TITLE: Operation of the Euthanex Smartbox Model M1-SBFF Euthanasia Chamber

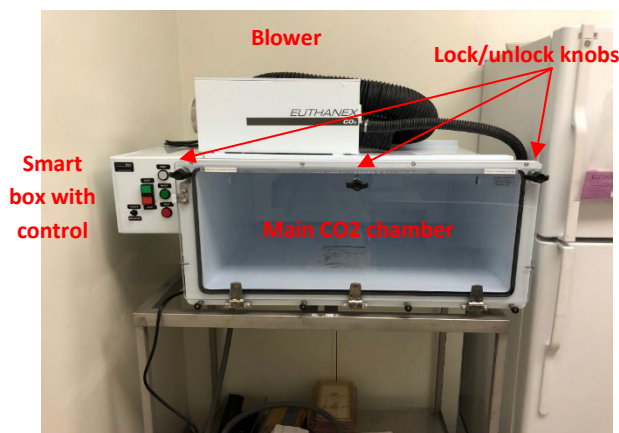| SOP Category: Veterinary	RUAC SOP #: 7.15	Page: 1 of 4
Effective Date: 04/22/2025	Approval:	
Revision Date: 03/31/2020, 04/27/22, 5/17/2022		

SCOPE: This SOP applies to all Animal Care Staff (ACS), ACS Supervisors (ACSS), Veterinary Staff (VS) and Research Staff members (RS) at the Rutgers Newark, New Brunswick and Piscataway facilities.

OBJECTIVE: The goal of this document is to provide direction on proper use of the Euthanex Smartbox model M1-SBFF euthanasia chamber along with reference values for the device.

<u>Note</u>: The Smartbox system is efficient for euthanizing multiple cages of animals in a single cycle. **If you are only euthanizing 1-2 cages of animals, the single cage euthanasia station will be more efficient and should be used.**

<u>**Materials:**</u>

Main parts of device:

Close up of Smartbox / control panel:

PROCEDURES:

<u>**To operate device:**</u>

1) Check to ensure the white READY light is on. If not, check to ensure that the SmartBox power switch, located at the back of the box, is set to ON.

2) Turn the three knobs on the front of the chamber door <u>counterclockwise</u> to open (Caution: door opens downward, lower gently to prevent hinge damage). **Knobs must be in a fully horizontal position to open.**

Knob locked (two dots)

Knob unlocked (one dot)

While the front door is open, the red FAULT light should turn on, indicating that the door is open. **No gas will flow, and the system will not operate while the FAULT light is activated.**

3) The chamber is now ready to load. Remove filtertop lids from all cages. Cages with wire bar lids can be stacked in two layers. Do not position upper layer cages directly over top of cages below. Cages must be slightly offset to allow circulation of gas to lower-level cages.

   The chamber accommodates up to 20 standard mouse cages or 4 standard rat cages. Do not exceed the maximum quantity of cages permitted in the chamber. When possible, do not combine cages prior to loading. If a large number of mice must be euthanized, boxes may be combined as long as no more than 10 mice are combined per standard mouse box. This will allow a maximum of 200 mice to be euthanized per cycle (20 boxes x 10 mice per box). If combined, mice must be combined immediately prior to starting the cycle.

4) After the chamber is loaded, close the door, and **turn all three knobs fully clockwise to seal. If the knobs are not fully turned, a slight gas leak may occur.** The red FAULT light only indicates that the door is open. The FAULT light does NOT indicate that the door is not fully latched.

5) Select the age group (adults or neonates) using the selection switch on the control box then **press the green START button**. The white READY light will remain on, and the illuminated green RUN light indicates the euthanasia cycle is operating. During the RUN cycle the front door will automatically lock and will not unlock until the cycle is complete, or the STOP button is pressed.

6) The system will cycle through three stages:

Life Stage:	Stage 1: Fill	Stage 2: Dwell	Stage 3: Exhaust	Elapsed Time
Adult	8 min. 30 sec.	5 minutes	3 min 30 sec.	17 min.
Neonate	8 min. 30 sec.	60 minutes	3 min 30 sec	72 min.

   The red emergency "STOP" button may be pressed at any time to stop the euthanasia cycle. Gas will immediately stop flowing. The system will then go into exhaust mode and require an additional 3 minutes 30 seconds until the chamber can be opened. At this point the system will reset and return to READY mode.

7) After the blower automatically switches off, remove animals from the chamber.

   An advantage of this system is that performing **a secondary form of euthanasia is not required when animals are euthanized with the Euthanex Smartbox**. When the cycle is complete animals can be immediately bagged and placed in the carcass freezer. **Usage of the Euthanex Smartbox must be recorded via a dedicated log** containing the date, operator name, life stage selection, number of boxes, and total number of animals for each cycle.
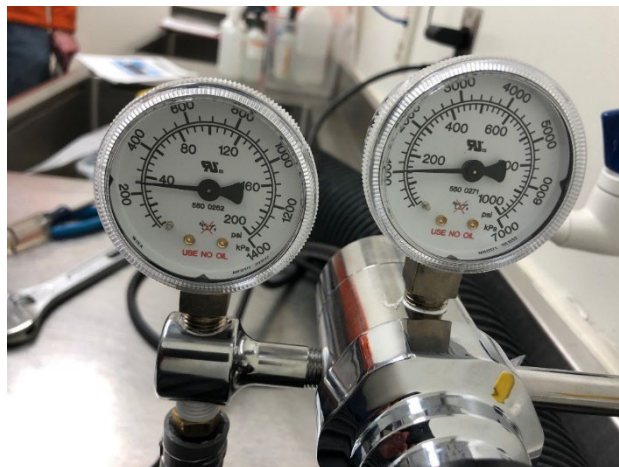
Cleaning:
Because the front door of the system is Plexiglas, **alcohol or ammonia-based cleaners <u>cannot</u> be used to clean this equipment**. **These chemicals will cause irreparable damage via fogging and/or cracking of the door.** Chlorine dioxide-based compounds such as MB10 or Clidox can be used but should not be sprayed directly onto the equipment. Spray first into a cloth or paper towel, then wipe down the surfaces. Alternately, hydrogen peroxide wipes or spray can also be used. If neither of these are available, a cloth or paper towel dipped into warm, soapy water should be used (note the cloth/paper towel should be moist but not dripping wet).

Appendix:
Note that the following parameters have been pre-set and should not require adjustment. Values are listed for reference only and for trouble-shooting purposes. VS will perform a visual and functional inspection annually.

CO2 Source: CO2 Cylinder or House supply should be set to the full OPEN setting.

Regulator: The left dial (regulator outflow pressure) should be set to 40 psi (inner numbers); the right dial reflects the pressure at the CO_2 source (regulator inflow pressure) and cannot be adjusted. The outflow pressure can be adjusted via the black control knob located below the right dial and will only be accurate when gas is flowing through the Euthanex system (i.e., set/ check when the chamber is charging and not at rest). The regulator is heated to prevent icing and should be plugged in when in use (no on/off switch).

Flowmeter: The flowmeter is located behind the Smartbox and is set to 60 lpm, which will displace 30% chamber volume per minute, in accordance with 2020 AVMA guidelines.
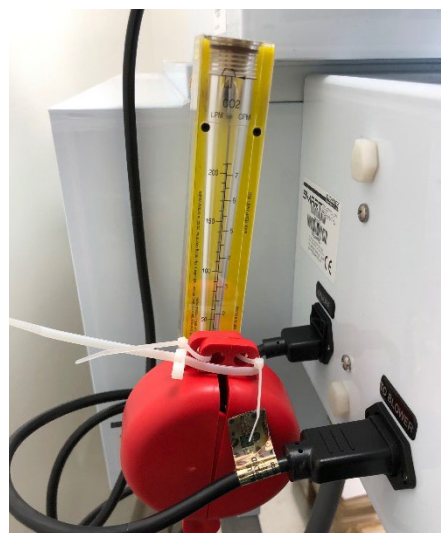
A lockout device such as a Prinzing donut may be placed over the control knob to prevent adjustment.

Insider chamber dimensions: 32" x 30.5" x 12.5"

Chamber volume: 12,200 in^3 = 200 liters

REFERENCES

1. https://www.ezsystemsinc.com/ (vendor homepage)

2. AVMA Guidelines for the Euthanasia of Animals, 2020 edition

TITLE: Operation of the Euthanex Smartbox model M1-SBFF euthanasia chamber
SOP #: 7.15
Supplemental Page: Example of Use log

Euthanex Smartbox log						
Date	Operator	PI / Protocol	Adults/ Neonates	# of boxes	# of animals	Initial