DIGITEL

Building high-precision samplers for dust, gas, and rain since 1970.

DPA-14 DL

Double Line Low Volume Aerosol Sampler (LVS)

Product Information

DIGITEL enviro-sense

Auchencorth Moss Air Quality Supersite in UK © Enviro Technology Services

Digitel DPA-14 Double Line

The DIGITEL Low Volume Sampler (LVS) DPA-14 Double Line (DL) is a fully automatic system to sample dust and aerosol particles in accordance with EN12341. It features two completely independent sampling lines that allow you to work with distinct sampling inlets simultaneously. The sampler's operation range in standard execution is 15 to 50 litres per minute (0.9 to 3m³/h). The DPA-14 DL includes two magazines of 30 filters each stretched in filter holders. They are automatically changed to the flow position at the preset time. Its cabinet housing is suited for 19" rack installation or can be installed on the floor in a measurement station. An additional noise baffler allows extremely silent operation. Superior workmanship in sampler mechanics backed by the latest technical and electronic control guarantee a long lifetime and 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 time for the filter change is kept at a minimum, the automatic filter change is done within 2 seconds and the blower is started again. The constant flow of sampled air through the filter is dynamically controlled, so that this value is kept at good reproducibility and at long term stability which keeps to a minimum of electrical power consumption. An optional auto calibration device for the autonomous calibration of the Venturi type orifice

flow control is available. The mechanical components which are in contact with measuring air are coated with a highly corrosion-resistant and extremely smooth surface. The Digitel LVS DPA-14 DL has different interfaces for data transmission and remote control. The filter magazines can be filled and emptied with one hand; no additional tools are needed. An optional bar code reader or RFID allows direct identification of the filters in the sampler.

GOOD TO KNOW

- Autonomous, continuous sampling
- Automatic filter changers for 2 x 30 filters
- Two completely independent sampling lines
- Constant and precise flow
- Flow range 15 - 50 l / min
- Filter diameter 47 mm
- PM2.5 and PM10 measurements according to EN12341
- TSP, PM10, PM2.5 and PM1 inlets

DIGITEL enviro-sense

Easy Programming

The touchscreen allows for simple and user-friendly programming. The current state of the sampling courses (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.
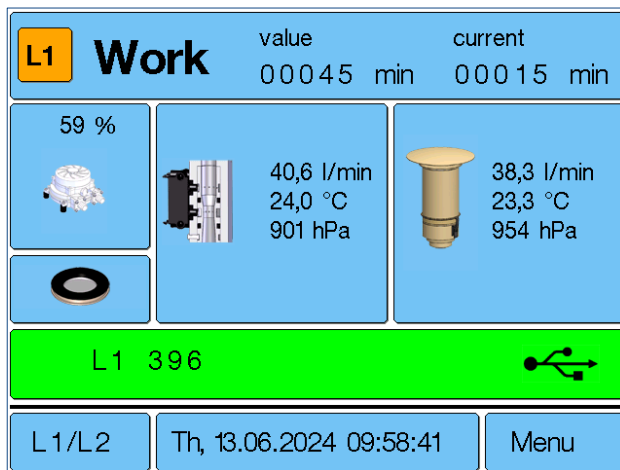
State of the Art Electronics

The Digitel LVS DPA-14 DL has a RS-232C interface which is used for data transmission with different protocols (DIGITEL-, Bayern-Hessen-Protocol, AK- protocol) and for remote control. The internal memory has the ability to store data during 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 DPA-14 DL also has an Ethernet interface, which enables connections to any TCP/IP network. This allows data collection via FTP and remote control of the DPA-14 DL (integrated HTTP-server) as well as software updates over Ethernet. An optional router allows direct remote access to the sampler (see Options).

Design and Operation

The air is sampled through two TSP / PM10 / PM2,5 / PM1 inlets, using sampling tubes. Around these tubes, protective tubes allow a ventilator forced, filtered air stream as sheath air to avoid thermal effects on the sampling tubes. The air flows vertically from the top to the bottom through the filters placed in the flow chambers. The upper part of the flow chambers work like diffusors with regular cross sections and ensure uniform loading of the exposed circular filters. The pressure-drop across the filters is limited, so that a rupture of damp or extremely loaded filters is prevented.

The LVS DPA-14 DL changes the filters automatically. Both sampling lines can be operated completely independently. Behind the filters, the transported air quantity is measured by a Venturi type orifice flow meters. The blowers are speed controlled, so that the air quantity keeps the setpoint value with minimal power consumption. Air pressure and temperature are measured upstream of the flow meters and continuously averaged by the electronic control unit. A real-time protocol states sampling volumes yielding from the sampling time and controlled volume flow as the core information. The sampling protocol lists the effective and the standardised averaged values of pressure, temperature, volume and the operating status as well as the failure status.

Design and Operation Flow Chart
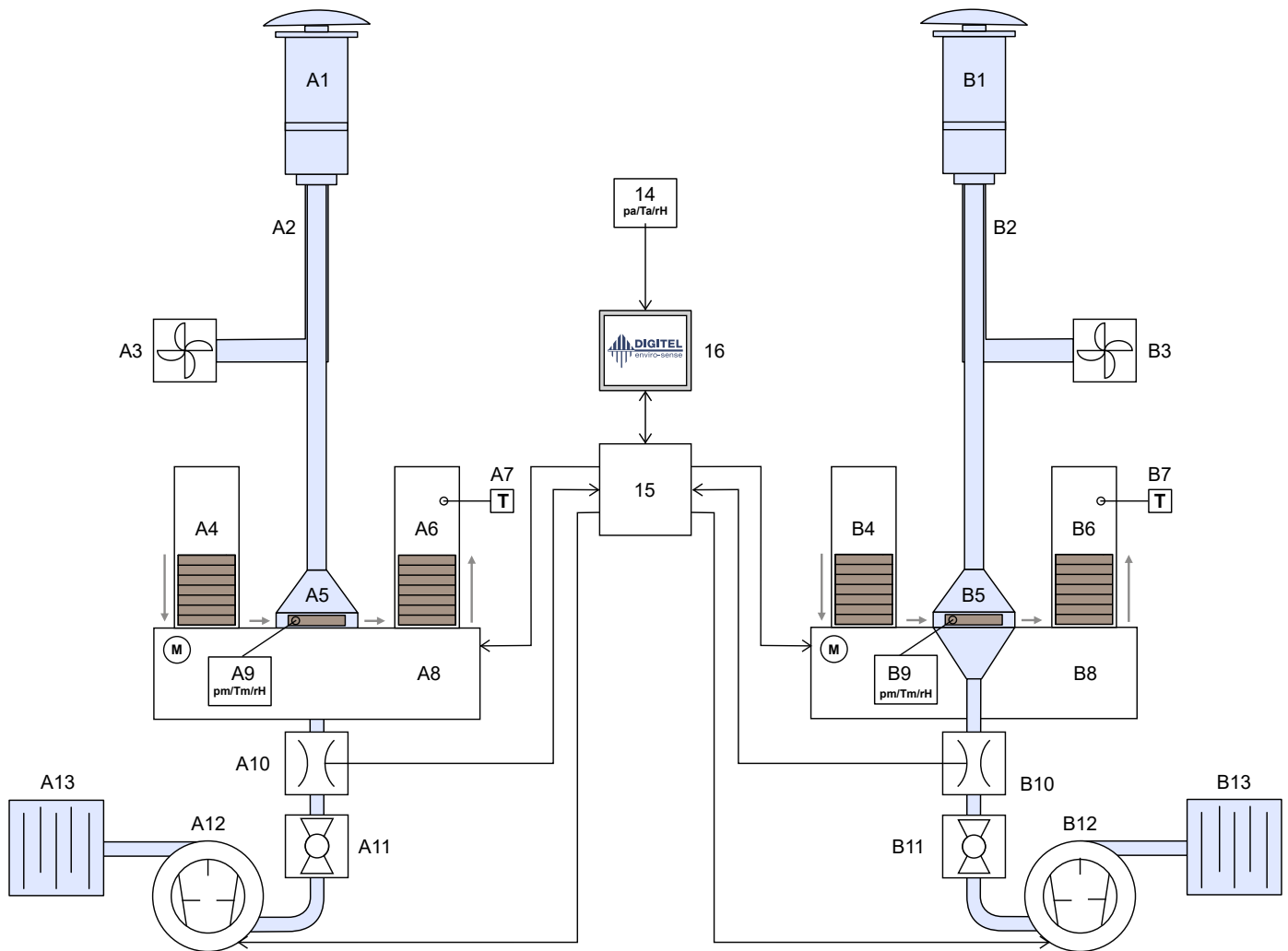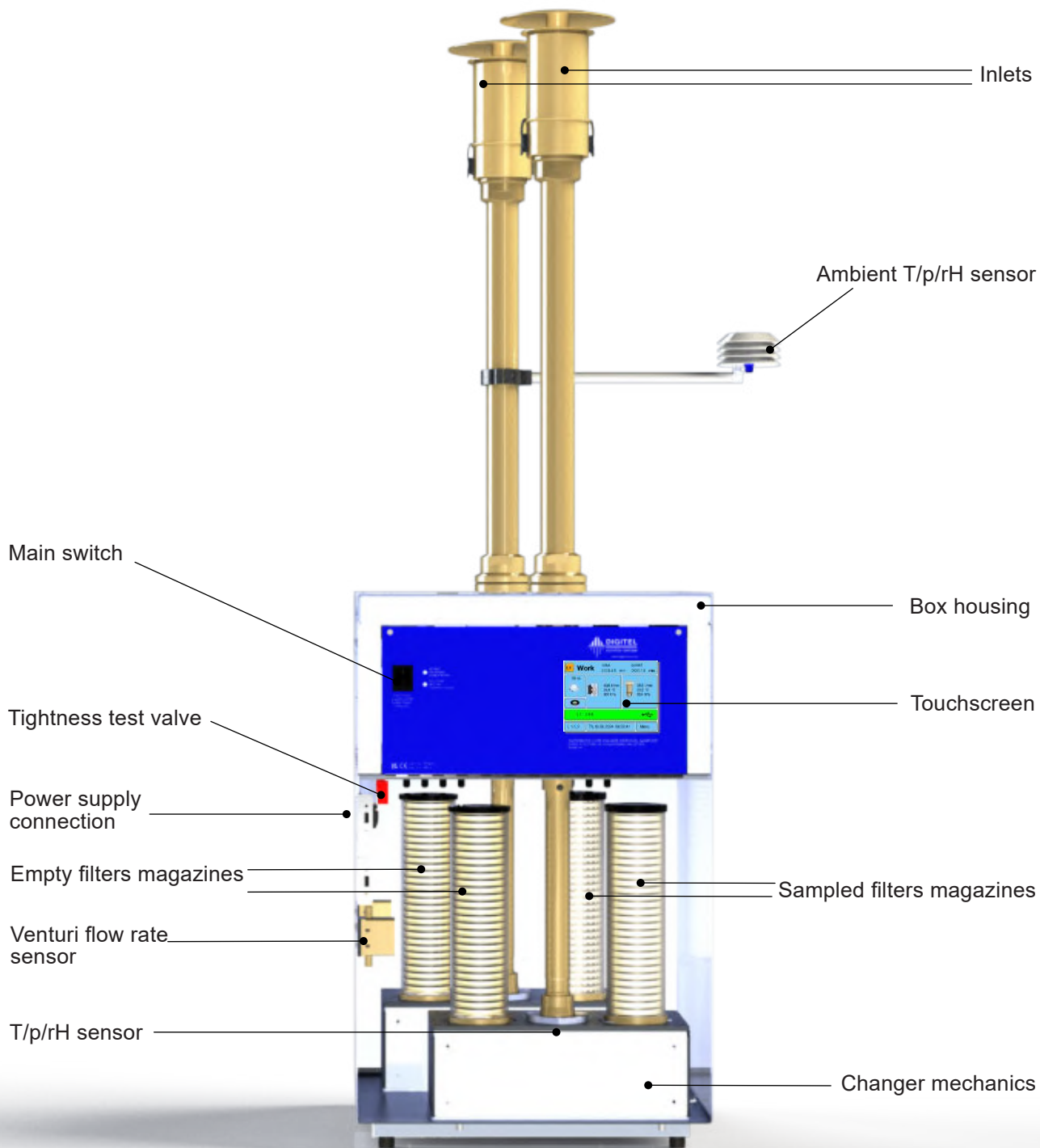

Line A and B
1. Inlet
2. Connecting pipework
3. Ventilation for sheath air
4. Empty filters
5. Current filter
6. Sampled filter
7. T measurement stored filters
8. Changing automatics
9. T/p measurement current filter
10. Flow meter
11. Ball valve
12. Blower
13. Noise baffle

Central control unit
14. Measurement ambient T, p and rH
15. Control unit
16. Touch screen

Parts overview

Inlets

Ambient T/p/rH sensor

Main switch

Box housing

Touchscreen

Tightness test valve

Power supply connection

Empty filters magazines

Sampled filters magazines

Venturi flow rate sensor

T/p/rH sensor

Changer mechanics

DIGITEL
enviro-sense

Superior coating

All parts that come into contact with measuring air, are made of aluminium and coated with a very corrosion- resistant and extremely smooth anodised surface (Ematal).
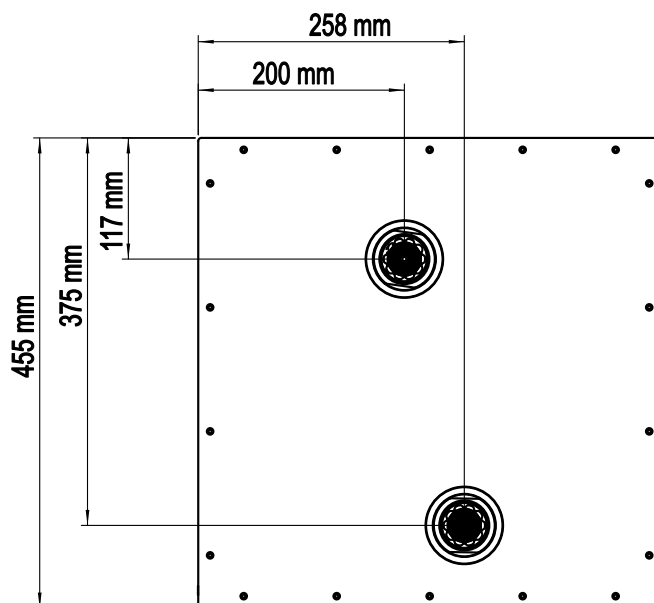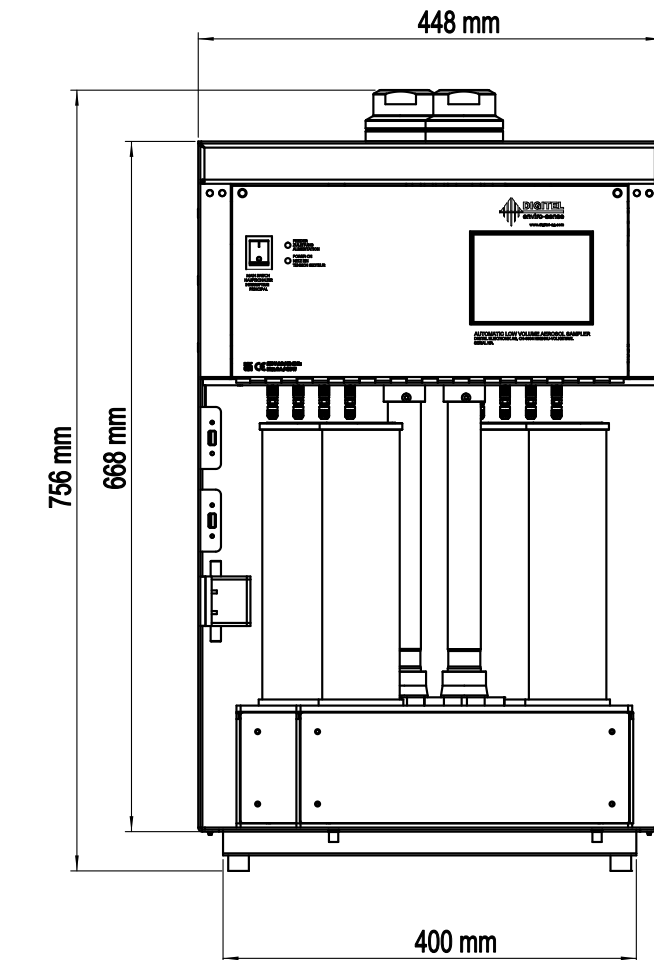
Excellent references

Together with a DIGITEL PM10 or PM2.5 inlet, the system is in accordance with the EN12341 Standard. Together with 1m3/h inlets (nozzle type or US EPA type) the system allows collection of samples in accordance with non-European standards.

With the cartridge option the system allows sampling of pesticides or VOCs.

FACTS & FIGURES

- Light weight but robust and weather proof (field housing)
- Low energy consumption
- Low maintenance cost
- Maintenance free blowers
- Easy programming with touchscreen
- Easy filter handling
- Software for EN12341 tests

DIGITEL enviro-sense

Indoor Housing Dimensions

Technical Data

Flow rate	Two lines, 15 – 50 l/min, independently programmable
Filter	2 x 30 round filters of d = 47 mm (flowing area of d = 40 mm), plus one in sampling position, 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
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
Cooling capacity of compressor	360 W, max. Power consumption 40 W
Mean life cycle suction unit	> 40'000 h
Constancy of sample flow	< 2 %, with calibration at 20°C, operating at -20°C – +50°C, see TüV report
Sensors	Flow sensor, ambient and internal (flow) pressure, temperature, humidity, filter storage temperature
Flow meter type	Venturi type orifice
Interfaces / interface protocols	RS232C, USB, Ethernet, RS485 / DIGITEL, Bayern-Hessen, AK, TCP/IP, HTTP, FTP
Internal memory	16MB, ring buffer, filter data of two years of daily sampling
Power supply	230 V AC / 50 – 60 Hz; max. 4 A / 360 W, mean consumption 160 W incl. cooler (50%): 200 W
Heating	Port for inlet heating / indoor heating / reserve heating
Application range	-40° to 50°C; 0 % to 95 % RH (cooling option: max. 40°C for cooling below 23°C)
Material	All components, including inlets in the suction area, are made of anodised aluminium. POM filter holders come as standard, while aluminium filter holders are available upon request. Stainless grids for filter holders can also be provided.
Dimensions & Weight	19'' Indoor housing: 448 x455 x 986 mm, 36 kg
Noise level	<50 dB (A) at 1m, < 32dB (A) at 8m
Flow sensor accuracy (calibrated)	< 1 %
Ambient/internal pressure sensor range	300 – 1100 h Pa
Ambient/internal pressure sensor accuracy (calibrated)	± 0.12 h Pa
Ambient/ internal temperature sensor range	-40 – +65°C
Ambient/ internal temperature sensor accuracy (uncalibrated / calibrated)	± 1°C / ± 0.5°C
Ambient/internal humidity sensor range	0 – 60°C: 0 – 100 %
Ambient/internal humidity sensor accuracy	± 3 % r H
Filter storage temperature sensor range	- 20 – +60°C
Filter storage temperature sensor accuracy	± 0.1°C

Alomar Observatory, Andøya Island, Norway

Features

- Two completely independent sampling lines
- One touchscreen interface
- Automatic filter change
- Change failure recognition
- Empty magazine recognition
- Overload cut-off
- Internal data memory
- Interchangeable filter magazines
- Valve and software for easy tightness test and checks according to EN:12341
- Two Venturi type orifices
- Ethernet port for remote control and data query
- Remote control and filter list upload

Options

- Cartridges for pesticide sampling
- LTE router for direct remote access
- Text message module for status and messages
- Filter identification via barcode reader or RFID
- Sampling controlled by external sensors (e.g.: wind sensor or particle counter)

Accessories

- TSP inlet
- EN nozzle style PM10, PM2.5, PM1inlets for 1 or 2.3m3/h
- US EPA type inlets
- Adaption for single walled US EPA type inlets
- Inlet heating (regulated, ambient temperature controlled)
- VenturiCal calibrator for automatic calibration
- Various transport cases for filter holders
- Delivery of single components on request

Customized Solutions

- Higher /lower flow rates
- PM inlets for customized flow rate
- Integration of other equipment and sensors (Multistage impactor, Iodine cartridges, Optical particle counter OPC N3, Black Carbon Monitor MicroAeth MA200, Vaisala WTX sensor)
- Customer specific functions (e.g. humidity-controlled sampling, wind-controlled sampling, PM controlled sampling)
- Customer specific interface protocols

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

DIGITEL enviro-sense

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.

info@digitel-ag.com · +41 44 908 20 30

DIGITEL
enviro-sense
digitel-ag.com
we care

Where to find us:

SWITZERLAND

Digitel Elektronik AG
Gartenweg 2
CH-8604 Volketswil

AUSTRIA

Digitel Elektronik GmbH
Illstrasse 30
AT-6706 Bürs