QuickGuide

DU200 DucTester

Unpack, connect DM-2 gauge

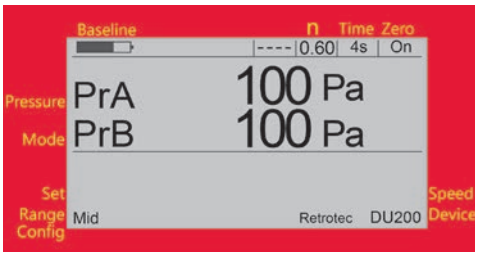
Check boxes for each step.

- ☐ Remove everything from the case.
- ☐ Install 4 NiMH AA batteries.*
- ☐ Plug in the battery charger.
- ☐ Press **[On]**, then **[Exit]**, to display the battery indicator.
- ☐ Charge for 18 hrs.
- ☐ Connect yellow, green and blue tube to gauge.
- ☐ Slide gauge into the clear sleeve and velcro Umbilical to case.

* If changing to non-rechargeable batteries, disable charging in **[Setup]** menu. For steps see: *Quick Guide DM-2 mark II Digital Gauge, page 1*

Gauge remains connected like this for all tests.

Prepare the DM-2 gauge



☐ Press **[Auto Zero]** until "On" appears - to keep the gauge zeroed and ready to measure.

Auto Zero 6

☐ Press **[Time Avg]** until "4s" appears.

Time Avg 5

☐ Press **[Device]** until "Retrotec DU200" appears.

If desired Device does not appear, see: *QuickGuide DM-2 mark II Digital Gauge,* Add/Remove Devices section

Device 0

☐ Press **[Range Config]** until "Mid" appears.

Range Config 2

☐ Press **[Mode]** to cycle through results. Select based on "Get the results you need" on page 4.
If you can't find the required results, see: *QuickGuide DM-2 mark II Digital Gauge*

Mode 1

Next, prepare the ducts, house, and fan following Steps 1 through 3.

Step 1: Prepare ducts and house

☐ Seal all supply and return grills/registers, including any exterior air inlets, with Grill Mask or tape.
☐ Open all interior doors leading to rooms containing a supply or return register, and open an exterior door or window.
☐ Shut off all HVAC (exhaust fans, dryers, A/C, furnaces).

Step 2: Connect to ducts

☐ Turn off air-handler and remove all filters.

☐ Tape Flange to main return or air handler cabinet using masking tape.

☐ Attach Flex Duct to Flange.

☐ Install Mid-Range Ring to start, as most systems can be tested on this Range Configuration.

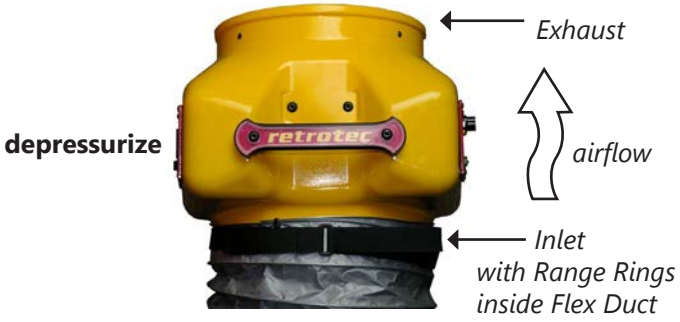
Remove Range Rings for leakier ducts, add Rings for tighter ducts.

☐ Press **[Range Config]** to select range on gauge to match fan, whenever Range Ring is changed.

Range Config 2

Step 2: Connect to ducts cont'd

☐ Connect Flex Duct to fan **inlet** for depressurization.



Depressurization is easiest and permitted in all States except CA & WA where it can still be used to evaluate, but not for a final result.

To pressurize, connect the Flex Duct to fan **exhaust**. All other connections remain the same

Step 3: Connect DM-2 gauge & fan

☐ Connect power cord.

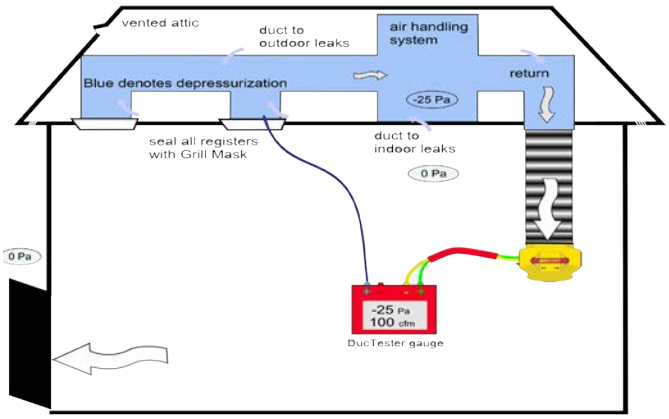
☐ Switch to on: "I". Green light indicates that power is connected.

☐ Connect yellow and green tubes to matching color ports on fan. Ethernet style Speed Control Cable will disable the knob. It is connected later in Step 4.

☐ Insert blue tube into the supply register closest to the air handler.

Total Duct Leakage Test: Depressurize

Ready to conduct the test by depressurizing the ducts:



Depressurizing works best because the fan pulls the Grill Mask tight on the registers during the test.

If Pressurizing, see tubing setup on page 7.

Step 4: Conduct test

☐ Press **[On]** twice to get to main screen.

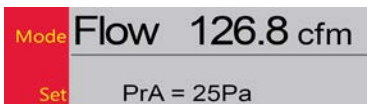
☐ Adjust fan speed knob clockwise until "PrA" reaches test pressure.

☐ If not possible, go to Step 5 for advice on changing setup.

☐ Connect Speed Control Cable to fan.

Solid green Status light indicates DM-2 is ready to control speed.

☐ For a test pressure of 25 Pa *, press **[Set Pressure] [25] [Enter].**



* 50 Pa for Northwest ENERGY STAR.

☐ Press **[@ Pressure]** to display what the result would be at exactly 25 Pa.

☐ Read results directly from the gauge.

Get the results you need

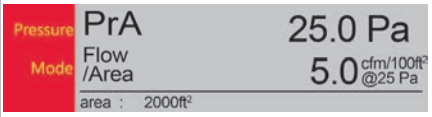
☐ Press **[Mode]** until required results appear

Flow at the induced pressure is the simplest result.

Mode = "Flow"
Units = "CFM"

Flow per ft² (sq ft) is required in some states, such as WA.

Mode = "Flow/Area"
Units = "CFM/ft²"
(enter a value for Area)



Flow per 100 ft² is required for the following states:

CT	ID	MD	NY	TX
DC	IL	MA	NC	VT
DE	IA	NH	PA	
GA	ME	NJ	RI	

Mode = "Flow/Area"
Units = "CFM/100 ft²"
(enter a value for Area)

☐ Press **[Setup]** for menu to change result units
☐ Press **[▼]** to find "Mode Setup", then **[Enter]**
☐ Press **[▼]** until the Mode you want is highlighted
☐ Press **[Enter]** to change displayed result units
☐ Press **[Exit]** twice to return to main menu

☐ Press **[Enter]** numbers **[Enter]** to input the floor area if CFM/ft² or CFM/100 ft² is used.

*Floor area of 2000 square feet was entered in the above examples.
[Enter] [2000] [Enter]

Show results as leakage area

Equivalent Leakage Area (EqLA) describes the leakage area in terms of one large hole in a flat surface.

☐ Press **[Mode]** until "EqLA" appears.

"PrA" displays the duct pressure and "EqLA" shows the combined size of all the holes in the ducts.

Leakage area is not a required result, but is a nice way to visualize the size of the hole in the ducts.

Step 5: Desired results not achieved?

Flow reads "TOO LOW" or "----" at test pressure?

If the test pressure has been reached, but "TOO LOW" or "----" appears, the fan is running too slowly to measure flow.

☐ Add the next Low-Range Ring.
☐ Change **[Range Config]** on the DM-2 to match.
☐ Re-adjust speed.

Cannot achieve test pressure at full speed?

If fan reaches 100% speed before reaching the target pressure:

☐ Remove a Range Ring and try again.
☐ Change **[Range Config]** on the DM-2 to match.
☐ Check seals on all registers. Look for disconnected ducts or ducts open to outdoors.
☐ Press **[@ Pressure]** to get the gauge to calculate what the flow would be at exactly 25 Pa.

620 CFM is the flow rate that would occur at 25 Pa, even though only 22 Pa was achieved.

Hold display and Jog speed

Use "Jog" to activate arrow keys **[▲] [▼]** then adjust target speed or pressure.

Use "Hold" to freeze results display and hold fan speed.

☐ Press **[Jog/Hold]** until "Hold" appears in top center of display.

The display will be frozen with the current values.

☐ Press **[Jog/Hold]** again to cancel "Hold".

☐ Press **[Jog/Hold]** until "Jog" appears.
☐ The **[▲] [▼]** keys now adjust the speed just like a TV remote. With **[Set Speed]** the % speed changes. With **[Set Pressure]** the pressure changes.

"Jog" is only available when **[Set Pressure]** or **[Set Speed]** have a value entered.

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Duct Testing
Watch universal training videos including:
- Set up
- Procedures
- Troubleshooting

Leakage: Blower Door
Watch video demonstrations including:
- Blower Door set up
- Common leak locations
- Software
- House preparation

Pressure: Gauge Training
Get help to successfully set up and use digital pressure gauges.
- Gauge set up
- Discover modes & devices
- Perform calibration checks

Optional Test

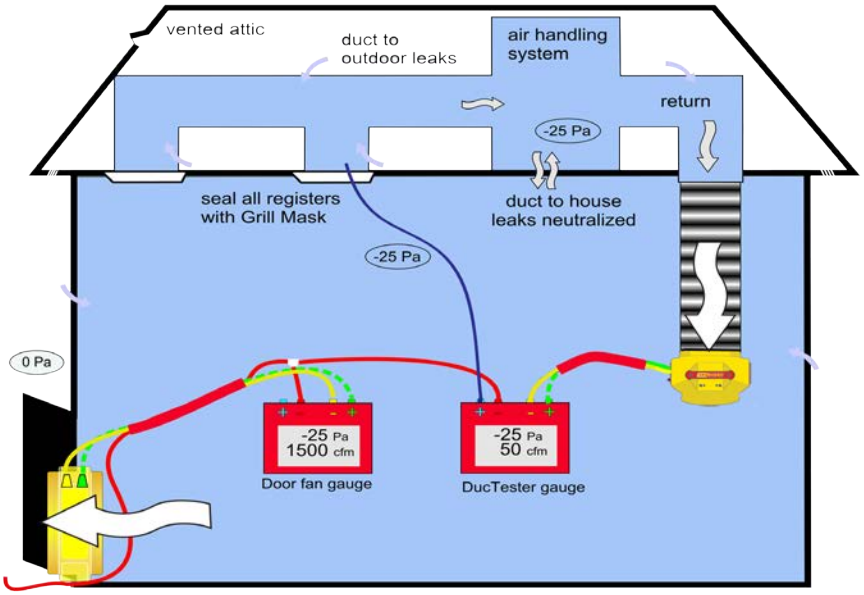
Duct Leakage to Outdoors: Depressurize

To measure the air leakage from the duct system to outdoors requires both a DucTester and a Blower Door system.

The Blower Door depressurizes the house and the DucTester depressurizes the ducts so leakage from the duct system back into the conditioned space of the home is neutralized.

Method 1 uses the DucTester set up the same way as for the Total Duct Leakage test, and allows use of **[@ Pressure]** to increase accuracy.
Results are easier to visualize since both the duct and house pressure can be seen.

Method 2 does not require connecting a red tube to the DucTester gauge but results in large errors if **[@ Pressure]** is turned on.

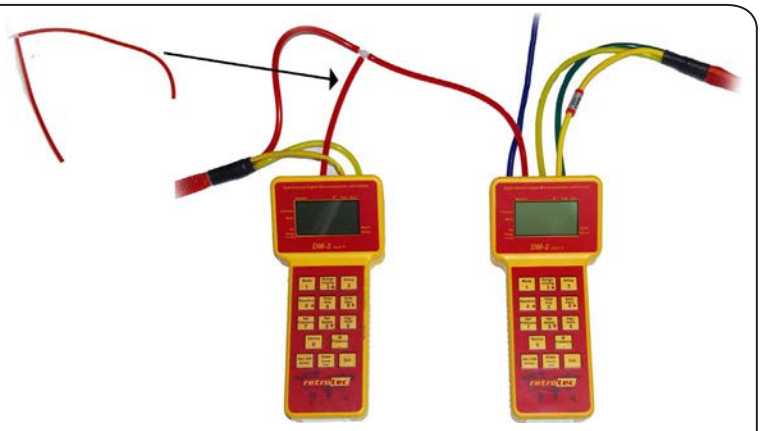


Method# 1

Method #1:

Set both gauges to -25 Pa **

- ☐ Connect the red T-connected tubes to red ports per diagram.
- ☐ Press **[Set Pressure] [25] [Enter]** on DucTester gauge then on Blower Door gauge.
- ☐ Press **[@ Pressure]** on DucTester gauge to display the results "@25Pa".
- ☐ When "25 Pa" +/– 1 is achieved on both gauges, record duct leakage to outdoors from the DucTester gauge.

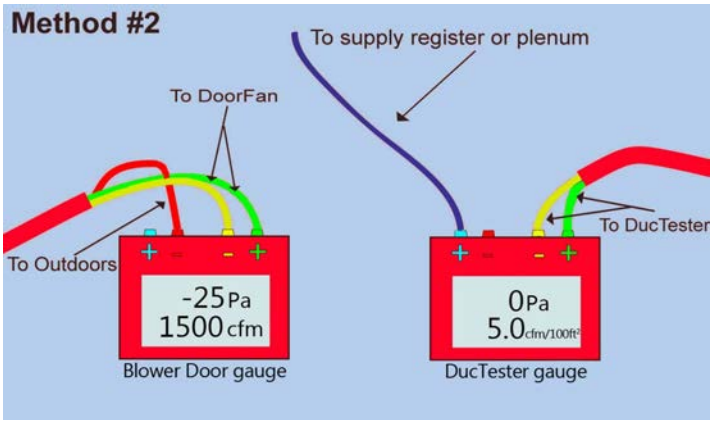


Blower Door gauge DucTester gauge

Method #2:

Set DucTester gauge to 0 Pa,
Blower Door gauge to -25 Pa **

- ☐ Connect tubes to gauges per diagram.
- ☐ With DucTester off, set the Blower Door gauge to -25 Pa by pressing **[Set Pressure] [25] [Enter]**.
- ☐ Press **[@ Pressure]** on DucTester to remove "@25Pa" from the display.
- ☐ Set the DucTester to "0 Pa" by pressing **[Set Pressure] [0] [Enter]**. When "0 Pa" +/– 1 is achieved, record duct leakage to outdoors from the DucTester gauge.



** If 50 Pa test pressure required, use 50 in all instructions.

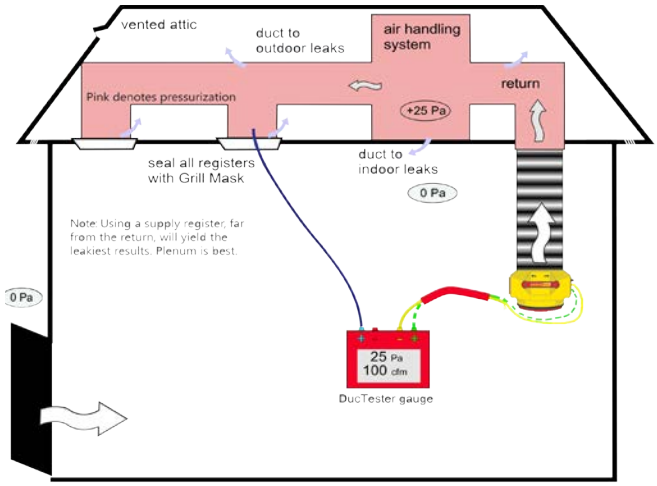
Options

Total Duct Leakage: Pressurize

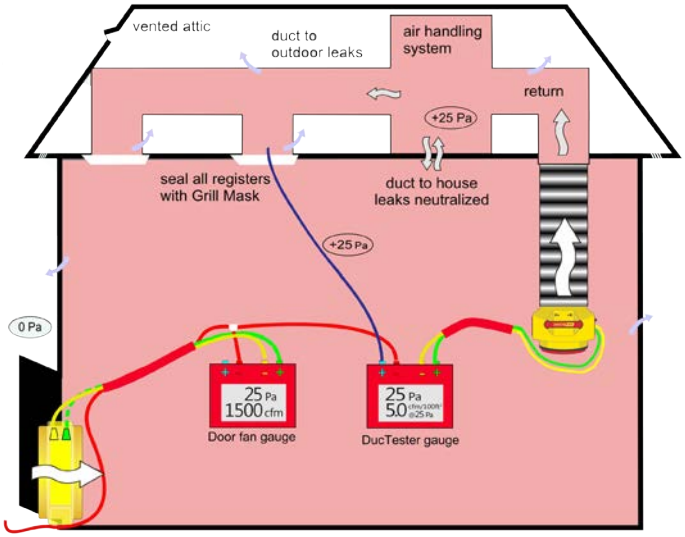
☐ Connect Flex Duct to fan **exhaust**.

☐ Check that tubing is connected the same as for depressurize test (step 3).
☐ Conduct test (step 4).

Pressurizing can blow the Grill Mask off the registers!



Duct Leakage to Outdoors: Pressurize



Follow depressurize test method (page 6) except both fan directions are reversed.

Using the optional Flow Hood

Connect it quickly to ceiling level returns to measure duct leakage or use it with your DucTester as a Powered Flow Hood to accurately measure HVAC system flow rates.

☐ Pass the Flange through the 10 inch hole in the Flow Hood and tape it inside.
☐ Attach the Flex Duct.
☐ Secure the Flow Hood over the register

To measure Duct leakage:

☐ Connect the Flex Duct to the fan and test as usual.

To measure HVAC System Flow:

☐ For measuring supply flows, attach the Flex Duct to the inlet (suction) side of the fan.
☐ For measuring return flows, attach the Flex Duct to the exhaust (discharge) side of the fan.
☐ Connect the umbilical to the DucTester.
☐ Attach the blue tube to the Flow Hood and gauge.
☐ Press **[@ Pressure]** until "@" is removed from display
☐ Press **[Mode]** to select "Flow"

When a definite pressure appears on "PrA":

☐ Adjust the speed until "PrA" reads a pressure of 0 Pa.
Or
☐ Press **[Set Pressure] [0]** to have the DucTester automatically achieve a 0 pressure.

☐ Read the HVAC system flow result directly from the gauge

Field check system monthly

Check the DucTester system monthly with a known setup—if flow is outside the acceptable range then system needs full calibration.

- ☐ Tape the optional flow Verification Plate to the Flange and attach the red tube.
- ☐ Attach the Flex Duct to the exhaust side of the fan to pressurize the Flex Duct.
- ☐ Stretch the Flex Duct to it's full length.
- ☐ Set the DM-2 to measure "Flow" in "CFM @25 Pa".
- ☐ Adjust the speed until "PrA" reads close to 25 Pa.
- ☐ Read the Verification Plate to determine the acceptable range for flow.

Typically, 100 to 110 CFM is a pass.

Optional DU159 Verification Plate shown.

Field check gauge weekly

Check gauge operation and check for blocked, leaking or pinched tubes weekly, and anytime results are in question.

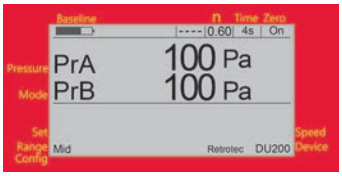
To perform the gauge check, you will need the gauge and Umbilical.

- ☐ Press **[Exit] [Time Average]** until "4s" appears.
- ☐ Press **[Mode]** repeatedly to display "PrB".
- ☐ Connect the yellow tube between the red and yellow ports.

If readings on "PrA" and "PrB" are within 2% and don't drop rapidly, the tube is not blocked or leaking and the gauge is correct.

- ☐ Repeat between different ports with each of the tubes you use for testing.

Checking your gauge and tubes regularly will eliminate a common source of error in readings.



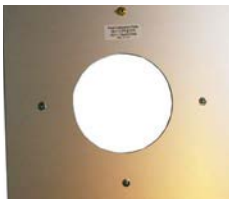
Optional accessories

Flange to connect Flex Duct to register

Part #: DU157

Verification Plate

Part #: DU159



Flow Hood 24 x 24 inches (61 x 61 cm)

Part #: PP105

12.5ft (3.8m) Flex Duct for DucTester

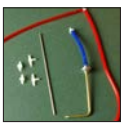
Part #: DU161

Mid-Range Ring & Low-Range Ring

(Mid) Part #: DU154
(Low) Part #: DU155

Tubing Accessory Kit

35 ft (10 m) of blue, red, yellow and green 1/4 inch (12mm) outside diameter tubing. Static Pressure Probe, 4 inch (100 mm) x 1/8 inch (6 mm) outside diameter metal probe, 2 T and 2 male-to-male connectors. Red L for duct leakage to outdoors test.



Part #: TU119

Umbilical for DucTester fans, 7ft (2 m)

Part #: DM240

Grill Mask 12in x 216ft, 12in perfs, Hi-stick White, Single Roll

Part #: GR116
Part #: GR117 (for case of 3)

Deluxe Cordura Toolbag with Shoulder Strap

Part #: TL118