

# **2013 NASEO ANNUAL MEETING**

## **VRF & VSMS TECHNOLOGY**



**Jay Perkins**  
**Sr. Government Affairs Specialist**

***Mitsubishi Electric is a proud NASEO Affiliate Member***

# Mitsubishi Electric Cooling & Heating

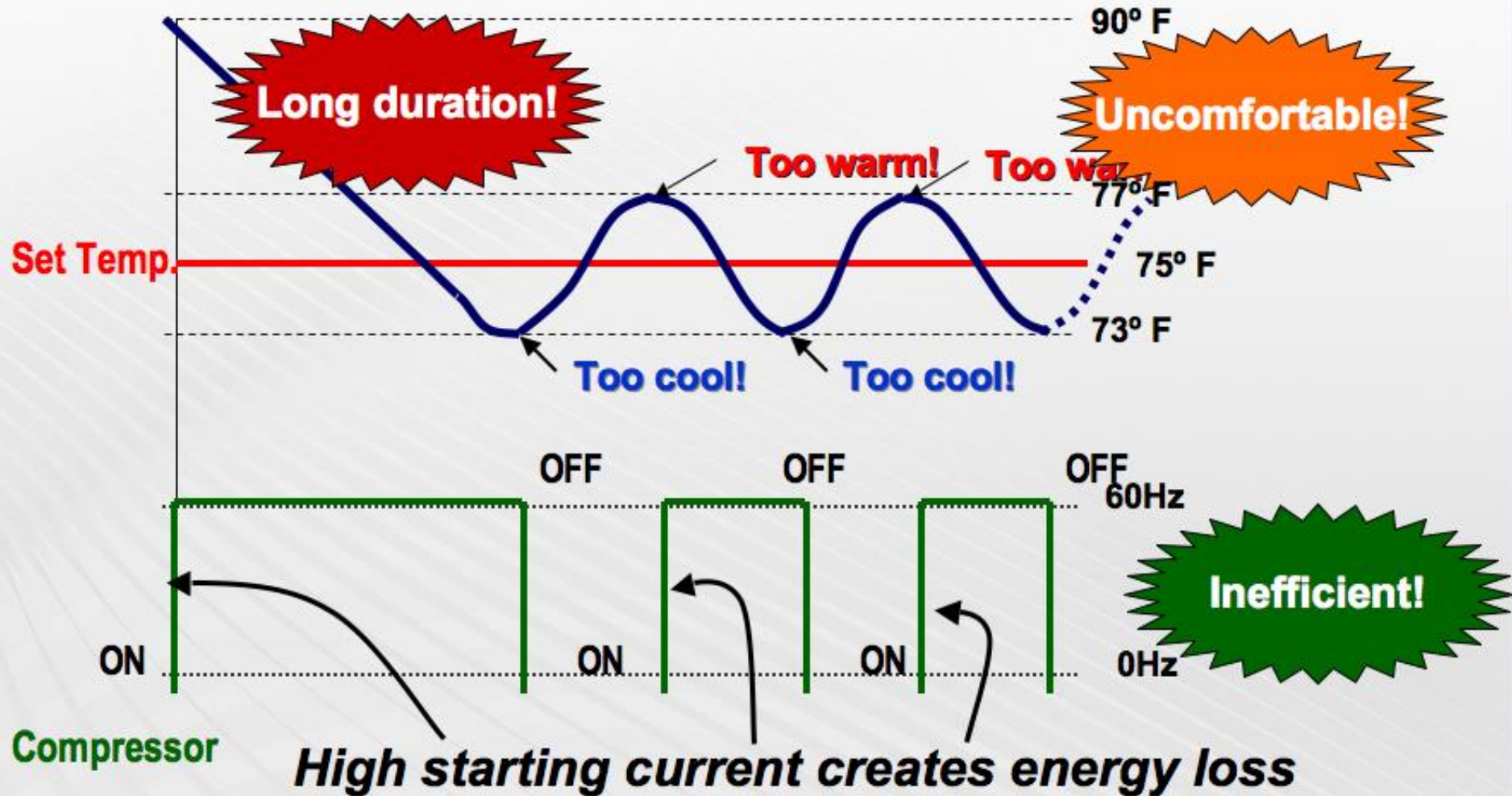
## *A Difference in Design*



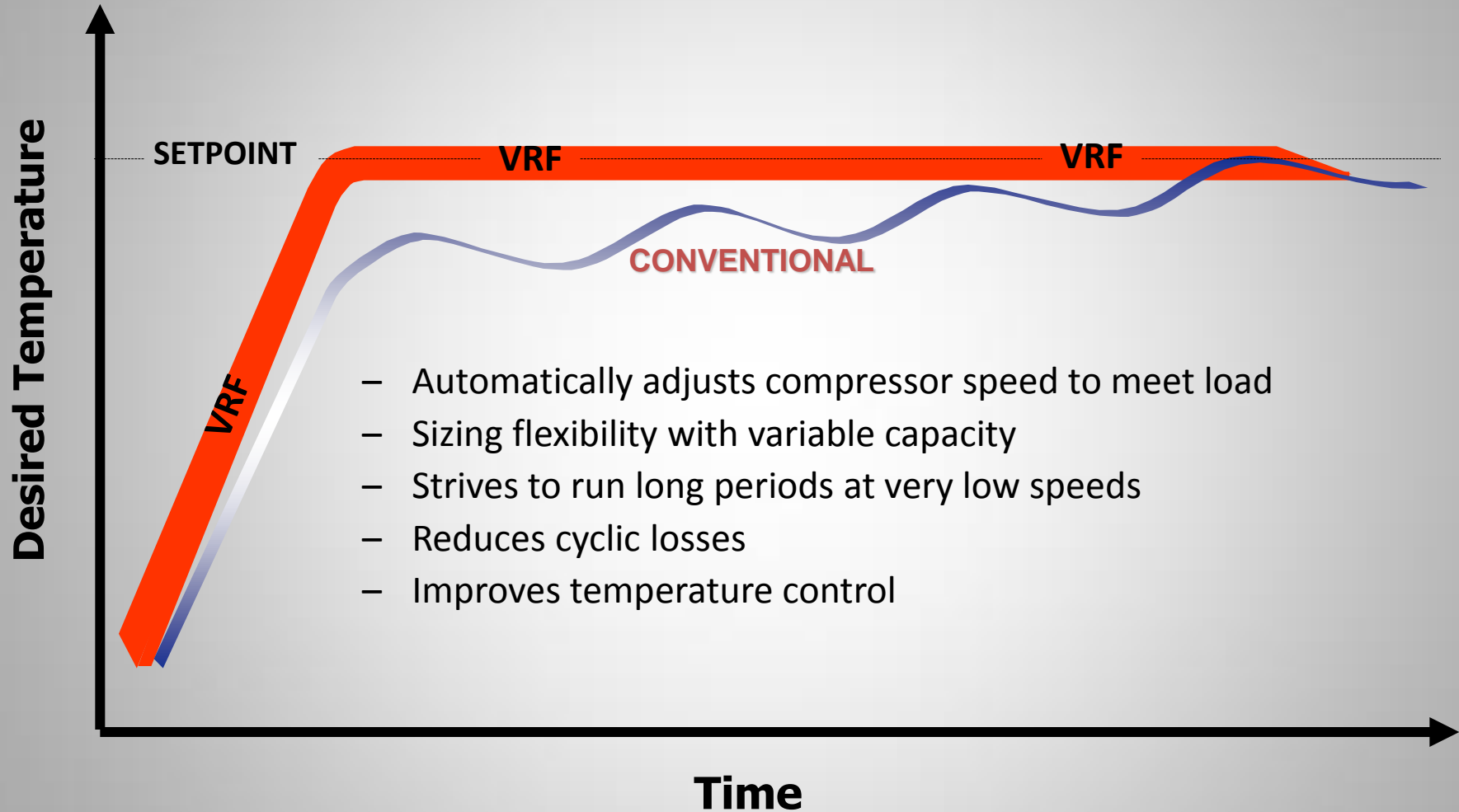
- INVERTER-driven compressors
- Zoning System
- *Optional* simultaneous cooling and heating
- Efficient installation – 2 pipes
- Variable capacity indoor units in multiple styles
- Superior part-load performance = **EFFICIENCY**
- Advanced integrated controls

# INVERTER Compressor Advantages

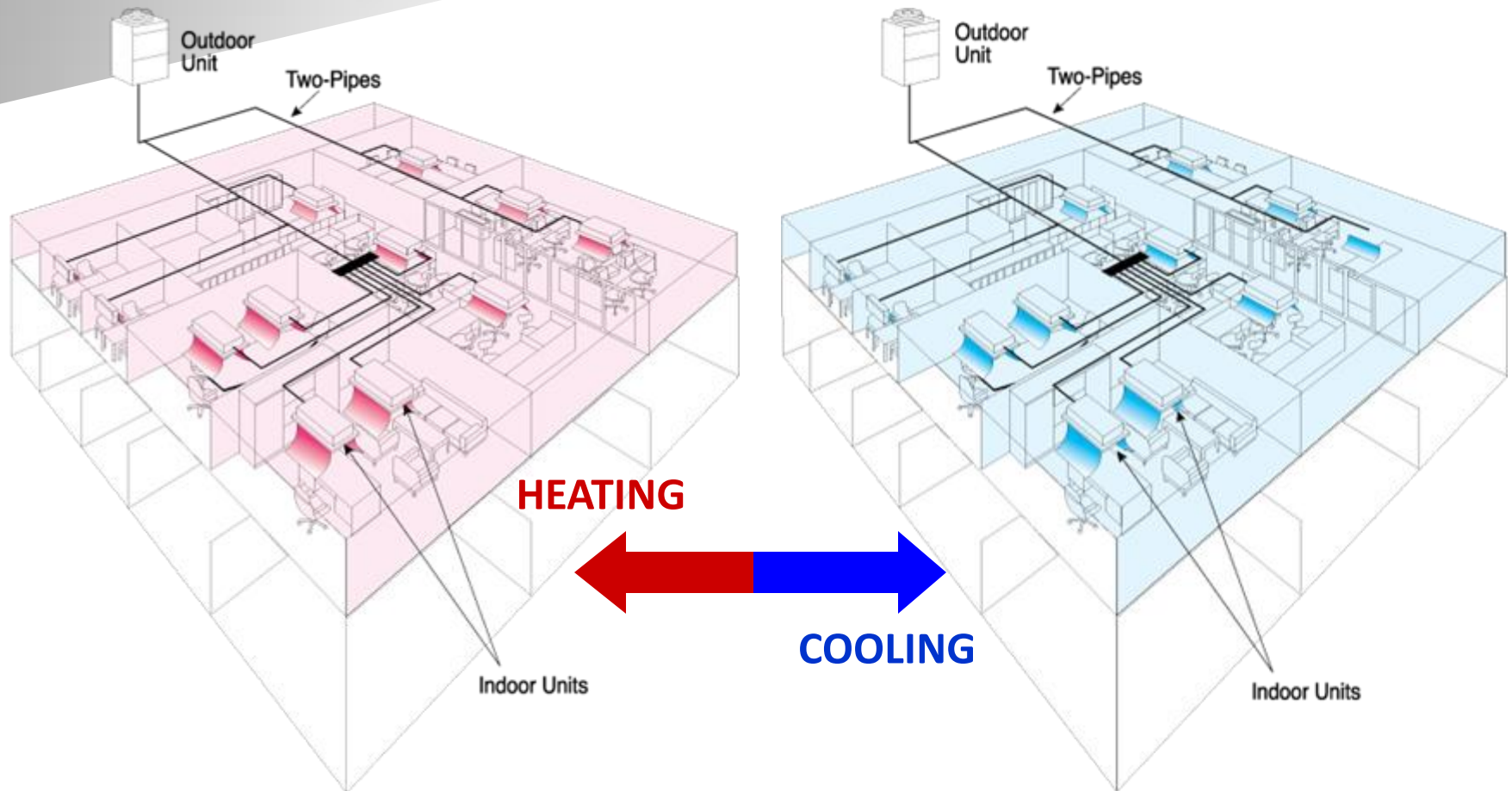
*Conventional ON/OFF control*



# INVERTER Technology

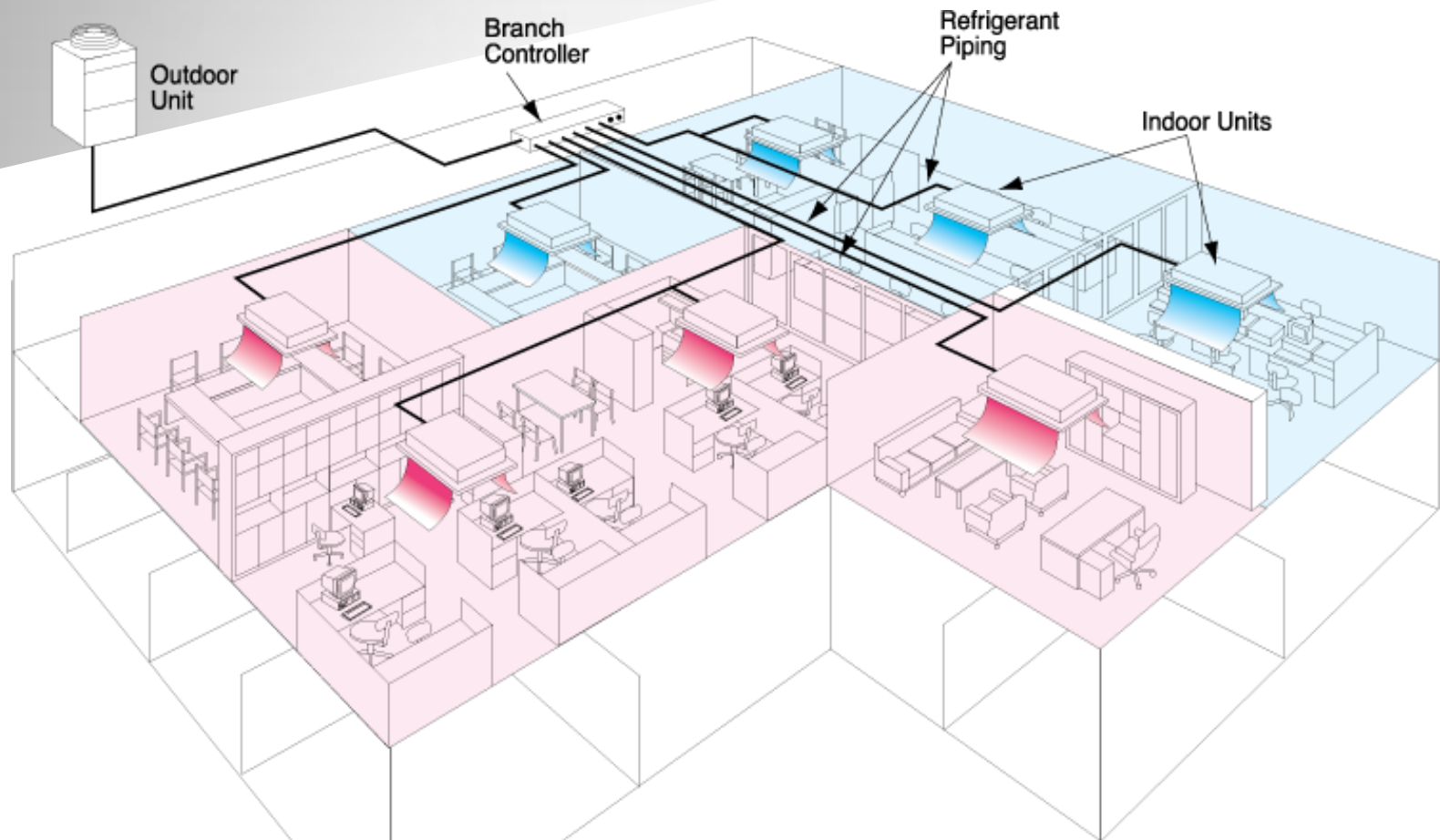


# VRF Heat Pump Technology





# VRF Heat Recovery Technology



**Simultaneous cooling and heating**

# Indoor Unit Types



Wall mounted



Four-way ceiling recessed cassette



One-way ceiling recessed cassette



Ceiling suspended



Low-profile ceiling-concealed ducted



Ceiling-concealed ducted



Floor-standing exposed



Floor-standing concealed

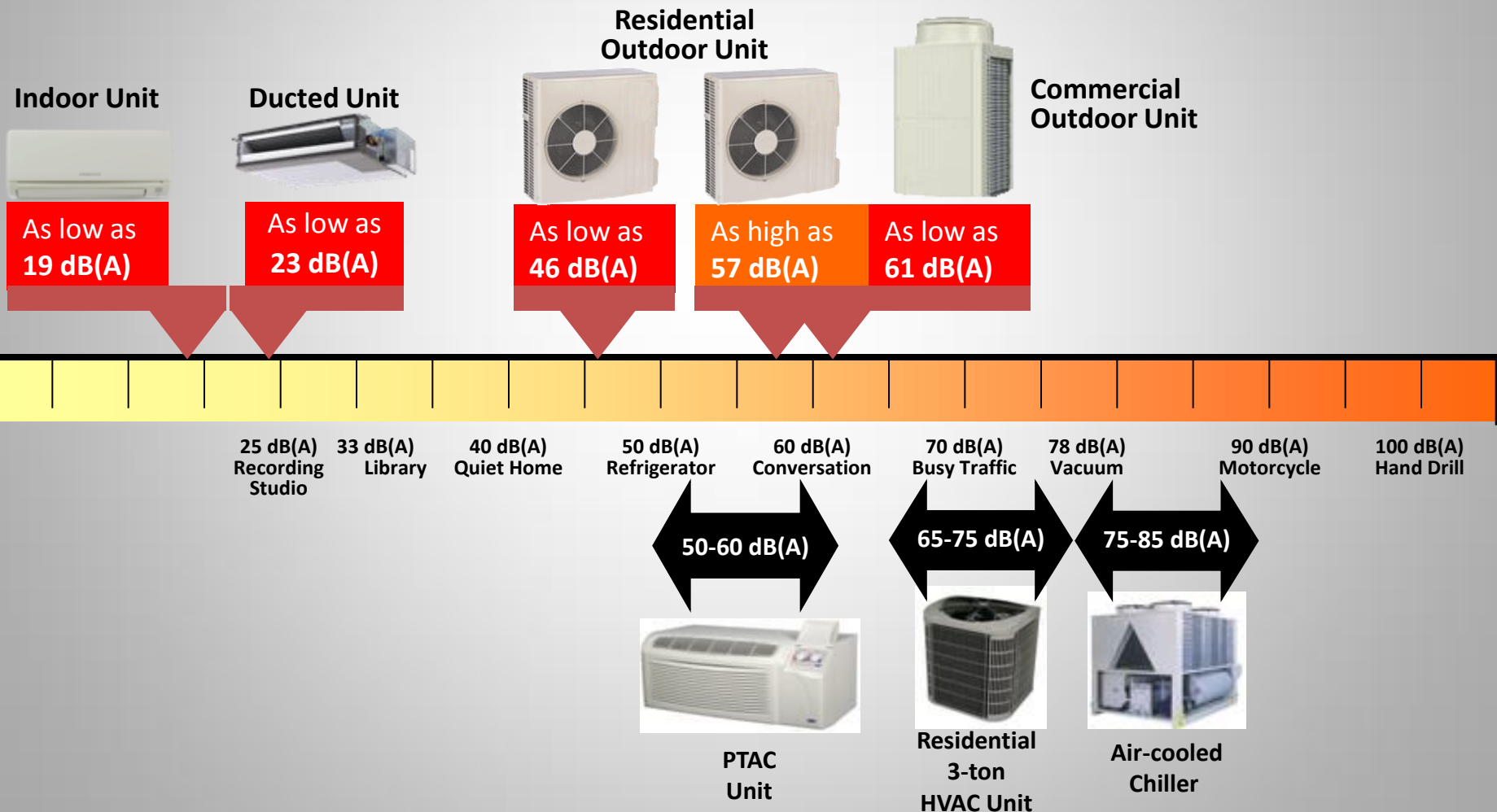


Air handler

# What Does QUIET Sound Like?

How QUIET are VRF Systems?

How LOUD is a traditional HVAC unit?





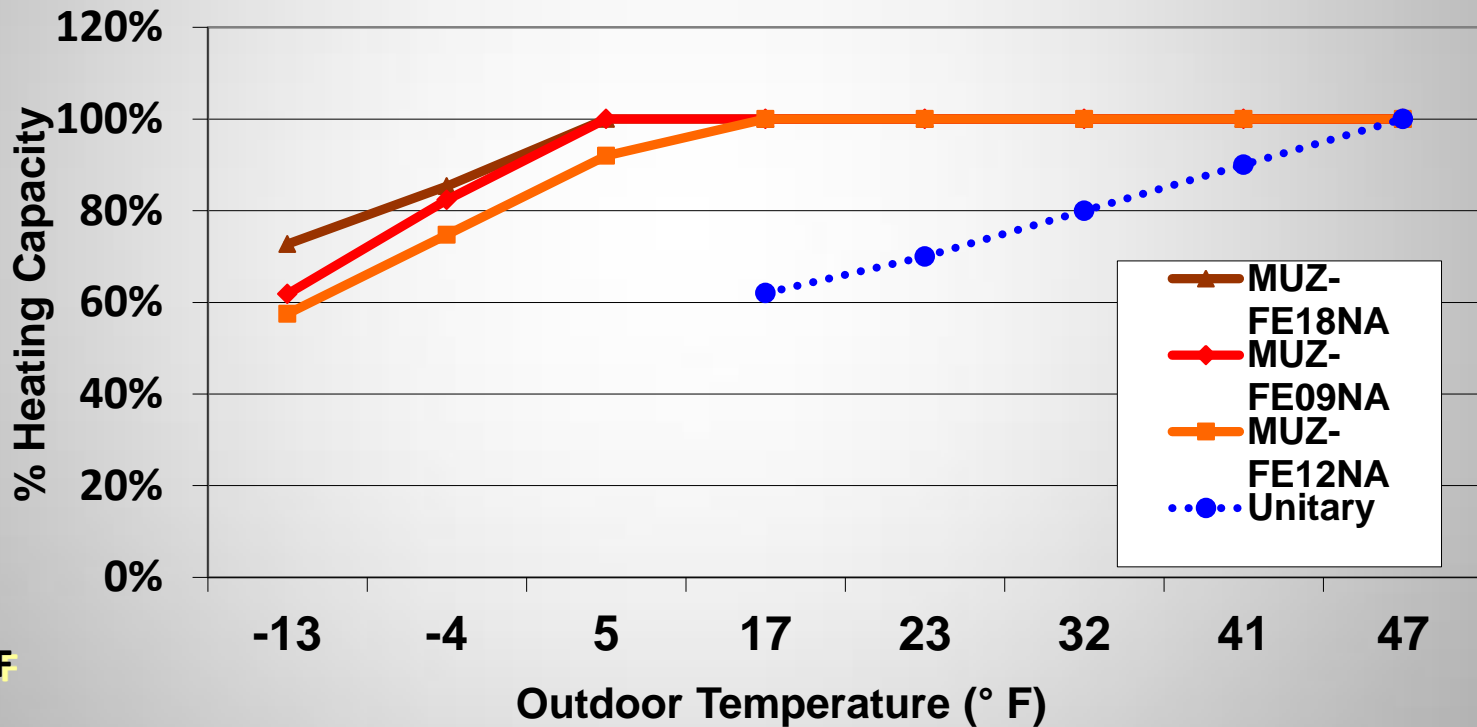
# Hyper-heating INVERTER Technology



## Extreme Comfort in Extreme Climates



### Hyper-heating INVERTER vs. Other Units % Heating Capacity vs. Outdoor Temperature



100% @ 5° F

87% @ -4° F

80% @ -13° F

# Mitsubishi Electric Tenant Billing



**505 Broadway Condos**  
Tacoma, WA  
Installed 2009

## Project Information

- Air Source Heat Recovery VRF
- Mixed Use & High-End Condo
- 12 Outdoor Units, 70 Zones
- Provided TG2000 Tenant Billing Program



- Optional TG-2000 software allows a landlord or building owner to measure the allocation of HVAC consumption per tenant rather than resorting to approximate usage.
- Allows building owner to measure HVAC usage per indoor unit (IDU) or multiple IDUs in an apartment or condo.
- Applicable in commercial buildings to allocate costs for HVAC usage across tenant spaces.

# A Leader in Energy Efficiency

## 9 Qualifying Systems ENERGY STAR Most Efficient 2013



### INVERTER-driven Heat Pump Systems:

- **MSZ-FE09NA (9,000 Btu/h Hyper Heating)**
- **MSZ-FE12NA (12,000 Btu/h Hyper Heating)**
- **MSZ-FE18NA (18,000 Btu/h Hyper Heating)**
- **MSZ-GE09NA (9,000 Btu/h)**
- **MSZ-GE12NA (12,000 Btu/h)**
- **MSZ-GE15NA (15,000 Btu/h)**

### INVERTER-driven Cooling-only Systems:

- **MSY-GE09NA (9,000 Btu/h)**
- **MSY-GE12NA (12,000 Btu/h)**
- **MSY-GE15NA (15,000 Btu/h)**

## 29 Qualifying Systems ENERGY STAR



### ENERGY STAR

#### Air-source Heat Pumps & Air Conditioners

(Tier 2 Effective January 1<sup>st</sup>, 2009)

Product Type	SEER	EER	HSPF (H/P Only)
Split Systems	≥ 14.5	≥ 12	≥ 8.2



FINDINGS, DECEMBER 2012

# VARIABLE REFRIGERANT FLOW



## VRF Systems Promise Savings in Targeted Building Types and Climates

Variable Refrigerant Flow (VRF) heating, ventilation, and air conditioning (HVAC) systems use refrigerant as their cooling/heating medium. A compressor unit, typically located on a roof, is connected through refrigerant lines to multiple indoor fan coil units, each individually controllable by its user. The system is capable of simultaneously cooling one area while heating another, and can transfer heat from spaces being cooled to spaces being heated and vice versa. Also, they are small, modular, and can be installed without the use of a crane. This high-performance HVAC technology was invented in Japan more than 20 years ago and has large installed bases in several countries but it's a relative newcomer to the U.S., which, according to a major VRF manufacturer, can claim only 3.4% of the market<sup>1</sup>. However, because VRF has proven to be effective under certain circumstances, particularly in retrofits of older buildings where room for additional ductwork is limited, and because it promises energy and cost savings when compared with many other HVAC systems, GSA's Green Proving Ground (GPG) program recently assessed the technology. Preliminary findings suggest that VRF systems can achieve 34% and higher HVAC energy cost savings.

# Re-Cap: Benefits of VRF & VSMS Systems

## ➤ Space Utilization

- Installation flexibility to meet building space requirements
- Minimal impact to existing building architecture and structure

## ➤ Occupant Comfort

- Indoor unit flexibility to meet the needs of any space
- Meets occupant ventilation air requirements
- Quiet operation

## ➤ Energy Savings

- Inverter driven compressor
- No waste heat (Heat Recovery)
- ENERGY STAR & LEED

# THANK YOU!



**Jay Perkins**  
**Sr. Government Affairs Specialist**  
**[jdperkins@hvac.mea.com](mailto:jdperkins@hvac.mea.com)**  
**@JayPerkinsJD**  
**678-275-8803**