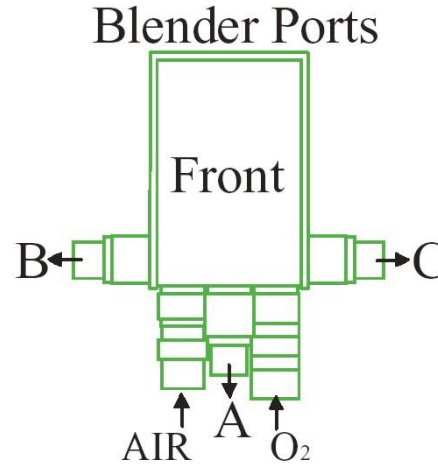




## Blender, Medical Air and Oxygen



• Accuracy-  $\pm 3\%$  of full scale • Supply Pressure- 30 to 75 PSI • O<sub>2</sub> Percentage- 21 to 100% *All blenders measure 3.5" x 3.4" x 3.6" and weigh 2 3/4 lbs.*

Model #	Ports	Flow Range Port A	Flow Range Port B	Flow Range Port C
BMD-2001	A, C	15 –120 (no bleed)	No output fitting	2 –108 lpm (10 –12 lpm bleed)
BMD-2001K	A, knob @ C	15 –120 (no bleed) 2 – 108 lpm (10-12 lpm bleed)	No output fitting No output fitting	Knob set > 15 Knob set < 15
BMD-2001M	A, C	15 –120 (no bleed) MRI	No output fitting	2 –108 lpm (10 –12 lpm bleed)
BMD-2002	A	15 –120 (no bleed)	No output fitting	N/A
BMD-2002F	A	15 –120 (no bleed)	1/8" NPT thread to F10-360xx Flowmeter	N/A
BMD-2002FM	A	15 –120 (no bleed) MRI	1/8" NPT thread to F10-360xx Flowmeter	N/A
BMD-2002M	A	15 –120 (no bleed) MRI	No output fitting	N/A
BMD-2003	B, C	No output fitting	3 –30 lpm (no bleed)	0 –30 lpm (3 lpm bleed)
BMD-2003M	B, C	No output fitting MRI	3 –30 lpm (no bleed)	0 –30 lpm (3 lpm bleed)
BMD-2004	A, B, C	15 –120 (no bleed)	15 –120 (no bleed)	2 –108 lpm (10 –12 lpm bleed)
BMD-2004M	A, B, C	15 –120 (no bleed) MRI	15 –120 (no bleed)	2 –108 lpm (10 –12 lpm bleed)



## Blender Configuration Guide

Please take a few moments to familiarize yourself with blenders. By knowing what they are and why different models are desired, you can be an asset to your customer rather than just an order taker that may order the wrong item...

The Bio-Med Devices Blender Story: About 8 years ago, Bird pretty much owned the market share for blenders. Since we needed a blender to use with our products, we asked for special pricing as an OEM. When Bird refused, we decided to look into making our own blenders. As it turned out, the patent had expired on the Bird blenders, so we followed their specifications in designing our own. If you note their specifications and ours, they are the same. So, it should be easy to cross-reference.

### Cross Reference

Bird 3800 = BMD 2001

Bird Low Flow = BMD 2003 (also see 2003FF)

Bird Omni Blender = BMD 2004

Bird Ultra Blender = BMD 2003FF (see below for comparison)

Sechrist blenders: They are very heavy and much larger than ours and Bird's and has different bleed flows. It is best to use the following guidelines to get the customer the correct blender to suit their needs.

### Guide

- What are blenders?
  - Blenders combine 100% oxygen with medical air (21%) and allow a specific FiO<sub>2</sub> to be delivered.
- Who uses blenders?
  - Blenders are most commonly used in the NICU, usually at every bedside.
    - They may be used to deliver very low flows of gas to a nasal cannula (1/4 or 1/2 lpm) at varying FiO<sub>2</sub>'s.
    - They may be used to deliver varying FiO<sub>2</sub>'s in a free-standing CPAP set up. Many hospitals are going back to a Bubble CPAP setup which requires using a blender.
  - Sometimes they are used in the Emergency Department, the Operating Room or in CT or MRI.
- How to know which model to suggest:
  - First, you need to know where they intend to use the blender and how they intend to use it.
    - If it is going to be used in the NICU, they probably intend on using it with a couple of flow meters to run a low flow nasal cannula and maybe a manual resuscitator bag. They probably need the 2003 or the 2003FF (NEO 2 Blender...see below for a detailed discussion on this blender).
      - Why: 1) Because they want to achieve an accurate FiO<sub>2</sub> at very low flows (for a nasal cannula) 2) The lower bleed flow of the 2003 wastes less gas and is quieter in the NICU setting. 3) They don't need a high flow output.
    - If it is going to be used to power equipment, they may need the 2001, 2002, or the 2004 since they allow for higher flow outputs.
- Why do blenders have bleed flows?
  - In order to mix gas accurately at low flows a bleed must be present.
    - Notice on the 2003...The port on the left side is accurate from 3-30 lpm, whereas the port on the right side is accurate from 0-30 lpm since it has a 3 lpm bleed flow that helps mix the gas. If I wanted to run a low flow of gas (less than 3 lpm) accurately, I would need to run it from the right side.
  - Why does bleed flow matter?
    - In transport situations, since you have limited gas resources, you may want lower or no bleed flows in order to conserve your gas.
    - The higher the bleed flow the louder the blender. This may be important in the NICU, where you want a quiet environment.
- How to read the specifications chart: Very Easy!
  - Look at a brochure or the web site.
    - Decide whether you need to attach flow meters to the blender. This will limit you to the 2001, 2003 or the 2004. (The 2002 does not have ports on the sides, only the bottom)
    - What are your flow requirements? Notice the flow range for each available port.
  - If you need accurate FiO<sub>2</sub>'s at very low flows, you need the 2003 or the 2003FF.
- What is the knob for on the 2001K?
  - The knob allows you to use the blender in low flow applications (less than 15 lpm) by activating a bleed flow, or in higher flow applications (greater than 15 lpm) by turning off the bleed flow.
- What about MRI compatibility?
  - Each blender can be made MRI compatible by adding an M to the part number when ordering. Note: there is a price difference!
- What about Hose kits?
  - Each blender needs a hose kit in order to attach it to the gas source.
    - If the blender will be used with the IC-2A, MVP-10 or a Cross vent, consult the web site to order the correct kit for each application.
  - For normal applications you have 2 kits to choose from:



- 2006: comes with the oxygen hose adapter (to connect the oxygen hose to the blender) and a 10' air hose and a 10' oxygen hose.
- 2006-2: comes with oxygen hose adapter and a 2' air hose and a 2' oxygen hose. These are used when customers plan on mounting the blender near the gas connections on the wall and do not want excess hoses.
- What about brackets? There are 3 to choose from:
  - 1-inch pole mount bracket #2013B. Designed to fit standard IV poles or mounting systems that provide a 1-inch pole for mounting purposes.
  - 2-inch pole mount bracket #2013BH. Designed for use with the BMD 2" stand.
  - Wall mount bracket #2013BW. Designed for mounting to the wall directly, or adapting to other brands of rail mounting systems.
- What About Water Traps?
  - Some hospitals can develop water in their gas supply lines. This is most common on the air supply line instead of the oxygen side. A water trap will protect the blender from that water. It is generally not a problem in the newer hospitals.
  - If a customer requests a water trap, it will most likely be for the air side (Bio-Med part # 4415). This will connect between the bottom of the blender and the air supply line.
  - If a customer wants to put one on the oxygen side (that means they probably want them on both sides) the Bio-Med part # 4414.
  - **Please make sure you order the correct water trap...if any!**

**Note: If the customer appears to need the #2003 blender...see the discussion below on the 2003FF. Since there is no competitive product to date that will allow the user to turn off the bleed flow, you should be able to maintain your margins. The key here though is to educate the customer on the amount of potential gas lost when not in use (3 lpm x 24 hours a day x 7 days a week). Gas is relatively inexpensive, but 25-40 blenders at 3 lpm can certainly add up. Since before now, nobody could turn off the bleed flow, it wasn't a part of the discussion.**

### The New BMD 2003FF or BMD 2003FF1 Low Flow Blender (NEO<sub>2</sub> Blender)

- Most nurseries or NICUs can use one of these blenders at every bedside.
- Why the low flow model?
  - Because they want to use 2 flow meters on the blender
    - One flow meter is typically used to connect a resuscitation bag (and therefore has a little higher flow capacity).
    - The second flow meter is typically used at very low flows (1/4 lpm-1/2 lpm) to connect an infant nasal cannula.
- What is special about this one?
  - Flow meters are already attached.
    - 0-15 lpm flow meter on the left side.
    - 0-3 1/2 lpm flow meter on the right side #2003FF. (0-1 lpm flow meter for the #2003FF1)
      - Have the ability to turn off the bleed flow when a nasal cannula is not in use.
- What is "Bleed Flow"?
  - In order to deliver an accurate FiO<sub>2</sub> at very low flows (such as those used for infant nasal cannulas), the port on the right side of the blender uses about 3 lpm of gas in order to mix the gas accurately.
  - Whenever the blender is plugged into a gas source this bleed is activated (even when the flow meter is turned off).
  - Even though gas is relatively inexpensive, using 3 lpm 24 hours a day and 7 days a week times several blenders can prove to be very costly.
- How can we save the customer money?
  - The #2003FF has a unique fitting on the right side that allows the bleed flow to be turned off when the flow meter is not needed.
  - This allows the resuscitator bag to still be connected to the left side and ready for use.
- Pricing: Hospital price is \$975.00 for the 2003FF. \$1025.00 for the 2003FF1.
- Accessories: Everyone usually needs the hose kit and whichever mounting bracket works best for their application.
  - Hose Kit: #2006 \$55.00 (includes hose adapter for blender and a 10' air and 10" oxygen hose). Or #2006-2 \$55.00 (includes hose adapter for blender and 2' air and 2' oxygen hose)
  - 1" Pole Mount Bracket: #2013B \$35.00
  - Wall Mount Bracket: #2013BW \$18.00 (allows the blender to be mounted to a wall, or allows the bracket to be adapted to other mounting systems)
  - 2" Pole Mount Bracket: #2013DH \$50.00 (allows the blender to be mounted to the BMD heavy duty 2-inch stand with casters.
- Competition: Bird Low Flow
  - In the past, especially with large quotes for the old #2003 low flow blender (without the flow meters), the pricing has gotten pretty competitive.
    - A customer may choose to try to buy the blender and the flow meters at low costs and install them himself.
    - They will be bulkier.
    - They will not be able to stop the bleed flow without disconnecting the entire blender.
  - Bird does have a model called the Ultra Blender that has a hospital price around \$1400.00
    - The DISS fitting sticks out to the side...The bleed flow is activated by screwing on the X-Mass tree fitting (...so, yes you could stop the bleed flow by disconnecting that fitting, which most people don't do since the fitting won't be there the next time they need it).
    - Since most people want to use a humidifier with their infant nasal cannula, they must put an elbow attachment on the Bird blender fitting in order to orientate the fitting to the appropriate (downward) position. Once the elbow is in place the bleed flow is activated (and this is generally never removed).