

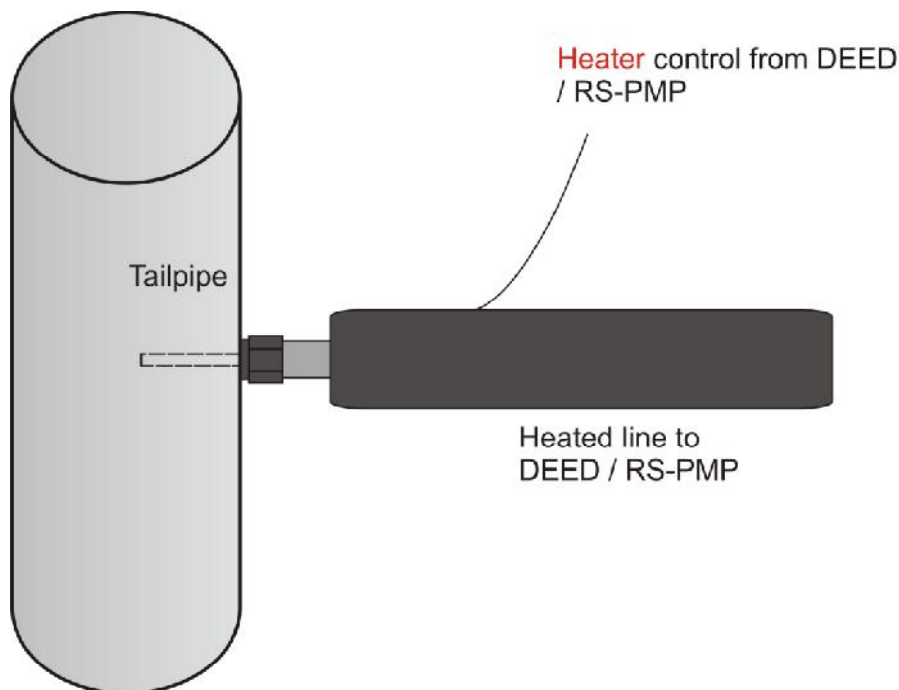
A. Accessories

The following accessories are available for the DEED-100 system:

- DEED-150 Post-DPF sampler
- DEED-300 Pre-DPF sampler
- DEED-500 EURO5b/6 compliant cyclone
- Pressurised air filtration and drying units

A.1 DEED-150 Post-DPF sampler

If the particle number measurements are carried according to the EURO5b/6 legislation, the sample for the conditioning unit should be taken from a CVS tunnel. However if there is no CVS tunnel available in the test cell, then the conditioning system must be connected directly to the tailpipe. The DEED-150 post-DPF sampler is designed to make connecting to the tailpipe easy and simple. The DEED-150 is most suitable for post-DPF conditions, where particle concentrations are low although it can also be used with vehicles without exhaust after-treatment system. The schematic of the DEED-150 is presented in the figure below.



The DEED-150 is connected to the tailpipe with a 10 mm Swagelok® and it uses a perforated probe to draw the sample from the tailpipe. The entire line from the

tailpipe to the DEED inlet is heated to approximately 60 degrees Celsius to avoid condensation of water. The heated line temperature is controlled automatically by the DEED system to optimal value. For the user there is no need to adjust any operation parameters from the DEED system when using the DEED-150 post-DPF sampler.

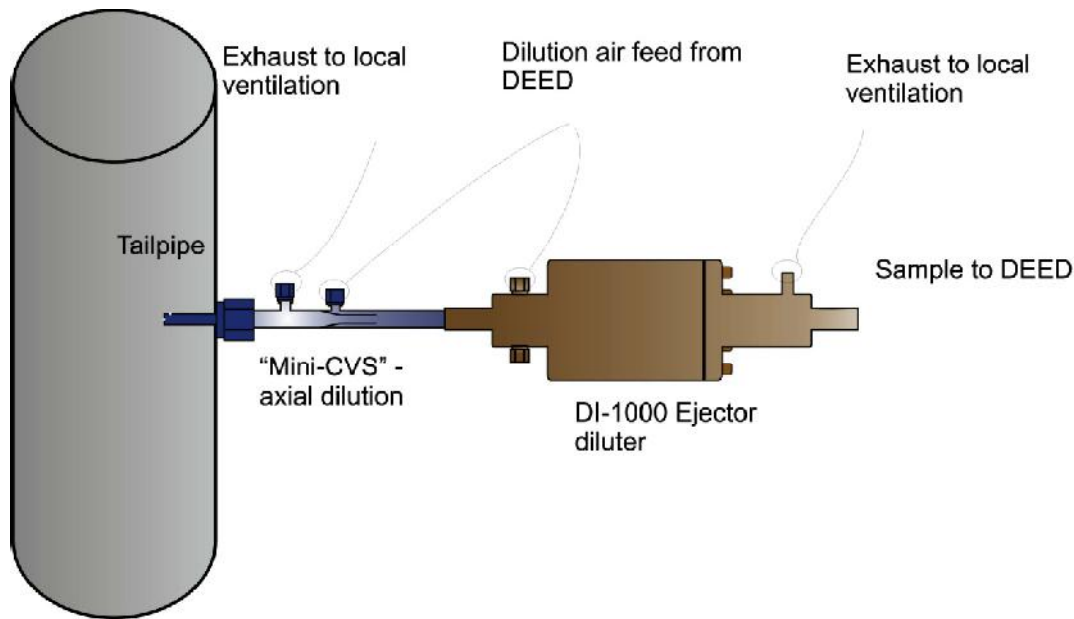
DEED-150 specifications:

Dilution factor	N/A
Connection to tailpipe	10mm Swagelok® (provided with order)
Connection to DEED	10mm Swagelok® (provided with order)
Heater power	200 W
Sample temperature range	0 – 400 °C

When the DEED-150 accessory is used, it is highly recommended to connect the DEED sample exhaust back into the tailpipe to avoid changes in the dilution factor due to pressure fluctuations.

A.2 DEED-300 Pre-DPF sampler

The DEED-300 Pre-DPF sampler enables connecting the DEED system to pre-DPF conditions, where typically particle concentration, pressure and temperature are high. Due to the innovative design, the DEED-300 always keeps a constant total dilution factor regardless of pressure and temperature conditions inside the tailpipe. The DEED-300 increases the total dilution factor of the DEED system by adding two additional dilution stages. Additional dilution ensures that the concentration in the DEED sample outlet is below 10 000 particles/cc even when sampling from high pre-DPF particle concentrations. The DEED-300 schematic can be seen below:



The DEED-300 uses a small orifice to sample exhaust from the pre-DPF conditions. A part of the sample is lead to a “Mini-CVS” axial diluter, while the excess raw sample is lead to the local exhaust. The sample is drawn from the “Mini-CVS” to the DI-1000 Dekati® ejector Diluter where it is further diluted and led onward to the DEED system. The exhaust from the DI-1000 and the DEED system should also be led into the local ventilation system. The specifications of the DEED-300 pre-DPF dilution system are presented below:

DEED-300 specifications:

Dilution factor	Constant at approx. 40 (individually calibrated)
Connection to tailpipe	12 mm Swagelok® (provided with order)
Connection to DEED	Sampling hose with connector (provided with order)
Sample temperature range	0 – 600 °C

A.3 DEED-500 EURO5b/6 cyclone

PMP-recommendation allows a cyclone to be placed before the inlet of the conditioning system. The purpose of the cyclone is to protect the number counting device from large particles that may be present in the sample. The cyclone must have a d_{50} cutpoint between 2.5 and 10 μm during operation.

The DEED-500 cyclone is connected directly to the DEED inlet, no additional parts or connectors are needed for operation.

DEED-500 specifications are:

Cutpoint	Between 2.5 and 10 μm @ normal DEED operating flow
Temperature range	0 – 200 °C
Inlet	10 mm outer diameter pipe
Outlet	1/2" female thread, direct connection to DEED inlet with provided connector

A.4 Pressurised air filtration and drying units

When aerosol sample is diluted for particle measurements, it is important that the dilution air is dry and particle free to avoid unpredictable problems caused by water condensation and impurities' effect on the measured particle concentration. Dekati's DI-1010b and DI-1032 pressurized air drying and filtration units can be used to condition the pressurized air used for dilution in the DEED, Dekati® FPS, Dekati® Diluter or the Dekati® Axial Diluter. Both units include particle and oil filters to remove impurities from pressurised air. DI-1010b unit uses a molecular sieve and silica gel for drying while DI-1032 has a membrane dryer to dry the air.