

## ***Interactive comment on “Application of an O-ring pinch device as a constant pressure inlet (CPI) for airborne sampling” by Sergej Molleker et al.***

### **Anonymous Referee #1**

Received and published: 8 April 2020

This manuscript represents a thorough description and characterization of a new design for a constant pressure inlet for airborne aerosol and trace gas sampling applications. This design will benefit the community because it represents a significant improvement of constant pressure inlets on measurement platforms where small dimensions, automated operation and reliable performance in presence of rapid changes of ambient conditions are a requirement.

The manuscript is overall well written and concise. Some sentences could benefit from comments from a native language reader. The typesetting requires some streamlining of the use of italic vs roman fonts in formulae.

I would recommend the manuscript for publication in AMT after a few minor comments have been addressed.

C1

#### Specific comments:

p2, l19: inner diameter x cross section (do not capitalize)

p2, l19: please give city/country information for reference to a manufacturer of equipment, no quotation marks.

p2, l23: include proper reference to the manufacturer

p2, l26: ...O-ring, i.e., the tube cross section... (include commas and “the”). Consider rephrasing.

p2, l34: comma after “i.e.”

p2, l35: “...not used for...” (d missing)

p2, l38: D<sub>bore</sub> – “bore” not in italics

p2, l45: include proper reference to the manufacturer of the pressure sensor

p2, l48: The research aircraft should be identified more consistently and clearly for readers outside the airborne science community (at least refer to the operating organizations of the respective platforms)

p3, l15: “meets” not “meet”

p3, l16: “particle” not “particles”

p3, sec 2 1st par: The discussion of particle losses is somewhat redundant to the next section where this is discussed in more detail. This paragraph motivating the use of visual inspection of the orifices could be shortened with reference to the next section. Consider moving this entire section after the discussion of transmission losses.

p3, 2nd par: Is there any information on longer-term stability of the results – do the O-rings degrade after a number of pinching cycles such that the particle transmission might change? How reproducible are those results with a different batch of O-rings made of the same material?

C2

p3, l43: “Supposedly” seems to be the wrong word here.

p4, l8: include reference to manufacturer

p4, eq 1: erf should not be italicized

p4, l38: ...factor C, due to \_the\_ decrease... (missing “the”. Parenthesis not really needed, include into previous sentence)

p5, l10: use roman font in formula subscripts “downstream” and “upstream”.

p5, l42: identify research aircraft more clearly - see comment above.

p6, l2: “higher” -> “larger”

p6, sec 6: can the authors give an outlook to the performance of the CPI design for other particle measurements beyond aerosol mass spectrometry where the transmission characteristics of smaller particle sizes might be relevant?

Figure 1: Typo in “constant pressure inlet” Figure 7: the mixed use of color and line style is not very intuitive as only one parameter is varied here. Consider, e.g., using the same line style while labeling each line in the plot.

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-66, 2020.