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Technologie-orientierte Partikel-, Analysen- und Sensortechnik

Gas Turbine Filter Test System

GTS 114

Test System GTS 114 for testing air intake filter systems for rotary machinery (ISO/DIS 29461-7).

The test system GTS 114 for testing air intake filter systems for rotary machinery is based on the well-established ALF 114 filter test system for general air filters (ISO 16890) and extended to fulfil the specifications of ISO 29461.

The GTS 114 was developed with the aim of testing filters with different shapes (filter cartridges, cassette filter, filter with filter bags and plane filter media) using varying test aerosols (salt, oil) under adjustable air conditions (air humidity, temperature) within the test duct. By using the test system the following filter characteristics can be determined: differential pressure curves, dust holding capacity, gravimetric efficiency, fractional efficiency, salt removal efficiency (ISO 29461-5) and water endurance (ISO/DIS 29461-7).

Applications

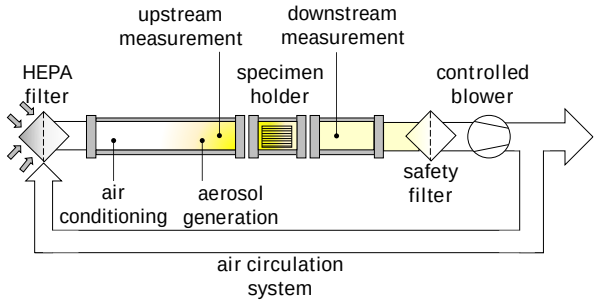
- testing of gas turbine intake filter systems according to ISO/DIS 29461-7
- testing of general air filters (ISO 16890, EN 779, ASHRAE 52.2)

Features

- circulation mode for control of the test parameters temperature and humidity
- injection of different aerosols (KCl, DEHS) into an optimal flow profile
- automated feeding of water droplets and supersaturated vapour
- high level of automation, mostly automated test runs with complete operator guiding

Principle of operation

The figure below depicts a simplified schematic illustration of the functional principle of GTS 114.



Schematic illustration of the operational principle of GTS 114.

A defined volume flow rate is sucked through a HEPA intake filter, the attached test duct and the safety filter. The test system is composed of 6 sections: aerosol inlet, upstream measurement, specimen holder, downstream measurement, safety filter and flow rate measurement. The measurement sections are equipped with ports for the aerosol characterization and the determination of the pressure drop.

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Specifications

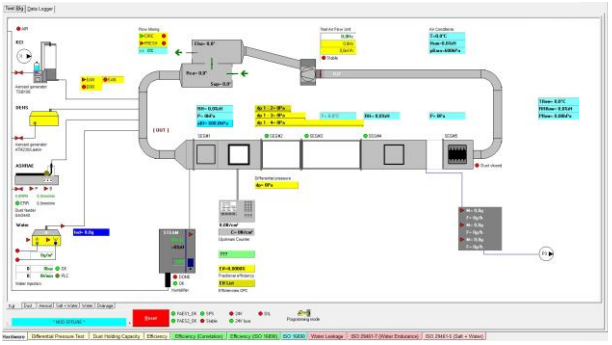
Details

The filter samples can be easily installed into the rotatable and movable glass-duct sections.

Specimen holder of GTS 114.

Aerosol characterization can be realised with different analytical instruments. Optical particle counters (OPC) can used to determine number-based particle size distribution and particle number concentrations of the test aerosol. To evaluate the salt concentration before and after the filter under test, a sodium flame photometer for aerosols (FAP 620) can be applied.

The GTS 114 is provided together with GTS 114Win. The inhouse developed software allows the visualisation and control of the test system as well as the acquisition and processing of the recorded data.



Exemplary GTS 114Win user interface.

The GTS 114 can be operated in manual or automatic mode. The operator can define test sequences for routine measurements, which lead the user through the individual measurement steps.

Technical specifications

air flow rate	800 ... 11 000 m^3/h
air circulation	0 ... 100 %
test aerosol substance	DEHS, KCl
dimension of specimen	pocket and cassette filters length ⩽ 610 mm filter cartridges length ⩽ 1,5 m diameter ⩽ 400 mm flat sheet filter media surface ⩽ 1 m^2
environmental sensors	temperature, relative humidity, air pressure
differential pressure	< 2 000 Pa
power supply	3 x 400 V AC; 125 A; 50 Hz
compressed air supply	> 5 bar (17 m^3/h)
water supply	> 3 bar
dimension (w × h × d)	4,6 m × 1,7 m × 14,0 m

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