

ES 78 Energy Management and Controls System

Bob Malone
Malone Controls Corp.

Control System Design

- Step #1
- -Know What Your Controlling!!
- -If you don't understand it you cannot control it.
- This step requires thought, visualization, hopefulness and anxiety.
- Past Experience is invaluable!!

Control System Design

- Step #2
- Create a List of Physical Control Points
- -List each Output Point
 - -Supply Fan
 - -Return Fan
 - -Economizer (analog)
 - -Variable Frequency Drive (analog)
 - -Cooling (digital or analog)
 - -Heating (digital or analog)

Control System Design

- List each Input Point
 - -Supply Air Temperature
 - -Space Temperature
 - -Fan Status
 - -Supply Duct Pressure
 - -Return Air Temperature
 - -Building Pressure

- Step #3 Assemble a Control Points List
- - List All Outputs
- -List All Inputs
- Then see what will fit in the controller that you selected

Control System Design

- OUTPUTS
- 1 UNIT Start
- 2 Compressor 1
- 3 Compressor 2
- 4 Unloader 1
- 5 Unloader 2
- 6 Economizer Open
- 7 Economizer Close

Control System Design

- Outputs (Continued)
- 8 Condenser Fan 3
- LED-1 Fan Alarm
- LED-2 Temp Alarm

Control System Design

- INPUTS
- 1 Supply Air Temp
- 2 Mixed Air Temp
- 3 Spare
- 4 Economizer Position
- 5 Supply Static Press
- 6 Compressor Load
- 7 Supply Fan Load
- 8 Supply Fan Speed

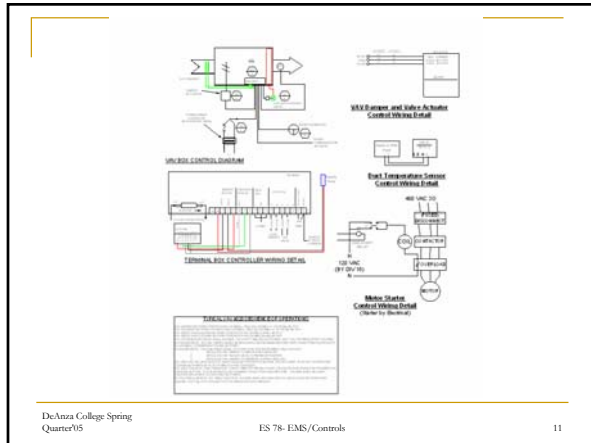
Control System Design

- ANALOG OUTPUT
- 1 Supply Fan Speed

- REMOTE POINTS
- AC-1 Out Air Temp
- AC-1 Return Air Temp

Control System Design

- Step #4 Generate Drawings
- -Draw detailed point to point wiring diagrams
- -Generate Sequence of Operation
- -Drawings Used to Generate System Software
- -Drawings Used to Build Control Panels



Control System Design

- Conclusion
- -Follow the Steps and Control Anything
