DIGITEL DHA-80

High Volume Aerosol Sampler (HVS)

Digitel DHA-80 HVS:

- For autonomous, continuous sampling
- Automatic filter changer for 15 filters
- Constant and precise flow from 100-1000 l / min
- Filter diameter 150 mm
- For PM2.5 and PM10 measurements according to EN12341
- TSP, PM10, PM2.5 and PM1 inlets

Wide range of options and accessories:

- Cartridges
- Climatisation
- Different housings
- Meteo sensors
- SMS communication
- Calibration units
- Installation material

DIGITEL enviro-sense

DIGITEL Elektronik AG
Alte Gasse 18
CH-8604 Hegnau
Tel. +41 (0)44 908 20 30

DIGITEL Elektronik GmbH
Illstrasse 30
A-6706 Bürs
Tel. +43 (0)5552 6785 0

www.digitel-ag.com
info@digitel-ag.com

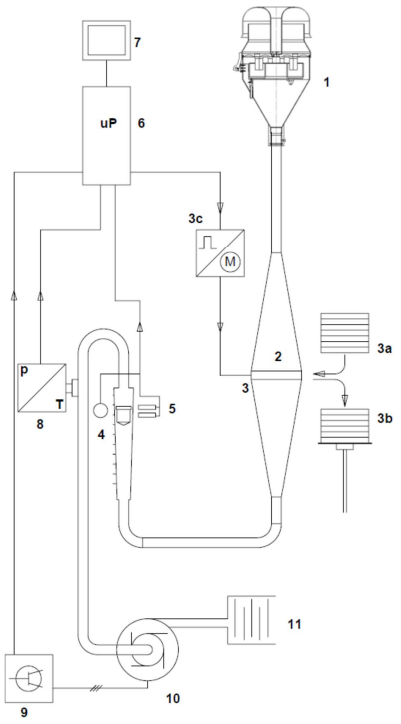
We are building high-precision samplers for dust, gas and rain since 1970.

Introduction

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 1.000 litres per minute (6 to 60 m³/h). The DIGITEL HVS DHA-80 has a magazine of 15 filters stretched in filter holders. 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.



1 Inlet
2 Flow chamber
3 Current filter
a Filter stack
b Used filters
c Changing automatics
4 Flow meter
5 Flow sensor
6 Control
7 Touch screen control panel
8 Pressure and temperature messurement unit
9 Frequency converter
10 Blower
11 Noise buffle

Figure 1: Design and operation flowchart

Design and Operation

The air is sampled through a PM10/ PM2,5 / PM1 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 (5). Its double photo-sensor (5a) optically captures the float position. The control electronics (5b,c) adapt the capacity of the blower (6), so that the air quantity keeps the set-point value. Air pressure and temperature (8) are measured upstream of the flow meter and continuously averaged by the control. A real-time protocol states sampling volumes yielding from the sampling time and controlled volume flow as the core information. The air is released from the instrument with reduced noise through the noise baffle (7). The sampling protocol lists the effective and the standardized averaged values of pressure and temperature for that period and the operating as well as the failure status. The DIGITEL HVS DHA-80 has a magazine of 15 filters stretched in filter holders. They are automatically changed to the flow position at the pre-set time.

Figure 2: Touch screen

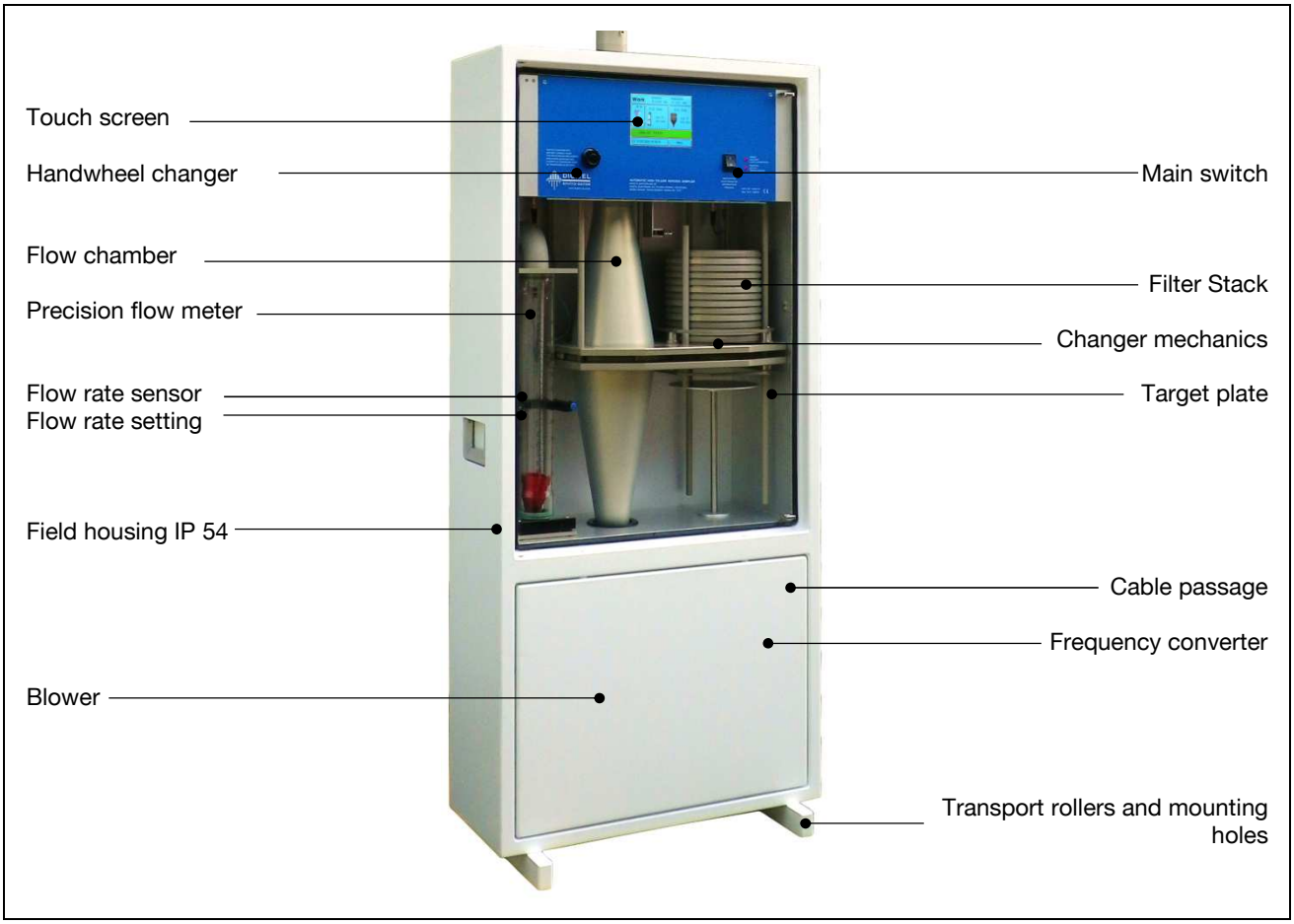


Figure 3: Components

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. The Digitel HVS DHA-80 has a RS-232C interface which is used for data transmission with different protocols and for the remote control. The internal memory has the ability to store data during several months of daily sampling. Alternatively, the measuring data is saved on a flash drive which can be attached to a USB interface. 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). Software-Updates can be performed via USB or Ethernet interface.

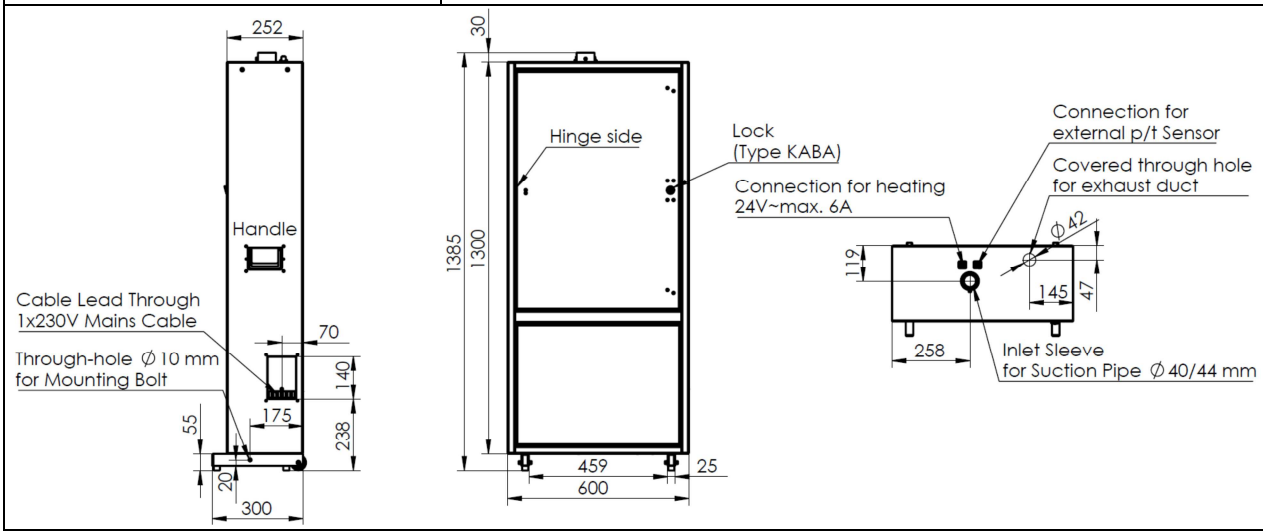
Superior coating

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 installation of the field housing space- savingly in a container.

Excellent references

The device is in use in important monitoring networks in Europe. This long term and varied field experiences have lead 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). More information about ptions and applications can be found on our website.

Technical Data	
Flow rate	100 – 1'000 l / min
Filter	15 round filters of d = 150 mm (flowing area of d = 140 mm), filter material is depending on aim of analysis
Time programs	Work, Pause (0 to 59'999 minutes each) start time adjustable, using date and time
Reproductible tolerance of settings	+/- 0.45 %
Accuracy of measured flow volume	+/- 2 %
Volume flow control accuracy	< 5 % of MRAV (uncalibrated)
Mean life cycle suction unit	> 36'000 h
Negative pressure at 1.000l/min	Max. 130 mbar
Interfaces	RS232C, USB, Ethernet, RS485
Interface protocols	DIGITEL, Bayern-Hessen, AK
Power supply	230 V, 50 / 60 Hz, max. 1700 VA
Heating	24 V, max. 160 VA
Application range	-20° to 40°C; 0 % to 95 % RH with interior heating, maximum operation altitude of 2'000 m above sea level
Material	Coated aluminium
Dimensions	
Field housing	1'385 mm x 600 mm x 252 mm, 60 kg, protection class IP54
Cabinet housing	1'300 mm x 525 mm x 250 mm, 30 kg



Features	**Options**	**Accessories**
Automatic filter change	PAH cartridge holder (single foam)	TSP Inlet (EMPA and VDI probe)
Changer failure recognition	PAH cartridge changer (4 foams)	PM10, PM2.5, PM1 inlets
Manual filter exchange option, empty magazine recognition	Protocol printer	Inlet heating
Overload cut-off	field housing, cabinet housing, 19'' housing	
Operating hours counter	Customer specific interface protocols	
Internal data memory	External meteorological data collection (e.g.: wind direction and wind controlled measurement)	
	SMS module for status and messages	
	Customer specific functions	

Table 1: DHA-80 summary