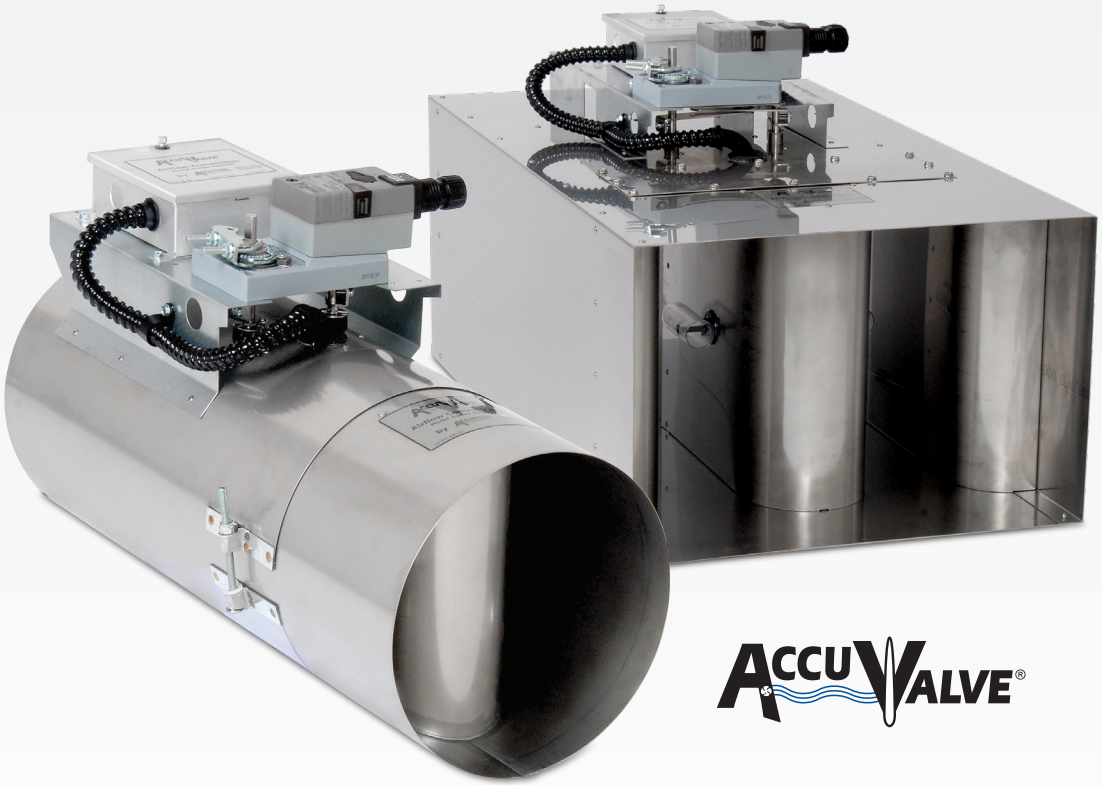
AccuValve Selection Guide for Operating Pressure



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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 90.1-2016.)

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.

NOTE: The tabulated minimum operating pressures in the tables below are based on tests in accordance with applicable sections of ANSI/ASHRAE 130. 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.

Sample Table Description

The AccuValve selection table (Figure 1, below) is designed to aid the engineer in selecting the best valve size based on the pressure requirements of the system.

A **ValveSize –** The nominal duct size where the AccuValve will be installed.

B **Airflow Range (CFM, L/S, CMH)**

Minimum: The minimum operating airflow for the valve.

Maximum Design Airflow: Seven columns of ascending maximum design airflow values. Each maximum airflow value is correlated to its respective operating pressure (**C**).

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 (647 L/S; 2328 CMH) would relate to the 4-20 ma, 0-20 ma, 2-10 V or 0-10 V jumper selectable output on the transmitter board.

AccuValve Sample Table

Optimal Energy Efficiency

Valve Size (mm)	Eng Units	Airflow Range								Transmitter Range
		Minimum	Maximum Design Airflow						Maximum	
10" (254)	CFM	120	304	428	524	606	860	1056	1300	0-1370
	L/S	57	143	202	247	286	406	498	614	0-647
	CMH	204	516	727	890	1030	1461	1794	2209	0-2328
12" (305)	CFM	180	413	591	726	840	1192	1461	1790	0-1900
	L/S	85	195	279	343	396	563	690	845	0-897
	CMH	306	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2481	[illegible]	0-3233
12"x48" (305x1220)	CFM	700	1780	2522	3115	3625	5228	6473	8000	0-8400
	L/S	330	840	1190	1470	1711	2467	3055	3776	0-3964
	CMH	1189	3024	4285	5292	6159	8882	10998	13592	0-14272
Operating Pressure **C**	"W.C.	< 0.01	0.025	0.05	0.075	0.1	0.2	0.3	0.45	
	Pa	< 2.5	6.25	12.5	18.75	25	50	75	112.5	

* Minimum operating pressure when tested in accordance with ANSI/ASHRAE 130-2008

Figure 1

Airflow Control Valve Selection

The AccuValve selection table (Figure 2, below) 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.

Example Use of Table

Please refer to the table below.

An AccuValve is required with an operating range of 130-600 CFM (61-283 L/S; 221-1020 CMH)

1. Choose a target pressure drop of 0.1" (25Pa) and follow the bottom row to that value.
2. Follow the column up from 0.1" (25Pa) until a value is reached that is equal to or slightly larger than the maximum design airflow. In this case 606 CFM (286 L/S; 1030 CMH).
3. Follow the row to the left to determine the valve size of 10". Verify that the minimum required 130 CFM (61 L/S; 221 CMH) is equal to or above the minimum for the selected valve.

AccuValve Selection Table for Operating Pressure

Optimal Energy Efficiency

Valve Size (mm)	Eng Units	Airflow Range								Transmitter Range
		Minimum	Maximum Design Airflow						Maximum	
8" (203)	CFM	80	169	252	315	367	528	650	800	0-850
	L/S	38	80	119	149	173	249	307	378	0-401
	CMH	136	287	428	535	624	897	1104	1359	0-1444
10" (254)	CFM	120	304	428	524	606	860	1056	1300	0-1370
	L/S	57	143	202	247	286	406	498	614	0-647
	CMH	204	516	727	890	1030	1461	1794	2209	0-2328
12" (305)	CFM	180	413	591	726	840	1192	1461	1790	0-1900
	L/S	85	195	279	343	396	563	690	845	0-897
	CMH	30						248		0-323
12"x48" (305x1220)	CFM	700	1780	2522	3115	3625	5228	6173	8000	100
	L/S	330	840	1190	1470	1711	2467	3055	3776	0-3964
	CMH	1189	3024	4285	5292	6159	8882	10998	13592	0-14272
Operating Pressure	"W.C.	< 0.01	0.025	0.05	0.075	0.1	0.2	0.3	0.45	
	Pa	< 2.5	6.25	12.5	18.75	25	50	75	112.5	

* Minimum operating pressure when tested in accordance with ANSI/ASHRAE 130-2008

Figure 2