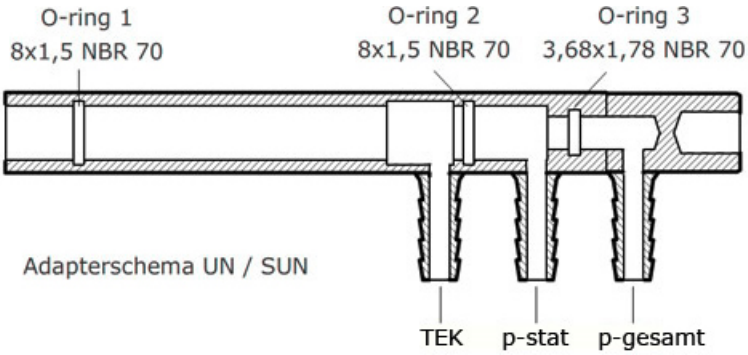
esa-systems
total energy & pressure probes

Instructions for Changing O-Rings in Adapters UN and SUN

The Adapter UN has 3 O-rings to mutually seal against each other the pressures taken by the multi-probe. Provided the shaft of the probe is kept clean and slightly lubricated with Vaseline or silicone grease, the O-rings practically won't wear (service life, tested up to now, exceeds 24 years). Should these conditions not be given, the rings, particularly O-ring 1, can be destroyed by abrasion. Thus, the system would not be air-tight any longer, and it would be necessary to change one O-ring or all of them. With the adapter in place, it is possible only to change rings 1 and 2.



Changing of ring 3 is possible only after the adapter has been taken out!

Procedure for changing of ring 1 and 2: With a sharpened needle (2 mm steel wire, sharpened and slightly bent) you lift the old ring out of its groove and pull it out of the adapter with a hook formed from a wire.

Lubricate the new ring 8 x 1.5 NBR 70 slightly with silicone grease, squeeze it, and insert it into the adapter.

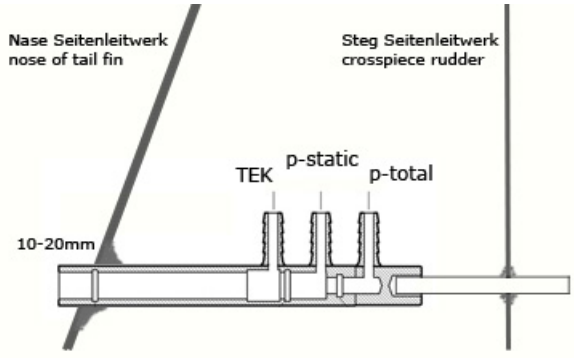
Then, by using a truncated round rod (approx. 4 mm in diameter), carefully push the ring further into the adapter until the first part of it slides into the groove. Then, step by step, push the remaining parts of the ring into the groove. This changing, particularly of ring 2, requires patience and delicate fingertips. A good illumination will facilitate the work considerably! (Hint: use a head lamp).

Procedure for changing of ring 3: After having taken out the adapter, you'll have to unglue the rearmost piece by heating it up to 90°C (195°F) with, for example, a hair dryer. After having pulled out that rear piece, changing of the O-ring 3.68 x 1.78 NBR 70 is possible as described above. After having inserted the new ring, the rear piece has to be glued again with an epoxide glue (e.g. ….) and to be tempered at approx. 70°C (160°F) for 1 hour.

Instructions for installing an esa-systems adapter into the tail fin

The installation of an esa-systems adapter into a fin is easy. The adapter should be mounted parallel to the standard flight plane.

The mounted adapter should protrude 10-20mm out of the fin. The correct distance to the elevator is about 150mm. In the back-end of the adapter you'll find a mounting hole where you can insert a 6mm tube through the crosspiece of the rudder (see picture),



To avoid the ingress of water the adapter's hose barbs should point upwards, the flexible tubes should become installed in shape of a syphon.

Note: As long as you keep the end of your totalenergie- or multi-probe clean and slightly greased, the internal O-rings will last for more than 24 years.

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Instructions for Tightness Checks of the Instrument System

Pressure-tightness of the instrument system is crucial for proper functioning of all instruments. It should be checked at regular intervals.
Parts needed for the system check:

- the airspeed indicator (ASI),
- a 60 ml syringe from a pharmacy,
- (lubricate the piston with Vaseline for ease of movement),
- an approx. 40 cm (16 in) length of instrument tube (preferably made from silicone)
- a T-connection

Procedure.

All steps to be done should be executed with consideration and care. Rapid pressure changes are to be avoided by all means.

Make sure that the pressure changes effected by the syringe take place slowly so as to avoid damage to the instruments!

First of all, the ASI has to be checked for air leaks.

Connect the ASI total pressure tube socket to the syringe by means of the silicone tube and slowly increase the pressure up to a reading of 150 kph (80 knots). If this reading stands for more than one minute, this side is o.k. Now, similarly, connect the ASI static pressure tube socket to the syringe and **very gently create a suction** until, again, the ASI will read 150 kph (80 knots). If this reading stands for more than one minute, too, the ASI is tight and can be used for the following steps.

Otherwise, the ASI is unserviceable. Proved tight, the ASI should be reconnected to total and static pressures.

Check-out of total and static pressure tubes as well as the TE system involving **all instruments connected**. The total and static pressure ports in the fuselage are meant to be connected to **ASI, altimeter, computer and transponder**. As a rule, the static pressure socket of the variometer is connected to a **TE probe**. Where a **multi-probe** is mounted, it should **exclusively** serve the **variometers** and the **computer**.

The static pressure ducts are checked out by increasing and decreasing pressure. For this purpose the static pressure ports in the hull (and, if applicable, in the probe) have to be sealed off by a soft tape. Then the T-connection has to be inserted into the static pressure duct, and its free end will, through the piece of hose, be connected to the syringe. Carefully increase **suction/pressure** until the ASI reads 150 kph. If this reading stands for more than one minute, this duct is o.k. Remove the T-Connection and reconnect the duct.

Now, seal the total pressure port of the fuselage (and, if applicable in the probe). Then repeat the procedure given above with the total pressure ducts – however, with **increased pressure** only, not with suction. If the ASI reading stands for more than one minute, the system is sufficiently tight. Should there appear any leakages, the sources of them have to be located and eliminated.

Leakage in the TE system is the main reason that prevents proper TE compensation!