# American Society of Home Inspectors Northern New England Chapter

# Trends in the HVAC Industry


## Brad Keyes

**brad.keyes@keyesweb.com**

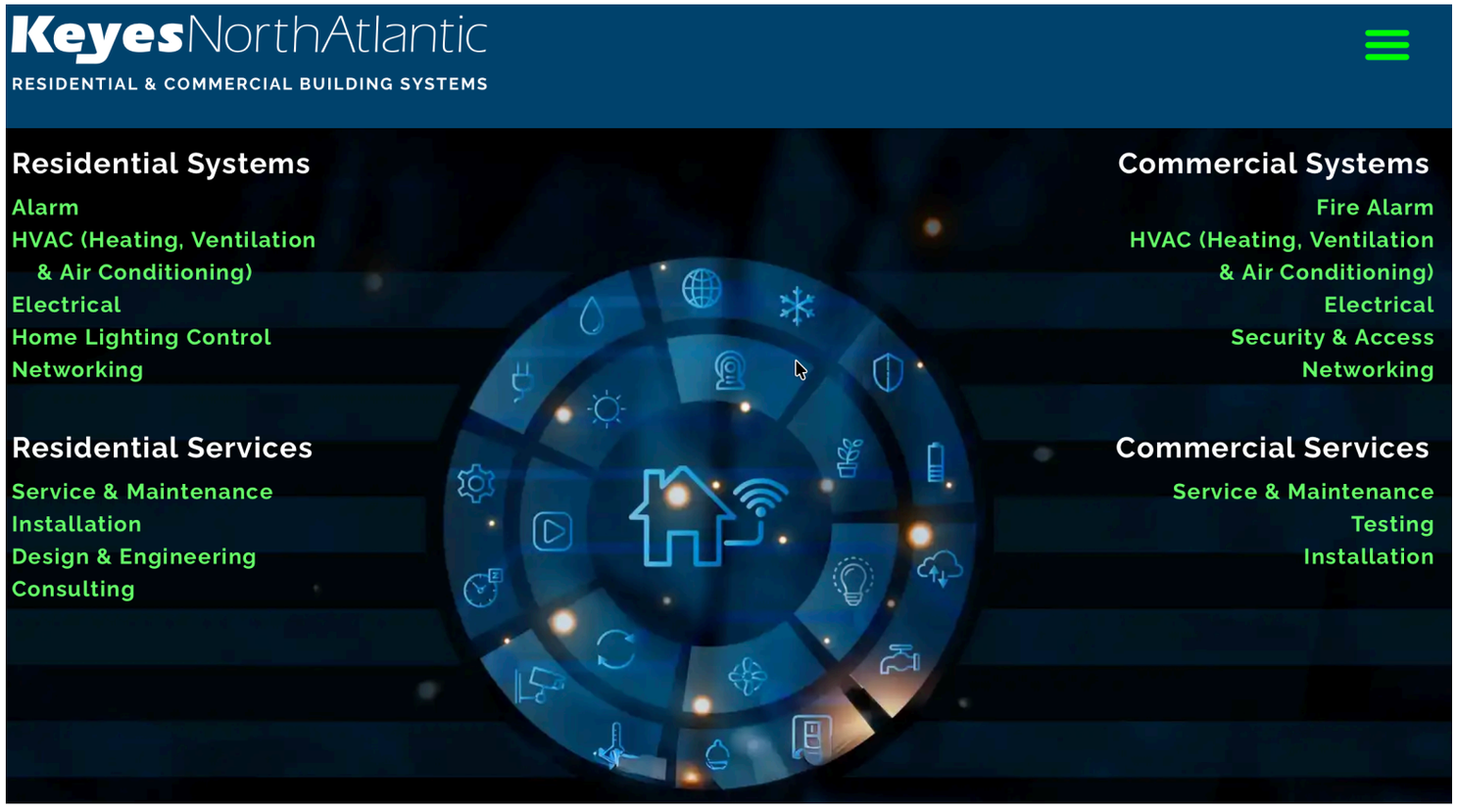
**www.keyesweb.com**


## Trends in HVAC 2025

Keyes North Atlantic

ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Presentation at keyesweb.com/ashi




## https://www.keyesweb.com/ashi

## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Statistics **Credit to ACCA**

Air Conditioning Contractors of America - ACCA
2025 Contractors of the Future Study
https://www.acca.org

Data based on 1,000+ respondents

60% family-owned 1st generation
27% family owned – 2nd or 3rd generation
6% private equity
5% corporate/franchise
2% ESOP

# Statistics Credit to ACCA

## Ducted 69%

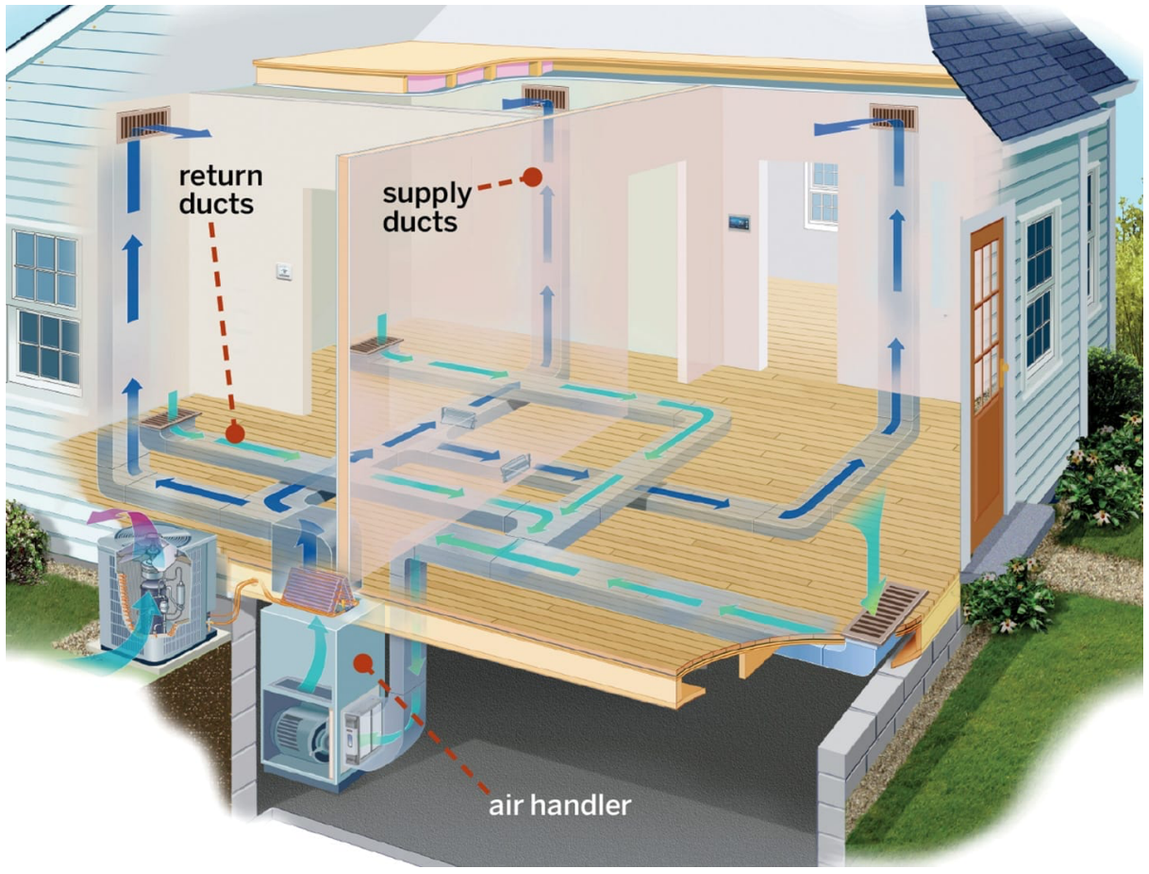



Illustration by Ian Worpole

## Ductless 31%

Photo by Modernize.com

## Trends in HVAC 2025

# Statistics Credit to ACCA

**Types of Heat Pumps Installed by the Respondents**

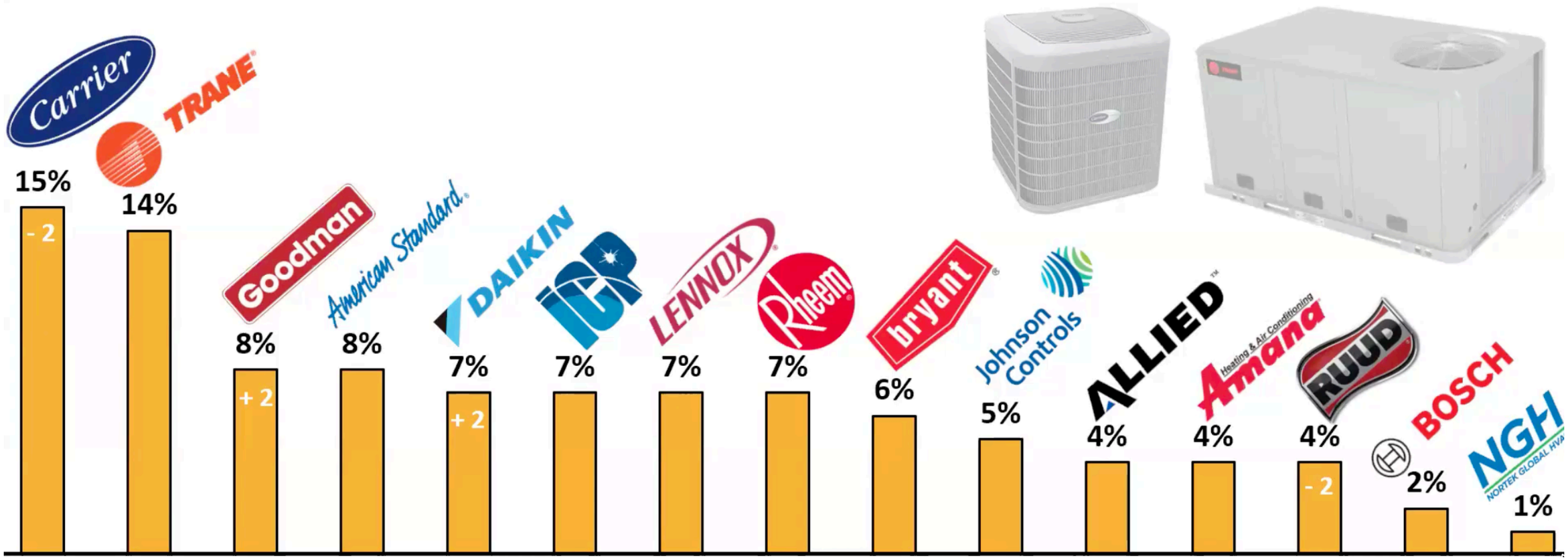
13% air-to-water
81% air-source
34% hybrid – HP with furnace or boiler
15% water source – more prevalent on the commercial side
16% ground source (geothermal)

# Statistics Credit to ACCA

**Equipment Efficiency**
43% average base model 13-14 SEER
28% mid-tier 15-16 SEER
20% premium 17-20 SEER
9% premium plus model 21+ SEER

# Statistics Credit to ACCA

## Brand Distribution - Ducted Systems

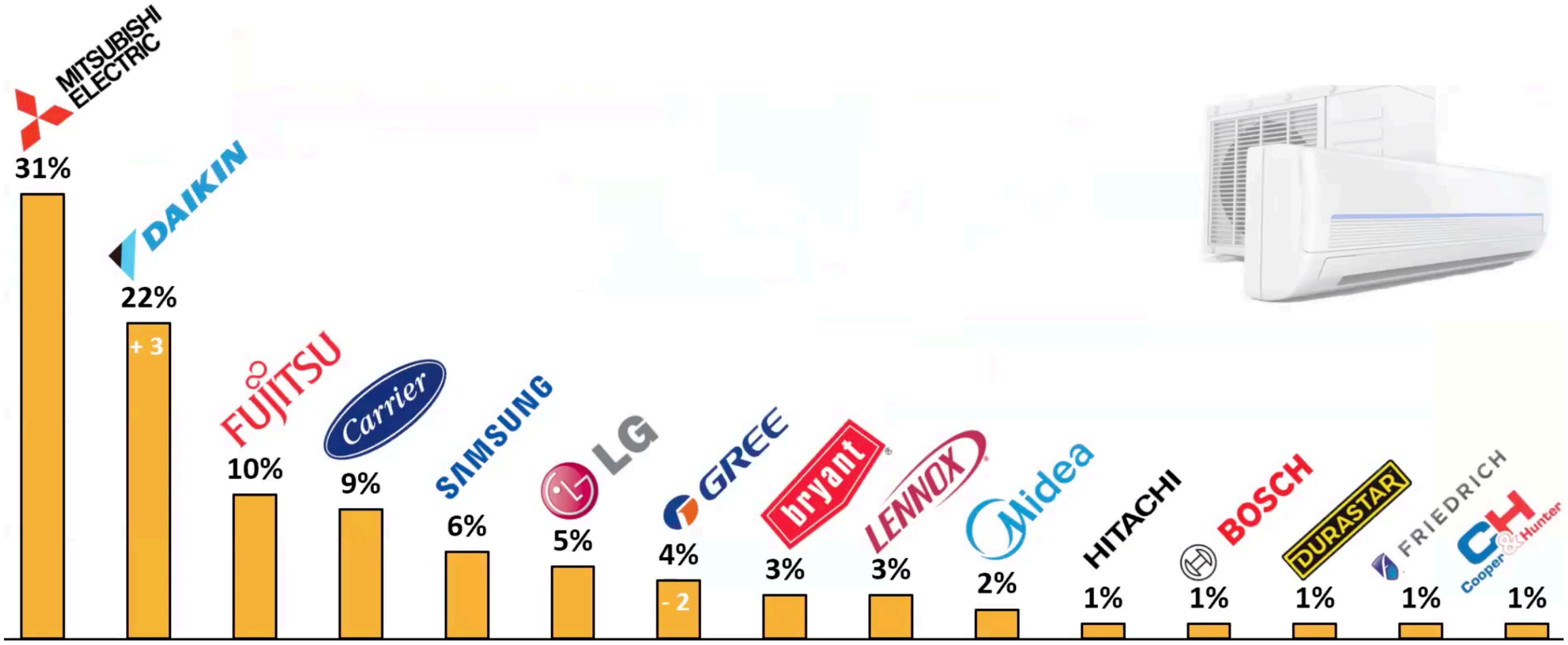



## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Statistics Credit to ACCA

## Brand Distribution - Ductless Systems






## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Statistics Credit to ACCA

## Boilers

CONTRACTOR OF THE FUTURE

FCG FARMINGTON CONSULTING GROUP ACCA

### Top 6 Preferred Boiler Brands by HVAC Contractors

#1) Lochinvar® 24%

#2) WEIL-McLAIN 19%

#3) KD NAVIEN 18%

#4) U.S. Boiler Company 10%

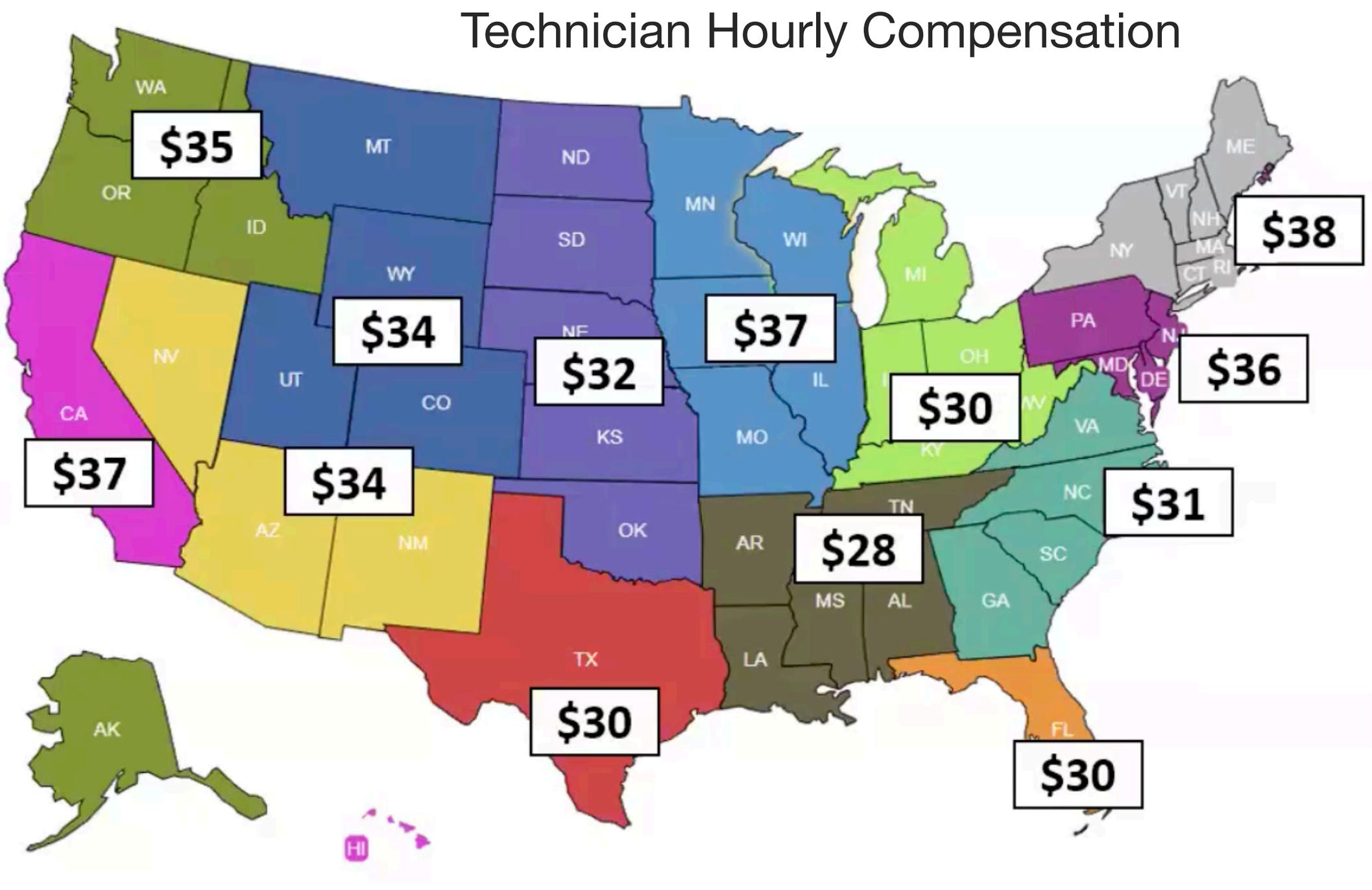
#5) BOSCH 6%

#6) VIESMANN 4%

## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

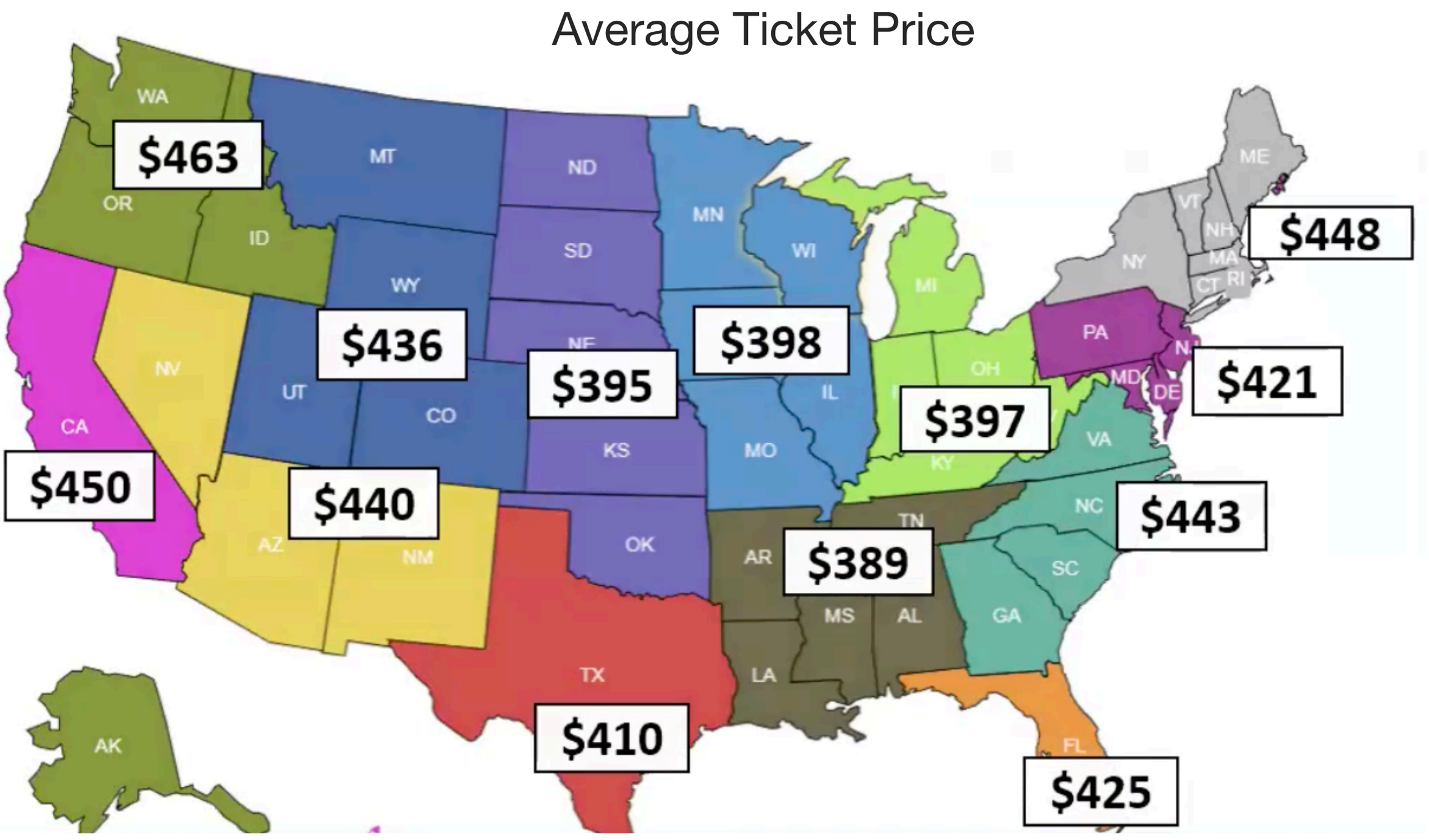
# Statistics Credit to ACCA




# Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Statistics Credit to ACCA

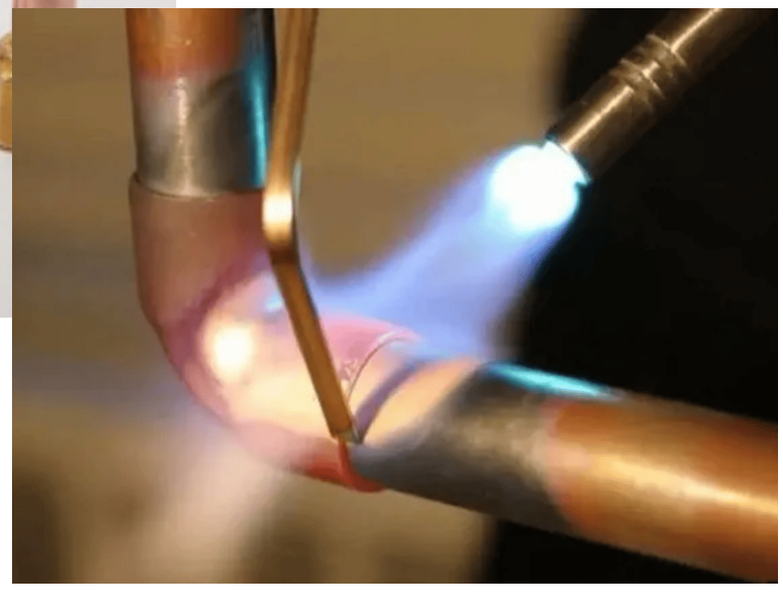



## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

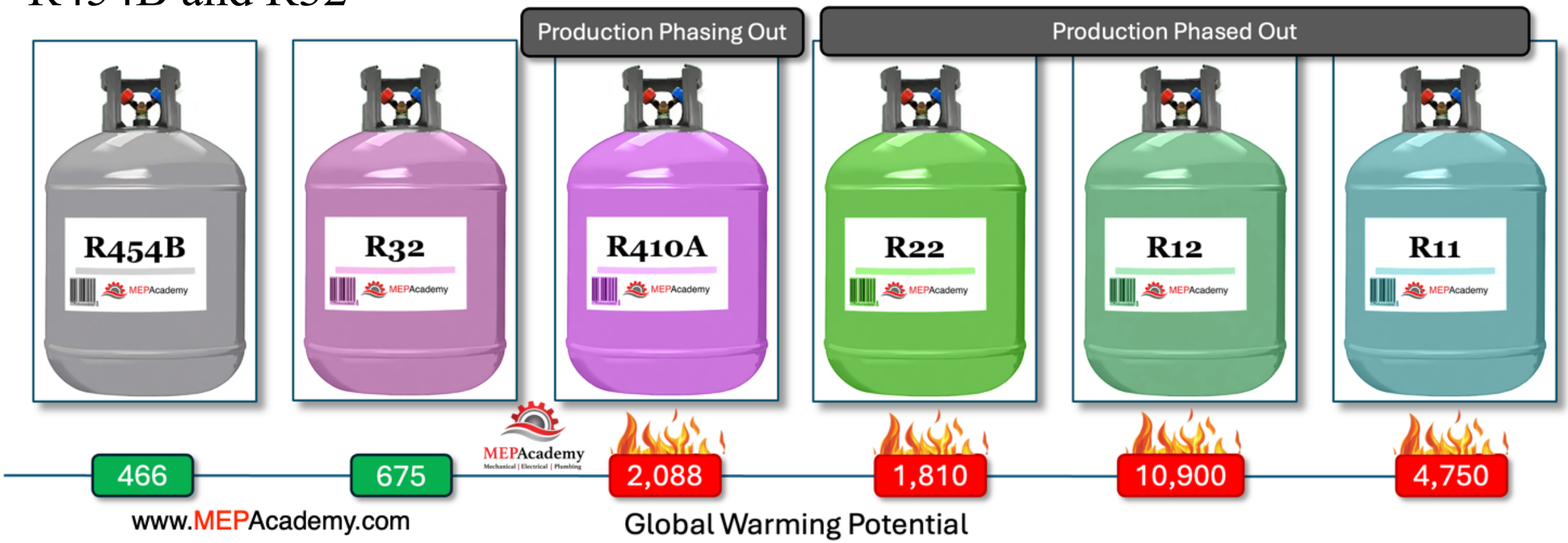
# Statistics Credit to ACCA

## Press fittings versus brazing - 41% today and estimated to be 62% in 2027



# Refrigerants

R454B and R32




May 2025 Pricing

| | |
|---|---|
| R22 | $ 33.20 per LB |
| R410A | $ 11.85 per LB |
| R32 | $ 17.87 per LB |
| R454B | $ ??.?? |

**Trends in HVAC 2025**

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Refrigerants

R454B Cylinder scarcity due to value manufacturing problems

# Refrigerant Recovery


## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Refrigerant Recovery


Vacuum pump


Recovery machine

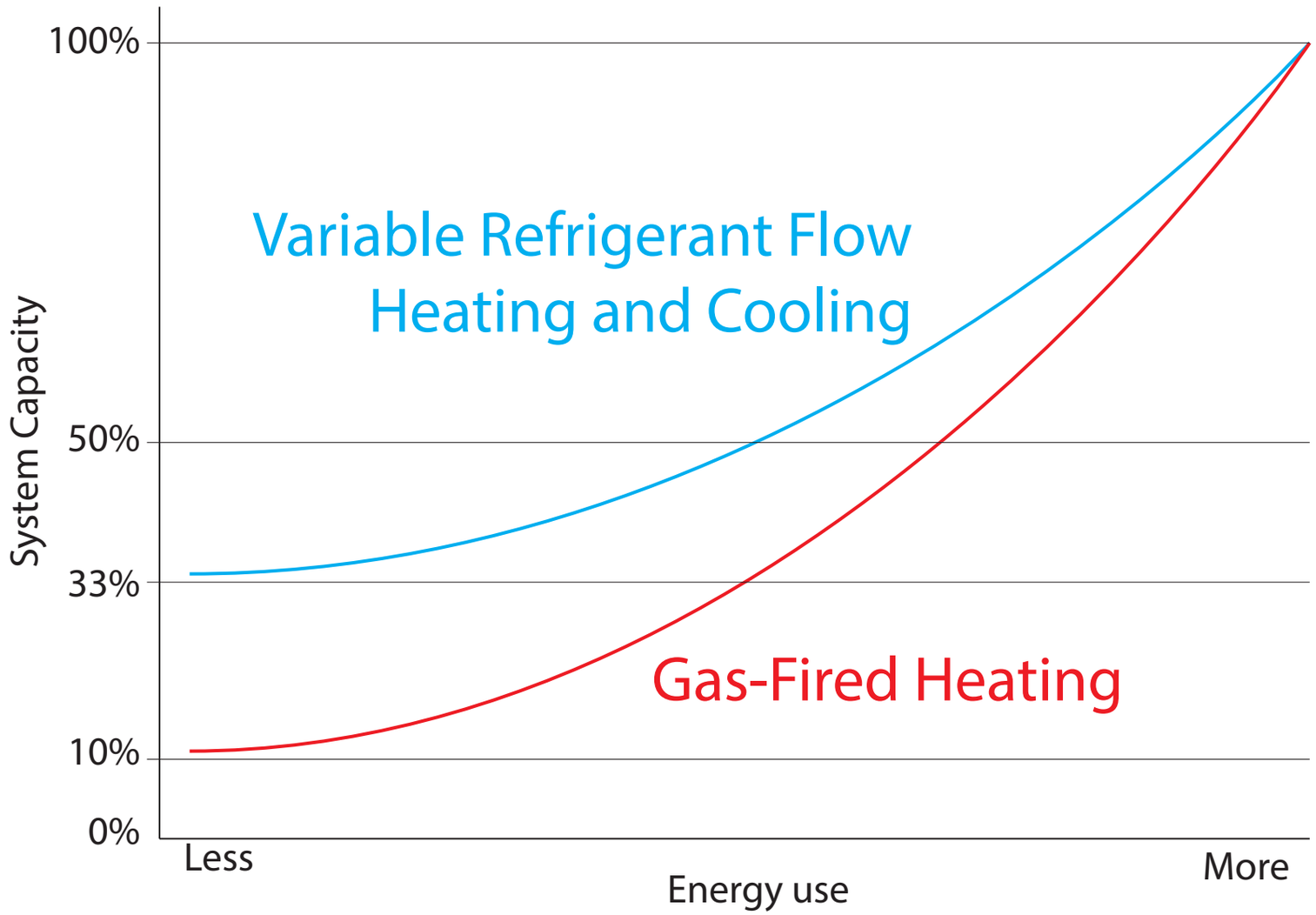
Recovery cylinder

**Trends in HVAC 2025**

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Variable System Capacity

The systems that operate most efficiently vary the power use in proportion to the varying demand



# Thermostats

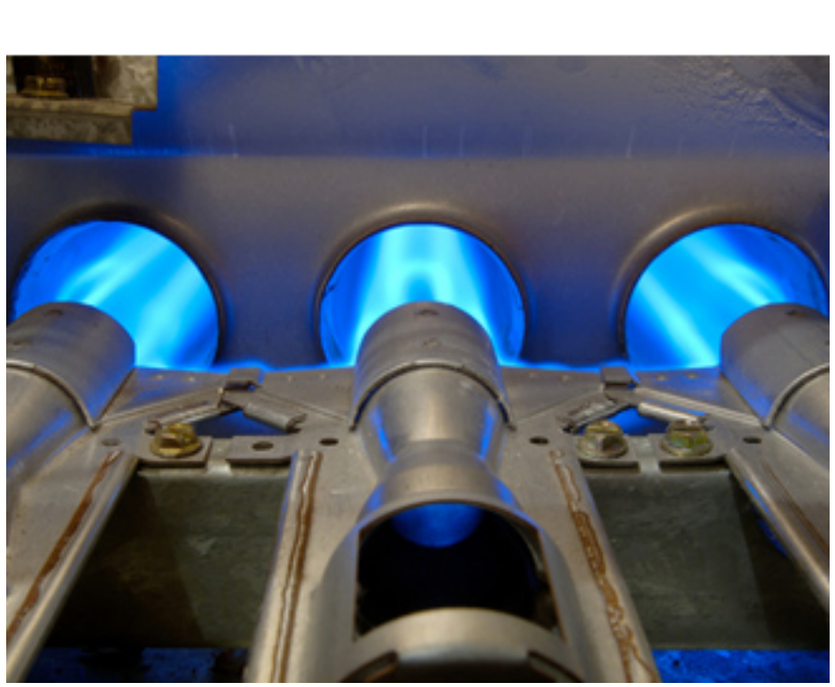
Linear thermostat


The display shows temperature as a single “degree” while the device sends a “linear” signal to the main controller

# Gas Burners

100% on or off - atmospheric burner

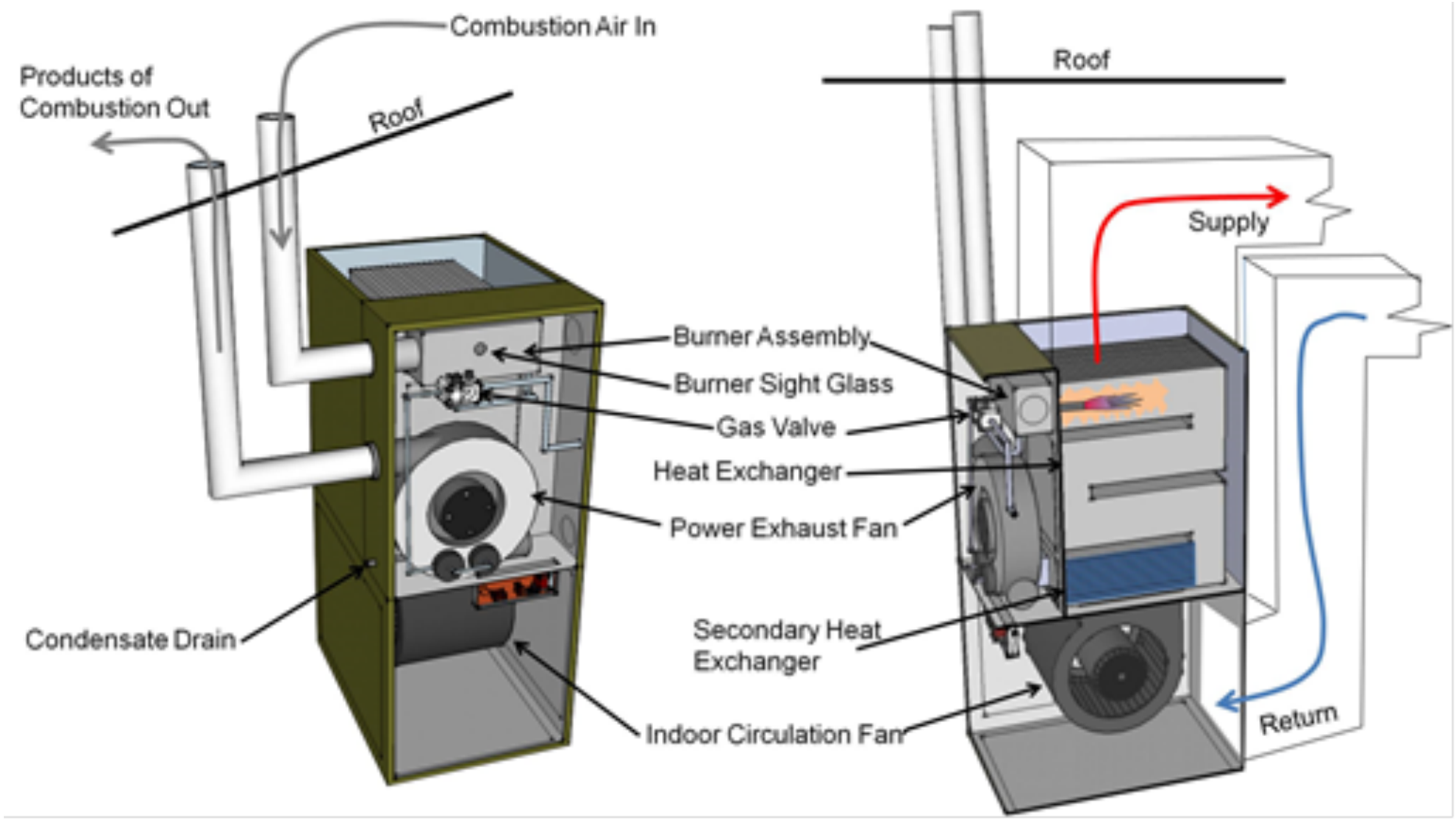
Gas ignition assembly



Gas valve feeding burner logs in an open “atmospheric” chamber

# Gas Burners

## Sealed Combustion




Gas and air are “injected” into the sealed burner assembly

# Gas Burners

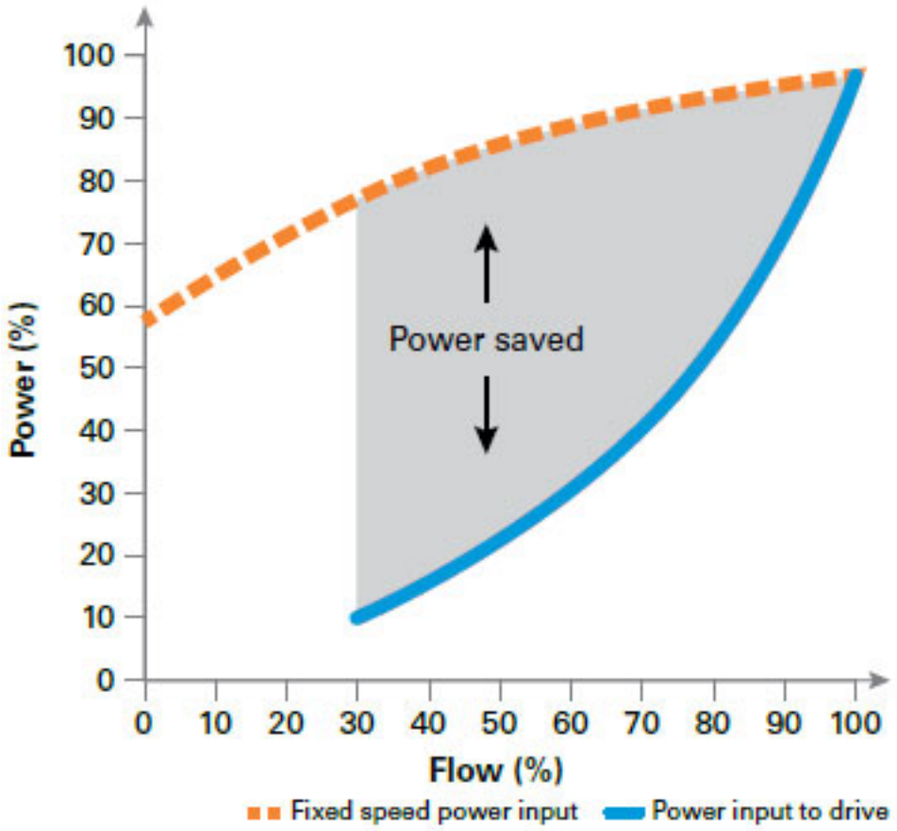
## Variable Capacity - Sealed Combustion

| Model Number | Input MBH Max | Input MBH Min | AFUE% | Heating Capacity MBH | Net MBH |
|---|---|---|---|---|---|
| KHB055N | 55 | 6.3 | 95.0 | 51 | 44 |
| KHB085N | 85 | 8.5 | 95.0 | 79 | 69 |
| KHB110N | 110 | 11.0 | 95.0 | 102 | 89 |
| KHB155N | 155 | 15.5 | 95.0 | 144 | 125 |
| KHB199N | 199 | 19.9 | 95.0 | 183 | 159 |
| KHB285N | 285 | 28.5 | 95.0 | 264 | 230 |


Gas fuel use range from +/- 10% to 100% of the capacity

# Power Use vs Flow Rate

The power use of variable speed circulators
versus fixed speed circulators





## Trends in HVAC 2025

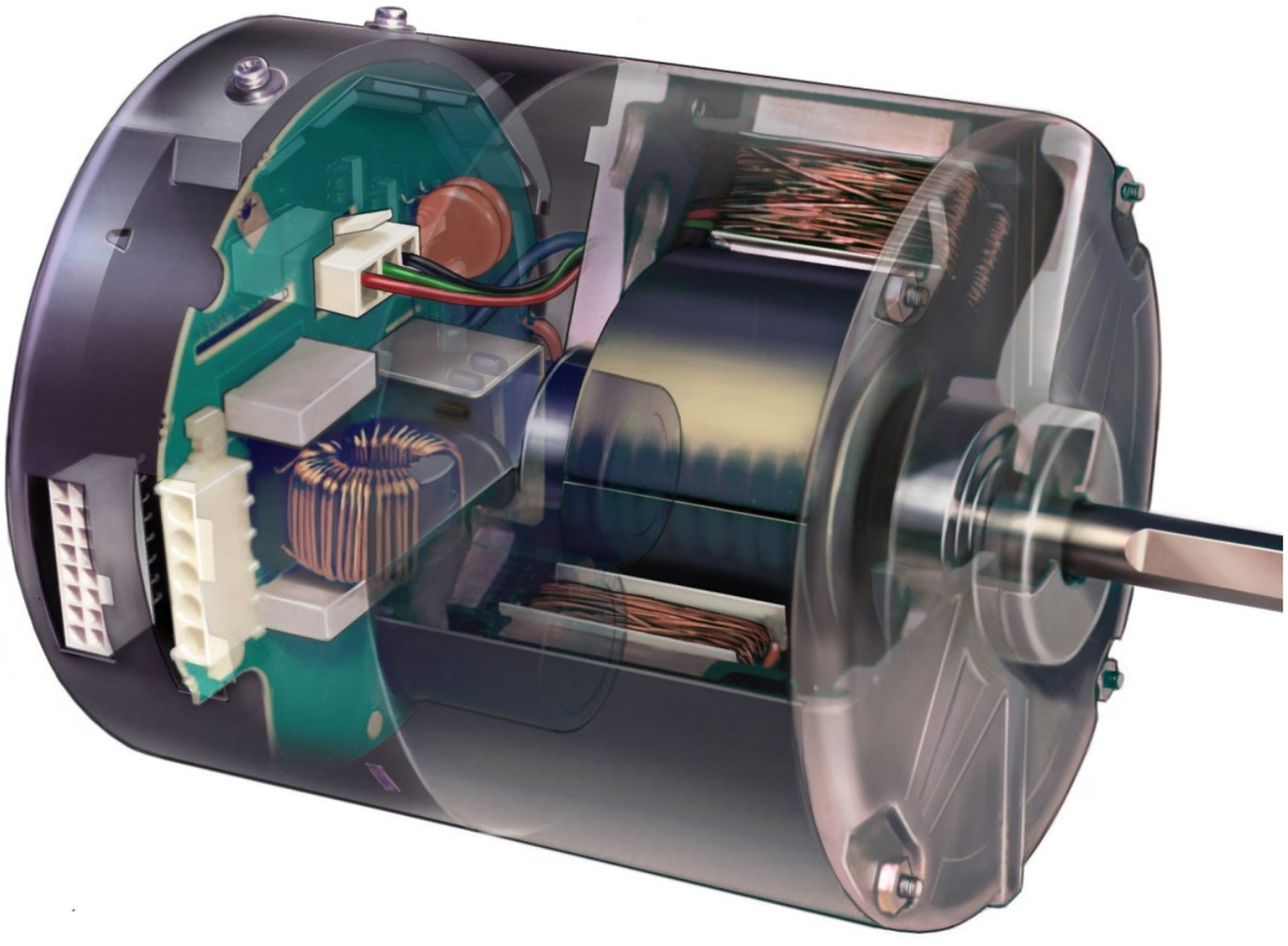
Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

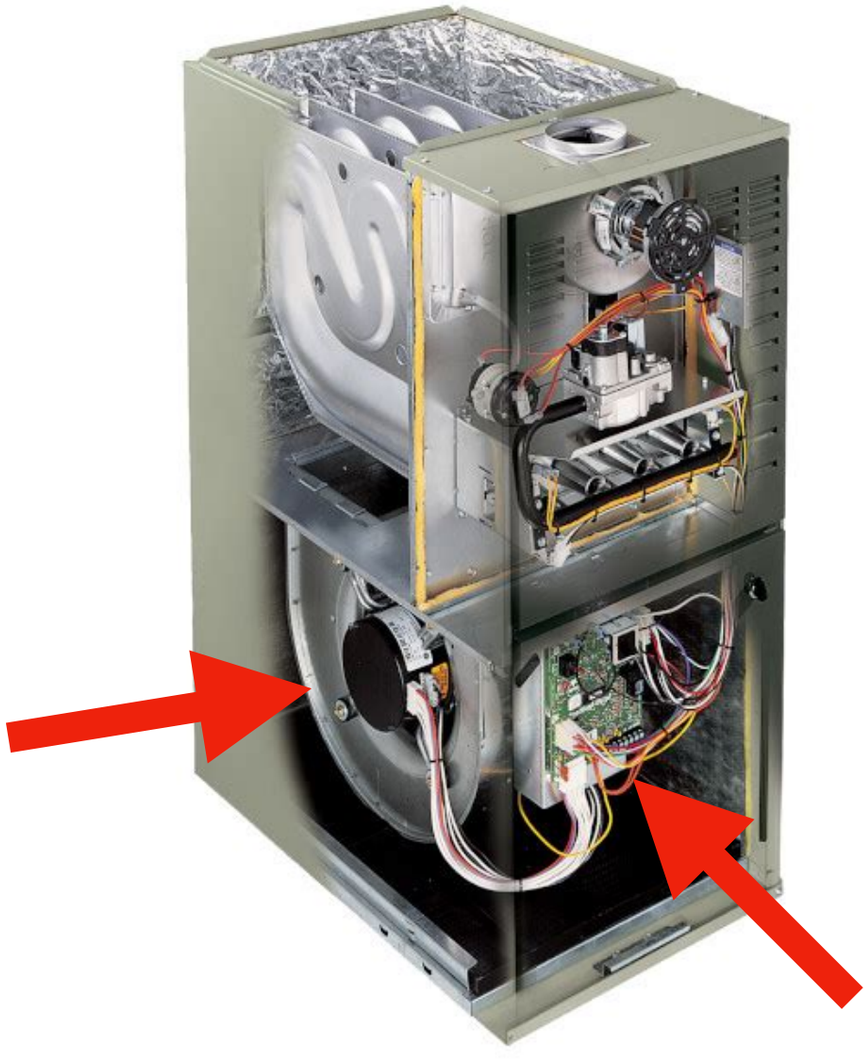
# Variable Flow Rate Circulator

Inside a variable speed
self-adjusting circulator

# Variable Flow Rate Blower Motors

Cut-away of a variable speed blower motor. Motor is controlled by the main processing board for the furnace

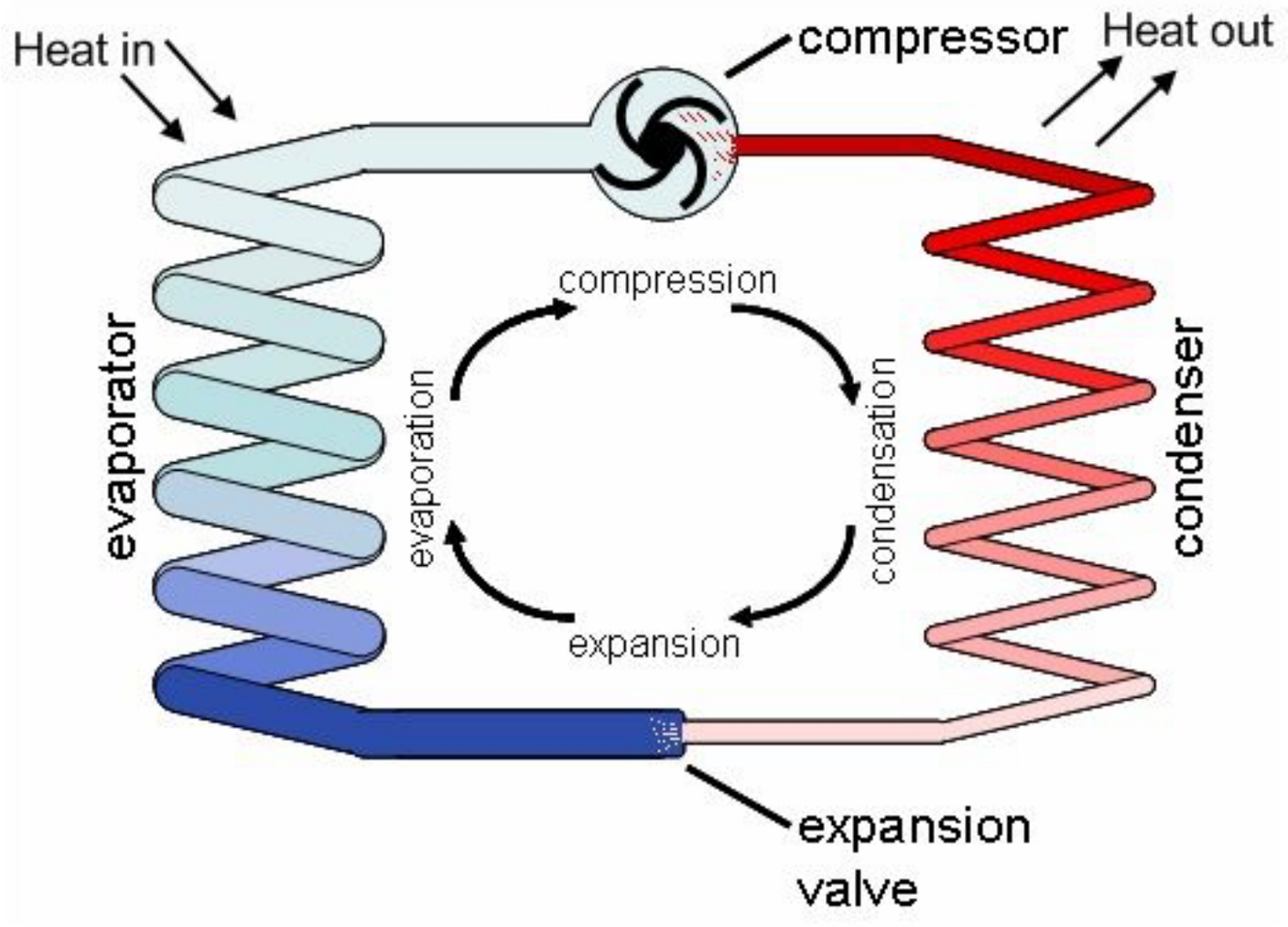




# Refrigerant Cycle

**A refrigerant cycle has four core elements:**

- **compressor**
- **expansion device**
- **a hot coil (condenser)**
- **a cold coil (evaporator)**



# Compressors

The longer and slower a compressor can run, the more efficient it will be

# Linear Expansion Valves

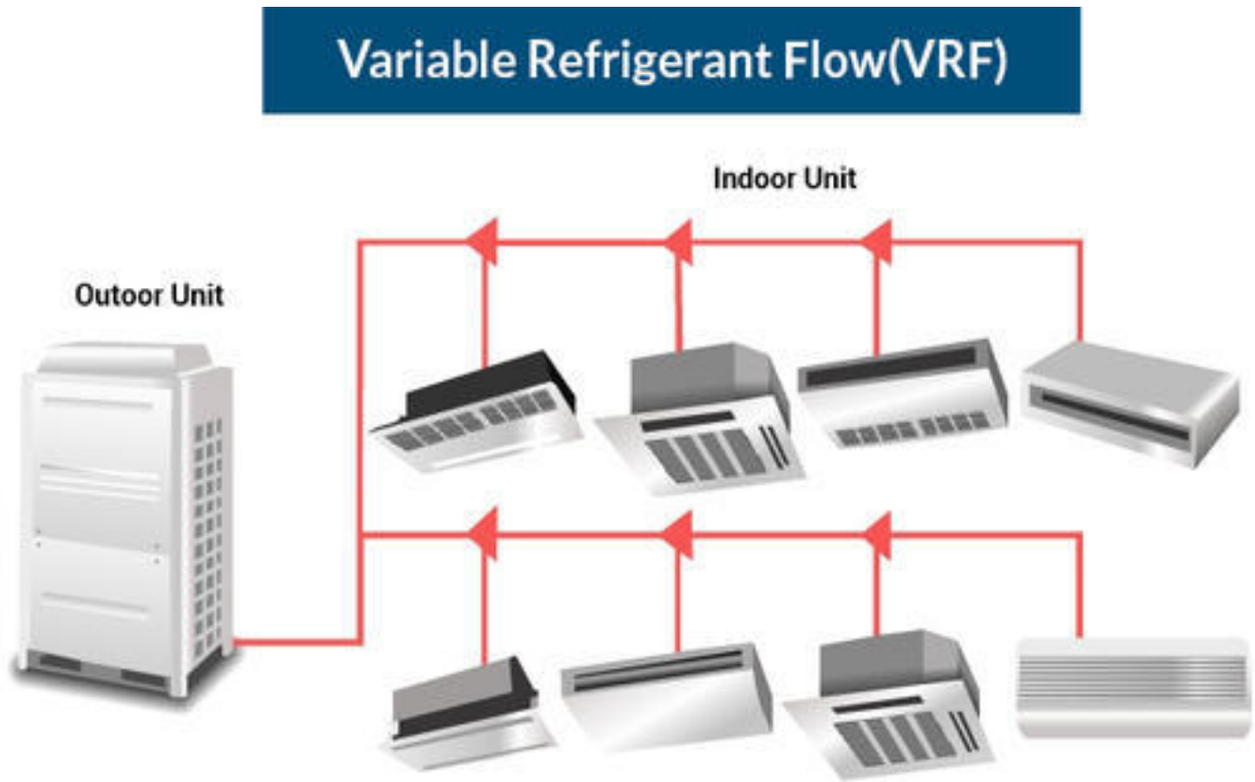
Linear expansion valves vary the flow rate of the refrigerant based on an electrical signal


Linear expansion valves (LEV)

Traditional “mechanical” expansion valve

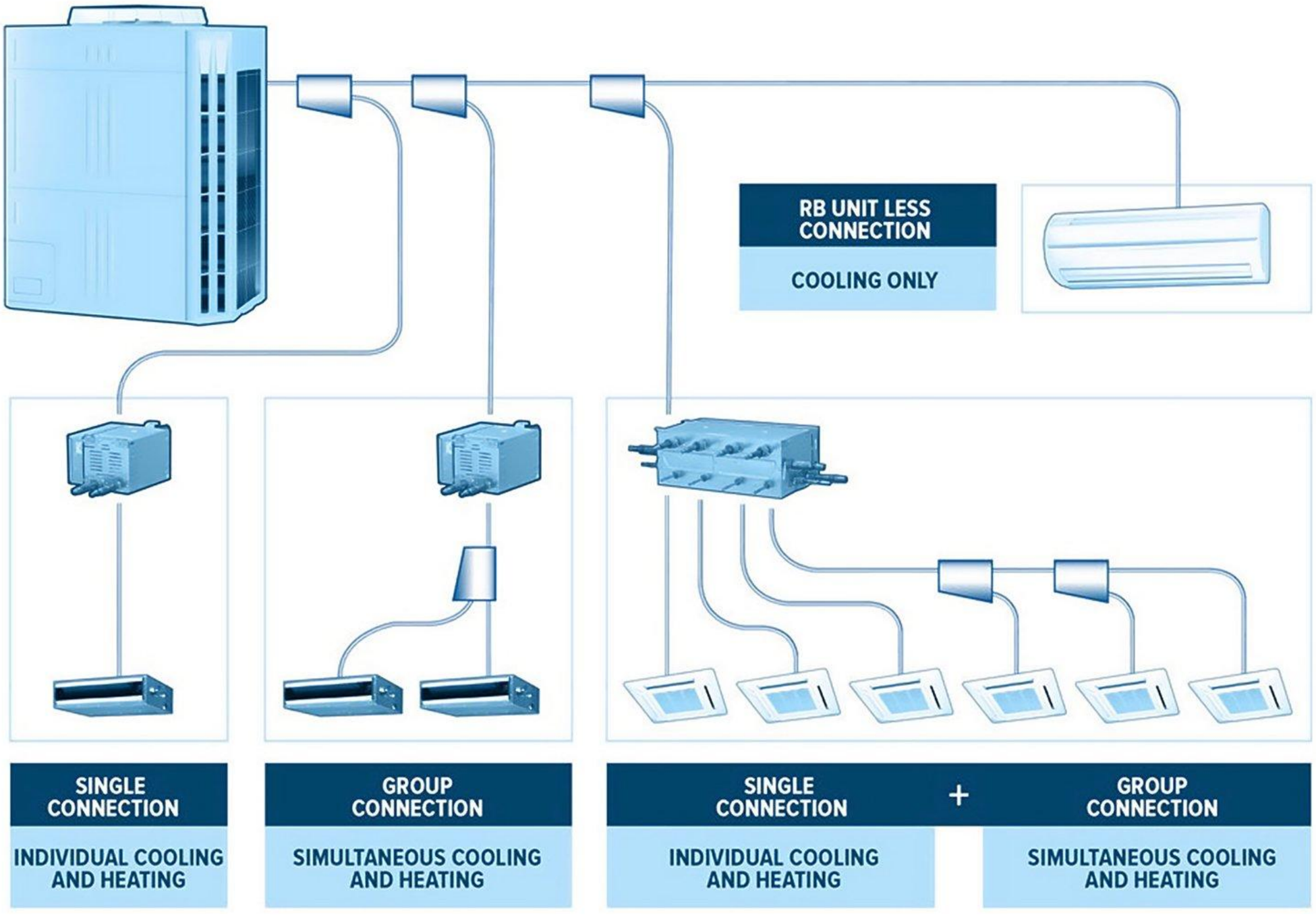
# Variable Refrigerant Flow (VRF)

Variable refrigerant flow allows one outdoor unit
to serve multiple indoor units.




Indoor units can heat or cool. Configurations include
ducted and non-ducted, wall, ceiling and floor-mounted design

# Simultaneous Heat-Cool Variable Refrigerant Flow (VRF)




## Trends in HVAC 2025

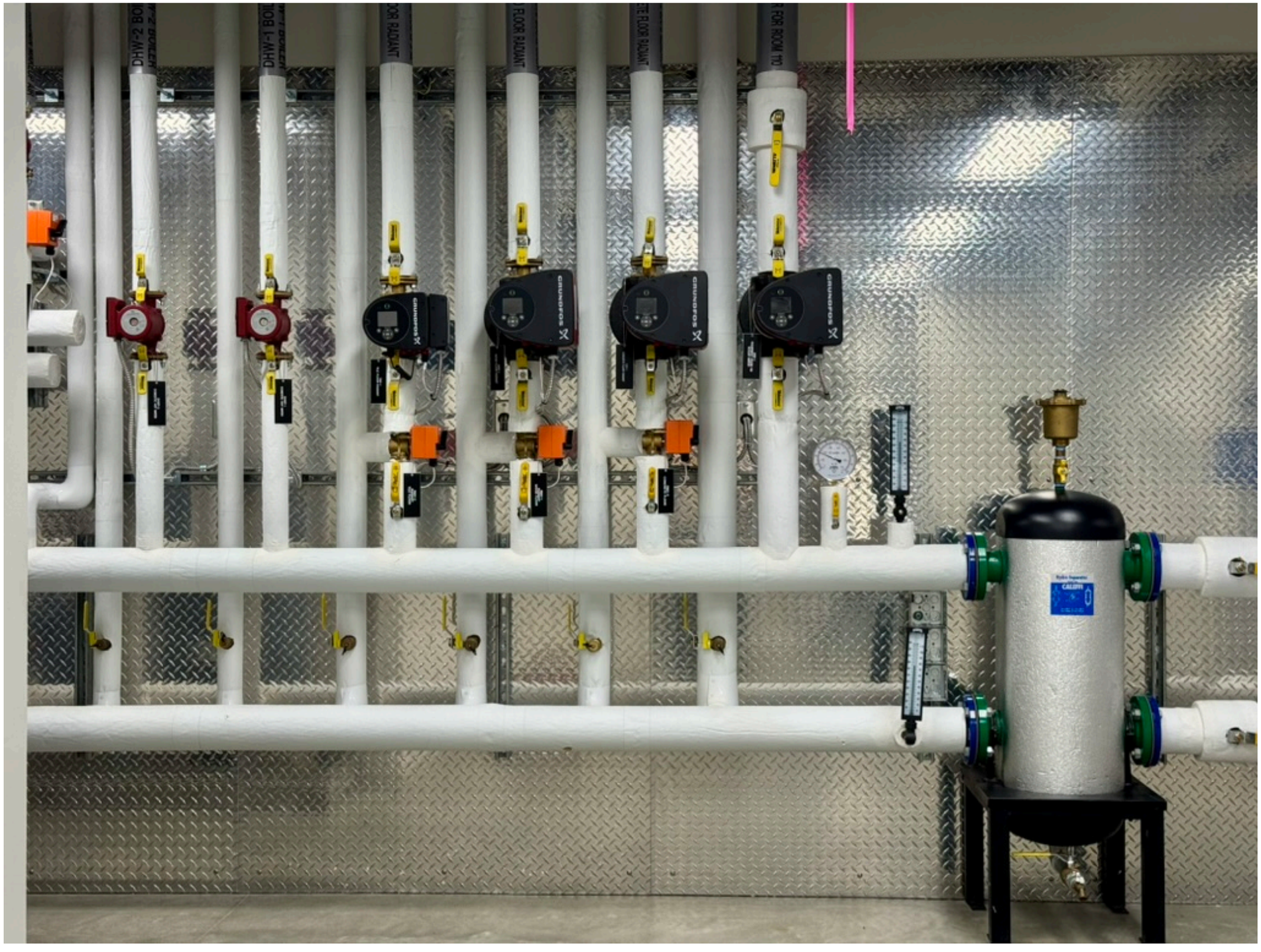
# Indoor air handler for a heat pump system


## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Steam humidifier

# Hydronic Piping




## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Hydronic Heating Manifold


## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING

# Air-to-Water Heat Pump


## Trends in HVAC 2025

Keyes North Atlantic
ELECTRICAL • DATA • ALARM • HEATING • COOLING