

Airflow Measurement: Old School Meets Latest Tech

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Learning Objectives



Airflow – who, what, how, why



Impacting different roles with airflow measurement



Airflow measurements of the future

Learning Objectives



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Airflow measurements of the future

Air Balancing Foundations

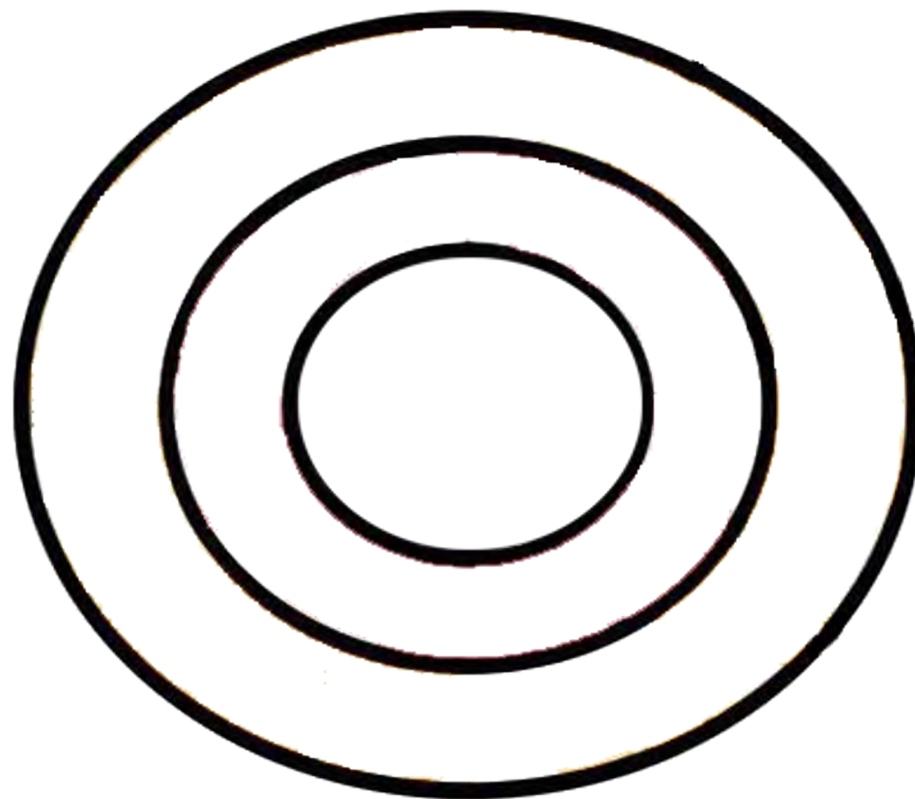


H. Taylor Kahoe – an engineer who observed how poorly the mechanical systems he designed performed once they were built in the field. **1962** - he moved into air balancing exclusively and in **1964** established the Associated Air Balance Council (AABC).

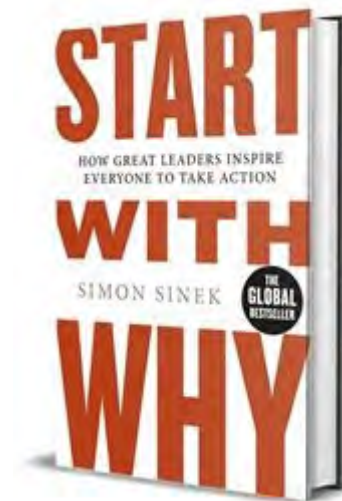


In the 1970s, **Ernie Shortridge** created the first air balancing hood, revolutionizing testing and balancing. We owe a debt of gratitude to Mr. Shortridge every time a hood measures airflow within just a few seconds.

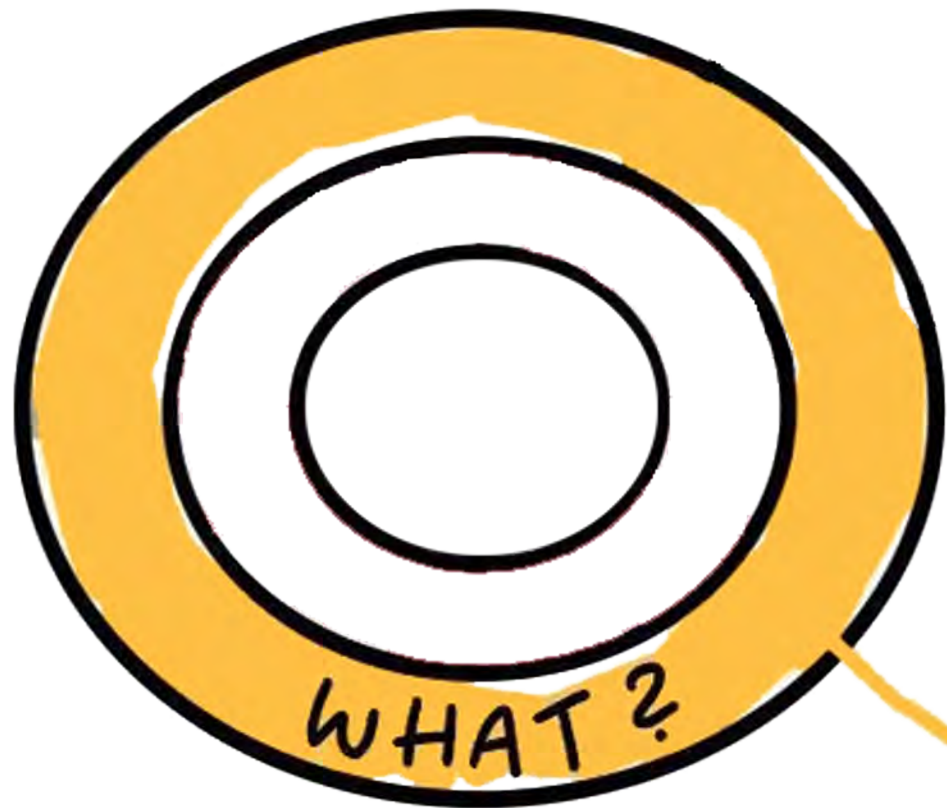
GOLDEN CIRCLE



IDEA: SIMON SINEK

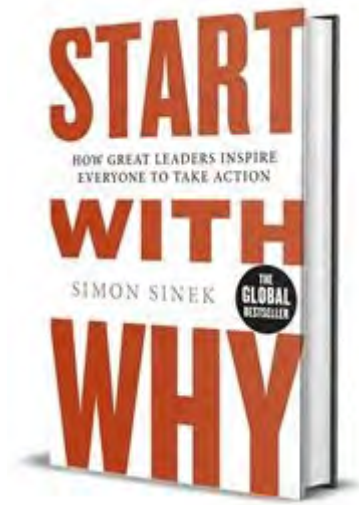


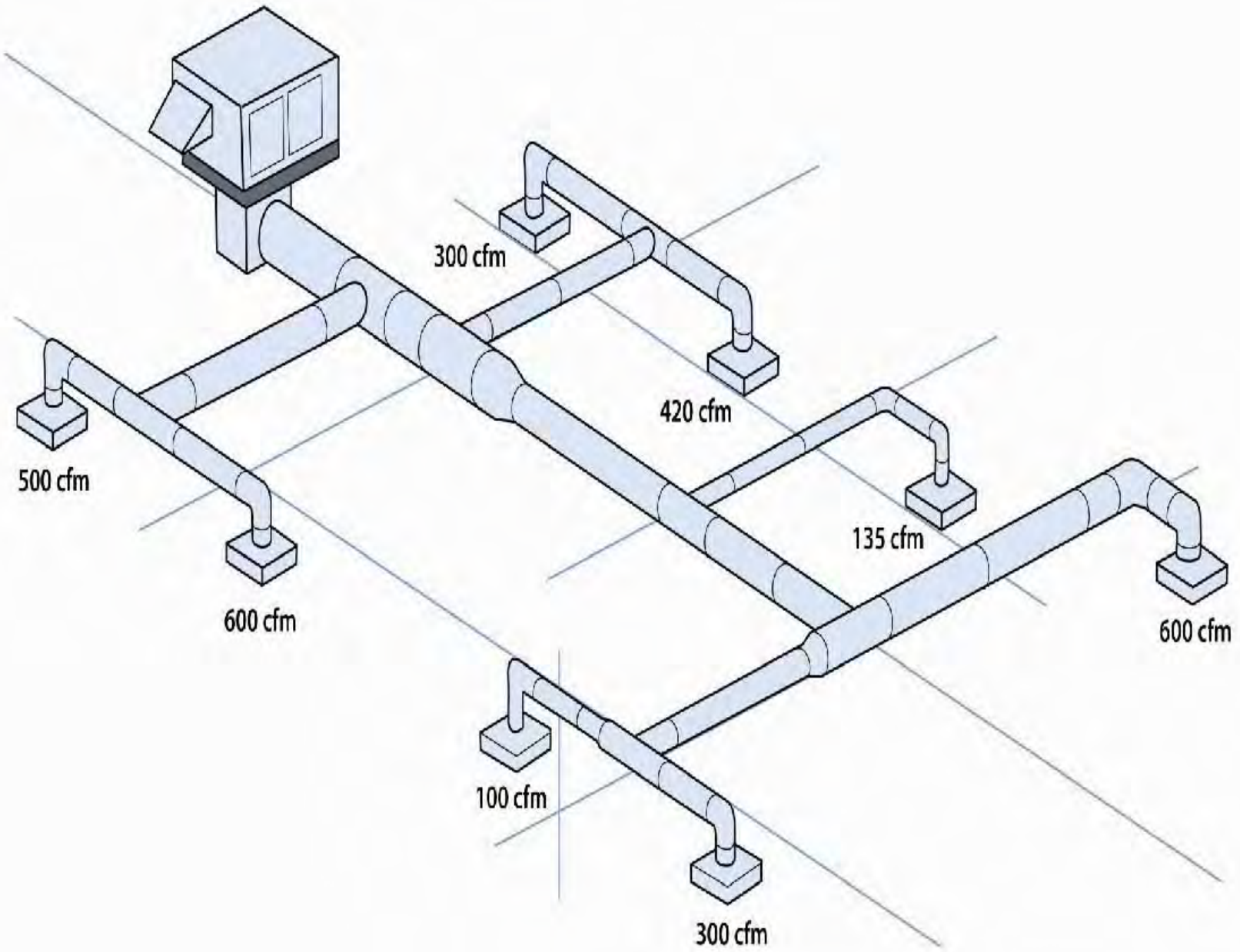
GOLDEN CIRCLE



IDEA: SIMON SINEK

WHAT DO YOU DO?



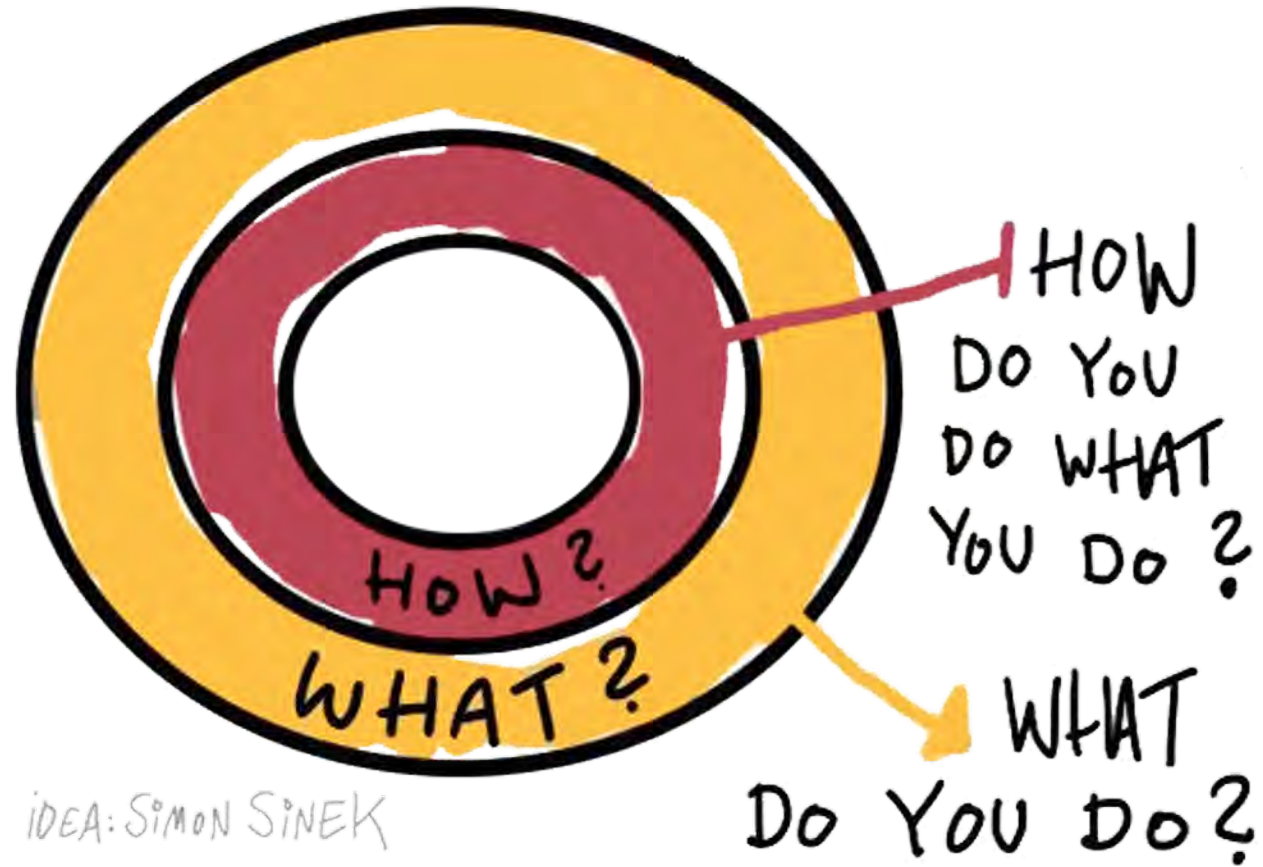


The What

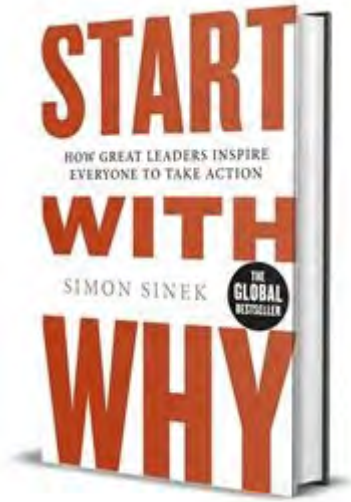
A way to prove the field performance of a design.

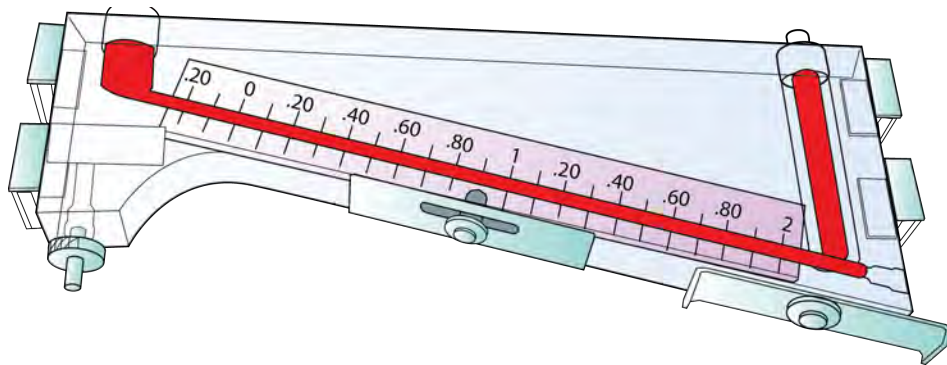
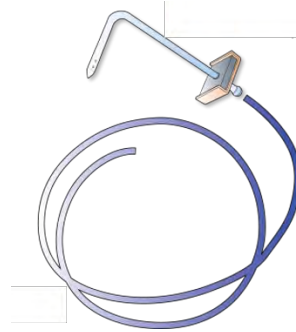
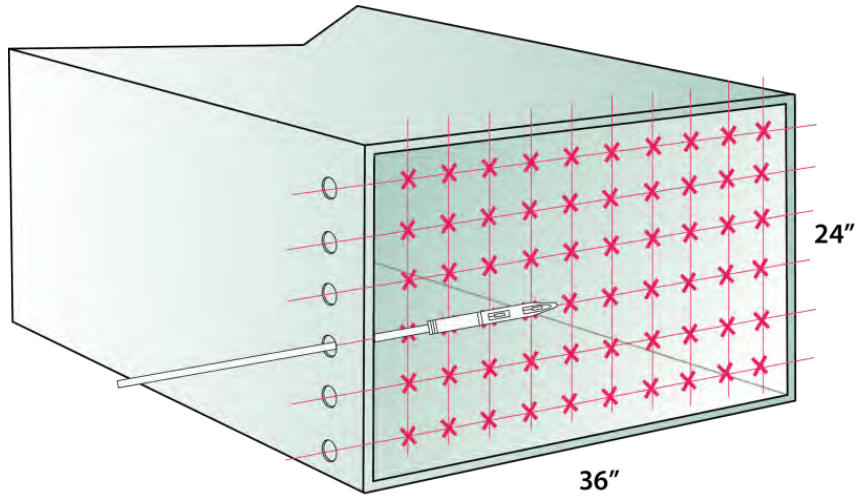
Both equipment and system.

GOLDEN CIRCLE



IDEA: SIMON SINEK

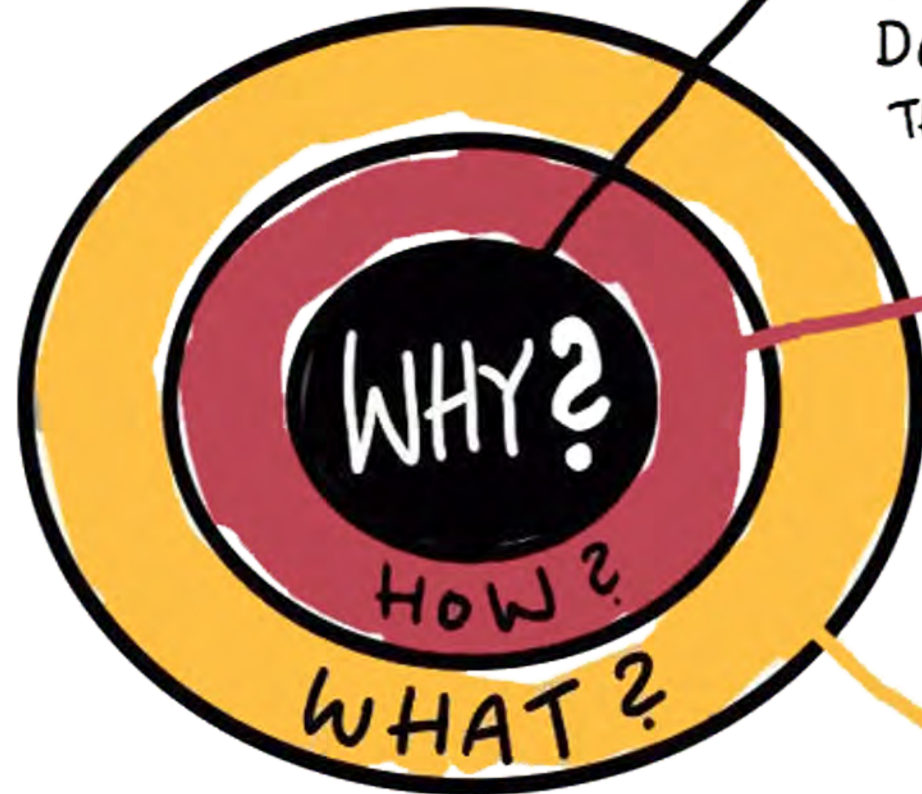




The How

Conducted various measurements and calculations to establish existing airside conditions.

GOLDEN CIRCLE

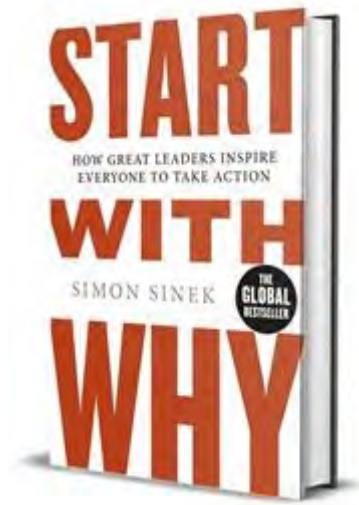


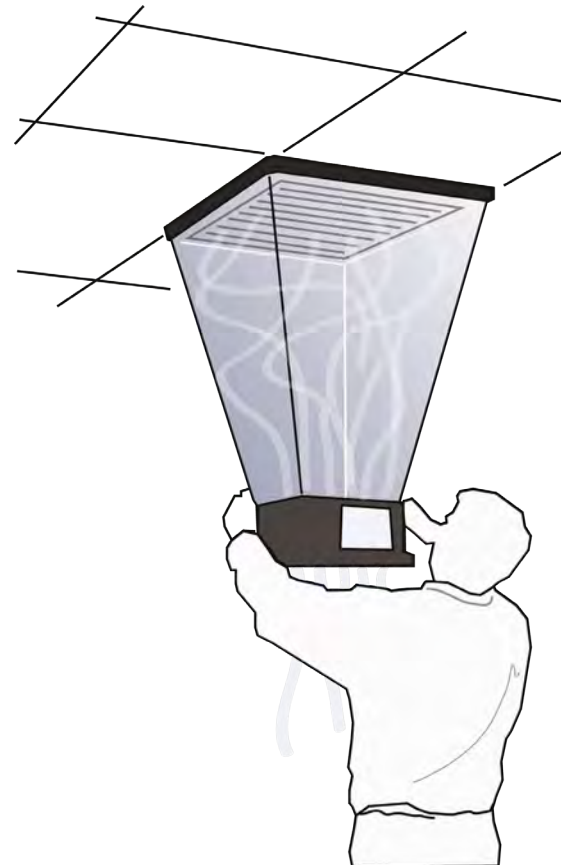
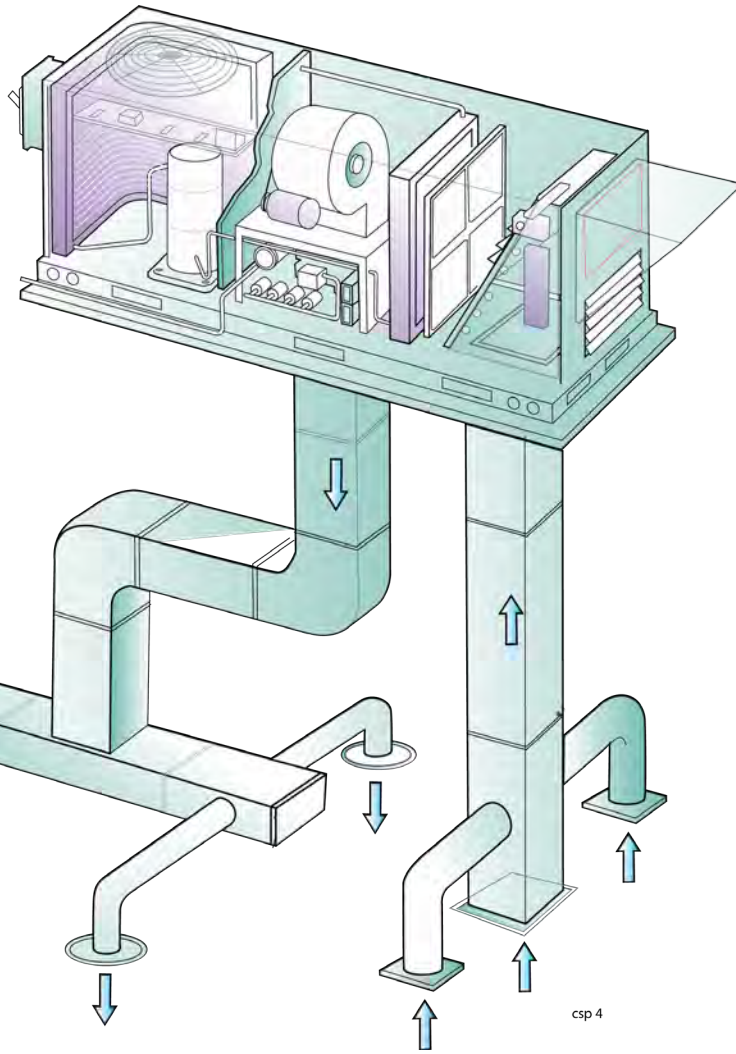
WHY DO YOU DO WHAT YOU DO? WHAT IS THE PURPOSE?

HOW DO YOU DO WHAT YOU DO?

WHAT DO YOU DO?

IDEA: SIMON SINEK

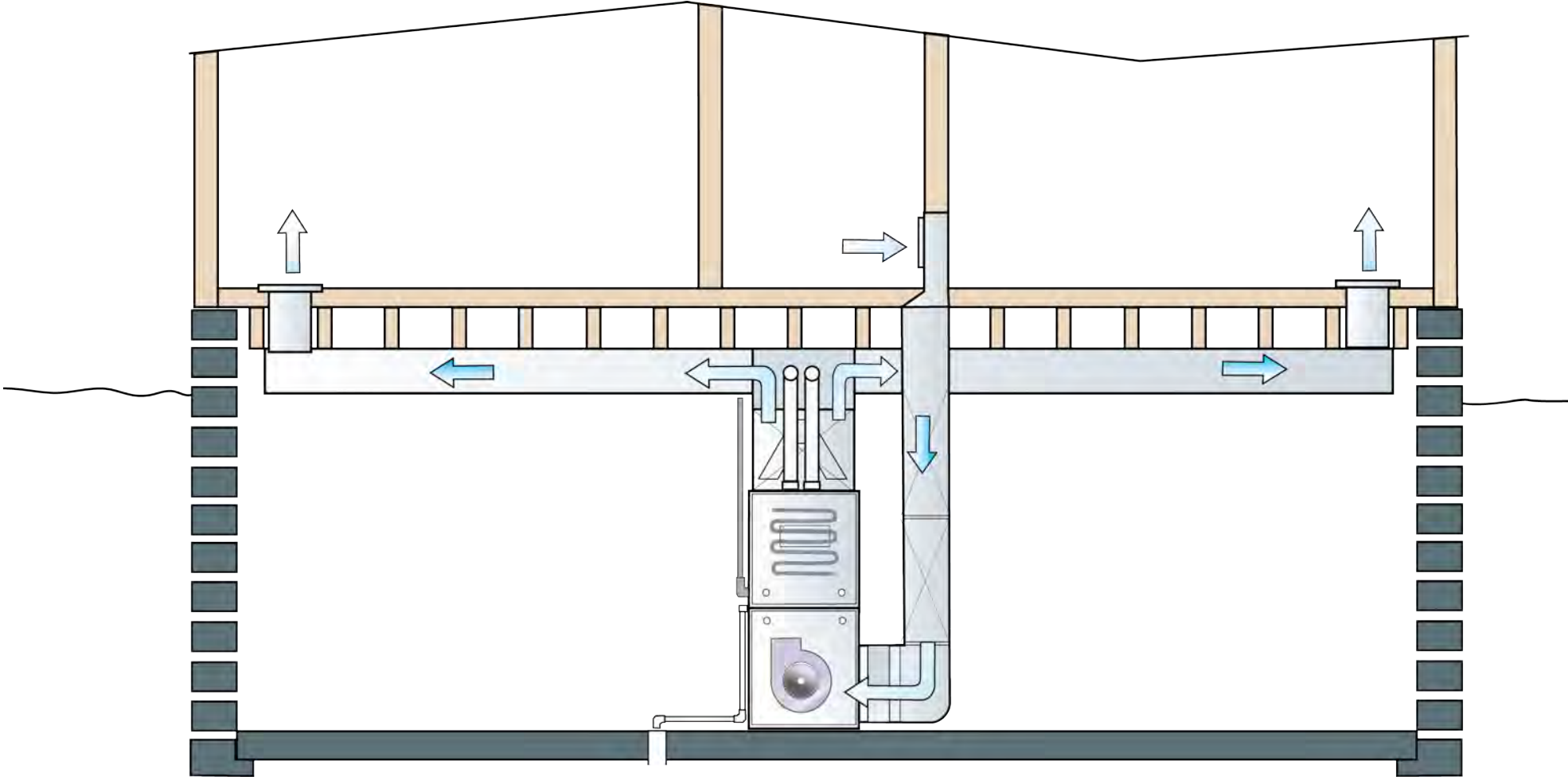




The Why

Airflow measurement helped prove whether an installation met design criteria or not.

Transitioning From Commercial to Residential



Learning Objectives



Airflow – who, what, how, why



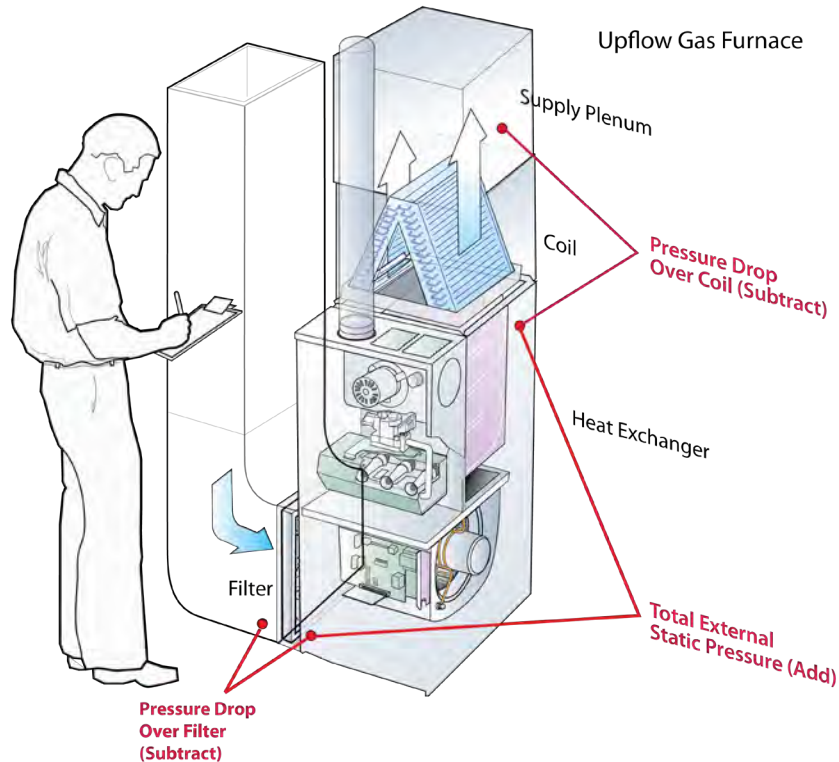
Impacting different roles with airflow measurement



Airflow measurements of the future

Present Day - New Faces/Same Roles

Airflow Measurement Skills Are Necessary For Today's Work Force.



Residential Roles


- Sales
- Design
- Install
- Quality Control
- Maintenance
- Service



Present Day Options – The Game Has Changed A Bit



Customer Friendly Reporting



Date tested: 5/25/2022
Test In

Company info
Name: Higgins Heating & Air
Phone: (985) 323-1234
Email: 9853231234

Tech info
Name: Marty Higgins
ID: 2413
Title: Technician
Credentials: Daikin Comfort Pro






True Flow System Air Flow and Static Pressure Analysis
Air measurements

Total air flow = 731 CFM
Return duct = -0.009 inH₂O
After filter = -0.370 inH₂O
Supply duct = 0.241 inH₂O



System & conditions

System Type: Electric
Orientation: Horizontal
Cooling Capacity: 2
Filter Location: InDuct
Cooling Climate Type: Moist
Elevation: 2 m

Summary calculations


Flow		365 CFM/ton
TESP		0.611 inH ₂ O
Return Plenum		0.009 inH ₂ O
Filter Drop		0.361 inH ₂ O
Supply Plenum		0.241 inH ₂ O

Summary of Warnings

-  Flow is OK, high filter drop
-  Flow is OK; High Supply Pressure.






Customer

Name: Chris Hughes
Phone: (612) 827-1117
Email: chughes@energyconservatory.com
Address: 49 Oak Park Dr Madisonville LA 70447 United States





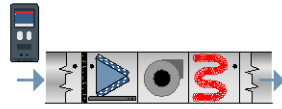
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Summary calculations

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Learning Objectives



Airflow – who, what, where, when, why

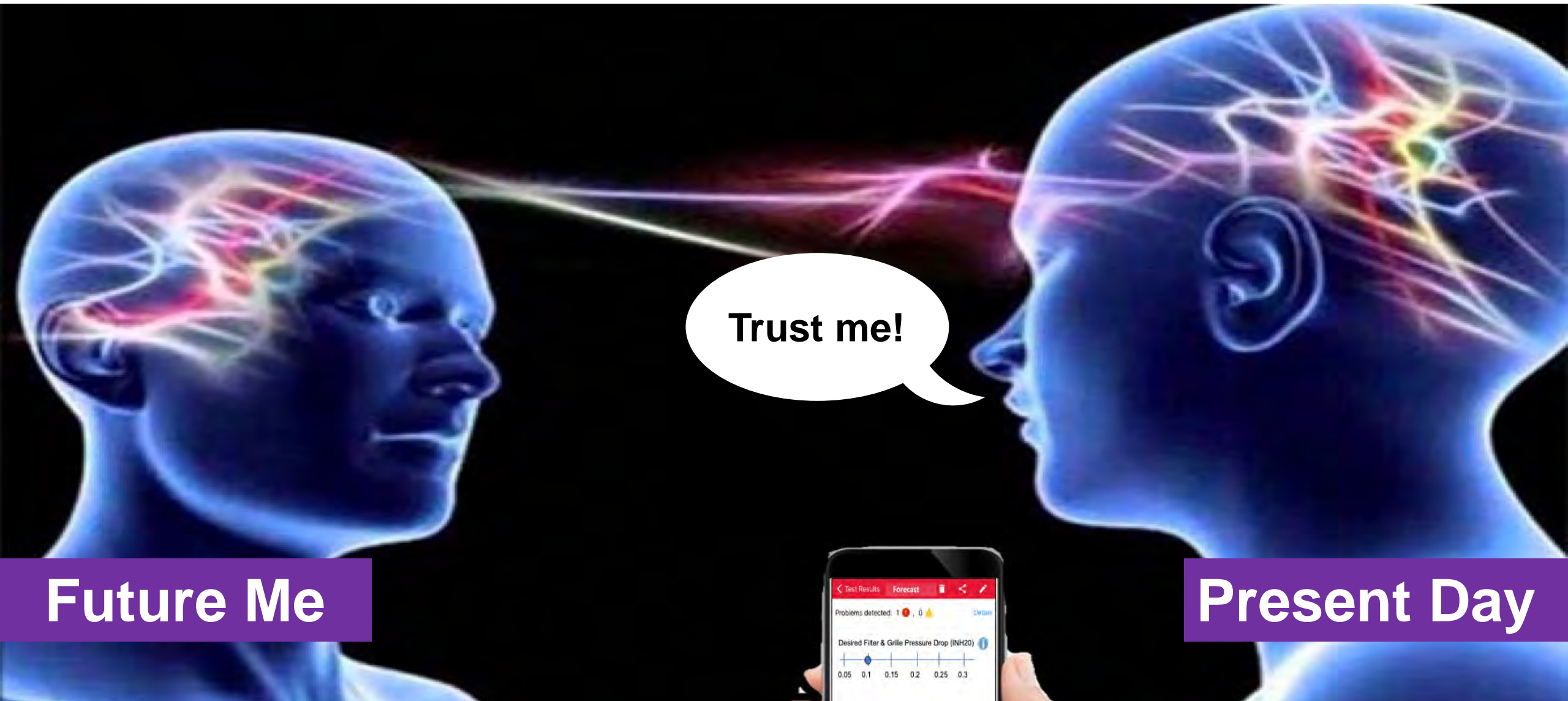


Impacting different roles with airflow measurement



Airflow measurements of the future

What if you could see into the future?



Future Me

Present Day

You Would Need A Time Machine



And One Of These!



Flux Capacitor!

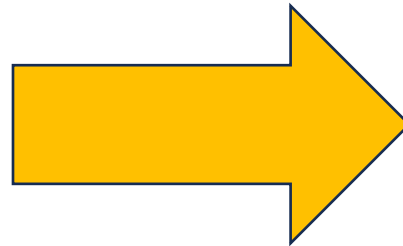


Our Industry's Challenge

40,000 BTU/h Furnace



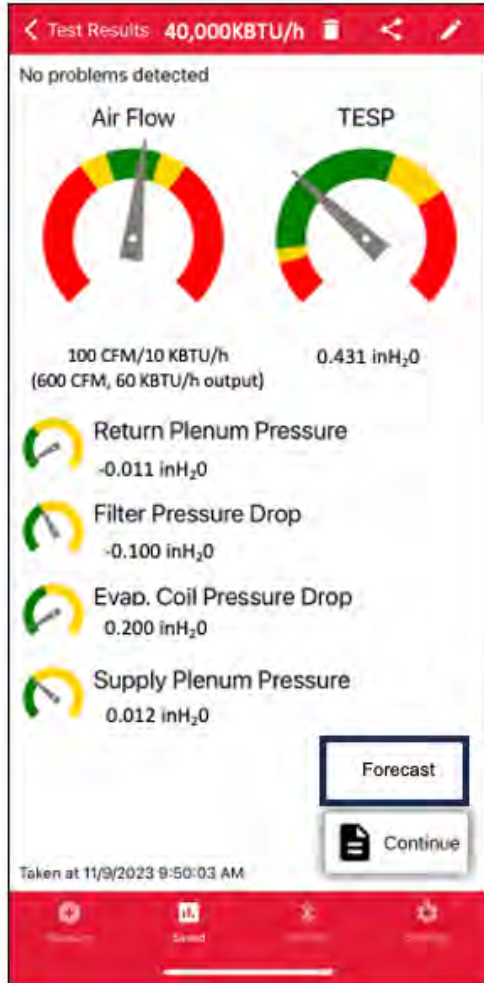
36,000 BTU/h Heat Pump



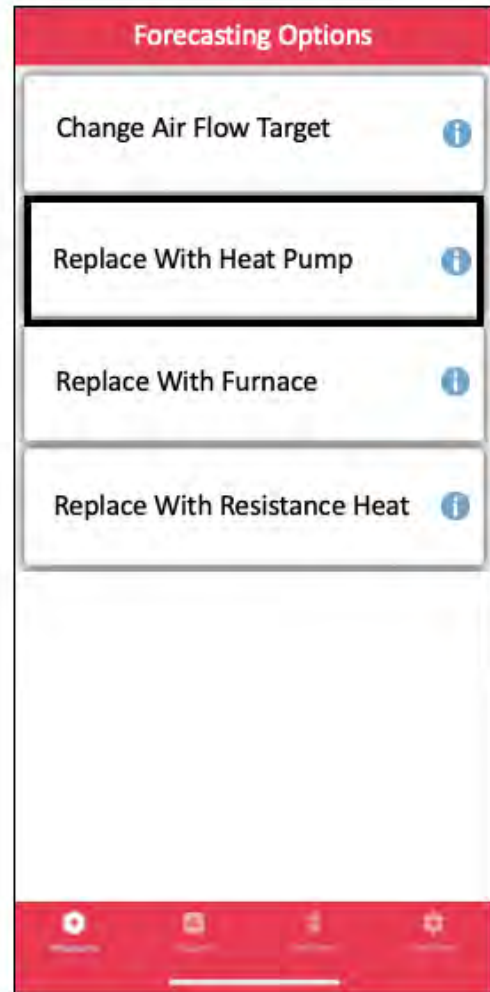
We're In For It Now Marty!



Step 1: Furnace to Heat Pump Retrofit



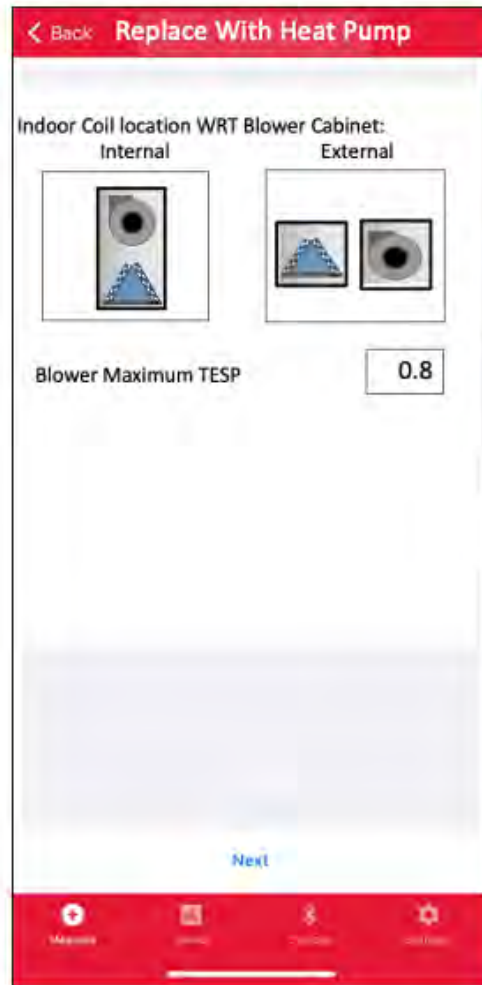
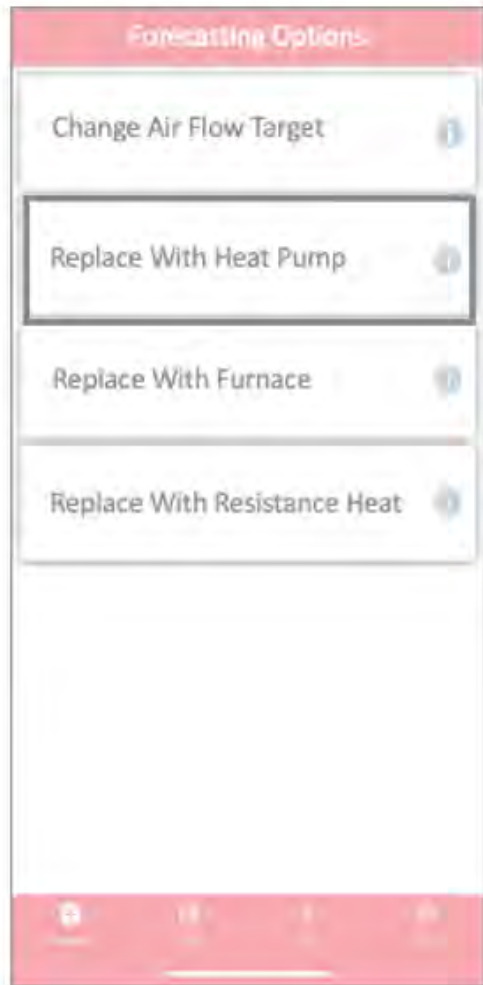
Step 2: Furnace to Heat Pump Retrofit



Select Option:

- Replace With Heat Pump

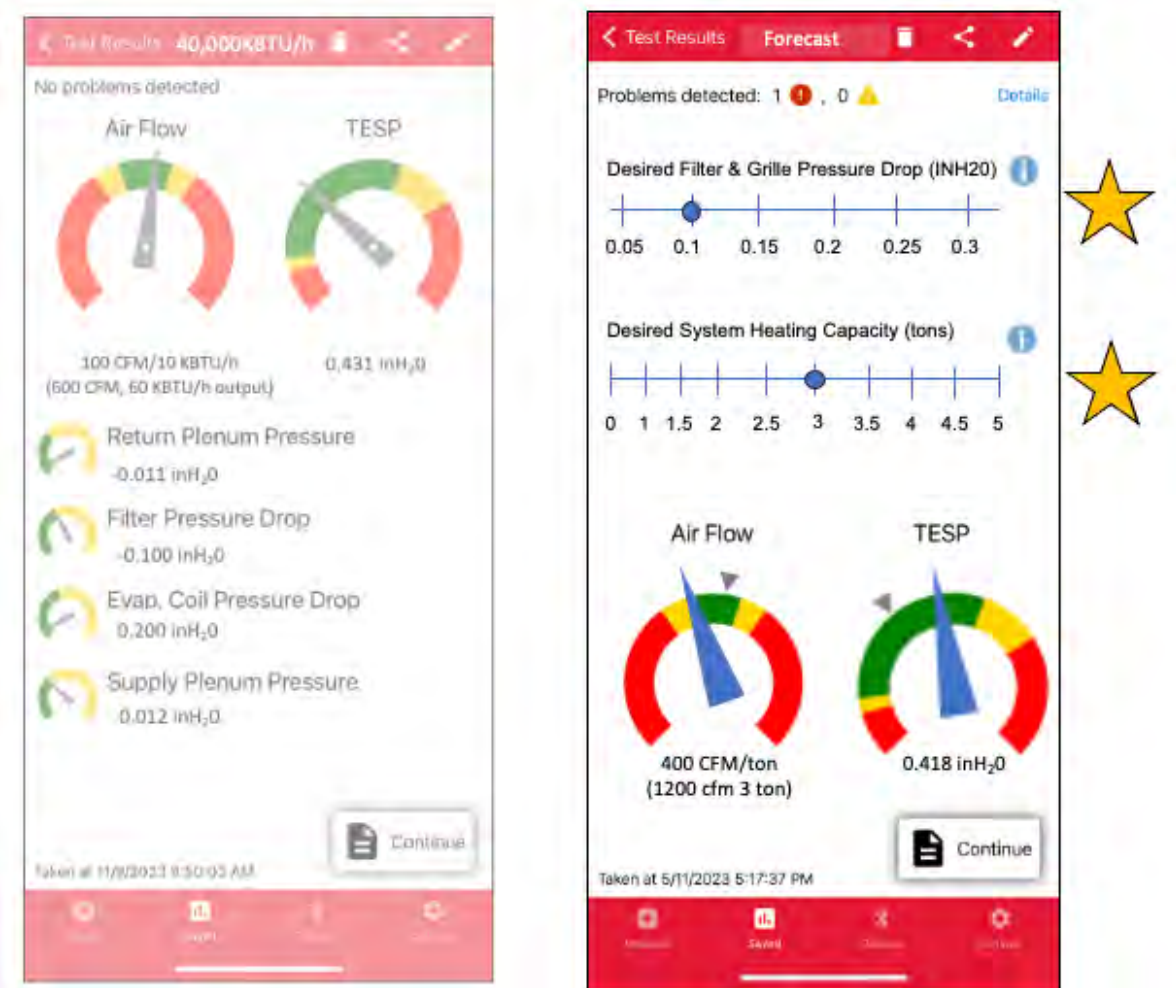
Step 3: Furnace to Heat Pump Retrofit



Select Option:

- **Select Coil location**
- **Select OEM TESP**

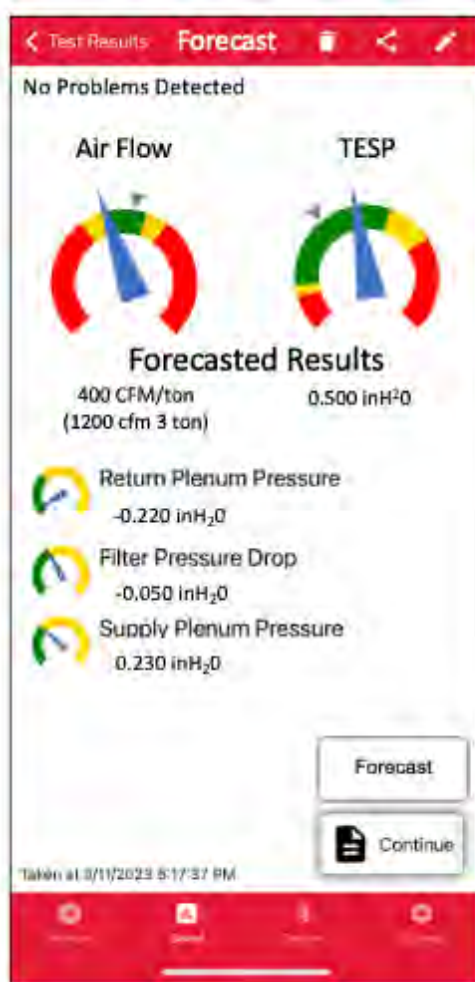
Step 4: Furnace to Heat Pump Retrofit



Use Forecast Tool:

- Use Active Sliders To Design Your New Heat Pump Installation

Heat Pump Retrofit Report In Seconds!



Forecast Report:

Know the result before you start

Heat Pump Retrofit Installed Free From High Static Pressure!



**Great Scott!
They Did It!**



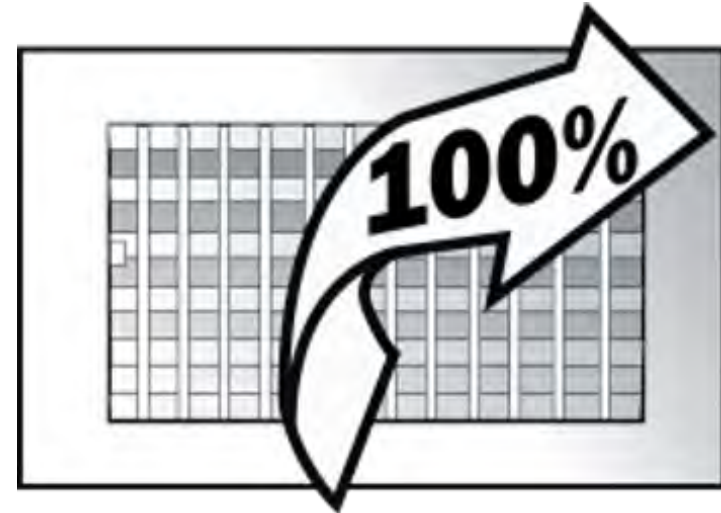
So, How Did They Do It?

Duct Renovation...

Two Duct Renovation Approaches



Air Upgrades



Duct Optimization

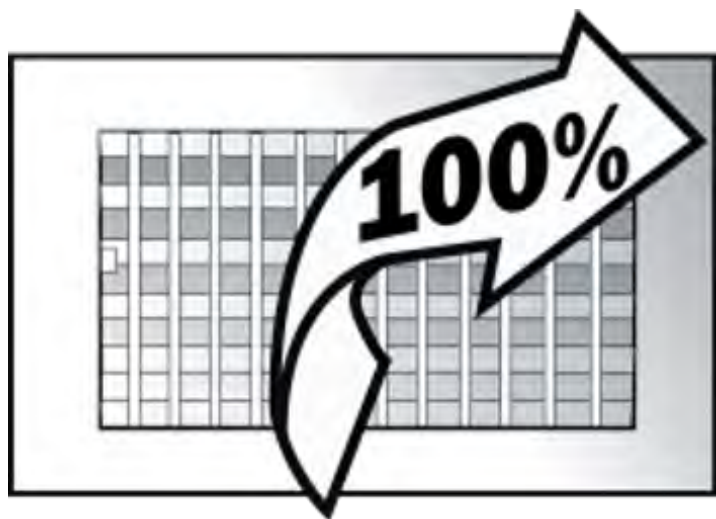
Air Upgrade Approach



Air Upgrades focus on improving static pressure and airflow.

They are pre-packaged duct repairs priced with flat rate.

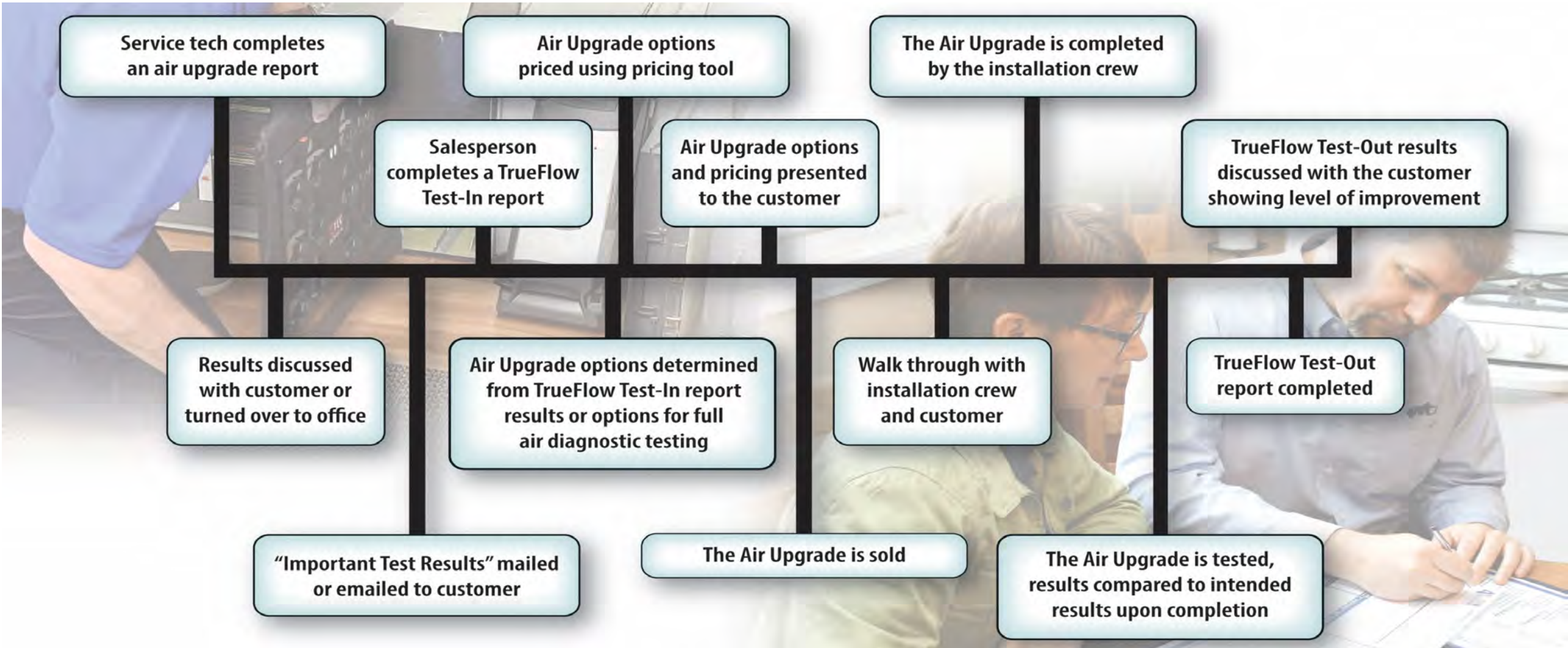
Duct Optimization Approach



Duct Optimization brings an existing duct system to the point where individual room Btu requirements are successfully achieved and verified.

It is a customized product with paid design work and airflow testing.

They Followed a Process



Next Steps



1. Figure out why you should measure airflow and write it down.
2. Purchase any needed test instruments you may not currently own.
3. Practice by testing and diagnosing systems in your home or office.
4. Teach others in your company as you learn.
5. Slowly add airside testing to your service calls and installs.
6. Increase your testing skills beyond static pressure and fan airflow.
7. Become known as the “airheads” in your community.

About NCI

Currently we train over 3,000 industry professionals each year and have certified over 50,000 people since our beginning in 1993.

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With a dedicated staff nearly 30 strong, NCI wants to continue to be a resource supporting your ongoing learning and business success.

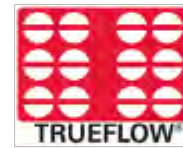
www.nationalcomfortinstitute.com



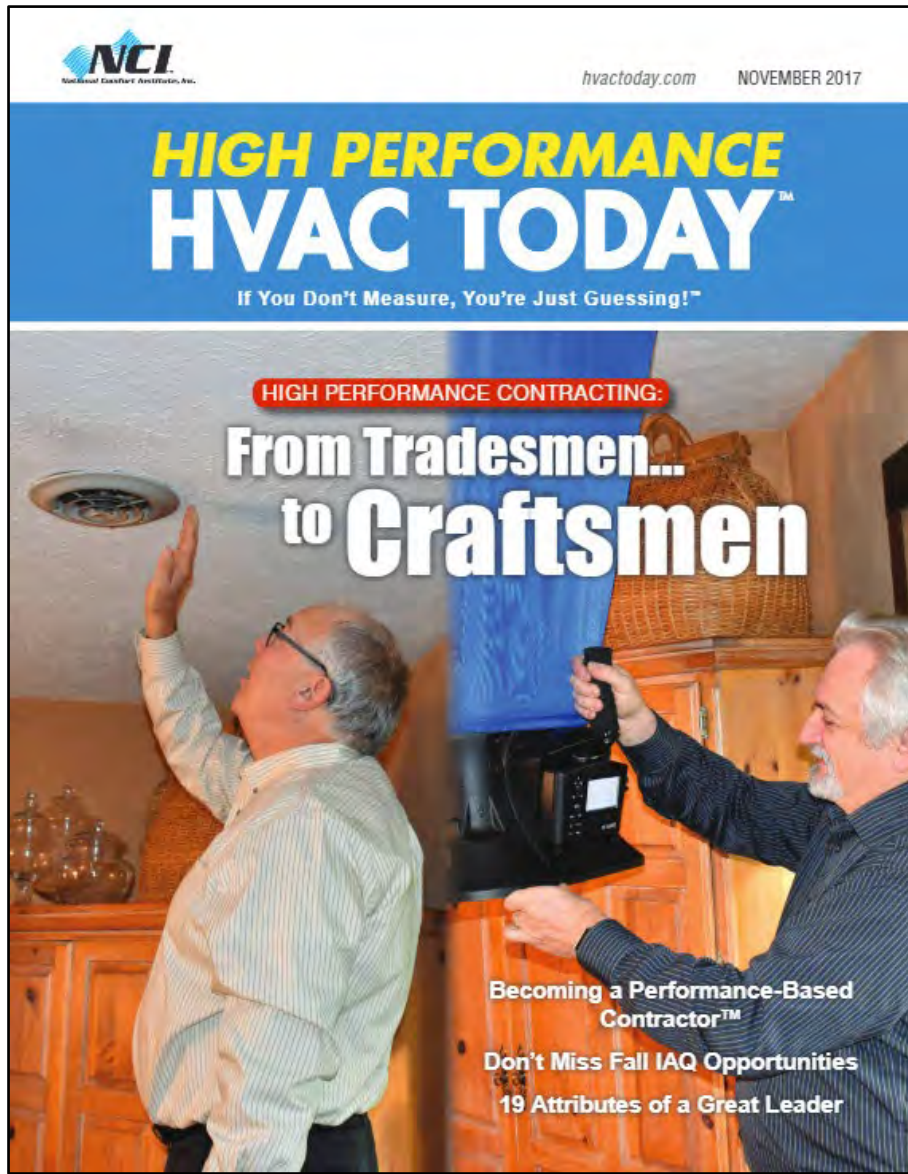


Developing Air Measurement Tools for Better Built Environments

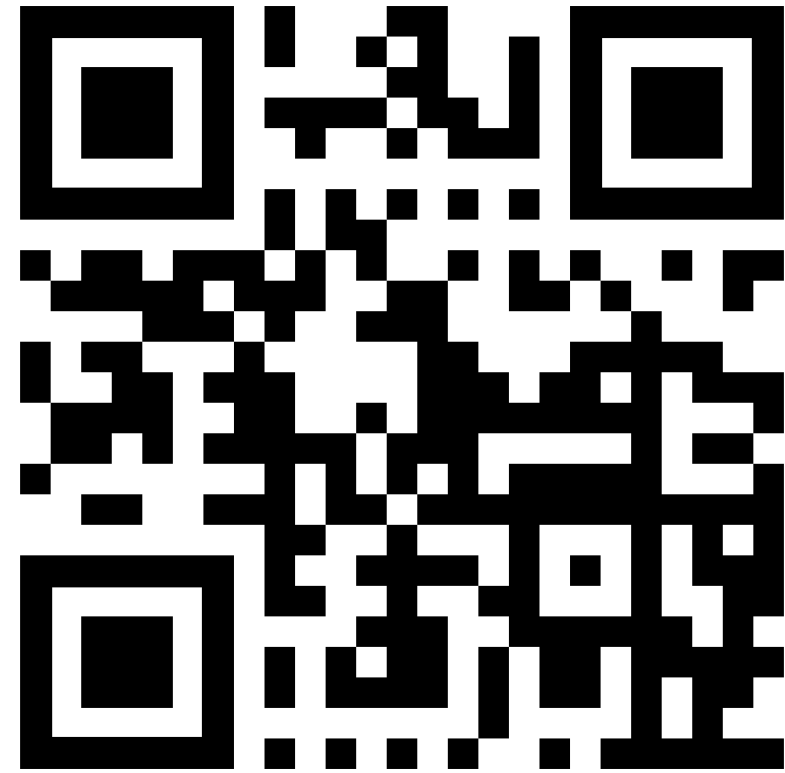
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