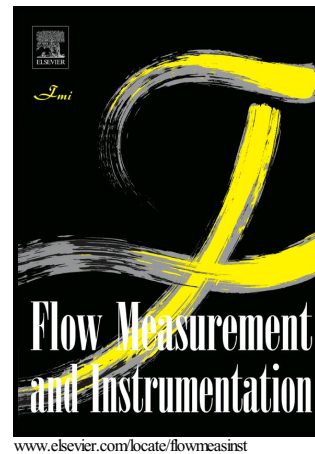


# Author's Accepted Manuscript

Venturi Tube Calibration For Airflow And Volume Measurement

Praneel John Titheradge, Robert Robergs



PII: S0955-5986(17)30031-6  
DOI: <https://doi.org/10.1016/j.flowmeasinst.2018.02.016>  
Reference: JFMI1417

To appear in: *Flow Measurement and Instrumentation*

Received date: 27 February 2017  
Revised date: 12 January 2018  
Accepted date: 11 February 2018

Cite this article as: Praneel John Titheradge and Robert Robergs, Venturi Tube Calibration For Airflow And Volume Measurement, *Flow Measurement and Instrumentation*, <https://doi.org/10.1016/j.flowmeasinst.2018.02.016>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Venturi Tube Calibration For Airflow And Volume Measurement

Corresponding author: Praneel John Titheradge. (Venturi development, data collection, data interpretation and manuscript writing)

Supervising author: Robert Robergs (Venturi development, data collection, statistics, data interpretation, figure development and manuscript writing)

Institution: Charles Sturt University, Bathurst NSW, Australia

Abbreviated title: Ventilation measured by a Venturi

ptitheradge@csu.edu.au

Mailing Address: Charles Sturt University, Panorama Avenue, Building 1431, 2795, NSW Australia

Word count: 4700

Figure count: 9

### Abstract

Ventilation measurement by Venturi meters ( $V_m$ ) has not been validated for human ventilation application in basic and applied physiology. This project aimed to demonstrate the feasibility of the  $V_m$  as an inexpensive, robust method for inspiratory ventilation measurements used in Indirect Calorimetry. A differential pressure transducer sensitive from 0 to 1,000 Pa combined with  $V_m$  made from retail PVC tubing (50mm Inside Diameter (ID) at inlet, 17.5mm ID throat section) allowed for airflow measurement of 1 to 8  $L \cdot s^{-1}$ . A Turbine ( $T_i$ ) was used as the criterion method. Variable airflow of atmospheric, temperature, pressure saturated (ATPS) conditions, were produced through manual 3  $L_{ATPS}$  manoeuvres of a calibration syringe and constant airflow was induced using a commercial air compressor. The  $V_m$  produced valid volumetric airflow ( $\dot{V}$ ) estimates across non-steady state pulsatile flow conditions ( $\pm 0.22 L \cdot s^{-1}$  95% confidence limits with zero bias for Bland-Altman). The

Download English Version:

<https://daneshyari.com/en/article/7113985>

Download Persian Version:

<https://daneshyari.com/article/7113985>

[Daneshyari.com](https://daneshyari.com)