

COMPRESSED AIR (PNEUMATIC) SYSTEMS

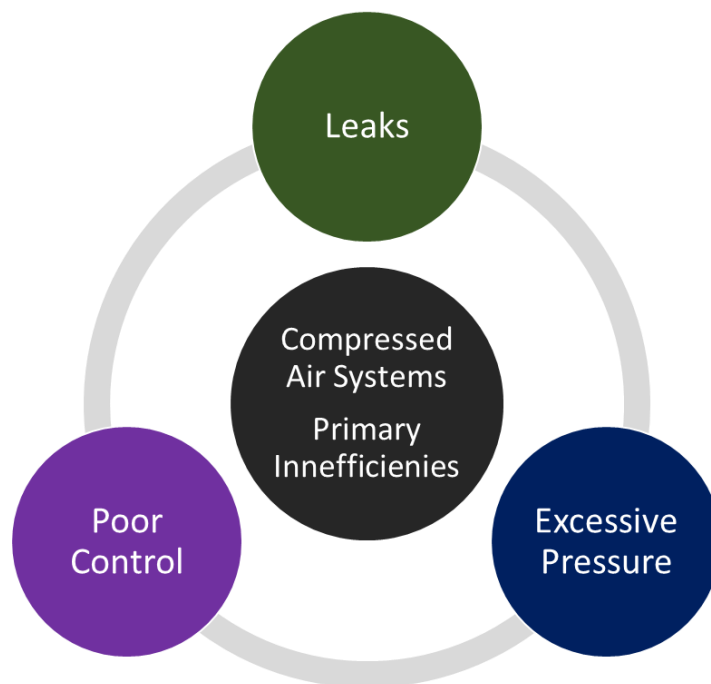
Concepts & Applications

BuildingsOne | November 6, 2018



Compressed air systems, also referred to as **pneumatic systems**, are utilized in certain facilities applications including operation of air-operated machinery, portable tools, and HVAC controls. Larger compressed air systems are more common in industrial manufacturing applications and provide enhanced opportunities for electricity conservation measures (ECM's).

For the commercial real estate manager, a preventive maintenance program that ensures compressed air systems are inspected for leaks and the distribution of clean dry air will result in reduced utility operating costs and enhanced life cycle preservation of HVAC controls. The typical office building, having a **pneumatic HVAC controls system**, will incorporate a **motor-driven reciprocating air compressor**. **Larger industrial compressed air applications** will utilize **rotary screw** or **centrifugal air compressors** of much greater horsepower. Potential inefficiencies and opportunities, associated with larger industrial compressed air systems, are highlighted below.

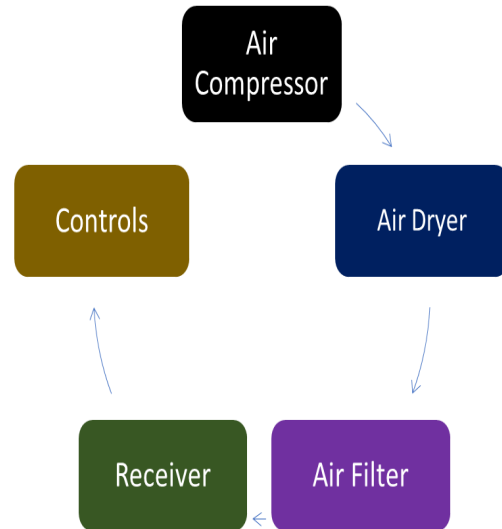


COMPRESSED AIR (PNEUMATIC) SYSTEMS

Concepts & Applications

Compressed air system primary components are represented in the graphic below.

“Keeping the compressed air system free of moisture and contaminants is the primary objective of a compressed air preventive maintenance program”.



Pneumatic systems are less common in commercial building HVAC controls applications. These systems do not offer the degree of accuracy and efficiency and are being replaced with more advanced Direct Digital Control (DDC) systems. Pneumatic-based HVAC control systems are also more challenging, problematic, and labor intensive to maintain. HVAC control systems comprise the following elements: thermostats, control valves, dampers, actuators, positioners, switches, duct variable air volume boxes and static pressure controllers, and other HVAC operating components. Building HVAC pneumatic control systems typically operate with primary air pressure in the 50 psi range. This main line pressure is reduced - 'stepped down' - through a pressure reducing valve (PRV) so that the HVAC controls operate at an estimated 15-25 psi operating air pressure.

The building owner operator's primary considerations, in the operation of pneumatic-based HVAC operating control systems, are the required on site technical expertise, as well as the additional labor needed, in properly operating and servicing the hundreds or thousands of pneumatic components connected to the supply air via flexible tubing. Keeping the pneumatic system free of moisture and contaminants is the primary objective of a compressed air preventive maintenance program. The system's air dryer and filters are considered critical system components in achieving this key objective.