

Dekati Accessory

DEED-300

Introduction

DEED-300 is an accessory for the DEED-100 sampling system. It is used for sampling from pre-dpf conditions. The DEED-300 uses two stage dilution system; first the sample is diluted in an axial diluter and then led to an ejector diluter. The total dilution factor of the DEED-100 + DEED-300 system can be calculated by multiplying the DEED-100 dilution factor with the DEED-300 dilution factor. The dilution factors can be found on the instrument specific datasheets

Operation principle

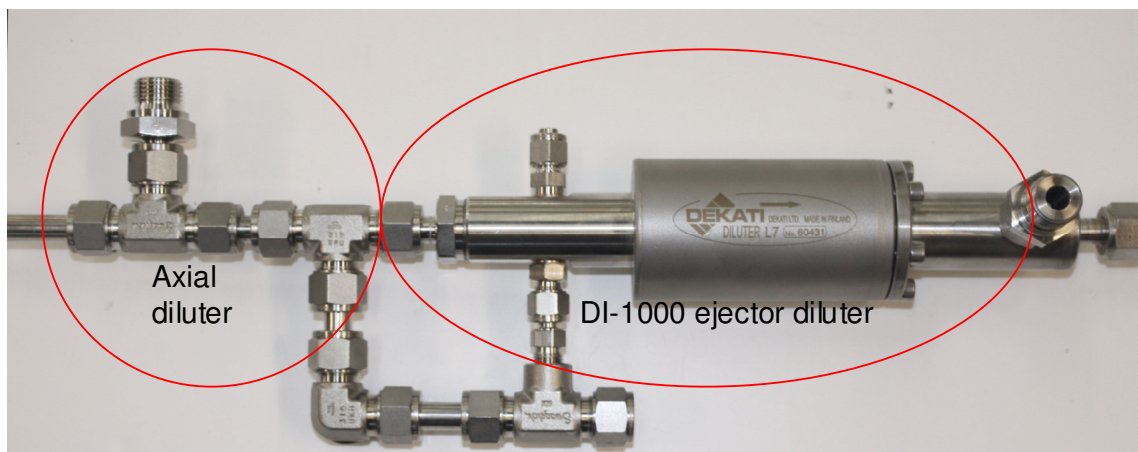
The DEED-300 uses a small orifice to sample exhaust from the pre-dpf conditions. Part of the sample is lead to a "Mini-CVS" axial diluter, while the excess raw sample is lead to the local exhaust. The sample is drawn from the "Mini-CVS" to the DI-1000 Ejector diluter where it is further diluted and led onward into the DEED system. The exhaust from the DI-1000 and the DEED system must also be led into the local ventilation system.

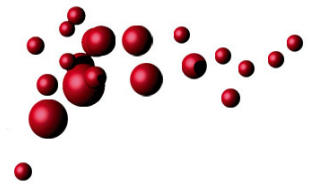
Operation conditions

Sample temperature	0-600 C
Sample pressure	20-3000 mbars ABOVE ventilation pressure
Dilution ratio	See separate data sheet (40-60 typical)

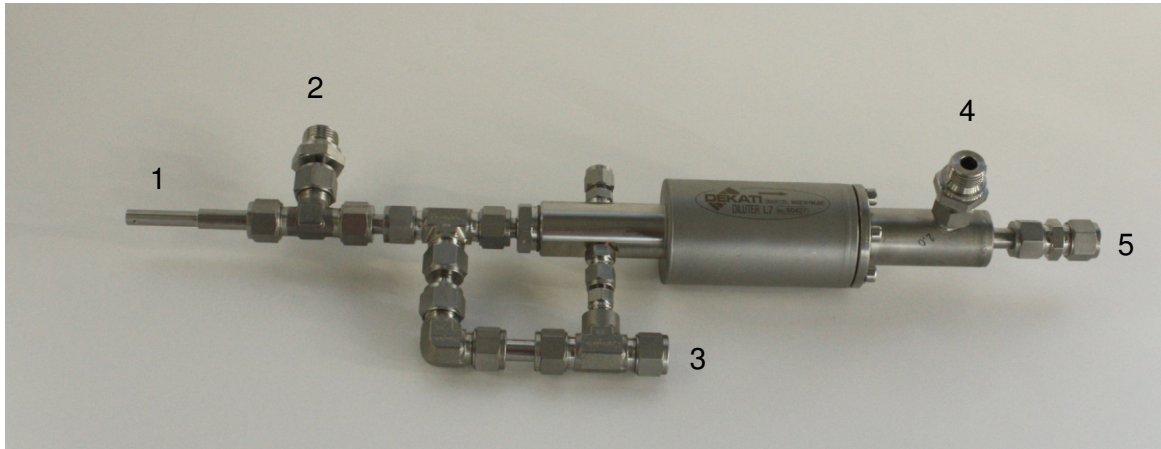
Using the DEED-300

The DEED-300 has two parts, the DI-1000 ejector diluter and the axial diluter.





DEED-300 connections

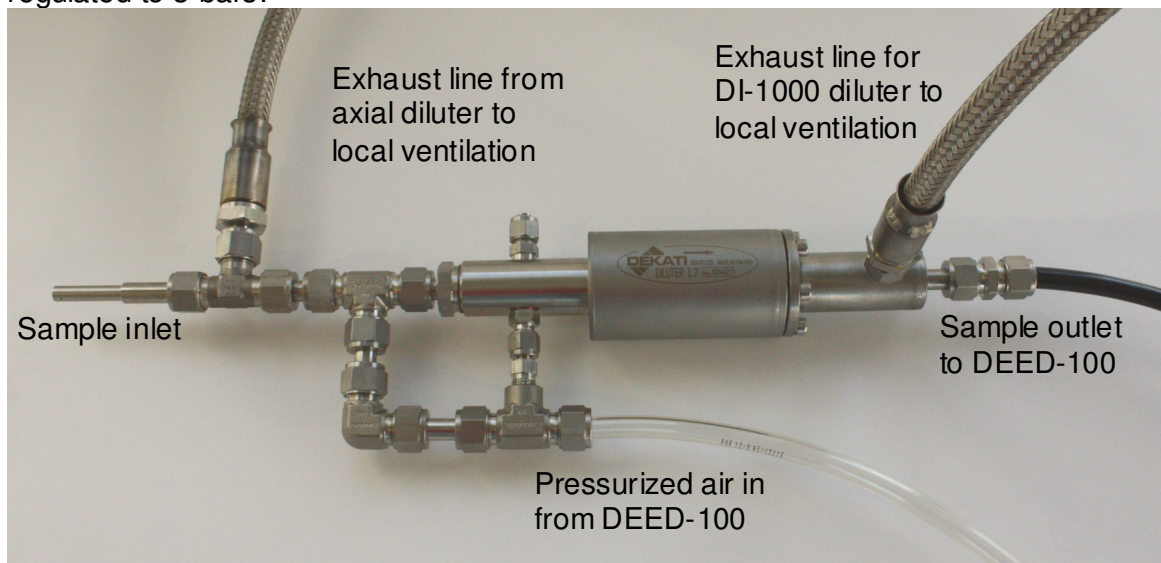


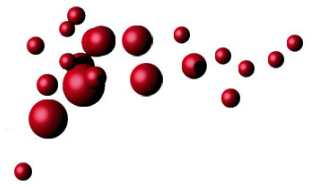
- 1 High pressure sampling probe
- 2 Exhaust of the axial diluter
- 3 Dilution air connector
- 4 Exhaust of the DI-1000
- 5 Sample outlet

The exhaust lines provided with the DEED-300 should be connected to DI-1000 and axial diluter exhausts and connected to local ventilation system.

Sample outlet is connected to DEED-100 backpanel connector “sample in” with black sampling hose provided with the DEED-300. Other sampling lines can be used as well as long they are suitable for particle sampling.

The dilution air should be connected to DEED-100 backpanel connector dilution air out. The DEED-100 regulates the dilution air pressure automatically to 3 bars. If external regulator is used the pressurized air should be clean and dry. Pressure should be regulated to 3 bars.



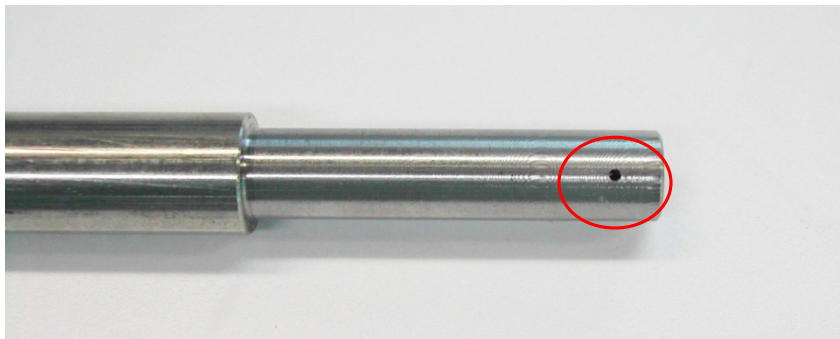


NOTE: The dilution air line MUST be connected first into the DEED-300 BEFORE connecting the quick connector into DEED-100 backpanel.

NOTE: If the DEED-300 is connected to the tailpipe and the engine is running, the DEED-100 must be turned ON to prevent fouling.

The exhaust line from the axial diluter should be directed downwards so any possible condensation water can easily exit the connector.

The DEED-300 should be installed perpendicular to the exhaust flow, so that the small orifice in the high pressure probe (marked with a red circle in picture below) is facing away from the flow.



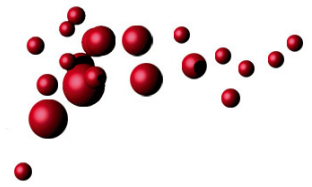
A Swagelok® weld fitting for connecting the high pressure probe to the tailpipe is provided in the shipment.

Disassembling and cleaning of the axial diluter

The axial diluter can be cleaned with a suitable solvent in an ultrasonic cleaner. First remove the exhaust and pressurized air hoses from the diluter.

Start disassembling the diluter by removing the high pressure probe from the diluter. The high pressure probe is attached to the diluter with a Swagelok®

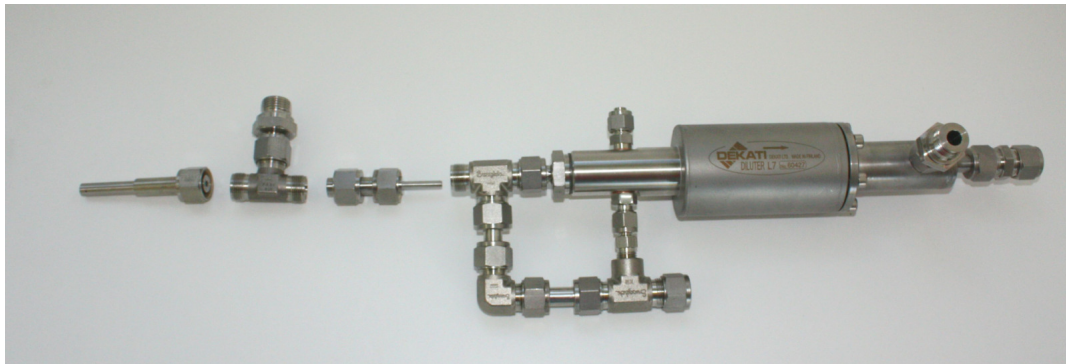




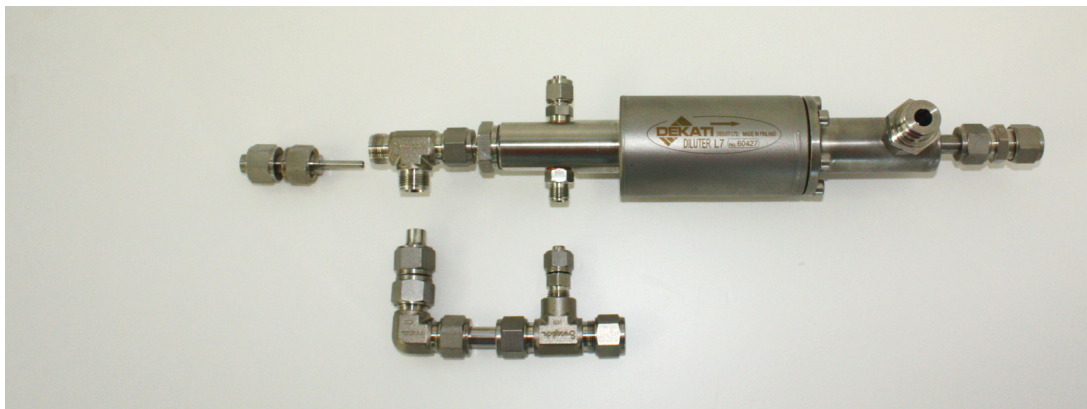
Then remove the axial diluter exhaust part.



Remove the axial diluter

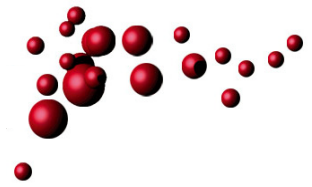


Open the pressurized air connectors for both axial diluter and the DI-1000.



Only clean pressurized air goes through these channels, so usually there is no need for disassembling and cleaning of this part. Remove the T-connector from the DI-1000.

Wash the parts in an ultrasonic cleaner with a suitable solvent. Let the parts dry and assemble the diluter. The assembling is done in reverse order than the disassembling.



Disassembling and cleaning of the DI-1000

Check the position of the flange relative to the body and open the six bolts that keep the parts together.

Marking the relative position of the flange and the body makes the assembly easier and the exhaust remains in the original position.



Check the gasket for any damages. Replace the gasket if it is damaged.

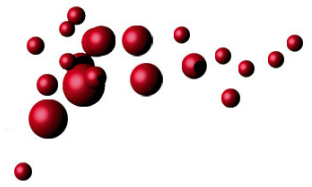


Open the inlet connector. The connector can be tight. The easiest way to open the connector is to put two wrenches as in the picture, one on the inlet connector and one on the diluter body. Press the wrenches so that the diluter connector opens.



Place the diluter on a table and carefully pull the ejector nozzle and copper gasket from the body. Tweezers provided with each diluter should be used to pull out the ejector nozzle. Place the tweezers to the holes on the nozzle wall. Be careful not to damage the nozzle when removing it from the diluter body. Check the copper gasket for any damages and replace if it is damaged.





The diluter can be cleaned with water or other general solvents in ultrasonic bath. **If acids are used as cleaning agent make sure they are suitable for stainless steel in order to avoid corrosion.**

A careful cleaning of the ejector housing is especially important because of the accurate tolerances of the housing and the ejector.

The ejector can also be cleaned quickly without disassembling by using an injection needle or equivalent tool with a 0.9 mm diameter to open the 1.0 mm hole in the ejector nozzle. Be careful not to damage the nozzle during cleaning. However, the ejector should be disassembled for cleaning from time to time to assure correct operation.

Fast cleaning of the diluter can be done also by conducting clean pressurized air through the critical orifice connector and the blocked connector. Close the exhaust connector and the outlet and conduct the pressurized air backwards via the ejector to the inlet. The same procedure can be done also by closing the connector for critical orifice and then conducting pressurized air into the diluter via exhaust connector or via the outlet. The cleaning pressure applied can be up to 10 bars.

Do not use any extra force when assembling the ejector back to the housing in order to avoid damaging the surfaces and the ejector nozzle. Use 10 kpm torque when assembling the inlet connector. If a torque-tool is not available turn the connector by hand and then tighten it 45° with a wrench. If there is a backspace between the gasket and the connector after assembly, check that the gasket is in the right position around the collar of the ejector.

Note that damaging of any part of the diluter may have effect on the dilution ratio of the diluter. Be especially careful when handling the ejector nozzle. Also damage of the gaskets may affect the dilution ratio.