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Figure 1

URN (UNIVERSAL RODENT NOSE CONE)

AS-01-0525-02
(17mm diameter)



Figure 2

URN NRB SYSTEM (UNIVERSAL RODENT NOSE CONE NON-REBREATHING SYSTEM)

AS-01-0525
(17mm diameter)

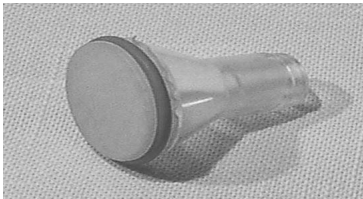


Figure 3

SMALL RODENT FACE MASK for use with URN NRB System body

AS-01-0305
(25mm diameter)



Figure 4

RODENT FACE MASKS

Small	AS-01-0305
Medium	AS-01-0306
Large	AS-01-0307
Extra Large	AS-01-0308

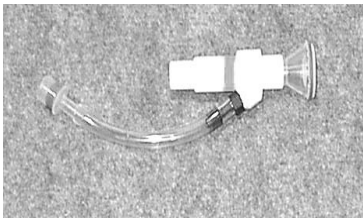


Figure 5

MAPLESON-D NRB - With Small Rodent Face Mask

AS-01-0500-07



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Face Mask / Nose Cone / URN / Mapleson-D NRB User Instructions

Application:

The URN (designed to be used with a coaxial non-rebreathing system), and URN NRB system (a coaxial non-rebreathing system), and Small Rodent Face Mask, and Mapleson-D NRB are designed to be used primarily with mice and rats. These devices are usually used in conjunction with an inhalant anesthesia system; however they could be used to administer oxygen and/or other metabolic gases without inhalant anesthesia (for example if the subject were anesthetized with an injectable anesthetic). However, any species can be safely anesthetized with either system as long as:

1. The subject's muzzle and/or breathing apparatus can fit within the nose cone or small face mask.
2. The reservoir of fresh gas is large enough to meet and/or exceed the tidal volume of the subject.
3. The URN and Small Rodent Face Mask is attached to a properly configured coaxial NRB system. (Example: Jackson Rees, Bain, Mapleson D, Ayers T piece, the URN NRB system body, and the Mapleson-D NRB.)
4. The proper oxygen flowrate is maintained to ensure no buildup of CO₂ in the fresh gas reservoir.

CAUTION: THIS PRODUCT CONTAINS NATURAL RUBBER LATEX WHICH MAY CAUSE ALLERGIC REACTIONS IN SOME INDIVIDUALS.

Parts List:

Figure 1 - The URN

Figure 2 - The URN NRB and/or Mapleson-D NRB System

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Figure 3 - The Small rodent face mask.

Figure 4 - The accessories for the URN and the URN NRB system are as follows:

- ❖ 1 each extra "O" ring. AA-00-0319
- ❖ 1 each extra diaphragm material 6 inches X 12 inches.

Figure 5 - The accessories for the Small Rodent Face Mask

- ❖ 1 each extra "O" ring. AA-00-0315
- ❖ 1 each extra diaphragm material 6 inches X 12 inches

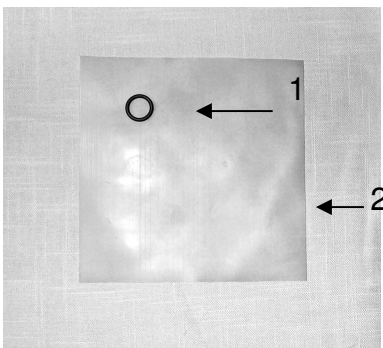


Figure 4

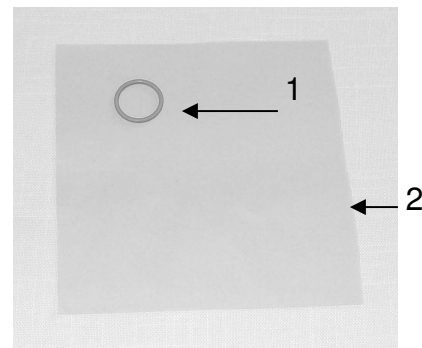


Figure 5

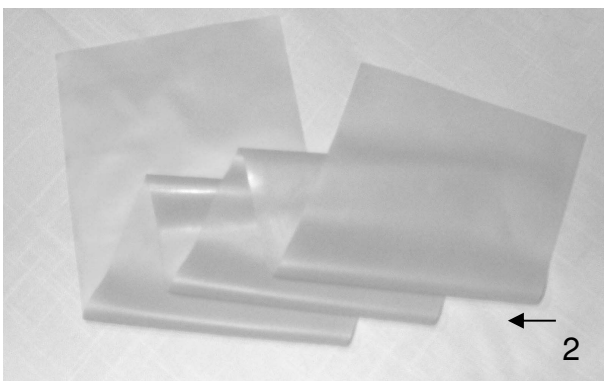


Figure 6

Optional Accessory - AA-00-0309

A 6 inch wide X 36 inch long sheet of 12 mil latex diaphragm material that can be purchased separately. (see figure 6)

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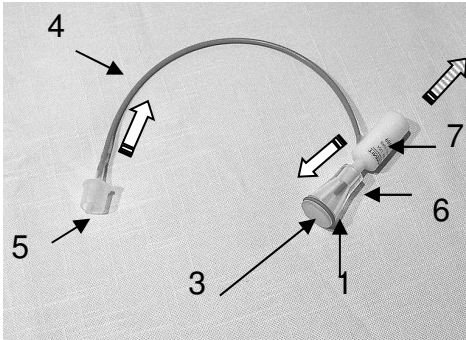


Figure 7

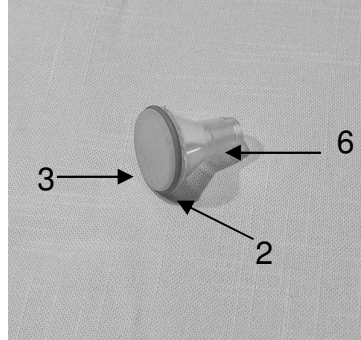


Figure 8

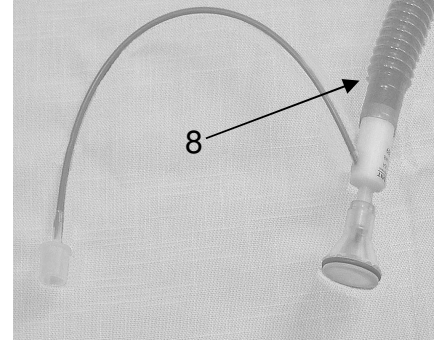


Figure 9

Legend for Figures #7, #8, and #9 (URN NRB and Mapleson-D NRB systems)

- #1. AA-00-0319 - Silicone "O" ring for URN and URN NRB System. Note: Each URN and URN NRB System comes with an extra "O" ring.
- #2. AA-00-0315 - Silicone "O" ring for Small Rodent Face Mask. Note: Each Small Rodent Face Mask comes with an extra "O" ring.
- #3. AA-00-0309 - 12 mil Latex Diaphragm. Note: Each URN, URN NRB System, and Small Rodent Face Mask comes with an extra 6 inch X 6 inch sheet of Latex Diaphragm material to facilitate replacing defective diaphragms. Note: Extra diaphragm material may be purchased separately. (6 inch X 36 inch roll).
- #4. Fresh Gas Feed Tube (note direction of flow of fresh gas marked by white bold arrow). Note: This component cannot be purchased separately.
- #5. AA-00-1120 - 3.0mm male X 15mm male endotracheal tube adapter. This adapter plugs into the 15mm Common Outlet (Fresh Gas Outlet) on the inhalant anesthesia system. Note: This item may be purchased separately.
- #6. Fresh gas reservoir of URN and Small Rodent Face Mask.
- #7. Body of URN NRB System. The blue 19mm evac tubing fits on this body to collect and manage Waste Anesthetic Gases. Note: This component cannot be purchased separately.
- #8. AA-00-0480 - Blue 19mm corrugated evac tubing. Note: This component may be purchased separately,

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Principle of Operation:

1. The URN NRB and Mapleson-D NRB Systems are coaxial flow systems in which the fresh gases flow towards the subject via the fresh gas feed tube (see bold white arrows for direction of flow). The exhausted gases (CO₂) and other unused waste anesthetic gases flow away from the subject towards the Waste Gas Management System (see bold striped arrow for direction of flow).
2. The flowrate of fresh gas is set relatively high in relation to the subject's tidal volume. This is done to ensure that the exhaled CO₂ from the subject is flushed towards the Waste Gas Management System.
3. Suggested minimum flowrate for a mouse: 500cc/minute.
4. Suggested minimum flowrate for a rat: 1 lpm.

CAUTION: Using fresh gas flowrates lower than the suggested flowrates may result in CO₂ buildup within the fresh gas reservoir.

5. Since the anesthetic gases and the typical carrier gases (Example: 100% Oxygen, Medical Air, Nitrous Oxide, Nitrogen, etc.) are extremely volatile, the fresh gas flowrate is used to continually flush the waste gases into the Waste Gas Management System. It is vital to the proper operation of the NRB System that the diaphragm of the URN and the Small Rodent Face Mask be cut with the proper sized orifice--appropriate for the size of the subject and the position of the subject.

Since rodents are obligatory nose breathers in the sternal recumbency, it is not necessary to insert more than the subject's nose into the fresh gas reservoir. The diaphragm can be cut appropriately (see section entitled "Replacing the Diaphragm") using a pair of delicate sharp/sharp scissors (see Figure 19).

- a. The circular hole in the diaphragm needs to be small enough such that the diaphragm forms a tight seal around the subject's muzzle.
- b. The circular hole in the diaphragm needs to be large enough so that it is not too tight and occludes the nares preventing proper spontaneous breathing.

CAUTION: Do not cut a cross (+) or an "X" in the diaphragm for the subject's nose because diaphragm will not seal properly around the subject's muzzle and anesthetic gases will escape into work space.

6. If the rodent is in the dorsal recumbency, it is recommended that the subject's nose and mouth be inside the fresh gas reservoir. When the subject is on its back, there is a risk of the subject breathing through its mouth. If the mouth is outside the fresh gas reservoir, and

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the subject is allowed to breathe room air through its mouth, the level of anesthetic may be diluted by the room air and the subject may not be sufficiently anesthetized. In the dorsal recumbency, we recommend that the subject's nose and mouth is within the fresh gas reservoir.

7. If the rodent is on its side, there may be the possibility of mouth breathing. Our recommendation is that the subject's nose and mouth be inside the fresh gas reservoir.

Replacing the "O" Ring and the Diaphragm:

1. The silicone "O" ring holds the diaphragm material in place on the URN and Rodent Face Mask fresh gas reservoir.
 - A. Silicone is more resistant to photo degradation and oxidation than latex. However, when it becomes cracked or broken and will no longer hold the diaphragm material in place, it is time to change the "O" ring. An extra "O" ring comes with each kit. Additional "O" rings can be purchased separately.
2. The "O" ring can be removed by rolling it from the groove it rests in. Using your thumb, press down and roll the "O" ring to the front to dislodge it from the groove (see figure 10).
 - A. The defective diaphragm material will be discarded and the new diaphragm material installed.



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3. The diaphragm is made of 12 mil thickness latex sheet material. This latex is much thicker, more durable, and more resistant to tearing; and more resistant to oxidation than surgery glove material (2 - 3 mil thickness). We do not recommend that you replace the diaphragms with surgery glove material

For those reasons stated above--and because the surgery glove latex material may be more permeable to the anesthetic gas molecules. There is a possibility of trace anesthetic gases escaping into the work space if surgery glove material is used. Extra diaphragm material comes with each kit. Additional diaphragm material can be purchased separately.

- A. The defective diaphragm material can be replaced. Please follow the following processes:
1. Roll the "O" ring out of the groove of the URN or Rodent Face Mask fresh gas reservoir (see figure 10, 11, and 12).
 2. Discard the flawed diaphragm material.
 3. Stretch the new diaphragm material over the end of the URN or URN NRB System or Rodent Face Mask fresh gas reservoir (see figure 13)
 - a. Hold the new latex diaphragm material with thumb and forefinger of one hand (see figure 14).
 4. Reinstall the "O" ring over the new diaphragm material and allow it to rest in the groove in the fresh gas reservoir (see figure 15).
 - a. Make certain that there is no gap around the periphery of the diaphragm where trace anesthetic gases might escape (see figure 16).
 5. Pull the diaphragm material around the edges to smooth out the diaphragm and create a slight tension on the diaphragm (see figure 16).
 6. Using a pair of delicate sharp/sharp scissors, cut off the excess diaphragm material from around the "O" ring. Save the rest of the new diaphragm material for subsequent diaphragm replacements (see figure 17 and 18).
 7. Using delicate sharp/sharp scissors cut a **circular** hole in the diaphragm the appropriate size of the subject's nose and/or nose and mouth. (see figure 20,21,22)
 - a. Position the circular hole in the diaphragm such that when the subject's nuzzle is placed in the diaphragm, the subject's head is relatively level with its body. The URN, URN NRB, and Mapleson-D NRB fresh gas reservoir can be rotated on its axis to ensure that the orifice in the diaphragm is in the proper position.

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Figure 10



Figure 11



Figure 12



Figure 13



Figure 14

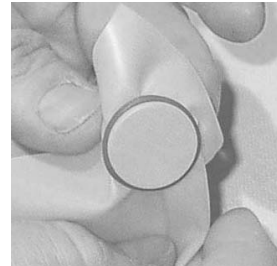


Figure 15

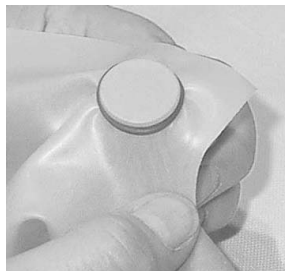


Figure 16

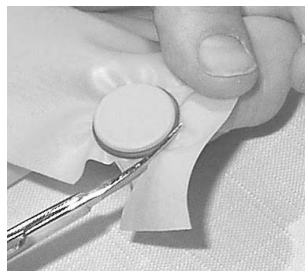


Figure 17

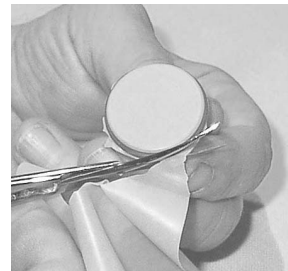


Figure 18

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Figure 19

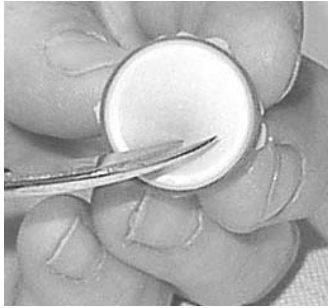


Figure 20



Figure 21

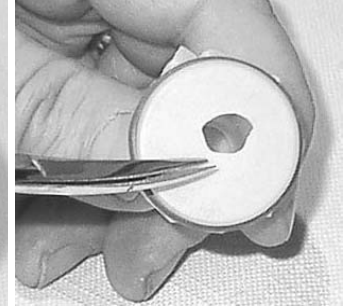


Figure 22