

8.15.2 Measuring Duct Air Leakage with a Duct Blower

Pressurizing the ducts with a duct blower measures total duct leakage. The duct blower is the most accurate common measuring device for duct air leakage. It consists of a fan, a digital

manometer, and a set of reducer plates for measuring different leakage levels. If you use a blower door with a duct blower, you can measure duct leakage to outdoors.

Measuring Total Duct Leakage

The total duct leakage test measures leakage to both indoors and outdoors. The house and intermediate zones should be open to the outdoors by way of windows, doors, or vents. Opening the intermediate zones to outdoors insures that the duct blower is measuring only the ducts' airtightness — not the airtightness of ducts combined with other air barriers like roofs, foundation walls, or garages.

Supply and return ducts can be tested separately, either before the air handler is installed in a new home or when an air handler is removed during replacement.

Follow these steps when performing a duct airtightness test.

1. Install the duct blower in the air handler or to a large return register, either using its connector duct or simply attaching the duct blower itself to the air handler or return register with cardboard and tape.
2. Remove the air filter(s) from the duct system.
3. Seal all supply and return registers with masking tape or other non-destructive sealant.
4. Open the house, basement or crawl space, containing ducts, to outdoors.
5. Drill a $\frac{1}{4}$ or $\frac{5}{16}$ -inch hole into a supply duct a short distance away from the air handler and insert a manometer hose. Connect a manometer to this hose to

measure *duct with reference to (WRT) outdoors*. (Indoors, outdoors, and intermediate zones should ideally be opened to each other in this test).

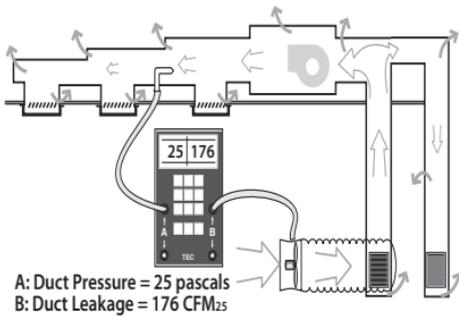
6. Connect an airflow manometer to measure *fan WRT the area near the fan*.



Video: Duct Pressurization Test Setup

— How to pressurize duct to test air leakage.

Check manometer(s) for proper settings. Digital manometers require your choosing the correct mode, range, and fan-type settings.



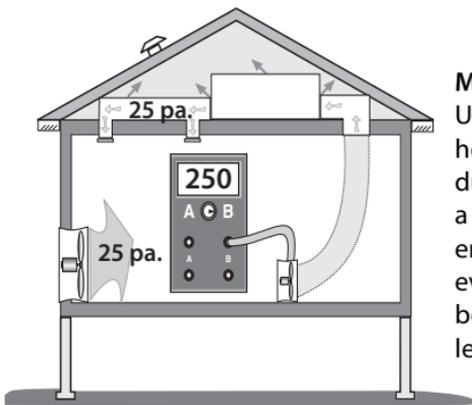
Total duct air leakage measured by the duct blower: All registers are sealed except the one connecting the duct blower to the system. Pressurize the ducts to 25 pascals and measure airflow.

1. Turn on the duct blower and pressurize the ducts to 25 pascals.
2. Record duct-blower airflow.
3. While the ducts are pressurized, start at the air handler and move outward feeling for leaks in the air handler, main ducts, and branches.
4. After testing and associated air-sealing are complete, restore filter(s), remove seals from registers, and check air handler.

Measuring Duct Leakage to Outdoors

Measuring duct leakage to outdoors gives you a duct-air-leakage value that is directly related to energy waste and the potential for energy savings.

1. Set up the home in its typical heating and cooling mode with windows and outside doors closed. Open all indoor conditioned areas to one another.
2. Install a blower door, configured to pressurize the home.
3. Connect the duct blower to the air handler or to a main return duct.
4. Pressurize the ducts to +25 pascals by increasing the duct blower's speed until this value is reached.
5. Pressurize the house until the pressure difference between the house and duct is 0 pascals (*house WRT ducts*). See "[Blower-Door Test Procedures](#)" on page 548.
6. Read the airflow through the duct blower. This value is duct leakage to outdoors.



Measuring duct leakage to outdoors: Using a blower door to pressurize the house with a duct blower to pressurize the ducts measures leakage to the outdoors — a smaller number and a better predictor of energy savings. This test is preferred for evaluating duct leakage for specialists in both building air leakage and duct air leakage.