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Installation suggestions in a "real World" Air Handling System

(A-6)

We offer these white papers as a contribution to the growth of our industry. These ideas may or may not apply to a specific project. Please contact us for detailed recommendations.

Flow control devices are supposed to operate predictably in changing conditions of flow and pressure. With proper control the device should modulate and output flow in a steady and predictable manner. But sometimes this steady and dependable output does not happen.

Why??

Flow control dampers are designed and tested under predictable and controlled conditions with very long entry and discharge ductwork and uniform upstream pressures. These ideal conditions hardly ever happen in the field. The art of our industry is to apply these dampers in an imperfect system with as close to perfect control over the fluid as possible.

Any device in the air stream must be able to structurally withstand the total pressure in the air stream i.e. the internal static pressure within the duct and as well as the dynamic (velocity) pressure of the air stream. Additionally the damper must be robust enough to withstand and control the airflow if special situations develop. If velocities are not uniform the highest possible dynamic pressure should be used when considering the controllability of the device.

Therefore when applying the control dampers the following fundaments should be considered

- Symmetrical inlet and outlet conditions
- Uniform entering velocities
- Uniform entering pressures

We are enclosing some recommended minimal distances for fittings up and downstream of the control valve. These recommendations only apply to average HAVC conditions i.e. velocity ranges of 1800 ft/m and lower and internal static pressures of 2 " (500 Pa) and less.

Where conditions above 1800 ft/m min and/or pressures above 2"(500 Pa) and/or distorted flow contours exist the adjacent fittings should be carefully controlled to provide as uniform pressures and velocities as possible. Consultation with a manufacturer or other specialist may be helpful. Some suggestions toward flow control under unusual conditions are the design and use of guide (turning) vanes of an aerodynamic profile,

internal perforated plates (of the proper free area), expanded fittings (to reduce the dynamic pressures) or quite often a carefully considered combination of the above.