



DPA-14 DL

Double Line Low Volume Aerosol Sampler (LVS)

Product Information





Auchencorth Moss Air Quality Supersite in UK © Enviro Technology Services

Introduction

DIGITEL Low Volume Samplers DPA-14 are fully automatic systems to sample dust and aerosol particles for later assessment and analysis (gravimetric and analytical determination) in accordance with EN12341:2014. The sampler operation range in standard execution is 15 to 50 litres per minute (0.9 to 3m³/h). The DIGITEL LVS DPA-14 DL has two magazines of 30 filters each 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 cabinet housing of the DIGITEL LVS DPA-14 DL 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 absolutely reliable operation.

Advantages

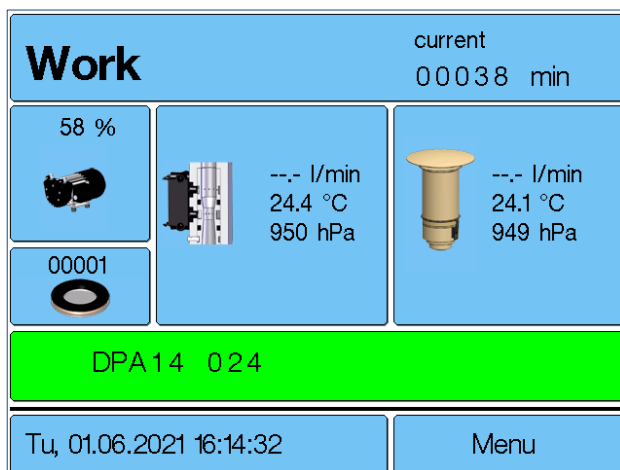
An integrated microprocessor unit controls the filter changes at the preset time and collects all relevant data and events. The status "work" and "pause" (filter change) can be programmed with a resolution of one minute. The time for the filter change is kept at a minimum, the automatic filter change 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 DPA-14 Low Volume Sampler 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 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 EN12341:2014
- ◆ TSP, PM10, PM2.5 and PM1 inlets

Easy Programming

The touch screen allows 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 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 (integrated HTTP- server) as well as software updates over Ethernet. An optional text message module sends alert error messages

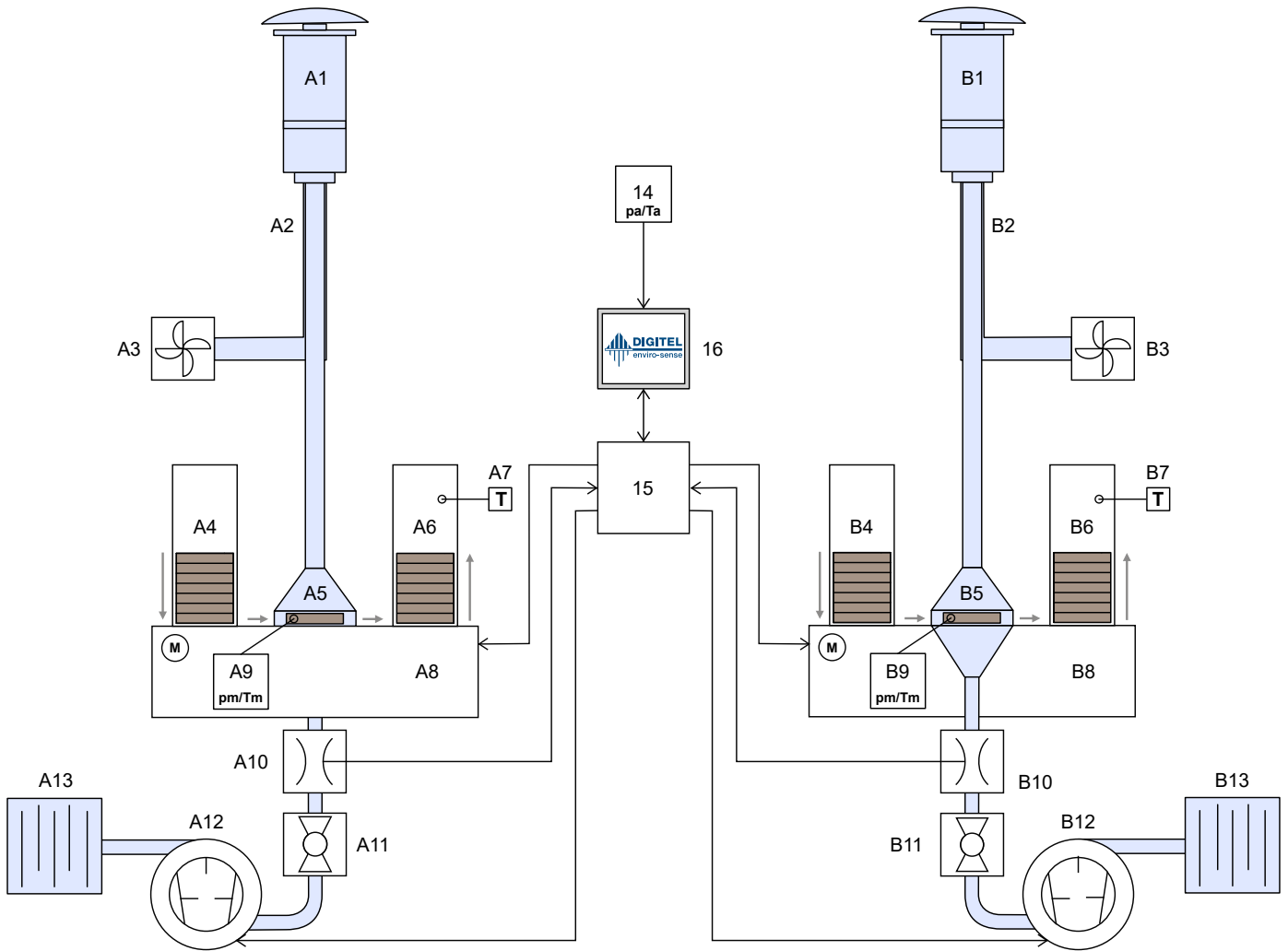
Design and Operation

The air is sampled through two TSP / PM10 / PM2,5 / PM1 inlets, using sampling tubes. Around these tubes, protective tubes allow a ventilator forced 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 filter placed in the flow chambers. The upper part of the flow chamber works like a diffusor with regular cross section and ensures uniform loading of the exposed circular filter. The pressure-drop across the filter is limited, so that a rupture of damp or extremely loaded filters is prevented.

The DPA-14 DL changes the filters automatically.

Both sampling lines can be operated completely independently. Behind the filter, the transported air quantity is measured by a Venturi type orifice flow meter. The blower is speed controlled, so that the air quantity keeps the set-point value with minimal power consumption. Air pressure and temperature are measured upstream of the flow meter 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 and temperature, volume and the operating status as well as the failure status.

Design and Operation Flow Chart



Line A and B

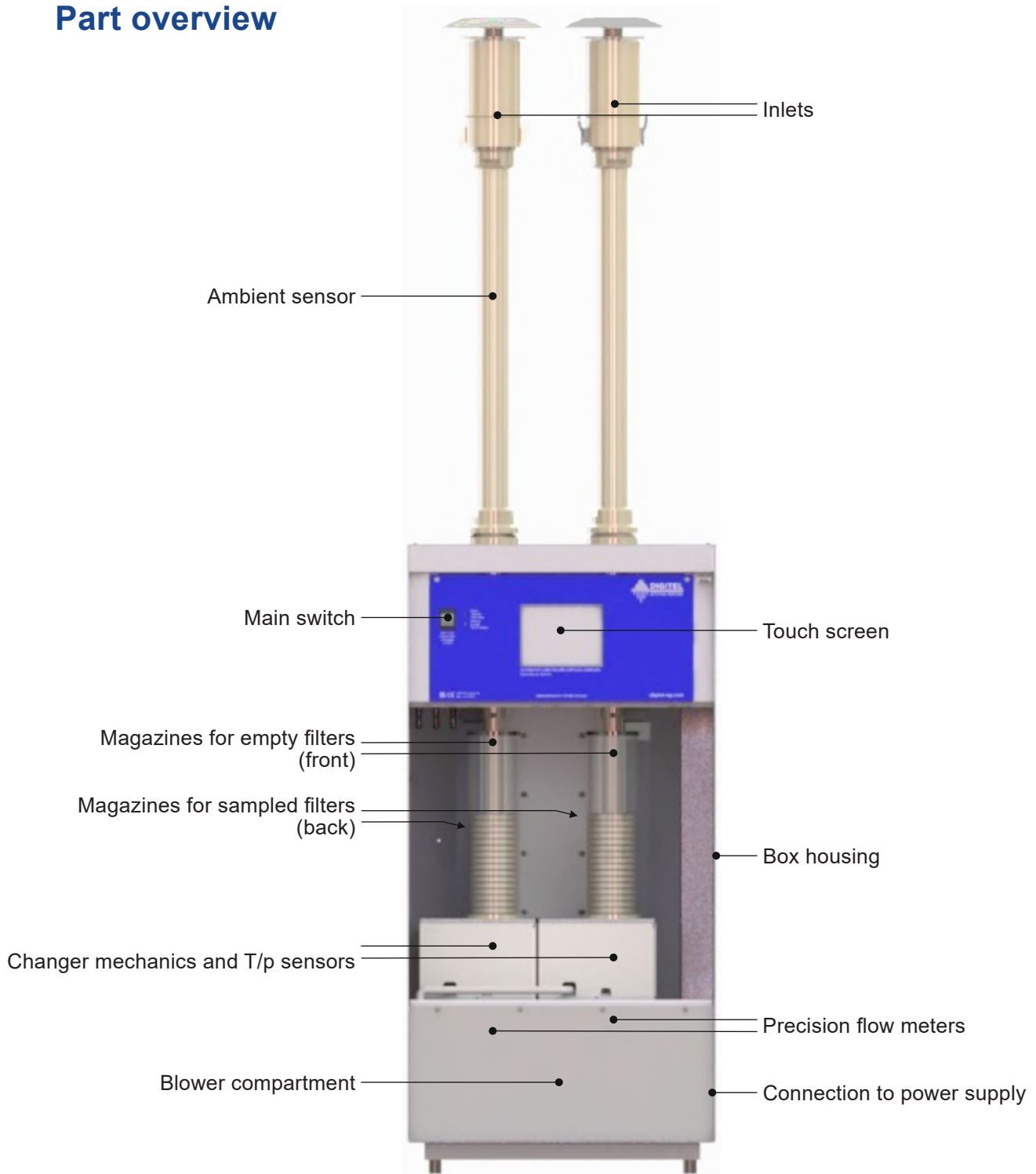
1. Inlet
2. Connecting pipework
3. Ventilation for sheath air
4. Empty filters
5. Current filter
6. Sampled filter
7. T measurement stored filters
8. Changing automatics

9. T/p measurement current filter
10. Flow meter
11. Ball valve
12. Blower
13. Noise baffle

Central control unit

14. Measurement ambient T and p
15. Control unit
16. Touch screen

Part overview



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.

Excellent references

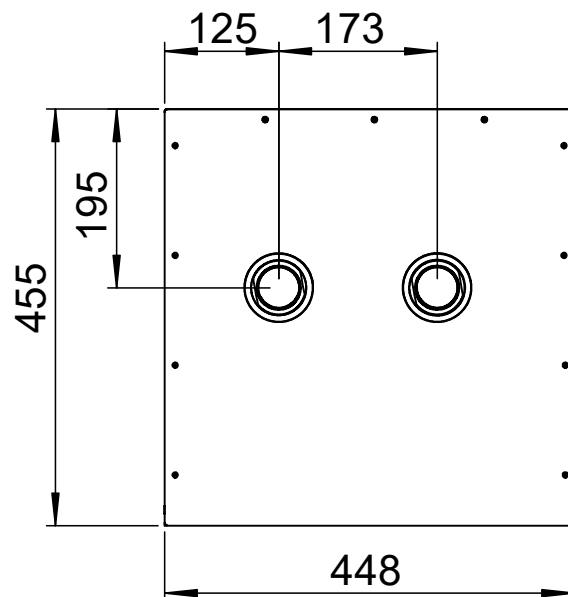
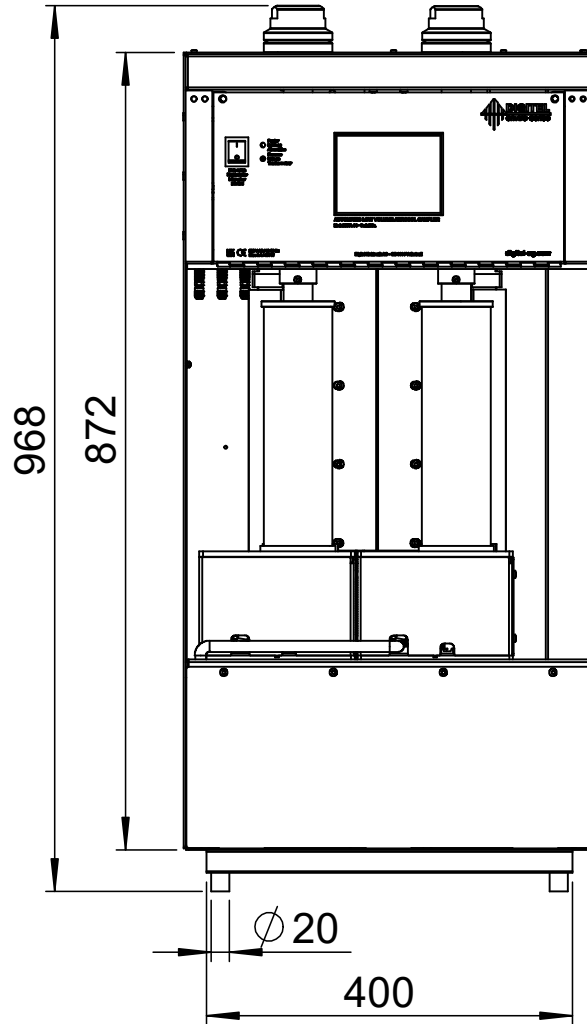
Together with a DIGITEL PM10 or PM2.5 inlet, the system is in accordance with the EN12341:2014 Standard (DPA-14 standard version confirmed by TÜV, report available on request). Together with 1m³/h inlets (nozzle type or US EPA type) the system allows collection of samples in accordance with non-European 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
- ◆ Easy programming with touchscreen
- ◆ Easy filter handling
- ◆ Software for EN12341 tests
- ◆ Wide range of options and accessories

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
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
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. 2 A / 300 W, mean consumption 80 W incl. cooler (50%): 100 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 (incl. inlets) in the suction area are made of anodised aluminium, POM filter holders, aluminium filter holders on request
Dimensions & Weight	19" Box housing: 448 x455 x 986 mm, 36 kg (with cooling 43 kg)
Noise level	<51 dB (A) at 1m, < 33dB (A) at 8m



Alomar Observatory, Andøya Island, Norway

Features

- Two completely independent sampling lines
- One touch screen 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 according to EN:12341:2014
- Two Venturi type orifices
- Ethernet port for remote control and data query
- Weather-proof housing made of aluminium, protected with an extremely weather and seawater resistant powder coating

Options

- Cartridges for pesticide sampling
- GSM Modem for direct remote access (remote control or filter list upload)
- Rotameter for auto calibration
- Sampling controlled by external sensors (e.g.: wind sensor or particle counter)
- Text message module for status and messages
- Filter identification: in-built bar code reader assigns filter data to bar code on filter
- Filter identification: filter data stored on filter holder over RF-ID
- Printer

Accessories

- TSP inlet
- EN nozzle style PM10, PM2.5, PM1 inlets 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
- Delivery of single components on request

Customised Solutions

- Higher /lower flow rates
- PM inlets for customised 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!

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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