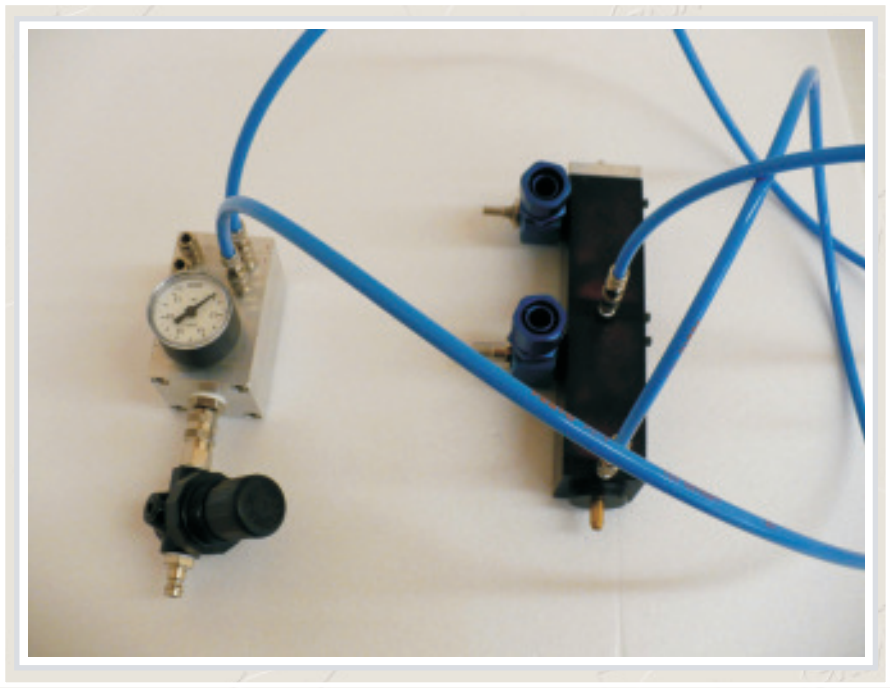
Cascadable diluter with compressed air, Model 7.951 VKL-mini



Applications

Aerosol measurements

Filter testing

Inhalation experiments

Aerosol research

Emission monitoring

Aerosol-Science

Highlights

Compact design, light weight

Variable dilution ratio due to modular design

low consumption of compressed dilution air

Easy to use, quick change of dilution ratio

Installation and maintenance without tools

Low particle losses, short and straight air flow passages

Compact, light weight diluter with modular design

The VKL-mini diluter, model 7.951 was designed for operation with all Grimm aerosol spectrometer. The complete system exists of a connector block for compressed air supply and up two diluter modules with variable inlet nozzles (1:10 and 1:31,6). Using the injector principle the aerosol sample is diluted with compressed air in each diluter module. Due to this modular design the dilution ratio can be chosen in steps between 1:10 and up to 1:1000 using two dilution modules in a cascade row. The VKL-mini is a very flexible but extremely compact system with a good performance and low consumption of compressed air.
For a correct and reproducible sampling it is absolutely necessary to assure, that the pressure of the undiluted sample flow entering the diluter and the pressure of the diluted sample flow leaving the diluter are the same, so no sampling in under or over pressure conditions.

Easy to install and to maintain

To install and operate the 7.951 VKL-mini no additional tools are required. All connections are easy to lock or unlock. This enables an easy installation and fast change of different dilution ratios. Simply connect compressed air to the connector block and adjust to a pressure of 200 mbar, choose the number of dilution modules and inlet nozzles, and connect the diluter modules with the connector block and the aerosol spectrometer - that's it.
Contaminations inside of the diluter can be easily detected and rapidly cleaned. This assures a good performance even for high aerosol loadings. There are no consumables in the complete system except of a high surface filter for the compressed dilution air in the connector block.

Model 7.951 VKL-mini

Specification

Principle: injector nozzle
Dilution media: compressed air
Comp. air pressure: 200 mbar
Inlet nozzles: variable, 1:10 or 1:31.6

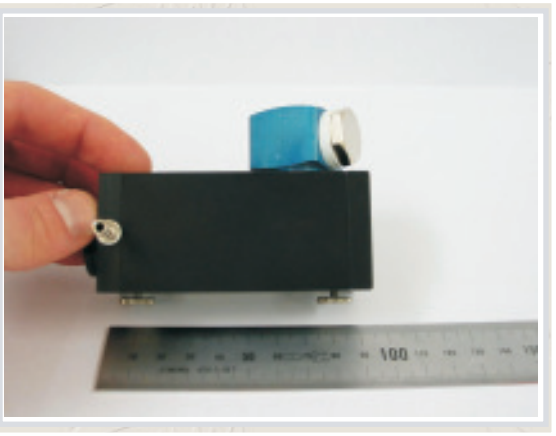
Dilution ratio:	Number of modules	compressed air consumption
1:10	one (1:10)	18 lpm
1: 31.6	one (1:31.6)	18 lpm
1:100	two (1:10 x 1:10)	36 lpm
1: 316	two (1:10 x 1:31.6)	36 lpm
1:1000	two (1:31.6 x 1:31.6)	36 lpm

Higher dilution ratios are possible, because the connector block is already prepared to supply three modules

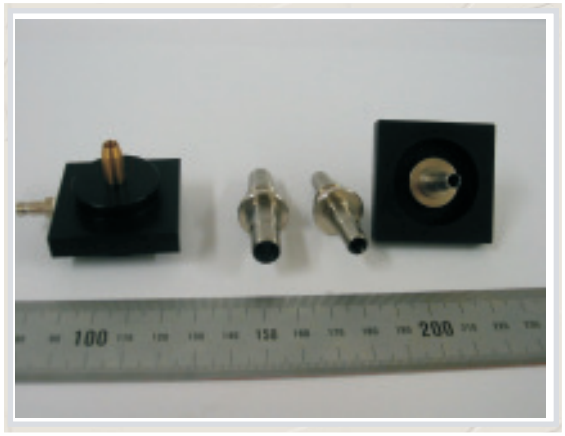
Reproducibility: 5 % over the whole range
Flow rates for each module
, aerosol in: 0.6 lpm (1:31.6), 1.8 lpm (1:10)
aerosol out: 1.2 lpm
compressed air in: app. 18 lpm (1:31.6), 18 lpm (1:10)
exhaust aerosol out: app. 17.4 lpm (1:31.6), 16.2 lpm (1:10)

Temperature range: 0 to +40 °C (32 to 104 °F)
Pressure range: $P_{in} = P_{out}$ (for pressure less sampling only!)
Humidity range: relative humidity < 95 % (non condensing)

Connector block (side view) and dilution module



Dilution module



Inlet nozzle (left) and outlet nozzles for dilution module

Connector block and dilution module

Claculation of the dilution ratio

D = Qd/Q0 = dilution ratio
Qd = Q0 + Q1 = diluted aerosol [litre/minute]
Q0 = undiluted aerosol [litre/minute]
Q1 = pure dilution air [litre/minute]

User experiences or application examples on request!

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