

Greenheck Industrial Dampers for Blower Outlets – How to Properly Select an Industrial Damper for Your Fan

This article provides guidance on selecting the appropriate industrial damper for mounting on the outlet of your blower fan. Special considerations are required when selecting dampers for this application to ensure years of trouble free operation.

We will cover selecting the

- Correct damper type
- Damper model selection
- Damper sizing and CAPS® configuration
- Actuator selection for control dampers
- Mounting Holes

Damper Type

First, you must determine if your customer needs a backdraft damper (gravity operated) or a control damper (motorized damper). Your customer’s specification or request determines this. Backdraft dampers do not require any control systems to operate, while control dampers require a powered actuator (or manual quadrant) to operate. Please note that all industrial dampers are flanged dampers, which requires installing a mating flange on the blower outlet.

Damper Model Selection

To select the appropriate damper model, determine the static pressure (in inches water gauge) and velocity (in feet per minute) of the fan the damper will be mounted to. You can find the static pressure of the fan on your blower submittal. To determine outlet velocity, take the CFM produced by the fan and divide it by the area of the fan outlet in square feet. The result is your outlet velocity in feet per minute (fpm)

$$\text{Velocity} = \text{CFM} / \text{Outlet Area (ft}^2\text{)}$$

Now that you have the pressure and velocity information, you can look at the fan class and fan size to find a damper model. Blower outlet dimensions are found in CAPS on the “Drawings” tab of your blower mark. Make note of both the outlet width and height dimensions for future use. *General* guidelines for selecting damper models with this information in mind are found in Tables 1 and 2.

Backdraft Damper Model Selection:

Models	Fan Class	Fan Outlet Width	Outlet Velocity (fpm)	Static Pressure (in. wg)
HB-120	I, II	36 in. or less	Below 3000	Below 2.5
HB-230	I, II, III	48 in. or less	Below 4000	Below 8.5
HB-330	I, II, III	48 in. or greater	Below 5000	Above 8.5

Table 1

Control Damper Model Selection:

Models	Fan Class	Fan Outlet Height	Outlet Velocity (fpm)	Static Pressure (in. wg)
HCD-120	I, II	36 in. or less	Below 3000	Below 2.5
HCD-220	I, II	48 in. or less	Below 4000	Below 8.5
HCD-230	I, II, III	60 in. or less	Below 4000	Below 8.5
HCD-430	Unrestricted	Unrestricted	Below 5000	Above 8.5

Table 2

Damper Sizing and CAPS Configuration

Greenheck industrial dampers use actual inside dimensions. Therefore, when sizing the damper, you should order the damper the same size as the blower outlet.

Backdraft Damper Sizing:

Enter the exact size shown on the blower outlet drawing for backdraft (gravity) operated dampers. In the example (Figure 1), the fan outlet is 38.51 in. wide by 51.65 in. tall. Therefore, you enter the same dimensions for your HB damper.

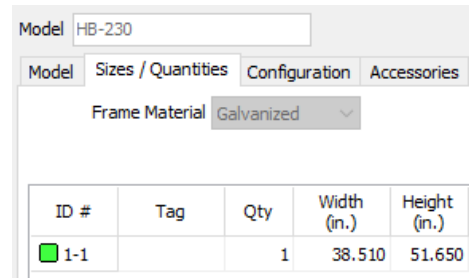
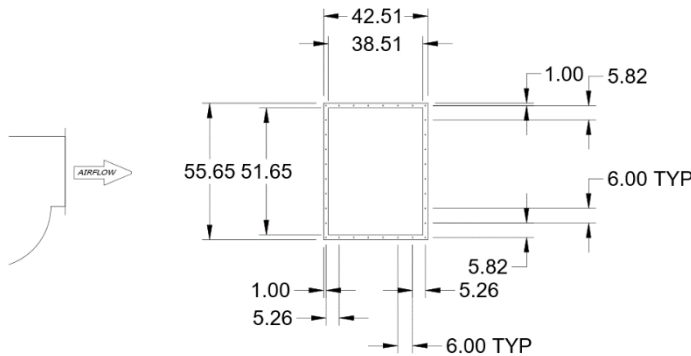


Figure 1

Control Damper Sizing

Orient the damper so that the blades are vertical when entering this size into CAPS. To do so, swap the width and height from the outlet dimension when entering the damper size. For example, your fan outlet is 38.51 in. wide by 51.65 in. tall (Figure 2); enter your damper in CAPS as 51.65 in. wide, by 38.51 in. tall (Figure 3).



0.44 DIA. 32 HOLES
 OUTLET DRAWN TO SCALE
 EXAMPLE SHOWS AIRFLOW DIRECTION
 EXAMPLE DISCHARGE POSITION IS "TH"

Figure 2

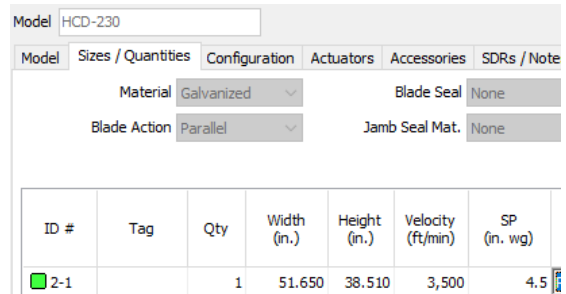
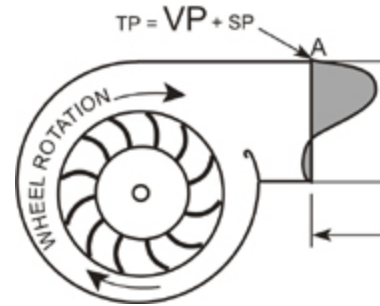


Figure 3

Reminder: A special design request (SDR) is required from the factory for this application because thrust washers must be installed in the damper to keep the blades properly aligned in the frame.

Control Damper Blade Orientation

Control damper blades are oriented perpendicular (or “vertical”) to the fan shaft to minimize pressure loss through the damper and maximize damper life expectancy by distributing stresses associated with velocity pressure evenly over all blades. Centrifugal fans produce a velocity curve with higher velocity near the top of outlet. If a standard horizontal blade orientation is used, the velocity force will have a severe effect on the top few blades, increasing the possibility of failure over time.



An SDR is required if you order an industrial control damper as a stand-alone item in CAPS. This construction is not currently selectable in CAPS. Contact the factory to request the SDR.

Control Damper Actuators

Blower outlet control dampers must have a method to actuate the blades, whether performed manually or with motorized actuator.

Electric Actuators

Electric actuators are the most common method for actuating outlet control dampers. Voltage of this actuator (available: 24V, 115V, 230V) is configurable and selectable as needed in the CAPS program. Standard configuration for outlet dampers should include a spring return operation with a fail closed position selected. Outdoor applications require NEMA 4 enclosures for these actuators (standard when an outlet damper is selected as an accessory to a blower). Use a standard NEMA 1 actuator if the fan is located in a dry indoor environment.

Manual Options

Two (2) types of manual actuators are available for Greenheck HCD control dampers:

- Manual quadrants
- Hand-wheel gearbox

Use manual quadrants for small and medium size dampers with operating torque of under 600 lb-in. Very large, high-torque dampers require the use of the hand-wheel gearbox option. Both options are suitable for indoor or outdoor environments.

Mounting Holes

Blower outlet flanges are pre-punched with mounting holes for attaching another flange. The Outlet Connection drawing in CAPS shows the pattern. Configure the damper CAPS to match these mounting holes to ease field installation. Select the damper flange size as the nearest .5 in. dimension. Most common flange sizes are 1.5 in. and 2.0 in. Select the damper mounting-hole pattern “w/Corner Holes.” The holes are centered in the flange. Standard 6 in. hole spacing is applied. Mounting-hole diameter should be selected as shown on the Outlet Connection drawing details. Please be aware that older fan models may use a different mounting-hole pattern than described above. Please contact the factory if you are mounting a damper to an older fan for mounting hole information.

Completed Selection

Following these guidelines will provide you with a damper for your fan outlet that will install effortlessly to your Greenheck fan outlet, providing years of reliable, trouble-free operation. Please feel free to contact Greenheck for further assistance should you have questions.

Greenheck Industrial Dampers

hddampers@greenheck.com

1-800-717-6540