

Application Notes

VT PLUS HF Gas Flow Analyzer and Blender Testing

What is a blender?

A blender is a pneumatic device that equalizes inlet pressure and proportions the gases to be mixed so that the specified concentration on oxygen is delivered. Most blenders (also called mixers) proportion two gases. Even 3-gas blenders only proportion two gases at a time, requiring the user to select which two gases will be mixed.

Why use VT Plus/VT PLUS HF to test blenders?

- Measure pressure, flow and oxygen concentration all in one NIST traceable device
- Document by hard-copy printouts, or use VT Plus for Windows to save test data on your computer
- Reduces the cost-per-use of the VT Plus/VT PLUS HF that you already own, or helps you justify the investment in a new VT PLUS HF by showing that it can do more than just ventilator testing

When using VT PLUS HF to evaluate the performance of oxygen-air and oxygen-air-nitrous oxide blenders, the following parameters will need to be tested:

- Loss of oxygen pressure alarm (usually a reed alarm activated by a flow of air across it)
- Oxygen concentration (compared to the blender control setting)
- Leak test (the check valves for the oxygen, air, and nitrous oxide hoses may leak)

To perform the testing above, the following equipment and supplies will be needed:

- VT Plus or VT PLUS HF
- A pair of regulators to vary the inlet pressures of each channel of the blender
- Leak detection fluid (this is a special soapy liquid that bubbles when leaks are present)

Test procedure:

1. Connect the Blender's outlet to the fabricated hose, and VT Plus/VT PLUS HF high-pressure inlet and high-flow inlet
2. Turn on the VT Plus/VT PLUS HF, allow to warm up and zero
3. While waiting, apply the leak-detector fluid to the high-pressure check valves on either the high-pressure hoses or the blender check valves. Bubbles indicate leaks that must be repaired
4. Connect high-pressure hoses to the Blender
5. Press the "pressure" button on the VT Plus/VT PLUS HF so that the pressure screen is displayed. Adjust the "units" for psi

Fluke Biomedical Corporation

5200 Convair Drive, Carson City, NV 89706, USA

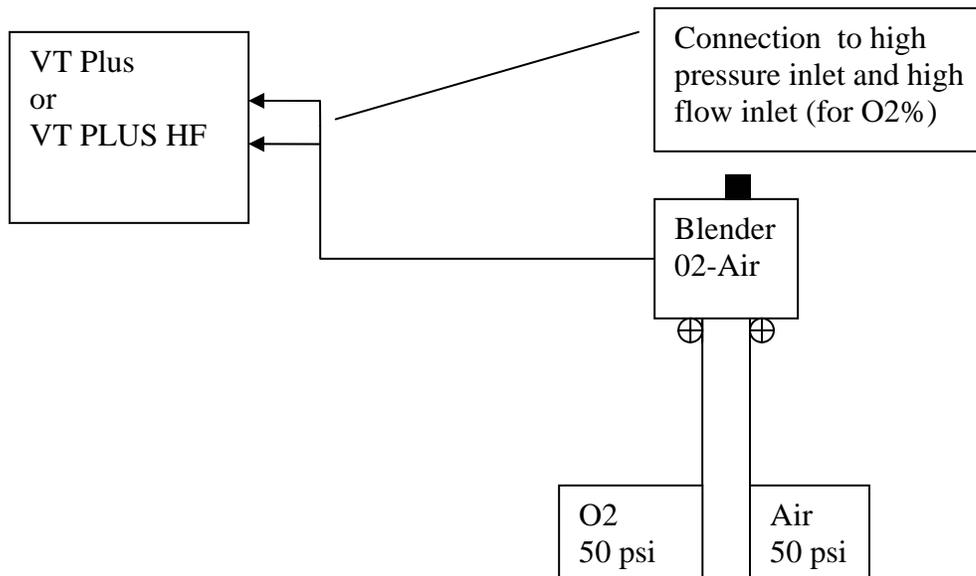
Tel: 775.883.3400, Toll Free: 800.648.7952, Email: sales@flukebiomedical.com

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6. Adjust the blender control for 21% O₂
7. Observe that 50 psi +/- the blender pressure specification tolerance is displayed
8. Press the “flow” button on the VT Plus/VT PLUS HF. Adjust the “units” for Lpm
9. Observe that the flow displayed is within the specified range of the blender
10. Press the “O₂” button on the VT Plus/VT PLUS HF
11. Observe that 21% O₂ +/- the blender oxygen concentration specification tolerance is displayed
12. Adjust the Blender control for 100% O₂
13. Observe that 100% +/- the blender oxygen concentration specification tolerance is displayed
14. Adjust the Blender for 50% O₂
15. Adjust the oxygen regulator so that the flow of oxygen is reduced, while listening for the reed alarm to sound and observing the O₂ concentration displayed on the VT Plus/VT PLUS HF

Here’s the connection diagram:



NOTE: Outlet of blender may be a quick-connect fitting and a special hose will need to be fabricated with a high-pressure “T” with one DISS O₂ Hand-tight Nut/Nipple, and one unterminated end to connect to the threaded hose barb adapter (in the accessory kit). This is necessary because the oxygen sensor in the VT Plus and VT PLUS HF is located in the high-flow channel.

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