

# SMART Variable Capacity Air Conditioners and Heat Pumps

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# Draft AHRI Standard 1380P

## ➤ **Scope: Two-stage and variable capacity AC/HP**

## ➤ **Structure**

- Matrix of signals and equipment responses
- Two Protocols: CTA2045 and OpenADR
- Method of Test

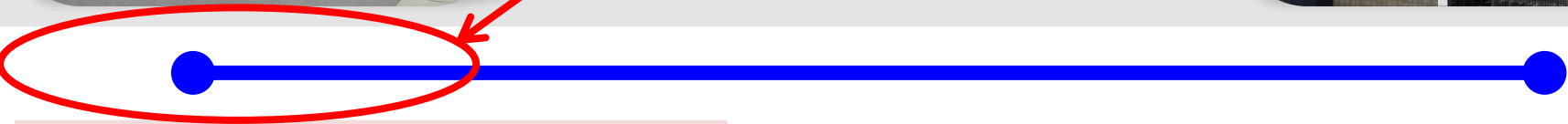
## ➤ **Control of equipment**

- Power draw reduction based on full load, rapidly responding, flexible, and scalable
  - Ex. Curtailment of 30%, 60%, and 100% of full load (EER) power within 5 seconds

# Broad Spectrum of Systems in Buildings



**Focus of  
AHRI, CEE and EPRI  
collaboration to  
develop a Standard**



## High unit volume

- Single family homes
- Small commercial
- Discrete systems
- Unitary AC & HP
- Water heaters

No building EMS

## Demand response

- A few kW per bldg.
- Very high unit volume
- Direct communication with HVAC & WH utilized
- Standardized utility program
- PUC regulated

New a/c and com systems  
**opportunity for  
manufacturers**

## Demand response

- Many kW per bldg.
- Low unit volume
- DR aggregators
- Negotiated contracts

Controls capabilities  
readily available

## Low unit volume

- Large multistory com'l buildings
- Complex systems
- Chillers
- Heat recovery

Sophisticated EMS

# Why Now?

- **Compressor technology is mature**
- **Communications protocols and technology improving**
- **Growing pressure to manage load and increase equipment efficiency**