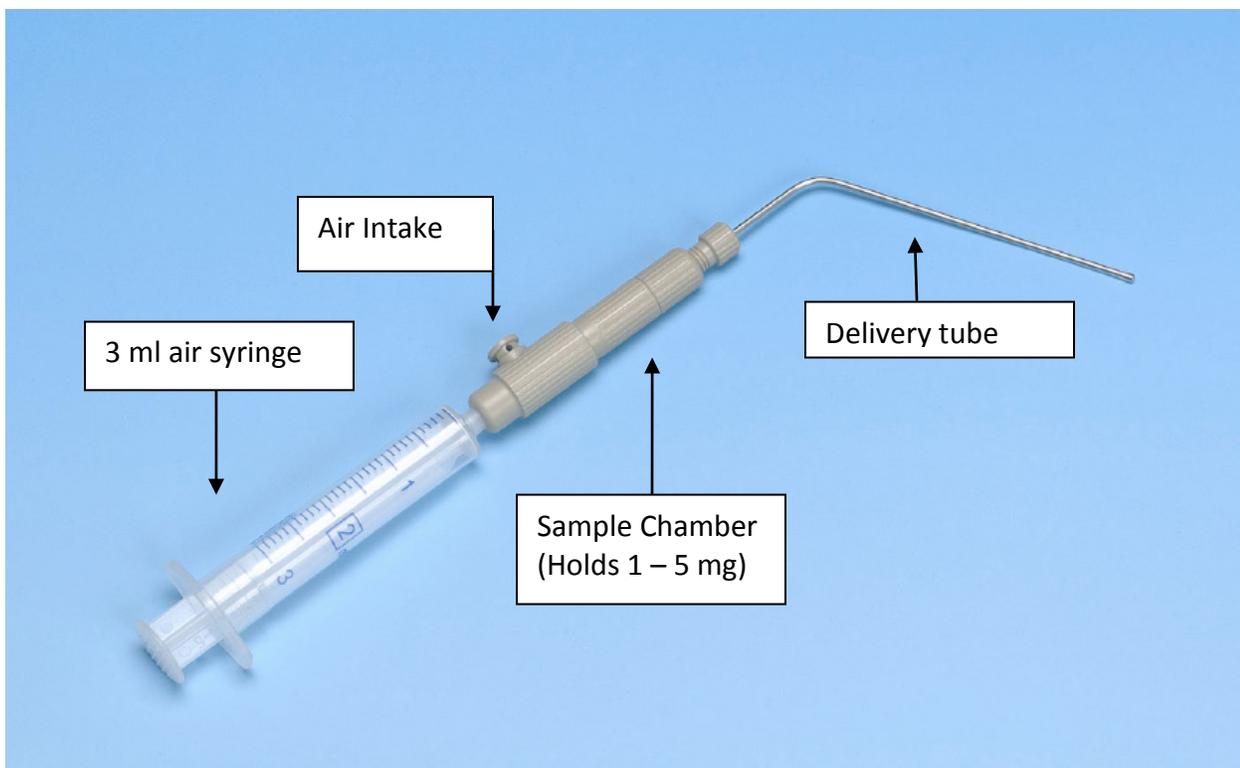


DRY POWDER INSUFFLATOR™ - MODEL DP-4 AND MODEL-DP-4M Instructions for Use

U.S. Patent Nos. 5,523,630; 5,542,412; 5,570,686

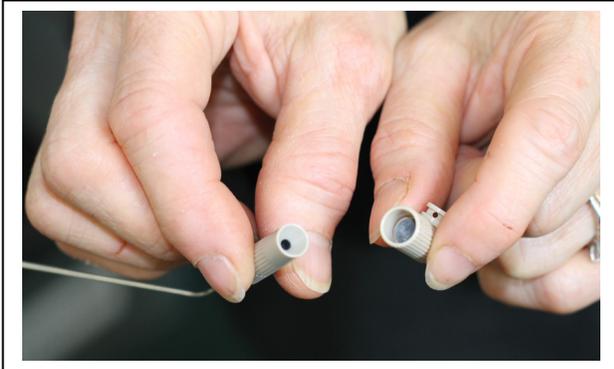


Penn-Century Dry Powder Insufflator™ Model DP-4

Summary of key features

Precise, hand-operated. The Penn-Century Dry Powder Insufflator™ is a hand-operated, pulmonary drug delivery device. It is designed to produce a cloud of fine particles from the end of a small-diameter delivery tube. It can be used to aerosolize and administer a precise dose of dry powder to the lungs, nasal cavities or other in-vitro applications. It has also been used for analysis, testing and development of dry powders. The body of the device is made of chemically resistant PEEK™ parts and silicone valves. It has a hollow stainless steel tip with a 120-degree bend that helps keep the user's hand out of the line of sight, making it easier to view the epiglottis. The device is sterilizable and reusable. (It is preferable to clean it with dry methods, as described on Page 8.)

Penn-Century Dry Powder Insufflator™ -DP-4 and DP-4M Key Features



The device twists apart into two halves: the Air Intake and a Sample Chamber that is connected to delivery tube. The device twists open at the center, revealing a hole that is the Sample Chamber. This can be gently filled manually (using a narrow spatula) with a small amount of powdered material (from 1 to 5 mg).

The device is designed to deliver one dose at a time. It is not intended to hold multiple doses. After it is loaded, the two halves are reconnected. Until the device is used, the powder sample is held securely inside the Sample Chamber by a valve assembly that is specially

designed to prevent loss of the sample, exposure to moisture or contamination from the outside during handling and activation of the device.

Puffs of air push the powder through the device. Small pulses or puffs of air are then administered to the device using the 3 ml commercial air syringe provided, or, if desired, the Penn-Century Air Pump, which has a spring-loaded thumb button and permits faster, more consistent administration of air pulses to insufflate the powder (blow air through it) and carry it out the delivery tube of the device. The volume of the air puff produced by the air syringe (up to 3ml) or Air Pump (up to 5ml) is adjustable, and must be set so that it does not exceed the maximum lung capacity (tidal volume) of the animal to be used.

More than one pulse of air may be required to release 100% of the dose from the Sample Chamber. The air pulse volume setting is determined by the maximum lung capacity or "tidal volume" of the animal to be used.

A precision balance is required for working with the Dry Powder Insufflator™. Because the device is very lightweight, it permits highly precise determination of the amount of dry powder sample that actually reaches the lungs. The user must precisely weigh the device, before and after filling it and after administering one pulse of air only, to verify how many pulses of air are needed to deliver 100% of the dose.

It works with a wide range of powders. Penn-Century Dry Powder Insufflators™ have been successfully used with a wide range of pharmaceutical, biologic, radio-opaque and toxicological dry powder compounds. By applying small pulses or puffs of air to the device, it is possible to administer a range of dry powder substances to the lungs. The characteristics of the powder sample (particle size, etc.) are essentially unaffected by passage through the device. Made of PEEK™ (polyether-etherketone), plastic silicone valves and a stainless steel delivery tube, the Model DP-4 is virtually indestructible chemically and is unaffected by temperatures normally encountered in heat sterilization procedures.

Determining the optimal dose range

- Direct aerosol administration to the lungs with a Penn-Century intratracheal device permits far more precise quantification of the delivered dose and far higher drug concentration than is possible with large nebulizer systems for animals that mix drug with compressed air that is blown - at high momentum - at the nose of the animal. The aerosol from the Dry Powder Insufflator™ is precisely quantifiable.
- A review of literature citing Penn-Century devices indicates that they permit far more efficient administration of very small doses, as well as the ability to deliver far larger doses volumes than would be safe or possible, for example, using liquid droplet administration through a catheter or endotracheal tube.

- **Therefore, researchers should take into consideration that the optimal, most effective dose range they can administer using a Penn-Century intratracheal drug delivery device may be an amount that is far smaller or far larger than is possible within the limitations of standard methods of pulmonary drug delivery in animal models.** The user may need to investigate the optimal dose range of their own formulation by increasing the dose in small increments to determine the minimum or maximum effective dose, and to plan for doing so in their experimental design.

Determining deposition and distribution of powder in the lung

Use of all Penn-Century devices for intratracheal applications is essentially a form of intubation. The user must insert the tip of the device gently down the trachea of the anesthetized animal, near to but not touching the carina.

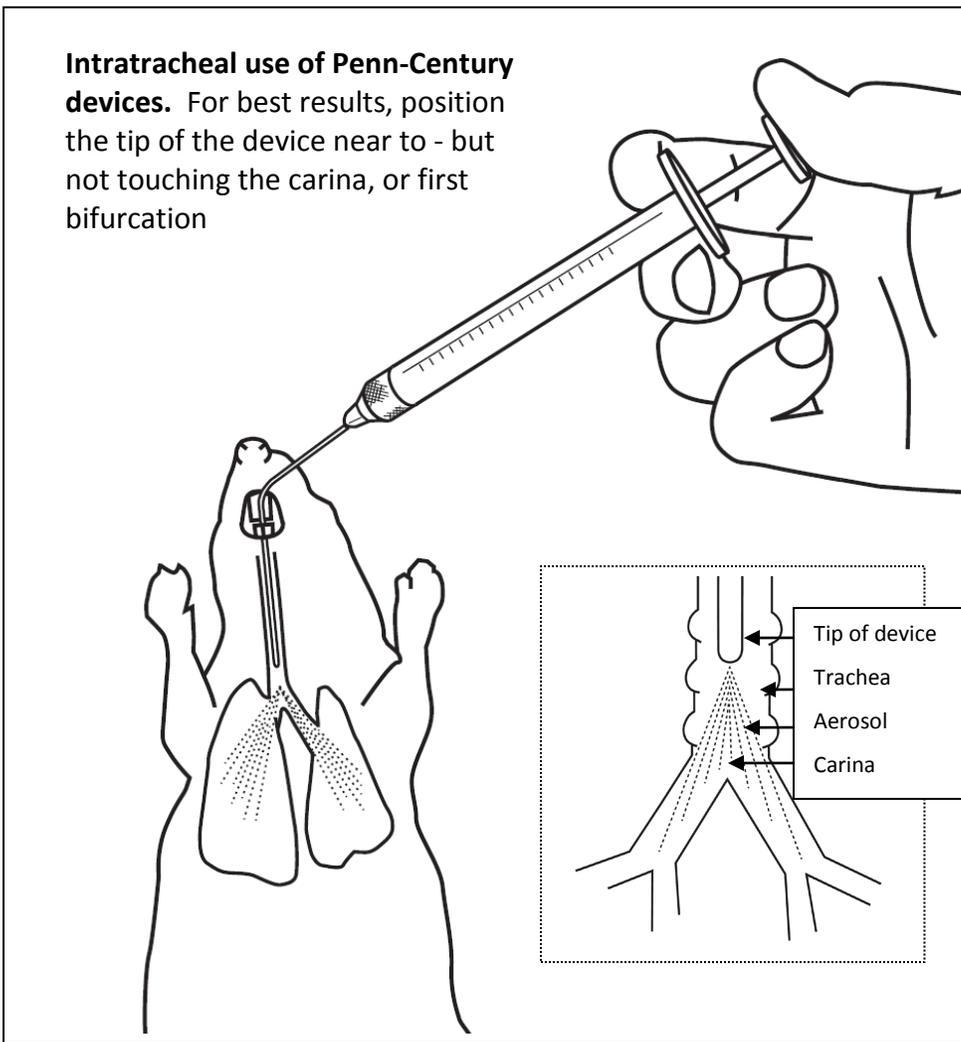
- Particularly when working with small animals such as mice, some users may sacrifice several test animals after use with imaging contrast material to determine if it has been well-distributed in the lungs, or was mostly deposited in the trachea or swallowed.
- Penn-Century also makes several helpful accessories, including a Small Animal Laryngoscope and a Mouse Intubation Platform for helping users quickly and easily visualize the epiglottis and correctly insert the tip of the delivery tube of the Dry Powder Insufflator™ for optimal results.



Correct placement in the trachea is essential.

For intratracheal use, the placement of the very tip of the delivery tube is critical for obtaining the best results. In prior published studies, optimal lung deposition from Penn-Century intratracheal aerosol devices is obtained when the very tip is carefully positioned in the trachea so that the very tip is near to but not touching the carina (first bifurcation) of the anesthetized animal. The device exerts a slight insufflating effect, and permits the user to administer a precisely measured dose of dry powder deep into the lung.

Cautions for intratracheal use in the animal. Use of all Penn-Century devices for intratracheal applications is essentially a form of intubation. Familiarity with intubation and anesthetized animal prep is a prerequisite for use of the devices. The user must insert the tip of the device gently down the trachea of the anesthetized animal, near to but not touching the carina. When using the any Penn-Century intratracheal aerosol device – whether liquid or dry powder, the user must push the plunger of the syringe fast and with force to aerosolize the liquid inside. For optimal lung deposition, the tip of the delivery tube must be positioned near to, but not touching the carina. Therefore, the user must exercise care and attention to minimize any forward motion of the hand while pushing quickly and firmly on the plunger, to prevent trauma or injury to the animal.



Description of Models

DRY POWDER INSUFFLATOR™ - MODEL DP-4

Dry Powder Insufflator™ Model DP-4-R for Rat is designed for intratracheal or intranasal use in Rat. The delivery tube is made of stainless steel that extends 2" after a 120-degree bend. The Model DP-4 is intended to be loaded with one dose (of 1-5 mg) per administration. It operates with a 3ml air syringe provided, or, if desired, a Penn-Century Air Pump. The air pulse is determined by the tidal volume of the animal to be used. For use in Rat, air pulses should not exceed 2 ml per pulse.



Dry Powder Insufflator™ Model DP-4-GP for Guinea Pig is designed for intratracheal or intranasal use in Rat. The delivery tube is made of stainless steel that extends 3" after a 120-degree bend. The Model DP-4 is intended to be loaded with one dose (of 1-5 mg) per administration. It operates with a 3 ml air syringe provided, or, if desired, a Penn-Century Air Pump. The air pulse is determined by the tidal volume of the animal to be used. For use in Guinea Pig, air pulses should not exceed 3 ml per pulse.

Dry Powder Insufflator™ Model DP-4-C (Custom)

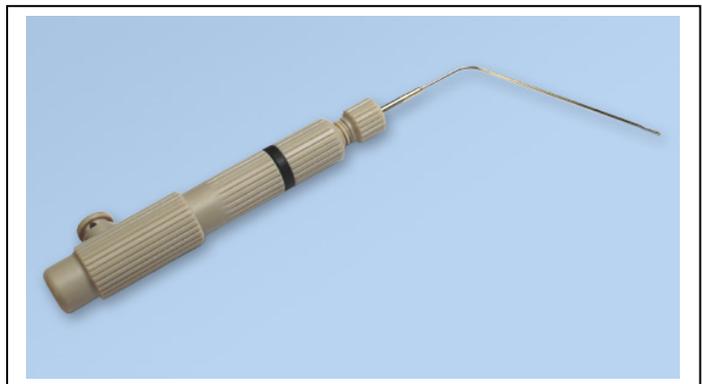
Custom devices can be made with delivery tubes that are sized for intratracheal use in larger animals. These custom-made delivery tubes can be made of soft, flexible plastic tubing that can be inserted into the trachea via a bronchoscope, or made of rigid stainless steel, to be inserted directly, or via an endotracheal tube.

DRY POWDER INSUFFLATOR™ - MODEL DP-4M FOR MOUSE

The Dry Powder Insufflator™ Model DP-4M for Mouse has a unique design and valve system that is not the same as the Model DP-4. It is specifically designed for intratracheal or intranasal use in Mouse. The device is made of chemically resistant PEEK™ parts, silicone valves, and a stainless steel delivery tube. It has a shorter, more narrow diameter delivery tube than the DP-4 and is suitable for intratracheal powder administration in mice that extends 1.25" at the tip (after a 120-degree bend). The DP-4M valve system is designed to release the powder using a far smaller volume of air than is required for powder release with the Model DP-4. It is designed for precise administration of one dose at a time in a dose volume of 1-2 mg. It is not designed to be filled with a large volume of powder to dose multiple animals.

The Model DP-4M is best used with Penn-Century Air Pump.

The Model DP-4M is designed to be operated with a Penn-Century Air Pump – Model AP-1, which permits precise, rapid, repeatable administration of pulses of air at 200µl per pulse. The Air Pump** minimizes hand motion, which is critical when working in a smaller animal, and eliminates the need to remove and reinsert the tip of the DP-4M to apply a second or third pulse of air, if needed. The size of the air pulse is determined by the tidal volume of the animal to be used. For use in Mouse, air pulses should not exceed of 200µl per pulse.



****NOTE:** *The Air Pump Model AP-1 has been discontinued due to changes from our suppliers. We are developing a new, hand-held Air Pump Model AP-2 for rapid applications of precise volumes of air for use with our Dry Powder Insufflator™ Model DP-4 or Mode DP-4M. The new Air Pump will be available after development and testing to assure t meets our quality standards. Contact us for updates.*

ACCESSORIES

PENN-CENTURY AIR PUMP – MODEL AP-1

****NOTE:** *The Air Pump Model AP-1 has been discontinued due to changes from our suppliers. We are developing a new, hand-held Air Pump Model AP-2 for rapid applications of precise volumes of air for use with our Dry Powder Insufflator™ Model DP-4 or Mode DP-4M. The new Air Pump will be available after development and testing to assure t meets our quality standards. Contact us for updates.*

Penn-Century Air Pump – Model AP-1 is designed to “insufflate” or blow air through the powder sample of the Model DP-4 or DP-4M. The pump has a spring-loaded thumb button that automatically returns, instead of a plunger that must be pulled up and pushed in each time. It permits the user to rapidly generate single pulses or puffs of air at a specific volume, each time the thumb button is depressed. The air setting of device is adjustable to administer pulses of air from 0 - 5 ml – depending on the lung capacity or tidal volume of the animal to be use. It may be used with any Model DP-4 and is required for use with the Model DP-4M. , Because the thumb button



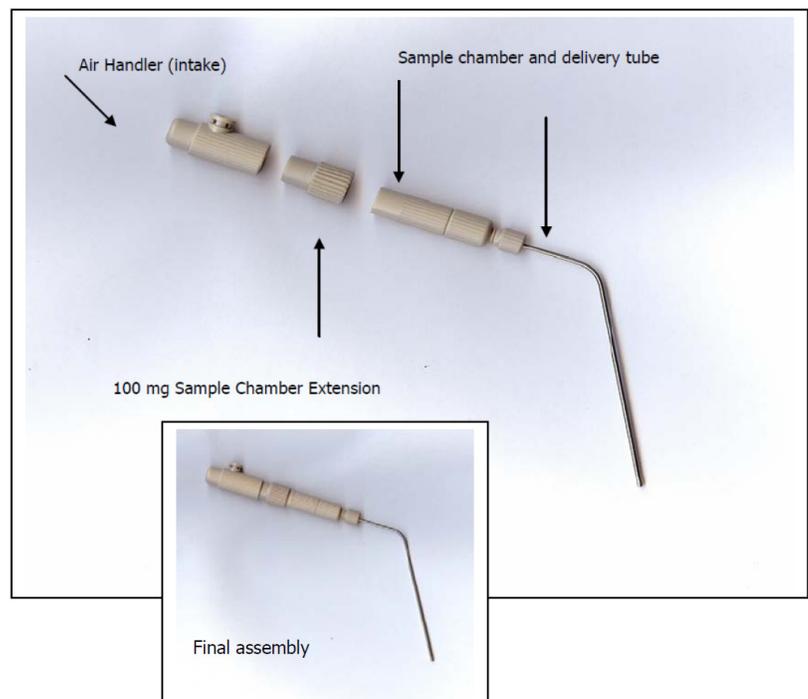
of the Air Pump returns automatically and delivers the same exact air volume pulse each time, it minimizes the undesirable hand motion that occurs when trying to aerosolize the powder using a plunger-style air syringe. It also avoids the necessity of removing tip of the Dry Powder Insufflator™ from the trachea to locate the correct air volume setting of a plunger-style air syringe each time the user wishes to administer more than one pulse of air. The Air Pump has a larger diameter piston than a commercial air syringe provided with the device and is made of plastic with a rubber seal and a male luer slip tip.

Setting of air volume: As a convenience to the end user, the device is shipped set to deliver a

volume of air for the animal specified. Typically, the device is set at the customer’s request to air volumes of: 200µl for mouse, 2 ml for rat, or 3 ml for guinea pig. The Air Pump can reset by the user to administer up to 5 ml using a small hex wrench provided.

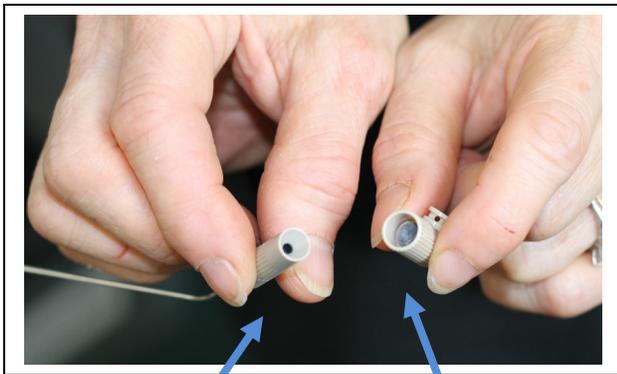
100MG SAMPLE CHAMBER EXTENSION – MODEL SC-X

Description: For administration of dose volumes greater than 5 mg, the 100 mg Sample Chamber Extension – Model SC-X can be purchased. This tube press-fits to the top of the Sample Chamber to provide a deeper capacity for larger powder samples. When filled, the Air Intake is attached to the Sample Chamber Extension. When administering large volumes, the user must determine how much emerges from the Model DP-4 with each pulse of air, as it may take more air pulses to administer 100% of the dose, particularly when volumes larger than 5 mg are being administered.



RECOMMENDATIONS FOR USE OF PENN-CENTURY DRY POWDER INSUFFLATORS™

- **First time use:** New users are encouraged to practice with the device by loading a volume of inhalation grade lactose that is similar to the volume they plan to use in their final study. Practicing using it in the open air will give a sense of how fast and hard the plunger of the air syringe or Air Pump must be pushed to produce a cloud of particles. If using the air syringe, it is necessary to first set the plunger using the measurement marks on the syringe to deliver the proper volume setting for the animal to be used. The user must push the plunger quickly and firmly to produce a cloud of particles. If using the Air Pump, normal thumb pressure is sufficient and the thumb button will return to the start position automatically. NOTE: The device is tested with inhalation grade lactose prior to shipping. Trace amounts of powder may be on the device when first opened.
- **Characteristics of use with dry powder formulations:** Penn-Century Dry Powder Insufflators™ have been successfully used with a wide range of pharmaceutical, biologic and toxicological compounds. The Penn-Century Dry Powder Insufflator™ does not filter or alter the powder formulation and can accommodate a very wide range of powder particle sizes from nanoparticle formulations to large porous particles. Dry powder formulations vary widely in their characteristics. Some powders may absorb ambient humidity more rapidly than others. In such cases, the entire device may be loaded in a glove bag to keep it from exposure to air. Once the device is loaded and the two halves are reattached, exposure to air is very minimal.
- **Dose volume capacity of Model DP-4:** The Model DP-4 is designed for precise administration of powder doses in the range of 1-5 mg. For larger doses, the user may purchase a 100 mg Sample Chamber Extension. Regardless of the dose capacity of the device, the dose is intended to be loaded with one dose per use. It is not intended to be filled with a larger volume of powder in order to dose smaller amounts to several animals in sequence.
- **Dose volume capacity of Model DP-4M:** The Model DP-4M is designed for precise administration of powder doses in the range of 1-2 mg. It is intended to be loaded with one dose per use. It is not intended to be filled with a larger volume of powder in order to dose smaller amounts to several animals in sequence.
- **Static electricity – Effect on powder sample:** It is important to note that the device is made of non-conductive materials which can build up a slight electrostatic charge that can interact with the powder samples and cause the internal surfaces to acquire a light coating of powder. This coating can add a milligram or more to the tare weight of the device. For this reason, the device should be loaded and discharged several times before starting an experiment in order to allow electrostatic effects to become saturated. Once the internal surfaces are coated, the device will be relatively stable gravimetrically. Tare weight variations of the stabilized device are on the order of 50-100µg. **It is not necessary to remove all traces of powder between each use, as this may refresh the static properties of the device.** The optimal sample delivery efficiency is achieved (nearly 100% with lactose) after two or three deliveries, when the static electrical effects have become saturated.
- **Quantifying dry powder dose delivery:** Because the devices are light, it is possible to precisely quantify the delivered dose, unlike passive exposure systems. To do this, the user must weigh the device before and after loading, using a precision balance or scale.
- **Preparing to load the Dry Powder Insufflator™:** The Model DP-4 and DP-4M each consist of two halves: an Air Intake and the Sample Chamber. The Sample Chamber is the portion of the device that is attached to the delivery tube. Separate the two parts with a simple “twist-and-pull” motion. On rare occasions, the two halves may stick together and cannot be twisted apart. If this occurs, grasp the two parts firmly with your finger tips close to the point where they meet and gently rock your hands up and down in unison – as if you were attempting to break the device in half. This usually immediately releases the two halves.



Sample Chamber

Air Intake

Load dry powder ONLY in the Sample Chamber (= the part that is attached to the delivery tube)

DO NOT load powder in the Air Intake, as it can interfere with the performance of the device.

- **How to correctly load the Dry Powder Insufflator™ - IMPORTANT!**
 1. Remove the air syringe or Air Pump from the Insufflator™ prior to loading and weighing it.
 2. Before loading, weigh the device empty using a precision balance.
 3. Determine the desired dose volume. Use a narrow spatula to place the dry powder dose into the hole of the Sample Chamber.
 4. It is best to simply let the powder fall from the spatula into the Sample Chamber. Take care not to jab or force the tip of the spatula too deeply into the Sample Chamber, as it may damage the valve assembly inside it.
 5. **NEVER load the Air Intake portion of the device with powder, as this may interfere with the proper function of the Dry Powder Insufflator™.**
 6. Once the powder is in the Sample Chamber, tap the chamber lightly to settle the sample contents toward the distal tip. (For the DP-4M, hold the device horizontal after loading and before insertion to avoid accidentally shaking loose some of the powder sample.)
 7. Check to be sure that the connecting surfaces of the tapered joint are free of powder,
 8. Re-attach the Sample Chamber to the Air Intake by gently pushing the two halves together. **When re-attaching the two halves, use only enough force to ensure that the connection between them will not separate when a puff of air is delivered. Pushing the two parts together forcefully may loosen some of the sample inside and force it out of the delivery tube.** This is particularly of concern when using very small dose volumes. Do not overtighten.

- **It may take more than one pulse of air to empty the device**

Prior to use in an in-vivo or in-vitro experiment, the user MUST determine what percent of the total dose is released after one pulse of air. Our experience indicates that more than one pulse of air may be needed to release 100% of the dose, depending on the characteristics of the powder. Different powder formulations may behave differently and require more or fewer pulses of air. A powder that is not hygroscopic, or electrostatic powder may require only one or two pulses to fully clear from the device. More complex, or larger samples but may require several discrete puffs of air, as many as ten. The user must take time to learn how many pulses of air will be needed to dispense 100% of the particular formulation or compound they are using.

- **Determining how many air pulses it will take to deliver 100% of your sample**
 1. First, use a precision balance to determine the exact weight of the device when empty.
 2. Weigh the device empty, without the air syringe or Air Pump attached.
 3. Load the device with the desired dose and reweigh the device. The new weight should equal the weight of the empty device plus the weight of your sample.

4. Set the air syringe or Air Pump at the correct setting for use with the particular animal or planned use.
5. Administer one pulse of air to the device while pointing the tip toward the open air or directing the powder into a safe enclosure, as appropriate.
6. After one pulse of air, weigh the device again to calculate what percent of the total dose came out.
7. Apply a second pulse of air.
8. Calculate what percent has now been delivered.
9. Repeat this process until 100% of the dose has been released and the device has returned to its empty weight.

This process will tell you how many pulses of air will be required to deliver 100% of the dose when the device is inserted in the animal or used for your intended purpose.

- **Delivering more than one pulse of air:**

When using the 3ml air syringe: If the user has determined that more than one pulse of air is required to deliver 100% of the dose, the user must remove the delivery tube from the trachea each time to locate and reset the plunger of the air syringe to the correct air volume for the animal to be used (e.g. 2ml for rat, 3ml for guinea pig.) Then, re-insert the delivery tube in the trachea and push the plunger quick and with some force.

When using the Penn-Century Air Pump: the user may maintain the delivery tube in position in the trachea while they administer more than one pulse of air. The thumb button will automatically return to the correct setting each time. Little pressure is needed to produce a puff of air.

- **Important cautions regarding air pulse volume and animal safety**

For *in vivo* use, the Penn-Century Dry Powder Insufflator™ is designed to aerosolize a precise dose of powder sample while producing a slight insufflating affect in the lung to enhance deposition in the animal. The recommended volume of each air pulse or puff of air is based on the tidal volume or maximum lung capacity of the animal to be used. Excessive applications of air can cause extreme stress to the test subject and even death. (If the device is being used to administer powders to other locations or for in-vitro testing, these air volume constraints may or may not be relevant.)

- **Setting the air pulse volume**

The Model DP-4 can be operated either with a 3 ml plastic, commercial air syringe (provided) or a Penn-Century Air Pump. The 3 ml air syringe has measurement marks along the side of it. The user must position the tip of the plunger to the correct volume mark for use in a particular animal. This process must be repeated each time another puff or pulse of air is administered to the animal. For use in rat, the plunger of the air syringe must be positioned to administer air volumes of 2 ml. For use in Guinea Pig, the plunger should be set to administer air volumes of 3 ml. For custom uses, this setting must to be determined by the end user. Please note that the air syringe is disposable. It may wear over time and is not intended for long-term use. The Penn-Century Air Pump has an adjustable air volume setting from 0-5 ml. Once the volume is set to the desired amount using the small wrench tool provided, the device will automatically administer the same volume by pressing down on the spring-loaded thumb button. It will automatically return to the same setting each time.

- **Positioning the delivery tube in the trachea**

The use of Penn-Century's intratracheal devices is essentially a form of intubation. The user is intended to gently insert the tip of the device into the trachea of the anesthetized animal so that the tip is near to but not touching the carina. If the tip is too high in the trachea, powder may accumulate along the walls of the trachea or against the carina, rather than pass into the lungs. In larger animals or primates, it is possible to use longer, custom-length Penn-Century devices via a bronchoscope or endotracheal tube and target the carina or one lung.

- **Cautions for intratracheal use in the animal**

When using the 3ml air syringe, the user must push the plunger of the device fast and with force to aerosolize the powder inside. For optimal lung deposition, the tip of the delivery tube must be positioned near to, but not touching the carina. The user must therefore exercise care and attention to minimize any forward motion of the hand while pushing firmly on the plunger, to prevent injury to the animal. If users are using an Air Pump with the Dry Powder Insufflator™, this hand motion is minimized, but care

must still be taken to minimize one's hand motion during repeated administrations of air and powder to the animal.

CLEANING AND CARE OF DRY POWDER INSUFFLATORS™

- **Cleaning the main device body – Dry methods preferred**
 - In general, the Dry Powder Insufflator™ is constructed of sterilizable, chemical and heat resistance materials. Due to the complex nature of the valve system inside, dry methods of cleaning are preferred. The user may employ an air compressor for this purpose, if one is available in the lab, or purchase a container of compressed air, ("Dust Off" or similar) such as is commonly used to clean computer keyboards or camera lenses.
 - To clean the Sample Chamber, detach it from the Air Intake and direct a small stream of air or other compressed gas into it. Do not thrust the nozzle of the air source down into the Sample Chamber – as it may damage to the valve assembly. Do not use excessively forceful compressed air sources as they may damage the device. If you have particular questions or concerns about acceptable methods of cleaning, feel free to contact us with your questions.
 - NOTE: Each time the device is cleaned with compressed air, it may remove the residue of powder that has coated the interior of the device. This may renew the static effects that will cause sample loss the next time the device is used. For consistency of dose administration, if possible, do not blow off the powder residue that remains inside the device after each use in an animal, **as this may refresh the static properties of the device and make it more difficult to have consistent dosing.** As noted above, the optimal sample delivery efficiency is achieved (nearly 100% with lactose) after two or three deliveries, when the static electrical effects have become saturated.
 - Liquid methods of cleaning the device, such as alcohol, organic solvents (ethanol or methanol), or water are less desirable than use of dry methods. Liquids, especially water, may work themselves into small crevices inside the Insufflator™ where it may be difficult to fully dry out and the moisture that remains can interfere with subsequent powder deliveries. Some users have reported that the device can be dried after use of liquid solvents or cleaners by placing the device in a low temperature (incubation temperature) oven at 60 degrees Fahrenheit for *Please note that dessicator systems are designed to remove water – not solvents.*
- **The stainless steel delivery tube can be removed and cleaned separately with liquid**

The delivery tube of the device is hollow and detachable, and may be cleaned separately, autoclaved or immersed in water, organic solvent or disinfectant. It should be thoroughly and completely dried – using compressed air or by air drying it, prior to reattaching it to the body of the device. To remove the delivery tube, simply twist the 10-32 fitting ¼-turn counterclockwise and pull the tube out. To replace, push the stainless steel tube in to a hard stop and twist the fitting ¼-turn clockwise, or until some resistance is felt. Do not overtighten.
- **Clearing clogged internal valves**

Relatively large inclusions, agglomerations, or impurities in the powder sample may occasionally clog up the valves of the delivery device. This is especially the case with samples that are highly hygroscopic or absorbing humidity from the air. If this happens, you will experience considerable resistance when attempting to deliver the air pulse, and no air will be expelled from the tip of the delivery tube.

Valve Clearing Tool A small red tool with a soft white tip has been provided with your device to permit you to gently probe and clear powder that may have formed a lump that is stuck in a valve inside either the Sample Chamber or Air Intake.

Air Intake If the device is not used for long periods of time (months), the valve assembly in the Air Intake may occasionally stick in the closed position, making it difficult to fill the air syringe. To open the valve, insert the valve-



clearing tool into the same opening of the Air Intake in which the syringe is inserted - as far as it will go. This technique may also be used to clear any obstructions that may compromise Air Intake valve function. Compressed air may be applied to the surfaces of the Air Intake.

Sample Chamber If there is dry powder material is stuck in the valve assembly of the Sample Chamber, remove the Air Handler and direct a small stream of air or other compressed gas ("Dust-Off" or a similar product for cleaning computer keyboards will do) into the Sample Chamber. Take care not to thrust the nozzle of the air source into the Sample Chamber to avoid damage to the valve assembly. Do not use excessively forceful compressed air sources.

As manufacturers, Penn-Century, Inc. can offer:

- Product knowledge
- Operation of our devices
- Familiarity with published studies related to use of the same device and, if possible, similar drugs
- Familiarity with customer feedback about them

These instructions and photos are the property of the Penn-Century, Inc. They must be not be reproduced without the written consent of Penn-Century, Inc.

IMPORTANT NOTICE

Requirements for references to Penn-Century devices in publications, abstracts and presentations

As a condition of sale, the Buyer agrees that upon publication or presentation of any research conducted using a Product, the Penn-Century name and Product name must be correctly referenced as the manufacturer ("Penn-Century, Inc. Wyndmoor, PA") and the Products must be correctly spelled and cited, and include Penn-Century's registered trademark and model number as follows and as applicable: "MicroSprayer@ Aerosolizer – Model ___", "FMJ-250 High Pressure Syringe", "Dry Powder Insufflator™ - Model ___" or "Small Animal Laryngoscope – Model LS-2". A breach of this section shall result in immediate harm to Penn-Century, and in addition to any and all rights available to Penn-Century, Penn-Century shall be entitled to an injunction or other equitable relief as a remedy for such breach.

For a full summary of the company's repair and warranty policies, please review the Penn-Century Terms and Conditions.

For any questions, contact us at Penn-Century, Inc. – info@penncentury.com or 215-753-6540.

**WARNING: This device is for laboratory use only; not for human *in vivo* use.
If you have a question or problem with the device that you feel is related to device malfunction, please contact Penn-Century immediately at: info@penncentury.com or (215) 753-6540**