1.1 P0.1 measurement with CO2 rebreathing

1.1.1 What is a P0.1 measurement with CO2 rebreathing?

P0.1 measurement with CO2 rebreathing is required for suspected central respiratory drive disorders. The measurement procedure is mainly identical to the standard P0.1 measurement, but the P0.1 is also measured during spontaneous respiration whilst the subject breathes out into a bag and in again from the air in the bag. This results in an increased concentration of CO2 in the inhalatory and expiratory air. On normal respiration, ventilation increases in response to the CO2 increase, and the P0.1 pressure increases accordingly, also dependent on the increase in CO2.

1.1.2 Setting up the measurement apparatus

An extended measurement device with two valves or shutters, a rebreathing bag and a CO2 analyzer are used.

Important: Observe the sequence in which the tubes are connected!

Important: The shutters differ in construction and must be mounted in precisely this sequence!
1.1.3 Carrying out the measurement

After selecting the symbol "P0.1 with CO₂ rebreathing", the following measurement screen will appear:

1.1.3.1 The measurement screen

1.1.3.2 Symbol key

- [F3] button: delete previous curve progression
- [F11] button: shutter test
- [F12] button: fetch the zero point
- [2] button: activate a P0.1 measurement
- [3] button: Activate a PImax measurement
- [Space] button: Switch from ambient air inhalation to rebreathing from the bag
- [Enter] button: Start or stop the measurement process

1.1.3.3 Measurement procedure

Before commencing, please check whether the shutter which is meant to close out the ambient air is open or closed. The rebreathing bag should not receive any air from the patient. This is usually the case once the program has been started.
If the shutter is set to the wrong position, the ZAN program must be stopped and restarted. If the shutter is still in the wrong position, please shut down the computer completely and switch off the power for at least 30 seconds. This will reset the system. If even that doesn't help, the measurement apparatus is defective. Please inform Service.

The bag should be empty.

**Important:** If the measurement is carried out using a mouthpiece, the patient must put on a nose clip.

1. Start the measurement by pressing the [Enter] button or the button.

2. Start the P0.1 measurement with spontaneous breathing.

3. After this, the Plmax measurement is carried out.

4. Finally, click on the symbol or press the [Space] button to switch to rebreathing.

**Important:** After switching over, do not select any more Plmax measurements.

5. P0.1 measurement with CO₂ rebreathing can also be activated by selecting the symbol or the button [2] (figure 2).

**Warning:** Rebreathing may cause some patients to become agitated or may cause them to collapse. Very high CO₂ concentrations may cause apnea. For this reason, rebreathing may only be carried out by specialist personnel.

6. The CO₂ concentration increases consistently, and the P0.1 pressure increases accordingly. The inhaled and exhaled CO₂ concentrations are displayed in the top right-hand measurement window.
7. During the measurement, the measurement window shows a similar image to the one below:

![Measurement Window](image)

8. By pressing the [Space] button or the [Enter] button again, the measurement is finished and the results are calculated and presented.
1.1.4 Findings of P0.1 measurement with CO2 rebreathing

In order to gain the typical CO₂ response curve, leave the measurement display and call up the inspection once again via the menu item *SHOW*.

1.1.4.1 Evaluation screen

![Evaluation screen diagram]

**Menu**

**Volume curve**

**Pₘₐₓ elicitation**

**P₀.₁ elicitation**

**P₀.₁ curves**

**Pₘₐₓ curve(s)**

1.1.4.2 Symbol key

- **[ESC] button**: finish
- **[F6] button**: switch over presentation
- **[F7] button**: print protocol
- **[Space] button**: show CO₂ response graphics
- **[F1] button**: record commentary
1.1.4.3 CO₂ response graphics

The CO₂ response graphics are shown or masked by pressing the [Space] button or the button.

By clicking on a window, the associated regression lines and the normal range show up on the screen. These ranges are determined by the computer at the beginning of the procedure. These elements can be moved manually using the mouse. The new position is automatically saved on closing the window.

HCVR means "Hypercapnic Ventilatory Response"