Non-Invasive retrofit from pneumatic to DDC

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Healthcare Users of WPT Technology – select examples

- Orlando Health (ORMC, FL)
- Sutter Health (6 hospitals, CA)
- VA Medical Centers (six hospitals)
- LifePoint Health (Seven hospitals)
- Prime Healthcare (Desert Valley, CA)
- AdventHealth (Deland, FL)
- CommonSpirit (Baylor St. Luke, TX)
- Aurora (St. Luke's, WI)
- Advocate (Trinity, Christ, IL)
- HCA (Lakeview, UT)
- NYC HHC (2 locations)
- Yale Medical Center (CT)
- Catholic Health (St. Francis, NY)
- NY Office of Mental Health









The Challenge with Pneumatic Thermostats

Recognize these thermostats?







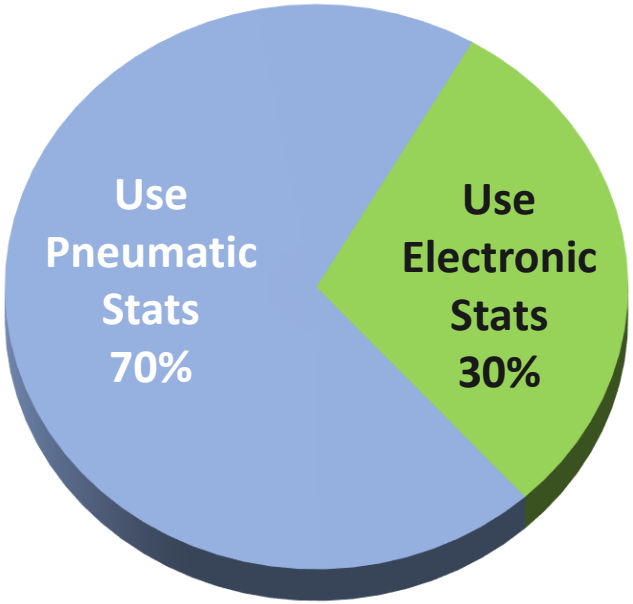


Challenges:

- No visibility – No BACnet/BAS connection
- Occupant discomfort – hot/cold calls
- High maintenance – no fault detection
- Obsolescence – hard to find parts
- Waste energy – not programmable

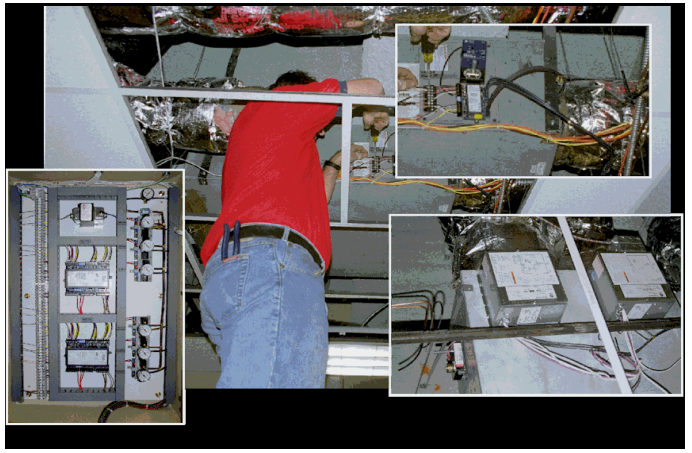
Pneumatics are Still Widely Used

Estimated 70% of hospitals still use pneumatic thermostats



Why so many pneumatics still?

- Buildings constructed before 1999
- Conventional DDC retrofit too disruptive to occupants
- Requires opening up walls & ceilings, replacing actuators, running wires
- Very expensive, >$3000 per terminal unit
- Long payback period, typically 10 years or more



Non-Invasive, 10 minute Pneumatic to DDC Retrofit

EXISTING LEGACY STAT



Minimal Disruption
10 Minute Upgrade

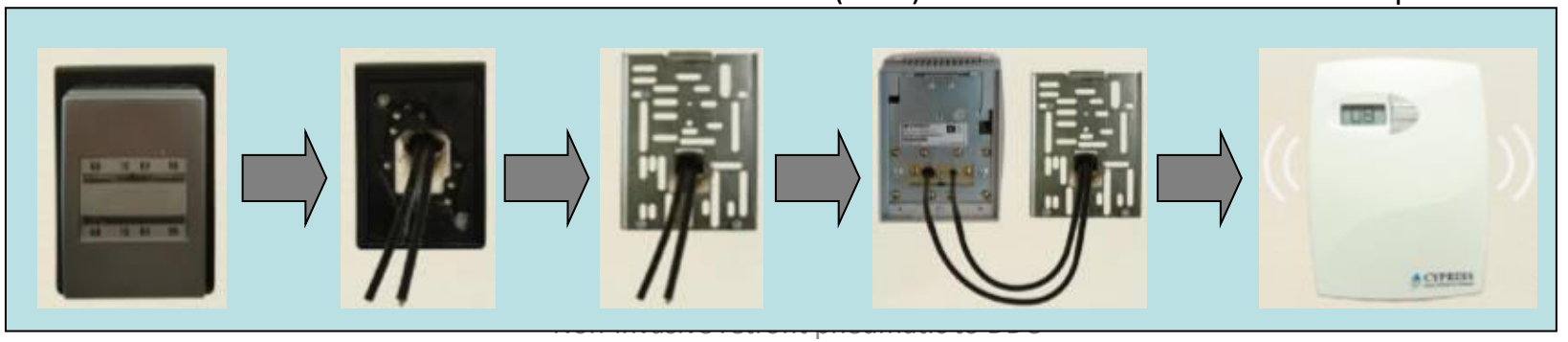
WIRELESS PNEUMATIC THERMOSTAT



- Manual control, non-communicating
- No fault detection, no energy savings strategies
- Manual Calibration Required

- Remote Monitoring, Alarming, Control
- BACnet Integration with 3rd party BAS
- Automatic Self-calibration
- Programmable energy savings, demand response
- Optional Relative humidity monitoring

The Wireless Pneumatic Thermostat Provides (WPT) DDC Zone Control without Disruption



CYPRESS ENVIROSYSTEMS

Technology Vetted by U.S. DOE GSA Proving Ground



"Our wireless pneumatic thermostats are easy to use and cost-effective, and they provide access to energy-saving control strategies that weren't available through our old pneumatic system."

—Greg Dix
Building Manager, Ronald Reagan Building
Washington, D.C.
National Capital Region
U.S. General Services Administration

GSA

OAK RIDGE National Laboratory

U.S. DEPARTMENT OF ENERGY

Finalist – 2016 Federal Energy Management Program JUMP Award



Link to GSA/DOE Report:
https://www.gsa.gov/governmentwide-initiatives/climate-action-and-sustainability/emerging-building-technologies/published-findings/energy-management/wireless-thermostats-for-pneumatic-systems

CYPRESS ENVIROSYSTEMS

Benefits of Retrofit

- **Improve Occupant Comfort:**
  Reduce Hot/Cold Calls

- **Reduce Maintenance Effort:**
  Improve Visibility and Fault Detection

- **Enhance Energy Efficiency:**
  Energy efficient control sequences

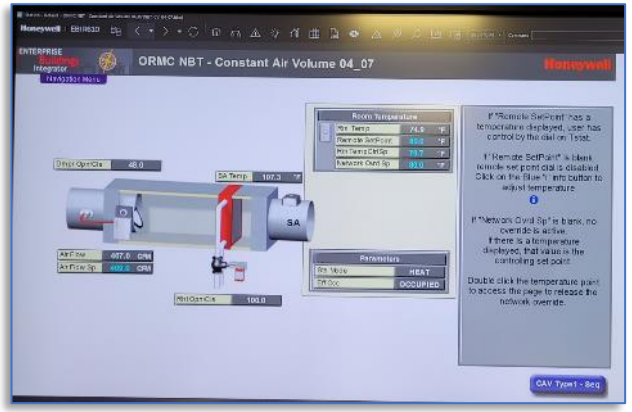
Orlando Health ORMC – ACC Operating Rooms











Thomas Henig
Senior Facility Manager
ORMC, Orlando Health

Case Study: LifePoint Conemaugh Medical Center



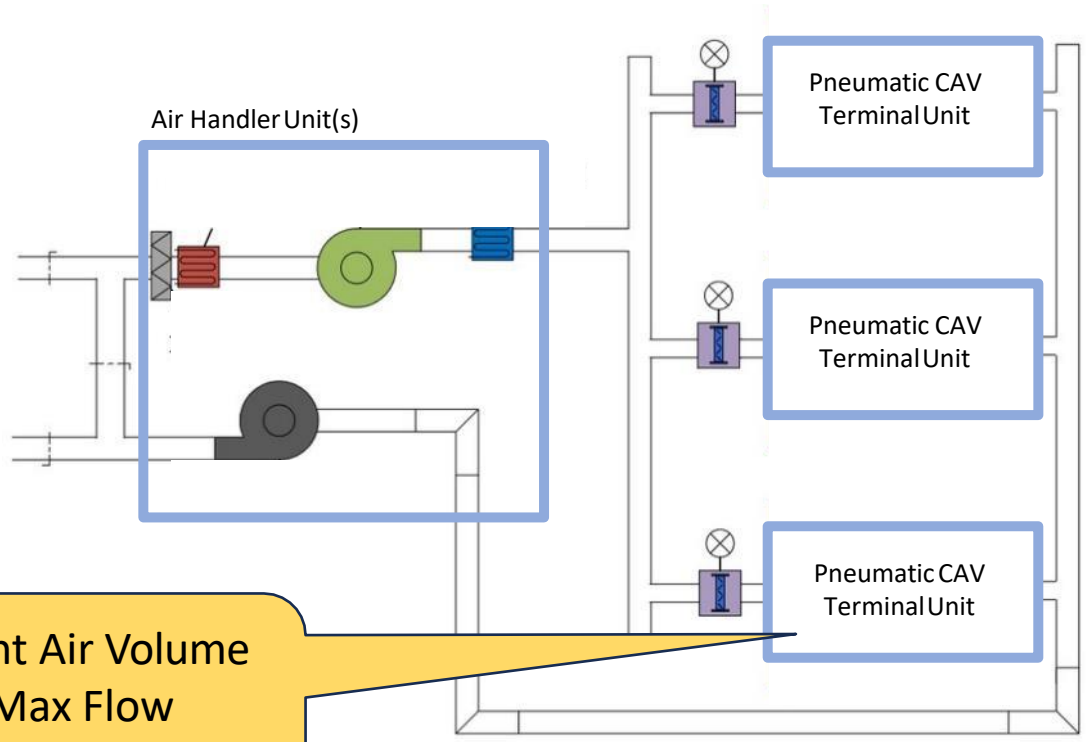
Facility Type	540 bed hospital, Level 1 trauma center
Location:	Johnstown, PA
Building:	Multiple Connected Buildings Built From 1962-2021
Total Hospital Area:	855,000 Sq-ft
Project Areas:	93,200 Sq-ft (patient wings and vascular support)
New Wireless Thermostats	156 Total: Patient wing, P Building - 128 stats Vascular support, M Building - 28 stats
Terminal Unit Type:	Pneumatic Constant Air Volume w/hot water reheat
AHU's	7 AHU's with VFD Fans
Central Plant:	Electric Chiller, Gas Boiler
BAS:	JCI Metasys
Utility:	Penelac

Multi-zone HVAC System - Before Upgrade

AHU's with VFD Fans

CAV Terminal Units with Hot Water Reheat

Pneumatic room thermostats





Constant Air Volume At Max Flow (worst case)

No visibility nor feedback from occupant zones

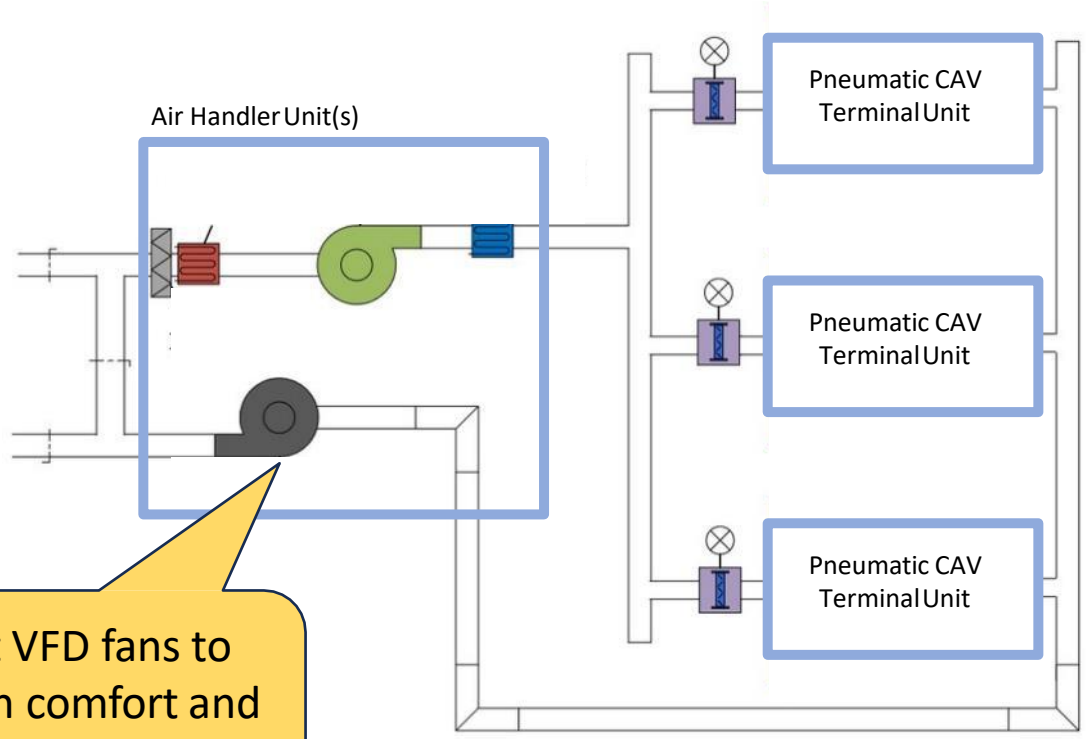
CYPRESS ENVIROSYSTEMS

Multi-zone HVAC System - After Upgrade

AHU's with VFD Fans

CAV Terminal Units with Hot Water Reheat

Pneumatic room thermostats





Adjust VFD fans to maintain comfort and code

Feedback from Zones Temperature, Comfort

CYPRESS ENVIROSYSTEMS

Project Payback Period: 2.9 yr with Utility Rebates

Project Cost and Payback (P Building)

Est. cost per installed thermostat	$1,100
Number of thermostats	128
Utility Rebate (for Electricity)	$32,385
TOTAL COST WITH REBATE	$108,415

Energy Savings (Gas and Electric)	$36,990
Payback Period without Rebate	3.8 Yrs
Payback Period with Rebate	2.9 Yrs

LifePoint Health - WPT Installations

• Conemaugh Medical Center, Johnstown, PA	152 WPT's – Completed
• Sovah Danville Regional Medical Center, Danville VA	80 WPT's – Completed
• Lake Cumberland Regional Medical Center, Somerset KY	90 WPT's - Completed
• Clinch Valley Medical Center, Richlands VA	83 WPT's - Completed
• Southern Tennessee Winchester, Winchester, TN	40 WPT's – In Progress
• Starr Athens Regional Medical Center, Athens, TN	60 WPT's – In Progress
• Sumner Regional Medical Center, Gallatin, TN	50 WPT's – In Progress
• Additional Locations Planned	Later 2025 and 2026

Summary – Non-Invasive Pneumatic Upgrade

Less cost and effort

- Upgrade from pneumatic to DDC thermostats in less than 15 minutes
- Less than 50% of the cost of conventional DDC
- No disruption to patients/occupants

Quantifiable Benefits

- Occupant comfort
- Reduced Maintenance
- Energy Savings
- Typically under 3 year payback

Thank you!
Q&A

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