

# Ventilation for Acceptable Indoor Air Quality

## Part 6 – Integrating Outdoor Air with Building Pressure Control

David S. Dougan, President



Loris, South Carolina



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# Airflow Control Points

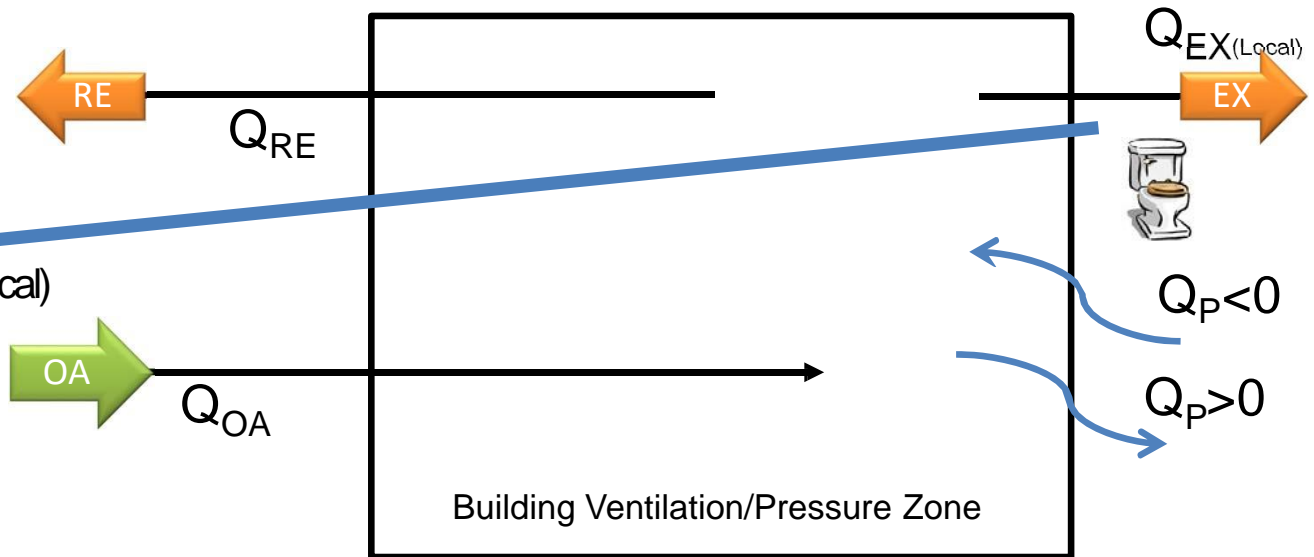
Dilution Ventilation/Economizer:

- $Q_{OA}$

Pressurization:

- $Q_P = (Q_{OA} - Q_{RE}) - Q_{EX(Local)}$

a.k.a.  $\Delta CFM$



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# Measurement Requirements and Airflow Control Strategies

## Supply/Return Fan Systems



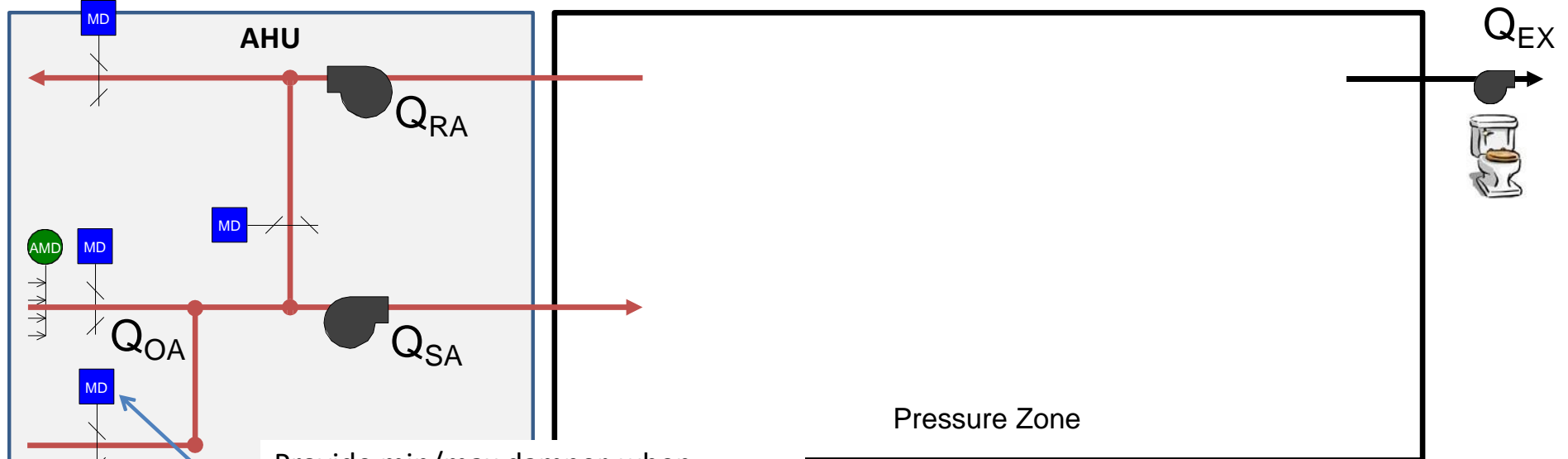
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# SA/RA Fan Systems

Measurement requirements for dilution ventilation,  $Q_{OA}$ , with or without active relief at the AHU



Provide min/max damper, when possible, if minimum OA velocity falls below 150 FPM (avoid false readings from transient wind gusts)

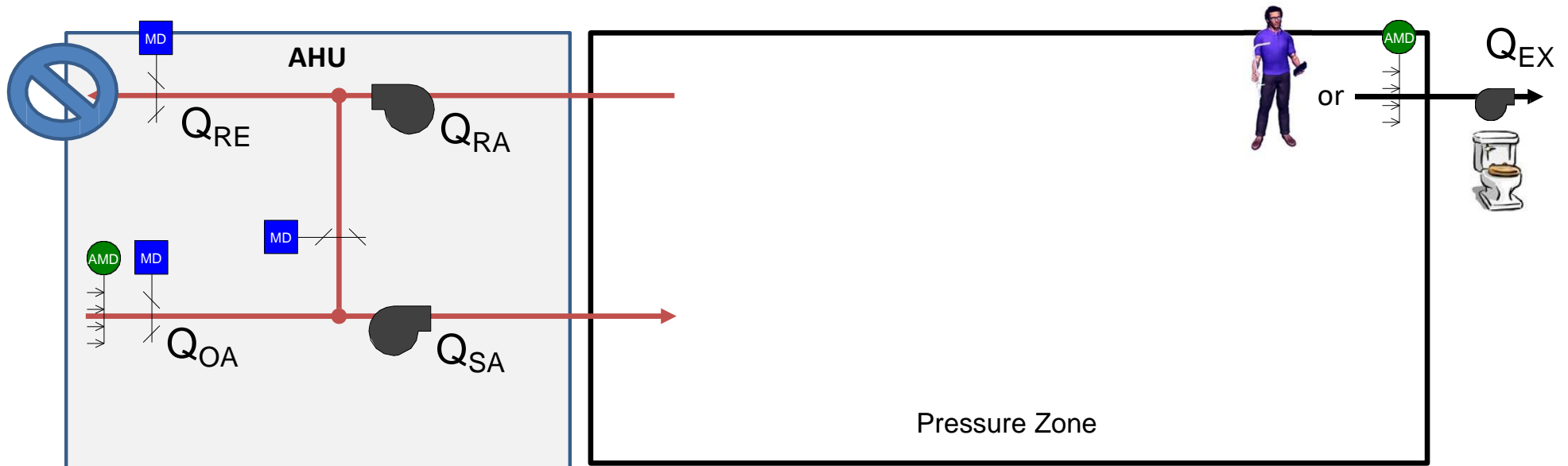
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# SA/RA Fan Systems

Measurement requirements for  $Q_P$  control when  $Q_P = Q_{OA} - Q_{EX}$   
(i.e. no relief is required at the AHU to maintain pressurization)



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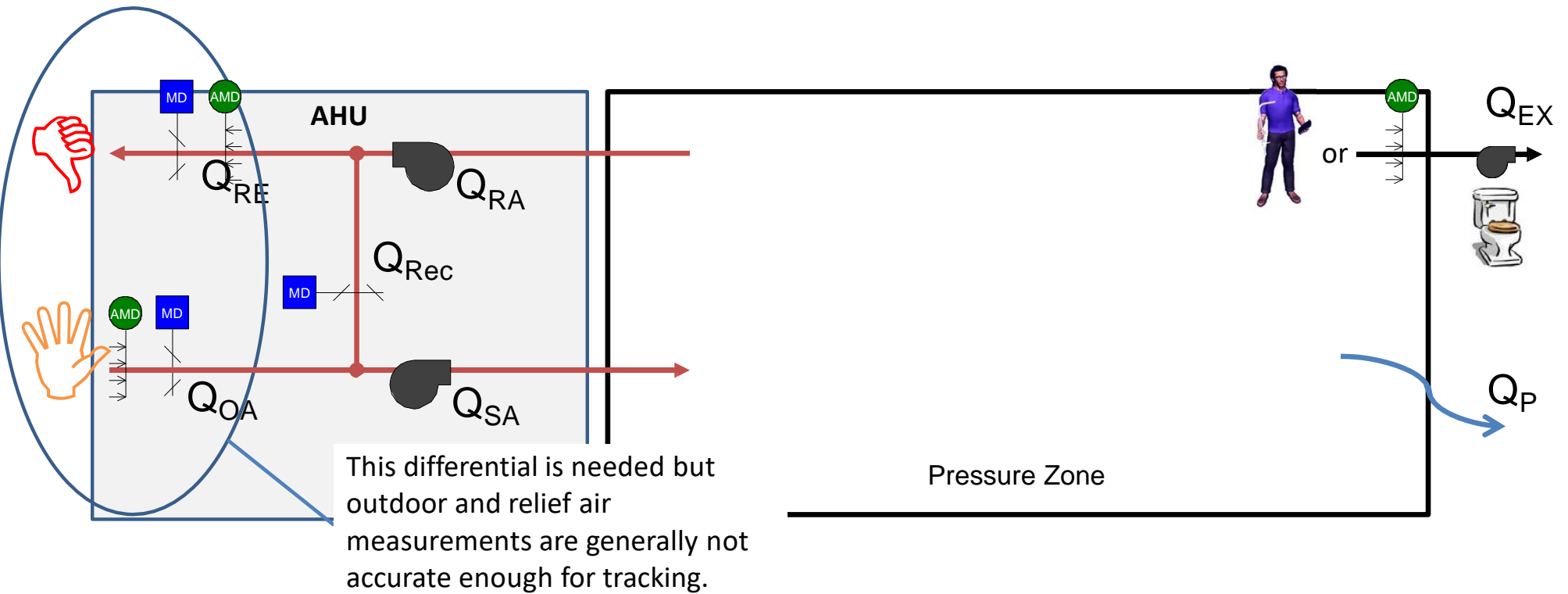
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# SA/RA Fan Systems

Measurement requirements for  $Q_P$  control (with active relief)

$$Q_P = [Q_{OA} - Q_{RE}] - Q_{EX}$$



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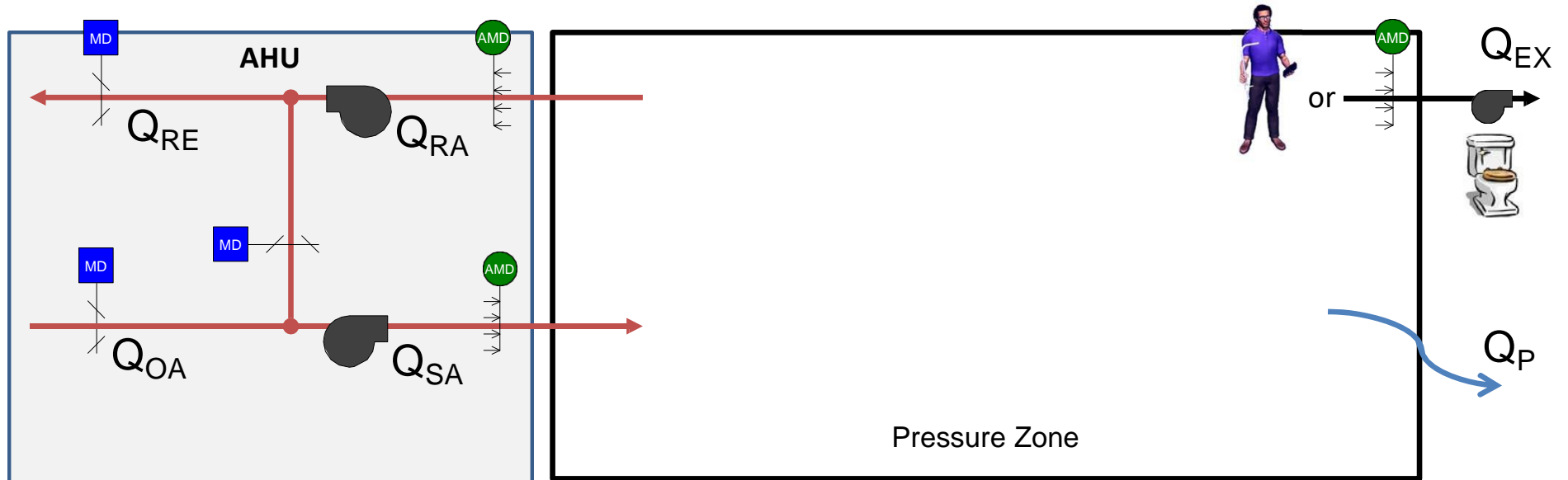
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# SA/RA Fan Systems

Measurement requirements for  $Q_P$  control  
(with active relief at the AHU)



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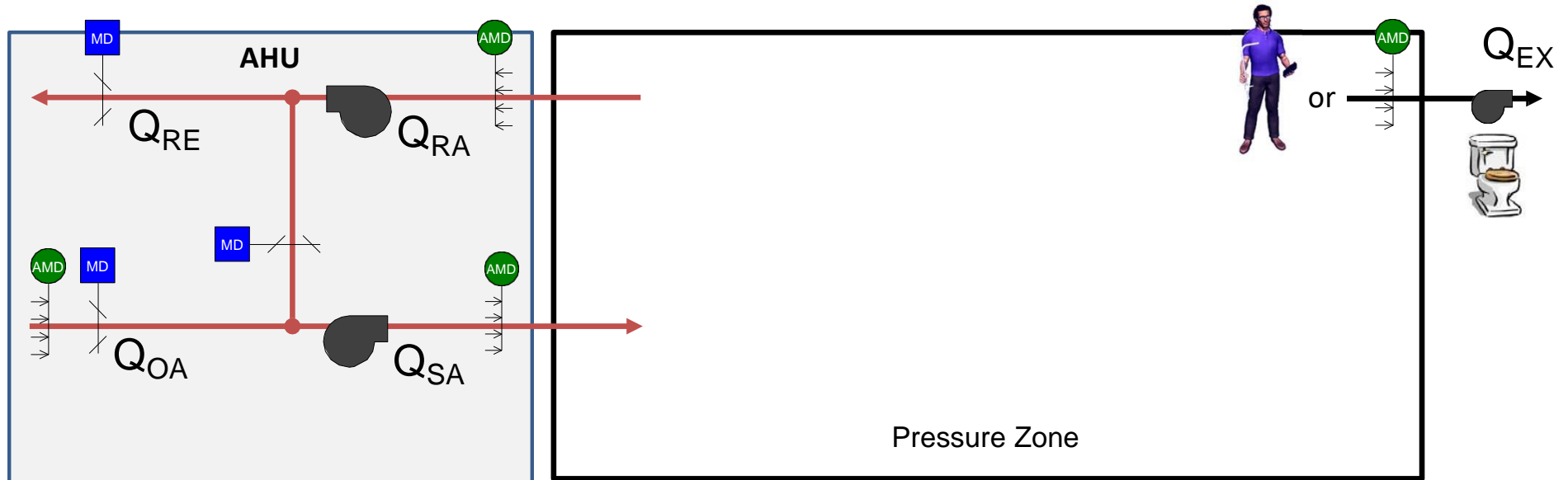
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# SA/RA Fan Systems

Required measurement paths for  $Q_{OA}$  and  $Q_P$  control



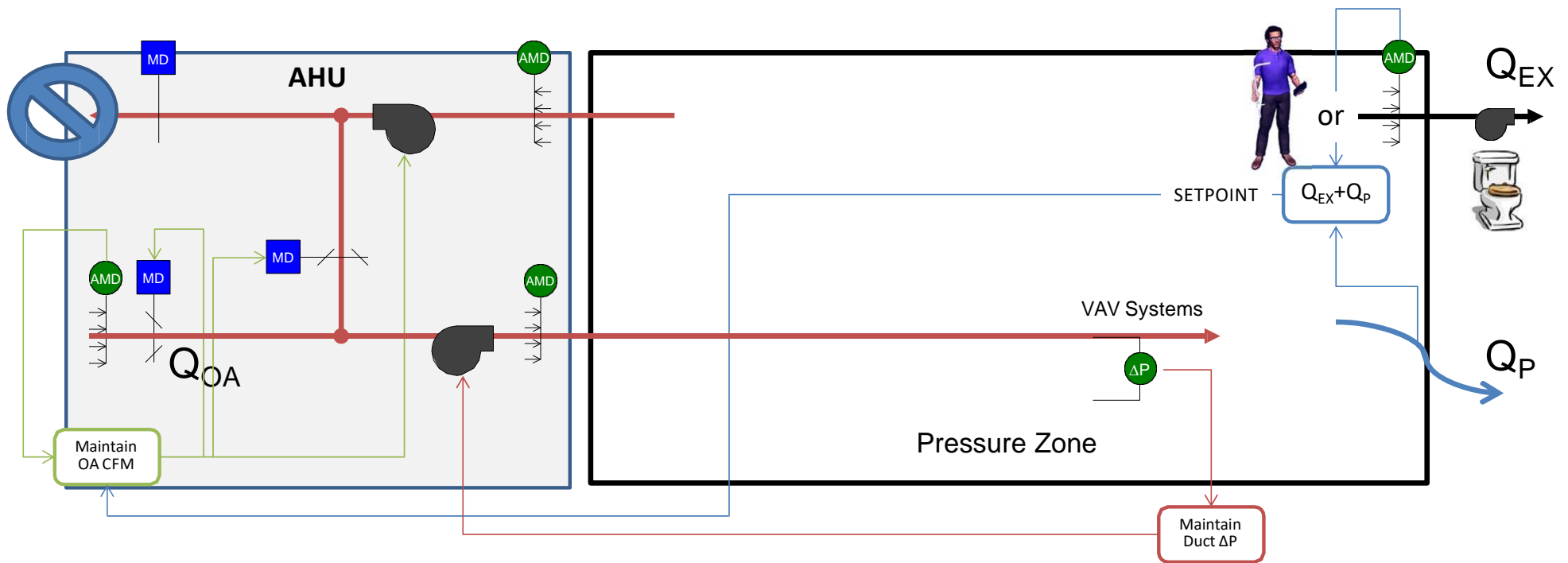
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# SA/RA Fan Systems

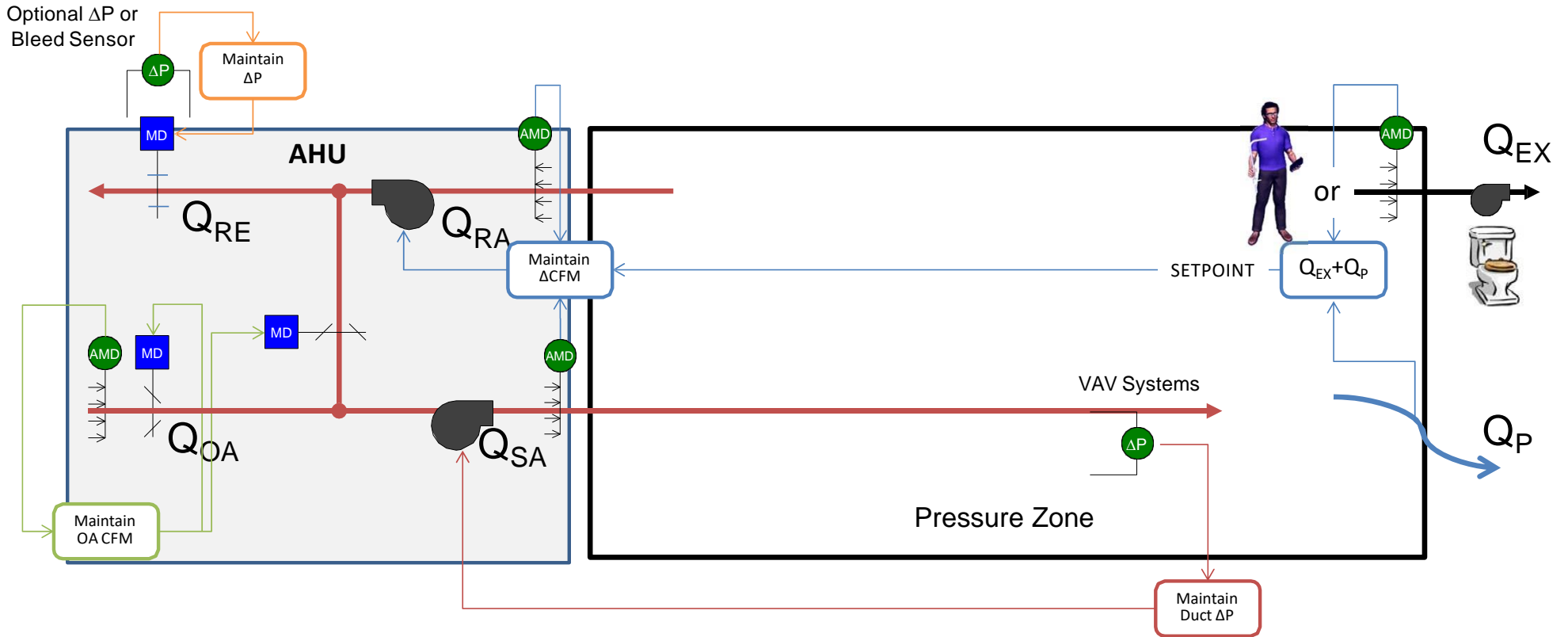
Control strategy when no active relief is required at the AHU  
(Do this)



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# SA/RA Fan Systems

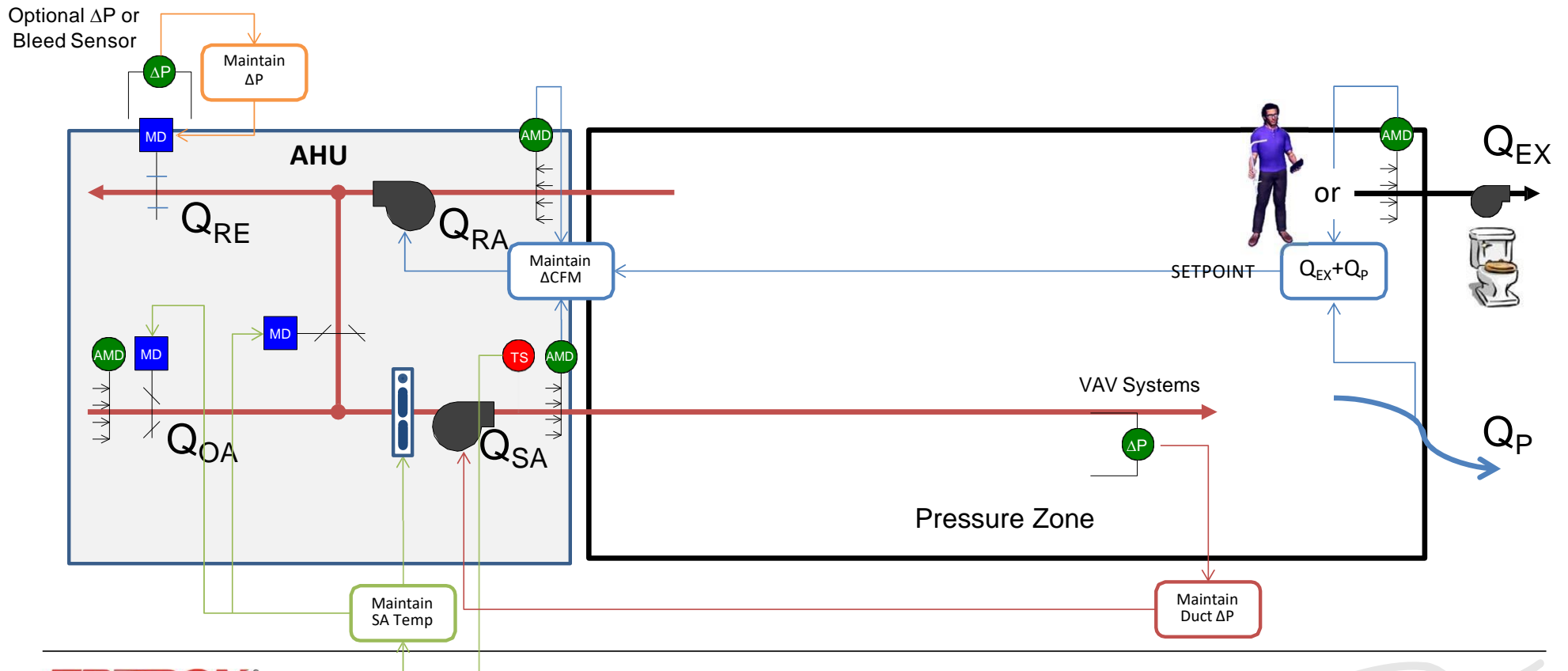
Control strategy when active relief is required at the AHU



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# SA/RA Fan Systems

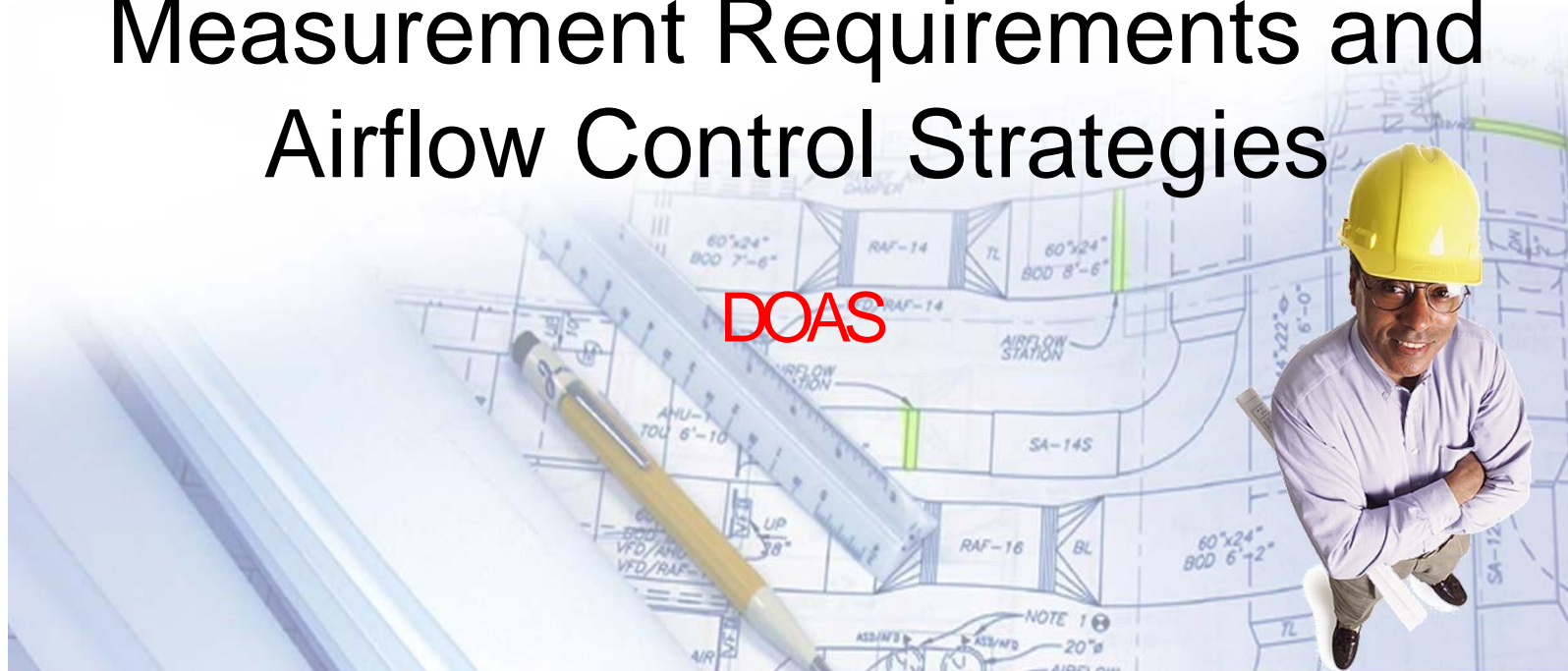
Control strategy when economizer mode is active



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# Measurement Requirements and Airflow Control Strategies



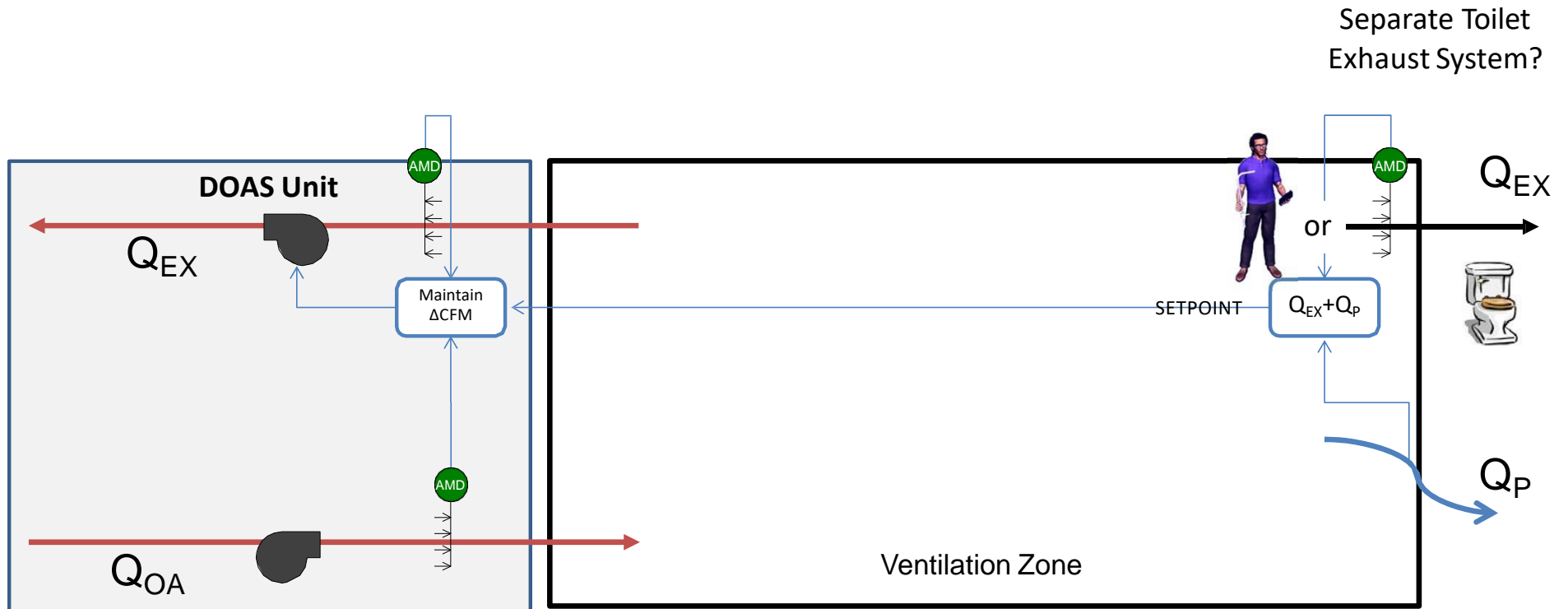
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# DOAS System Considerations

Simple, constant single or multi-zone OA during occupied periods



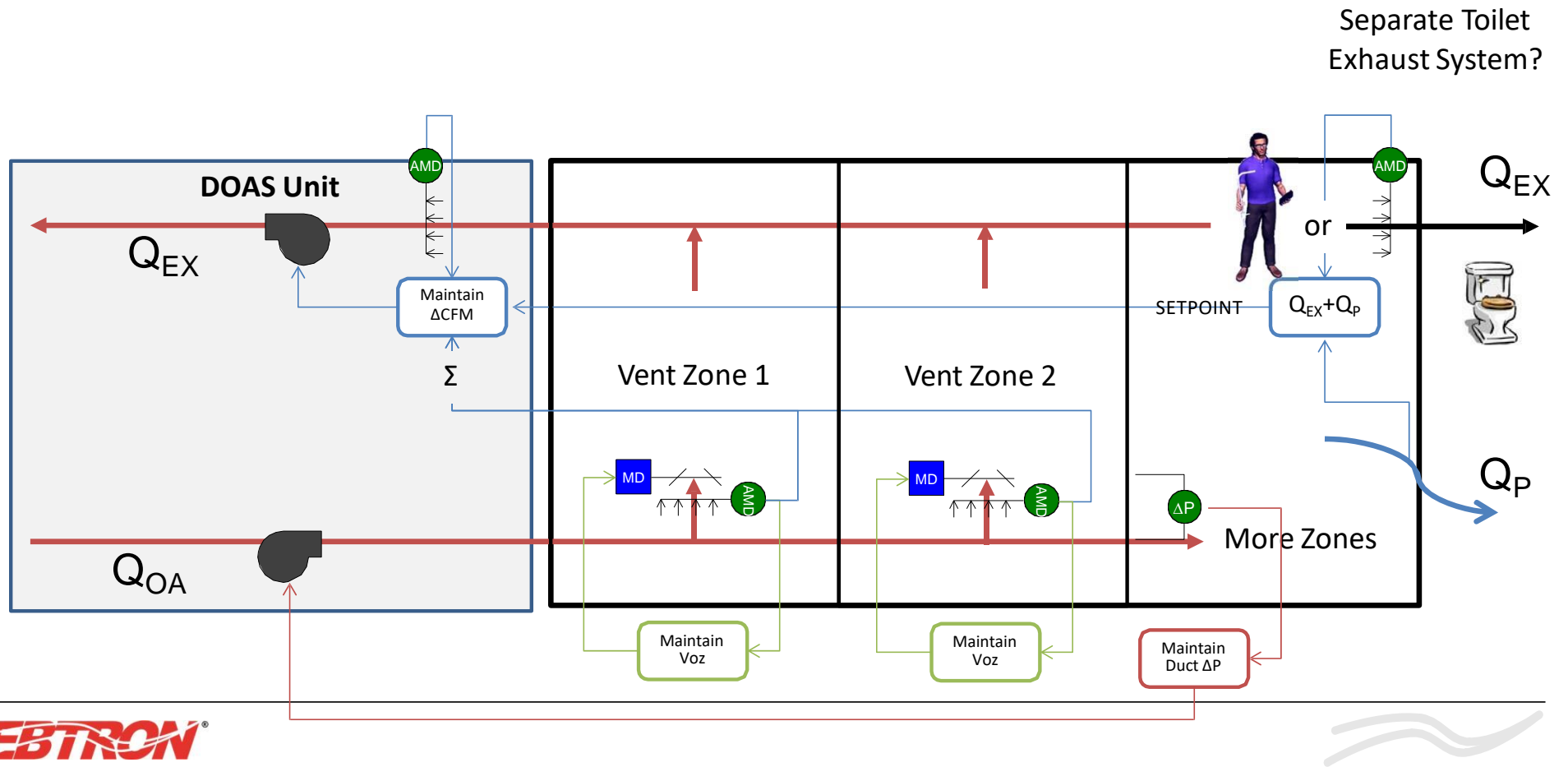
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# DOAS System Considerations

Serving multi-speed fan coils or VAV terminals



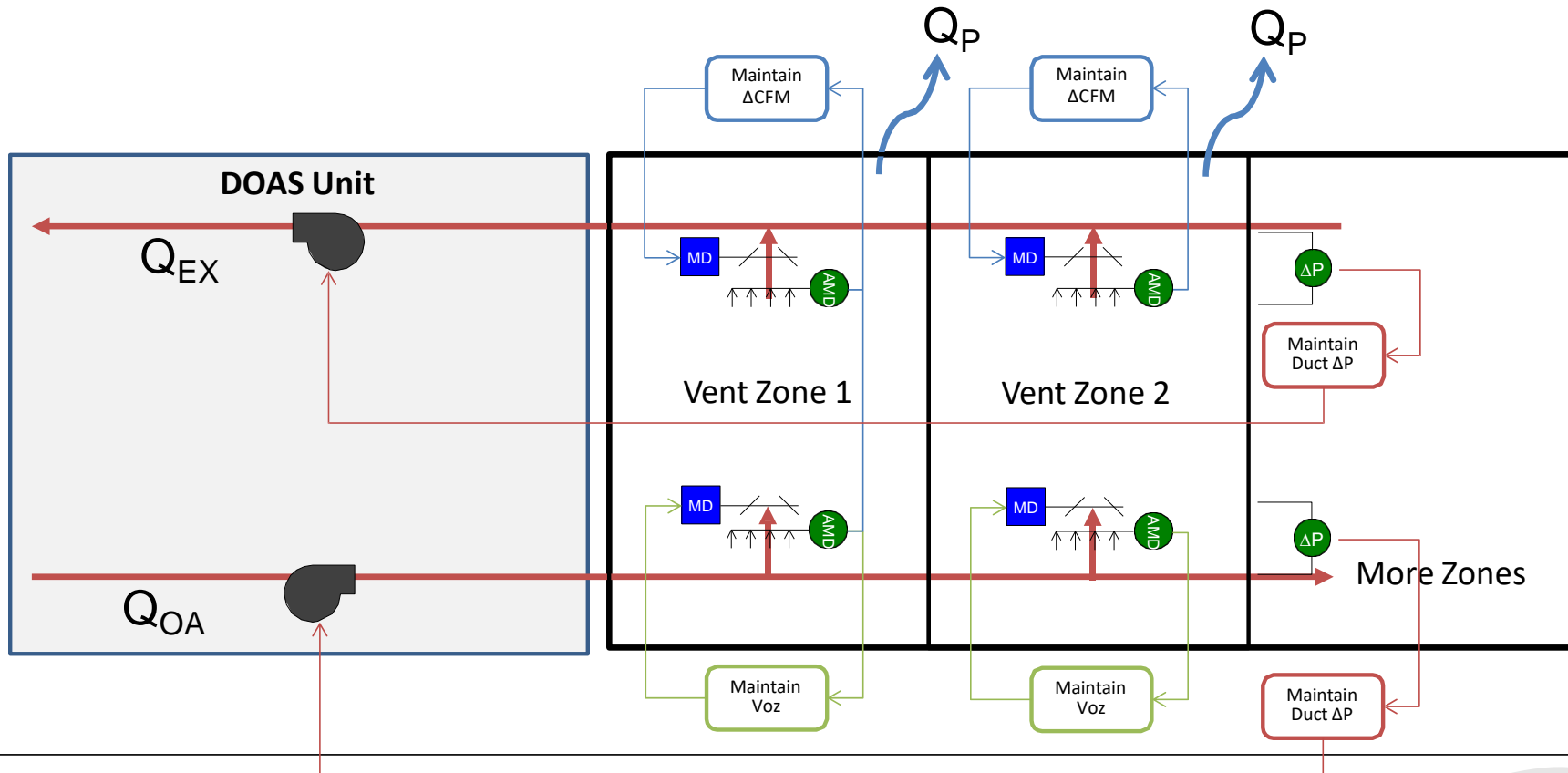
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# DOAS System Considerations

Alternate for zone level pressure control



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# Thank You!

Questions? More information?

Contact Technical Air Systems, Inc.

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The EBTRON logo features the word "EBTRON" in a bold, italicized, red sans-serif font. A white swoosh underline is positioned beneath the letters "B" and "T".

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