The ENERGY CONSERVATORY

DIAGNOSTIC TOOLS TO MEASURE BUILDING PERFORMANCE

Minneapolis Blower Door™

Building Airtightness Testing Systems

Blower Door

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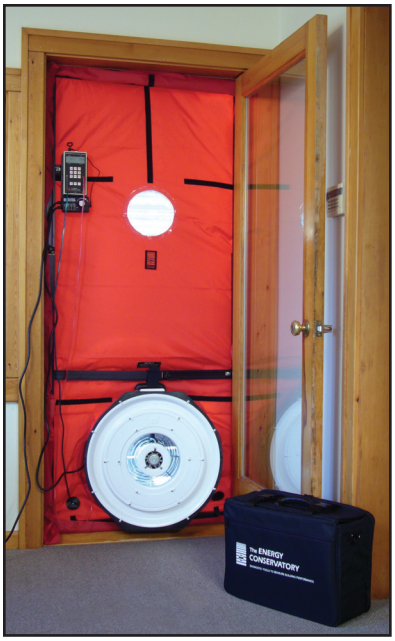
Blower Door tests are used to measure the airtightness level of building envelopes, diagnose and demonstrate air leakage problems, estimate natural infiltration rates, estimate efficiency losses from building air leakage, and certify construction integrity.



For more than 25 years, the Minneapolis Blower Door™ has been recognized as the best designed and supported building airtightness testing system in the world. Combined with specialized accessories and complete testing procedures developed by The Energy Conservatory (TEC), The Minneapolis Blower Door is the system of choice for building science trainers, utility programs, energy raters and auditors, HVAC contractors, builders, insulation contractors and weatherization professionals.

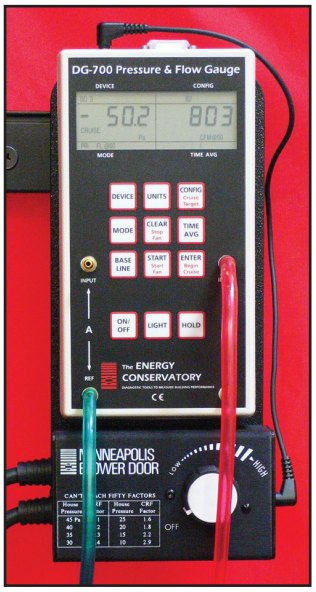
Minneapolis Blower Door Features

Precision Engineered, Calibrated Fan

- Lightweight and rugged injection molded fan housing.
- Quick and accurate flow measurements from 300 to 6,100 CFM (141 to 2,879 l/s, 510 to 10,364 m^3/h). Optional rings C, D and E will measure down to 11 CFM (5 l/s, 19 m^3/h).
- Powerful 3/4 hp motor provides continuous flow for testing and air sealing work.
- Solid state variable speed fan control.
- Compatible with both pressurization and depressurization testing.
- Both 110V and 220V models available.

Accurate, Powerful Digital Gauge

- DG-700 Pressure and Flow Gauge contains 2 precision pressure sensors to provide simultaneous display of both building pressure and Blower Door fan flow readings.
- Auto-zeroing of both channels eliminates sensitivity to orientation and temperature.
- Specialized @50 and @25 test modes make it simple to conduct one-point airtightness tests of buildings and duct systems. Test results can be displayed in CFM or square inches of leakage area.
- Cruise 75, 50, 25 and 0 Pa building pressure without connection to a computer. The Cruise Control feature automatically adjusts the speed of the Blower Door fan to maintain a constant building pressure while you perform additional diagnostics or air-sealing procedures.
- Four separate time-averaging modes (1, 5, 10 second & long-term) allow you to accurately measure fluctuating pressures.
- "Baseline" feature allows the user to measure and record a baseline pressure reading, and then display the baseline adjusted reading.
- The DG-700 can be used along with a computer and specialized TEC software: TECTITE™ to conduct automated Blower Door tests; and TECLOG2™ for data logging of pressure measurements and large building airtightness tests.
- The DG-700 has both a USB and a serial port for connection to your computer.

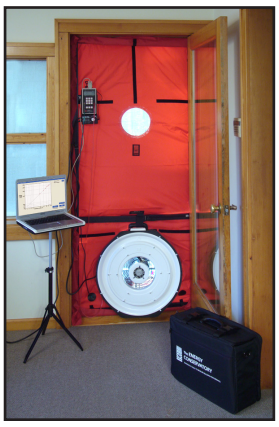


DG-700 Pressure and Flow Gauge with Cruise feature

Automated Testing Accessories Included With Every System

Automated testing provides computerized control of the Blower Door fan and automated capture of the building pressure and fan flow measurements. This feature reduces operator error, ensures that tests are conducted the same way every time, and improves test accuracy in windy weather. Automated testing accessories include:

- TECTITE Software
- Fan Control Cable.
- USB Cable to connect the Blower Door system to your laptop computer.
- Testing of large buildings with multiple fans and gauges is done with our TECLOG2 software. (Can be downloaded at no-charge from our website)



Anatomy of the Minneapolis Blower Door

Lightweight, Durable Door Frame and Panel

- This innovative design is the result of years of refinements based on the experience of thousands of users. There is no easier way to seal a Blower Door fan into a door opening.
- Snap-together aluminum frame comes in a compact case and sets up in seconds.
- Precision cam lever mechanism securely clamps the nylon panel into the door opening.
- Fits an 8 foot door without special parts.

DG-700 Pressure and Flow Gauge

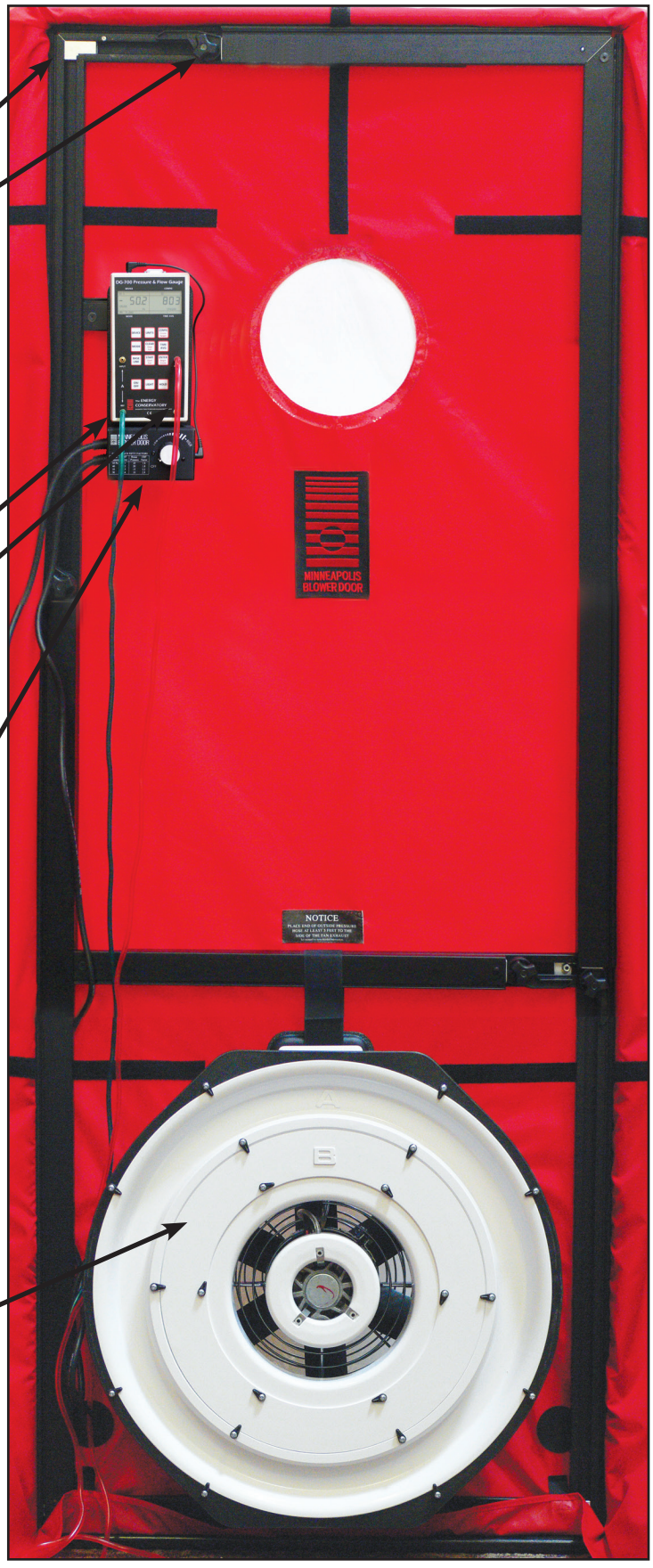
- Specifically designed for airtightness testing with specialized measurement functions. One of the best all around pressure measuring gauges on the market.
- Built-in Cruise Control feature with settings for 75, 50, 25 and 0 Pa.
- Channel A measures the change in building pressure.
- Channel B measures air flow from the Blower Door fan.
- DG-700 can be connected to a laptop computer for fully automated testing. (Both USB and serial ports included.)

Fan Speed Controller

- Precision control of fan speed throughout the entire range.
- Fan Control port for Cruise Control and automated testing.
- Fan cooled controller is easy to handle and improves the life of the controller.

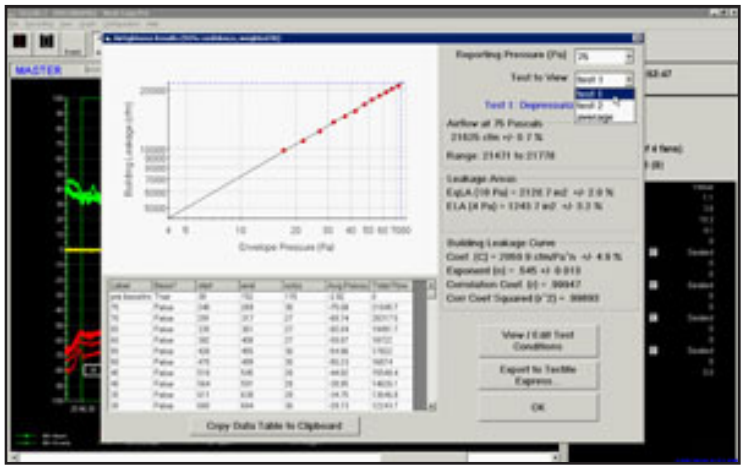
Powerful, Calibrated Fan

- The 3/4 hp motor of the Minneapolis Blower Door Fan is designed to maintain accurate flow for hours while you work.
- Accuracy of the Blower Door Fan and DG-700 Gauge is +/- 3% down to 85 CFM. No special calibration or extra charges required.
- The Blower Door Fan comes with Rings A and B to measure a wide range of airtightness conditions. Optional Rings C, D and E extend the low range of the Blower Door fan.
- Precision readings from 11 CFM to 6100 CFM.



Multi-fan Blower Door Systems

Airtightness testing of larger buildings requires more fan flow. The Minneapolis Blower Door can be configured to install 2 or 3 fans in a single doorway, making it possible to measure the airtightness of almost any size room or building. Very large or complex buildings may require more than a single door location.



Our TECLOG2™ software is designed specifically for multi-fan and multi-gauge testing in large buildings. TECLOG2 provides a master control for all fans, as well as individual fan control. All data from each gauge is captured by a single computer and airtightness test results can be displayed on-screen or exported for use by other software.

The Energy Conservatory

All of our products come with a full two year warranty on parts and labor, and access to the most knowledgeable customer service staff in the industry. When your personnel have questions on the use of our products or how to handle unusual situations they encounter, you can count on us to give dependable answers. We always stock a complete line of replacement parts and can respond quickly to any service or equipment problem.

Our nearly 30 years of expertise goes beyond simply knowing our equipment. The Energy Conservatory's on-going research, active participation with technical associations, and close working relationship with the world's leading building scientists has kept us actively involved in the development and field testing of many of the techniques currently being used in the performance testing industry. This experience ensures that our customers always have the most up to date information and testing procedures.

Blower Door Accessories/Options

TECTITE™ Airtightness Test Analysis Software

- Calculates building airtightness test results including leakage areas, ACH50, CFM50, building leakage curve, estimated natural and design infiltration rates and the estimated savings of air sealing.
- Includes the 3 new RESNET Blower Door test standards (auto and manual) in addition to the CGSB standard.
- The zonal pressure feature can be used with multiple DG-700 gauges
- Compatible with both manual Blower Door tests and automated tests using a DG-700 or APT System.
- Calculates mechanical ventilation requirements in accordance with updated to ASHRAE 62.2-2010..
- Easy to use data entry screens, file storage and file retrieval features.
- Choice of report formats including an easy to read homeowner report or a detailed technical report. along with a built-in pdf file report generator.
- Included with each new Blower Door kit and available for free download.

TECLOG2™ Data Logging Software

- Datalog values from up to 16 gauges or APT Systems.
- Control each individual fan or all fans simultaneously. (Total number of fans controlled and measured is based on available number of pressure channels.)
- Calculate and display multi-fan airtightness test results, ideal for testing in large commercial buildings.
- Data viewing capabilities include auto-axis rescaling, adjustable graph scrolling, quick graph zooming, and a moveable measurement line for determining the numeric value and time for individual data points. A statistics utility can be used with stored data files to provide basic statistical summaries for the entire file, or for a user selected portion of the data.

Laptop Computer Stand

- Using a computer stand increases the stability of your laptop while conducting a Blower Door test. This collapsible laptop stand can be taken anywhere.
- Minimum height is 15 inches and extends to a height of 27 inches.
- The detachable top is 11 x 13 and has a non-skid surface that helps keep the laptop computer in place.

Smoke Puffer

- A convenient source of white smoke for diagnosing air leakage sites. The smoke puffer consists of a small 3 inch (7.6 cm) high Teflon bottle and 2 vials of chemical smoke.
- The smoke puffer will last for several months and can be easily refilled.

Fan Cases

- The Standard Minneapolis Blower Door System does not come with a fan case. The rugged and durable fan can handle transport in a car or minivan without any further protection. If storing or transporting the fan in a panel or delivery style truck, a fan case is suggested.

- Our lightweight, heavy duty, water resistant nylon case provides excellent protection from dirt and scratches.
- The Padded nylon case is made of the same tough material as our lightweight fan case, but also includes plenty of high density foam to protect your Blower Door fan from the bumps and bangs of everyday use.

Pressure Pans

- The pressure pan is a duct leakage diagnostic tool which is used along with the Blower Door and digital pressure gauge to identify exterior air leakage in duct systems. The pattern of pressure pan readings allows for quick identification of major exterior leakage sites, and can be used to tell technicians if they have sufficiently air sealed the duct system. Because the pressure pan does not require taping off registers and grills, it is an extremely quick diagnostic procedure.

- Two size pressure pans are available: 12 1/2 in. x 14 1/2 in. x 4 in. (32 cm x 37 cm x 10 cm) and 22 in. x 22 in. x 2 in. (56 cm x 56 cm x 5 cm).

- Handle with heavy duty Velcro provides a secure connection to the Pressure Pan. The threaded handle fits most standard painter's pole.

Blower Door Specifications

Component	Specifications	
Model 3 Blower Door Fan	Maximum Flow:	6,100 CFM at free air (2,879 l/s, 10,364 m^3/h) . 5,250 CFM at 50 Pa (2,478 l/s, 8.920 m^3/h). 4,900 CFM at 75 Pa (2,313 l/s, 8.325 m^3/h).
	Minimum Flow:	300 CFM with Ring B (141 l/s, 510 m^3/h). 85 CFM with Ring C (40 l/s, 144 m^3/h). 30 CFM with Rings D (14 l/s, 51 m^3/h). 11 CFM with Rings E (5 l/s, 18 m^3/h).
	Dimensions:	20 in. (50 cm) inlet diameter, 10.25 in (26 cm) length.
	Weight:	33 lbs. (15 kg) with Flow Rings A & B.
	Flow Accuracy:	+/- 3% with DG-700, Rings D & E +/- 4% or 1 CFM.
	Calibration:	Meets ASTM Standard E779-10, E1554-07, CGSB-149.10-M86, RESNET 2012 EN 13829, CIBSE TM23, ATTMA TS-1 and NFPA 2001.
	Power	3/4 hp motor available in 110V or 220V.
Adjustable Frame and Frame Material	Frame Material:	Extruded Aluminum.
	Width:	28 in. to 40 in. (71 cm to 101 cm).
	Height:	52 in. to 96 in. (132 cm to 244 cm).
	Seal:	EPDM flexible gasket.
	Panel Material:	Nylon w/built-in vinyl window.

Specifications subject to change without notice.

Standard Minneapolis Blower Door Kit includes:

- Fan with variable speed controller and fan control cable.
- Two Flow Rings (A and B) and No Flow Plate.
- DG-700 Pressure and Flow Gauge
- TECTITE™ Building Airtightness Testing Software
- USB cable - 16 feet (5 meters) long
- Fabric door panel with viewing window.
- Five piece adjustable aluminum door frame and frame case.
- Padded attache case to hold gauge, manuals, tubing, speed controller, and fabric panel, with room for a laptop computer and other documents.

Other building diagnostic products available from The Energy Conservatory

The Minneapolis Duct Blaster® is used to measure the airtightness of duct work.

Infrared Cameras by Flir help speed up diagnostic work, especially when used with a Blower Door.

The TrueFlow® Air Handler Flow Meter, shown with DG-700, is used to measure the total amount of air moving through an air handler.

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