Test Rig Control and Data Acquisition Software PAFWin 3.1

General Features
For filter test rig control and data acquisition a user friendly and considerably self explaining software has been developed. It runs under all Windows platforms like Windows 3.x/95/98/NT and visualizes the test rig as well as the running test in realtime.

More features are
- Automatic test procedures according to instructions as given by existing standards and guidelines
- Manual control of single test rig components for calibration, service and research tasks
- Datalogger for long-term investigations
- Filter sample and types data base
- Test dust and test gas database
- Graphics, tables for data presentation and statistical functions
- Clip board functions, Dynamic Data Transfer to Excel spreadsheets
- English and German language
- Extensive Online help and user manual

The conception of a versatile suitable control software was decided by the independency on special hardware to be extremely flexible.

Consequently PAFWin is a perfect solution for a wide range of complete filter testing rigs for either particle filters as well as adsorptive filters and media. Also PAFWin can be used for smaller testing setups.

Visualization and Manual Control
Beside an optical attractive visualization of the installed filter test system PAFWin enables manual interaction with basic hardware modules beyond defined testing procedures. This feature is of special importance for test rig validation which is increasly considered in the standards.

Test rig detail PAF 113 showing test channel with particle counter and current measuring values of gas concentration, temperature, relative humidity. After clicking on the particle counter figure a new window would appear showing particle size distribution and current fractional efficiency curve.

For a lot of specific instruments like aerosol generators, particle sizer/counter, gas analyzer, gas dosing systems particular software components are available. Performing test rig validation is supported by several Excel spreadsheets.
Reproducible Testing Procedures

Systematic conception and the realized software design allow operator friendly testing procedures following existing standards. From the test rig specific adjustment of flowrate up to instrument calibration corresponding instructions are given to the operator.

Interaction Dialog and Operator Requests as well as Modal Status Display Simplify Software Operation and Ensure more Reproducible Testing Procedures

For data management of test settings and testing results a dBase compatible data base system has been developed. Information about filter to be tested (samples) as well as testing related properties of test dusts and gases are stored there.

Test Dusts (Left) and Test Gase (Right) are Clearly and Transparent Stored in Separate Data Bases

All Performed Tests are Recorded in the Database SAMPLE.DBF

Filter sample and filter test data base allows the complete repersecution of all relevant data and enables fast access to existing measuring data.

Differential Pressure Test

This test is to measure and record differential pressure values in a range of filter surface loadings (similar to face velocity), which are almost automatically adjusted.

Test Dialog for Differential Pressure Testing
The not negligible tare pressure loss of the testing channel/tubing can be extra measured and used for data correction as requested by some standards.

**VDI 3926 Cleanable Filters**

Performing a filter test according to the standard above of flat sheets of cleanable filter media is implemented in the PAFWin software.

**DIN 71 460 Part I and II Cabin Air Filters**

As given by the two parts of this standard fractional efficiency is measured with optical particle sizers/counters when the filter is challenged to dust aerosol and gas adsorption and desorption can be tested with gas analyzers. Software conception allows fast and alternatively installation of miscellaneous particle sizers. For a number of gas analyzers (FTIR, FID, NDIR, CLD) adequate interfaces has been developed. Procedures for connecting and disconnecting gas sources as well as gas analyzer calibration routines are software controlled. Testing flow rate depending dust feeder settings are calculated and displayed to the operator.
ISO 11 155 T1 Air Filters for Passenger Compartments

The complete realization of this draft standard outlines the claim of innovation of PAFWin. Beside consideration versatile testing parameters also extensive statistical calculations for fractional efficiency curves with confidence limits have been implemented. A correlation ratio describing particle losses across the filter holder itself can also be used for data correction.

Further Features

For all tests the results are presented in printouts according to the suggestions as given in the standards and guidelines. By dynamic data exchange DDE to Excel data can be transferred to country specific Excel spreadsheets.

Detailed Test Results

Test Dialog for Testing Fractional Efficiencies of Air Filters with Extensive Statistical Calculations and Confidence Limits

EN 779 General Air Filter

Test procedure according to this standard has been modified by measuring filtration efficiency by means of an oil aerosol and a particle counter. Gravimetric measurements for dust holding capacity and clean air dust concentration are requested in realtime by the software.

Customized Test Procedures

Deviating testing procedures can be performed by using the manual control in combination with the data monitor (data logger) which can be flexible configured. As well the data monitor can be used for recording data parallel to a running test.

In connection with our certification according to ISO EN 9001 validation of this software and implemented calculation routines is based on own practical tests as well as with MS Excel. Demonstration software is available on request. If you are interested, please contact us. Look at our World Wide Web site at http://www.topas-gmbh.de now.

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