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The ENERGY  
CONSERVATORY

DIAGNOSTIC TOOLS TO MEASURE BUILDING PERFORMANCE

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## New TrueFlow™ Air Handler Flow Meter Makes Measurements Of Flow Through Air Handlers Easy And Accurate

The Energy Conservatory (TEC) is pleased to introduce a brand new test instrument, the TrueFlow™ Air Handler Flow Meter. The TrueFlow Meter is designed to directly measure the air flow rate through residential air handlers, a critical variable used in diagnosing and optimizing the performance of heat pumps, air conditioners and furnaces. The TrueFlow Meter is placed in a filter slot or remote filter grill and the air flow rate is determined from a measurement made directly at the device. No other testing device has been able to provide a quick, accurate, and direct real-time measurement of total system air flow until now. The Energy Conservatory is awaiting approval on its patent application with the United States Patent and Trademark Office.

The TrueFlow Meter replaces the most widely used methods for estimating the air handler flow rate (the temperature rise method, the Duct Blaster pressure averaging method and the static pressure/fan curve method) which have been found to be problematic or time consuming to perform. Because of the problems with the current testing methods, most technicians simply assume the air flow to be 400 cfm per ton when determining refrigerant charge and other system settings. Numerous field studies of actual residential HVAC performance has shown that air flow is commonly much less than assumed. Performance studies of the TrueFlow Meter through the U.S. Department of Energy have shown that the device is 4 times more accurate than the single-point temperature rise method, allowing technicians to analyze system performance and adjust system settings in less time and with greater confidence.

At the Affordable Comfort Conference on Home Performance Strategies in San Ramon, CA, the value of the TrueFlow Meter was demonstrated in a working model of a residential HVAC system containing 7 ducted supply branches. The TrueFlow Meter

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was installed to measure the total air flow through the demonstration model while an air flow capture hood was used to measure the air flow exiting each of the 7 supply registers. Using built-in dampers to restrict sections of the duct work, participants could easily watch the real-time impact of duct restrictions on reduced flow through individual branches, as well as reduced total system flow because of higher static pressures in the duct system. In a typical HVAC system, low air flow results in both decreased capacity and decreased overall system efficiency.

The TrueFlow Air Handler Flow Meter kit consists of two calibrated gasketed metering plates (14" x 20" and 20" x 20") with attached pressure sensing manifolds. A set of 8 spacers are included to adjust the size of the metering plates to fit the most common sizes of residential filter slots and remote filter grills. In addition, the unique design of the metering plate gasket makes it easy to attach custom sized spacers (made by the technician) so that the TrueFlow Meter can be used in just about any size filter slot or grill.

The TrueFlow Meter can be used with most standard pressure gauges. Pressure readings from the

metering plates are converted directly to flow in cubic feet per minute (cfm) using a flow table. When the TrueFlow Meter is used with our DG-3 Digital Pressure Gauge, the air flow through the metering plates can be directly displayed in cubic feet per minute. The TrueFlow Meter can measure air flow rates from 400 cfm to 2000 cfm, and has an accuracy of  $\pm 7\%$  of reading when used with the DG-3 gauge.

The TrueFlow Meter kit is available now and ready to ship. The complete kit, including the 14 x 20 plate, the 20 x 20 plate, 8 spacers, connection hoses, manuals and charts, comes in a heavy duty nylon carrying case and sells for \$1,070. Additional space in the carrying case can hold either a Digital Pressure Gauge or a Magnehelic gauge set. The DG-3 Digital Gauge costs \$695. An upgrade for existing DG-3 gauges to display air flow from the TrueFlow Meter (and the Exhaust Fan Flow Meter) is \$50 including recalibration of the gauge. The Magnehelic™ gauge set, which includes a 60 Pascal gauge and a 250 Pascal gauge mounted on a magnetic board, costs \$225. For more information, technical details, photos and a download version of our literature, visit our website at <http://www.energyconservatory.com/>, and click on **Products**.

## Aluminum Frame Extension Kit

In some parts of the country there has been an increase in the use of 8 foot tall entry doors for new housing developments. While these super tall doors make it easier for the furniture mover, they make the home energy rater's job more difficult when a Blower Door test is required. The standard adjustable aluminum frame that is part of the Minneapolis Blower Door System is designed to extend to 7 feet 10 inches, 2 inches short for an 8 foot door. While in the past we have manufactured extra tall door frames for our customers, they have been very expensive.

With this problem in mind, TEC has developed an Aluminum Frame Extension Kit. The Kit in-

cludes 2 specially designed extension arms which attach to your existing aluminum frame and provide an additional 6 inches of frame height (to a total height of 100 inches). The extension arms are inserted into your existing frame by removing the corner blocks from the frame's vertical frame pieces. Each extension arm has snap pins to position them and keep them securely attached to your frame. The extension arms will need to be removed to fit the frame pieces into the carrying case. Also available is an extra tall nylon door panel which can be used with the extension pieces.

The Aluminum Frame Extension Kit costs \$40, and the extra tall door panel costs \$125.

## New Exhaust Fan Flow Meter

Measuring the actual air flow moving through an exhaust fan can be difficult without the use of an expensive capture hood. And even many capture hoods lack the sensitivity to accurately measure the low flow rates commonly seen in residential exhaust fans. However, as more and more houses begin to use exhaust fans as a primary ventilation system, the importance of verifying actual installed air flow rates becomes critical.

Numerous studies have shown typical air flow rates in installed residential exhaust fans to be well below their rated capacity. Air flow through the fan can be reduced by many installation factors including the type of flex duct used, the number of bends in the duct work, and the choice of termination kit.

The Energy Conservatory has developed the Exhaust Fan Flow Meter for just this application. The Exhaust Fan Flow Meter consists of a plastic molded metering box with an adjustable calibrated opening. During the measurement procedure, the

metering box is placed directly over the operating exhaust fan and pushed up against the wall or ceiling so that the flexible gasket on the end of the metering box creates an airtight seal around the fan grille. A pressure reading is then taken from the metering box, using a pressure gauge with a 0.1 Pascal resolution, and this pressure reading can be easily converted to air flow using a flow table. If you are using a DG-3 pressure gauge, the flow rate in cfm can be displayed directly on the gauge.

The Exhaust Fan Flow Meter has a flow range of 10 to 124 cfm, and an accuracy of +/- 10% when used with a DG-3 or DG-2 gauge. The price for the Exhaust Fan Flow Meter is \$190 and includes a 6 foot extension pole for hard to reach fans. An upgrade for existing DG-3 gauges to display air flow from the Exhaust Fan Flow Meter (and TrueFlow Meter) is \$50 including recalibration of the gauge. For more information, technical details and photos, visit our website at <http://www.energyconservatory.com/>, and click on **Products**.

### TEC Website Update

Over the last couple of months we have been adding resources to our website for users of our products. Recently, we have added several product manuals, quick test guides and the most recent newsletters to the website. The files are in PDF format and can be viewed, saved and printed using Adobe Acrobat, a free, downloadable, document reader. Over the next few months we will be expanding the documents that will be available on from our website. Below is a list of files currently available at <http://www.energyconservatory.com/>, click on **Support**, then click **Manuals**.

#### Minneapolis Blower Door:

Model 3 Flow Table (0.1 MB)  
 Sample Blower Door Test Form (0.1 MB)  
 Quick Test Guide #1 - 1 Point Test with DG-3 (0.2 MB)  
 Quick Test Guide #2 - 1 Point Test with Magnehelic Gauges (0.4 MB)  
 TECTITE Software Users Guide - Manual Test Data Entry (0.9 MB)

#### Minneapolis Duct Blaster:

Series B Flow Table (0.1 MB)  
 TECBLAST Software Users Guide (0.9 MB)  
 Quick Test Guide #1 - Pressurization Test (0.2 MB)  
 Quick Test Guide #2 - Depressurization Test (0.2 MB)

#### Digital Gauges:

DG-3 User Manual (0.1 MB)

#### Pressure Pan:

Pressure Pan User Manual (1.0 MB)

#### TEC Newsletters: (In Article Section)

Summer 2001  
 Summer 2000  
 Winter 2000  
 Summer 1999  
 Winter 1998  
 Fall 1998  
 Fall 1995

### Upcoming Shows

The following is a list of industry tradeshows where TEC will be exhibiting. If you are in the area, stop by the booth and see some of the new products first hand.

ComforTech, Nashville, September 6 – 8, 2001

Energy & Environmental Building Association, Orlando, October 24 – 27, 2001

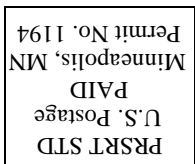
Air Conditioning Contractors Association, Kissimmee, FL, February 27 – Mar 2, 2002

Affordable Comfort, Cincinnati, April 16 – 18, 2002



### Contractor Registration at TEC Website

We frequently get calls from homeowners or building owners asking about contractors that have either a Minneapolis Blower Door™ or a Duct Blaster® or both. Frequently, these callers are trying to find a contractor that can perform various building performance tests. To help these people get in touch with our customers, our website includes a contractor list sorted by state and province. This contractor list currently contains the name and contact information for over 250 contractors providing performance testing services. If you would like to add your company to the list, go to the TEC website at <http://www.energyconservatory.com/>, click on **Contractors**, and enter your company information. There is no charge to be included in the list. The contractor portion of the website is updated about every two weeks. If you have changed phone numbers, addresses or even company names, let us know so that we can update your information.



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