

Collins 

DPM

(Digital Pulmonary Manometer)

Instruction Manual

#750072

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Operation of the Collins DPM

The Collins DPM is very easy to use. To prepare the system for testing:

1. With the POWER switch on the DPM rear panel in the OFF position, insert the 3-prong plug at the end of the DPM's power cord into a grounded 3-prong, 110 volt AC receptacle.
2. Switch the POWER switch to the ON position. Numbers will be displayed on the front digital panel meter. The DPM requires no warm-up time and is ready to use immediately upon turning it on. The system has been carefully calibrated at the factory and does not require continuous re-calibration at each use.
3. To prepare the DPM for measuring maximum inspiratory pressure, connect the Luer fitting at the end of the mouth assembly tubing to the INHALATION port on the DPM front panel. For measuring maximum expiratory pressure, connect the fitting to the EXHALATION port.

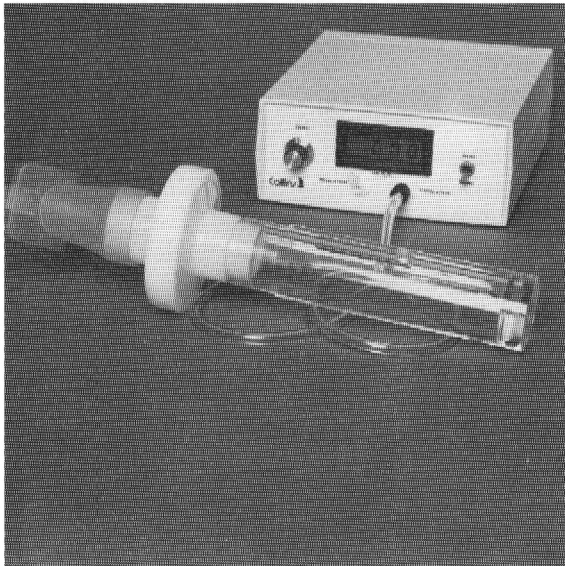


Figure 2. DPM Setup for Measurement of MEP

4. Set the zero point by placing the READ/ZERO switch on the DPM front panel to the ZERO position.
5. Adjust the ZERO knob on the front panel for a reading of "000" on the digital display. The reading may fluctuate by ± 1 . This is normal and no cause for concern.
6. Switch the READ/ZERO switch to the READ position. The DPM is now ready to record maximum pressure.

NOTE:

During the maneuvers be certain that the calibrated aperture at the end of the mouth assembly is not blocked. (See Figure 3). It must remain open throughout the test to ensure correct results.

MAXIMUM EXPIRATORY PRESSURE (MEP)

1. Have the mouth assembly connected to the EXHALATION port, as shown in Figure 2.
2. Place a nose-clip on the patient's nose and insure that no air can leak in or out. Have the patient insert the mouthpiece and check for a tight lip seal.
3. Instruct the patient to inhale as deeply as possible, encouraging him to continue drawing in air until he has inhaled to maximum lung capacity.
4. Place your finger over the occlusion hole in the mouth assembly (see Figure 3) and instruct the patient to blow out as forcefully as possible. The number on the digital display will get larger as the expired pressure increases. Encourage the patient to continue forcing out his breath until he has pushed the reading as high as possible.

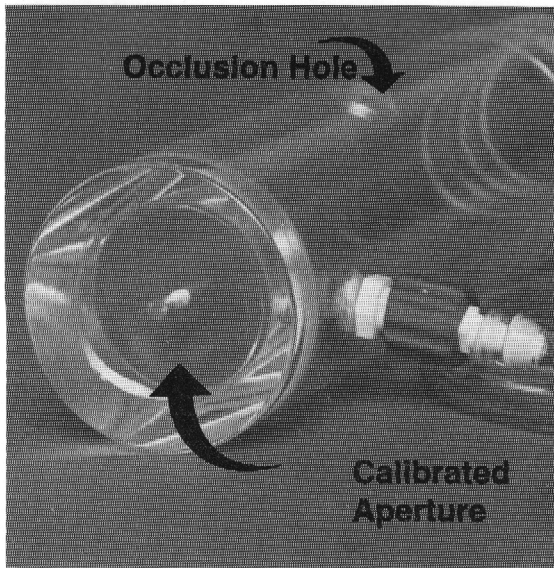


Figure 3. Mouth Assembly Apertures

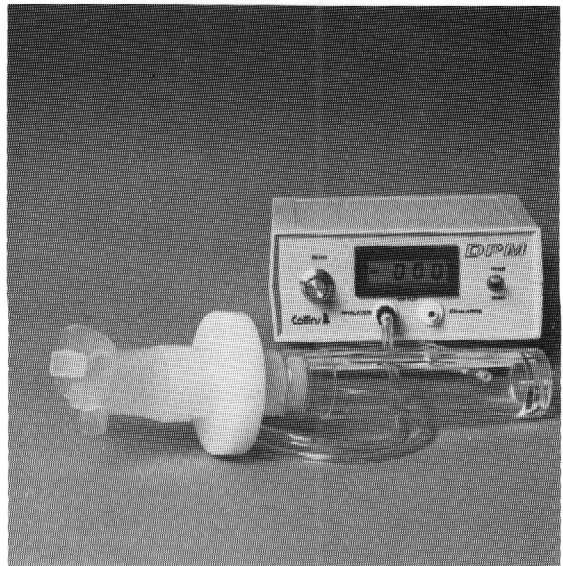


Figure 4. DPM Setup for Measurement of MIP

5. When the patient can no longer exhale, remove the mouthpiece from his mouth and allow him to rest a moment while you record the reading on the digital display.

NOTE:

The DPM captures and displays the highest pressure reading attained during the maneuver. This reading will be displayed on the digital display for about one minute, after which time it will start to slowly fall. Be sure you record the reading before it starts falling.

6. To repeat the maneuver, switch the READ/ZERO switch to the ZERO position and verify that the digital display reads "000". Readjust with ZERO knob if necessary. Switch the READ/ZERO switch to the READ position and repeat the above maneuver.

MAXIMUM INSPIRATORY PRESSURE (MIP)

1. Have the mouth assembly connected to the INHALATION port, as shown in Figure 4.
2. Place a nose-clip on the patient's nose and insure that no air can leak in or out. Have the patient insert the mouthpiece and check for a tight lip seal.
3. Instruct the patient to exhale as deeply as possible, encouraging her to continue pushing out air until she has emptied her lungs.
4. Place your finger over the occlusion hole in the mouth assembly (see Figure 3) and instruct the patient to inhale as forcefully as possible. The number on the digital display will increase in the negative direction. Encourage the patient to continue inhaling as long and as hard as possible.

5. When the patient can no longer inhale, remove the mouthpiece from her mouth and allow her to rest while you record the reading on the digital display.

NOTE:

The DPM captures and displays the highest pressure reading attained during the maneuver. This reading will be displayed on the digital display for about one minute after which time it will start to slowly fall. Be sure you record the reading before it starts falling.

6. To repeat the maneuver, switch the READ/ZERO switch to the ZERO position and verify that the digital display reads "000". Readjust with ZERO knob if necessary. Switch the READ/ZERO switch to the READ position and repeat above maneuver.

Using the Collins DPM as a General Manometer

To use the DPM as a general purpose laboratory manometer, you should be aware of the function of the READ/ZERO switch. For maximum accuracy, all pressure readings should be taken with this switch in the READ position. However, in the READ position the DPM will capture and hold the highest pressure attained during the measurement. To avoid recording a spurious momentary pressure spike during a measurement, which can result in a falsely high pressure reading, place the READ/ZERO switch in the ZERO position and apply the pressure being measured. Wait until the pressure is stable, then switch to the READ position. Always be certain that the READ/ZERO switch is in the READ position before you record the reading from the digital display.

Collins DPM Calibration Check

1. The Collins DPM is designed so that, once calibrated at the factory, it will not require daily recalibration. However, you may wish to verify the calibration from time to time. This is easily accomplished using a liquid manometer containing either water or mercury. We recommend using a mercury manometer, due to the wide range of pressures at which the DPM is calibrated. This device should have a zero to 300 mmHg scale with 2 mmHg graduations. The following steps describe the procedure:
2. The manometer squeeze bulb has two tubes. Attach one to the manometer and the other to the Exhalation port on the DPM front panel.
3. Loosen the pressure release knob on the manometer bulb to release any pressure.
4. Place the READ/ZERO switch on the DPM front panel to the ZERO position.
5. Adjust the ZERO knob on the DPM front panel until the digital panel meter displays 000.
6. Tighten the pressure release knob on the manometer bulb. SLOWLY squeeze the manometer bulb to the desired reading in mmHg on the liquid column. The reading may be met within +/-10 mmHg (except for open circuit zero), due to the difficulty of attaining an absolute value using a squeeze bulb.
7. Switch the READ/ZERO switch on the DPM front panel to the READ position. The DPM digital panel meter will display the liquid manometer pressure in cmH₂O.
8. Convert the manometer reading to cmH₂O, using the following conversion factor:

Conversion Factor = mmHg x 1.3595 = cmH₂O

Accessories and Replacement Part Numbers

mmHg	cmH ₂ O
30	40.79
60	81.57
100	135.95
140	190.33
160	217.52
180	244.71

Description	Part Number
Rubber mouthpiece (large)	022243
Rubber mouthpiece (pediatric)	022241
Nose-clip (plastic injection molded)	021230
Metal screw type nose-clip	022939
Metal spring type nose-clip	022940
Sponge refills for metal types	022441
DC-1 Barrier Filters (box of 24)	022370
MIPS/MEPS mouth assembly	381152

9. After making the conversion, the DPM reading should correspond to the reading on the manometer column, within +/- 3 % or 3 counts, whichever is greater. If it does not, adjust the knob labeled Cal on the rear panel of the DPM so that the DPM reading corresponds to the manometer reading.

10. Loosen the knob on the manometer bulb to release the pressure. Repeat steps 3 through 9 for each pressure point listed in the chart above, and for zero.

NOTE:

In order to check the zero point, simply omit step 6; the circuit should be open.



Warren E. Collins, Inc.
220 Wood Road
Braintree, MA 02184
(617)843-0610
FAX (617)843-4024