Application Note 21

Calibrating CPR Oxylators with CITREX

analyser
the art of measuring

Proper calibration is crucial and therefore requires the use of high-precision calibration equipment. Correct functionality of ventilation devices is of paramount importance, errors can cost lives.

CITREX is one of the most versatile flow-, volume- and pressure-measurement devices available, with a wide variety of use in medical device testing, calibration and industrial applications. One specific field of products that can be calibrated by Engineers and Technicians are the Oxylators from CPR Medical Devices Inc.

Editorial

Fasli Dervishi
Product Manager
imtmedical ag

Oxylators and their functions

Oxylators are patient-responsive, oxygen-powered resuscitation/inhalation devices intended to provide emergency ventilatory support. They are simple, safe and effective and give the caregiver utmost flexibility in airway management during emergencies and attended short-term ventilation.

During a full ventilatory cycle they incorporate two distinct functional elements. The first, during the inspiratory phase, is a selectable pressure limit which initiates the second, a passive expiratory phase, which is flow controlled.

The Oxylator will not start a new inspiratory cycle until exhalation is complete. That point is reached between 2–4 cmH_2O of PEEP in automatic or continuous mode, and at baseline in manual mode. This eliminates "stacked" breaths and their associated complications. The end of the expiratory phase then triggers the next inspiratory cycle, hence the new inspiratory phase is flow triggered.

Oxylator FR-300, EMX and HD (l.t.r.)

How to calibrate

To perform an accurate and correct calibration on Oxylators, distributors are using CITREX to provide their customers with optimum service and to ensure correct functionality.

Thanks to the design of CITREX, calibration requires only an Air supply, a filter, the honeycomb inlet tube, the CITREX Gas Flow Analyser and a test lung. All this components (besides air supply) are part of the biomedical test set "CITREX mobile" (302.161.000).

As the calibration works in conjunction with the specially designed OxyLab Software, it is necessary to ensure that the settings in CITREX are chosen correctly, as shown here.

Execute Zero Offset in CITREX before setting up the calibration by holding the "X" button for three seconds.

Required settings in CITREX:	
1. Gas Type	Air/O_2 auto
2. Gas Standard	ATP
3. Humidity	Surrounding Humidity
4. Trigger	Adult (standard settings)

The set up of the calibration station is extremely important; it is recommend using the set up with all the components in place, as shown below.

Set up for correct calibration:

Gravity has a significant influence on the magnetic valve of the Oxylator. Therefore, the calibration setting has to be placed horizontally.

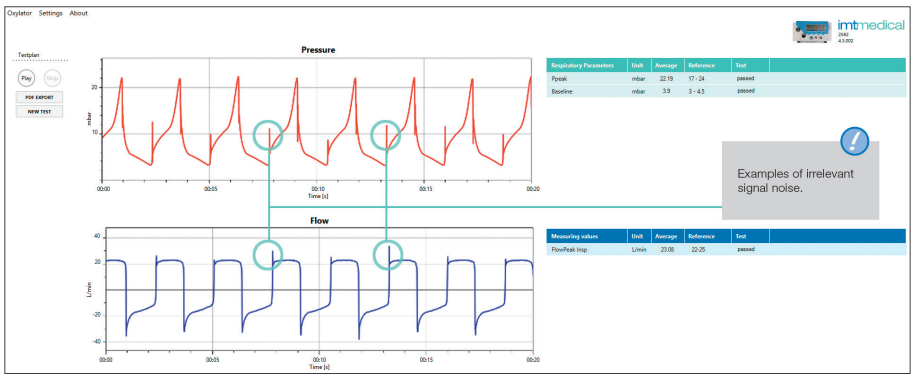
After presetting the CITREX flow analyser and arranging the correct set up, the Oxylator can be started.

OxyLab – Specifically designed Calibration Software for CPR Oxylators

The combination of CITREX and OxyLab make the calibration of Oxylators simple and efficient. The Software has been designed to show only the relevant gas parameters **P_{peak}, Baseline (filtered PEEP) and $Flow_{peak,insp}$** and to automatically deliver the functional status of the Oxylator.

Once CITREX is connected to a computer and the OxyLab Software is started, the measurement can be performed. After choosing the correct Oxylator, the software automatically filters the irrelevant signal noise created by the magnetic valve. Furthermore, it compares the filtered measurements with the predefined ranges from the Oxylator manufacturer and let the user know automatically if the calibration test has passed or failed. It is recommended that the calibration be run for a minimum of three minutes for optimum performance verification.

For review and documentation, the resulting curves and parameters can then be printed out. The printed document shows clearly if the Oxylator has passed the calibration test or not. It also allows the technician to provide documentation of the calibration test to their customer(s).



Customer Feedback:

"Thanks to the Oxylator calibration solution from imtmedical, I can offer a precise calibration service to all my customers.

With the documentation abilities of OxyLab my customers get always a comprehensive overview of all measuring results and can easily understand if their Oxylator is working correctly or not."

Wolfram Schuhwerk
REA2000 Switzerland

OxyLab Download Link:

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imtmedical ag . Gewerbestrasse 8 . 9470 Buchs . Switzerland . info@imtmedical.com . www.imtmedical.com