TOPAS®
Technologie-orientierte Partikel-, Analysen- und Sensortechnik

**Dynamic Dilution System**

# DDS 560/C


Dynamic Dilution System DDS 560/C for variable flow rates and adjustable dilution.

The DDS 560/C is an aerosol conditioning system that serves for free-adjustable and defined reduction of the particle number concentrations. Moreover, the dilution system can be passively operated by various aerosol sample flow rates.

Aerosol conditioning by dilution is one basic measure for analyses of aerosols. For example, numerous aerosol-analytical instruments are limited to specific concentration levels. Too high concentrations can cause a false estimate of aerosol characteristics due to the re-entrainment of deposited particles, coincidence effects within optical particle counters or insufficient bipolar neutralisation during differential mobility analyses.

## Applications

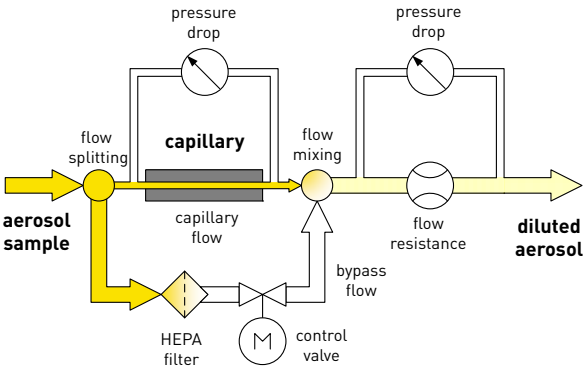
- calibration of aerosol-analytical instruments
- indoor aerosol analyses
- occupational safety measurements
- fundamental research

## Features

- free adjustable dilution factor over wide range (approx. one decade)
- compatible with various aerosol-analytical instruments (i.e., variable flow rate)
- automatic readjustment of setting value of dilution
- stand-alone or remote-controlled operation with parameter monitoring

## Principle of operation

The DDS 560/C principal of operation is based on a splitting of the aerosol sample flow rate into a bypass and a capillary flow rate. All particles within the bypass flow rate are removed by a HEPA filter. The capillary flow is substantially lower than the bypass flow. Both the capillary flow rate and the total flow rate are determined via pressure drop measurement.




Functional principle of the Dynamic Dilution System DDS 560/C.

The control valve in the bypass flow rate path serves for adjusting the bypass flow rate and therefore the dilution ratio. After the capillary, all flow rates are merged.



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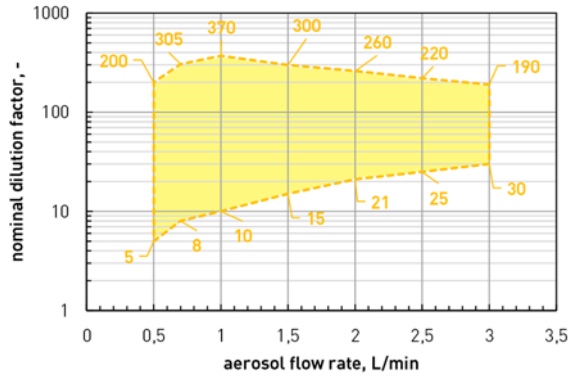
## Specifications

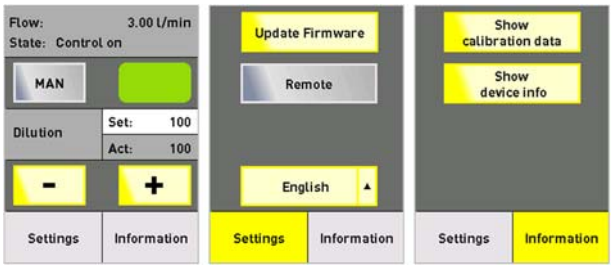
### Details

The nominal operation range of the DDS 560/C is shown in the diagram below (other specification are possible on request). Accordingly, the dilution range depends on the aerosol sample flow rate.




Nominal operation range of the Dynamic Dilution System DDS 560/C.

The adjustment of the required dilution can be set via both the touch screen on the device and the serial interface.




User interface of the DDS 560/C: operation menu (left), tab for menu settings (middle), tab for menu information (right).

During operation, the touch screen shows the set value and the actual value (measured value). Readiness is shown by a green status indicator. The operate mode of the device (controlled or non-controlled) can be changed by pressing the MAN button.

### Accessories

- antistatic hose line
- spare HEPA filter

### References


Göhler et al. (2024) Performance of intraoperative surgical smoke management technologies for laparoscopic surgery: A comparative in-vivo pig study. J. Aerosol Sci., 177, 106309, doi: 10.1016/j.jaerosci.2023.106309

Tran et al. (2020) Determining the cutoff diameter and counting efficiency of optical particle counters with an aerodynamic aerosol classifier and an inkjet aerosol generator. Aerosol Sci. Technol., 54, 1335-1344. doi: 10.1080/02786826.2020.1777252

Kretzschmar et al. (2020) Modulation of silica layer properties by varying the granulometric state of tetraethyl orthosilicate precursor aerosols during combustion chemical vapour deposition (CCVD). Aerosol Sci. Technol., 54, 10, 1124-1134. doi: 10.1080/02786826.2020.1762845


### Technical specifications

| | |
|---|---|
| setting parameter | dilution factor |
| setting range (depending on flow rate) | 5 ... 200 (@ 0,5 L/min)<br>10 ... 370 (@ 1,0 L/min)<br>30 ... 190 (@ 3,0 L/min) |
| setting resolution | stepwise by 1 or 10 |
| set up time | < 10 s |
| operating flow rate range | 0,5 ... 3,0 L/min<br>(others on request) |
| operating medium | air (others on request) |
| communication interface | RS232 (M9 IP67, 5 pole) |
| power supply | 24 V DC (power adaptor) |
| power consumption | < 25 W |
| noise emission | not relevant |
| hose connector | 8 mm (outer diameter) |
| dimensions (w × h × d) | 140 × 200 × 285 mm |
| weight | 3,3 kg |