



Preset Flow System (PFS)

For CO₂ Euthanasia

Operators Manual and Guidelines

Humane endpoints should always be considered when working with animals, and the AVMA has established guidelines that should be followed for euthanasia. For a full reading of the guidelines, please visit <https://www.avma.org/sites/default/files/2020-01/2020-Euthanasia-Final-1-17-20.pdf>.

The VetEquip Preset Flow System (PFS) system is designed to meet all of the criteria with respect to the AVMA guidelines when working with small rodents, as well as reduce the potential for individual investigators to deviate from the prescribed SOP. Each unit will have two specific flow devices, keyed with a quick-disconnect, in order to deliver the proper flow to an animal housing cage. The delivered flows in these devices have been predicated on the AVMA guidelines of a flow equal to *'a displacement rate from 30% to 70% of the chamber volume/min*. VetEquip has calculated an average cage size of rodent housing cages (Rat and Mouse) currently on the market from a range of manufacturers. The PSF units are designed to hit the mid-range 50% volume per minute flow criteria, based on this average size cage.

The advantage of the PFS over traditional flowmeter assemblies is the inability of the investigator to deviate from the guidelines. In a facility where there are numerous labs using animals, and direct supervision cannot be accomplished, a more restrictive system can be an advantage. This will help assure compliance with the guidelines and the SOP of the facility.

SPECS:

Part number	Description	Connector	Mouse flow	Rat Flow
#934105	CO2 H-Tank Regulator with PFS	CGA320 inlet	3.11LPM	8.74LPM
#934115	CO2 E-cylinder Reg with PFS	CGA940 inlet	3.11LPM	8.74LPM
#934130	CO2 Wall mount*	3/8NPT Male	3.11LPM	8.74LPM

*The wall mount units may be purchased and incorporated into systems where an adjustable CO2 regulator is already in service. Outlet pressure of the regulator MUST be set to 55PSI. Different inlet connectors may be required. Check with your VetEquip representative.

Custom configurations are possible, so it important for the facility manager to record these modifications and maintain the records in a safe place. Variations in flow may be present with these custom configurations.

Operation and sample SOP:

- 1) Assure connection of PFS to proper CO2 supply source and turn on CO2 supply
- 2) Confirm volume of CO2 in cylinder is sufficient for upcoming procedure(s)
- 3) Leaving animals in their home cage, attach the appropriate lid to the top of the housing cage*
- 4) To initiate flow of CO2, connect the tubing of the housing cage lid to the appropriate quick-connect on the PFS. These connectors are color-coded as well as keyed in order to preclude the connection of the wrong device.
- 5) Flow begins immediately when the connection is made. Observe the animals and listen for flow to assure proper operation
- 6) Allow gas to flow for a period prescribed by your veterinarian or IACUC committee. Keep in mind that neonates typically will require longer periods than adults
- 7) To discontinue flow, simply disconnect the quick connect from the PFS
- 8) Confirm complete euthanasia according to internal guidelines and SOP's
- 9) At the end of the day, turn off CO2 supply to prevent inadvertent loss of gas

*It is important that your lid has a port to allow gas to enter the chamber AND exit the chamber. Obstructing an outlet port merely allows a small pressure gradient to build up within the chamber, until the gas can force its way out of the perimeter of the lid. This small amount of pressure may cause discomfort for the animal prior to loss of consciousness. Permissible exposures for CO2 are 5000ppm. Under normal use, the PFS does not pose a hazard of exceeding this PEL.

Periodic Maintenance:

The PFS is essentially a closed system and the ability of contaminants to enter the system is very limited. However, care should always be used when disconnecting and connecting to CO2 tanks (if applicable). On systems where a regulator is incorporated, always observe the operation of the contents gauge to assure the gauge is working properly. The gauge should deflect to indicate the remaining pressure within the tank. Likewise, when the tank is turned off and the pressure is relieved (such as when bleeding the line by connecting either quick connect for a short period) the gauge should fall to zero.

Inspection and verification of flow from each orifice should be checked on an annual basis by qualified personnel. This can often be accomplished by, and at the same time as your annual anesthesia machine maintenance. Alternatively, verification devices can be purchased through your VetEquip representatives.