



Model 622  
**Automatic Airflow Test Stand**

Dimensions: 39" H x 48" W x 22" D  
 991mm H x 1219mm W x 559mm D

## GAS TURBINE AND JET ENGINE COMPONENT TESTING

### Mass Airflow Test Stand

#### PRODUCT REQUIREMENTS

Multiple manufacturers in the Aerospace industry required Airflow Test Stands to calculate Mass Airflow and test equations. Flow test sequences, called "circuits," can automatically flow air with multiple test steps and various airflow equations (such as specialized reduced airflow measurements). CCDI was first in the industry to offer such test equations, and has continued to do so for over 30 years. The Automatic Airflow Test Stand is now available in the Model 622.

#### A VERSATILE SOLUTION

CCDI has been developing Airflow Test Stands since 1976 and automated units since 1986. The years of experience resulted in a refined design of a product that considers the fast-paced nature of the industry. CCDI continues to satisfy customers by adding new test requirements from various turbine manufacturers. Some specifications come from ABB/Alstom Power and related, UTC P&W, P&W Canada, GE Aircraft, GE Power, Honeywell, Allison, Rolls-Royce, Solar Turbines, Snecma, and Siemens.

#### FEATURES

- Accuracy: +/- 1.0% Standard
- Repeatability: +/- 0.25% Standard
- Simple WYSIWYG Windows Based Software
- Multiple Manufacturers Test Specs and Formulas
- Five Nozzle design with ability to combine nozzle brings maximum measuring range
- Small internal volume for rapid measurements
- Circuit switching, pressure control and acceptance, fully automatic
- EDI feature for piping data to network systems
- Will operate on Notebook Computer
- Configurations Available: 622L, 622M, 622H, 622XH



Front View



Adjustable Viewing Angles

**SYSTEM SPECIFICATIONS**

NIST Traceable Air flow Measurement  
 Flow Measurement Accurate to +/- 1.00%  
 Flow Measurement Repeatable to +/- 0.25%  
 GE, PW, ABB, Honeywell, Siemens, Rolls-Royce, and Solar Parts Testing  
 Automatic Flow Correction Equations according to mfg specs.  
 15 to 30 Seconds per Flow Test  
 Manual/Automatic Operation  
 Internal Sonic Nozzles (4 to 6)  
 Automatic Single or Double Nozzle Select  
 Part Test Profiles  
 English and SI Units  
 IBM Pentium Computer  
 MS Windows Based Part Test Software  
 QC Report, Label and Data Acquisition File  
 Can also flow small Effective Flow Area measurements  
 Data Acquisition File compatible with Excel  
 Free Operator Training, Testing and Certification  
 Tabletop mounted for better installation flexibility  
 One-Year Warranty on Parts and Labor

**Flow Capabilities**

0.000119 to 0.154153 Pounds per Second, 0.000054 to 0.069922 kg/s (Greater range with XH Series)  
 0.000189 to 0.244840 Flow Parameter  $W * \sqrt{T} / Pa$   
 Sonic Nozzle P1/P2 pressures are monitored during testing and provide a real time "Not-Sonic" message if the nozzle is not in a "choked" state.

**FACILITY REQUIREMENTS**

Electrical Power and Air	100-250 VAC Single Phase, 50-60 Hz, 5A Service Pressurized air at 100 psig, dry to 0° F Dew Point		
Pressure Range	0.5 to 50 PSIG – Standard 0-50 Inches Water Gauge – Optional		
Temperature Ranges	T1 Upstream Temperature	46-120°F	(8- 49 °C)
	T3 Part Downstream Temperature	46-120°F	(8- 49 °C)
Transducer Pressure Ranges	P1 Upstream Pressure	0-100 PSIG (0-690 kPa)	0.10% FS
	P2 Downstream Pressure	0-100 PSIG (0-690 kPa)	0.25% FS
	P3 Part Pressure	0-50 PSIG (0-345 kPa)	0.10% FS
	P4 Probe Pressure	0-30 PSIG (0-207 kPa)	0.10% FS*
	PB Barometric Pressure	26-32"HgA	0.10% FS
	T1 Upstream Temp	46-120°F (8- 49 °C)	+/- 1Deg F
	T1 Downstream Temp	46-120°F (8- 49 °C)	+/- 1 Deg F

\*Probe pressure is optional

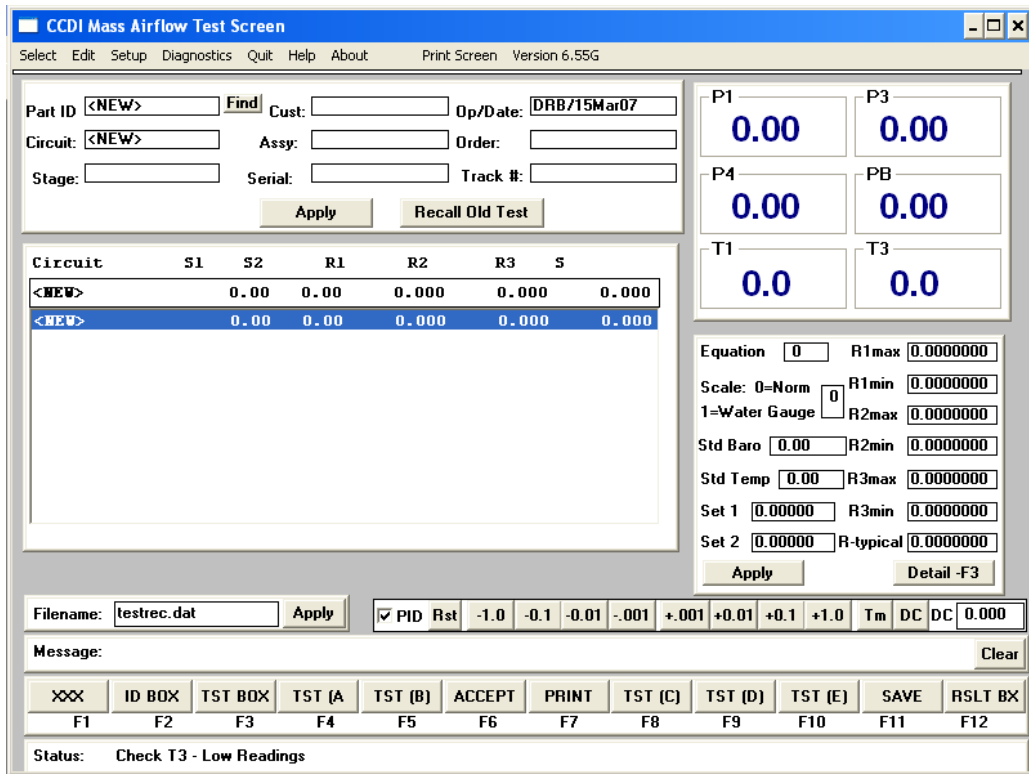
**SOFTWARE**

CCDI Airflow Test Stands have basic operation screens and a calibration screen.

The Test Screen - Operators operate the machine from this screen

The Setup Screen - Carries the machine's configuration and calibration data.

The Diagnostic Screen - From this screen you can see what valves are open, what nozzles are selected.



**Test Screen**

**Menu Bar** - Allows navigation to other screens, selection of part test programs, finding information.

**Identification Box** - In the upper left corner box, fill in details associated with the airflow test that gets recorded and printed. This information is also kept with files that can be transmitted to a network.

**Test/Log Box** - CCDI machines can have up to 64 test sequences (or increased as needed) for a single part. The first box (short) is the real time results box that shows the test data in operation. The second box (long) is the log of the test results. Some software versions have three result boxes for parts that use "Exit Flow" measurements. The log provides a summary of test data.

**Gauge Displays** - Gauge measurement readings. They are automatically converted to units that match the parts being measured.

**Test Parameters Box** - Right corner box allows the test parameters and limits to be entered. Selecting "Detail", which will open the detail box, you can enter even more information.

**Filename** - This allows selection of a filename for the test data. The filename can be stored in the part "profile" - A file recipe in the hard drive for the next time you test.

**PID Control Box** - Displays activity of the pressurization controller and allows user to adjust values.

**Message and Status Boxes** - Messages from the system and operator instructions can be posted here.

**Function Key Menu** - Our test screen can be operated by mouse or function key.

**Detail Box**

From this screen, you can adjust percent error allowed on set points and the "Auto Timer" to shut off the air for a certain period of time. This will end the test after the pressure is consistent for the selected time interval.

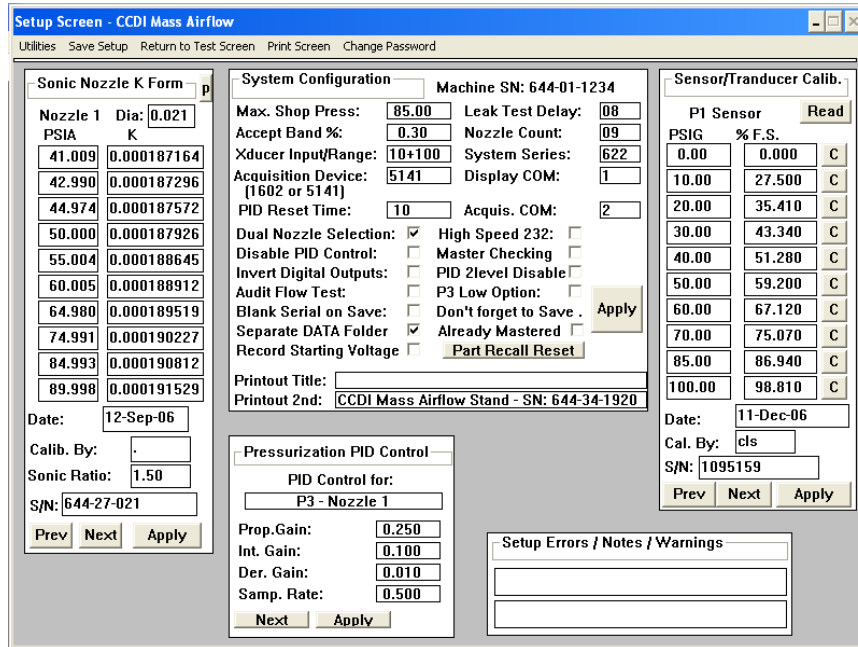
Auto-step allows the next flow sequence to proceed automatically. The Startup Delay makes time at the beginning of the test to stabilize.

Manual Nozzle allows the user to select the nozzles. The system defaults to set point and flow limit information. The Master Parts Limits section is to be completed by the user as well.

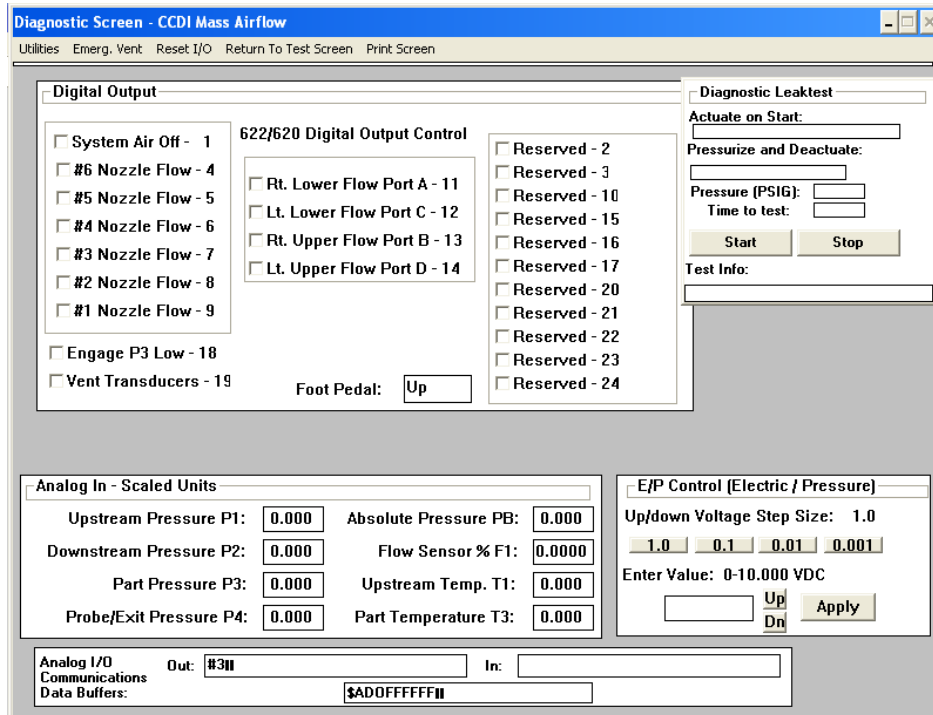
The PID Control (Pressurization) can be finely tuned for the most demanding production lines. Note: Fixtures/Tooling varies in volume. These parameters are adjustable to achieve the best response

**Flow Testing Features**

- CCDI Airflow machines were the first machines on the market with automatic sequencing.
- If you test a part in various manufacturing stages, the old data can be recalled at a later time to fill-in the blanks.
- Automatic or Manual, Single or Dual Nozzle Selection Available
- Two-stage cancel button can temporarily stop a test and restart; a second cancel can discard the results to start over.
- Beginning of a test can be paused for a specified number of seconds.
- Test results record all gauges and K values making analysis simple for auditing.
- In a Flow Restriction Test, the PID control can be turned off in order to monitor for flow restriction cause by external tooling.
- The program has leak tests that check for internal and external leaks at various stages
  - Our leak testing sequences can be automated
  - Volume based leak tests allow for fixed volume entry in testing parameters.
- The Diagnostic screen is great tool for technicians and makes understanding of the equipment easy for maintenance



**Setup Screen:** Contains nozzle calibration, transducer calibration, system configuration data, and built-in pressurization tuning information.

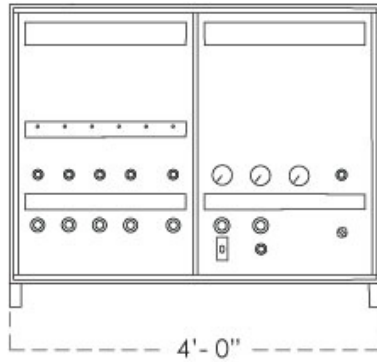


**Diagnostic Screen**

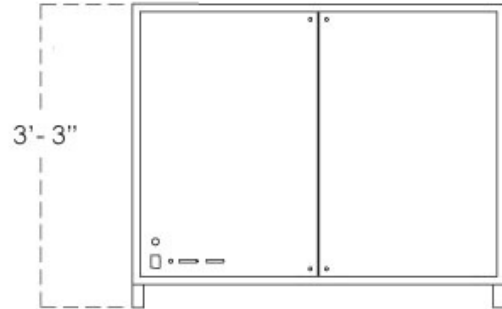
From the Diagnostic Screen, you can operate the valves, take pressure measurements, check data-communications, and control output pressure. Very useful for troubleshooting.

**DRAWINGS**

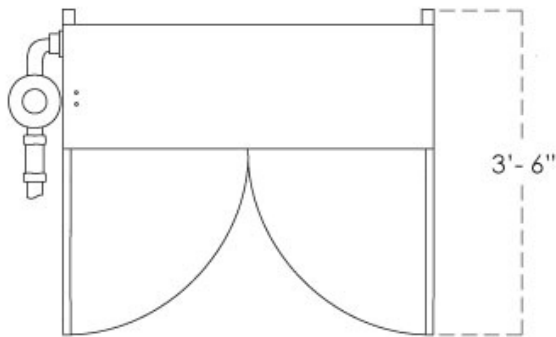
Front View



Back view



Top View



Side View

