# AccuValve Selection Guide for Operating Pressure

## Background

In our energy conscience world, engineers are striving to provide their clients with the most energy efficient buildings. This goal requires careful attention to fan energy, as this is a significant component of the overall HVAC system energy usage. In fact, ASHRAE Standard 90.1 – "Energy Standard for Buildings" specifically limits fan horsepower for various applications. (refer to standard 90.1-2007 section 6.5.3.1)

After proper measures have been taken to minimize airflow, further reductions in fan energy are achieved through the reduction in system pressure drop. To this end, the AccuValve is a significant energy savings tool in the HVAC design engineer's arsenal. Since it does not require static pressure to operate, the AccuValve can operate at very low pressure drops. The intent of this selection guide is to assist the design engineer in sizing the AccuValves to achieve minimum system pressure drop. As an added benefit, the effort to reduce pressure drop will also reduce sound levels.

## Airflow Control Valve Selection

The AccuValve selection table (Figure 1) offers a simple approach for the selection of AccuValves within an overall HVAC system. The procedure is straightforward. First - choose a target pressure drop based on the desired level of energy efficiency, and find this pressure drop on the bottom row of the table. Second - using the column that corresponds to the chosen pressure drop, choose the valve size corresponding to the maximum airflow (design airflow) in the branch associated with the valve. Of course the valve selected should have a maximum airflow equal to or slightly greater than the required airflow. Third - determine the valve size by moving to the left for the appropriate design airflow. Once the valve is chosen the minimum airflow expected in the branch should be compared to the minimum airflow rating of the chosen valve. If the minimum airflow is below the valve minimum the next smaller valve size should be chosen. By using this table, an engineer is able to design the airflow system to a specific pressure drop to minimize the fan pressure requirement for that system.

**AV3000 SELECTION TABLE FOR OPERATING PRESSURE**

| Valve Size | Airflow Range (CFM) | | | | | | | | Transmitter Range (CFM) |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Maximum Design Airflow | | | | | | | |
| 6″ | 30 | 69 | 99 | 123 | 143 | 206 | 254 | 315 | 0-330 |
| 8″ | 80 | 169 | 252 | 315 | 367 | 528 | 650 | 800 | 0-850 |
| 10″ | 120 | 304 | 428 | 524 | 606 | 860 | 1056 | 1300 | 0-1370 |
| 12″ | 180 | 413 | 591 | 726 | 840 | 1192 | 1461 | 1790 | 0-1900 |
| 14″ | 250 | 678 | 979 | 1191 | 1364 | 1884 | 2275 | 2750 | 0-3000 |
| 12x18″ | 260 | 722 | 1003 | 1235 | 1437 | 2086 | 2596 | 3200 | 0-3400 |
| 12x24″ | 350 | 890 | 1261 | 1558 | 1812 | 2614 | 3237 | 4000 | 0-4200 |
| 12x36″ | 520 | 1443 | 2005 | 2470 | 2875 | 4172 | 5191 | 6400 | 0-6800 |
| 12x48″ | 700 | 1780 | 2522 | 3115 | 3625 | 5228 | 6473 | 8000 | 0-8400 |
| Operating Pressure* | <0.01″ | 0.025″ | 0.05″ | 0.075″ | 0.1″ | 0.2″ | 0.3″ | 0.45″ | |

*Minimum operating pressure when tested in accordance with ANSI/ASHRAE 130-1996

Use highlighted area for optimal energy efficiency.

Figure 1

## Example use of table:

An AccuValve is required with an operating range of 130-600 CFM

1) Choose a target pressure drop of 0.1″ and follow the bottom row to that value.
2) Follow the column up from 0.1″ until a value is reached that is equal to or slightly larger than the maximum design CFM. In this case 606 CFM.
3) Follow the row to the left to determine the valve size of 10″. Verify that the minimum required CFM (130) is equal to or above the minimum for the selected valve.

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## Table Description

The AccuValve selection table is designed to aid the engineer in selecting the best valve size based on the pressure requirements of the system. Refer to Figure 2.

A. **Valve Size:** The nominal duct size where the AccuValve will be installed.

B. **Airflow Range (CFM):**
   a. Min: The minimum operating airflow for the given valve size.
   b. Maximum Design Airflow: Includes seven columns of ascending maximum design airflow values. Each maximum airflow value is correlated to its respective operating pressure below.

C. **Operating Pressure:** This row is associated with the Maximum Design Airflow. For a given size and maximum design airflow combination the operating pressure drop of the valve is listed.

D. **Calibrated Range (CFM):** The calibrated range of the integral airflow transmitter. This range is related to the analog output of the transmitter. Thus for a 10" valve the analog output for the transmitter is 0-1370 CFM which would relate to the 4-20 ma, 0-20 ma, 2-10 V or 0-10 V jumper selectable output on the transmitter board.

**AV3000 SELECTION TABLE FOR OPERATING PRESSURE**

| Valve Size A | Airflow Range (CFM) B | | | | | | | | Transmitter Range (CFM) D |
|---|---|---|---|---|---|---|---|---|---|
| | Min | Maximum Design Airflow | | | | | | | |
| 6" | 30 | 69 | 99 | 123 | 143 | 206 | 254 | 315 | 0-330 |
| 8" | 80 | 169 | 252 | 315 | 367 | 528 | 650 | 800 | 0-850 |
| 10" | 120 | 304 | 428 | 524 | 606 | 860 | 1056 | 1300 | 0-1370 |
| 12" | 180 | 413 | 591 | 726 | 840 | 1192 | 1461 | 1790 | 0-1900 |
| 14" | 250 | 678 | 979 | 1191 | 1364 | 1884 | 2275 | 2750 | 0-3000 |
| 12x18" | 260 | 722 | 1003 | 1235 | 1437 | 2086 | 2596 | 3200 | 0-3400 |
| 12x24" | 350 | 890 | 1261 | 1558 | 1812 | 2614 | 3237 | 4000 | 0-4200 |
| 12x36" | 520 | 1443 | 2005 | 2470 | 2875 | 4172 | 5191 | 6400 | 0-6800 |
| 12x48" | 700 | 1780 | 2522 | 3115 | 3625 | 5228 | 6473 | 8000 | 0-8400 |
| Operating Pressure* C | <0.01" | 0.025" | 0.05" | 0.075" | 0.1" | 0.2" | 0.3" | 0.45" | |

*Minimum operating pressure when tested in accordance with ANSI/ASHRAE 130-1996

Use highlighted area for optimal energy efficiency.

Figure 2

NOTE: The tabulated minimum operating pressures in the table above are based on tests in accordance with applicable sections of ANSI/ASHRAE 130-1996. This code requires specified lengths of straight duct both upstream and downstream for the test specimen. Therefore if valves are installed immediately before or after elbows or transitions sufficient allowance to compensate for these factors must be included when calculating the minimum operating pressure of the AccuValve.

ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

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