

DG Flugzeugbau GmbH



Of Pressure and Probes

"The precision of today's soaring computers is so great that erroneous indications are almost always caused by incorrect pressure readings. The precision of the read-out is a function of the accuracy of the probe pressure."

This quote is from a well known manufacturer of soaring computers and should serve to call particular attention to this subject. The correct installation of the pressure source and the correct connection of the computer is almost a science in itself.

You know that there are basically three pressure source positions in a sailplane:

- the static pressure port for the altimeter
- the pressure port for the air speed indicator that also has to be connected to the static port
- and the probe for the vario compensation

The most sensitive and most difficult to attain is, surprisingly, the static pressure source. It's not enough for instance to just read the pressure in the cockpit. One only has to open the ventilation or the slide window to produce considerable pressure variations.

The designer has to seek, and test, positions on the fuselage where the pressure from in front and the suction of the passing air stream are equal. You will see these points marked by little red dots and the small hole in the middle must not be plugged.

The connection of several instruments to one port can lead to erroneous readings. If a static port connects to the altimeter and also to the computer, the **DSI** and, by pneumatic switch, to the vario, then the possibility exists that small leaks in the system will give wrong readings. This is why a sailplane should have at least two static ports so that instrument connections can be separated.

The pressure readings are usually taken from the nose and the static pressure from the fuselage side. The probe is usually located in the vertical tail fin. A long tube facing forward should avoid interference from the rudder. If the probe slot is in only one side of the tube, that side should face up to avoid turbulence from the wings.

There are also multi-function probes that combine static, pressure and vario ports and need an adapter that connects the three tubes to the instrument panel - it's usually called a "Prandtl-M-Probe with Prandtl-M-Adapter".

The most ideal location for such a probe would be well in front of the sailplane nose out of any turbulence generated by the sailplane.

Unfortunately, such a tube would not last very long. In the start line a helper goes past in front and 😊



Prandtl-M-Düse

That is why pitot tubes are located in the vertical fin. And to ensure that such a multi-function tube can be used all DG sailplanes have a Prandtl-M-Adapter included as standard equipment.



TEK-Probe

Motor sailplanes such as DG-808B etc. need a different solution. The propeller turbulence in motorized flight would render the readings useless and might even damage the instruments. That is why the vario is switched by pneumatic switch from the aft probe to the front static port and one does without compensation for the time being. That is also why the DG-808B has two static ports in front so that all instruments can be connected.

It is important to remember that in DG single seat sailplanes the static port is always the most forward hole in order to get precise air speed readings. The more rearward hole is intended for the connection of the vario, altimeter etc.

Another exception:

The "Cambridge Computer" must have it's own pressure port because it changes the pressure and would lead to false readings of the regular ASI. That is why the "Cambridge Computer" can only be connected via a Prandtl-M-Probe, because only it provides a second pressure port. If you want to install a "Cambridge Computer" in a DG-800 you must order it with a Prandtl-M-Probe and Adapter. For all others the multi-probe is not necessary in motor sailplanes and is not installed by us.

Instead we offer a very good "Total-Energy-Compensated" (TEK) probe, which is now made out of carbon fiber instead of aluminum, and is longer and less prone to fluctuations. Because fluctuations can also cause erroneous readings!

And lastly one could forego a probe altogether and have the computer compensated electronically, i.e. that it calculates the required compensation out of the altimeter and air speed reading changes. The manufacturers admit that this type of compensation is not as accurate as the readings from a good probe, and any additional manual vario would not be properly compensated and read

differently from the computer.

For the best solution to these problems:

- **For sailplanes order the standard equipment Prandtl-M-Adapter and a suitable multi-probe.**
- **For motor sailplanes order the carbon fiber TEK probe.**

Only if you also want to install a Cambridge Computer in your motor sailplane you must order a Pradtl-M-Probe and the Adapter.

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