

Maximum Performance... Sustained

With John Henry Foster Air Service, Assessments and Automation.

Compressed air is one of the most expensive uses of energy in a manufacturing plant. Eliminating waste and inefficient applications of compressed air is crucial to maximizing the profitability of your operation. SUSTAINING those improvements are even more important. The compressed air experts at John Henry Foster will assess your system to identify opportunities, help you implement cost saving measures AND ensure those savings are sustained for years to come.

The Difference is in the Data

Most "air audit specialists" can tell you how to save now. John Henry Foster goes a step further to ensure you sustain your savings for years to come. The difference is in the data. The AIRx and AIRx Pro controllers offer USEFUL and MEANINGFUL data to maintain peak performance of your operation. Generating meaningful report-outs requires performing detailed monitoring of all compressed air system components. The AIRx and AIRx Pro controllers by John Henry Foster provide specific health and status checks on each of the following:

SUSTAIN SAVINGS Compressor Maintenance Report: 6/5/2016 - 6/11/2016 PSI/AMPS TRENDING Comp 3 / Ingersoll Rand - EP100 / 7032TPW3F Overall Perfo 120 110 100 90 90 70 60 50 5.4 CEWKW 320 13120.8 KWH 280 892.21 s 240 N 200 420.8 SCFM 2.1 SICFM COMPONENT MAINTENANCE -Remaining % Hours Statur 217/2000 A Replace 0 + 0 6/6/10 6/9/16 6/11/10 2153/8000 MOST FREQUENT ALARMS Most Recent Date/Time Description Qua 1821/3000 Warnin Comp 3 Low Water Flow Alarm 06/08/2016 19:00:00 06/08/2016 17:00:00 Comp 3 Temerature Ala Comp 3 Dirty Inlet Alarm 12 06/08/2016 14:00:00 979/8000 A Replace 06/08/2016 18:00:00 Comp 3 Load Feedback Alarm 11 06/08/2016 20:00:0 Comp 3 Run Feedback Alarm TOTALS

Week	Month To Date	Quarter To Date	Year To Date		Week	Month To Date	Quarter To Date	Year To Date	
100.0	94.3	88.7	88.7	Running	90	134	170	345	
115.3	109.4	84.7	84.7	Loaded	12	58	164	256	
78.1	74.1	57.2	57.2	Unloaded	67	108	176	222	
420.8	401.2	308.1	308.1	Off	5	38	138	260	
2.1	4.4	16.9	16.9	KWH	13120.8	25712.7	76762.4	76762.4	
5.4	5.4	5.4	5.4	\$	892.21	1748.46	5219.84	5219.84	
	Week 100.0 115.3 78.1 420.8 2.1 5.4	Week Month To Date 100.0 94.3 115.3 109.4 78.1 74.1 420.8 401.2 2.1 4.4 5.4 5.4	Week Month To Date Quarter To Date 100.0 94.3 88.7 115.3 109.4 84.7 78.1 74.1 57.2 420.8 401.2 308.1 2.1 4.4 16.9 5.4 5.4 5.4	Week Month To Date Quarter To Date Year To Date 100.0 94.3 88.7 88.7 115.3 109.4 84.7 84.7 78.1 774.1 57.2 57.2 420.8 401.2 308.1 308.1 2.1 4.4 16.9 15.9 5.4 5.4 5.4 5.4	Week Month To Date Quarter To Date Year To Date 100.0 94.3 88.7 88.7 Running 115.3 109.4 84.7 84.7 Loaded 78.1 74.1 57.2 57.2 Unioaded 420.8 401.2 308.1 308.1 Off 5.4 5.4 5.4 5.4 \$	Week Month To Date Quarter To Date Year To Date Week 100.0 94.3 88.7 88.7 Running 90 115.3 109.4 84.7 84.7 Loaded 12 78.1 77.1 67.2 57.2 Unioaded 67 420.8 401.2 308.1 308.1 Off 5 2.1 4.4 16.9 16.9 KWH 13120.8 5.4 5.4 5.4 \$ 88221	Week Month To Date Quarter To Date Year To Date Week Month To Date 100.0 94.3 88.7 88.7 Running 90 134 1115.3 109.4 84.7 84.7 Loaded 12 58 78.1 74.1 67.2 57.2 Unloaded 67 108 420.8 401.2 308.1 308.1 Off 5 38 2.1 4.4 16.9 16.9 KVH 13120.8 22712.7 5.4 5.4 5.4 5.4 5.4 5.4 5.4 5.4 5.4 5.4	Week Month To Date Quarter To Date Year To Date Week Month To Date Quarter To Date 100.0 94.3 88.7 88.7 Funning 90 134 170 115.3 109.4 84.7 84.7 Loaded 12 58 164 78.1 74.1 57.2 Unisoded 67 108 176 420.8 401.2 308.1 308.1 Off 5 38 138 2.1 4.4 16.9 16.9 KVH 13120.8 25712.7 76762.4 5.4 5.4 5.4 5.4 \$ 862.21 1748.46 5218.84	

For questions or to schedule service, please call John Henry Foster at: 1-800-444-0522

Actual System Performance Report from John Henry Foster AIRx Pro Controller

- UCFM/kW
- PSI
- SCFM
- kW
- kW/hour
- Cost
- \$/cfm
- Component Health Status and run hours

(H)

COMPRESSOR

100.0 PSI

78.1 KW

Description

Oil (035)

Air Filter (AF5G2)

Oil Filter (OF215K)

Seperator (S15J)

AVERAGES

- Trending PSI/Amps
- Average Performance (week, MTD, QTD, YTD)

X IDENTIFY OPPORTUNITIES

VALIDATE EFFICIENCY

IMPLEMENT IMPROVEMENTS

- Most Frequent Alarms
- Total Performance (Running, Loaded/Unloaded, Off, kWH, Cost)

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REAL SAVINGS...Sustained

John Henry Foster Turns Opportunity into Savings at Commercial Process Operation

Learning Phase (Current State of Facility)

- Automation is alarmed out (needs repaired)
- Valve is shut on 100hp water cooler
- Additional Capacity 100 hp for growth
- Compressor Controls are out of adjustment
- Alarms on current dryers Dryer heater is turning on/off unnecessarily

Pressure fluctuating +/- 6psi

Opened ball valves to help reduce water contamination in pant air system

Total System Approach & Analysis- (Finding Opportunities for Improvement)

- Investigate the current system to determine opportunity to improve operation and reduce energy consumption
- Identify inefficiencies in the system and provide data to support recommendations
- Provide options for improving existing system and upgrade additional components
- Provide financial figures for project investment, annual energy savings and return on investment
- Determine what potential Ameren Act On Energy™ incentives may be available for system improvements

Solutions Engineering and Implementation (Improvement Implementations)

Repaired Demand Valve

- Base loading 200hp downstream of demand valve and running it at the lower pressure
- Replace open blowing drains with PNLD Switched from desiccant dryers to cycling refrigerant dryers Added 2560 gallons of additional storage
- Trim with more efficient 100hp compressor

Validation & Sustainment (Outcome Based on Implementing JHF Recommendations)

Utilizing John Henry Foster's AIRx controller, the facility is now able to match different demand profiles with the most efficient compressor configuration-creating the ability to add and remove base and trim units as needed during all production levels. By locating and operating the 200hp in a base load configuration, the compressor can provide full load capacity at a lower kW requirement due to operating at a lower pressure. Adding storage and repairing the demand valve have allowed the 100hp efficient compressor to be used as a trim unit (to supplement air that the base unit cannot provide) and maintain production at the proper pressure (+/- 1 psig) and flow requirements. During low demand and weekends the plant can now operate the 100 efficient compressor alone. These leaves the 150 & 100hp supplemental units for backup and future growth.

Demand reduction was achieved by switching dryer technologies and lowering plant pressure. The current desiccant dryer provided over-dried air (overkill), causing very high operating and maintenance costs. Limiting the purge air requirement and operating the heater for regeneration cycle were achieved by installing new cycling dryers. Due to the plant pressure fluctuating by +/- 10psig, the plant header pressure had to be operated at a minimum of 95psig. With the AIRx controller, added storage and repaired demand valve, we are able to hold the plant pressure to +/- 1psig, even in the event of the largest compressor failing.



