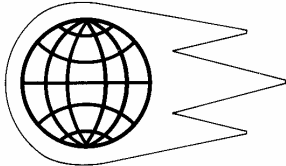


Breath Simulation Module

For use with Dual Adult Training/Test Lungs



Manufactured By



**Michigan
Instruments**
INC.

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Technical Support / Factory Service

To help ensure maximum performance and productivity from your equipment, The *Breath Simulation Module* is backed up by Michigan Instruments' commitment to total customer satisfaction. If you have a question, please contact us.

If you feel that factory service may be required, call Michigan Instruments, Inc. Monday through Friday between the hours of 9:00 a.m. and 5:00 p.m. Eastern Standard Time. To maintain peak performance and accuracy, factory service and recalibration is recommended every three years.

Phone: (616) 554-9696, or 1-800-530-9939

E-mail: mii@michiganinstruments.com.

Mailing address:

Technical Support – *Breath Simulation Module*
Michigan Instruments, Inc.
4717 Talon Ct. SE
Grand Rapids, MI 49512
USA

Please include the following information when you contact Michigan Instruments:

- Product name, and serial number.
- Training Test Lung model that the Simulator is being used with.

Warranty Information

The *Breath Simulation Module* is warranted by Michigan Instruments, Inc., Grand Rapids, Michigan to be free of defects in material and workmanship for a period of **One (1) year** from the date of its receipt by the purchaser.

All repairs necessitated by a malfunction of this equipment during the warranty period, when used in accordance with the instructions provided, will be accomplished at Michigan Instruments, Inc. without charge other than the cost of transportation to the factory. Michigan Instruments, Inc. undertakes no liability for special or consequential damages, or any other expense or liability beyond furnishing the materials and labor for the repairs covered under this warranty. The warranty does not cover marks, blemishes, scratches etc. which may result from normal use of this equipment, or malfunctions due to mishandling or damaging accidents. This warranty is VOID unless the equipment to be repaired is returned in the original factory carton. If unavailable, the carton may be obtained from Michigan Instruments, Inc.

If the warranty registration card is not returned, the warranty period will begin the date the system was shipped from the factory.

This warranty is in lieu of all other warranties expressed or implied, and shall be void for any products which have been altered or repaired by others, or have been subjected to misuse or abuse. The buyer agrees that this written warranty constitutes the entire agreement as to warranties between the parties. Any prior or contemporaneous oral statements, which have not been written into this agreement, are not binding and this contract shall not be rescinded or modified except by a signed agreement.

Introduction

The purpose of this manual is to familiarize the user with the function, care, and maintenance of the Michigan Instruments, Inc. Breath Simulation Module. Please read it thoroughly before attempting to use your system.

Features

The Breath Simulation Module (BSM) is designed to be used with the Michigan Instruments, Inc. Dual Adult Training Test Lung (TTL), models 1600, 2600i, or 5600i. The addition of the Breath Simulation Module makes the Test Lung a spontaneously breathing lung simulation system.

Specifications

Breath Rate: 2 – 60 Breaths per Minute

Inspiratory Time: User selectable – 0.50, 1.0, 1.5, and 2.0 seconds (± 0.15 seconds)

Breath Volume: 50 – 2000 mL

Manual Mode(Breath Trigger): Push-button control of individual breaths.

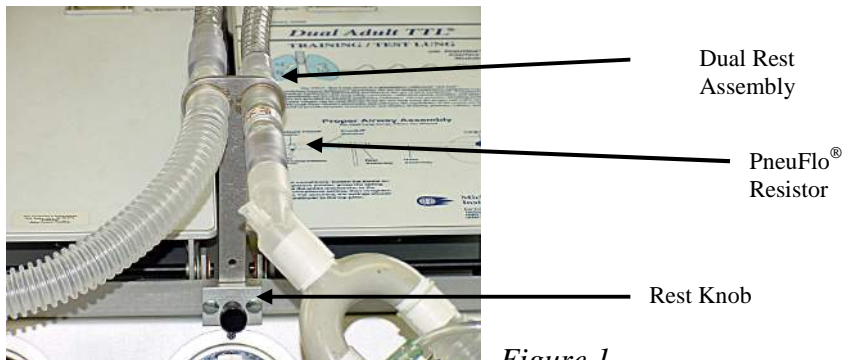


Figure 1

Setup and Operation

Lung Setup

1. Loosen the *Rest Knob* on the front of the TTL and insert the *Dual Rest Assembly* into the holder. Lock it in place by tightening the knob. (*Figure 1*)
2. Select the desired *PneuFlo*[®] *Resistor* to simulate airway resistance and connect it to the proximal (outward-facing) opening on the rest assembly. (*Figure 1*)

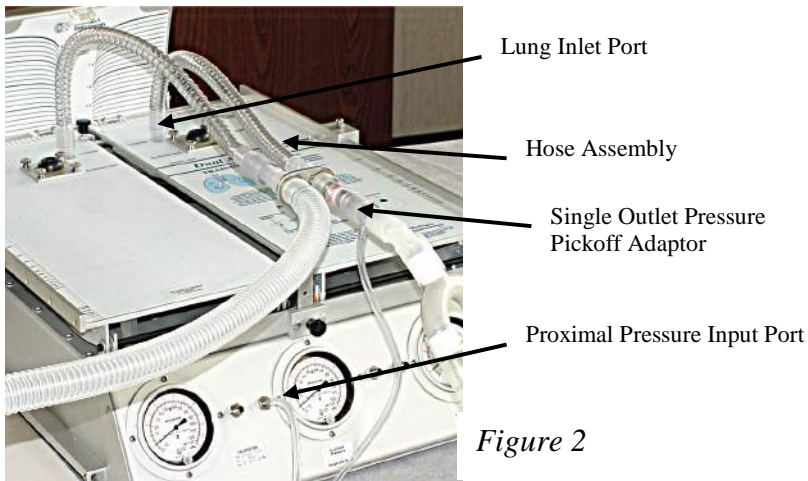


Figure 2

3. Connect one end of the *Lung Hose Assembly* onto the right side of the Dual Rest Assembly and the other end into the *Lung Inlet Port* in the top plate of the **right** lung. (Note: the *Breath Simulation Module* must be connected to the left lung.) (Figure 2)
4. Attach a *Single-outlet Pressure Pickoff Adaptor* to the proximal end of the Resistor. (Figure 2)
5. Use the *1/8" Hose* to connect the *Pressure Pickoff Adaptor* to the *Proximal Pressure Input Port* located to the left of the center gauge. (Figure 2)
6. Set lung compliance as desired (per the Test Lung manual.)
7. Attach the lung coupling clip to the left lung and under the right lung. This will allow the left lung to drive the right lung when a breath is delivered from the *Breath Simulation Module*. (Figure 3)

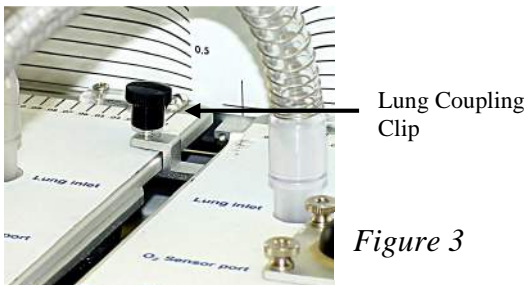


Figure 3

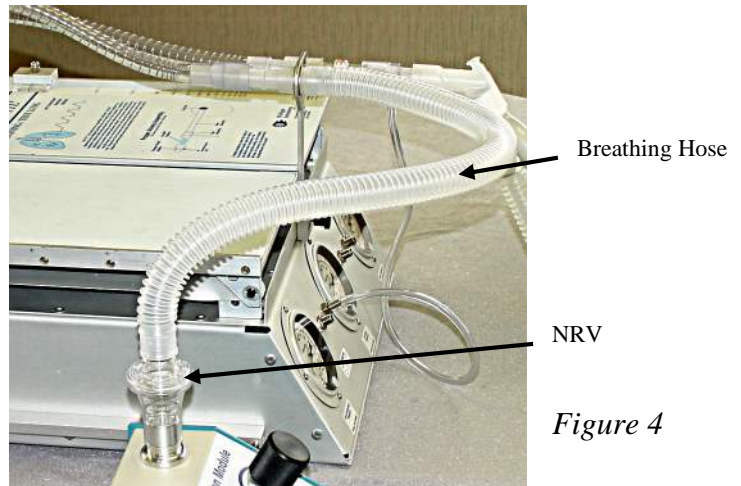


Figure 4

Breath Simulation Module Setup

1. Put the *Non-rebreathing Valve (NRV)* on the *Outlet* of the *Breath Simulation Module* as shown in *Figure 4*.
2. Connect one end of the *Breathing Hose* to the *NRV* and the other end to the left side of the *Dual Rest Assembly*. (Figure 4)
3. The other *Lung Hose* is connected to the lung side of the *Dual Hose Rest* and the other end to the *Lung Inlet Port* of the left lung.
4. Connect the supplied *Gas Input Hose* to a source of air (or Oxygen) at 50 – 60 psi. Connect the other end to the *Gas Input* on the back of the *Breath Simulation Module*. (Figure 5)

5. Connect the power supply to the *Power Jack* on the Interface Box and to a 110 or 220 volt outlet. (*Note: for TTL PneuView[®] systems the PneuView[®] power supply is used and power for the PneuView[®] system is supplied from the Breath Simulation Module with the patch cord supplied.*)

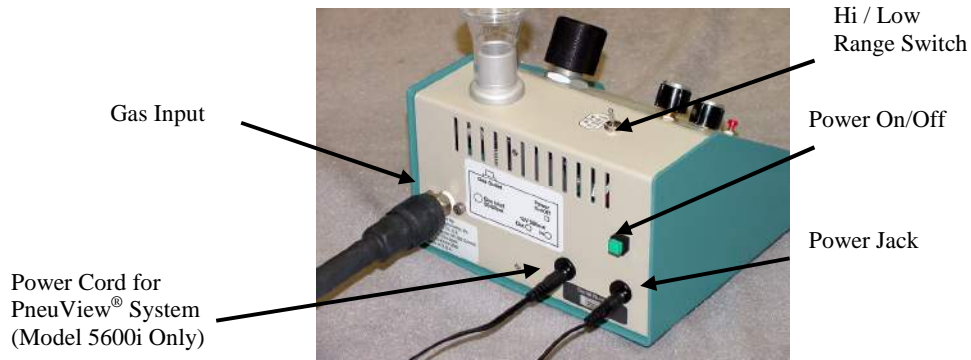


Figure 5

Operation

1. Press the On/Off switch to turn the unit on. The Power Indicator in the switch will light indicating that the system is turned on. (*Note: To avoid over pressurizing the lung, verify that the Breath Volume knob is turned fully counterclockwise before turning the unit on.*)
2. Choose the desired inspiratory time using the Inspiratory Time knob. (*Note: Breath volume should be turned fully counterclockwise before increasing the Inspiratory Time setting.*)
3. The breath rate is continuously adjustable using the Breath Rate knob. Two ranges are available using the switch on the top of the unit (Figure 5.) Breath rates from 1 – 16 BPM are available with the switch in the up position, and 2 – 60 BPM in the down position. Turning the knob clockwise increases the breath rate.
4. Breath volume is adjustable using the Breath Volume knob. Turning the knob clockwise increases the breath volume.
5. Pressing the Breath Trigger button will immediately deliver a breath at the current BSM settings.



Using the Breath Simulation Module with PneuView[®] software. (Model 5600i only)

1. Set up the PneuView[®] /TTL system described in the Model 5600i users manual.
2. Set up the Breath Simulation Module as described above.

3. To use the Breath Simulation Module with PneuView Software, press the SBM icon found on the toolbar on the “New Projects” screen. (*Figure 7*)

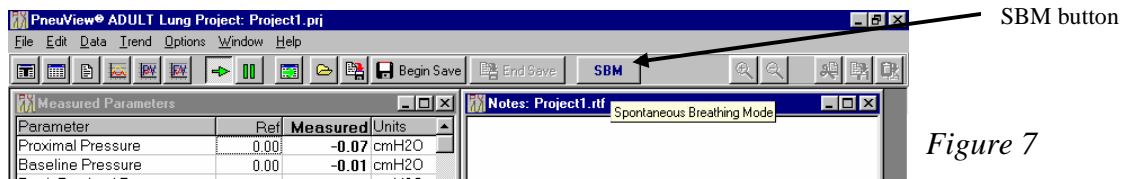


Figure 7

4. With the “SBM button” activated, pressing F6 on the keyboard will display the “Direct Measurement” dialog box. This screen displays the following Spontaneous Breath measurements: (*Figure 8*)
 - a. Differential Pressure
 - b. Airway Pressure
 - c. Trigger Pressure
5. The “Reset Trigger Pressure” button is used to reset the display.

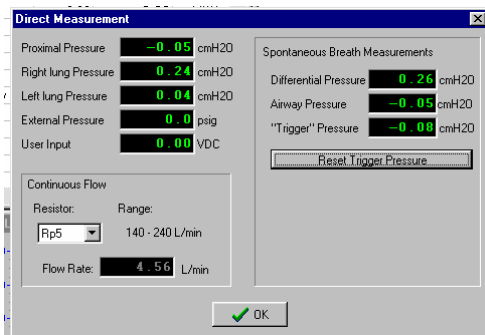


Figure 8