

A Simple Guide for Using DDC Systems to Improve VAV System Efficiencies

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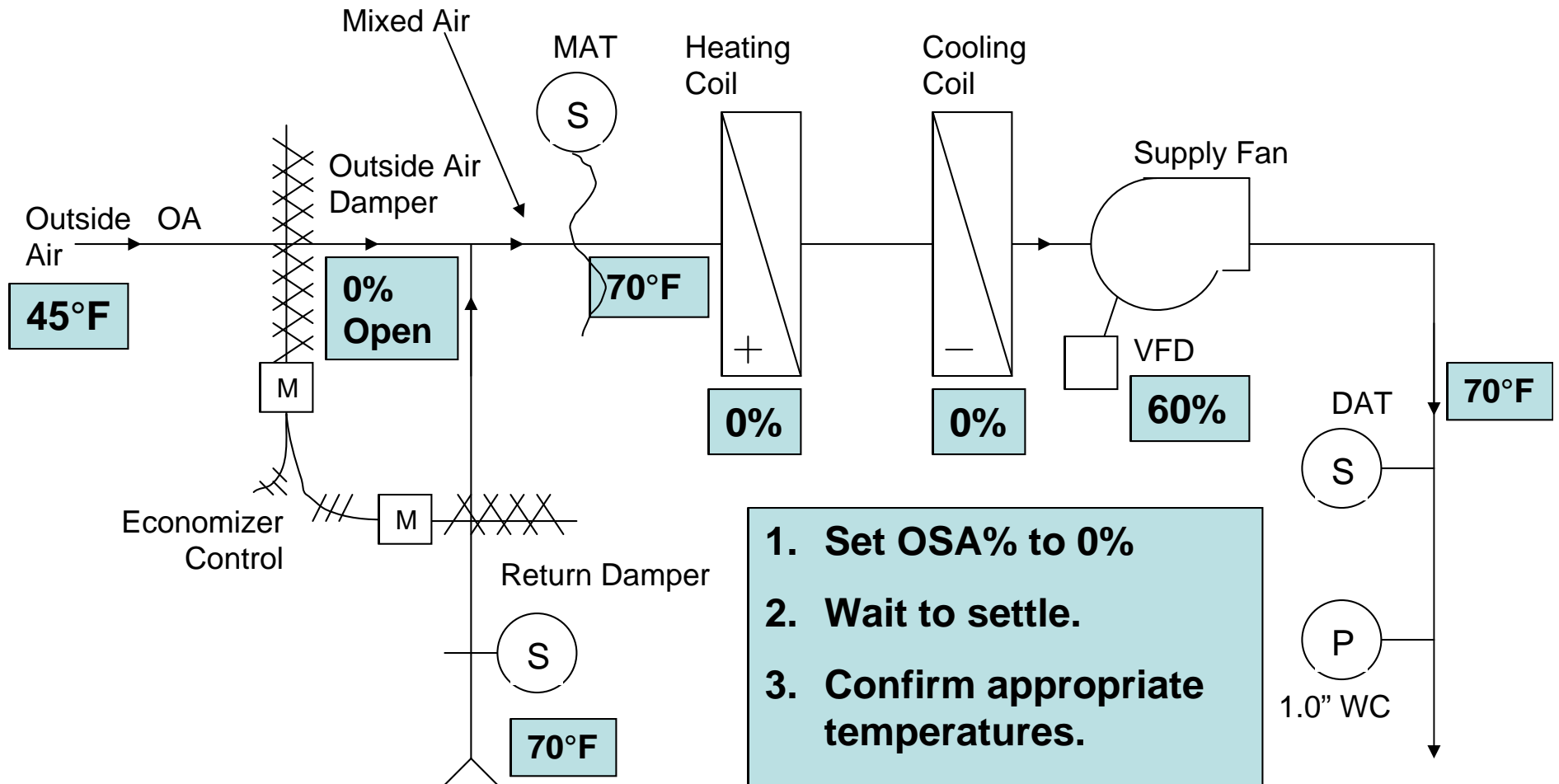
United Energy Engineers

Bellingham, WA

Achieving Good HVAC System Performance (And keeping it)

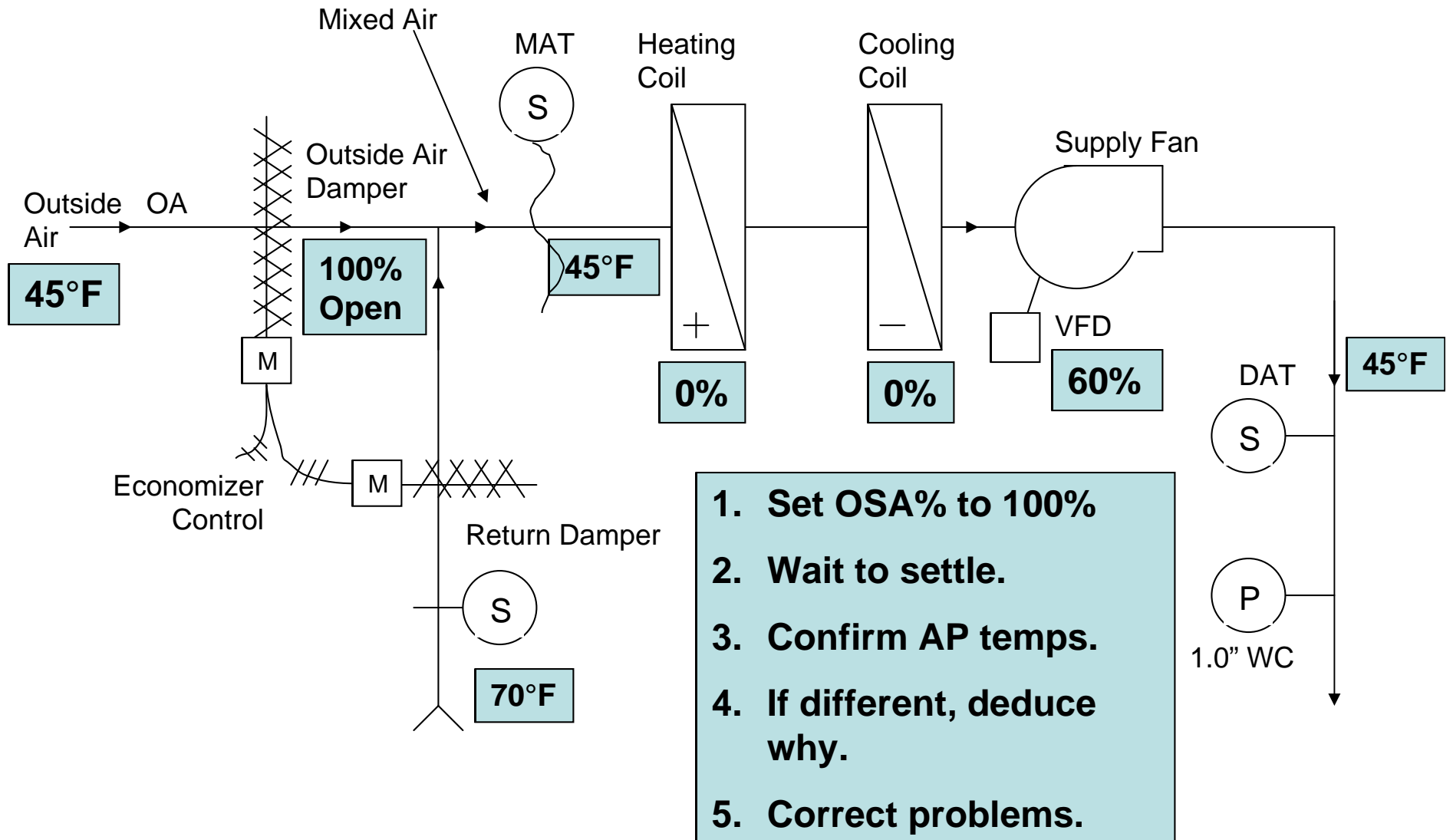
- The Performance of HVAC systems could be improved dramatically.
- Even systems that were well tuned when installed erode over time.
- The only HVAC system problems that “come and get you” are temperature control problems. Energy waste problems have no voice.
- We present a simple method of using the existing DDC system to quickly check system performance.
- Also present some ideas on how to have energy problems “come and get you”.

Test OSA OSA/Return Dampers

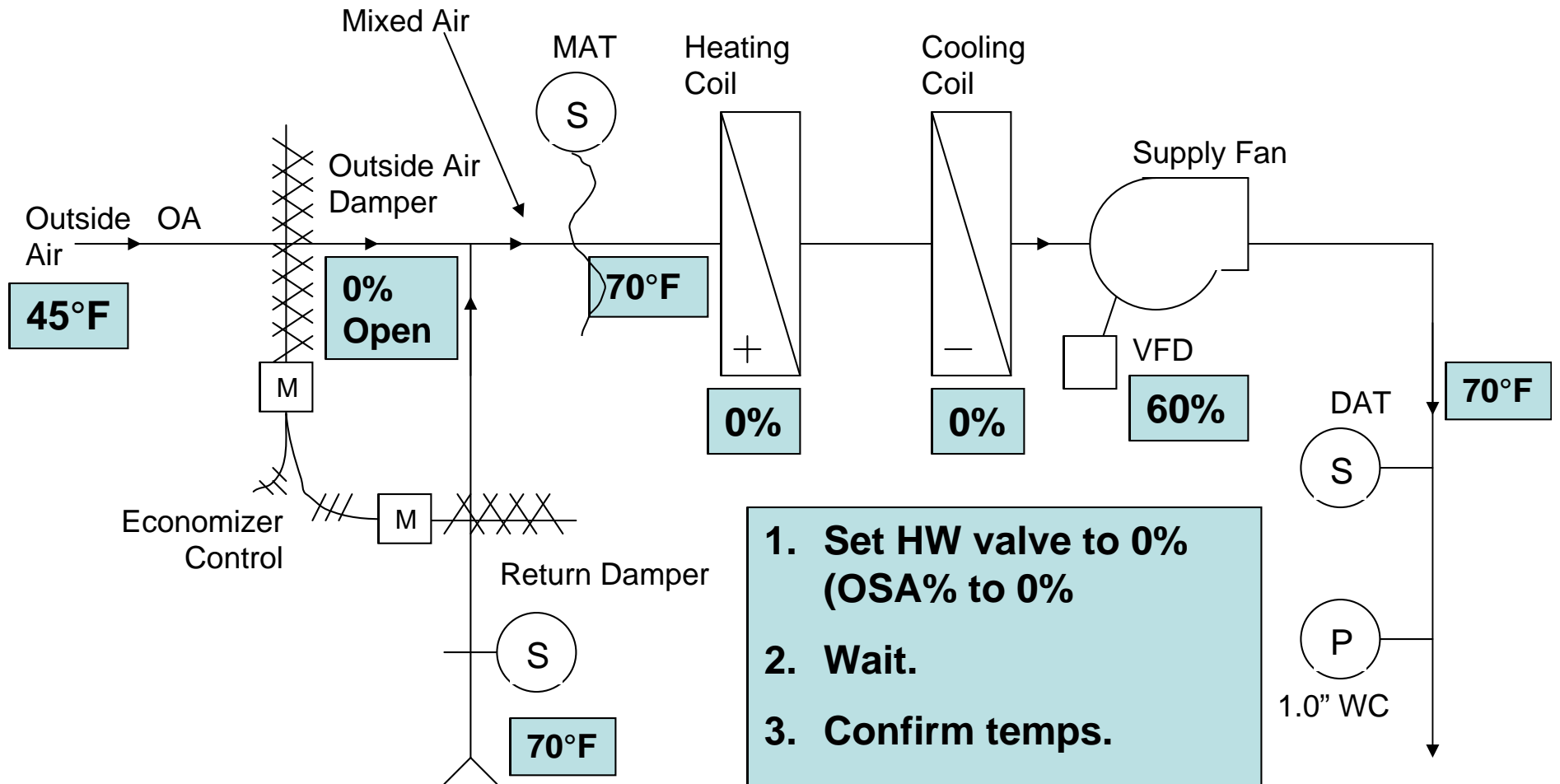


- 1. Set OSA% to 0%**
- 2. Wait to settle.**
- 3. Confirm appropriate temperatures.**
- 4. If different, deduce why.**
- 5. Correct problems.**

Test OSA OSA/Return Dampers

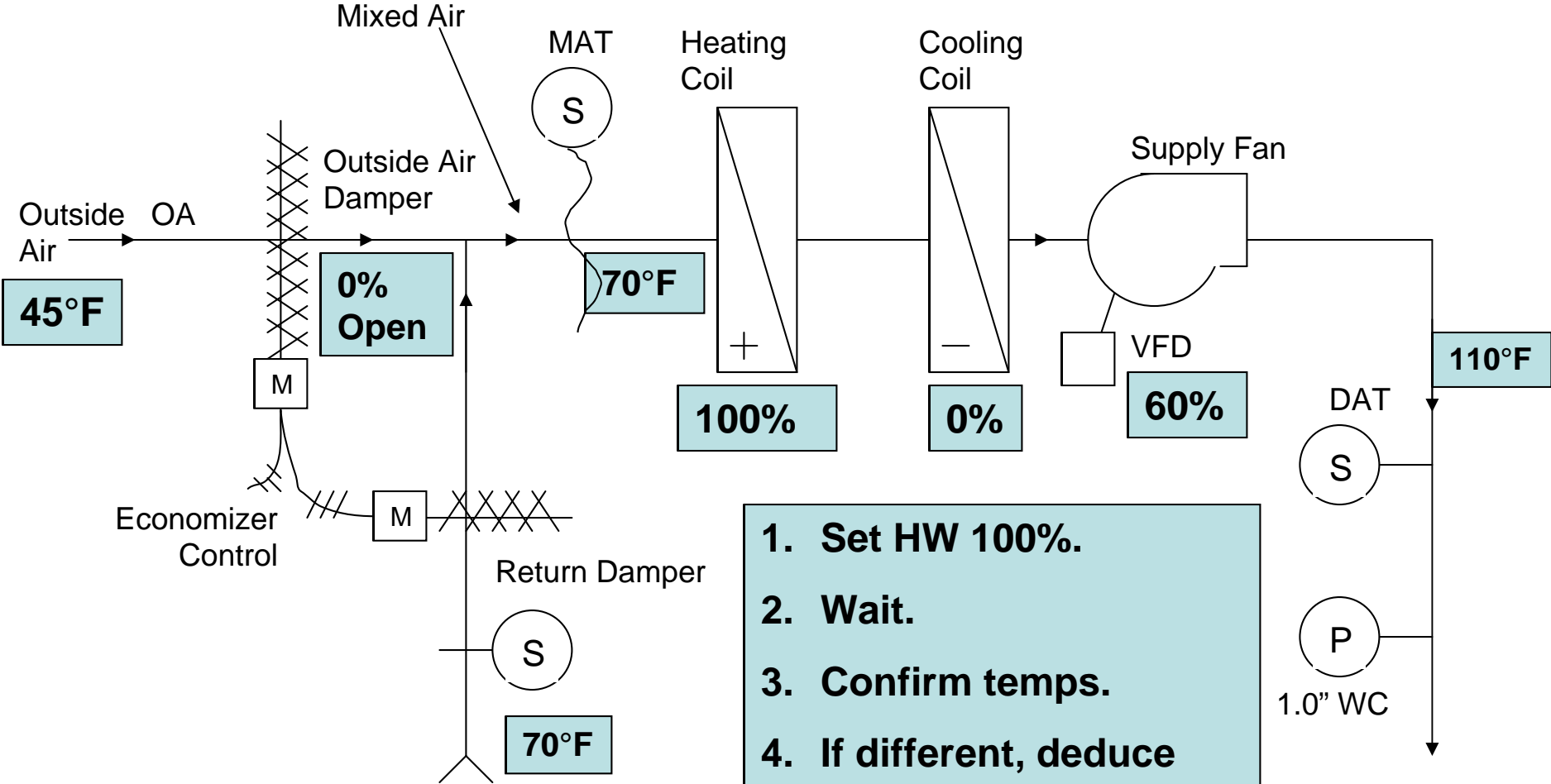


Test HW Valve

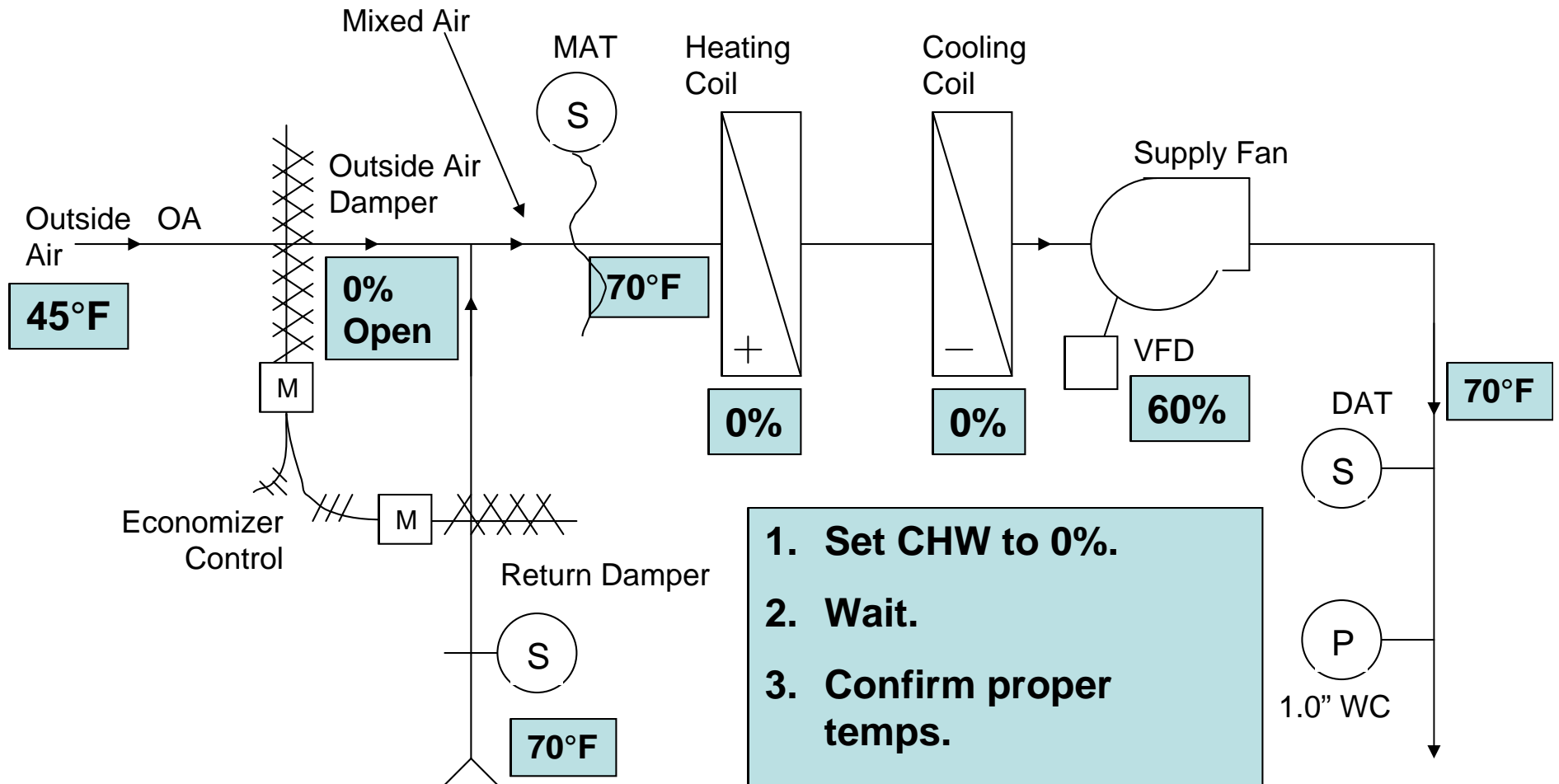


1. Set HW valve to 0% (OSA% to 0%)
2. Wait.
3. Confirm temps.
4. If different, deduce why.
5. Correct problems.

Test HW Valve

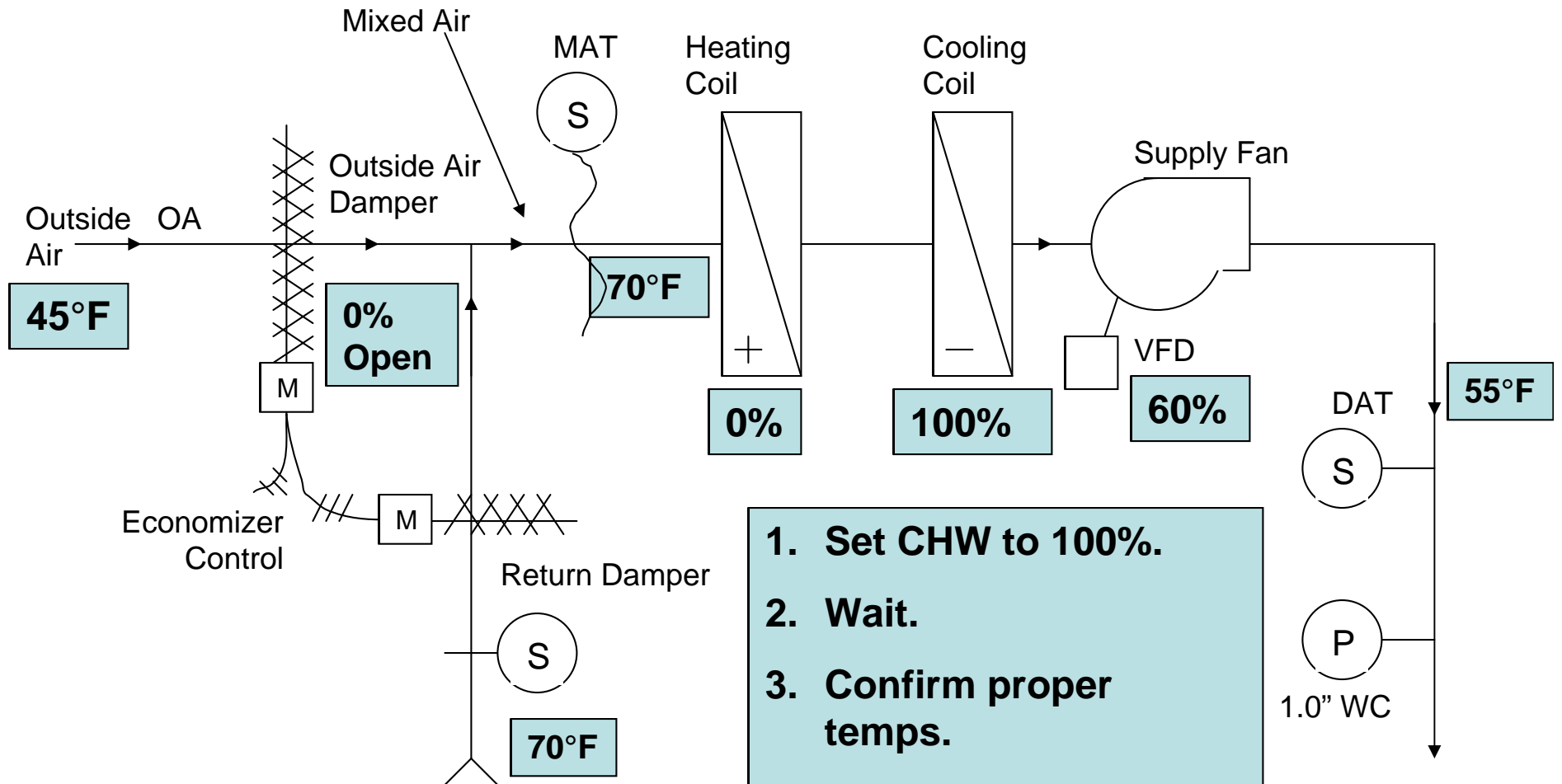


Test CHW Valve



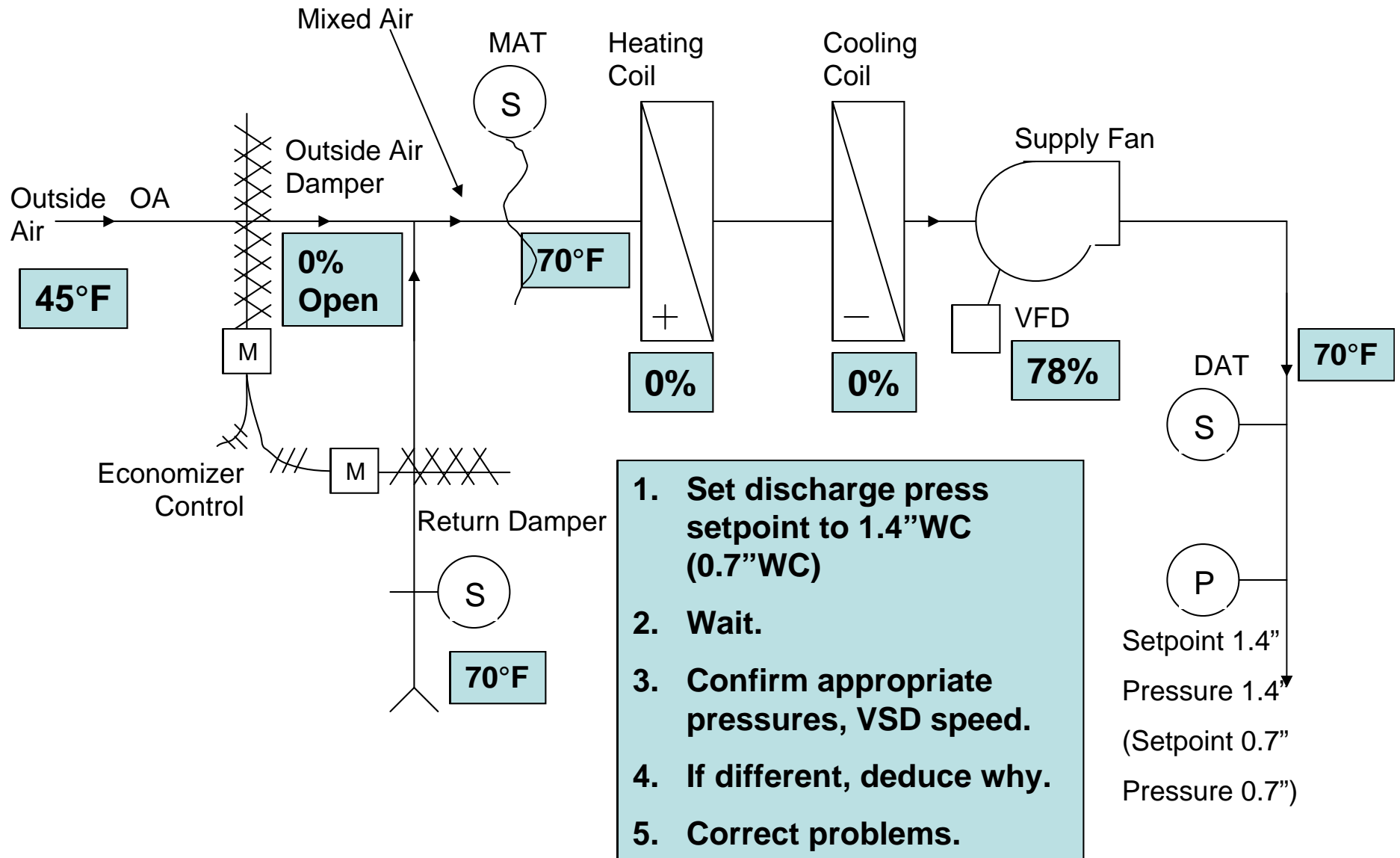
1. Set CHW to 0%.
2. Wait.
3. Confirm proper temps.
4. If different, deduce why.
5. Correct problems.

Test CHW Valve



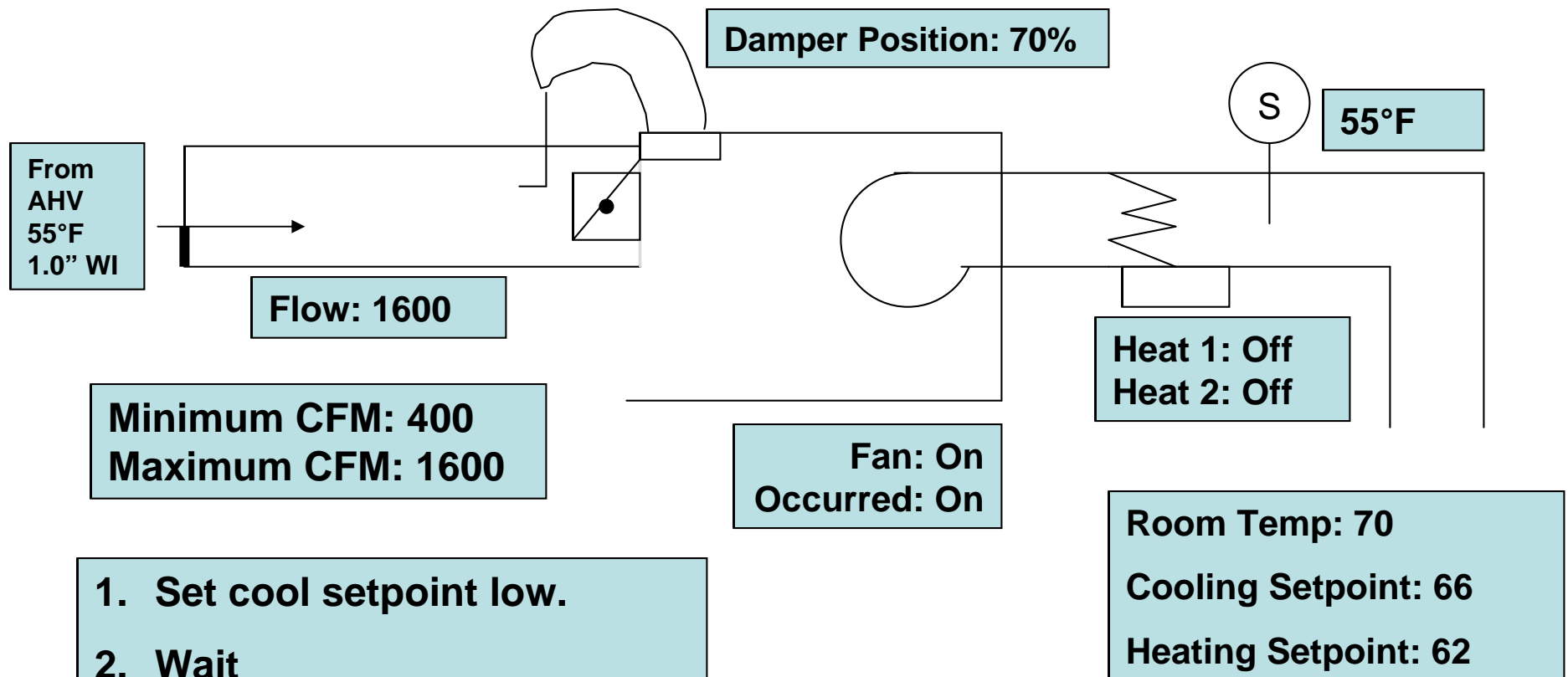
1. Set CHW to 100%.
2. Wait.
3. Confirm proper temps.
4. If different, deduce why.
5. Correct problems.

Test VSD/Duct Pressure



Test FTU Operation

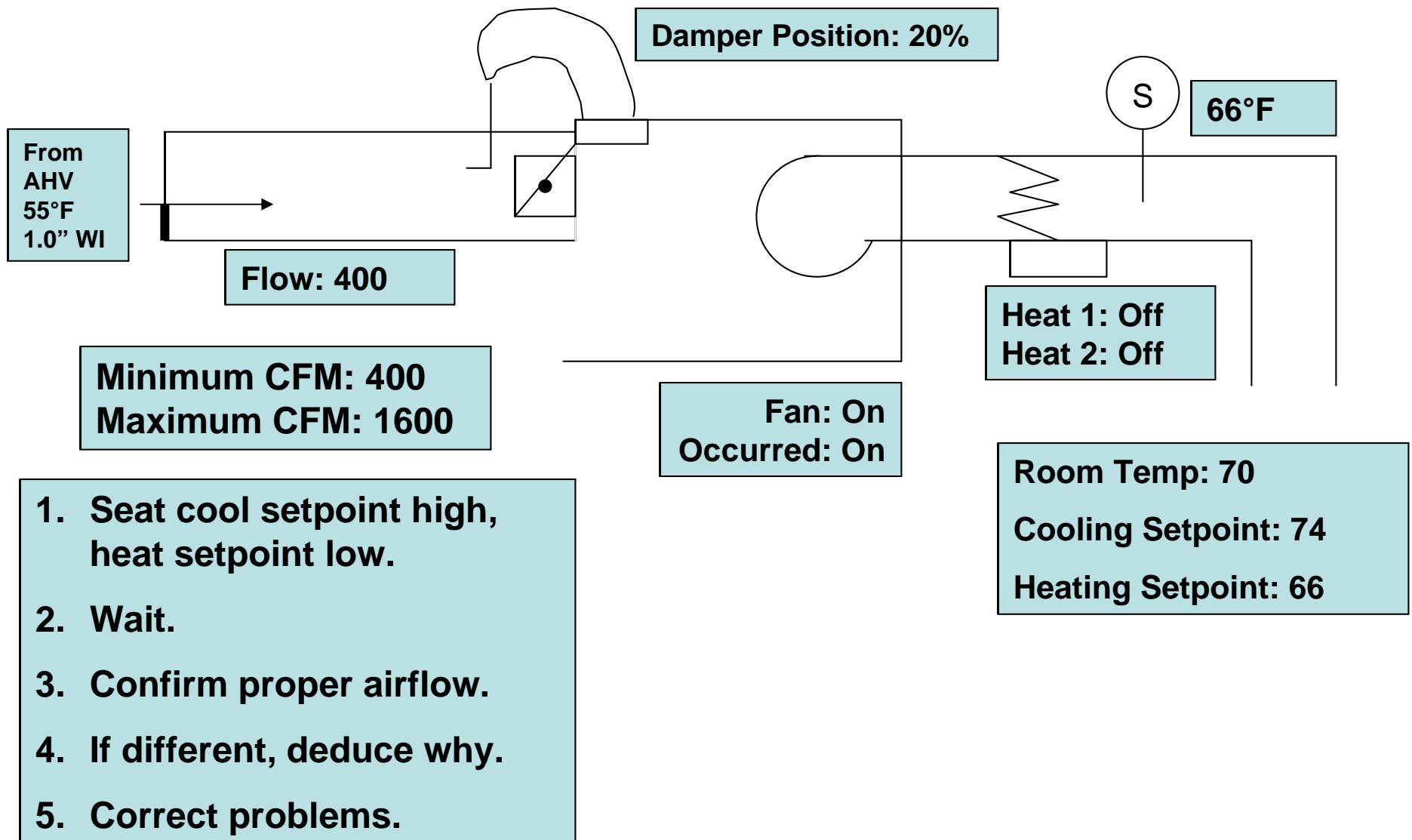
Series Fan Terminal Unit



1. Set cool setpoint low.
2. Wait
3. Confirm proper airflow.
4. If different, deduce why.
5. Correct problems.

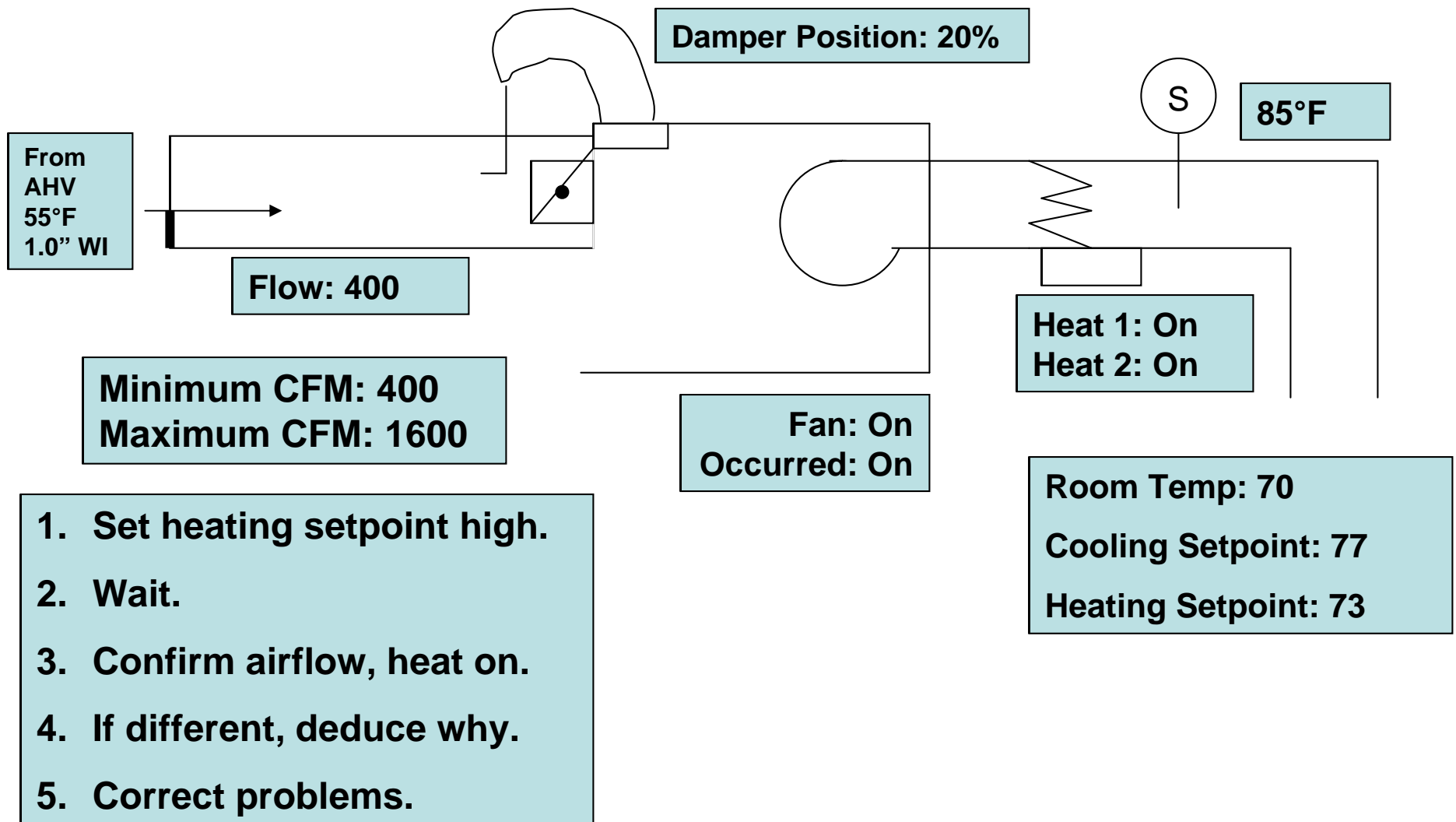
Test FTU Operation

Series Fan Terminal Unit



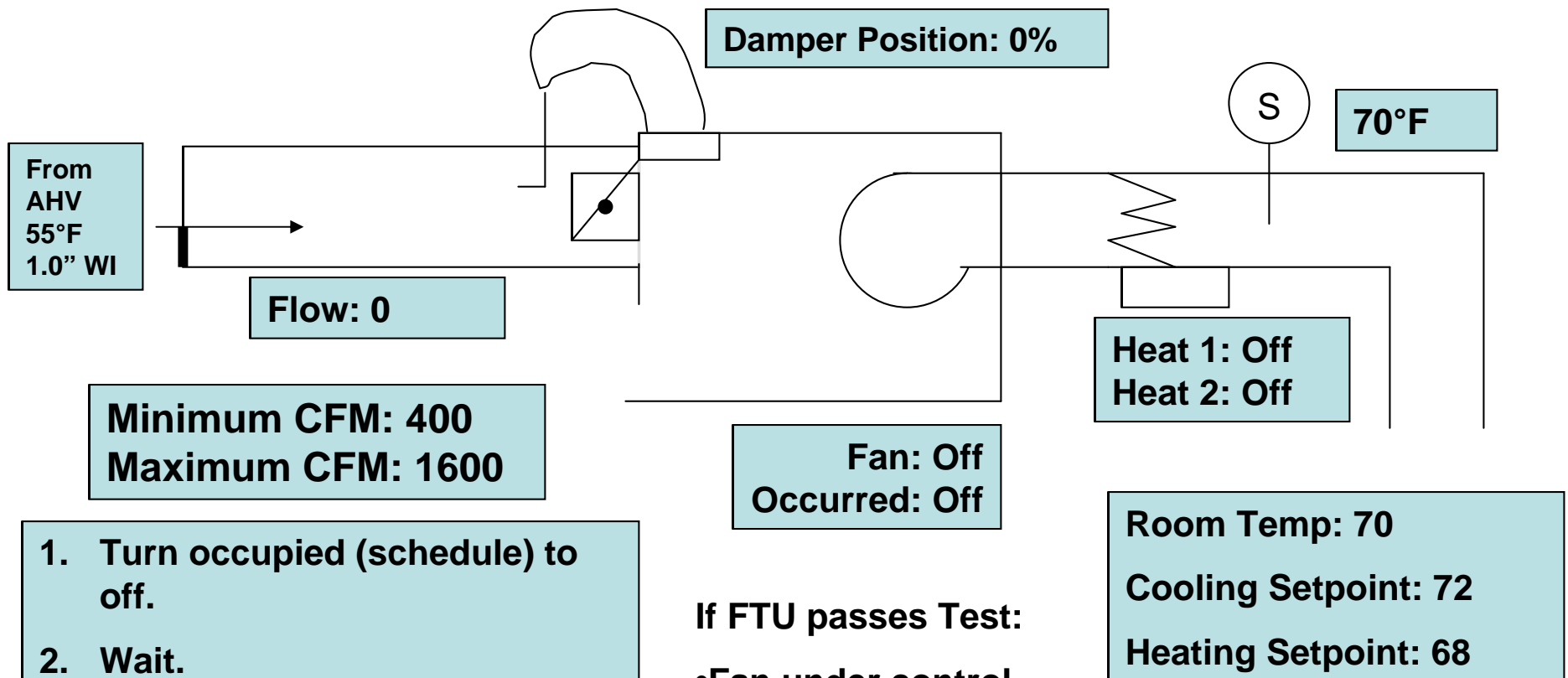
Test FTU Operation

Series Fan Terminal Unit



Test FTU Operation

Series Fan Terminal Unit



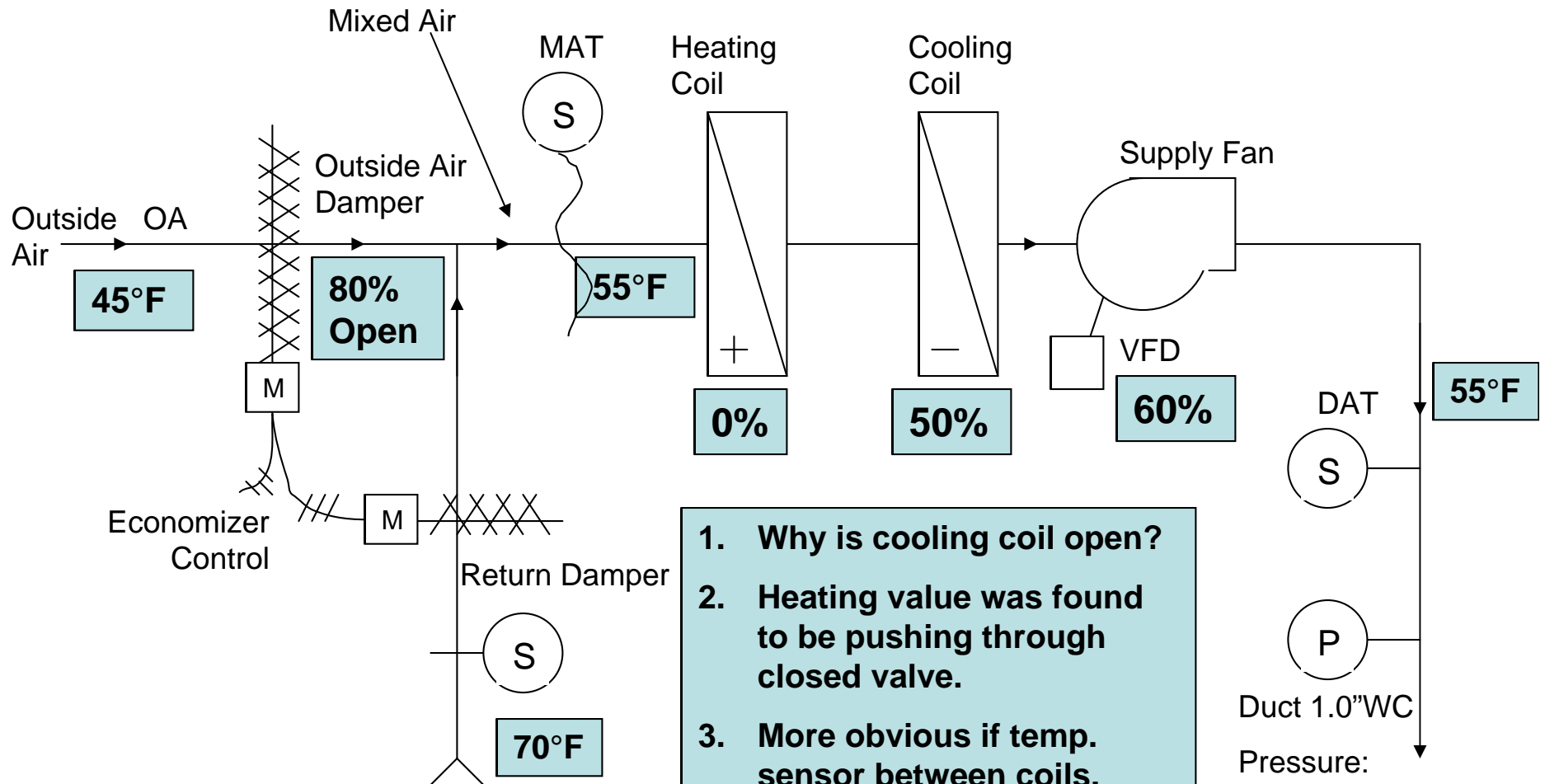
1. Turn occupied (schedule) to off.
2. Wait.
3. Confirm fan off, flow 0, heat off.
4. If different, deduce why.
5. Correct problems.

If FTU passes Test:

- Fan under control
- Heat under control
- Van damper under control
- Airflow measurement working

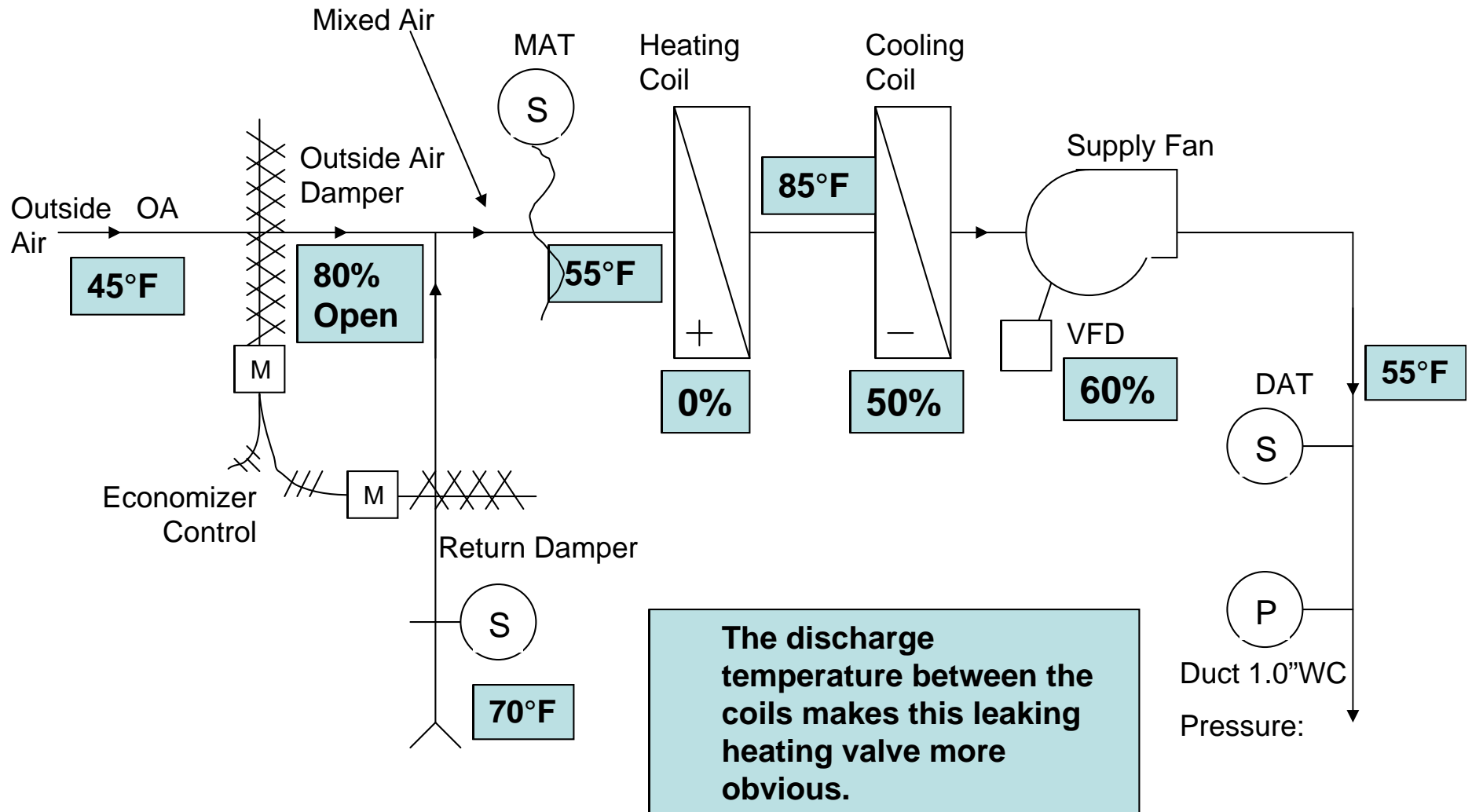
Considering reducing minimum.

Build Graphics To Make Problems Obvious



1. Why is cooling coil open?
2. Heating valve was found to be pushing through closed valve.
3. More obvious if temp. sensor between coils.
4. System was transferring 40 tons of cooling between chiller and boiler.

Build Graphics To Make Problems Obvious



Simple Auto-diagnostic ideas

- Set up flags to identify problems
 - If TOD = 2 AM and fan on then flag
 - If VAV discharge setpoint < 53 then flag
 - If refrigeration compressor = ON and OSA Temperature < 50 F then flag.
- The goal is to have problems that waste energy come to you instead of having to look for them.

Powerful Business

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Track 1 • Session 2

HVAC & Controls

QUESTIONS??

Speakers:

Al Cunningham, Cunningham Engineering

*Main Mechanical Systems Overview
& Orientation to Optimization*

Jim Merfeld, United Energy Engineers

*A Simple Guide for Using DOC Systems
To Improve VAV System Efficiencies*