Cert-Pro Products

Software and Equipment for Certifcation Professionals

Autoscan 5.0 Product Specifications

Overview:

The Cert-Pro Autoscan 5 system is a highly integrated hardware/software solution specifically designed to perform leak testing of HEPA and ULPA filters. The Autoscan system has been developed with many years of field use in filter manufacturing facilities. The Autoscan system incorporates highly reliable components to ensure maximum life and reliability required in manufacturing plants.
The Autoscan system consists of the following components:

Motion Control System:
The Autoscan system utilizes highly accurate and reliable ball screw linear actuators as the motion control platform. The two actuators when mounted allow for full X-Y movement of the scan system. The ballscrews have been carefully selected to provide maximum scanning speed while delivering highly accurate positional control.

Servo Motors:
The linear actuators are driven by servo motors on both the X and Y axis. The servo motors incorporate 8,000 line encoders to provide precise feedback for probe positioning. The servo motors are mounted and tuned to the actuators for optimal performance. The scan speed of the actuators are fully software controlled and allow scan speeds from 0.1 to 5 inches per second over the full dimensions of the filter under test. The servo controllers and power supply is mounted in a stainless steel control box at the rear of the Autoscan plenum. Over-travel and home positioning is provided by optical switches mounted on the linear actuators. These switches provide secondary protection to the motion control system.

Airflow Orifice Plates:
The Autoscan system utilizes sharp edge orifice plates to measure airflow to the filter under test. Each of the three supplied plates includes an electronic identifier which allows the Autoscan system to automatically recognize the currently installed orifice plate. The system then uses the 6 point calibration curve for the currently installed plate to ensure accurate airflow volumes are recorded.

AS2000 System Controller:
The AS2000 system controller serves as the main control system for the Autoscan. The controller includes a custom programmed microcontroller which collects and analyzes most of the input signals for the scan system. The controller includes two (2) low pressure manometers with front panel digital readouts, three (3) high speed TTL pulse counters, six (6) high flow solenoid valves and a front panel Emergency Power Off switch for emergency shutdown of the motion control system. The controller communicates with the Autoscan PC thru a bidirectional RS232 link. The AS2000 controller is available in a 19” rack mount cabinet or table top cabinet.

Upstream Sample Diluter:
The Autoscan system can utilize the Cert-Pro SD1000 sample diluter or any other customer supplied sample diluter. The software allows the user to define the diluter as either a fixed rate diluter or as an analog voltage input that is proportional to the current dilution ratio.

Autoscan v5.0 Software:
The Autoscan software is designed to allow maximum flexibility and ease of use. The user interface provides oversize menu buttons to allow for quick navigation of the screens. Additionally, with numerous user configuration options, the system can be fine tuned to meet the user’s specific requirements. This includes the option to store filter set-up screens, scan speeds, motion control access speeds and numerous other options. See below for full software features.

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Minimum Computer Requirements:

- Operating System: Microsoft Windows XP (Home Or Professional) SP2
- Processor: Pentium III, 500 MHz or better
- Memory: 256 MB RAM
- CD or DVD drive
- SVGA Video adaptor and display
- Windows compatible laser or ink-jet printer

Filter Setups:

The software allows the user to select either single use filter definitions or the ability to store an unlimited number of pre-defined filter setups. The filter definition contains the following fields:

- **Filter Identification Test fields:** Project Name; Style Code; Control Number and Part Number
- **Filter Dimensions:** X; Y; Filter Height and Frame Width.
- Filter **Construction Details:** Pleater ID; Assembly Station ID, Medial Lot and Adhesive Lot.
- **Test Parameters:** User defined specifications for pressure; flow rate; efficiency and air velocity. Each of these parameters may print the user default text or the actual measured values where applicable by clicking the Print Actual check box.
- **Scan Speed:** User defined from 0.1 to 5.0 inches per second.
- **Leak Tolerance:** Low; Medium or High. Actual leak settings may be specified in the system configuration menu (requires supervisor access). This allows operators to select pre-defined levels without the need to enter absolute values.
- **Challenge Particle Size:** Pick list to allow selection of the actual particle challenge size (typically the MPPS).

System Configuration:

The system configuration screen allows the user to define specific configurations for the scanning system:

- **Leak Penetration Values for Low, Medium and High leak tolerance:** Supervisor enters the desired filter penetration definitions for three separate leak tolerance thresholds. This allows operator selection of Low, Medium or High in the filter setup screen.
- **Metric Conversion:** Allows user to specify if units of measure will be metric or US standard.
- **Use Passwords:** Selecting this checkbox enforces password protection for all configuration screens.
- **Default Upstream Count**: Allows user to specify a default upstream challenge to use if unable to measure upstream concentrations directly.
- **Particle Counters Connected:** Allows user to select one, two or three particles counters for scanning the filter.
- **Test Report Printing:** Allows user to specify if reports will be printed after the test. The available reports are Pass Report, Fail report table with leak positions and sizes, Graphical leak map (color showing location and magnitude of leak graphically) and air velocity report (if optional air velocity probe is purchased).
- **Scanner Configuration:** Allows user definition of scan probe size; Upstream sample settings (sample duration, frequency, counter to use and sample line purge time).
- **Maximum Filter Size:** Allows maximum filter dimension entry to protect against input errors in filter dimensions resulting in motion control over travel.

Sensor Configuration:

The sensor configuration screens allows definition of the filter pressure drop, flow orifice pressured drop and diluter voltage inputs. This screen is used for ease of system calibration and verification of the various voltage inputs to the AS2000 controller.

Flow Orifice Configuration:

The flow orifice configuration screen allows for definition and calibration of the three Autoscan orifice plates. Each orifice plates has a 6 point calibration table assigned. The software uses the calibration table for the currently installed orifice plate. Each orifice plate includes an electronic identification which allows the Autoscan system to automatically select the correct orifice plate calibration with no user interaction required.

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Air Velocity Configuration:
The air velocity configuration screen allows the user to define the parameters for testing the air velocity of the filter under test. These parameters include: the probe dimensions, probe X and Y offsets, the desired test grid and the amount of time to wait before taking the velocity reading after the probe has moved to the current position.
In addition to the configuration screens described above, the Autoscan system includes dedicated screens to display upstream concentrations, filter pressure drop and airflow and AS2000 sample valve control screen.

Fully Automated Test Cycle:
Once the system has been configured, the operator simply selects the current filter installed and clicks on the START button. The Autoscan system will start the PSL generator, perform all upstream samples (on the pre-configured frequency), scan the filter and perform a face velocity test (if velocity option is purchased). After the filter test is complete, the system will shut off the PSL generator, print the appropriate test reports and return the scan probes to the filter unload/load position.

Maximum Flexibility and Ease of Use:
With the configuration screens described above, the Autoscan system can be used specifically the way the user desires. Password protection of all the critical set-up screens ensures that only supervisor level access can make critical configuration changes. Use of filter definition files allows supervisors to create filter templates which define filter acceptance values, scan speeds and reporting requirements to ensure consistent test results. When testing low volume custom filters, the system can be configured to allow the use of a single filter template for quick test changes.

Most text fields utilize radio buttons, check boxes or pull down menus to ensure consistent data entry and ease of use. The pull down menus includes an edit option to allow users to add additional options at any time.

While optimal scan speeds are achieved with the use of three particle counters simultaneously, when a particle counter must be removed for calibration or fails, the system can be reconfigured in a matter of minutes to still allow scanning to be performed with only one or two particle counters.

After testing is complete, all defined test data is stored in a database. This allows for trend reports to be created on critical manufacturing steps such as media lots, pleater station ID’s, assembly station, adhesive lots or particular filter part numbers.