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Cabin Air Filter Test System (Particulate Filtration)

PAF 111



PAF 111 Cabin Air Filter Test System (Particulate Filtration)

With the Cabin Air Filter Test Rig PAF 111 fractional filtration efficiency is measured while the filter is continuously loaded with dust at constant air flowrate.

The test system and the testing process comply with the requirements of the standard DIN 71460-1 and ISO/TS 11155-1.

Main Components

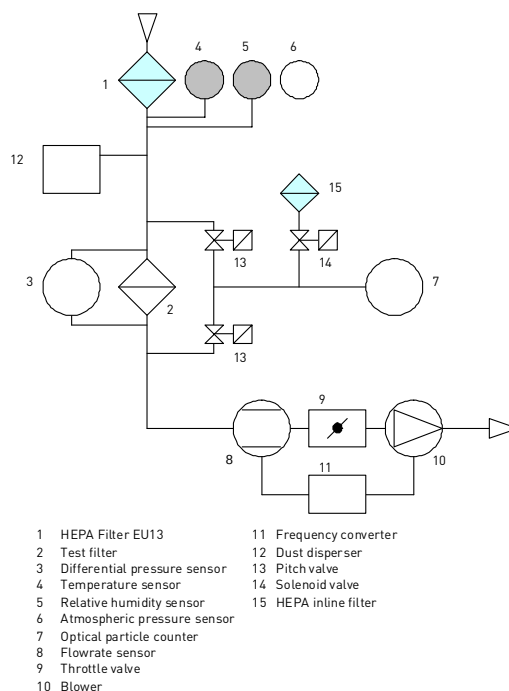
- Flow test channel according to standard including generation of volume flow
- Dust disperser SAG 410
- Aerosol neutralizer EAN 581
- Aerosol generators ATM 220/221
- Optical particle counter LAP 322
- Sensors (pressure, temperature, humidity)
- Software PAF111Win for test rig control, data acquisition and processing.

Special Advantages

- Standard-compliant testing
- High degree of automation
- Modular design
- Traceable test documentation
- Adapter for filter elements and media

Applications

- Differential pressure test
- Fractional efficiency measurements
- Dust loading test
- Combination measurements according to DIN 71460-1 (ISO/TS 11155-1)
- User-defined tests

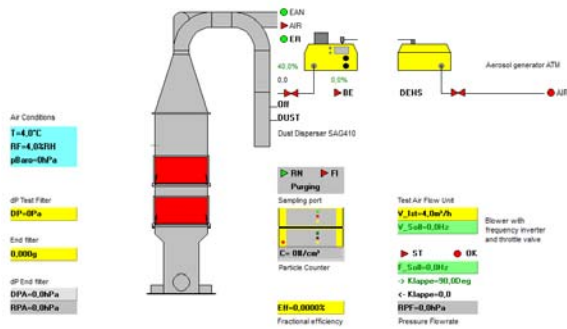


Schematic of the Particle Filter Test Rig Series PAF

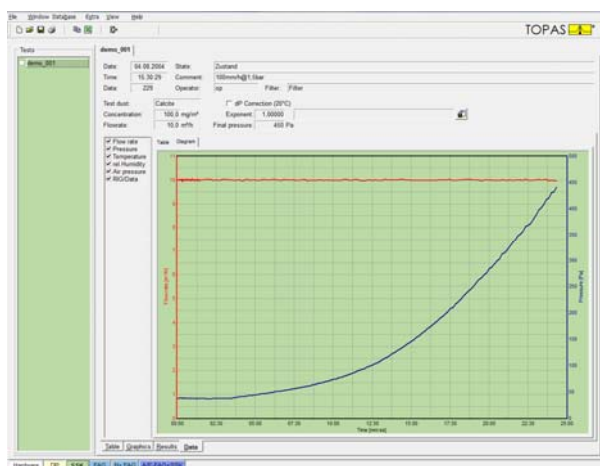
Specifications

Control and DATA Acquisition Software PAFWin

- Automatic test procedures in accordance with issued standards
- Manual control for service, calibration procedures and research
- Data monitor for long term investigations
- Sample and tests database
- Test dusts and test aerosol database
- Data presentation and statistical calculations
- Data copy & paste, dynamic data exchange DDE
- Multilingual software (German, English, French)



PAF11Win Main Window - Test Rig Visualization



Example of a Dust Holding Test

Technical Data

Air flow ¹⁾	70...700 m³/h
Differential pressure	0...1000 Pa
Filter adapter	300 × 600 mm
Media cross section	180 cm²
Sensors	Temperature, relative humidity, atmospheric pressure
Dust disperser	SAG°410/L (2...245 g/h)
Aerosol generators	ATM 220
Electrostatic aerosol neutralizer	EAN 581
Optical particle counter ²⁾	Laser Aerosol Spectrometer LAP 321, Topas
Power supply	400 V AC, 16 A
Test rig dimensions	460 x 120 x 340 cm

¹⁾ Higher volume flows on request

²⁾ Other models on request

ALC.5520 #3	
Date:	12.08.2015
Time:	12:53:28
Data:	219
Operator:	op
Filter:	ALC-5520
Test aerosol:	ISO A2 FINE
Concentration:	10.0 mg/m³
Flowrate:	300.0 m³/h
Test air conditions:	Test result:
Temperature:	31.7 °C
Relative humidity:	43.3 % H.
Barometric pressure:	1005 hPa
Flow rate:	300.3 m³/h
Tare pressure:	001-150812 Bar
Efficiency at 0.400µm:	14.8 %
Efficiency at 1.000µm:	21.5 %
Efficiency at 5.000µm:	76.0 %

Fractional efficiency of an ISO 11155-1 Test

For more information please



PAF 112 Cabin Air Filter Test System (Gas Adsorption)

Since 1995 Topas has been developing test stands for measuring the adsorption capacity or desorption behaviour of adsorptive filters. The design of the test stand, the test procedure and data acquisition have been based on the DIN 71460-2 standard and ISO 11155-2.

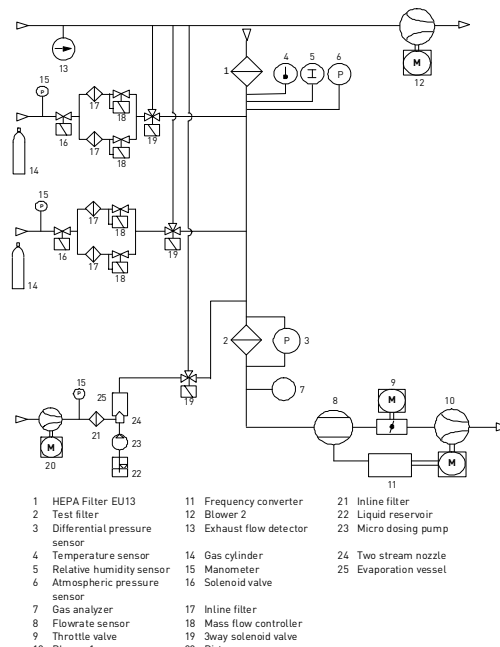
The test section and associated ductwork are fabricated from stainless steel. Different sizes of filter media samples and elements can be tested and are mounted in a special adapter. A window in front of the test section allows visual observation of the sample during the test. A pair of mass flow controllers is used for metering gaseous components from gas cylinders and a new, sophisticated, dosing unit for liquid gas components has been developed specifically for this application. This is based on evaporation of a droplet spray atomized by means of a two-stream nozzle fed from a μ l-dosing pump. The gas concentration can be measured downstream of the filter. An exhaust system by-passing the test channel facilitates maintaining a very stable gas dosing even when the filter must be inserted or removed. This technique of a continuous exhaust also meets stringent safety requirements.

Special Advantages

- Test channel and rig
- Gas dosing system
- Exhaust system
- Flow meter
- Gas analyser
- Sensors
- Test stand control

Applications

- Differential-Pressure measurement
- Adsorption/Desorption measurement acc. ISO 11155-2 (DIN 71460-2).
- Operator is guided through test routines
- Modular system
- Versatile
- State of the art



Schematic of the PAF 112 Adsorptive Filter Test Rig

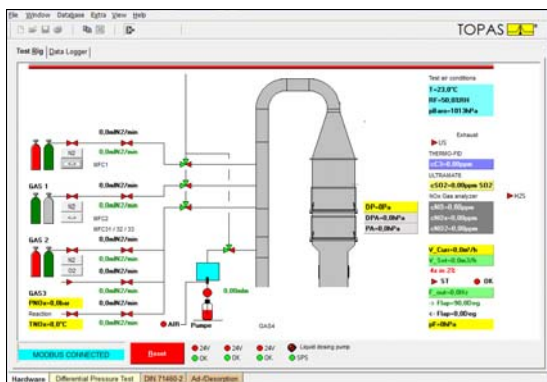
Specifications

Test System Control and DATA Acquisition & Processing Software PAFWin

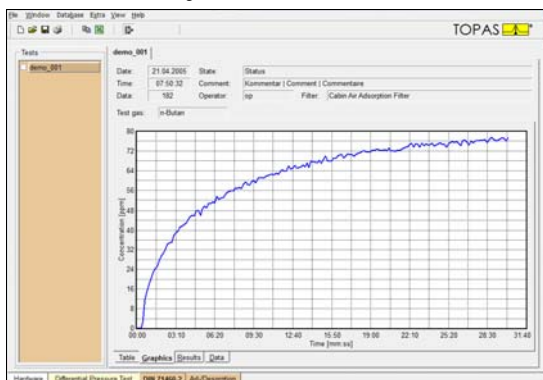
A new software package has been developed for control of the test stand and data acquisition. This user-friendly software runs under all Windows platforms and displays the actual status of the test rig.

Further main features are:

- Automatic test procedures in accordance with issued standards
- Manual control for service, calibration procedures and research applications
- Data monitor for long term investigations
- Sample and test data base
- Test dust data base
- Data analysis and statistical calculations
- Data copy & paste, Dynamic Data Exchange DDE



test system control and data acquisition & processing software
PAF112Win Test Rig Visualization



DIN 71460-2 Test Result (Penetration Curve)

Technical Data

Air flow	70...700 m ³ /h
Differential pressure	0...1000 Pa
Filter adapter	300 × 600 mm
Sensors	Temperature, relative humidity, atmospheric pressure
Standard Test Gases	• n-Butane 80 ppm (C₄H₁₀) • Toluene 80 ppm (C₆H₅CH₃) • Sulphur dioxide 30 ppm (SO₂)
Special Test Gases	• Ammonia 30 ppm (NH₃) • Hydrogen Sulfide (H₂S) • Acetaldehyde
Purge Gas	• Nitrogene
Gas analyser	Thermo FID Siemens Ultramat Horiba Other on request
Power supply	3 x 230 V AC, 50/60 Hz, 16 A
Test rig dimensions	1800 x 1100 x 2500 mm

Cabin Air Filter Test System (Particulate Filtration)

PAF 113



PAF 111 Cabin Air Filter Test System (Particulate Filtration)

With the Cabin Air Filter Test Rig PAF 111 fractional filtration efficiency is measured while the filter is continuously loaded with dust at constant air flowrate.

The test system and the testing process comply with the requirements of the standard DIN 71460-1 and ISO/TS 11155-1.

Main Components

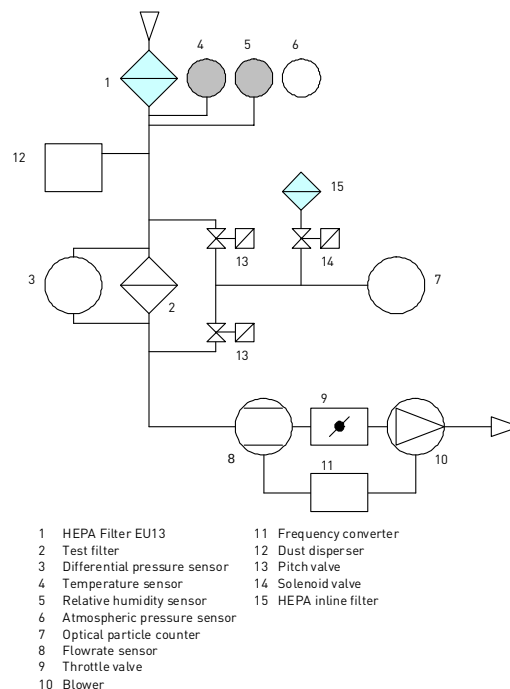
- Flow test channel according to standard including generation of volume flow
- Dust disperser SAG 410
- Aerosol neutralizer EAN 581
- Aerosol generators ATM 220/221
- Optical particle counter LAP 322
- Sensors (pressure, temperature, humidity)
- Software PAF111Win for test rig control, data acquisition and processing.

Special Advantages

- Standard-compliant testing
- High degree of automation
- Modular design
- Traceable test documentation
- Adapter for filter elements and media

Applications

- Differential pressure test
- Fractional efficiency measurements
- Dust loading test
- Combination measurements according to DIN 71460-1 (ISO/TS 11155-1)
- User-defined tests

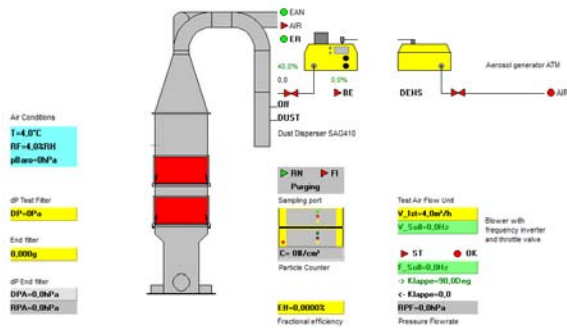


Schematic of the Particle Filter Test Rig Series PAF

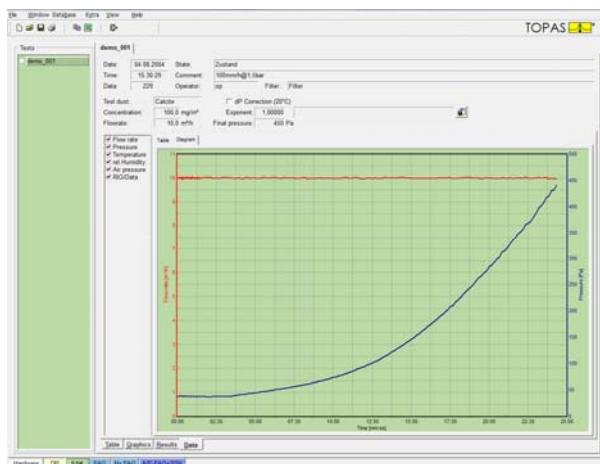
Specifications

Control and DATA Acquisition Software PAFWin

- Automatic test procedures in accordance with issued standards
- Manual control for service, calibration procedures and research
- Data monitor for long term investigations
- Sample and tests database
- Test dusts and test aerosol database
- Data presentation and statistical calculations
- Data copy & paste, dynamic data exchange DDE
- Multilingual software (German, English, French)



PAF11Win Main Window - Test Rig Visualization



Example of a Dust Holding Test

Technical Data

Air flow ¹⁾	70...700 m³/h
Differential pressure	0...1000 Pa
Filter adapter	300 × 600 mm
Media cross section	180 cm²
Sensors	Temperature, relative humidity, atmospheric pressure
Dust disperser	SAG°410/L (2...245 g/h)
Aerosol generators	ATM 220
Electrostatic aerosol neutralizer	EAN 581
Optical particle counter ²⁾	Laser Aerosol Spectrometer LAP 321, Topas
Power supply	400 V AC, 16 A
Test rig dimensions	460 x 120 x 340 cm

¹⁾ Higher volume flows on request

²⁾ Other models on request

ALC.5520 #3	
Date: 12.08.2015	State:
Time: 12:53:28	Comment: filter number 1
Data: 219	Operator: op
Filter: ALC-5520	
Test aerosol: ISO A2 FINE	☐ dP Correction (20°C)
Concentration: 10.0 mg/m³	Exponent: 1.00000
Flowrate: 300.0 m³/h	
Test air conditions:	Test result:
Temperature: 31.7 °C	Efficiency: 24.6 %
Relative humidity: 43.3 % H.	
Barometric pressure: 1005 hPa	
Flow rate: 300.3 m³/h	Differential pressure: 59 Pa
Tare pressure: 001-150812 Bar	
	Efficiency at 0.400µm: 14.8 %
	Efficiency at 1.000µm: 21.5 %
	Efficiency at 5.000µm: 76.0 %

Fractional efficiency of an ISO 11155-1 Test

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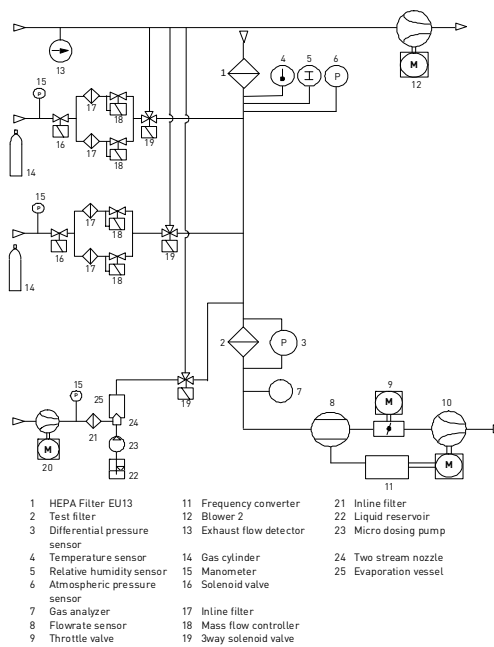
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- Exhaust system
- Flow meter
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- Sensors
- Test stand control

Applications

- Differential-Pressure measurement
- Adsorption/Desorption measurement acc. ISO 11155-2 (DIN 71460-2).
- Operator is guided through test routines
- Modular system
- Versatile
- State of the art



Schematic of the PAF 112 Adsorptive Filter Test Rig