

Compressor Performance Algorithms and PLC Support

When a PLC does not properly model the unit it is controlling, then unit optimization is rarely achieved, issues with safety occur, and reduced operating maps are likely.

ACI not only provides dynamic compressor performance curves to operators, but the same level of performance prediction can be provided to Automation Controls so that unit is properly modeled in the PLC.

Robust Algorithms Provide:

- Load Predictions
- Flow Predictions
- Fuel Predictions
- Pressure Drop Considerations
- Proper Rod Load Considerations
- Crosshead Pin Reversal Considerations
- Low Volumetric Efficiencies
- Discharge Temperatures
- Safe Startup Maps
- And much more...

Also Included:

- Load step sequencing chart with load indication for automation purposes
- Alerts for any known areas of concern during compressor operation
- Fast-executing code for Gas Compressibilities and Interstage Pressure Balancing routines
- Automation Methodologies
- Comparisons between PLC-based prediction routines against those from eRCM, or other OEM software

Automation Support

The screenshot displays the ACI eRCM software interface for Unit #1 in 2-Stage Mode. It includes several key components:

- Unit #1: 2-Stage Mode Header:** Shows 'Full Load' and a table of 'HEAD END POCKETS' and 'HEAD ENDS' with columns for Load Step, HE1, HE2, HE3, HE4, h1, h2, h3, and h4.
- Unit #1 Data Tables:**
 - FIXED DATA:** Lists parameters like Ampere/psi, Gas/GK Value, and In/GasK2 Value.
 - TEMP VARIABLES:** Lists In/GasK1, In/GasK2, and Temp actor values.
 - ROD LOADS:** Lists Max Discharge Temp, Max LDR1, and Max Discharge Temp.
 - ROD LIMITS:** Lists Max Rod Load, Max Rod Load, and Max Rod Load.
 - ROD Constants:** Lists Max Rod Load, Max Rod Load, and Max Rod Load.
 - ROD Adjustment Constants:** Lists Max Rod Load, Max Rod Load, and Max Rod Load.
- Special Limits on P₁ for Rod Load/Pin Reversals:** A table with columns for Max P₁, Max P₂, LSP, and LSP (Low/Low/Low).
- Unit Safe Startup Table P₁ versus P₂ (First safe load step to use):** A large table with columns for Region to Map, P₁ - Min, P₁ - Max, P₂ - Min, and P₂ - Max.
- Table of First Safe Load Steps:** A table with columns for P₁ (psig), P₂ (psig), and a grid of values.
- Graphs:**
 - Suction Pressure (X) versus D:** A graph showing suction pressure vs. diameter.
 - Display plot in High Resolution:** A graph showing suction pressure vs. diameter.
- PLC Programmer Instructions:** A section of code for the PLC programmer, including comments and instructions.

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