

## Frequently Asked Questions

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**Question:**

**How should my esa-systems probe or venturi head be aligned?**

**Answer:**

In practice as well as in literature time and again you can see probes and venturi heads mounted head-down. The proper way, however, is to push the probe into the adapter head-up, the sole exception being esa-systems probes of DN/x type - these probes are to be aligned horizontally, i.e. parallel to the wings.

Aerodynamics professor Loek Boermans/ TU Delft observed in this regard:

**“Taking it all, it is preferable to mount the probe pointing upward.”**

As a reason he mentioned, “Flow calculations for a complete sailplane ... show that:

- The flow direction at the probe (which is assumed to be parallel with the reference line, being the tailcone axis) depends on the lift coefficient of the wing (which causes the curvature of the flow), the zero lift angle of attack of the wing and the incidence angle of the wing.
- Elevator deflections have a negligible effect on the flow direction at the probe.
- In circling flight there is an additional angle of attack because the probe moves on a larger circle than the center of gravity.
- In thermals the angle of attack varies continuously.

Maybe that the range in alpha of our tests is too wide...”

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**Question:**

**What kind of esa-systems probe or venturi tube is recommended for my glider?**

**Answer:**

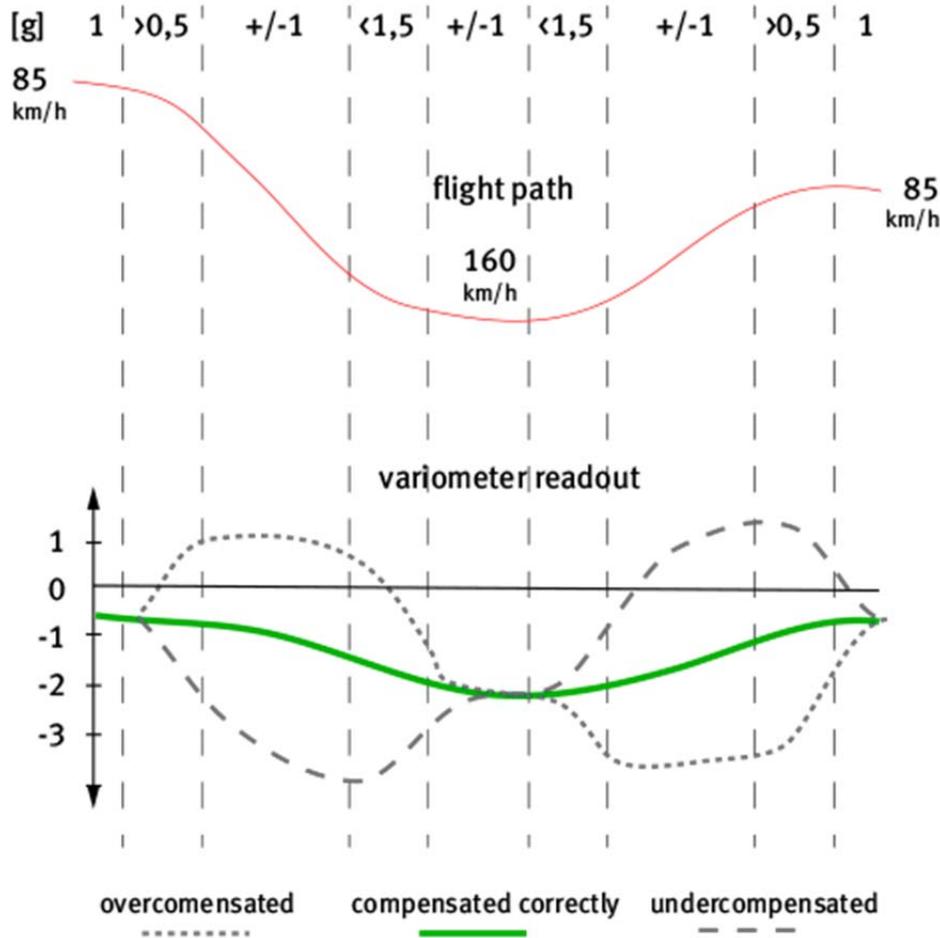
The probe or venturi tube is to be considered on it's own, regardless of the type of glider. In all possible flight attitudes, a probe or venturi tube must render a pressure coefficient of -1 ( $p_{\text{probe}} = p_{\text{stat}} - p_{\text{total}}$ ). This coefficient ought to be constant, independent of airspeed as far as possible, and the probe or venturi tube should not be sensitive to changes in angle of attack or yaw.

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**Question:**  
**How can I check the quality of my TE compensation?**

**Answer:**

For a reliable check, it is necessary to conduct the flights in absolutely calm air (first sufficient light prior to or at sunrise, no wind). Check flights do require some experience, and the instrument readings should be, if feasible, recorded by a video camera. This would help to eliminate interpretations influenced by emotions. Normally esa-systems probes and venturi tubes are perfectly compensated and do not need any readjustment. In exceptional cases of over- or undercompensation, depending on the particular glider, adapting the probe may be necessary. The sketch will help to interpret the variometer readout correctl



**Question:**

**The TE compensation of my variometer is unsatisfactory. What can I do about it?**

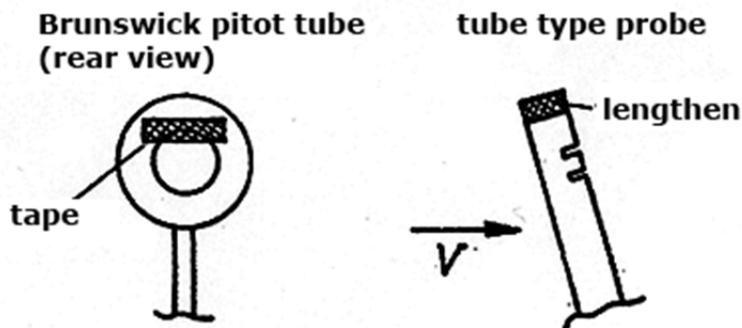
**Answer:**

Resulting from day-to-day use, there are problems that in most cases prove to be the reason of unsatisfactory compensation. The only remedy is to narrow down and eliminate the flaw in subsequent steps. Here are the possible problems in order of their incidence:

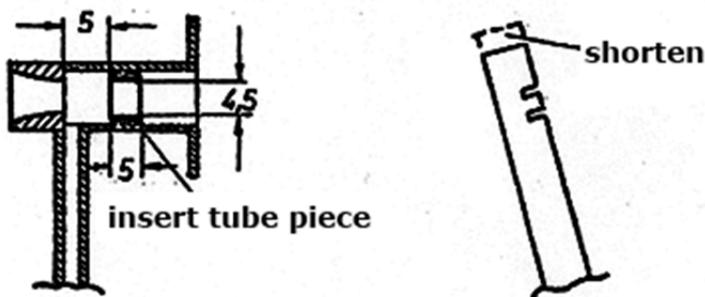
- leakage in the system between probe and instrument
- mix-up of TE and p-stat connections
- foreign objects or insects in the adapter
- computer wrongly connected for electronic compensation
- tube T-connection too close to the instruments (swirled airflow!)
- wrong computer configuration
- instrument case not tight

Online you will find detailed instructions for step-by-step procedures for narrowing down any flaws in the system under menu item service/instructions. The sketch shows how to proceed should the system require the probe to be adapted to the particular sailplane.

**a) remedy in case of overcompensation**



**b) remedy in case of undercompensation**



**Question:**

**The O-rings are worn – where can I get spare ones ?**

**Answer:**

The O-rings remain tight practically forever, proper care provided (service life, tested up to now, exceeds 24 years). Should the o-rings get worn or lost, esa-systems would be pleased to send replacements. Attention: for proper functioning of the probe or tube, dimensions and degree of hardness of the rings are crucial. You need O-rings made from material NBR (70 shore/hardness), dimensions 5 x 1.5 mm and 3 x 1.5 mm.

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**Question:**

**What is the proper care of the O-rings?**

**Answer:**

It is completely sufficient to wipe the rod of the probe with a clean piece of cloth and to lubricate the O-rings with a **little bit** of Vaseline or silicone grease. A hint: should, as an exception, neither be at hand, a wee-bit of saliva would do it for the moment.