



## SPIROMETER INSTRUCTIONS

We are delighted you chose to purchase a Boehringer Spirometer. We feel confident it will provide you with many years of trouble-free service. To keep your warranty intact, please read these instructions carefully.

### ACCURACY

Our Spirometers are guaranteed for forced vital capacity. The Turbines are individually calibrated so that any model Turbine may be used with any Counter, without loss of accuracy.

Boehringer Spirometers have the characteristics shown on the accompanying calibration curve. By using this curve to correct the reading, maximum accuracy can be obtained.

### SAFETY

Boehringer Spirometers are inherently safe. In the unlikely event that jamming occurs, air can still pass through the instrument freely. As with any in-circuit device, read these instructions thoroughly, and carefully monitor patient respiration after changing circuit connections.

### CONVENIENCE

The Counter may be rotated to four positions for convenient reading. The meter may be left in the circuit permanently, without moisture or wear problems.

### START-STOP-RESET

There are two buttons for Spirometer control. The center button starts and stops the instrument. The side button resets the instrument to zero. When the instrument is in the circuit but not in use, we recommend leaving the instrument in the "run" mode.

### DISINFECTION

To clean the instrument after use:

1. Remove the Spirometer from the circuit, and detach the Turbine from the Counter. (Turn the Counter counterclockwise to detach from the Turbine.)

2. The Turbine can be disinfected in Cidex, ethylene oxide, autoclave, or by pasteurization. (To prolong meter life, we recommend cold Cidex.) It is acceptable to run water through the ports to flush out foreign matter.

3. A final, thorough rinse in water should precede use on a patient.

**WARNING:** The Counter should NEVER be autoclaved, gas disinfected or immersed in a water solution. We recommend a light wipe with Cidex.

4. It is possible for each patient to have his own Turbine, to minimize the risk of cross-contamination.

## CARE

Our Spirometers have been designed to require little or no maintenance. We do recommend an annual calibration which will be performed quickly and for a reasonable charge.

If water collects in the circuit (hose or between expiratory valve and Spirometer), remove the Spirometer and allow the water to drain. "Shake out" excess water and return to the circuit.

There is no need to dry the Turbine. Do not attempt to dry the Turbine with compressed air. This could overspeed the Turbine and destroy the Counter mechanism and/or calibration.

The meter will be damaged by dropping and the warranty voided. The precision mechanism should be regarded as fine "camera quality," and treated carefully for long, satisfactory service.

## WARRANTY

All Boehringer products are fully warranted for parts and labor for one year after purchase, unless evidence of abuse or tampering is present.

Should service be necessary, please pack the instrument carefully, call for a return material authorization and return material to Boehringer Laboratories, 500 E. Washington St., Norristown, PA 19401. A note describing the malfunction you experienced would be helpful.

Turnaround time is less than one week from factory receipt of the authorization to repair.

## SPECIFICATIONS (See catalog for complete listing)

Adult Spirometer Threshold: 6 liters/minute (steady state flow)

Pediatric Spirometer Threshold: 1 liter/minute (steady state flow)

## WARNING (For Pediatric Spirometers)

Pediatric Spirometers are designed for tidal volumes of 50-300 cc. High flows caused by normal adult vital capacity and/or coughing may exceed the range of the instrument and cause excess back pressure for the patient. (See chart below.) In situations requiring high flow rates, use Adult Spirometers.

### Pediatric Spirometer Back Pressure

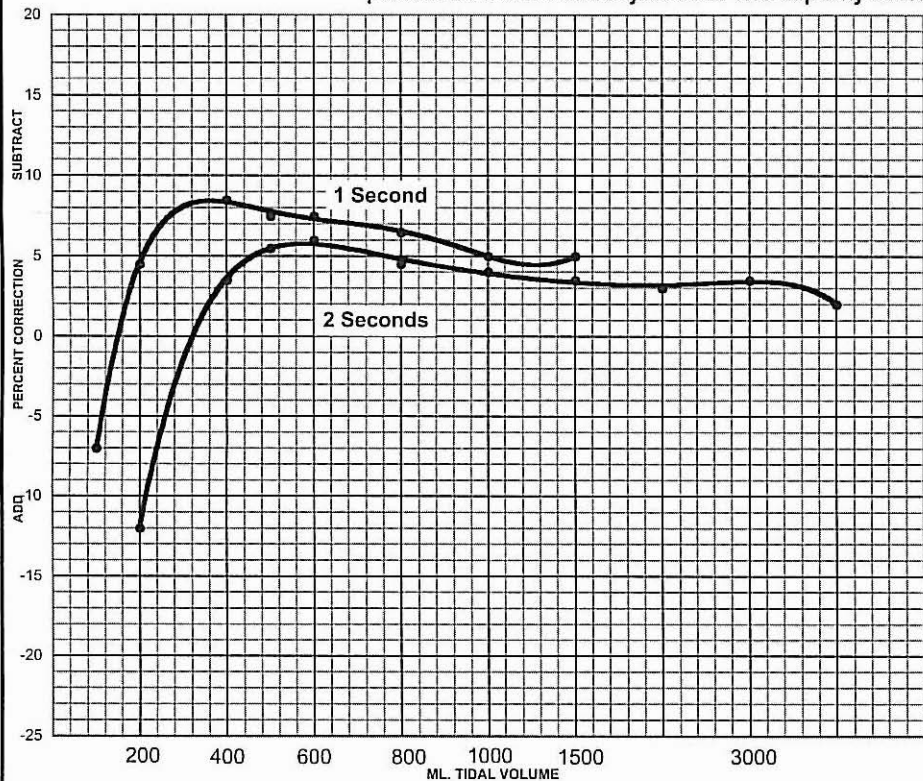
Continuous flow rate (liters/minute)	1	2	5	50
Back pressure cm. H <sub>2</sub> O less than	.2	.4	1.0	35.0

## INSTALLATION AND USE

### 1. Adult Spirometer (Model #8800) and Pediatric Spirometer (Model #8805)

- a. Connect inflow port on side of Turbine to patient. (For non-intubated patients, a 22 mm. disposable mouthpiece may be used, or the 22 mm. inflow port may be inserted into a face mask.)
- b. For mounting in the anesthesia circuit, follow the instructions included with the Anesthesia Machine Permanent Mount (Model #9032).

Using average tidal volume or vital capacity and the expiratory time (usually 1 second.) Read correction percent from curve and adjust  $V_e$  or vital capacity accordingly.



<b>BOEHRINGER</b>	
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TITLE Spirometer Calibration Curve	
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