

SPM Sampling



Low/Medium Volume Sampler **LVS/MVS**

for Collecting Particulate Matter $PM_{10/2.5/1}$



Low/Medium Volume Sampler LVS/MVS

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The low or medium volume samplers LVS and MVS collect suspended particulate matter on sampling filters according to EN 12341:2014 (PM₁₀ and PM_{2.5}). They take in ambient air and fractionate the airborne particles in a sampling inlet. The particles are collected on a filter and made available for subsequent gravimetric assessment or analysis. The volumetric flow rate is electronically adjusted with an accuracy of ≤ 2 % deviation.

- Sampling equivalent to EN 12341:2014
- Simple operation with jog dial
- Electronically adjusted volumetric flow rate
- Operating modes: TIME, PERIOD and QUANTITY
- Displays pressure, temperature and humidity
- RS-232 interface

Suitable according to the following standards and directives:

- EN 12341:2014 (PM_{2.5} / PM₁₀)
- VDI 2463 sheet 7 and 8
- VDI 2465 sheet 1 and 2
- VDI 3498 (dioxins and furans)
- VDI 2267 (heavy metals)
- VDI 3492 (total dust and asbestos)
- MVS 6.1 in addition:**
- VDI 3875 (PAK)
- VDI 4301 (PCP/Lindan)

Design

LVS (Low Volume Sampler) and MVS (Medium Volume Sampler) consist of the following principal components:

- Stainless steel cabinet with lockable doors
- Control unit with display, electronic modules, SD card reader and RS-232 interface
- Rotary-vane vacuum pump
- Orifice plate
- Sampling inlet (optional) for particulate matter fractions PM₁₀, PM_{2.5} or PM₁
- Intake tube Ø 12 mm
- Temperature and humidity sensor
- GPRS modem (optional)

The **LVS 3.1** is equipped with a 4 m³/h pump. The volumetric flow rate for sampling PM₁₀ or PM_{2.5} fractions is usually set to 2.3 m³/h; the maximum vacuum at the filter is 300 mbar. The maximum volumetric flow rate when using glass fiber filters is 3.5 m³/h. The LVS 3.1 functions according to European directive EN 12341:2014.

The **MVS 6.1** is equipped with an 8 m³/h rotary-vane vacuum pump and can be operated with a maximum volumetric flow rate of approx. 5.5 m³/h. It is especially suitable for measur-

ing semi-volatile organic compounds (SVOCs) and for use in conjunction with special filter materials (e.g. cellulose nitrate or Nuclepore filters). The maximum vacuum at the filter is 500 mbar. The MVS 6.1 also functions according to European directive EN 12341:2014.

Operating Principle

Before sampling begins, the desired settings are entered in the control unit. Once the operating cycle is activated, sampling takes place automatically according to the set parameters. During operation, the vacuum pump draws in air, containing fine particulate matter, through the sampling inlet. The particles are segregated by size in the inlet with impactor. The air with particles of the desired fraction then continues on through the filter holder, and the particles are deposited on the sampling filter in the filter cartridge.

The volumetric flow rate is measured with an orifice plate between filter and vacuum pump and electronically controlled with an accuracy of ≤ 2 % deviation. The ambient climatic conditions are continuously monitored by temperature and humidity sensors.

Various data captured during sampling is saved in the internal memory and on an SD card, and can be transferred to a

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PC via RS-232 interface. This data includes serial number, filter number, sampling start/end/duration, mean volumetric flow rate, sampled air volume, and filter storage temperature.

Benefits

LVS and MVS were developed in 1976 and have been continuously improved in the intervening years. Numerous LVS/MVS units have been reliably operating for many years.

Their reliability and quiet operation facilitate the continuous collection of particle samples, both in densely populated areas at any time of day or night, as well as indoors. Thanks to their small footprint, the devices can also be installed e.g.

on masts or lampposts. Since the sampling inlet can also be operated at some distance from the unit, it can be installed in the immediate vicinity of the emission sources, typically for monitoring road traffic pollution. In view of their portability, one single unit can determine immission profiles for soot (elemental carbon) and other particulates at several permanent measurement stations.

As standard, the LVS 3.1 and MVS 6.1 are also designed as control units for the filter changers of Comde-Derenda sampling systems. For further details, please consult the data sheet for the sampling system PNS DM.

Scope of Delivery:

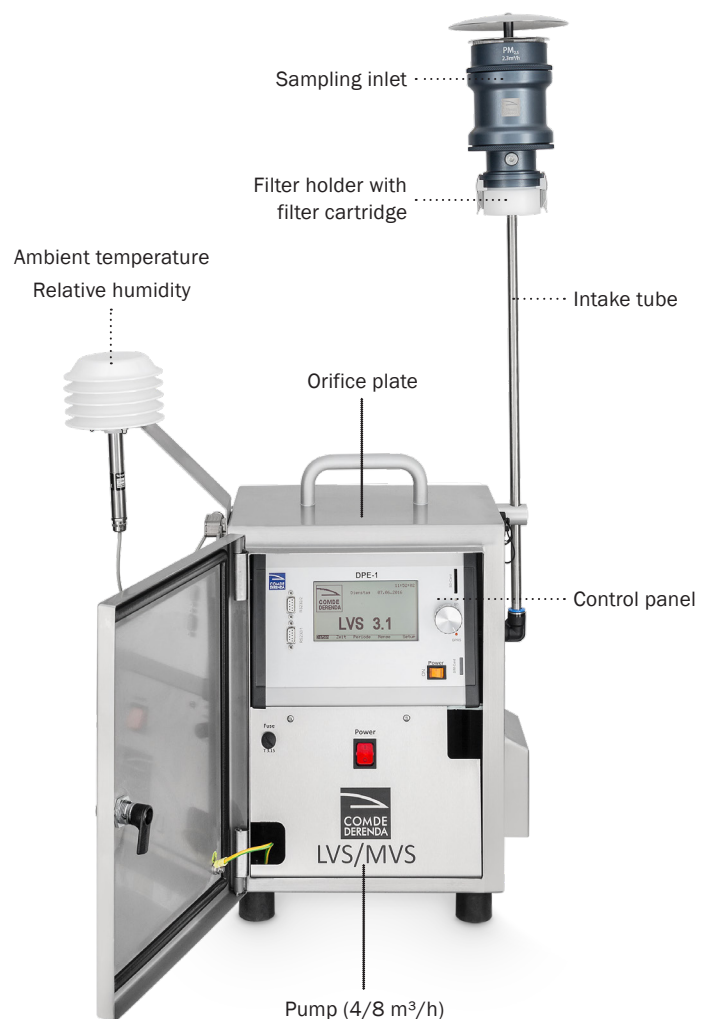
Basic device Low Volume Sampler LVS 3.1 or Medium Volume Sampler MVS 6.1, intake tube \varnothing 12 mm, connection socket for filter changer, 2 \times SD card for data storage, 1 \times transfer cable, 1 \times SD card reader, calibration protocol, key, and instruction manual

Ordering information:

D120001 Low Volume Sampler LVS 3.1
D120002 Medium Volume Sampler MVS 6.1

Accessories (Selection):

D100868 Sampling inlet PM₁₀ according to EN 12341, flow rate 2.3 m³/h
D100870 Sampling inlet PM_{2.5} according to EN 12341, flow rate 2.3 m³/h
D100871 Sampling inlet PM₁, flow rate 2.3 m³/h
D100863 Filter holder
D100930 Calibration adapter



Technical Data LVS/MVS

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Types: LVS 3.1 / MVS 6.1

Volumetric Flow Rate	
LVS 3.1 (controlled)	1.0 ... 3.5 m ³ /h (Nm ³ /h)
MVS 6.1 (controlled)	1.0 ... 5.5 m ³ /h (Nm ³ /h)

Power Consumption	
LVS 3.1	approx. 240 VA
MVS 6.1	approx. 300 VA

Sampling time	1 min ... 1000 h
Power supply	230 V, 50/60 Hz
Filter diameter	47 mm
Diameter of the sampled filter surface	41 mm

Dimensions (without external sensor, intake tube and inlet)	
Width	approx. 360 mm
Height (with handle and feet)	approx. 490 mm
Depth (with lock)	approx. 290 mm

Weight	
LVS 3.1	approx. 17 kg
MVS 6.1	approx. 19 kg

Sound pressure level acc. to EN 3744:2010 in 8 m distance	< 31 dB(A)
Operating temperature range	- 30 ... +50 °C
Operating humidity range	0 ... 100 % RH
IP classification	IP 55

This information corresponds to the current state of knowledge. Comde-Derenda GmbH reserves the right to discontinue or change specifications. Liability for consequential damage resulting from the use of Comde-Derenda products is excluded. *Ed. 2019-11*