



TAKING YOUR AUDIT BEYOND THE ENVELOPE: NEW TOOLS TO UPGRADE YOUR DIAGNOSTIC PROCESS

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Energy Circle Webinar Series

August 28, 2024

Categories of Differentiation

1. Trust & Credibility
2. Branding & Reputation
3. Quality
4. Building Science & Innovative Technologies
5. Process
6. Community Involvement
7. Price Transparency
8. Risk Reduction (Licensing, Insurance, Guarantees)



HOW DO WE WIN THIS JOB?

Your Quote

21.5 SEER 1 ton Fujitsu ducted heat pump, 4 supply registers, 1 return grill, new R8 flex duct system.	\$14,856
Attic Insulation Removal, Air Sealing, Reinsulation	\$7,707
Airseal uninsulated portions of subfloor	\$4,735
Upgrade electrical service to support home electrification	\$5,805
TOTAL	\$33,103

Competitors Quote

17 SEER 1.5 ton Daikin ductless mini split system (2 indoor heads)	\$7,447
Upgraded electrical service	\$6,241
TOTAL	\$13,688



WHAT IS A "HIGH PERFORMANCE" CONTRACTOR?

Building Science Oriented

Building Science Standard

- A clear diagnostic process
- Working to a standard
- Calculating loads
- Addressing ducts
- More comprehensive jobs
- etc

Customer Oriented

Communications

- Web
- Sales process
- Documentation
- Scheduling
- Compelling case
- etc

On Site

- Timeliness
- Cleanliness
- Politeness
- Attire
- Craftsmanship
- etc

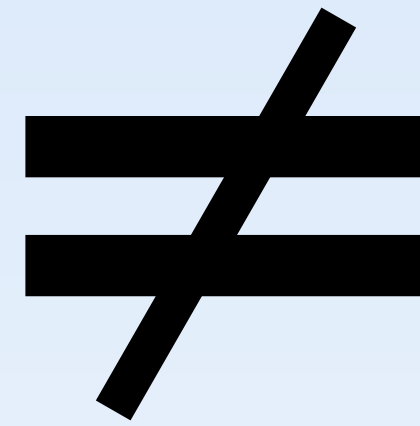
A Better Home

Outcomes

- Better outcomes and results
- Comfort?
- Efficiency?
- Cost?



USING BUILDING SCIENCE



“ENERGY AUDIT”

USE DIAGNOSTICS YOUR OWN WAY



**To a Homeowner—
They're Just Labels**

Energy Audit

Energy Assessment

Healthy Home Assessment

Commissioning

Walk Through

Home Evaluation

Free Quote

Site Visit

Test Out

Etc



CORE Tools: Primarily Envelope

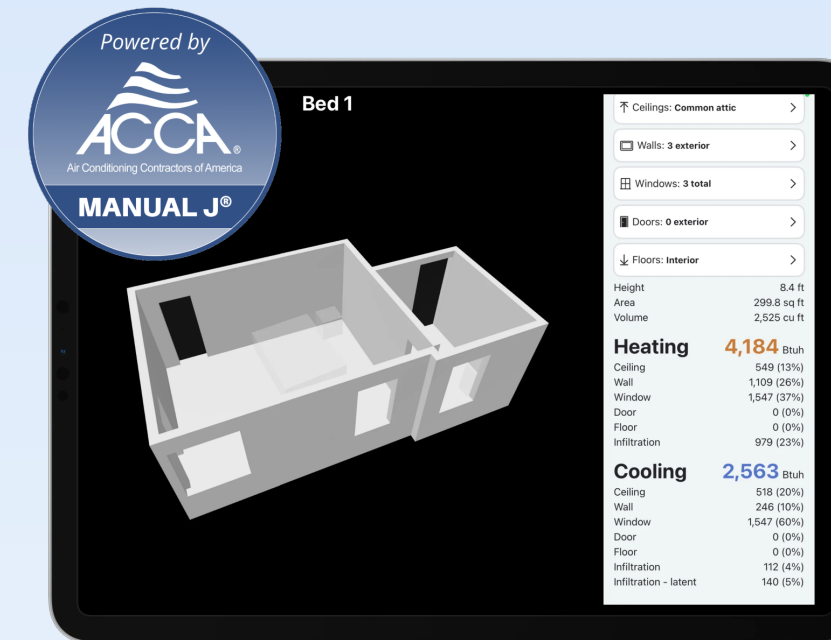


CORE Tools: Primarily Envelope

NEW Tools: HVAC, Ducts, Energy



Amplify Manual J



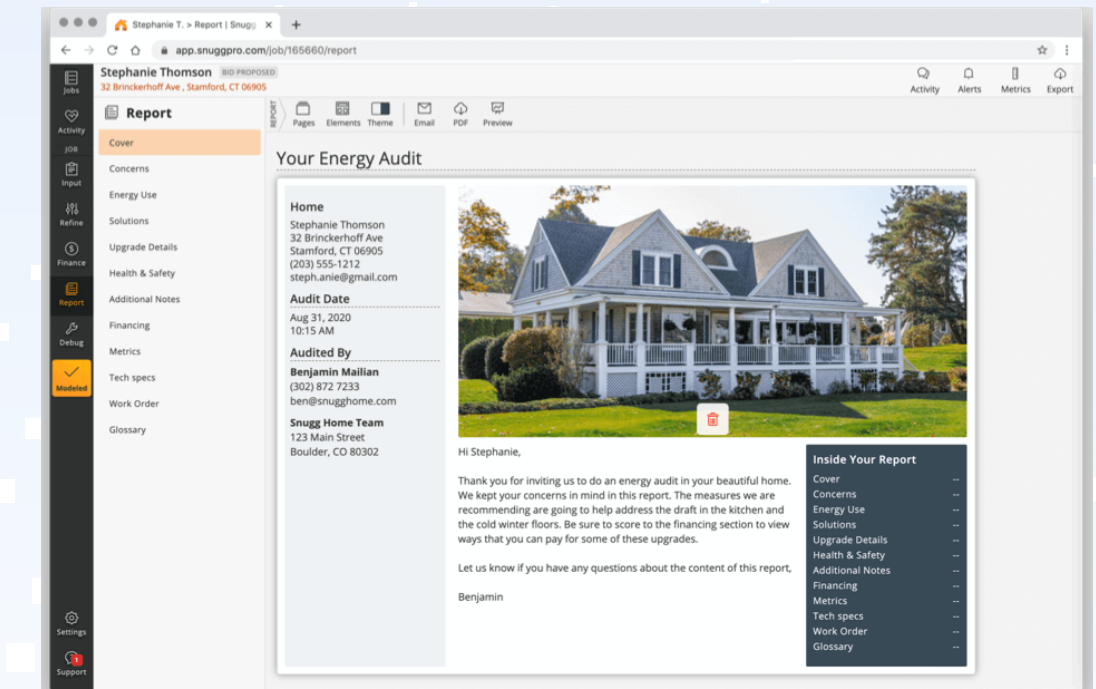
TruFlow Grid



measureQuick



Snugg Pro



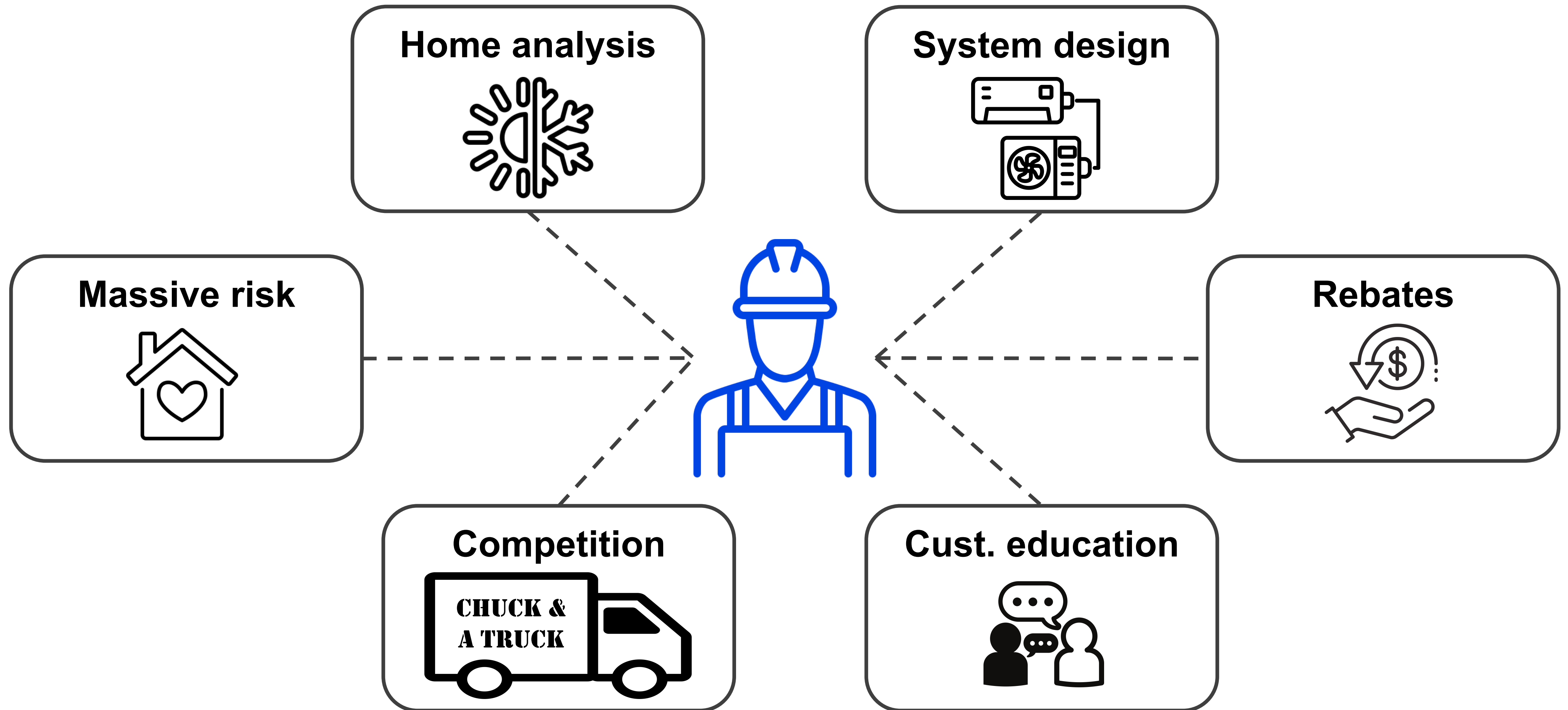


Amp up your heat pump business

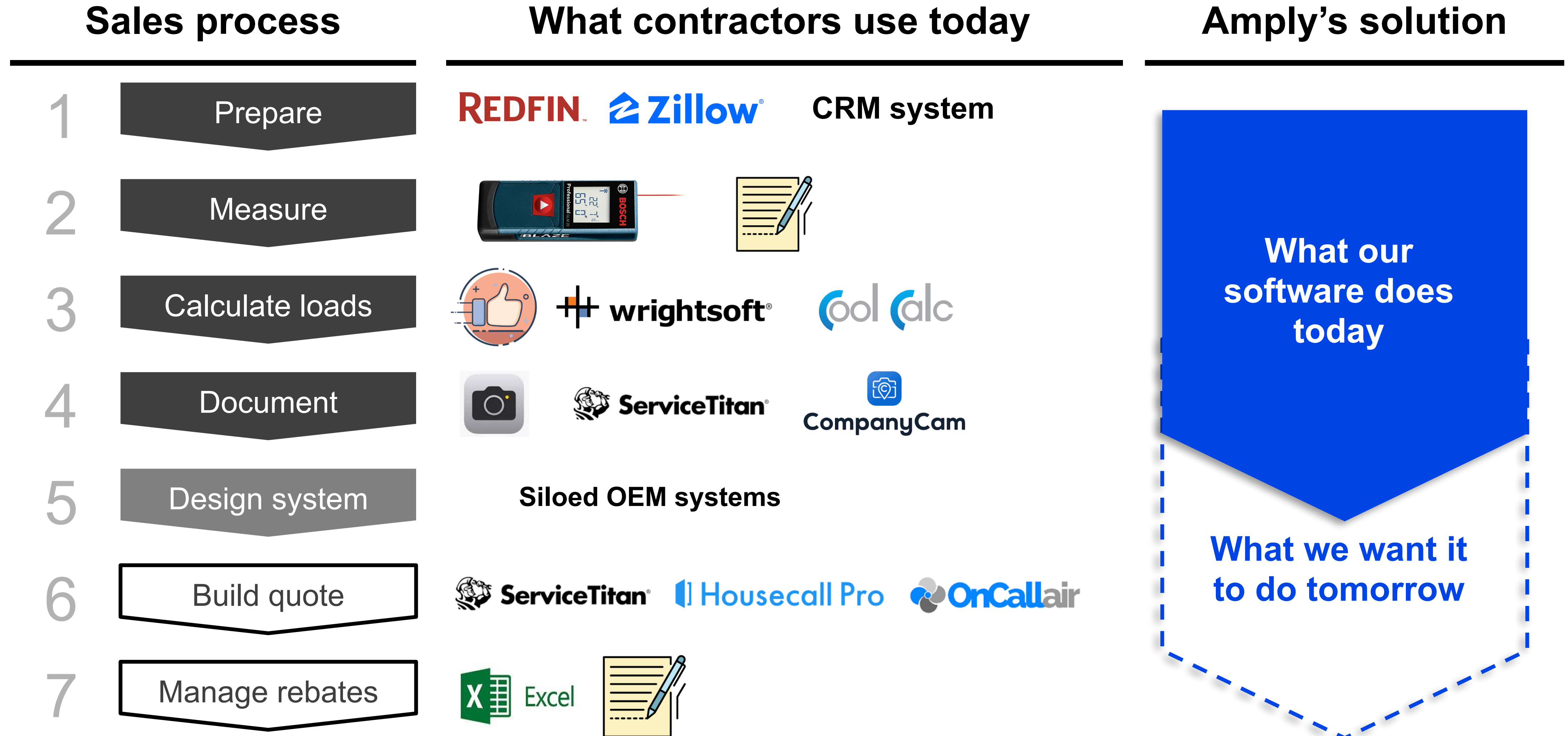
Game-changing sales
software for heat pump pros



What we are asking heat pump installers to do is beyond painful – it is almost impossible






AmPLY: a single software solution for the heat pump design-sales-rebates






Benefits: More sales, less time, better performance




Contractors:  **DAVE'S WORLD**
HEATING & COOLING
Awesome!

-  More sales
-  Less paperwork time
-  Happier customers




Distributors:  **ABC CO**
HVACR
Supply +
Solutions

-  More sales
-  Less tech support
-  Fewer warranty issues

Manufacturers:  **DAIKIN**

-  More sales
-  Fewer warranty issues
-  Happier customers

Utilities & rebate admins  **NYSERDA**

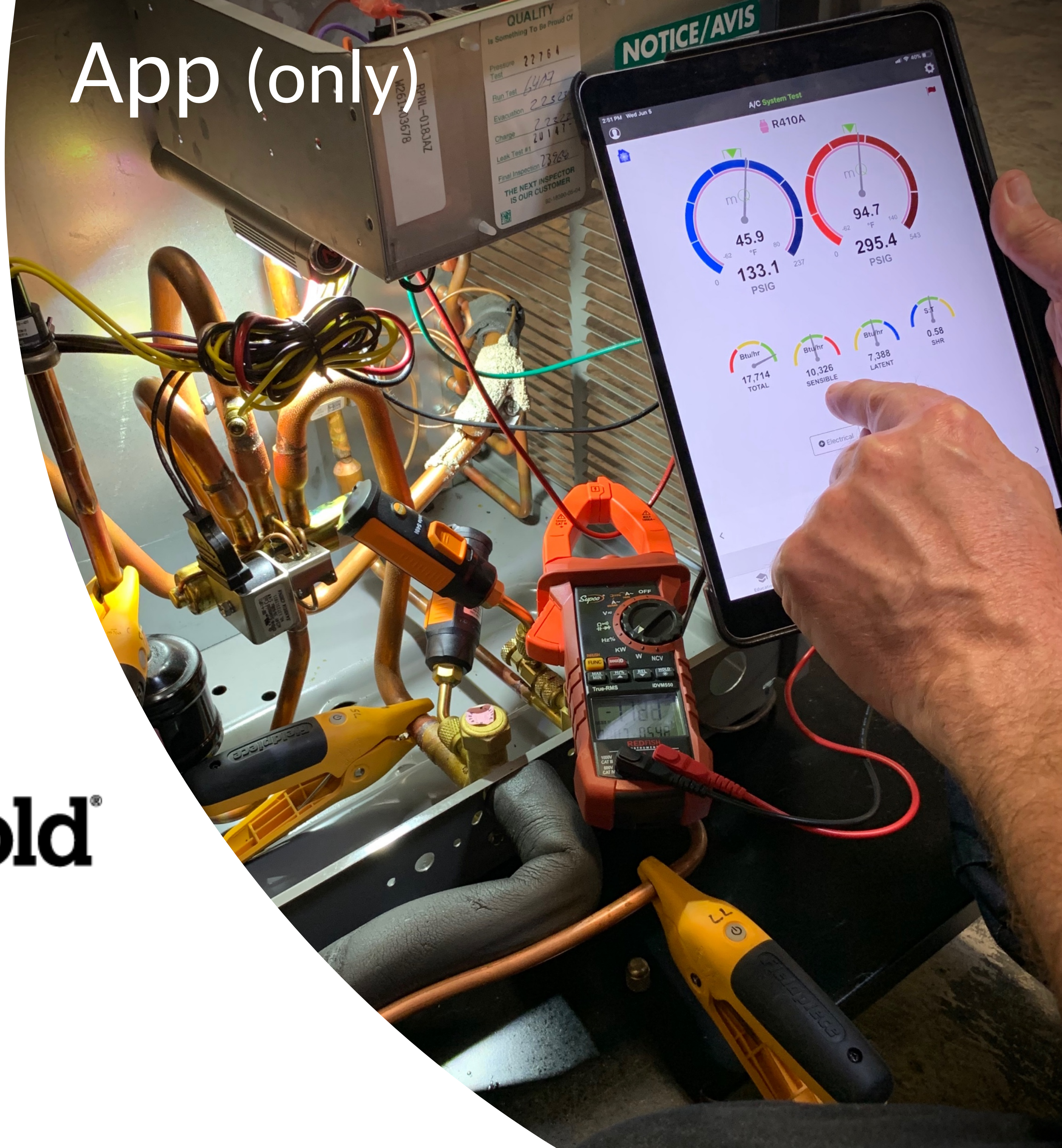
-  Less CO2
-  kWh optimized
-  Auditable paperwork

measureQuick

App (only)



measureQuick



QUALITY
Is Something To Be Proud Of

Pressure Test	22764
Run Test	6427
Evaluation	22523
Charge	20147
Leak Test #1	
Final Inspection	23288

THE NEXT INSPECTOR IS OUR CUSTOMER

NOTICE/AVIS



What is measureQuick?



Return Indoor Air Temperature

Supply Indoor Air Temperature

Return External Static Press

Supply External Static Press

Outdoor Air Temp

Suction Temperature clamp

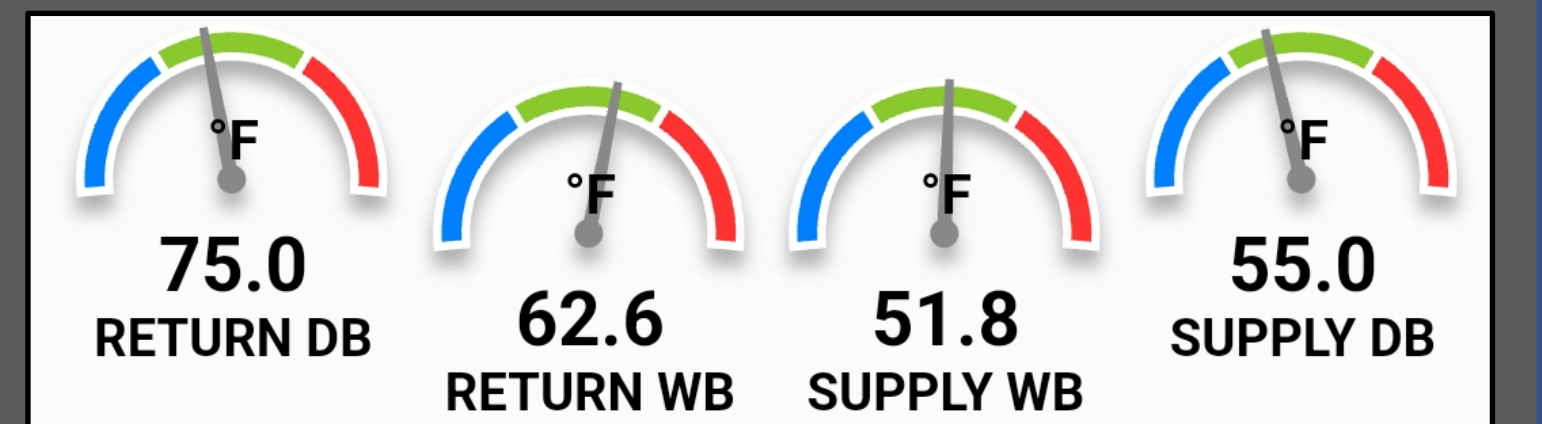
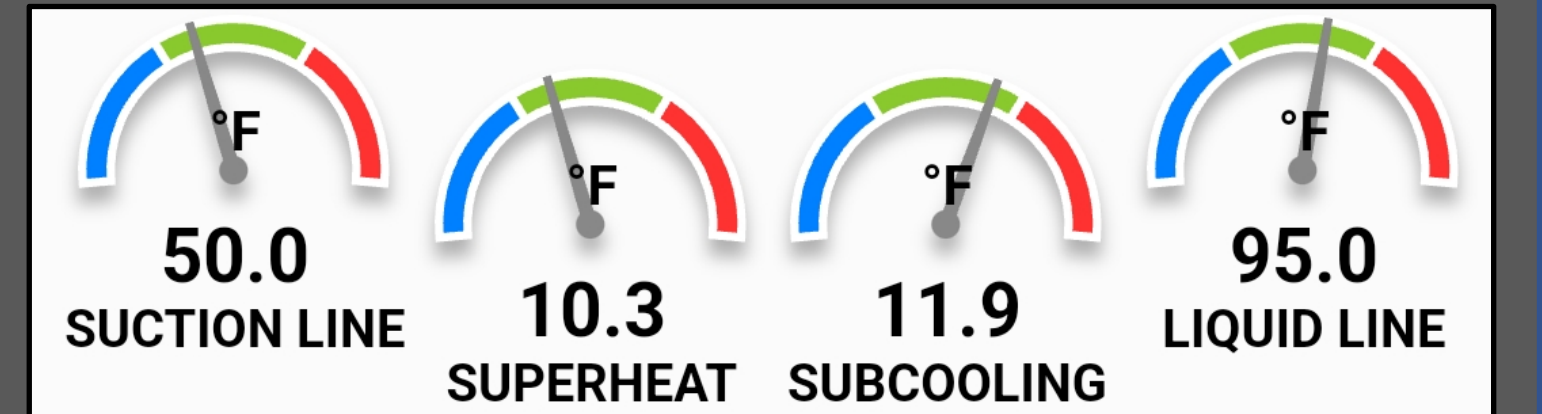
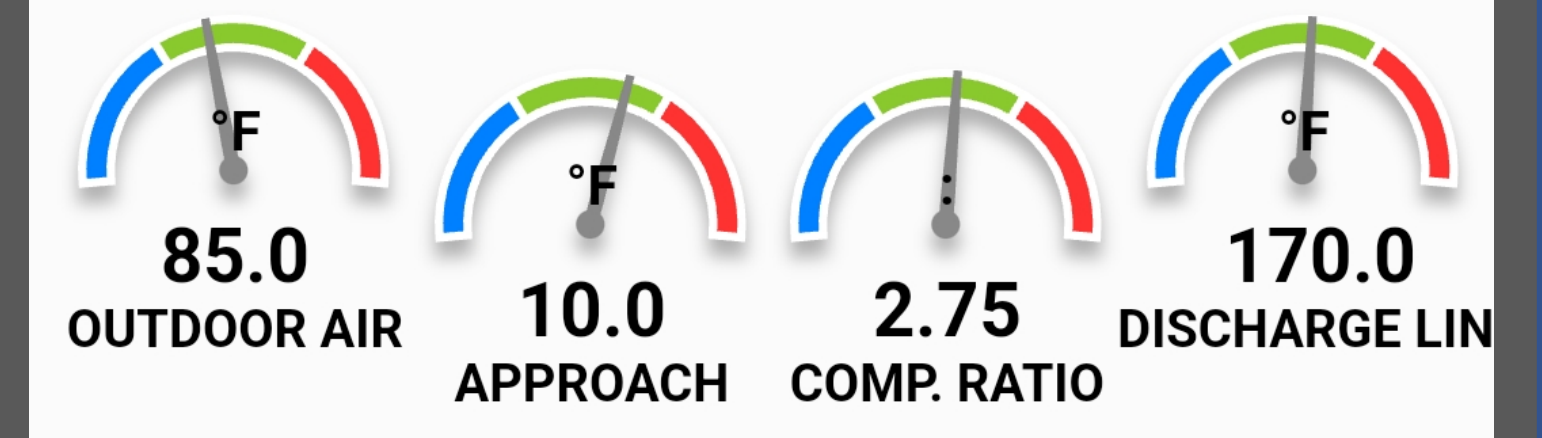
Liquid Line Temperature Clamp

High Pressure Refrigerant

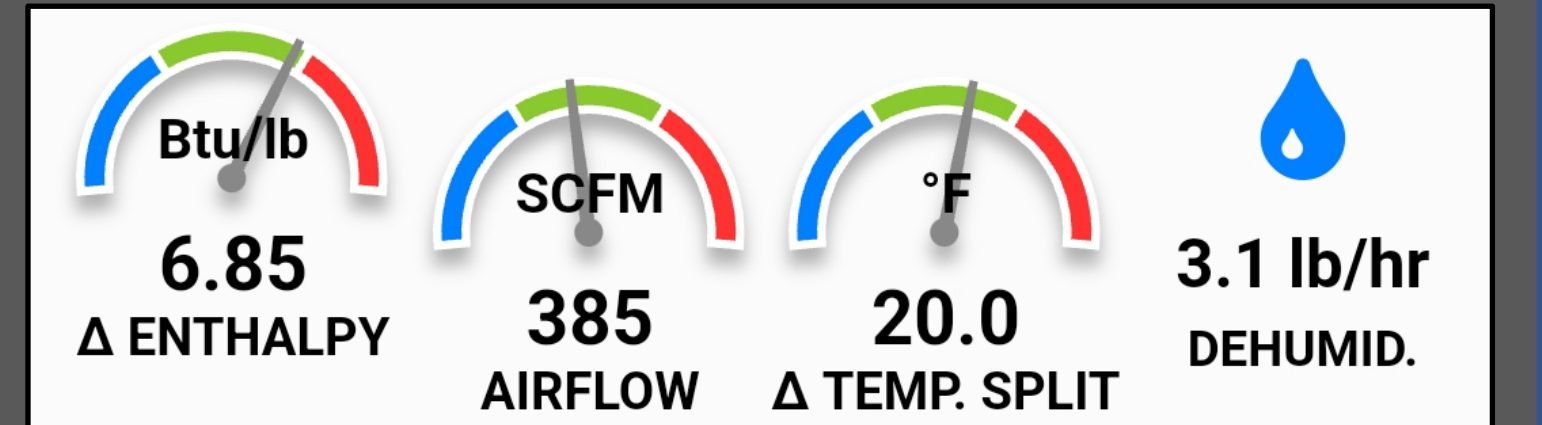
Low Pressure Refrigerant

[Residential Commissioning App.](#)

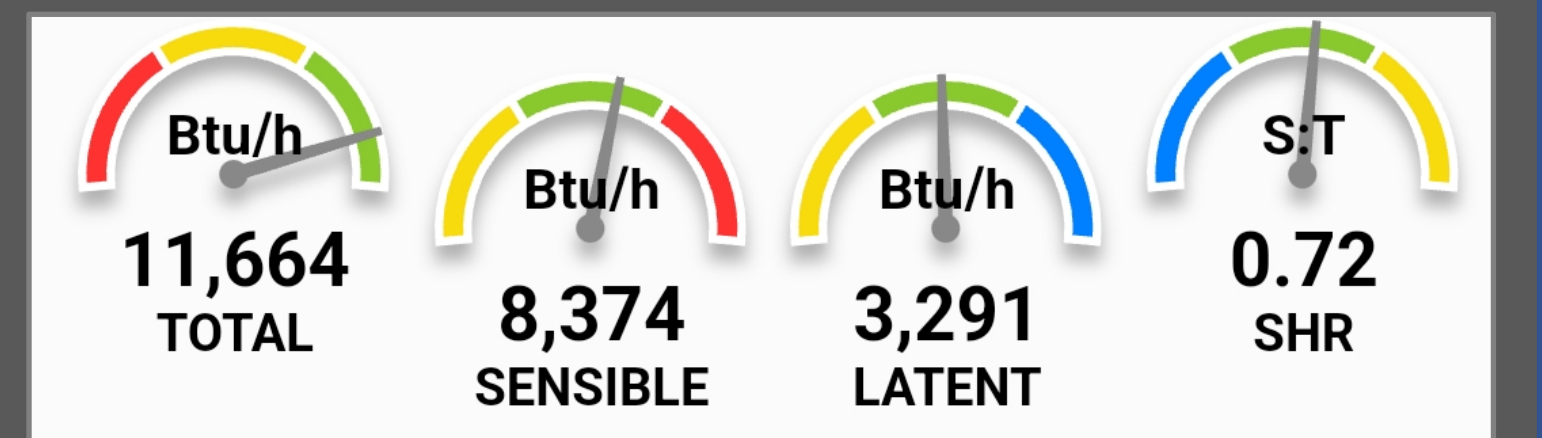
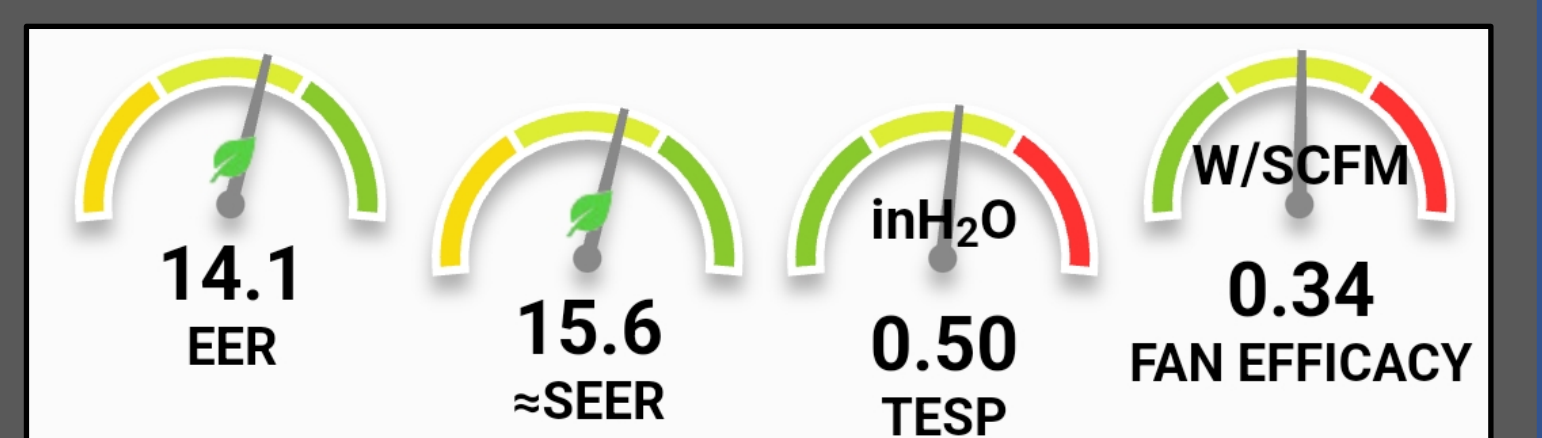
OUTDOOR



INDOOR



Performance



What is measureQuick?

PROFILE: 2 TON SPLIT

REFRIGERANT		AIRSIDE	
118.0 PSIG LP ✓	390.0 PSIG HP ↑	75.0 °F RADB ✓	58.0 °F SADB ✓
38.6 °F EVAP ✓	114.2 °F COND ↑	61.8 °F RAWB ✓	54.4 °F SAWB ✓
50.0 °F SLT ✓	91.0 °F LLT ✓	17.0 °F ΔT ✓	5.41 BTU/lb ΔH ↓
85.0 °F ODA ✓	170.0 °F DLT ✓	-- inH ₂ O RESP	-- inH ₂ O SESP
11.4 °F SH ✓	23.3 °F SC ↑	800 SCFM AF ✓	0.50 inH ₂ O TESP ✓
R410A	TXV	13-16 SEER	400 /Ton

OUTDOOR

85.0 °F OUTDOOR AIR	10.0 °F APPROACH	2.75 COMP. RATIO	170.0 °F DISCHARGE LINE
50.0 °F SUCTION LINE	10.3 °F SUPERHEAT	11.9 °F SUBCOOLING	95.0 °F LIQUID LINE

INDOOR

75.0 °F RETURN DB	62.6 °F RETURN WB	51.8 °F SUPPLY WB	55.0 °F SUPPLY DB
6.85 Btu/lb Δ ENTHALPY	385 SCFM AIRFLOW	20.0 °F Δ TEMP. SPLIT	3.1 lb/hr DEHUMID.

Performance

14.1 EER	15.6 ~SEER	0.50 inH ₂ O TESP	0.34 W/SCFM FAN EFFICACY
11,664 Btu/h TOTAL	8,374 Btu/h SENSIBLE	3,291 Btu/h LATENT	0.72 S:T SHR

Increases ticket sales per job



Testimonial, the numbers below are reflective of only one technician

Without measureQuick

- June - Aug, 2021
- Total Sales \$288,300
- Conversion rate 50%
- Ave. ticket \$2848.81
- Ave. options/call 2.34

With measureQuick

- June - Aug, 2022
- Total Sales \$465,456
- Conversion rate 56%
- Ave. ticket \$4637.18
- Ave. options/call 3.50

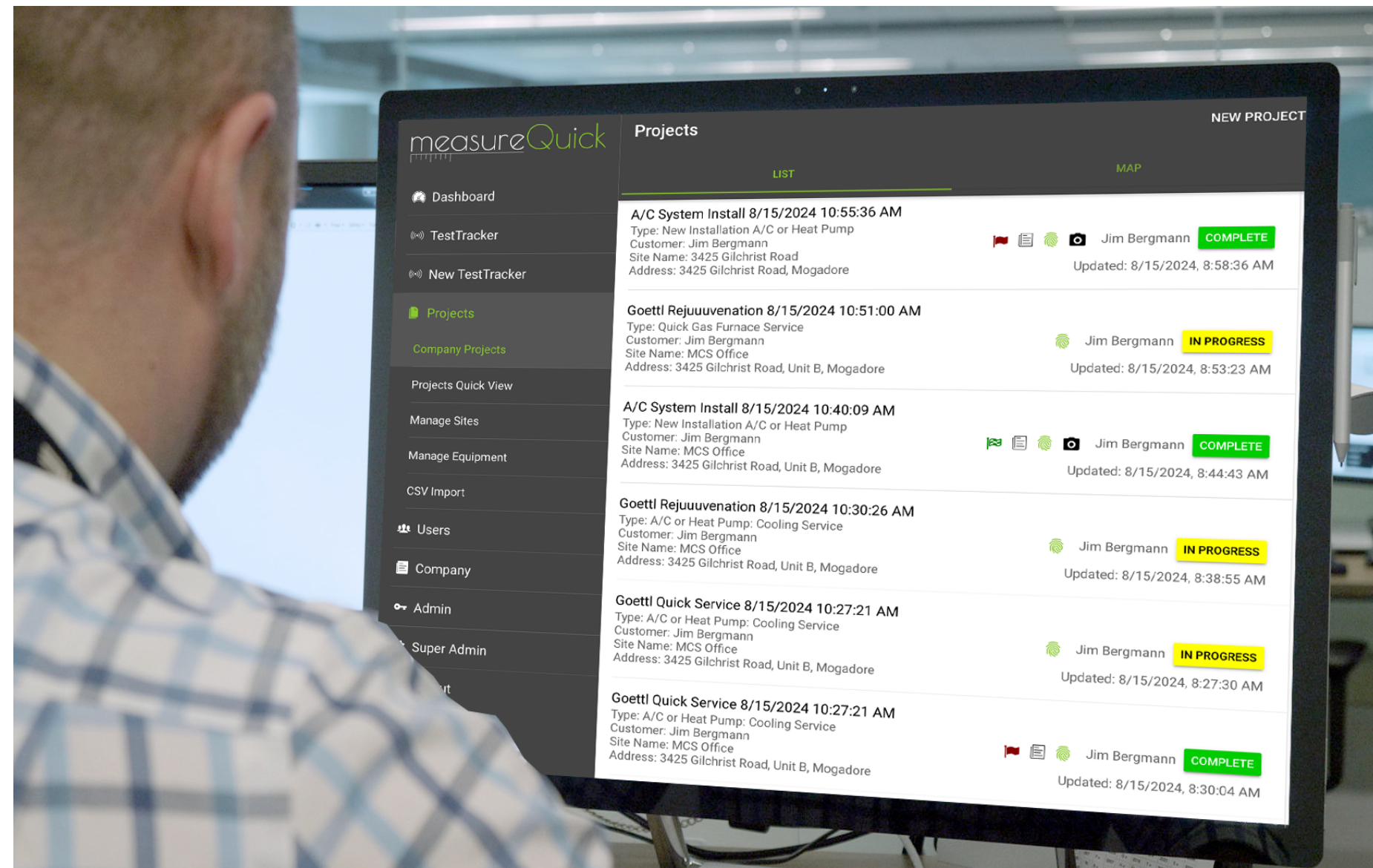
Total spent on Premier Services \$460
(for the entire company of 11 techs)

measureQuick Platform



mQ Cloud Backend portal

- Company set up
- Live data streaming
- View Saved projects
- Prepopulate jobsite info



Application

- In the field
- Used by the technician
- Does the calculations
- Uploads to **mQ Cloud**



measureQuick Live QA Data Streaming

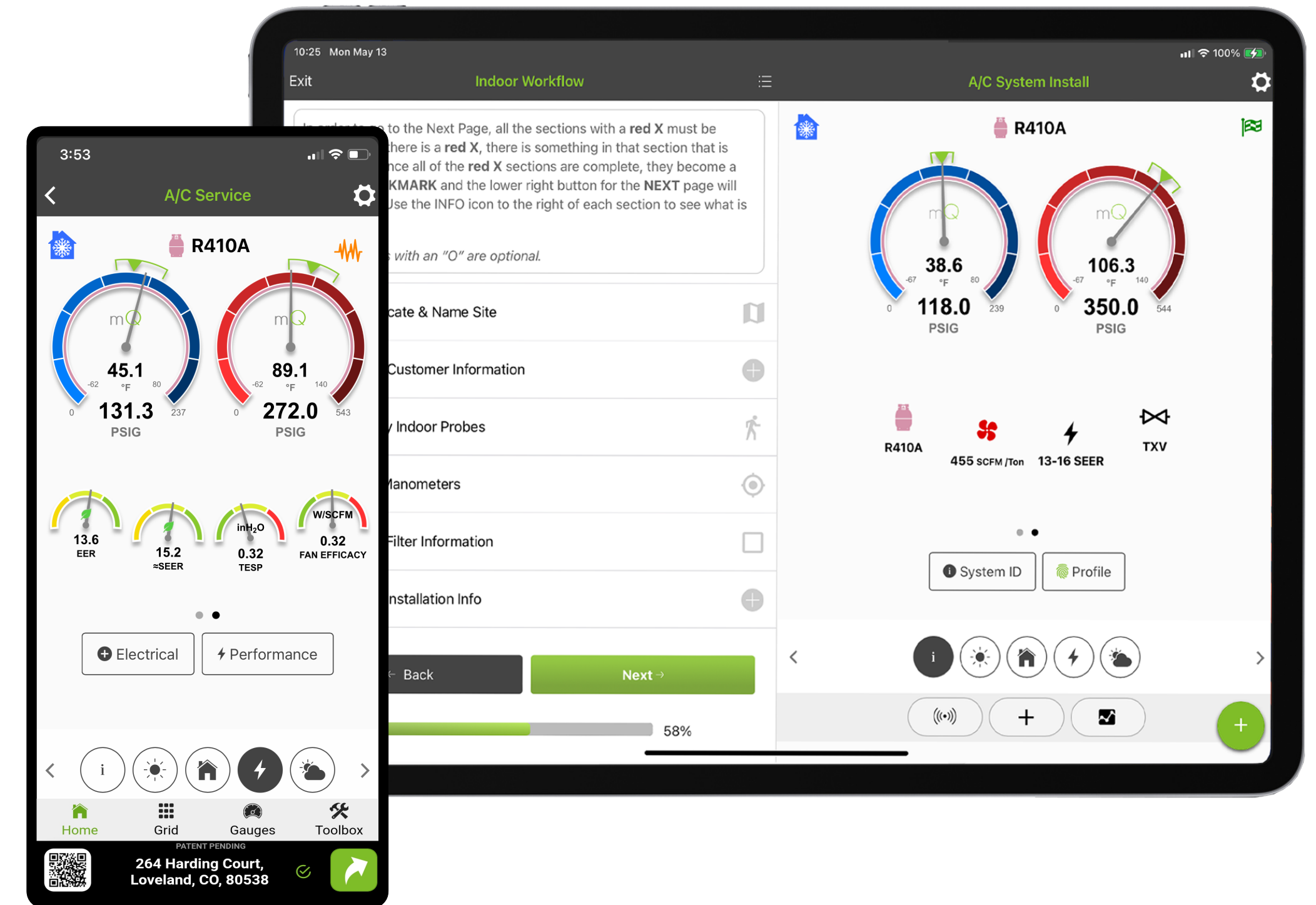
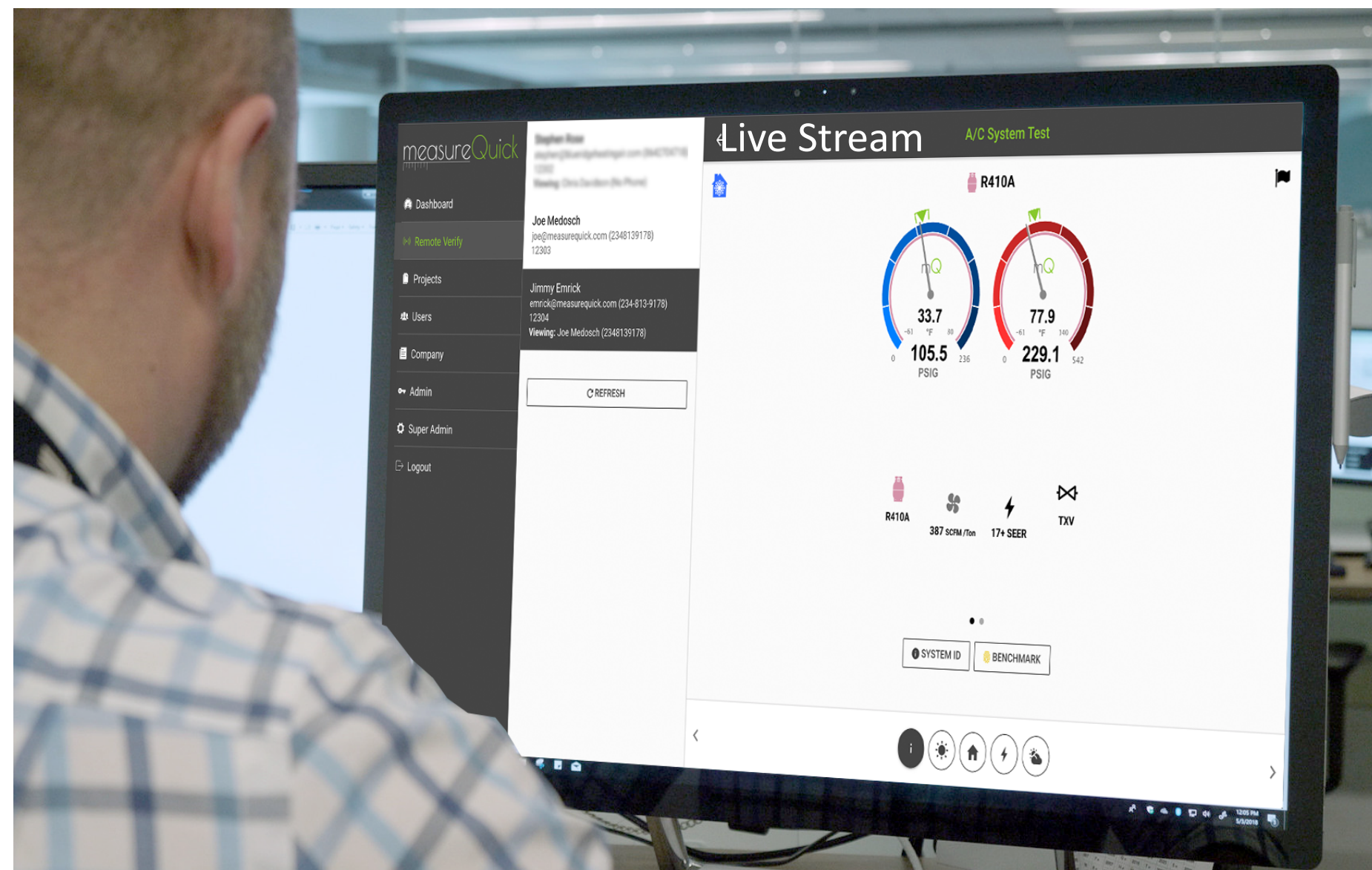


mQ Cloud Backend portal

- Live data streaming
- See all the measurements – LIVE
- Quality control and oversight

Application

- In the field



How Smart are the Probes?



JB App

Temperature 68.1 °F

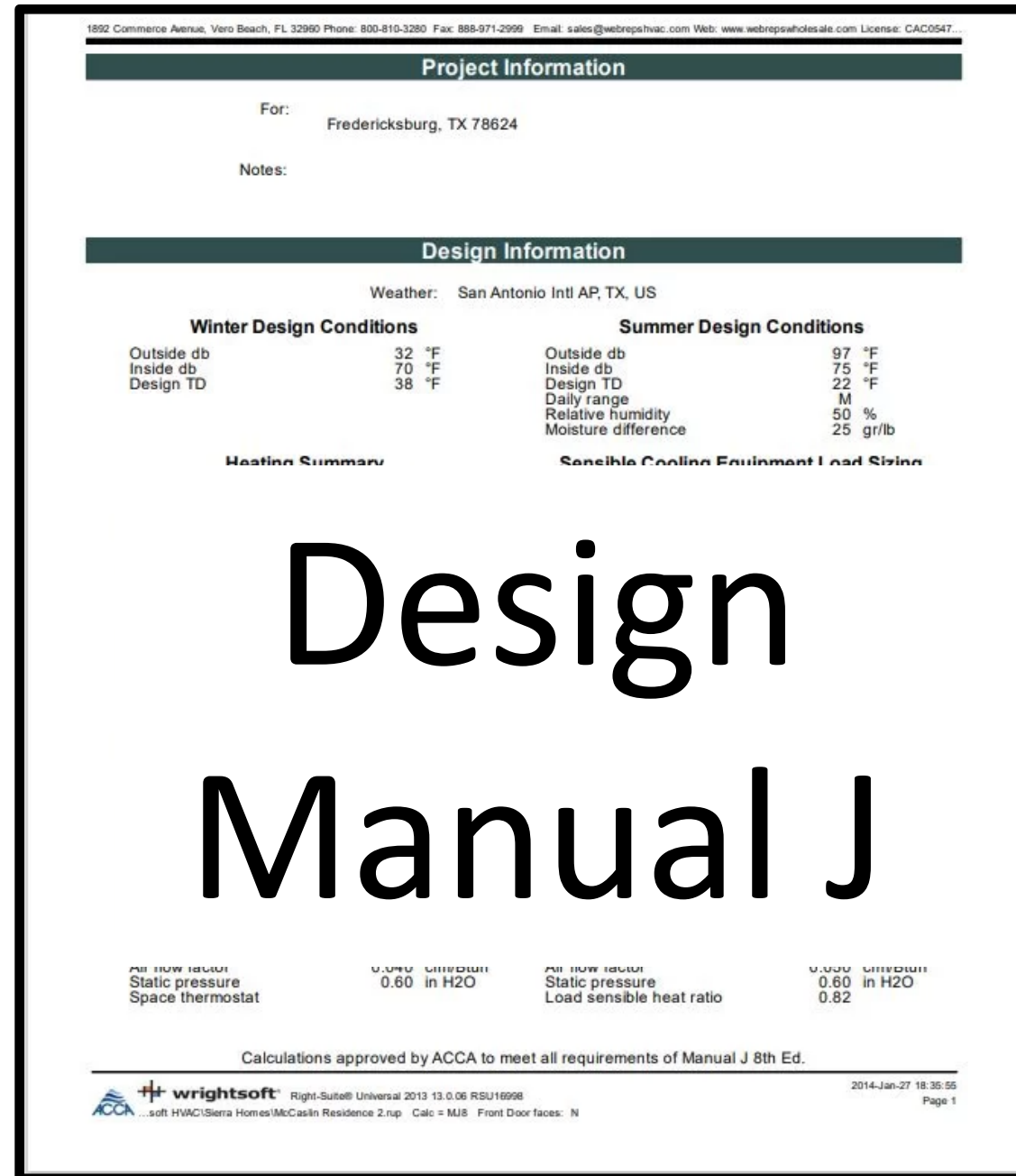
Temperature 53.0 °F



Indoor Measurements	
Air Conditions	
Return Temperature (°F)	68.1
Return %RH	50
Return Wet Bulb (°F)	56.9
Supply Temperature (°F)	53.0
Supply %RH	81
Supply Wet Bulb (°F)	49.9

Temperature Split	
Current Value: 15.1°F	
Calculated Target: 16.4°F	
Allowable Range: 12.7°F to 20.1°F	
Measurement is in range	

ACCA QI Verified System Performance (VSP)



Duct Leakage Test



Airflow Measurement



System Balancing

ACCA
QI
QUALITY INSTALLATION

✓+ VERIFIED SYSTEM PERFORMANCE

Powered by **measureQuick®**

ENERGY STAR
VERIFIED HVAC
INSTALLATION



measureQuick

Prove-It!

measureQuick can act as the program administrator
measureQuick can do onsite verification
You can print your certificate in the field



VERIFIED!

Your new heating and cooling equipment meets ACCA's minimum requirements for equipment operation*

Certification Date: 4/2/2024
Certification Number: X2FUVPGX25YG
System Location: 34.77920661339399, -92.2655083112
Installation Contractor: Joe Medosch

110 Short Main Street

VERIFIED EQUIPMENT OPERATION



Powered by **measureQuick**
Connect. Perform. Prosper.

This Certification is limited to an assessment of compliance with the Quality Installation Standards and is not otherwise a warranty of any HVAC contractor's, or similar person's, work or performance.
*Excludes proper size calculations and air distribution elements.



ENERGY STAR® VERIFIED HVAC INSTALLATION CERTIFICATE

CONGRATULATIONS!

Your new heating and cooling system has been designed, installed, and verified to meet ENERGY STAR Verified HVAC Installation (ESVI) requirements.

JOB DETAILS

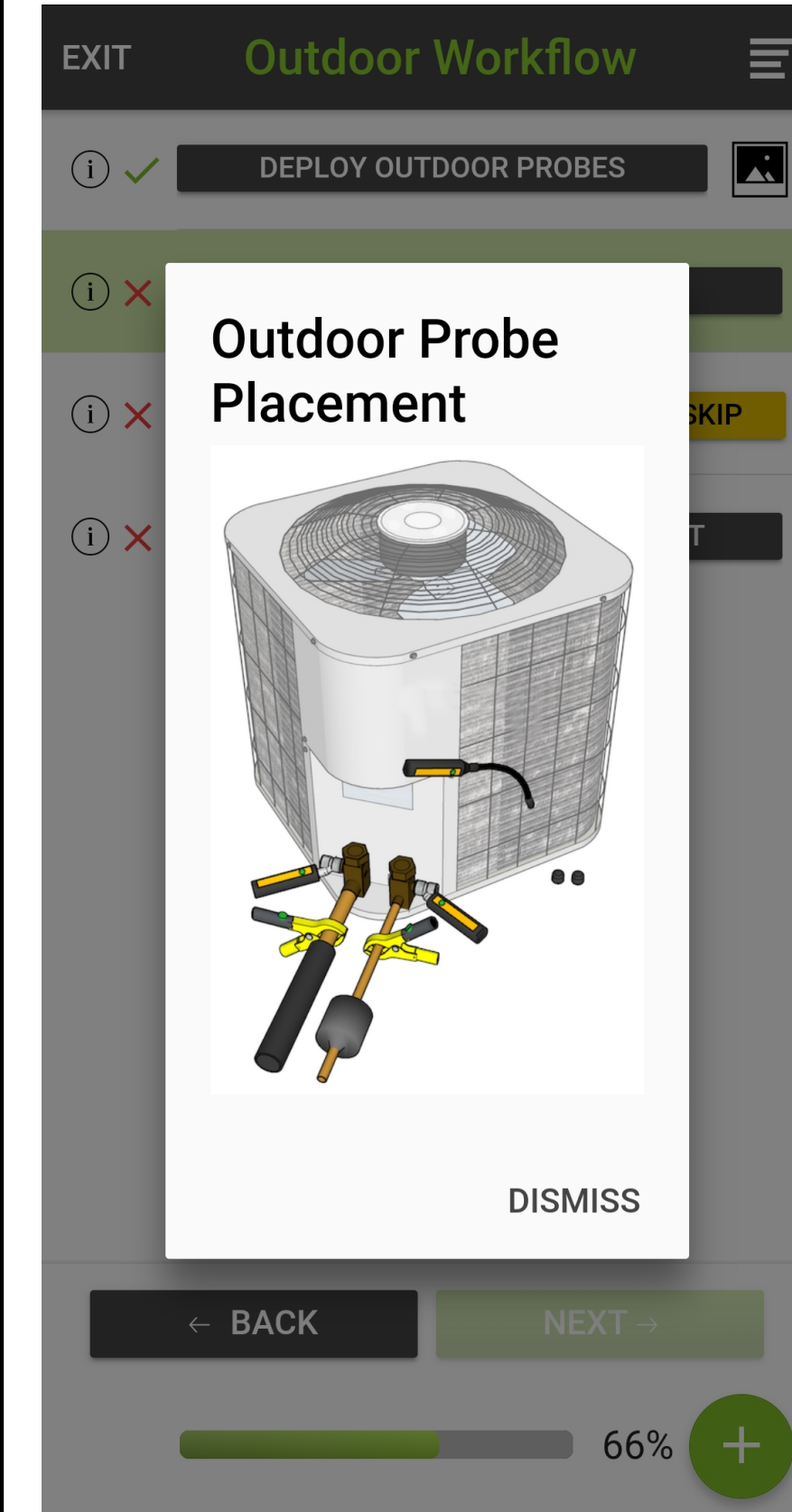
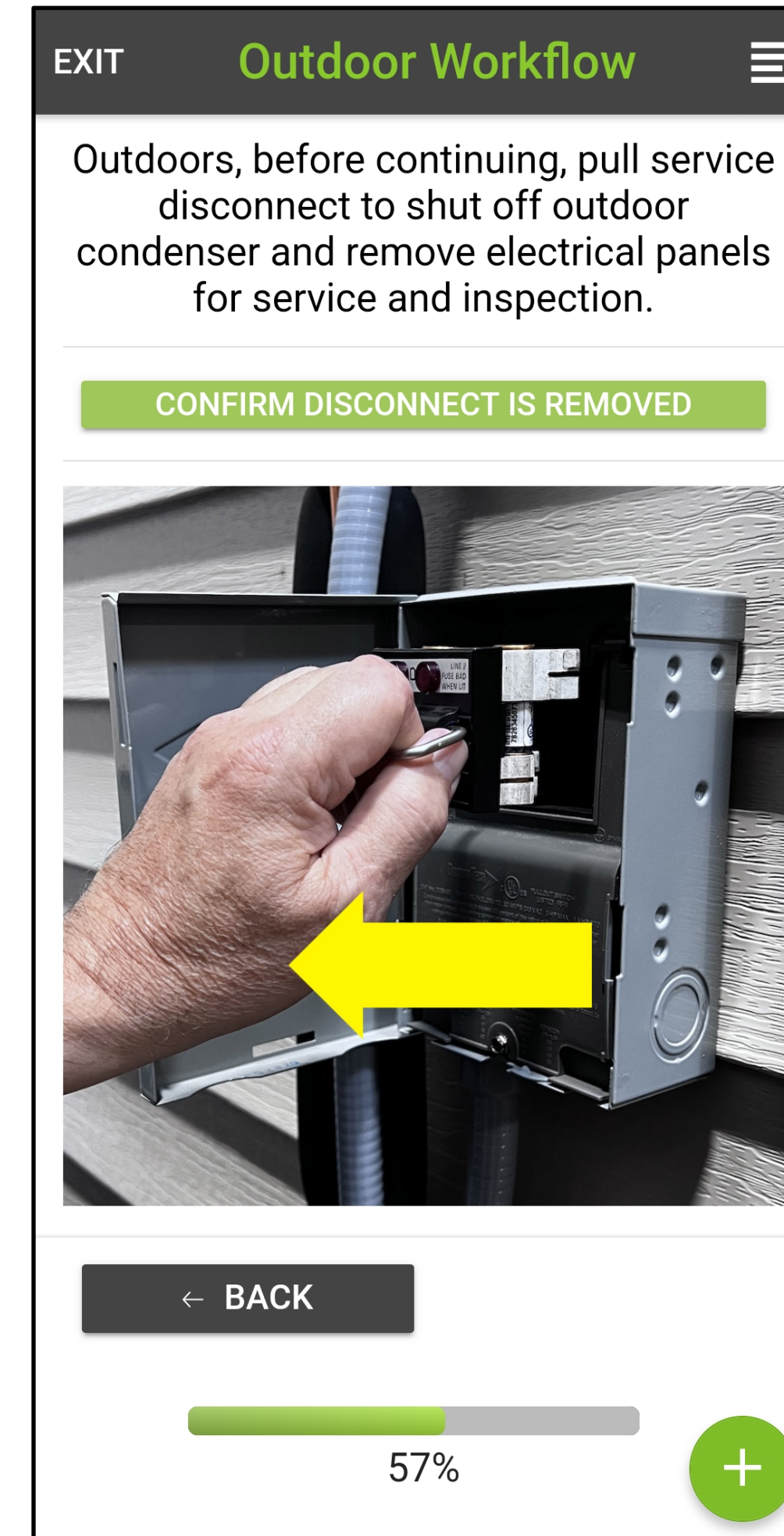
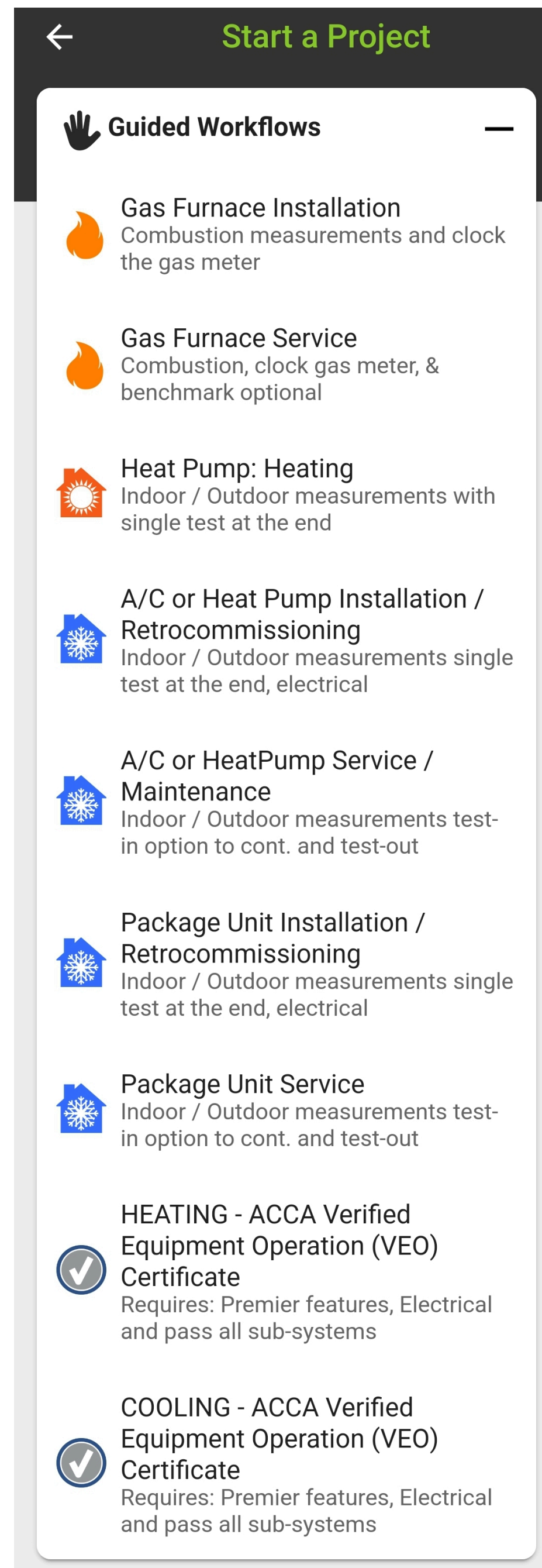
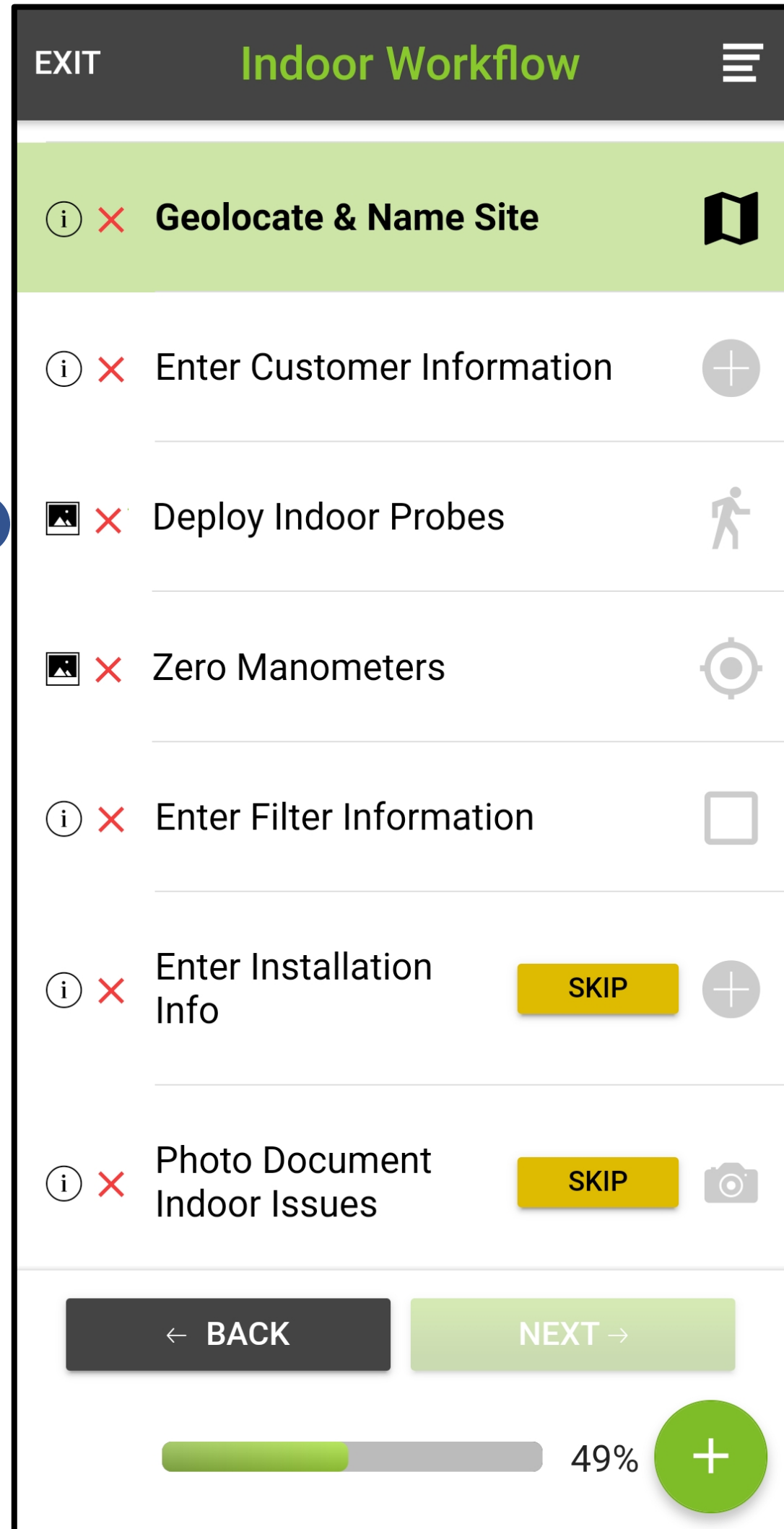
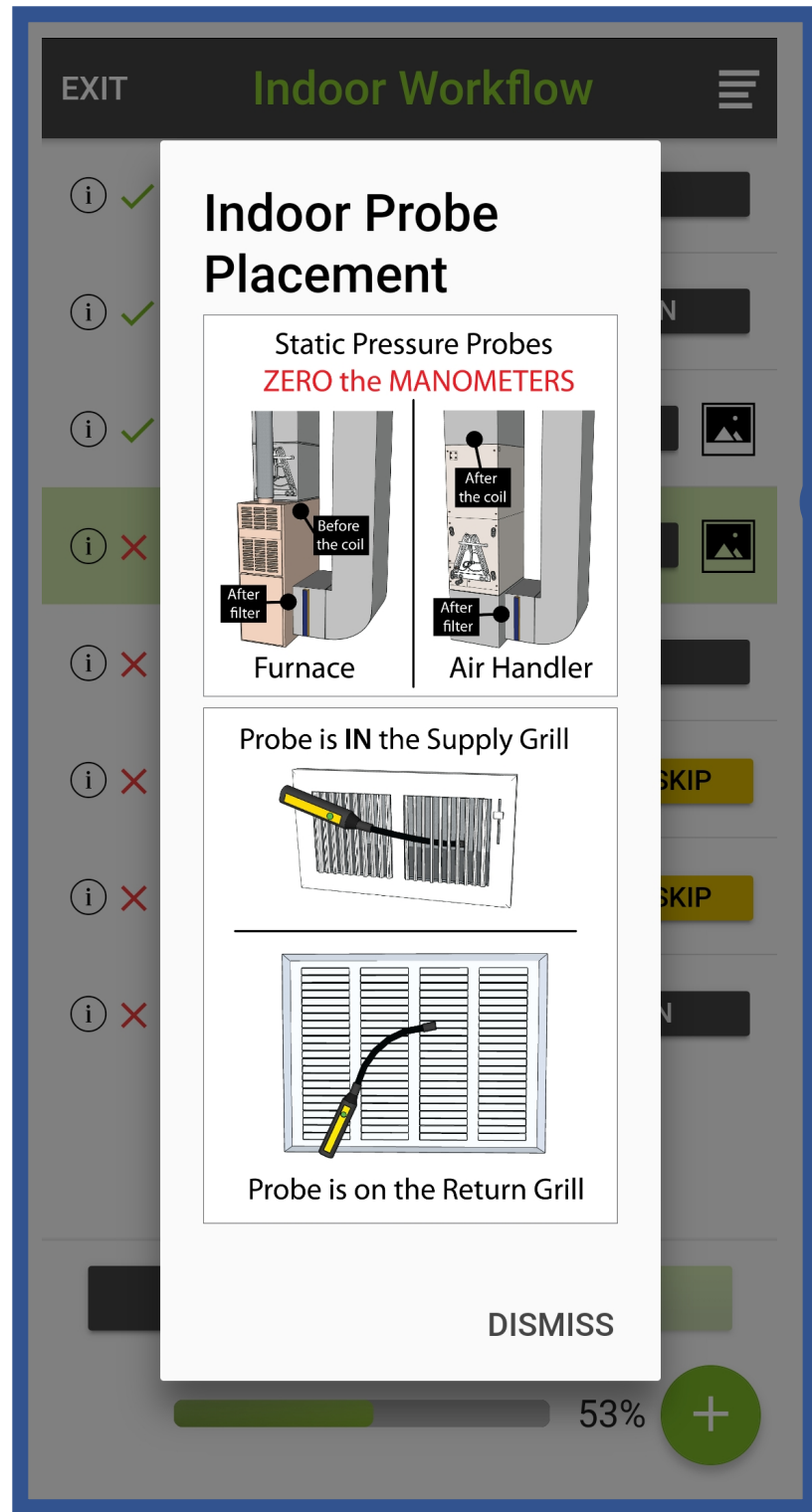
Certificate / Job Number: _____
Home Address: _____

Technician: _____ Date: _____
Contractor Company: _____
System Location: _____
System Description: _____

YOUR ESVI PROGRAM IS SPONSORED BY:



Guided Workflows



Reporting Documentation

- Measurements and Calculations
- Test in/Test out
- Pass/Fails for subsystems
- Corrective Actions
- Photo documentation
- Geo Location
- New QR Code verification



A/C System Vitals Report
YOUR SYSTEM SCORE: 100% A+
Refrigerant Charge: Superheat: 13.0 °F, Subcooling: 9.7 °F
Heat Transfer: Condenser Approach: 4.2 °F, Temperature Split: 19.1 °F
Air Distribution & Filtration: Total External Static Pressure: 0.57 inH2O, Filter Face Velocity: 240.8 FPM
Subsystem Review: No system-wide issues were detected.

Score Breakdown
Efficiency Losses: 0
Temperature Split Losses: 0
Pressure Losses: 0
Air Losses: 0
Refrigerant Charge Losses: 0
System Score: 100% A+

Report Information
A/C System Vitals Score combines the cooling performance, age degradation, initial SEER and capacity, and static pressure of the duct system into a single grade.
The report includes a comprehensive list of mechanical equipment and several subsystems including the control, electrical, air distribution, air conditioning, and condensate disposal systems. Servicing and/or replacing the mechanical equipment without addressing the underlying issues can lead to premature equipment failure.
Systems are designed to last between 10 and 15 years but only when properly installed. System life is dramatically impacted by poor installation or long deferred maintenance.
Systems that are 10 years or more are typically considered excellent candidates for repair.
Systems under 10 years may require significant repairs. These systems may be better candidates for replacement.
Refrigerant Charge (Superheat and Subcooling)
Refrigerant charge is the amount of refrigerant to sufficiently "charge" the equipment. Moreover, these same calculations may further indicate refrigerant leakage and contamination.
Superheat and Subcooling are used to determine if the refrigerant is properly charged. Superheat is the temperature difference between the evaporator coil and the condenser coil. Subcooling is the temperature difference between the condenser coil and the evaporator coil. Superheat and Subcooling are used to determine if the refrigerant is properly charged. Superheat and Subcooling are used to determine if the refrigerant is properly charged.
Approach and Temperature Split
A high approach has heat rejection issues. This can be the result of a refrigerant undercharge, overcharge, or a non-condensable, condenser clearances, and/or condenser air return with a high approach may also have a low temperature return to the metering device through the liquid line.
Refrigerant Charge Losses
Refrigerant charge losses can be the result of a refrigerant undercharge, overcharge, or a non-condensable, condenser clearances, and/or condenser air return with a high approach may also have a low temperature return to the metering device through the liquid line.
System Score
The System Score is a proprietary scoring system to grade the system based on the results of the measurements and calculations. The score is based on the results of the measurements and calculations. The score is based on the results of the measurements and calculations.

Measurement Details
YOUR SYSTEM SCORE: 100% A+
Outdoor Measurements: Low Pressure (PSIG): 119.2, High Pressure (PSIG): 237.8, Suction Line Temp (°F): 70.7, Liquid Line Temp (°F): 66.5, Outdoor Air Temp (°F): 13.0, Superheat (°F): 9.7, Subcooling (°F): 1.9, Compressor Ratio: 240.0, Cond. Volts: 4.3, Cond. Amps: 0.97, Cond. Power Factor: 100.5, Cond. Power (W): 105.5
Indoor Measurements: Return Temp (°F): 68.1, Return %RH (%): 32.5, Return Wet Bulb (°F): 52.0, Supply Temp (°F): 62.0, Supply %RH (%): 67.4, Supply Wet Bulb (°F): 67.4, Est. Airflow (SCFM): 240.0, TESP (inH2O): 0.57, AHU Volts: 1.1, AHU Amps: 0.99, AHU Power Factor: 264, AHU Power (W): 264
System Info & Weather: System Type: Split, System Tonnage (Tons): 1.5, Normal Tonnage (Tons): R410A, Rated Airflow: 400, SEER: 13-16, Metering Device: Piston, Air Handler: R410A, Elevation (ft): 14,113, System Benchmark: 14,113, System Stability: Stable
Performance Calculations: Normal Capacity (Tons/Btu/h): 1.5 / 18,000, Normalized Capacity (Tons/Btu/h): 1.4 / 16,400, Actual Capacity (Tons/Btu/h): 1.1 / 13,451 (82% Normalized), Serviceable Capacity (Tons/Btu/h): 1.1 / 13,451 (101% Normalized), Latest Capacity (Tons/Btu/h): 0.0 / 0 (0% Normalized), Latent Capacity (Tons/Btu/h): 1.0, Sensible Heat Ratio: 19.1, Temp Split Target (°F): 0.9, Temp Split (°F): 0.4, Dehumidification (lb/h): 1269, Fan Efficiency (W/SCFM): 10.6, Total Power (W): 11.8, EER: 11.8, Approx. SEER: 11.8

Corrective Measures
YOUR SYSTEM SCORE: 100% A+
System Information: Coordinates: 41.05704, -81.40254, Condenser: GMC V5X130181EL, SN: 1500036516, Air Handler: GMC ARUP25B14AC, SN: 2009176230
System Profile: System Type: Split, System Tonnage: 1.5, Refrigerant: R410A, Normal Airflow: 400, SEER: 13-16, Metering Device: Piston, System Benchmark: Yes, System Stability: Stable
Corrective Actions: Indoor Equipment: Verified adequate clearance to combustibles, Verified adequate clearance for service, Cooling Capacity: Resolved maintenance issues, Resolved airflow issues, Cooling Efficiency: Operation satisfactory

Project Photos
Electrical System, Air Distribution System

mQ Pro Report

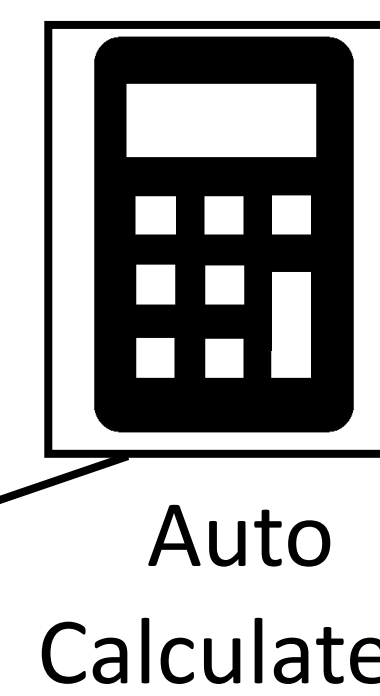
Documented Measurements

- Direct Measurements and Calculations
- Confirmation of device
- Serial number / calibration
- Documented in mQ Cloud and sharable PDF



Red Fish Electrical meter

Outdoor Measurements		
Low Pressure (PSIG/°F):	120.2 / 40.4	
High Pressure (PSIG/°F):	282.2 / 91.6	
Suction Line Temp (°F):	49.4	
Liquid Line Temp (°F):	76.2	
Discharge Line Temp (°F):	138.1	
Outdoor Air Temp (°F):	70.5	
Superheat (°F):	9.0	
Subcooling (°F):	15.5	
Compression Ratio:	2.2	
Condenser Voltage:	242.0	
Condenser Amperage:	4.7	
Condenser Power Factor:	0.97	
Condenser Power (W):	1,113	



Measurement Details

Jim Bergmann
3425 Gilchrist Road
Mogadore, OH 44260

Date of Service: 4/18/2022
Time of Service: 8:30:14 AM

YOUR SYSTEM SCORE
100% A+

Outdoor Measurements

Low Pressure (PSIG)	119.2	
High Pressure (PSIG)	237.8	
Suction Line Temp (F)	52.9	
Liquid Line Temp (F)	70.7	
Discharge Line Temp (F)	--	
Outdoor Air Temp (F)	66.5	
Superheat (F)	13.0	
Subcooling (F)	9.7	
Compression Ratio	1.9	
Cond. Volts	240.0	
Cond. Amps	4.3	
Cond. Power Factor	0.97	
Cond. Power (W)	1005	

Indoor Measurements

Return Temp (F)	68.1	
Return %RH (%)	32.5	
Return Wet Bulb (F)	52.0	
Supply Temp (F)	49.0	
Supply %RH (%)	60.2	
Supply Wet Bulb (F)	42.7	
Est. Airflow (SCFM)	674	
TESP (inH2O)	0.57	
AHU Volts	240.0	
AHU Amps	1.1	
AHU Power Factor	0.99	
AHU Power (W)	264	

System Info & Weather

System Type	Split
Nominal Tonnage (Tons)	1.5
Refrigerant	R410A
Rated Airflow	400
SEER	13-16
Metering Device	Piston
Atmos. Pressure (psia)	14.113
Elevation (ft)	1116
Benchmarked	Yes
System Stability	Stable

Performance Calculations

Nominal Capacity (Tons/Btuh)	1.5 / 18,000
Normalized Capacity (Tons/Btuh)	1.4 / 16,400
Actual Capacity (Tons/Btuh)	1.1 / 13,451 (82% Normalized)
Sensible Capacity (Tons/Btuh)	1.1 / 13,451 (101% Normalized)
Latent Capacity (Tons/Btuh)	0.0 / 0 (0% Normalized)
Sensible Heat Ratio	1.0
Temp Split Target (F)	19.9
Temp Split (F)	19.1
Dehumidification (lb/hr)	0.9
Fan Efficacy (W/SCFM)	0.4
Total Power (W)	1269
EER	10.6
Approx. SEER	11.8

END

