

FEATURES:

- Uses data gathered by Cypress Envirosystems Green Box Controllers (GBC)
- Works with all existing WPT installations
- Cloud based algorithms analyzes GBC history data, and produces reports and graphs for faults detected
- SAAS technology – no upfront cost, easy subscription service

BENEFITS:

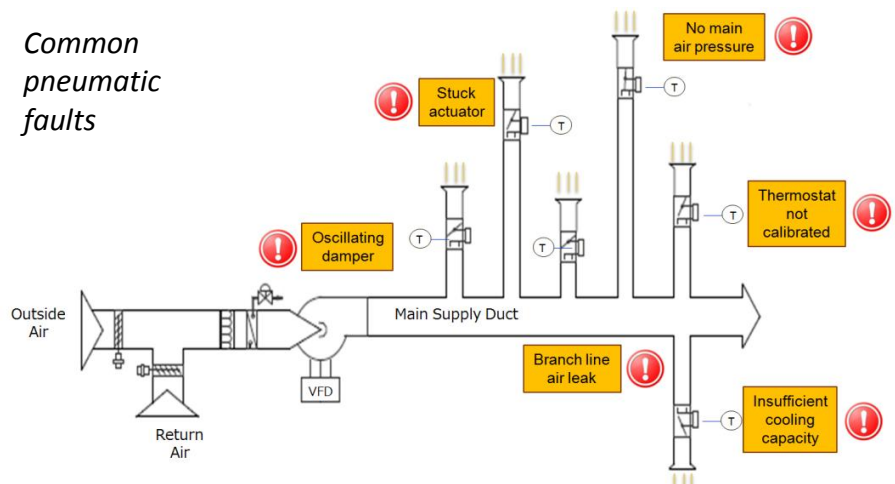
- Patented analytics software unique for pneumatic faults
- Akin to having in-house pneumatics expert engineer
- Improve occupant comfort, save energy, reduce maintenance costs
- Reports may be run as often as required – helps for ongoing commissioning

Patented advanced fault detection software for HVAC pneumatic controls and terminal units - SMARTPneumatics is the *only* analytics software to work with pneumatics.

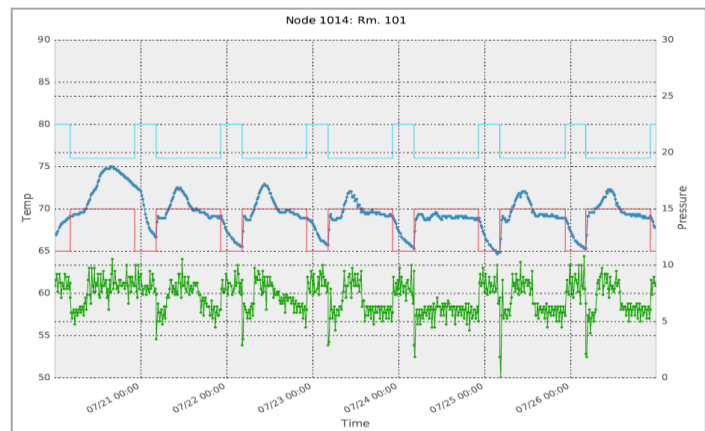
Save energy, reduce maintenance costs, and improve occupant comfort by detecting common pneumatic problems:

- Air Leaks
- Calibration issues
- Stuck damper or valve actuators
- Oil or water in pneumatic air supply
- Insufficient cooling or heating capacity
- Oscillating dampers

Common pneumatic faults



Patented statistical and pattern recognition fault detection algorithms for pneumatics



Easy to understand reports to help identify and correct issues

Prescriptive Recommendations

Adjust Setpoint(s) to More "Reasonable" Temperature

| NodeID | Description | Recommended Action |
|--------|---------------|--|
| 118 | O'Brien Rm 25 | Cool Above Setpoint is too low (63F). Try adjusting. |
| 119 | O'Brien Rm 27 | Cool Above Setpoint is too low (63F). Try adjusting. |

Check for Oil in Pneumatic Lines

| NodeID | Description | Recommended Action |
|--------|--------------|---|
| 113 | O'Brien Rm23 | May need to clean system, install new filter/dryers, replace WPT. |

Actuators May be Stuck

| NodeID | Description | Recommended Action |
|--------|---------------|--|
| 118 | O'Brien Rm 25 | Check Heating Actuator - may be stuck open |
| 117 | O'Brien Rm 30 | Check Heating Actuator - may be stuck open |

Check Thermostat Calibration

| NodeID | Description | Recommended Action |
|--------|---------------|---|
| 116 | O'Brien Rm 28 | Check thermostat calibration - 4.1 deg F offset |

Detailed fault statistics

| Node | Type of WPT | Action | Sample Rate (min) | Maintain Setpoint? (ABS DeltaT) | Heating Setpoint Suspect? (deg F) | Cooling Setpoint Suspect? (deg F) | WPT Calibrated? (psi error) | Main Pressure OK? (psi) | Oil in Line? (sticking psi) | Heating Actuator Stuck Open/Uncal? | Cooling Actuator Stuck Open/Uncal? | Insufficient Heating Capacity? | Insufficient Cooling Capacity? | Low Batt? | Wire-less Missed Comm? |
|------|-------------|---------|-------------------|---------------------------------|-----------------------------------|-----------------------------------|-----------------------------|-------------------------|-----------------------------|------------------------------------|------------------------------------|--------------------------------|--------------------------------|-----------|------------------------|
| 0118 | 1.0 | Direct | 0.0 | 7.9 | 65 | 65 | 1.7 | 14.2 | 1.8 | TRUE | FALSE | FALSE | FALSE | OK | 1.9% |
| 0119 | 1.0 | Direct | 0.0 | 6.9 | 63 | 63 | 2.5 | 14.0 | 0.0 | FALSE | FALSE | FALSE | FALSE | OK | 0.5% |
| 0113 | 1.0 | Direct | 0.0 | 4.3 | 68 | 72 | 0.9 | 15.3 | 4.0 | FALSE | FALSE | FALSE | FALSE | OK | 5.1% |
| 0117 | 1.0 | Direct | 0.1 | 4.1 | 68 | 70 | 1.2 | 15.3 | 5.5 | TRUE | FALSE | FALSE | FALSE | OK | 0.5% |
| 0116 | 1.0 | Direct | 0.0 | 3.9 | 70 | 74 | 4.1 | 15.3 | 1.8 | FALSE | FALSE | FALSE | FALSE | OK | 0.7% |
| 011A | 1.0 | Reverse | 0.0 | 0.5 | 71 | 71 | 1.4 | 11.3 | 0.0 | FALSE | FALSE | FALSE | FALSE | OK | 1.1% |

Zones not able to maintain setpoint (points to DeltaT column)
 Cooling setpoints too low (points to Cooling Setpoint Suspect? column)
 Heating valve may be stuck open (points to Heating Actuator Stuck Open/Uncal? column)
 Check WPT calibration (points to WPT Calibrated? column)
 Check for oil or water in pneumatic line (points to Oil in Line? column)

HEADQUARTERS

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