Air Pressures for Pneumatic Controllers and Transmission Systems

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Air Pressures for Pneumatic Controllers and Transmission Systems

1. Scope and Purpose

1.1 This standard applies to:
(a) *Pneumatic controllers*
(b) *Pneumatic intelligence transmission systems*

1.2 The purpose of this standard is to establish:
(a) Standard operating pressure ranges for *pneumatic intelligence transmission systems.*
(b) Standard air *supply pressures* (with limit values) for operation of *pneumatic controllers* and *pneumatic intelligence transmission systems.*

NOTE: For *pneumatic controllers*, the standards for air supply pressures apply directly. On the other hand, while it is common practice to refer to a particular controller as—say—a 3 to 15 lb. device, output air pressure may vary from zero to *supply pressure*, with the effective *operating pressure range* depending on the mechanism positioning the final control element. The range of operation will be whatever is required for control action, limited by the *supply pressure*. On this basis, it appears technically difficult to apply the definition of standard *operating pressure range* to *pneumatic controllers.*

EXAMPLE: Assume a *pneumatic controller* with an associated air-to-close diaphragm actuator operating a single seated valve directly without a pneumatic positioning relay. At maximum pressure drop across the valve, the valve might be wide open at 6 psi and closed at 16 psi; at minimum pressure drop across the valve, the valve might be open at 3 psi and closed at 11 psi. A controller designed for and operating with a *supply pressure* of between 18 and 20 psi would be suitable for this application; its *operating pressure range* is as required, limited by the *supply pressure* for which it is designed and at which it is operated.

2. Definitions

2.1 The following definitions give the meaning of the terms as used in this standard. Defined terms are italicized throughout this standard.

2.2 **Pneumatic Controller.** A *pneumatic controller* is a device which measures the value of a variable quantity or condition and operates to correct or limit deviation of this measured value from a selected reference by pneumatic means.

2.3 **Pneumatic Intelligence Transmission System.** A *pneumatic intelligence transmission system* is a system for conveying information comprising (1) a transmitting mechanism converting input information into a corresponding air pressure, (2) connecting tubing and (3) a receiving element responsive to air pressure to develop an output directly corresponding to the input information.

EXAMPLE: A flow measurement is converted into an air pressure at the point of measurement and transmitted by pneumatic means to a remote recorder.

2.4 **Operating Pressure Range.** The *operating pressure range* consists of stated high and low values of pneumatic pressure for full range operation of *pneumatic intelligence transmission systems.*

2.5 **Operating Pressure Span.** The *operating pressure span* is the difference between the stated high and low pneumatic pressure values of an *operating pressure range.*

2.6 **Supply Pressure.** *Supply pressure* is the pressure of air supplied to the pneumatically-operated devices to which this standard applies.

3. Operating Pressure Ranges

3.1 This standard establishes two *operating pressure ranges.* These ranges have spans of 12 psi and 24 psi.

3.1.1 **12 psi Span.** The *operating pressure range* for the 12 psi *operating pressure span* shall be 3 psi to 15 psi for *pneumatic intelligence transmission systems.*

3.1.2 **24 psi Span.** The *operating pressure range* for the 24 psi *operating pressure span shall* be 3 psi to 27 psi for *pneumatic intelligence transmission systems.*

4. Supply Pressures

4.1 This standard establishes two *supply pressures.*

4.1.1 **12 psi Span.** The *supply pressure* for the 12 psi span (3 psi to 15 psi *operating pressure range*) shall be not less than 18 psi nor greater than 20 psi.

4.1.2 **24 psi Span.** The *supply pressure* for the 24 psi span (3 psi to 27 psi *operating pressure range*) shall be not less than 30 psi nor greater than 35 psi.