

1 Scope

The scope of this standard is to define the statement of typical control valve inherent flow characteristics and inherent rangeabilities, and to establish criteria for adherence to manufacturer-specified flow characteristics.

2 Basic definitions

2.1 Terminology

Basic terminology used herein is based on definitions stated in "Control Valve Terminology" ANSI/ISA-75.05.01-2000 (R2005) or applicable IEC standards.

2.1.1 flow coefficient:

a constant (C_v), related to the geometry of a valve, for a given valve opening, that can be used to predict flow rate. See ANSI/ISA-75.01.01 (IEC 60534-2-1 Mod)-2007, "Flow Equations for Sizing Control Valves," and ANSI/ISA-75.02.01-2008, "Control Valve Capacity Test Procedures." K_v can be substituted for C_v , where $1 K_v = 0.85 C_v$.

2.1.2 inherent flow characteristic:

the relationship between the flow rate through a valve and the travel of the closure member as the closure member is moved from the closed position to rated travel with constant pressure drop across the valve.

2.1.3 inherent rangeability:

the ratio of the largest flow coefficient (C_v) to the smallest flow coefficient (C_v) within which the deviation from the specified inherent flow characteristic does not exceed the limits stated in Clause 4.

The stated inherent rangeability of a specific control valve is related solely to the interaction between the closure member and the flow control orifice of a valve. Other factors such as the positioning accuracy of the actuator or the effects of hydraulic flow resistance of associated piping should be considered when deriving the installed rangeability for a specific application.

Within the limitation given in 4.1, both the flow coefficient deviation given in Figure 1 and the slope deviations given in Figure 2 are applicable in determining the inherent rangeability. Only the slope deviations are applicable for C_v values below 5.

2.1.4 relative flow coefficient (ϕ):

the ratio of the flow coefficient (C_v) at a stated travel to the flow coefficient (C_v) at rated travel.

2.1.5 relative travel (h):

the ratio of the travel at a given opening to the rated travel.

3 Typical inherent flow characteristics

3.1 The typical inherent flow characteristic for a specific size, type, and trim configuration of a control valve shall be specified by the manufacturers either graphically or in tabular form.

3.2 When tabulated, specific flow coefficients shall be stated for the following travel positions: at 5%, 10%, 20%, and every subsequent 10% of rated travel up to and including 100%.

3.3 The manufacturer may publish flow coefficients in addition to those at the above-stated travel positions.