



OR Pressure Control: Design Approaches and Control Strategies

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Course Description

Maintaining proper pressure relationships in the operating room (OR) environment is critical to patient safety, infection control, and regulatory compliance. Yet, achieving and sustaining these conditions presents unique challenges for design, construction, commissioning, and operations teams alike.

This webinar will explore the fundamentals of OR pressure control, including brief codes and standards that govern compliance, the commissioning process for verifying performance, and common pitfalls observed in both new and existing facilities. Attendees will gain practical insight into strategies for testing, monitoring, and maintaining pressure relationships to ensure reliability and long-term success.

Learning Objectives

At the end of this session, participants will learn to:

1. Explain how infection control, design intent, code requirements, and clinical needs influence pressure control in healthcare environments.
2. Identify common sources of pressure control challenges within the built environment, including leakage pathways.
3. Compare the strengths and limitations of popular control strategies such as Constant Volume, CFM offset, and VAV with active pressure control.
4. Evaluate lessons learned from real-world projects to anticipate and address unexpected issues affecting pressure control.

Test Your Knowledge

How many ORs exist in the United States
(as of 2024)?

A. 27,622



B. 38,329



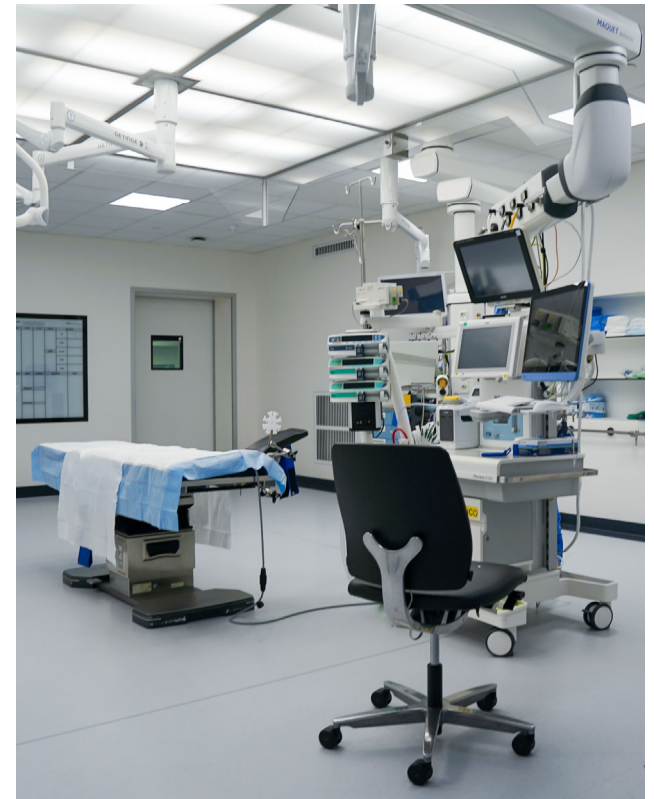
C. 65,178



D. Monster Truck



<https://www.definitivehc.com/resources/healthcare-insights/number-of-us-operating-rooms>

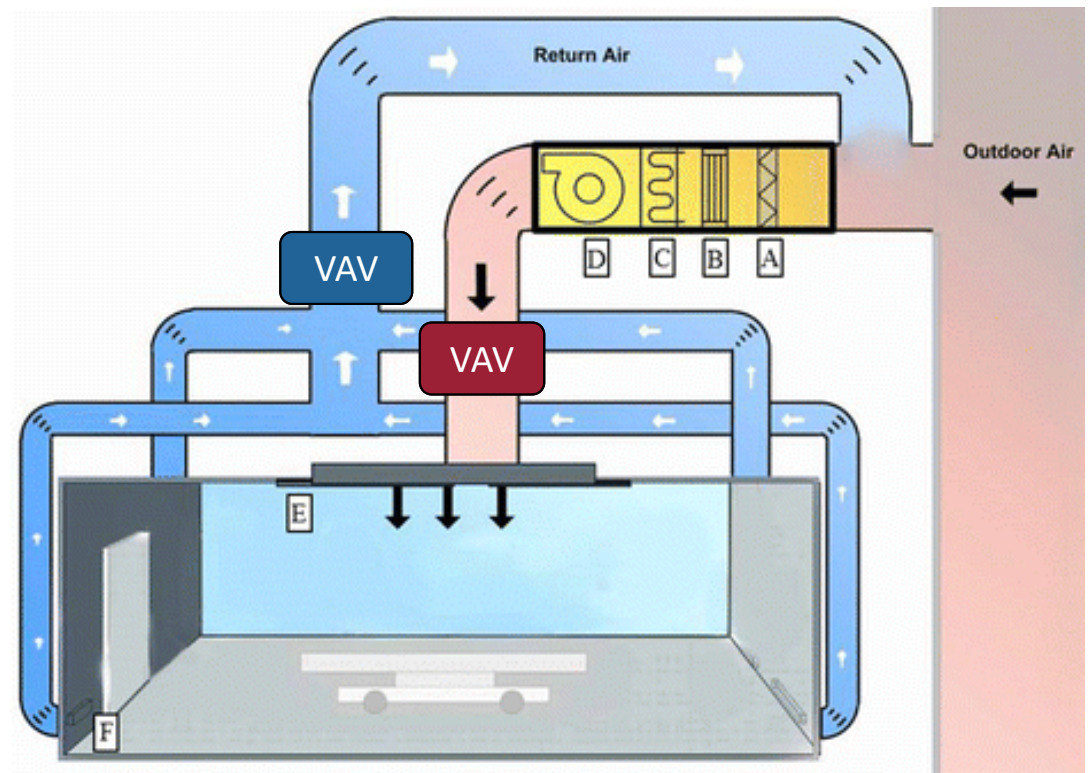


OR TAB Questions That Should Come To Mind



- Key points:
 - Infection Control
 - Staff Safety
 - Compliance
 - Energy
- What else is attached?
- How is airflow controlled - in the space and at the AHU/Exhaust
- Challenges for New vs Existing Ors

(Not the Entire List)



Regulatory Requirements

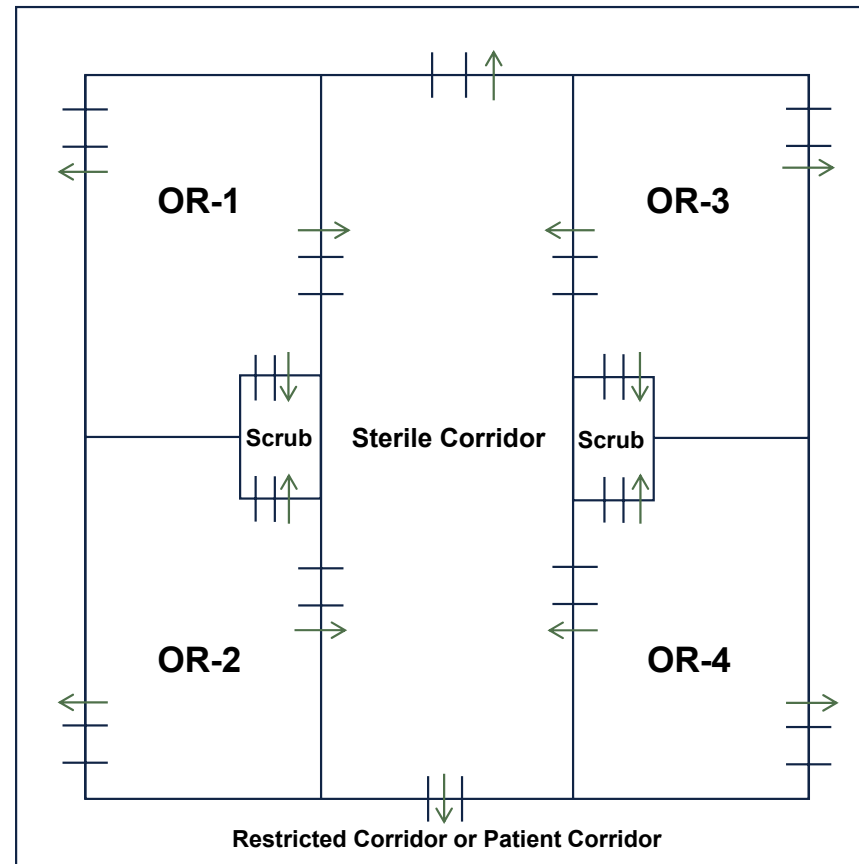


FGI

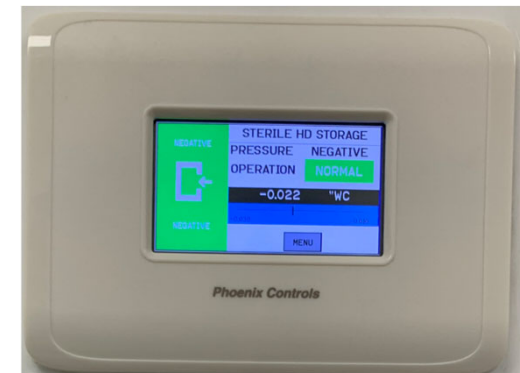




Typical OR Pressure Map



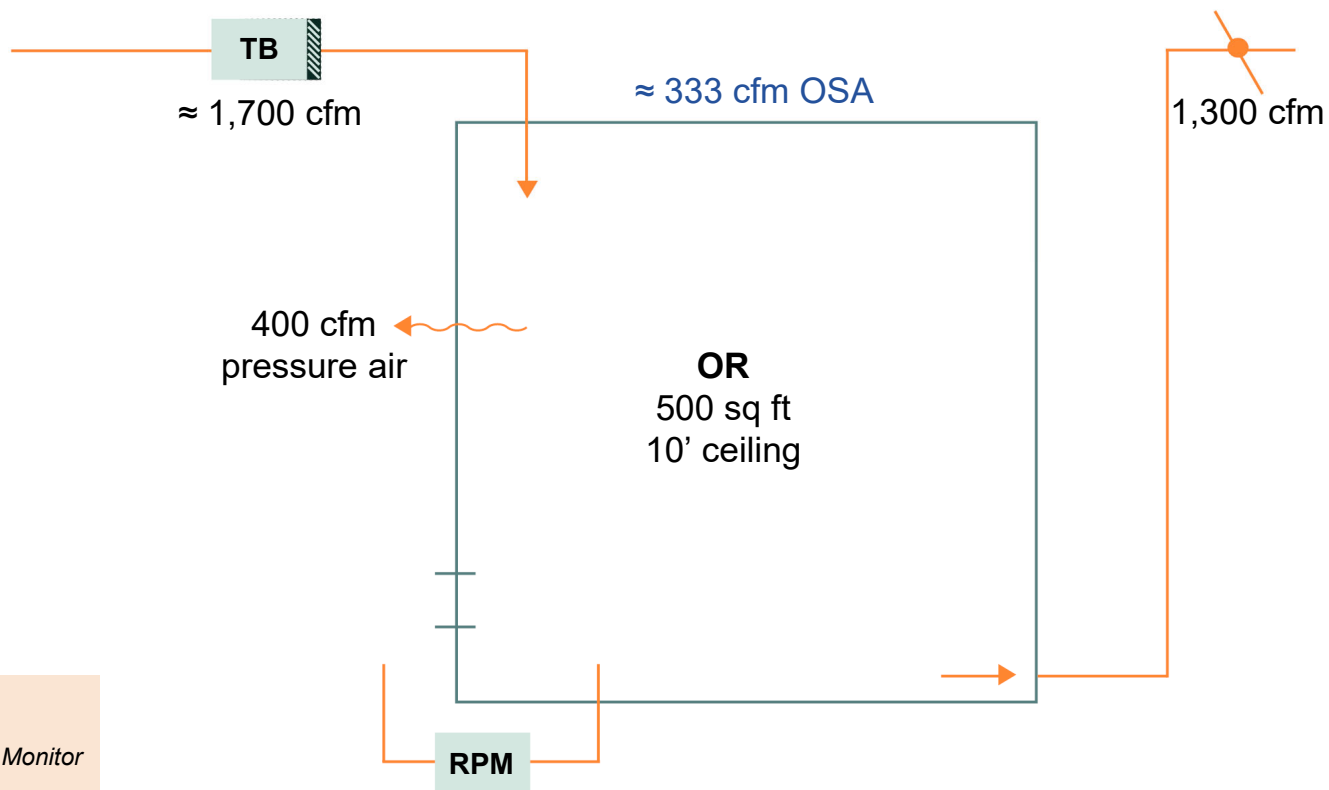
Monitoring & Controls



Monitoring & Controls



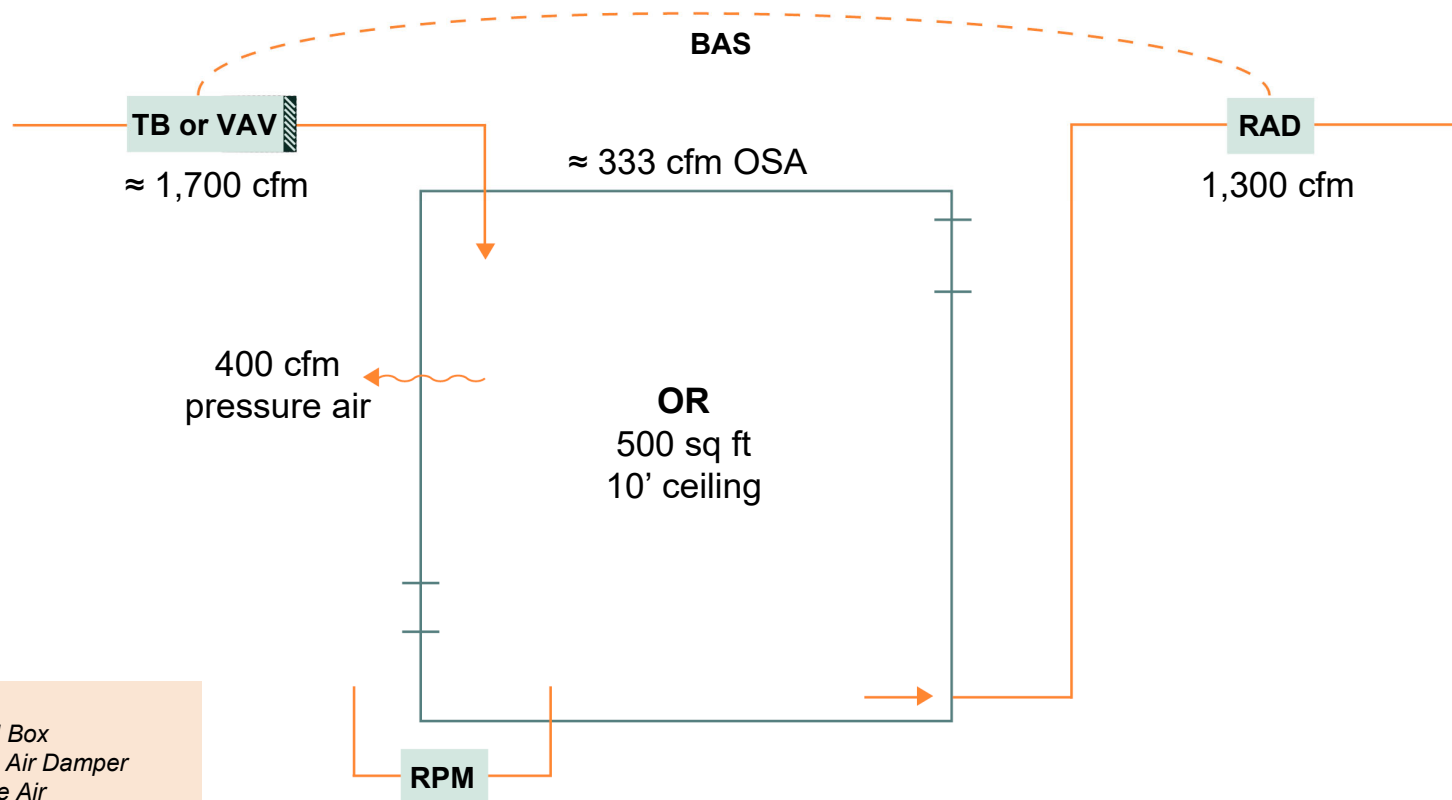
Strategy #1: Constant Volume (CV)



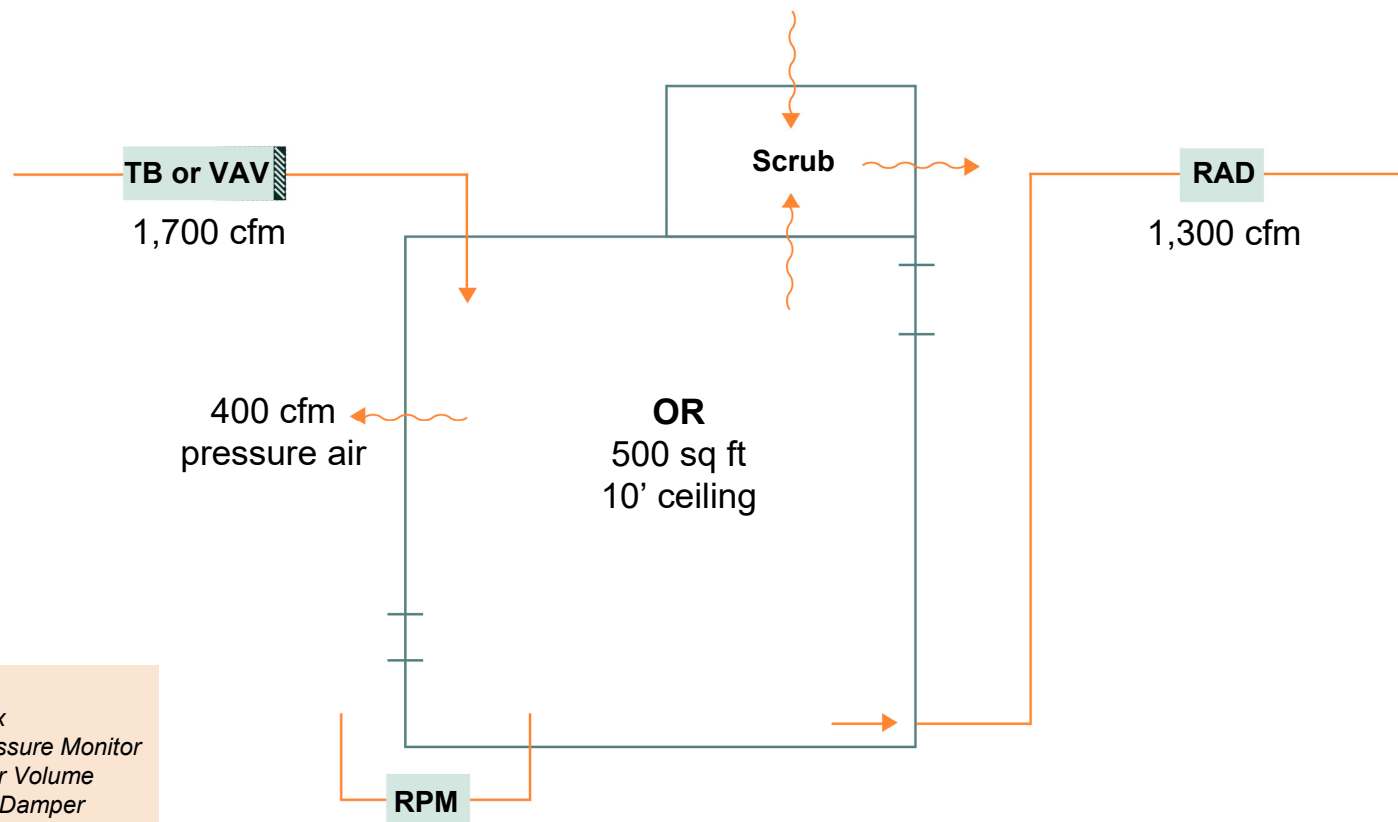
Key:

- TB – Terminal Box
- RPM – Room Pressure Monitor
- OSA – Outside Air

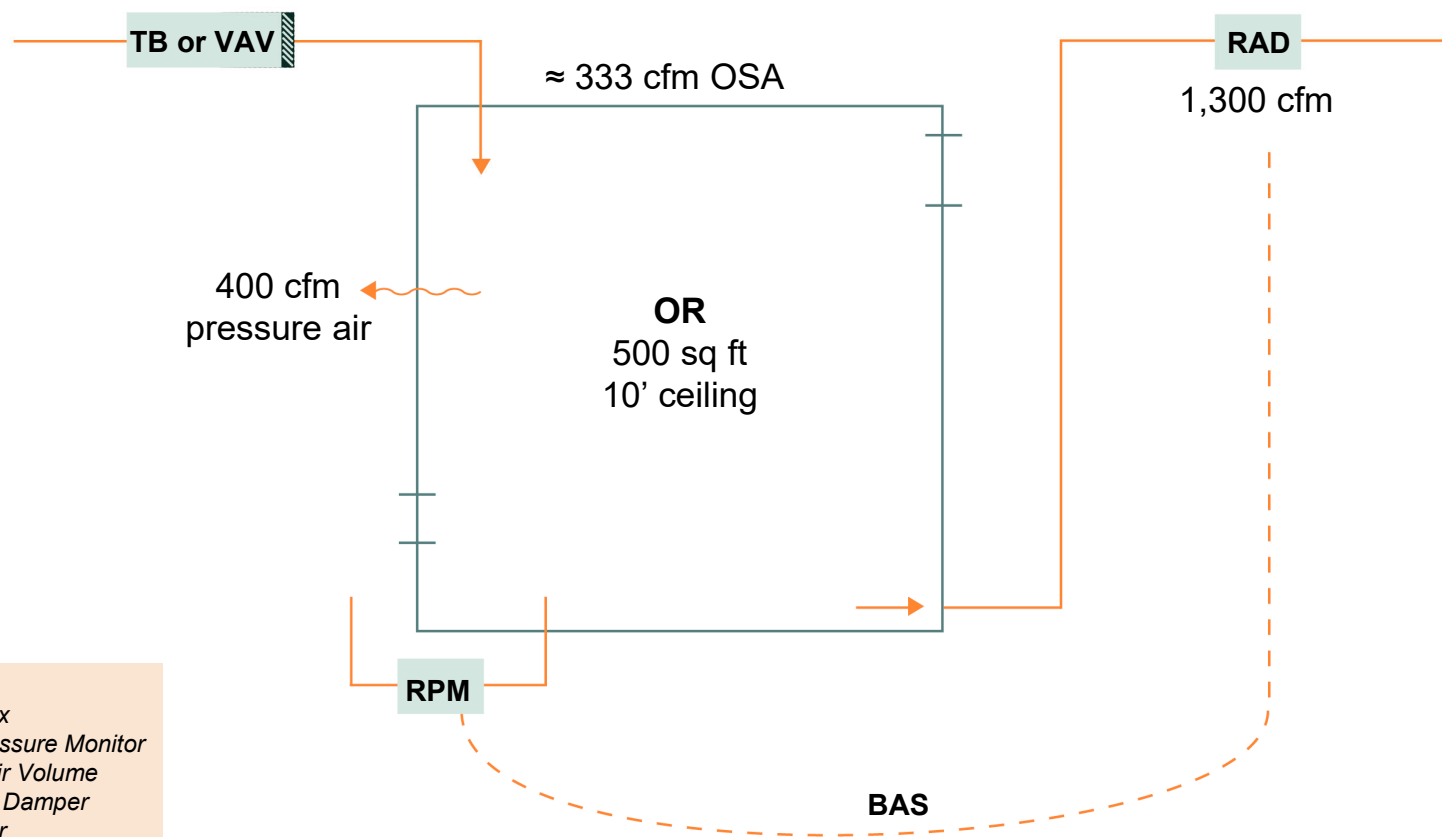
Strategy #2: Variable Air Volume (VAV)



Strategy #3: Anterooms



Strategy #4: Using Pressure to Save Energy



Key:

- TB – Terminal Box
- RPM – Room Pressure Monitor
- VAV – Variable Air Volume
- RAD – Return Air Damper
- OSA – Outside Air

Strategy #5: Door Interactions



TAB Reports: What's the Good Stuff?

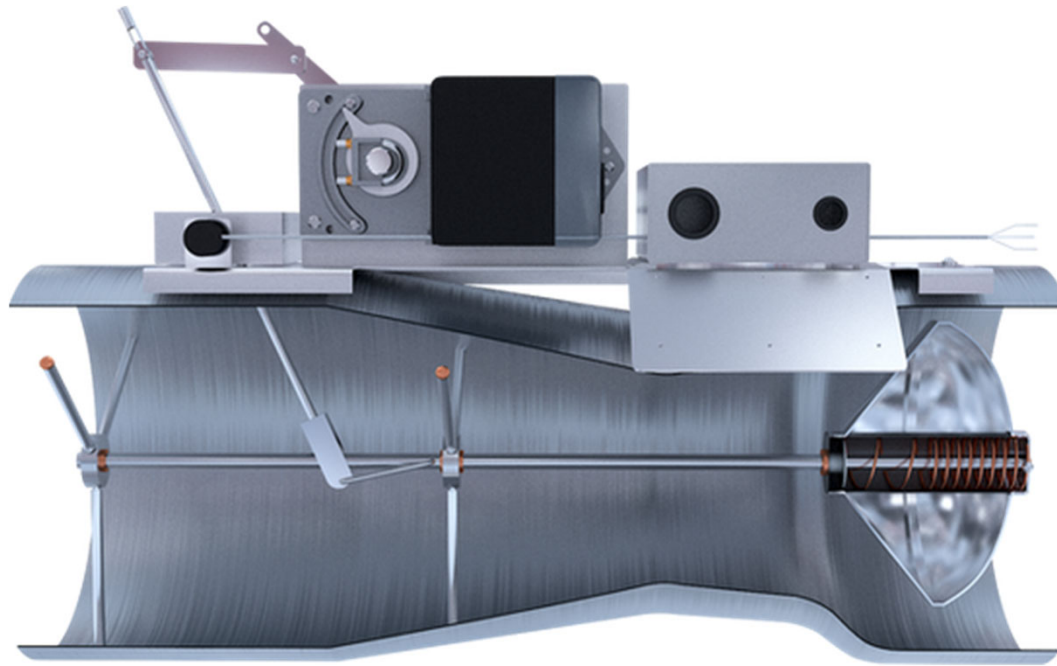


Single Duct Terminal Unit with Reheat									
Project Name									
Job Number									
Test Date:									
Readings by:									
Unit Designation	VAV1-19								
Terminal unit address	42								
Correction / Calibration Factor	.69								
Diameter	12	Area	0.785						
Scheduled Designs	Cooling	Heating							
Design CFM Max	925	465		Design EAT:	55	Actual EAT:	55		
Design CFM Min	278			Design Heat LAT:	95	Actual LAT:	98		
Cooling									
Area Served	Grille No.	Neck Size	Type	Design Airflow	Prelim CFM	% Deviation	Final Reading	% Deviation	
Clinic Hall-1135	1	6	A	100	104	1.04	98	0.98	
Nurse Station-1137	2	8	A	250	189	0.76	226	0.90	
Exam-1144	3	6	A	125	159	1.27	137	1.10	
Exam-1146	4	6	A	125	128	1.02	127	1.02	
Clinic Hall-1150	5	6	A	100	143	1.43	102	1.02	
Exam-1148	6	6	A	125	159	1.27	125	1.00	
Clinic Hall-1013	7	6	A	100	135	1.35	105	1.05	
Total				925	1017	1.10	920	0.99	
Instrument Used for Testing:	Balometer (FLOWHOOD)								
ISSUES:									
COMMENTS:									
Heating Water test data									
Valve Make	Nexus			Serial		NA			
Model	NA			Actual PSI DP		8			
Design Ft/PSI	2-45			Actual GPM		1.3			
Design GPM	1.3								

Impacts & Lessons Learned



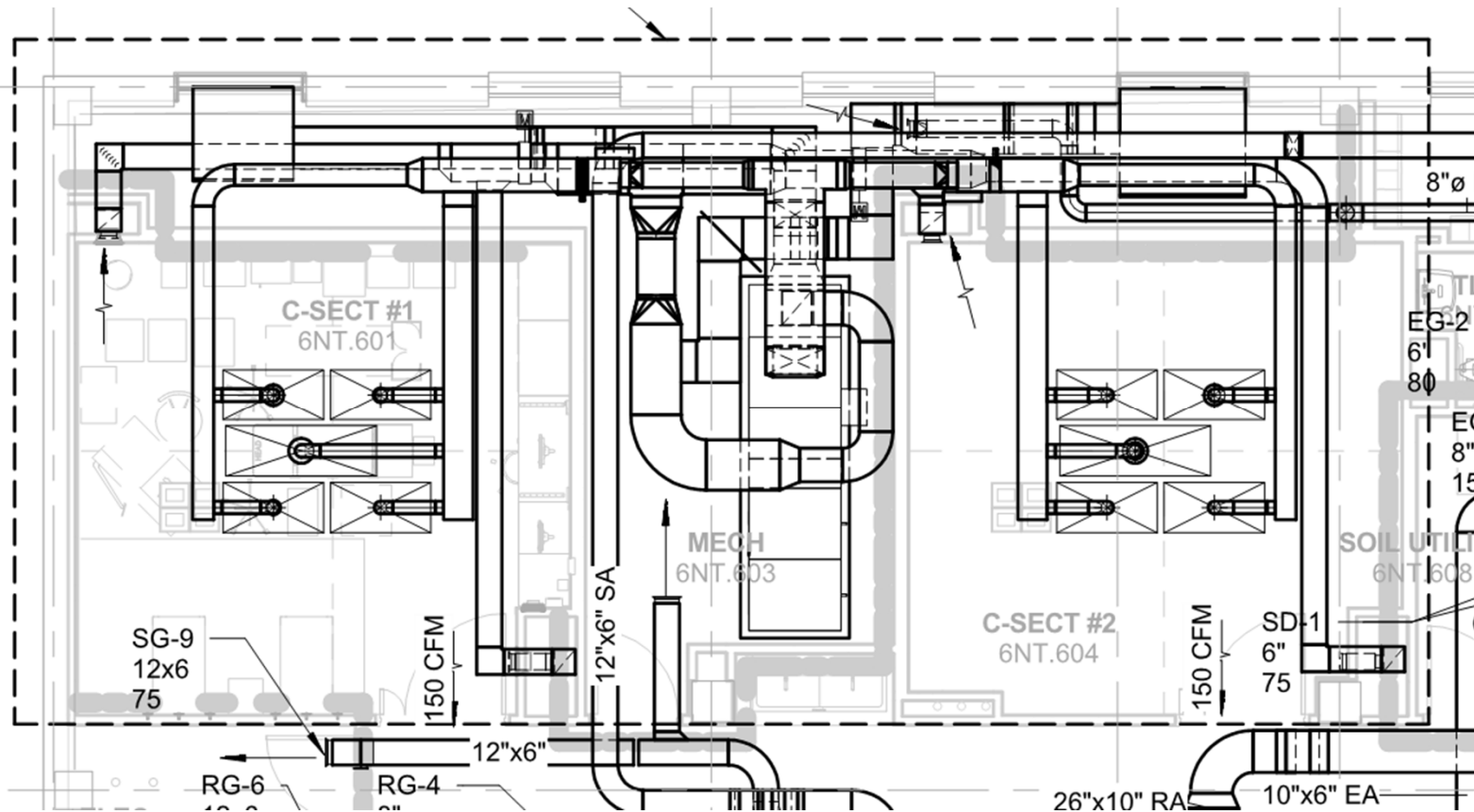
You Can't Regulate What You Don't Have



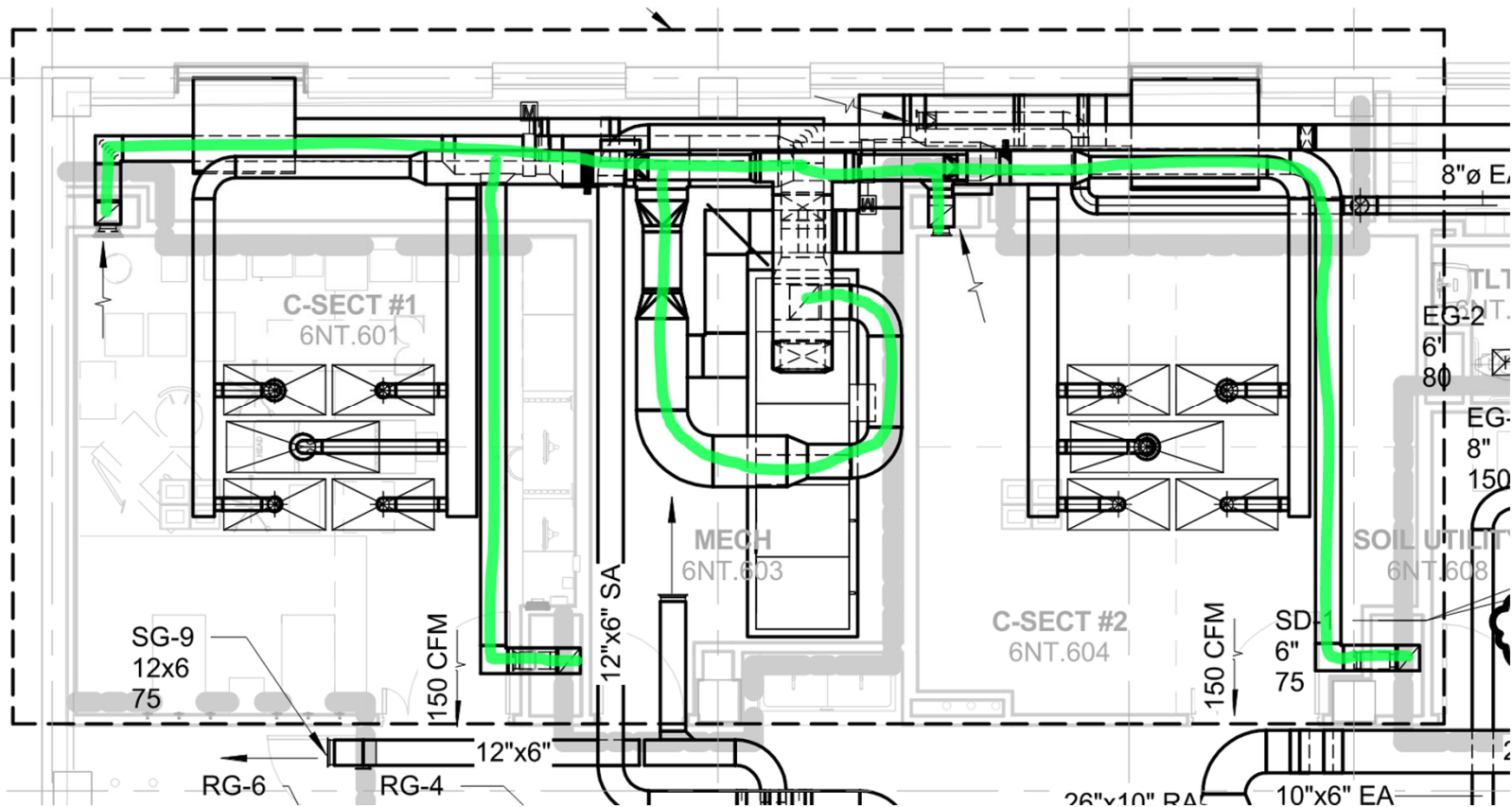
Impacts & Lessons Learned

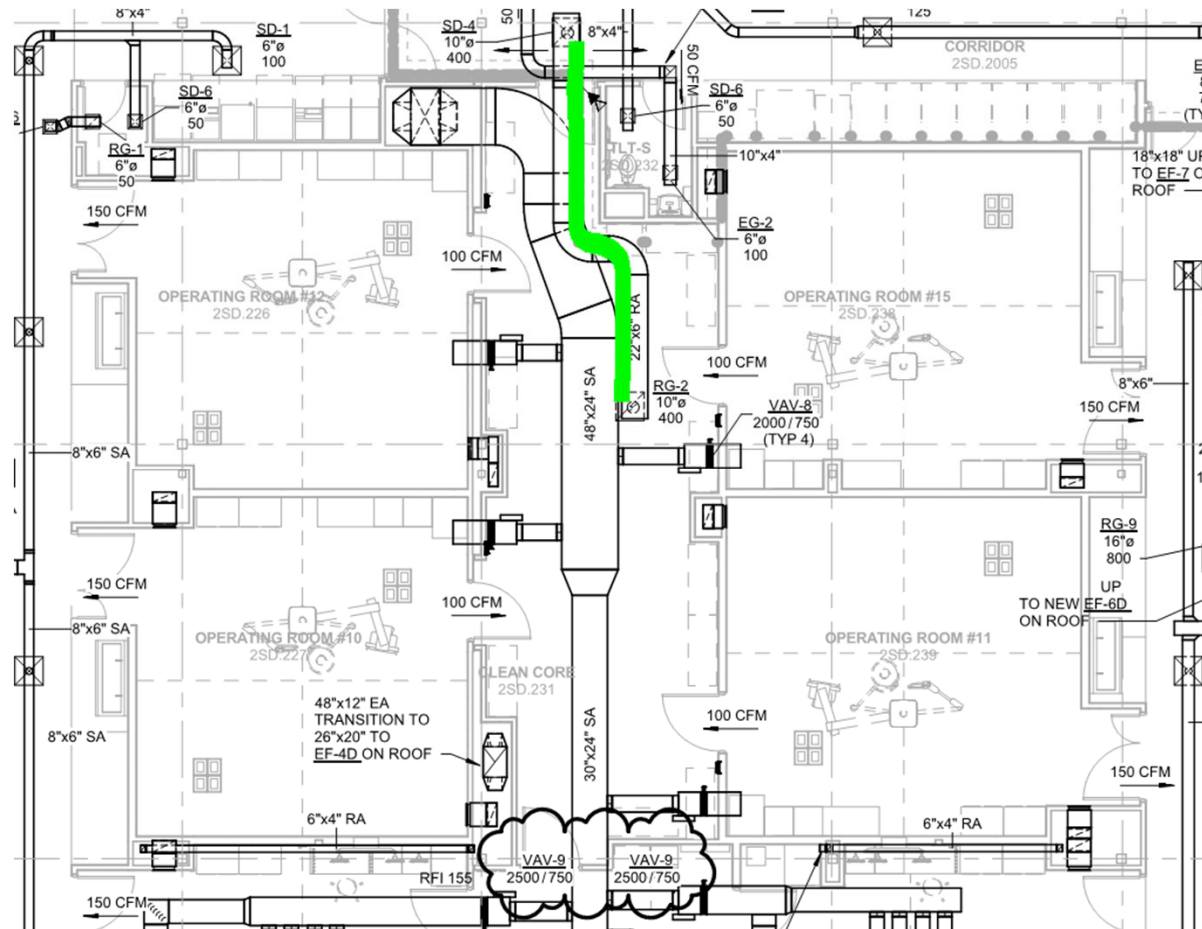


To Return or Not to Return?



To Return or Not to Return?





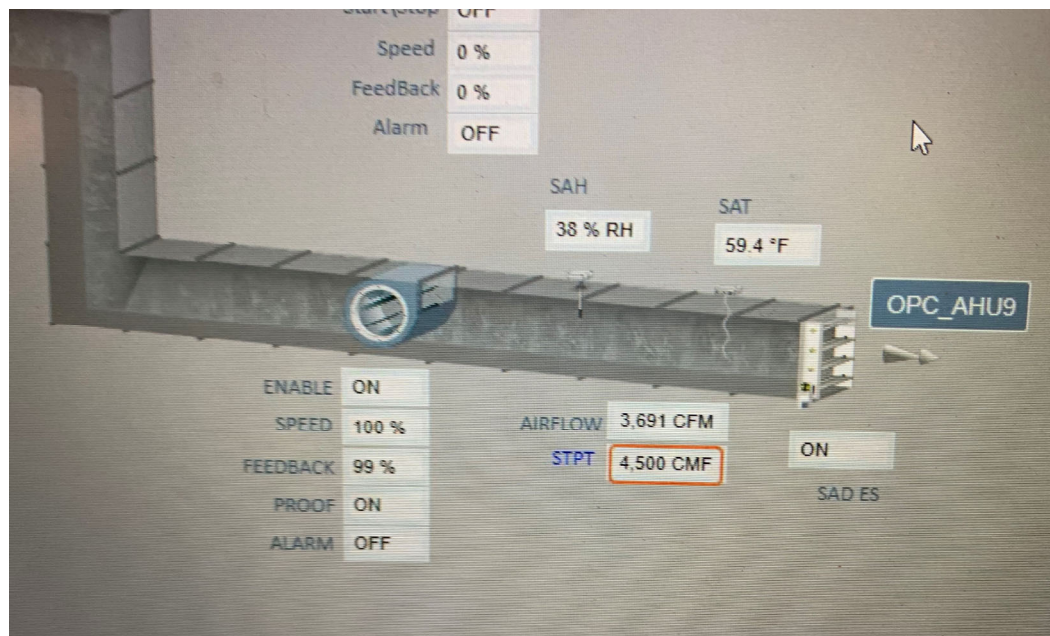
Impacts & Lessons Learned



This Is Why We Can't Have Nice Control



This Fan Gave 110%... Then Gave Up.





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- 14 years of experience in higher education, healthcare and complex facilities
- Expertise in mechanical systems, controls programming and functional testing
- Has worked on 215+ ORs across 25+ healthcare facilities
- B.S. Mechanical Engineering, *University of Dayton*
- Named BCxA “20 Under 40” industry leader (2022)