diversey products (including packaging), no ozone depleting substances (such as chlorofluorocarbons, methyl chloroform and carbon tetrachloride) are used.

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## Appendix B: Specifications

### Specifications:

System:	Integrated system for targeted on-demand disinfection with three articulating ultraviolet C (UV-C) lamp bulbs
Bulb:	Lamps (Bulbs): 3 x Diversey-supplied UV-C bulbs (95 watts)
UV-C head physical range, per head:	6" (15 cm) to 84" (210 cm) high
Device weight:	39 pounds (17 kg) complete 27 pounds (13 kg) Base Unit
Device Size:	15" x 44" (38 cm x 112 cm)
Ecological:	No ozone generation, high output UV-C lamps
Environmental:	<i>Operating:</i> Temperature: 40 to 86°F (4 to 30°C) Humidity: 20 to 80% (non-condensing)  <i>Shipping and Storage:</i> Temperature: 30 to 100°F (2 to 38°C) Humidity: 20 to 85% (non-condensing)
Acoustic Noise:	Negligible db
Power:	100-120V~, 3.2A, 50/60Hz, 200-240V~, 1.6A, 50/60Hz
Regulatory:	This product satisfies the Class A limits of IEC60601-1-2. Conforms to IEC/EN/UL 61010-1, Certified to CAN/ CSA Std C22.2, Nos. 61010-1.



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Diversey has been, and always will be, a pioneer and facilitator for life. We constantly deliver revolutionary cleaning and hygiene technologies that provide total confidence to our customers across all of our global sectors. Headquartered in Fort Mill, South Carolina, USA, Diversey employs approximately 8,800 people globally, generating net sales of approximately \$2.7 billion in 2018.

For more information, visit [www.diversey.com](http://www.diversey.com) or follow us on social media.