ENGINEERING UPDATE

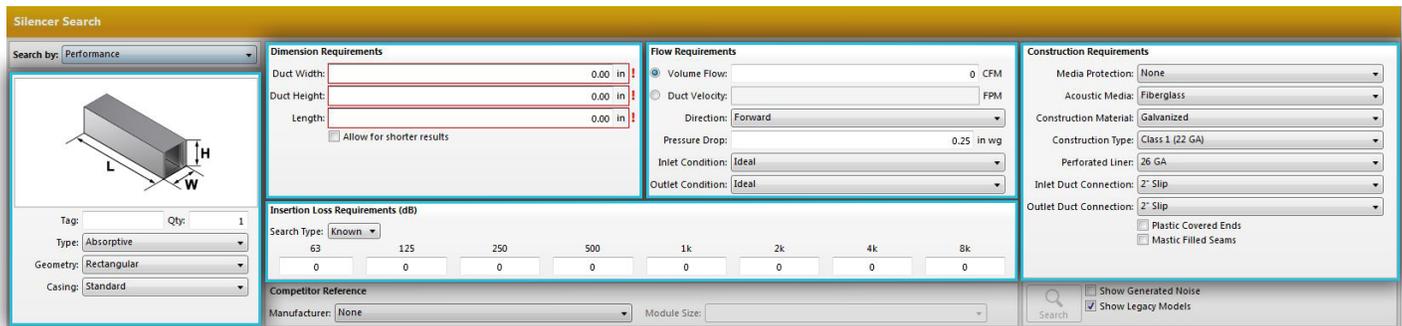## PRICE ALL-IN-ONE 3 – SILENCER SELECTION MADE EASY

Figure 1 - Silencer Search

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Price Industries is excited to offer the most intuitive and comprehensive noise control selection tool in the market. The noise control software module in All-In-One (AIO) 3 allows users to quickly change parameters during the design process. Typical project variables include airflow, pressure drop, insertion loss, and construction requirements. This article provides readers with a basic understanding of what to look for and consider.

Five major design parameters included in the main noise control selection view are each highlighted in **Figure 1** and discussed in further detail in this article.

SILENCER TYPE

Price AIO software allows for all types of silencer selection (rectangular, elbow, circular, absorptive, film-lined, etc.) depending on project requirements. In most cases, the designer knows where the silencer will fit since they are driven by ductwork layouts. **Figure 2** depicts the silencer type window for a typical packless circular elbow silencer.
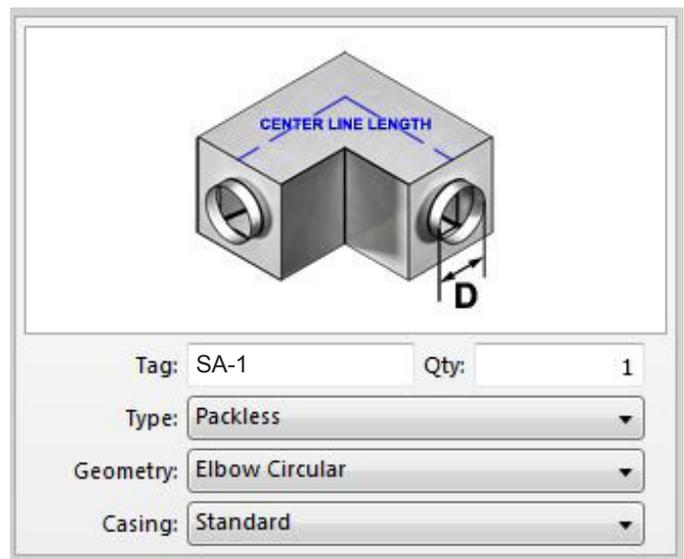
DIMENSION REQUIREMENTS

Figure 3 depicts typical dimensions for a rectangular silencer. AIO users can input silencer dimensions down to 0.01 inches. For projects requiring larger sizes, we typically recommend contacting your local representative or the noise control team directly. Checking the *Allow for shorter results* box will optimize silencer lengths to satisfy performance requirements. This feature is helpful for reducing costs and/or addressing duct layout constraints.
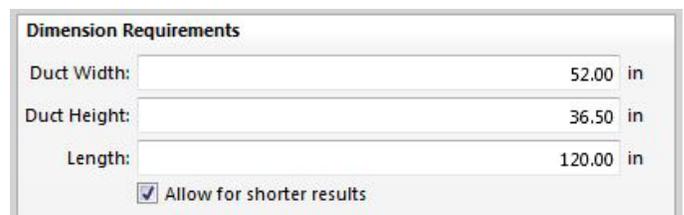

Figure 2 - Silencer type window

Figure 3 - Dimension requirements window

FLOW REQUIREMENTS

Figure 4 depicts various flow conditions that AIO users can modify (not all values need to be entered to obtain silencer results). We recommend entering as much information as possible to obtain the most accurate selections and reduce surprises later on.

Volume flow and duct velocity automatically update each other. Airflow direction is important to input since it affects the silencer insertion loss. Inlet and outlet conditions are incredibly important to consider since many project conditions do not provide the recommended three to five
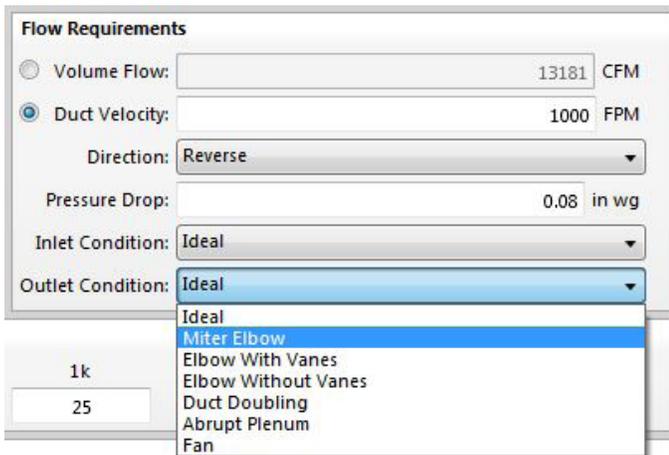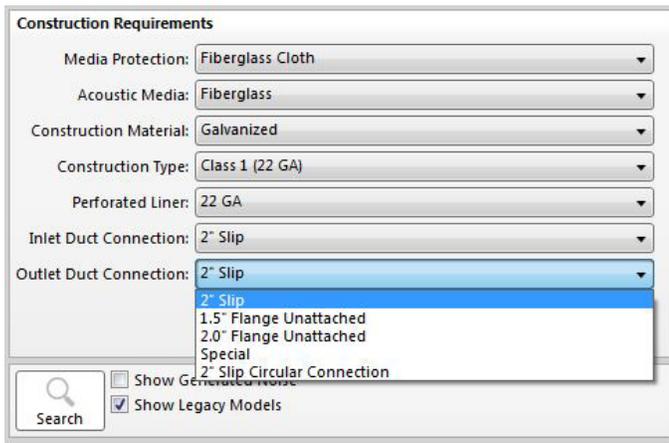

Figure 4 - Flow requirements window

Figure 5 - Construction requirements window

Figure 6 - Insertion loss requirements window

unobstructed duct diameters upstream and downstream of silencers. These non-ideal connections are common and can greatly increase the resulting system effect pressure drop. Outlet conditions that the AIO noise control module considers are depicted in **Figure 4** (based on the 2011 ASHRAE Applications Handbook Chapter 48.26, Table 27).

CONSTRUCTION REQUIREMENTS

Figure 5 depicts various construction requirements. While these have a minimal impact on silencer performance, they can greatly impact cost and installation. The default casing construction is Class 1 (22 GA), but the AIO software allows for heavier options down to 10 GA. Inlet and outlet duct connections are important to consider. In most cases, slip connections are acceptable but in some applications flanges are more appropriate.

INSERTION LOSS REQUIREMENTS

If insertion loss values are known, they can be entered between 0 and 55 dB (see **Figure 6**). If insertion loss requirements are unknown, the low- or mid-frequency bands can be optimized in the 63-125 Hz or 250-1,000 Hz ranges by changing the search type. For many projects, the noise control requirements are driven by two to three octave bands typically in the lower frequency bands (63-250 Hz).

At a minimum, the dimensions and basic flow requirements should be established before selecting a silencer. Other variables are not always needed, but will improve silencer search result accuracy. Once input variables are defined, the user simply clicks the search button and appropriate silencers are listed based on insertion loss, pressure drop, and cost. Silencer selections and tags can be saved and a schedule can be created quickly. AIO also allows for the creation of submittals and schedules in both PDF and Excel formats. Most importantly, AIO files can be saved and easily shared or updated as needed during the project.

We hope this provided some basic context for silencer selection and encourage you to explore and download AIO at www.priceindustries.com/software/all-in-one. If you have any questions related to noise control, please contact our team at **noisecontrol**@priceindustries.com.