



DHA-80

High Volume Aerosol Sampler (HVS)

Product Information

EN12341: 2014, Annex B





Figure 1: Villum Research Station North Greenland

Digitel DHA-80

DIGITEL High Volume Samplers DHA-80 are fully automatic systems to sample dust and aerosol particles for later assessment and analysis (gravimetric and analytical determination). The sampler operation range in standard execution is 100 to 1'500 litres per minute (6 to 90 m³/h). The DIGITEL HVS DHA-80 has a magazine of 15 filters stretched in filter holders for up to 2 weeks of daily sampling. They are automatically changed to the flow position at the preset time. The devices can be integrated in automatic monitoring systems via various interfaces. The field housing of the DIGITEL HVS DHA-80 is suited for outdoor installation. It is easy to transport and because of a good sound insulation very quiet. Superior workmanship in sampler mechanics backed by the latest electronic control guarantee a long lifetime and absolutely reliable operation.

Advantages

An integrated microprocessor unit controls the filter changes at the preset time and collects all relevant data and events. The status "work" and "pause" (filter change) can be programmed with a resolution of one minute. The constant flow of sampled air through the filter is dynamically controlled. This value is kept at good reproducibility and at long-term stability which keeps to a minimum of electrical power consumption. The blower unit is maintenance free and ensures a long life (MTBF >36.000 hours).

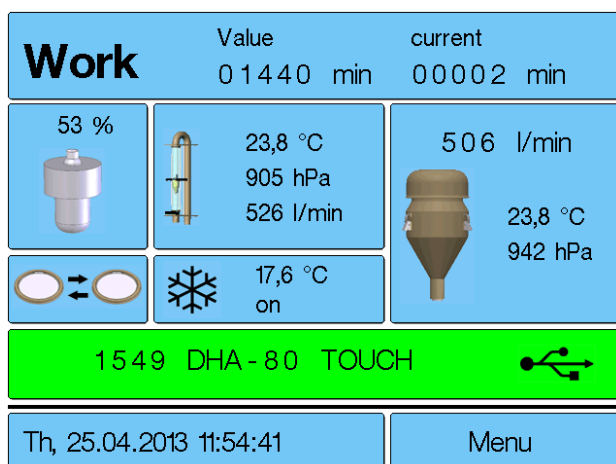
All mechanical components which come into contact with measuring air are coated with a highly corrosion-resistant and extremely smooth "Ematal" surface. A low surface velocity is obtained by the large filter surface. The uniform dust distribution on the filter allows cutting of the filter for different analyses. The DHA-80 High Volume Sampler has different interfaces for data transmission and remote control. The systems are in operation in important monitoring networks and scientific sites.

KEY FEATURES

- Autonomous, continuous sampling
- Automatic filter changer for 15 filters
- Constant and precise flow
- Flow range 100-1500 l / min
- Filter diameter 150 mm
- TSP, PM10, PM2.5 and PM1 inlets
- PM2.5 and PM10 measurements according to EN12341:2014 Appendix B

Easy Programming

The touch screen allows simple and user friendly programming. The current state of the sampling course (e.g. program status, status periods, failure indication messages) is shown on the display. In case of power failure, all settings are stored. The time program is then internally running in the standard presetting and continued once the power is back. Therefore, programmed filter change times are not postponed in case of meantime power interruptions.



State of the Art Electronics

The Digitel HVS DHA-80 has a RS-232C interface which is used for data transmission with various protocols (DIGITEL, Bayern-Hessen-Protocol, AKprotocol...) and for the remote control. The internal ring buffer memory stores data during several months (two years) of daily sampling. Additionally, the measuring data can be saved on a USB drive.

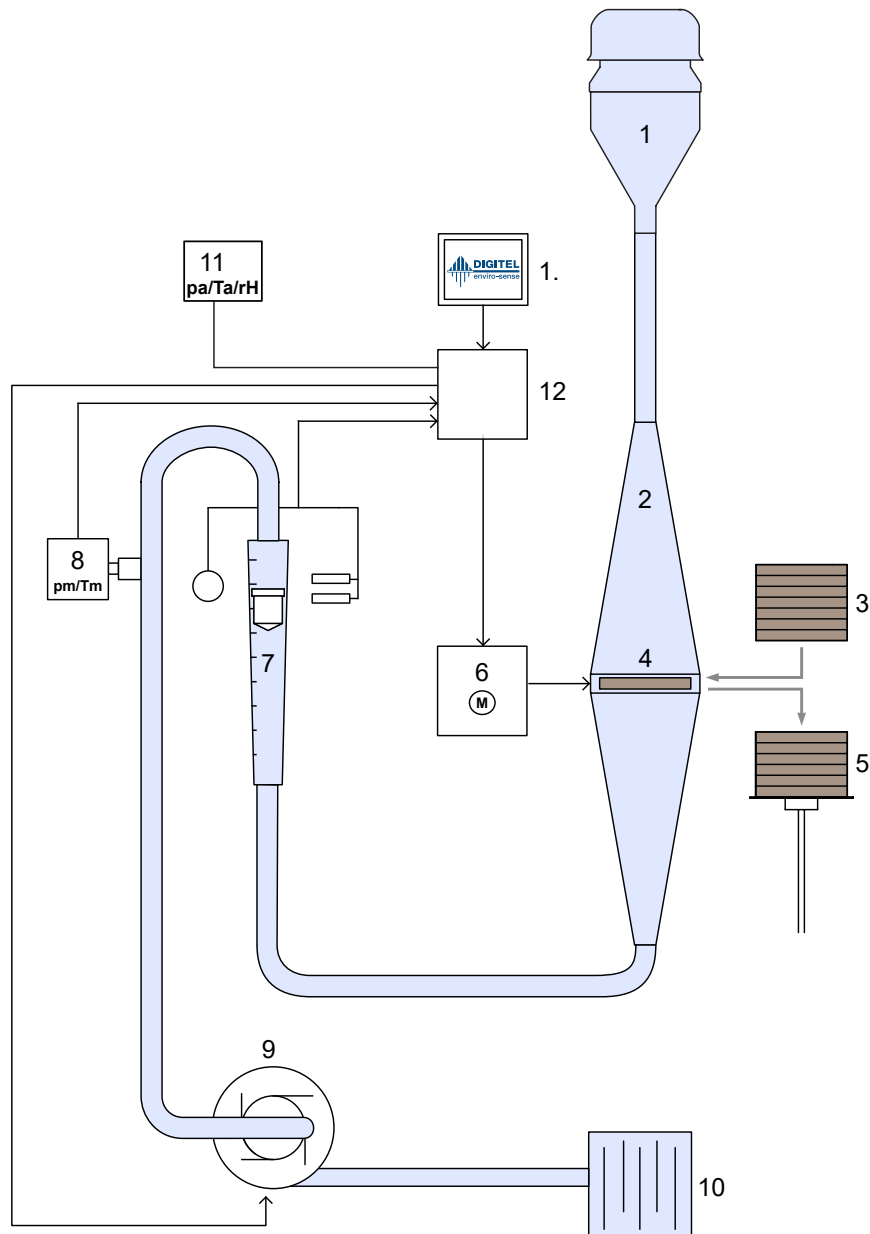
The USB port can be used for software updates, which allows a simple in field update of the instrument. The DHA-80 also has an Ethernet interface, which enables connections to any TCP/IP network.

This allows data collection via FTP and remote control of the DHA-80 (integrated HTTP-Server) as well as software updates over Ethernet. An optional router allows direct remote access to the sampler.

Design and Operation

The air is sampled through a PM10/ PM2,5 / PM1/ TSP inlet (1), using a sampling tube, vertically from the top to the bottom through the filter (3) placed in the flow chamber (2). The upper part of the flow chamber works like a diffuser with regular cross section and ensures uniform loading of the exposed circular filter. Due to the relatively large filter diameter, the face velocity of the sampled air through the filter is only 0,5m/s (at a flow rate of 500l/min). The pressure drop across the filter is limited to 130 mbar, so that a rupture of damp or extremely loaded filters is prevented. The DHA-80 changes the filters automatically. Behind the filter, the transported air quantity is measured by a flow meter with a float (7). Its double photo-sensor (8) optically captures the float position. The control electronics (12) adapt the capacity of the blower (9), so that the air quantity keeps the set-point value. Air pressure / temperature/rH (11) are measured upstream of the flow meter and continuously averaged by the control. A real-time protocol states sampling volumes and controlled volume flow as the core information. The air is released from the instrument with reduced noise through the noise baffle (10). The sampling protocol lists the effective and the standardised averaged values of pressure and temperature for that period and the operating as well as the failure status. The DHA-80 has a magazine of 15 filters stretched in filter holders (3). They are automatically changed to the flow position (4) at the preset time.

Design and Operation Flow Chart



- | | | |
|---------------------------|----------------------------|--------------------------------|
| 1. Inlet | 6. Changing automatics | 11. Ambient T, p and rH sensor |
| 2. Flow chamber | 7. Flow meter | 12. Control unit |
| 3. Empty filters | 8. Internal T and p sensor | 13. Touchscreen |
| 4. Current filter | 9. Blower | |
| 5. Sampled filter storage | 10. Noise baffle | |

Figure 1: Design and Operation Flow Chart DHA-80

Parts overview



Figure 2: Parts overview DHA-80

Superior coating

All mechanical components of the changing automatics and all parts that come into contact with measuring air, including filter holders, are coated with a highly corrosion - resistant and extremely smooth "Ematal" surface. The DIGITEL HVS DHA-80 is equipped with a protection class IP54 field housing. It is suitable for direct open-air installation. The field housing is double-walled, which leads to a considerably improved interior thermal insulation. The extraordinary compact type of construction, especially the low depth, allows a space-saving installation of the field housing in a container.

Excellent references

The device is in use in important monitoring networks in Europe. This long term and varied field experiences have led to the efficiency and reliability of the instruments. The flow path of the DHA-80 is equal to the flow path of the DH-77. Both Systems are described in the EN12341:2014 annex B (PM10) and annex B2.2 (PM 2.5). Please visit our [website](#) for more information about options and applications.

GOOD TO KNOW

- Light weight but robust and weather proof (field housing)
- Low energy consumption, low energy cost
- Low maintenance cost
- Maintenance free blower
- Easy programming with touchscreen
- Easy filter handling
- Wide range of options and accessories

Field Housing Dimensions

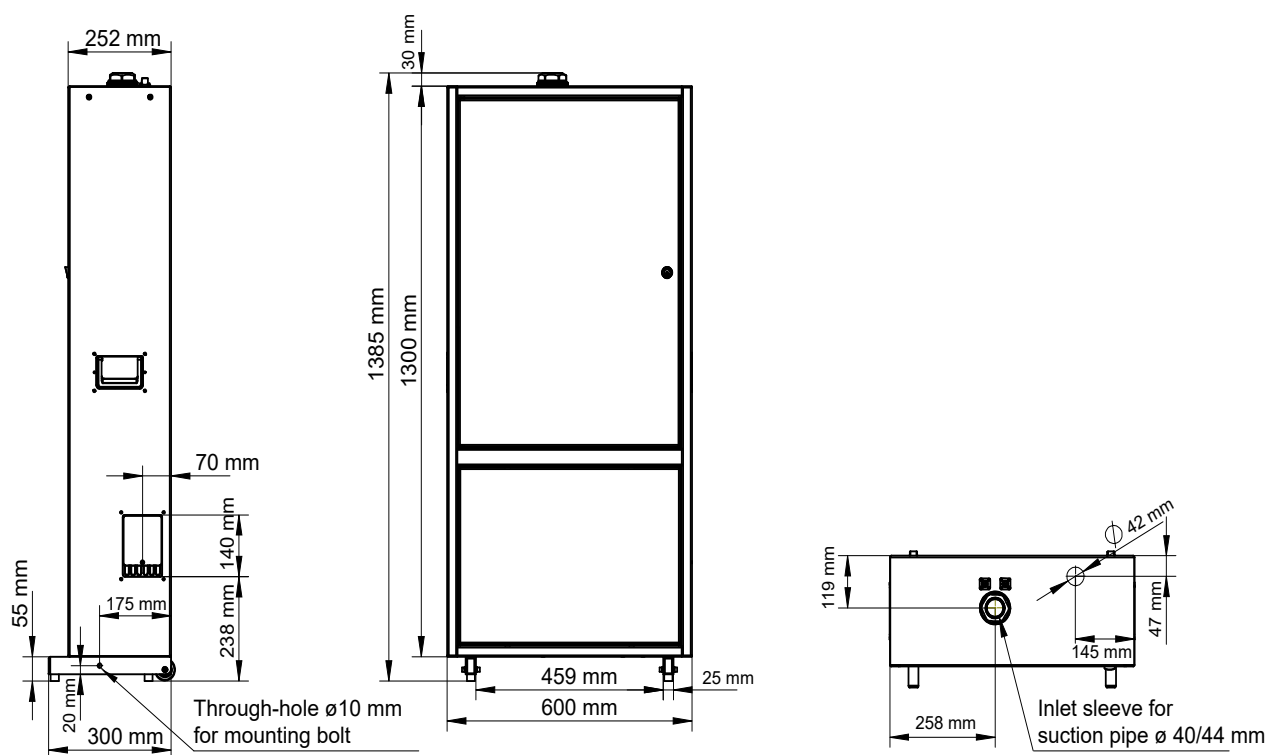


Figure 3: Dimensions DHA-80

Specifications

Sampling	- Flow rate: 100-1,500 l/min, delivered with 420-600 lpm glass tube as a standard - Filter: round filters of d = 150 mm (flowing area of d = 140 mm), other filter diameters on request - Filter changer capacity: 15 filters in filter magazine plus one in sampling position - Application range: -20° to 50° C; 0 % to 95 % RH
Operating points	PM inlets for 500l/min and 1133 l/min as a standard
Time programs	- Work, Pause (0 to 99'999 minutes each) - Start time adjustable, using date and time - Different sampling cycles programmable
Protocol files	- Data of filter, temperature, pressure, humidity, flow, blower load - Calibration history, sensor mean value record file - Settable averaging period 1 min - 24 h
Accuracy	- Reproducible tolerance of settings: +/- 0.45 % - Accuracy of measured flow volume: +/- 2 % - Volume flow control accuracy: < 5 % of MRAV (uncalibrated)
Operating data	- Power supply: 230V AC / 50-60 Hz; max. 1700 W - Heating 24 V, max. 160 W - Mean life cycle suction unit: > 36'000 h - Negative pressure at 1.000l/min: Max. 130 mbar - Sensors: Ambient and flow pressure, temperature, humidity, filter storage temperature
Interfaces	- RS232C, USB, Ethernet, RS485 - Interface protocols: DIGITEL, Bayern-Hessen, AK, TCP/IP, HTTP, FTP - Internal memory: 16 MB, ring buffer, filter data of two years of daily sampling
Inlets	TSP, PM10, PM2.5 and PM1, customized inlets on request
Materials	- Coated aluminium, stainless steel, POM, PTFE, NBR - Material of sampling line: EMATAL coated aluminium
Dimensions & Weight	- Field housing: 1,385 mm* x 600 mm x 252 mm, 60 kg**, class IP54 <i>*Height with inlet 1923 mm</i> <i>**65 kg with cooling</i>
Sensor specifications	- Ambient & internal pressure sensor range / accuracy (calibrated): 300 – 1100 hPa / ± 0.12 hPa - Ambient & internal temperature sensor range / accuracy (calibrated): -40 – +65°C / ± 0.5°C - Ambient & internal humidity sensor range / accuracy: 0 – 60°C; 0 – 100 % / ± 3 % rH - Filter storage temperature sensor range/accuracy: -20 - +60°C/ ± 0.1°C



Ostluft Air Quality Monitoring, Zurich, Switzerland © OSTLUFT

Features

- Touchscreen interface
- Automatic filter change
- Changer failure recognition
- Empty magazine recognition
- Overload cut-off
- Internal data memory
- Ethernet port for remote control and data query
- Weather-proof field housing made of aluminium, protected with an extremely weather and seawater resistant powder coating
- Remote control and filter list upload

Options

- Compressor cooled filter storage with defrosting/drainage system
- Ambient p/T/rH measurement
- Wind sensor for wind controlled sampling
- [PAH cartridge holder \(single foam\)](#)
- PAH cartridge changer (4 foams)
- Text message (SMS) module
- LTE router
- Thermal printer
- Protocol printer
- Customer specific interface protocols
- Ball valve for easy tightness test (automatic calculation of leak rate)

Accessories

- [TSP Inlet \(EMPA and VDI probe\)](#)
- [PM10, PM2.5, PM1 inlets](#)
- Inlet heating (regulated, ambient temperature controlled)
- VenturiCal electronic calibrator for flow calibration or Rotameter type calibrator
- [Calibration Instruments](#)
- [Transportation cases for filter holder.](#)
- Insect screens

Customised Solutions

- Filter diameters 100-140mm
- PM inlets for customised flow rate
- Inlets with Ozone denuders
- Customer specific functions (e.g. humidity controlled sampling, wind controlled sampling)
- Customer specific interface protocols
- Configuration avoiding certain materials (e.g. PFAs)

For more information about options and accessories, please follow the links or check our website **digitel-ag.com!**

Have a question? We'd love to help!

If you have questions about anything, please contact us and we will be glad to assist you.

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