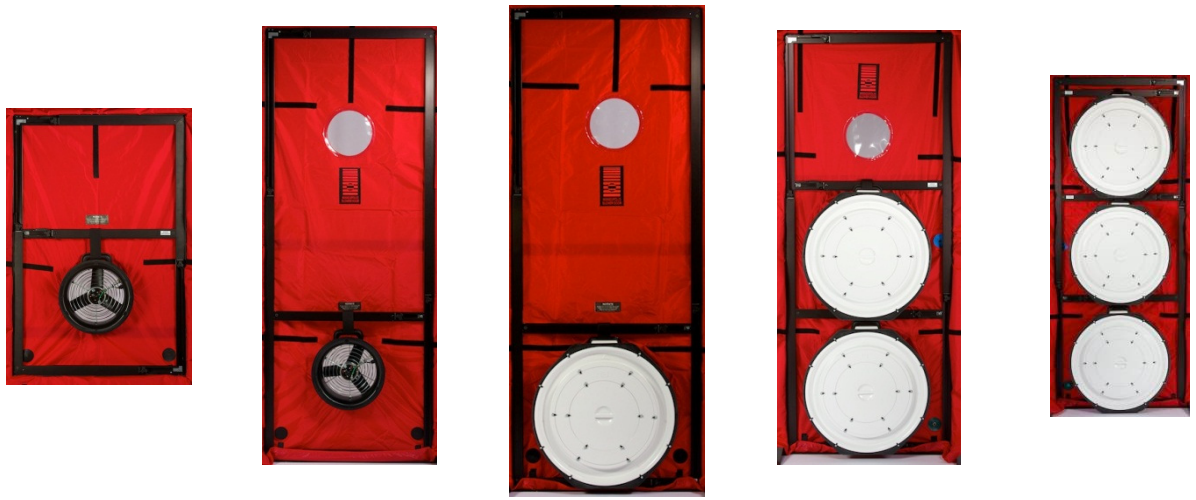
2015 RESNET Multifamily Blower Door Testing



Paul Morin

The Energy Conservatory

Agenda

- Commonly used airtightness standards
- Programs requiring testing
- Total leakage vs leakage to outside
- Preparing for the test
- Software

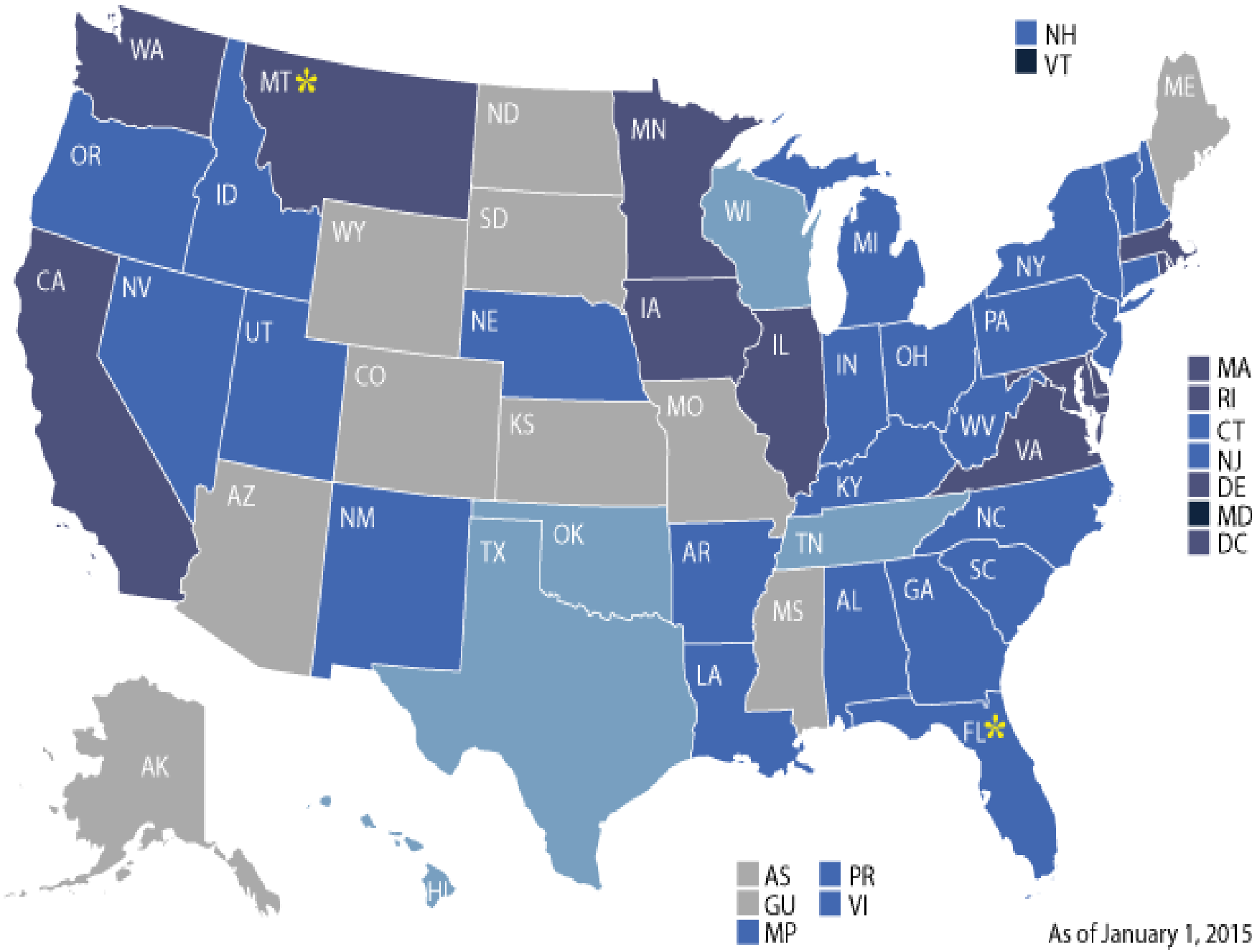
Commonly used Airtightness Standards

- ASTM E1827
- ASTM E779
- CGSB-149
- RESNET Chapter 8

Programs Requiring Testing

2012 IECC (Residential less than 3 stories)

- CA, DC, DE, IA, IL, MA, MD, MT, RI, VA, WA
- All residential buildings must be tested for airtightness and meet the following levels:
  - 5 ACH50 Climate zones 1-2
  - 3 ACH50 Climate Zones 3-8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As of January 1, 2015

Programs Requiring Testing

- **Army Corp of Engineers**
- 0.25 CFM75 / ft^2 enclosure area (.19 CFM50)
- What is achievable with proper design? 0.11
- Refers to ASTM E779 -10

Programs Requiring Testing

- **EnergyStar for Highrise**
- 0.3 CFM50 / ft² enclosure – adjacent units open
- Blower door test must be conducted (E779-10 or E1827)
- Sampling protocol may be used
- Requires preliminary and final testing
  - Inspect air sealing details during construction
  - Test at least 2 units as soon as they are ready

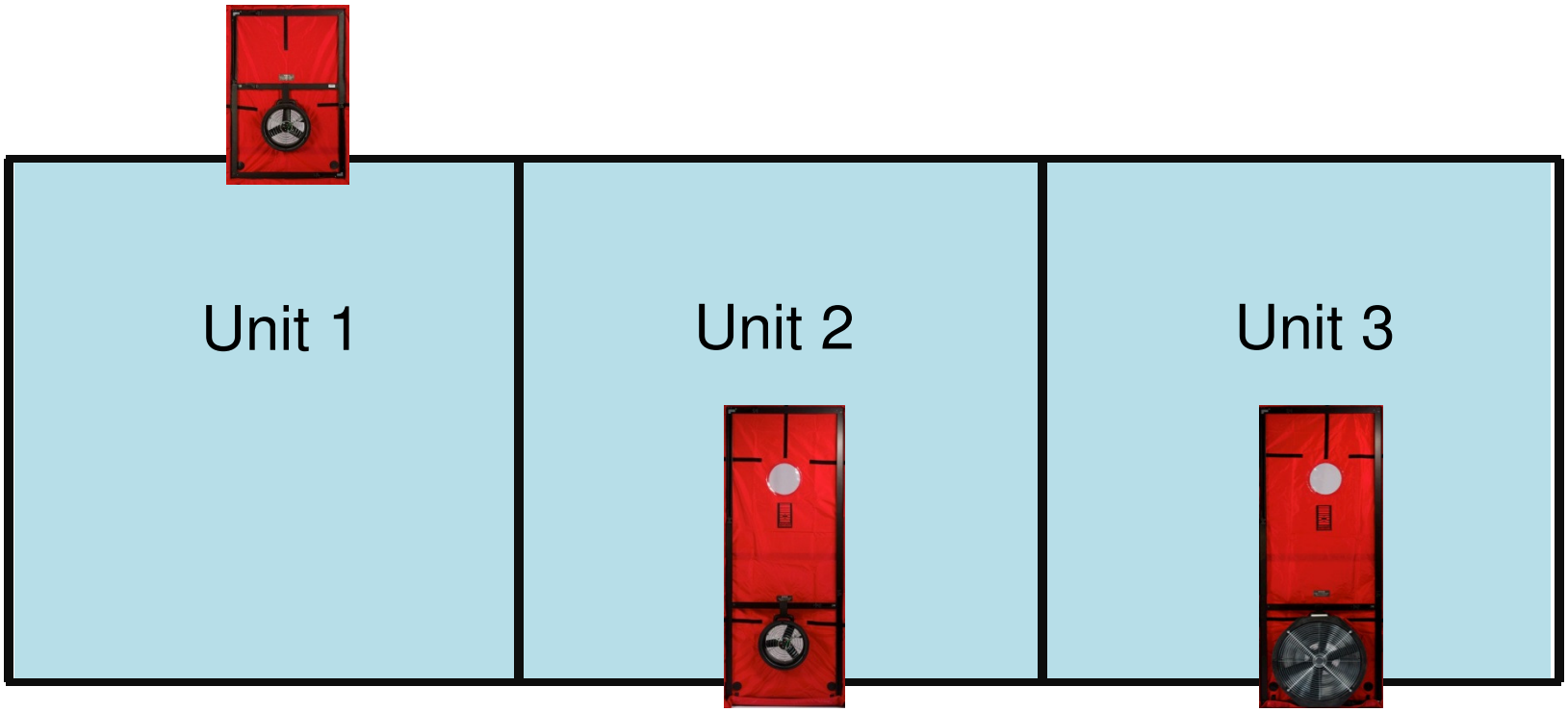
Programs Requiring Testing

- **LEED Multifamily IEQ PR 2012 - ETS**
- 1.25 in² leakage area/ 100 ft² enclosure area (6 sides)
- 0.23 CFM50/ ft² enclosure
- A sampling protocol may be used
- Setup?

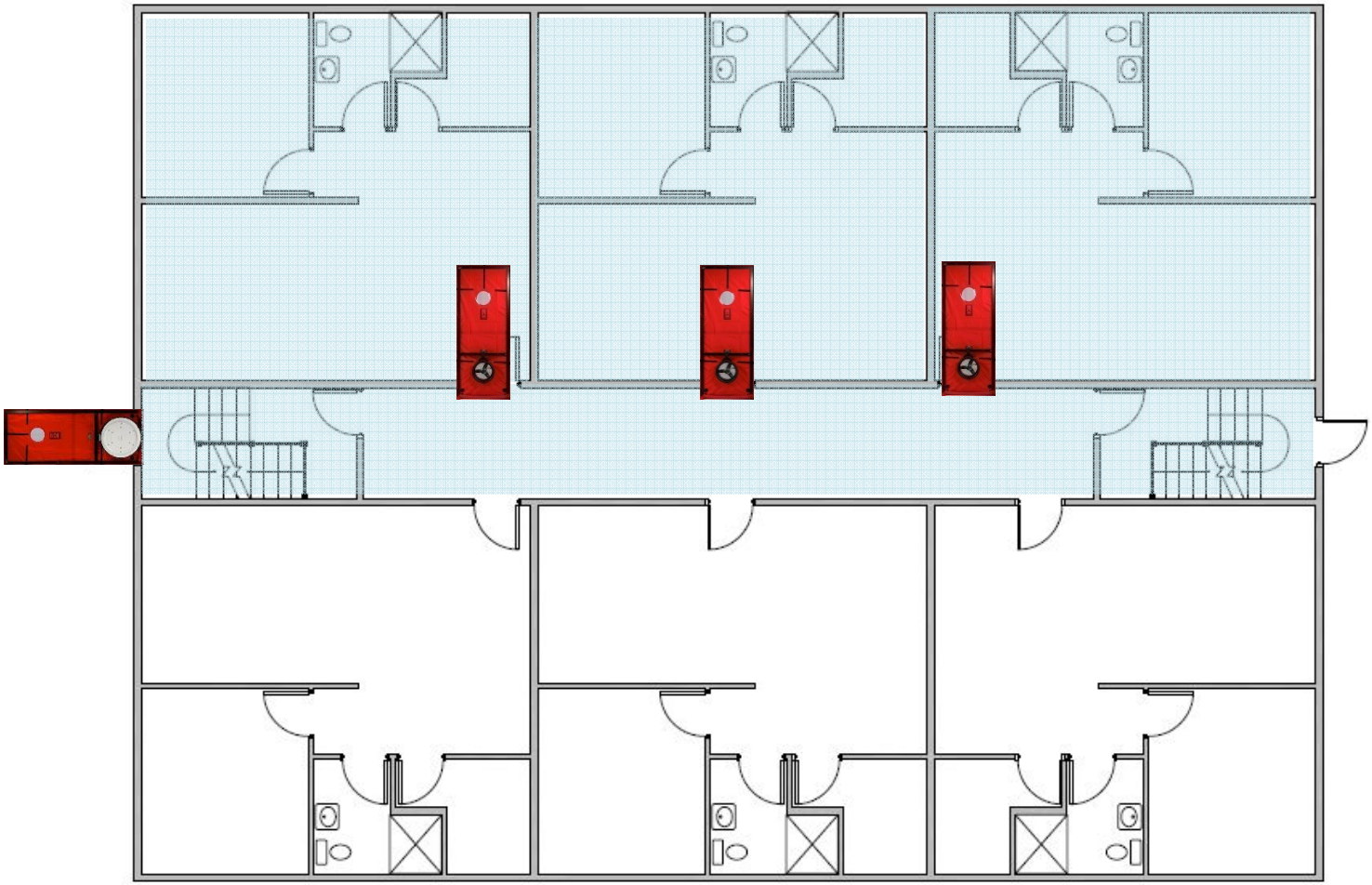
Programs Requiring Testing

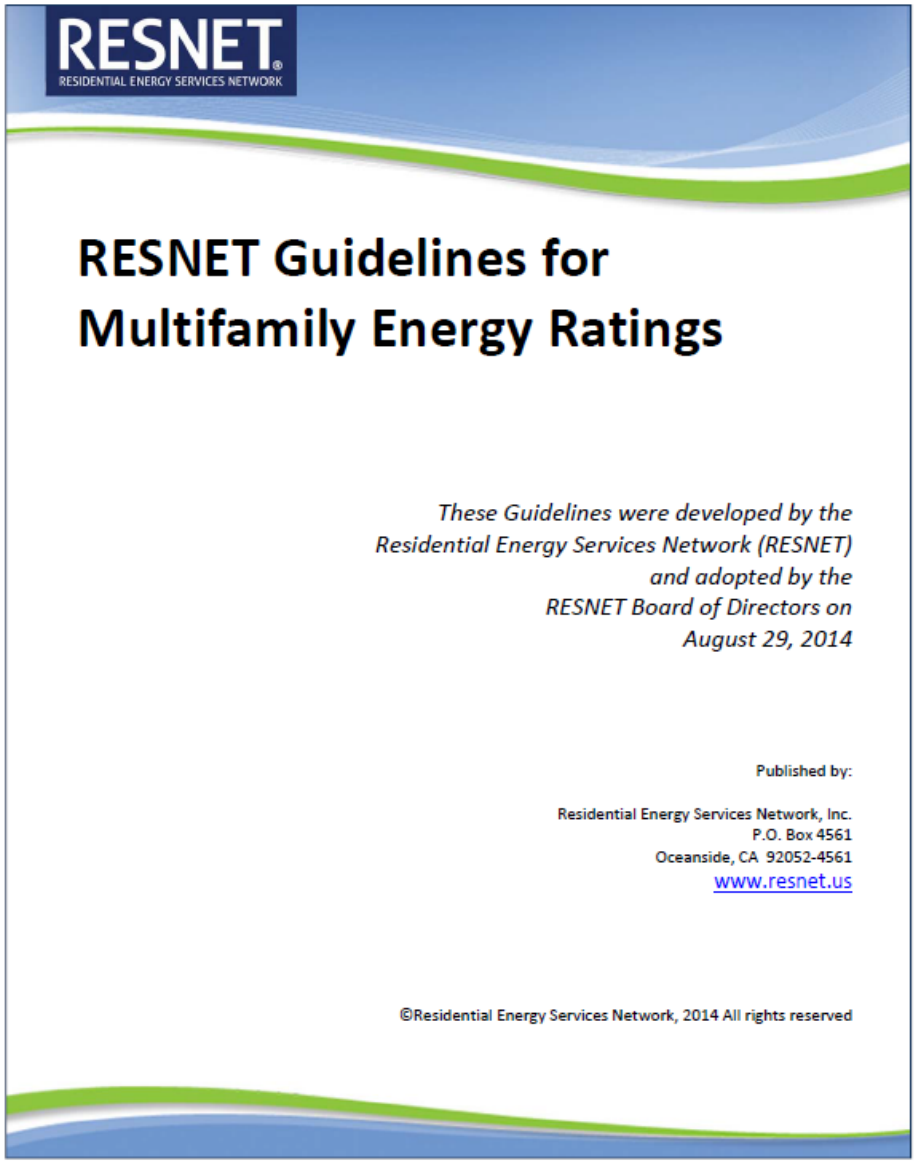
- WA State – all buildings > 3 stories
- HERS Rating – multifamily units
- State or Utility multifamily programs
- Other multifamily programs?

Town House Test Options



Apartment Building Test Options





RESNET
RESIDENTIAL ENERGY SERVICES NETWORK

RESNET Guidelines for Multifamily Energy Ratings

These Guidelines were developed by the Residential Energy Services Network (RESNET) and adopted by the RESNET Board of Directors on August 29, 2014

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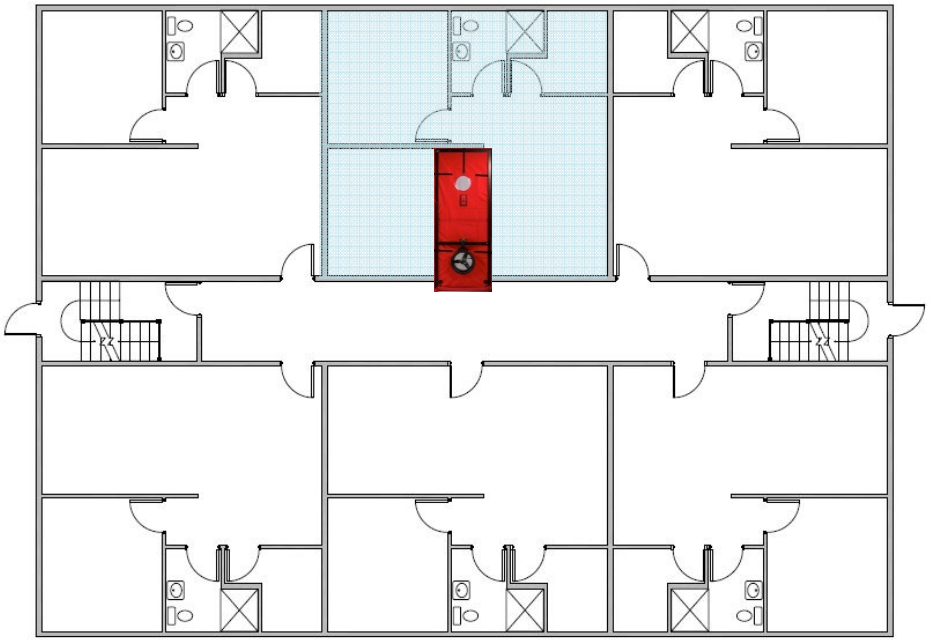
P.O. Box 4561
Oceanside, CA 92052-4561
www.resnet.us

Page 1

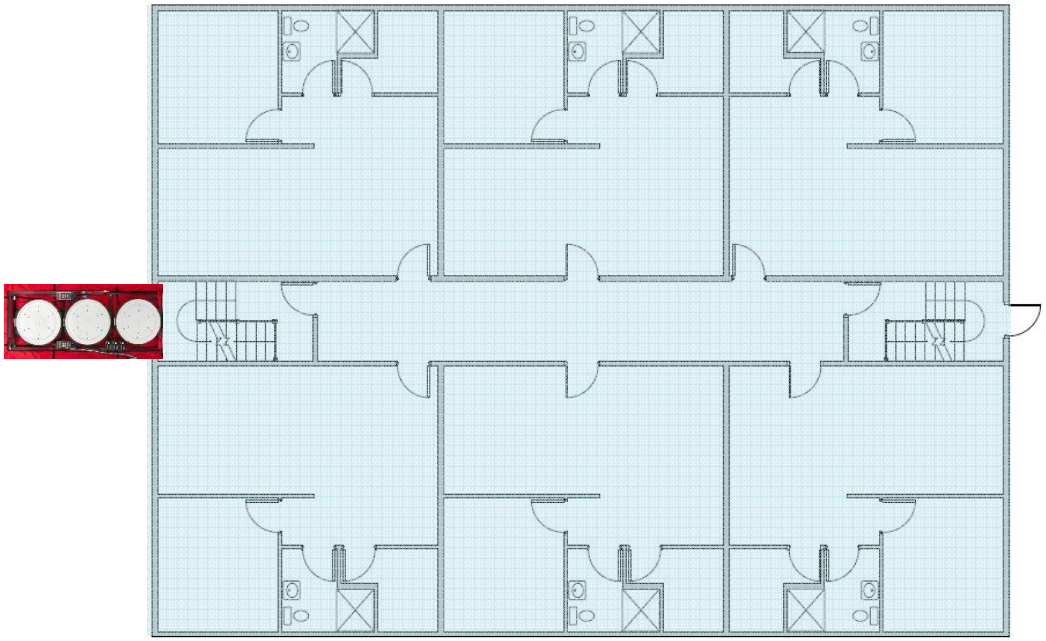
Four Separate Protocols

1. **An unguarded *dwelling unit*-level blower door test – "*Compartmentalization*" test**



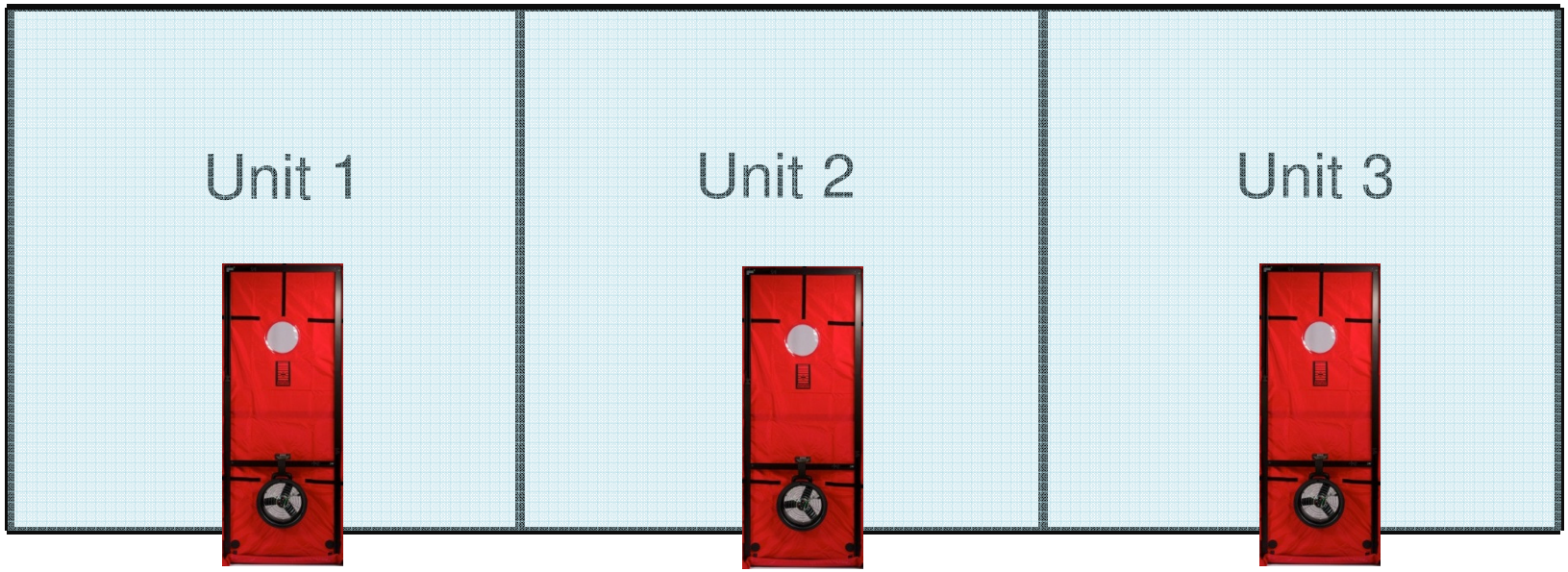
Four Separate Protocols

2. A full building single zone blower door test



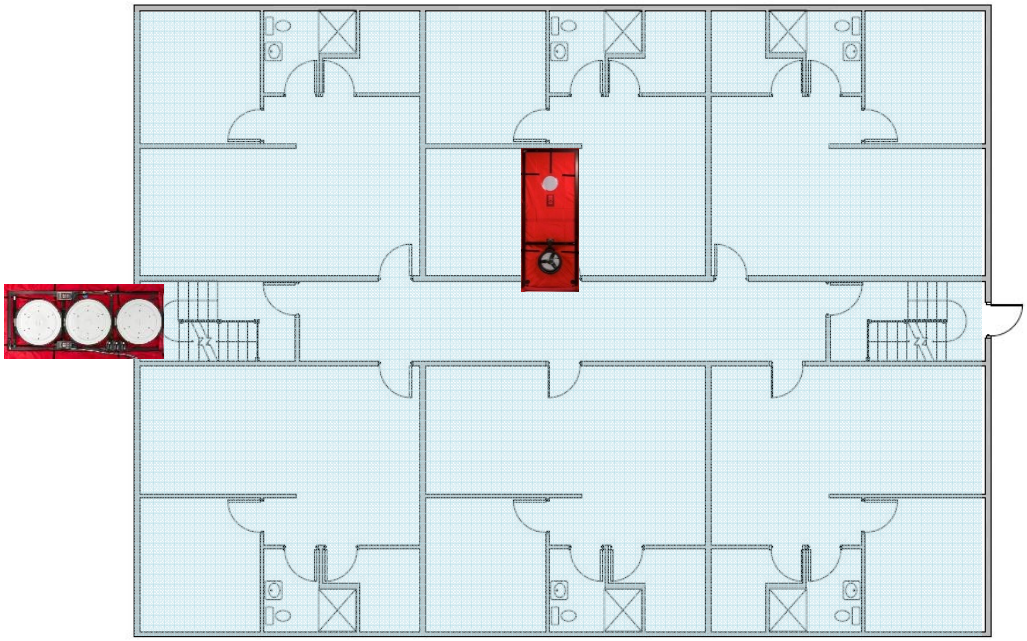
Four Separate Protocols

3. A full building multi zone blower door test



Four Separate Protocols

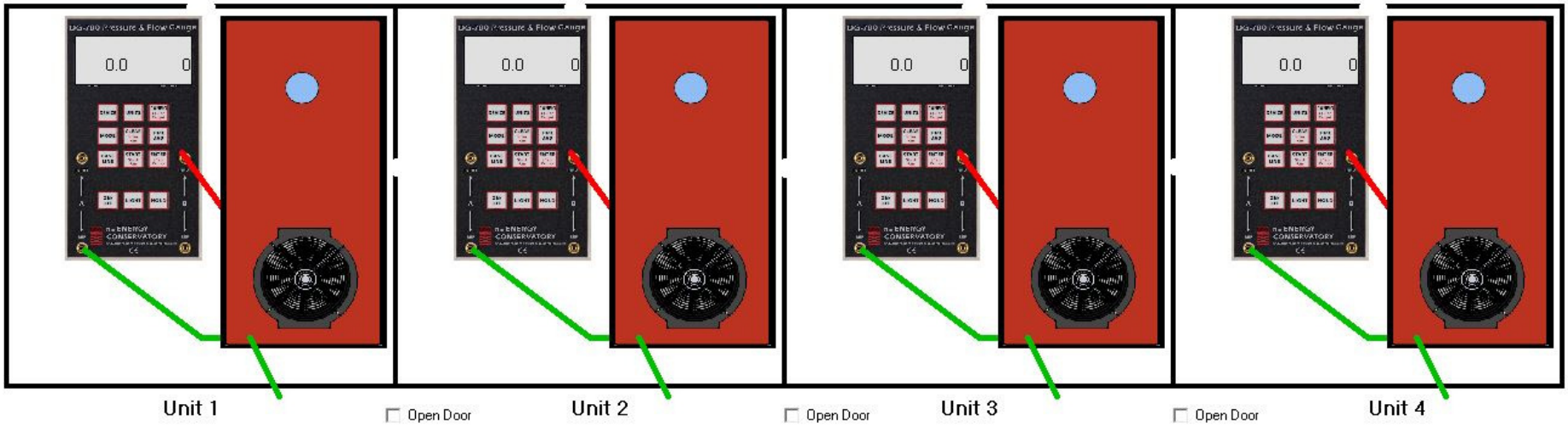
4. A full building blower door test simultaneously with a target *dwelling unit* test



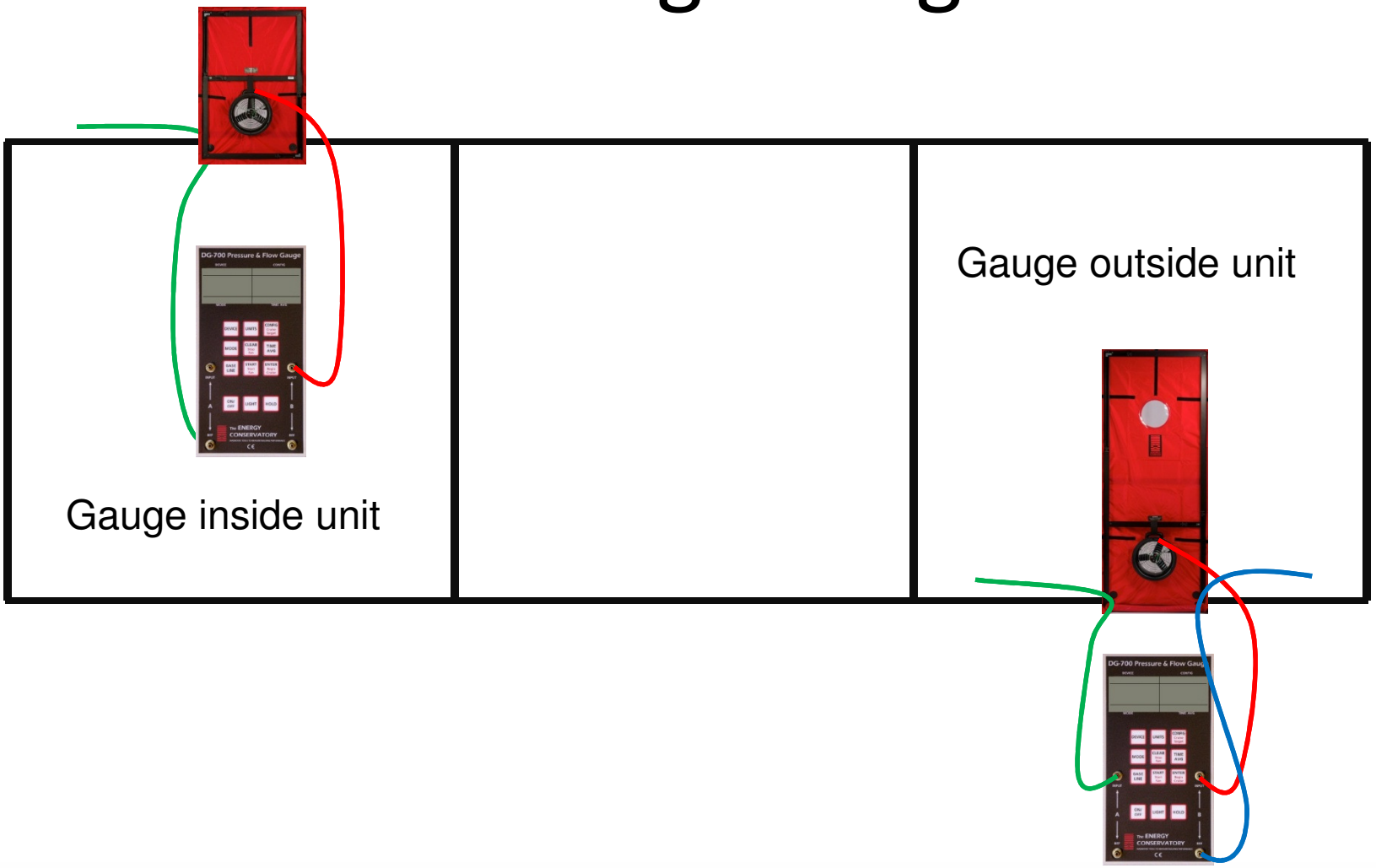
Advantages to Compartmentalizing Units

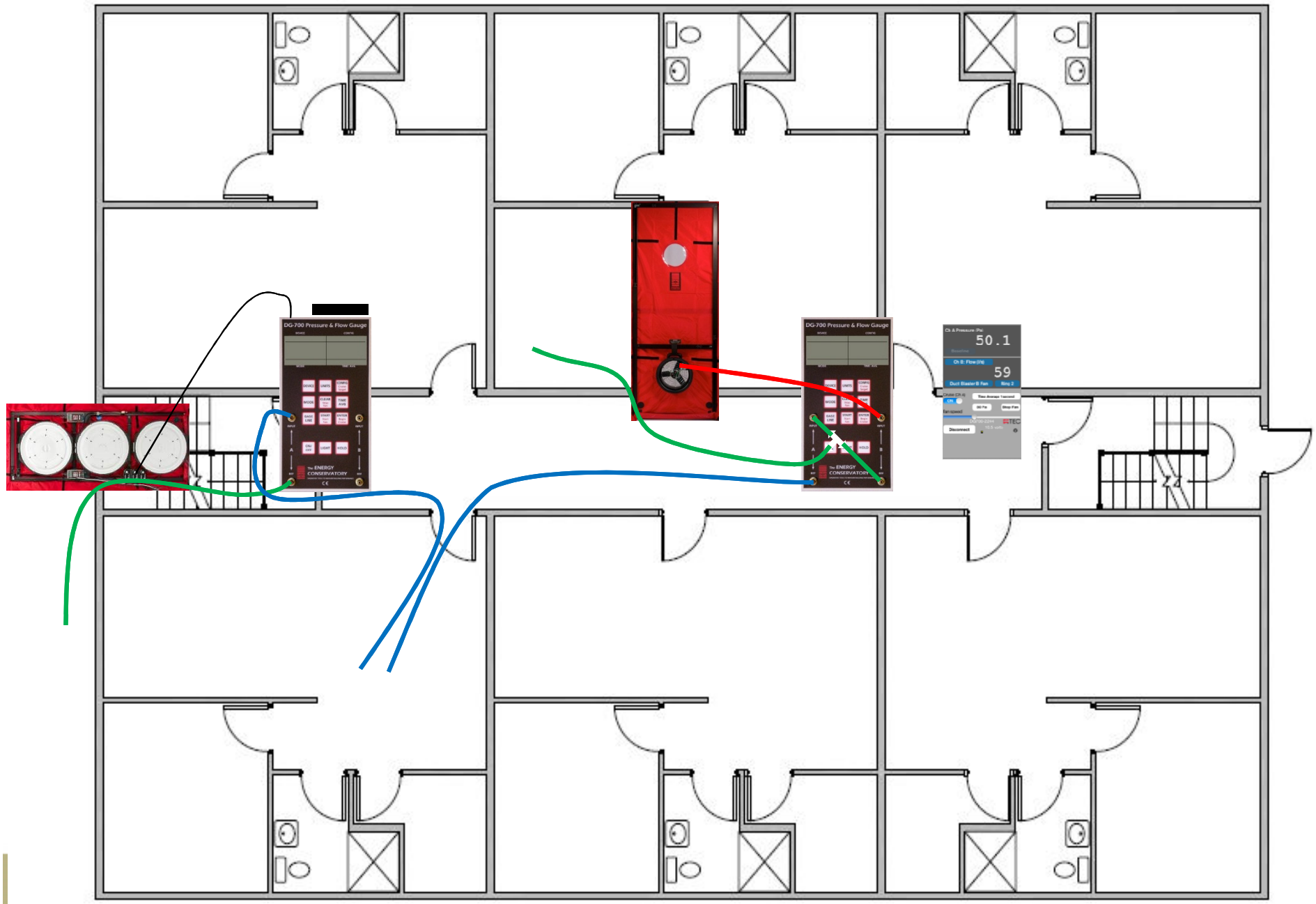
- Reduces sound transfer
- Reduces odor / pollutant transfer (ETS)
- Reduces wind effect
- Reduces stack effect
- Better able to control mechanical ventilation
- New construction
  - Seal plate to floor
  - Seal sheetrock at edges
  - Flanged / gasketed electrical boxes

Single Unit vs Leakage to Outside

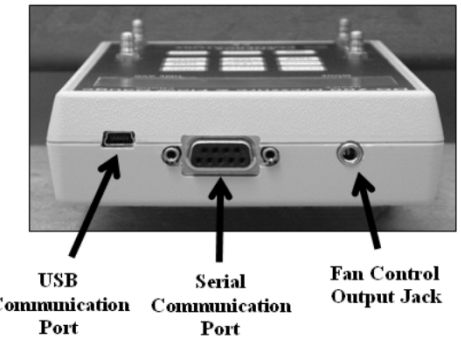


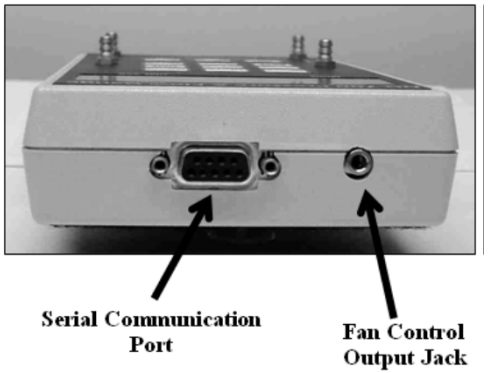
Tubing Connections
Testing a Single Unit

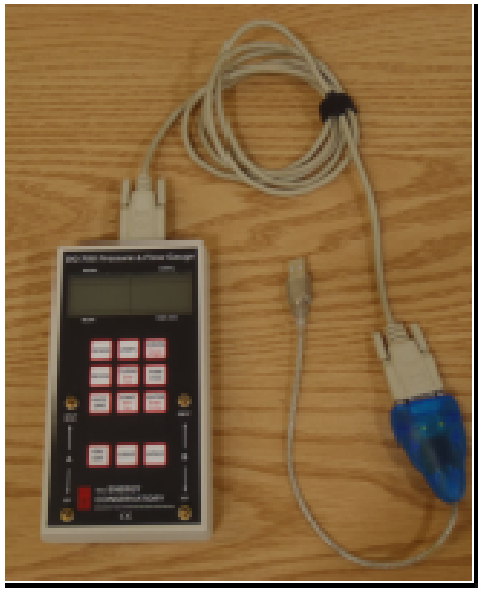



DG-700 Pressure & Flow Gauge
DG-700 Pressure & Flow Gauge
50.1
59

Using Software

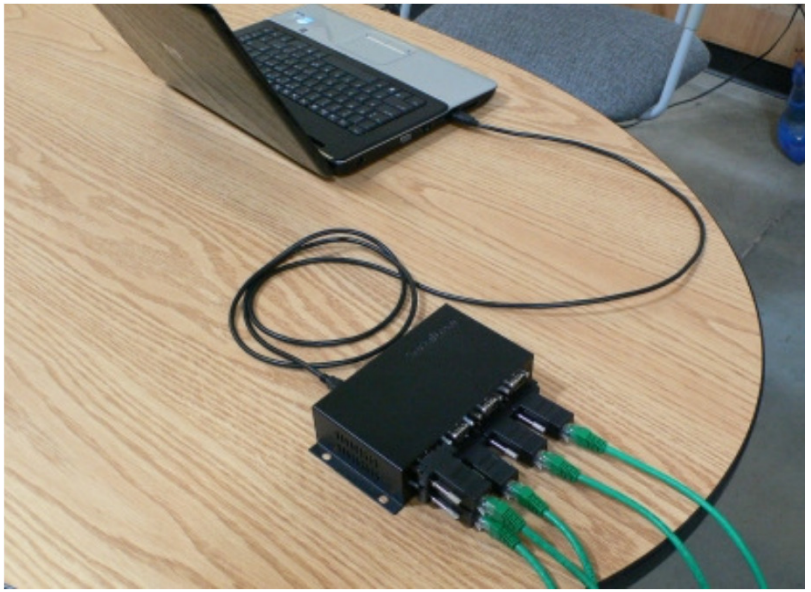






Connecting to a Computer with Multiple DG-700s

- Wired connection – 9 pin serial to USB Hub



Connecting to a computer with Multiple DG-700s

- Wireless connection – router required

Connecting to a computer
Multiple DG-700s

- Multiple Routers

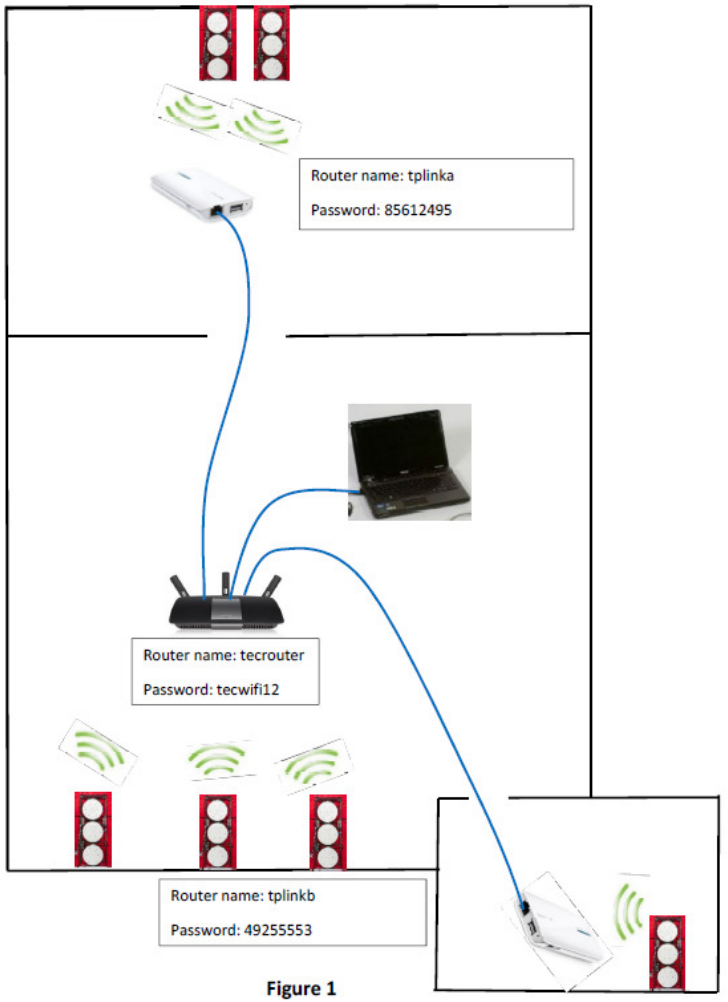


Figure 1

Setup the Fans

Two Gauges and Three Fans

Gauge 1
A: Envelope Press.
B: Bottom Fan

Gauge 2
A: Middle Fan
B: Top Fan

3 Controllers

No open taps on gauges

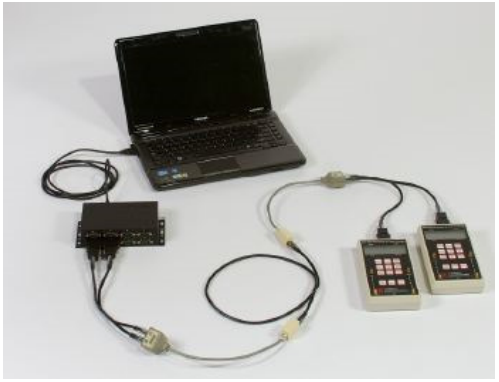
Fans plugged into separate circuits

Two Gauges and Three Fans

3 way
Fan Control Splitter

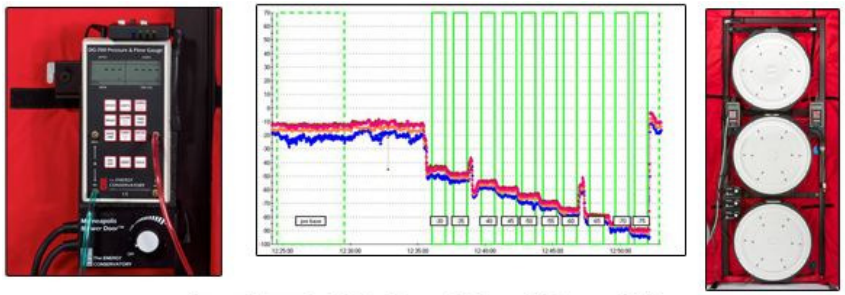
3 Controller
Board

CAT5 Splitter



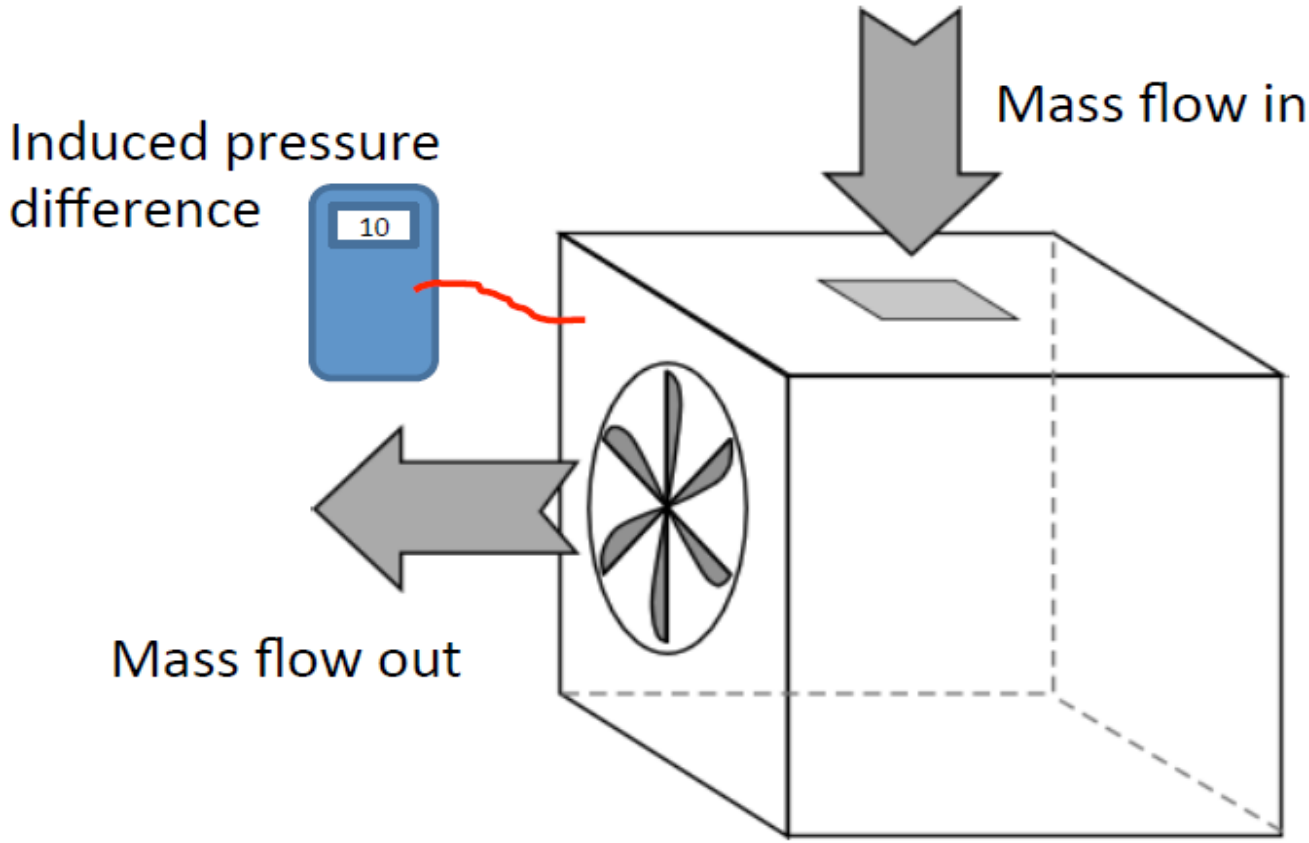
Kill-O-Watt
Meter

Single fan TECLOG3 Demo



TECLOG 3

Fan Pressurization Airtightness Test



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Configuration worksheet

TECLOG3 Device Configuration Worksheet

Serial ____ Label ____ Chan A ____ Chan B ____	Serial ____ Label ____ Chan A ____ Chan B ____
Serial ____ Label ____ Chan A ____ Chan B ____	Serial ____ Label ____ Chan A ____ Chan B ____
Serial ____ Label ____ Chan A ____ Chan B ____	Serial ____ Label ____ Chan A ____ Chan B ____
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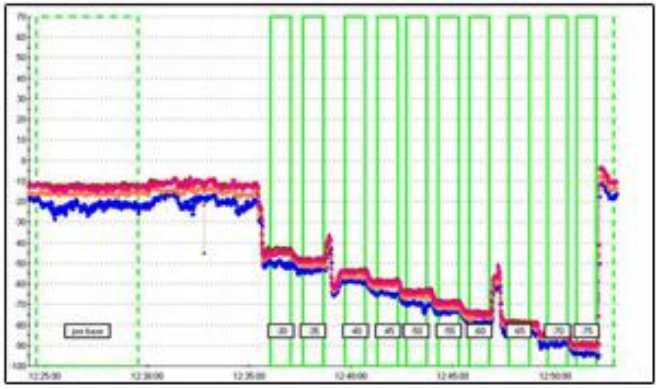
Serial ______________ Label ______________

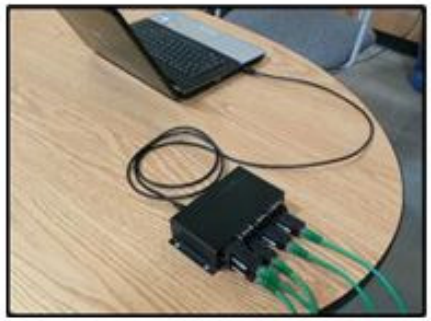
Chan A ______________ Chan B ______________

TECLOG3 Demo



TECLOG 3

The Energy Conservatory



Performance Testing Tools

2015 RESNET Multifamily Blower Door Testing

Questions?

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