

the best of
Brew
YOUR OWN[®]

OUTDOOR VENTILATION FAN



Please note all file contents are Copyright © 2020 Battenkill Communications, Inc. All Rights Reserved. This file is for the buyer's personal use only. It's unlawful to share or distribute this file to others in any way including e-mailing it, posting it online, or sharing printed copies with others.

OUTDOOR VENTILATION FAN

BY STEVEN TROTT

Save space & reduce noise in the brewery

Adequate and dependable ventilation is an essential part of an indoor brewery.

Installing a ventilation system that takes the least amount of space, has quiet operation, and can be activated with the flip of a switch requires a manageable amount of planning and the proper materials. Any kind of operation requiring thousands of watts of power or tens of thousands BTUs of heat will need considerable ventilation to prevent moisture buildup. Industrial units used in professional kitchens are large and expensive. Residential under-the-cabinet units have tiny scroll type blowers that have trouble moving enough air to rid the brewery of the heat and steam created when doing larger batches. Snail-type blowers generally provide enough airflow but require considerable space. Industrial-type in-line blowers are a bit more compact and are easier to connect to round ductwork. However, the downside is they generate lots of noise because of the 3,600 rpm motor driving them. The sound is similar to a shop vac or a small jet engine. That is where this project comes into play.

By locating my fan unit outside, this design saves space in my brewery, dampens the sound tremendously, and is aesthetically pleasing from outside. The material and the design have weathered storms with 70+ mph winds, heavy rain, and freezing temperatures. The 150 lbs. (68 kg) of concrete keep the box from blowing away in high winds. The batt insulation performs about ⅓ of the sound dampening while the divider greatly reduces the noise. There was a risk of choosing batt insulation due to moisture buildup, but that is not an issue because of the velocity of the air moving through the box, and I let the fan run for about an hour after the boil. This extra run

time dries out the ducts, hood, and the insulation inside the box. It's been well over a year with numerous batches and inside the box still smells like fresh cut wood.

Your ventilation requirements may vary depending on your brew house size, hood proximity, and power method. Refer to John Blichmann's article in the January-February 2017 issue or at www.byo.com/article/ventilation/ to determine what size works for you.

MATERIALS & TOOLS

MATERIALS

Vortex VTX1000 Power Fan (10-inch/25-cm duct, 750+ CFM)
12 x 12-inch (30 x 30-cm) Damper, Lloyd Industries
10-inch (25-cm) 90-degree round adjustable elbow duct
10-inch (25-cm) airtight duct collar
10-inch (25-cm) round start collar
Sheet metal screws #8 x ½
3-inch (7.5-cm) Gorilla Tape
(2) 4 x 8 treated plywood, ½-inch
(2) 2 x 2 treated lumber, 8-foot
(2) 2 x 4 treated stud, 8-foot
Seam sealant
Batt insulation
Deck screws 1½-inch
Steel barn siding
Corner trim and J-Trim
1-inch pole barn screws
(2) door hinges (weather resistant)
Weather stripping
#4 x .047 wire mesh
120V 15A light switch, box, and cover
Nema 5-15 120V outlet, box, and cover
2-14 Romex outdoor wire
Concrete screws (Tapcon) #10 x 3-inch
(4) concrete blocks and small stone

TOOLS

Angle grinder and steel cut-off wheel
Drill and wood drill bits
Hammer drill, masonry bits
Jig saw and wood blades
Wire Cutters

By locating my fan unit outside, this design saves space in my brewery, dampens the sound tremendously, and is aesthetically pleasing from outside.



PHOTOS BY STEVEN TROTT

I. SET AND LEVEL THE CONCRETE BLOCKS

Clear an area 40 x 32 inches (101 x 81 cm) and install a quick foundation roughly 12 inches (30 cm) away from the vent. Remove all vegetation, pack stone into the dirt with a tamping tool, and set the concrete blocks onto the stone. Level the blocks in every direction. You may need to add stone and re-pack numerous times until the blocks are level and even. If you prefer, you could alternatively pour a foundation in the area with a few bags of concrete instead of using blocks.



2. DETERMINE WHERE TO CUT THE BOX INLET HOLE

My egress window sits just above ground level. The 10-inch (25-cm) 90-degree elbow can mate between two parallel surfaces and offset quite a bit from one position to the next by simply rotating the three pieces. You will need to determine how high or low the inlet to the box needs to be based on where the duct goes into the brewery. Keep in mind, the bottom of the box will be 3.5 inches (9 cm) above the top of the concrete blocks. Using the level, measure the drop or rise the duct needs to make to get from the brewery to the box. Adjustments may be required depending on your build. As construction continues double check how everything will fit so you don't end up patching mistakes or requiring extra material.



3. DESIGN, MEASURE TWICE, CUT ONCE

The size and configuration of your box may vary by the brand and power level of your fan. The key is to place the fan somewhere in the middle of the box with enough room for the air to flow around the baffle. A sturdy full plywood construction can be tricky. Instead of screwing directly into the edges of the plywood, which would fall apart under a light load, I used "screw cleats." The boards are screwed into treated 2 x 2 lumber at every joint. The damper can be centered on the outlet, but be sure to place the inlet near the side of the box so sound waves are blocked by a baffle. This internal duct is the secret to diverting the sound. As long as the sound is blocked, it will be absorbed in the fiberglass insulation. Be sure to seal all the joints on the suction side of the fan before installing the baffles.





4. ATTACH THE FEET, INSTALL DUCT, CUT & INSTALL THE BAFFLES, INSTALL FAN & DAMPER, ADD LID

The feet are screwed to the bottom of the box, on center. The duct can be attached to the inlet side at this time with the ring flange. Use sheet metal screws on several tabs to ensure a secure fit. The top of the baffle extends past the vertical wall by 1½ inches to accommodate the screw cleat. The vertical wall physically blocks the sound from the fan and the inlet. I chose the size of rectangular duct to be larger than the area of the round duct to ensure proper flow. My duct measures 8 x 14 inches (20 x 36 cm), which should give us 112 in² (723 cm²) of area vs. a 10-inch (25-cm) round duct having only 78.5 in² (506 cm²). The damper attaches from the outside with just a few screws. Secure a screw cleat (24-inch/61-cm long) outside and on top of the tall wall. Attach the door hinges and secure the lid in a position where it evenly hangs over each end. A few doubling strips of plywood may be required to ensure a strong construction, or use two layers of plywood for the lid.



5. ATTACH INSULATION, ANCHOR TO FOUNDATION

Using concrete screws, secure the 28-inch (71-cm) 2 x 4 to the concrete as shown. It is critical to ensure the spacing matches the feet that are secured on the bottom of the box. Place the box onto the foundation, with the feet straddling the anchored studs. Secure the other end of the duct to the outside wall. Trim and place the insulation into the box in the areas shown. Cut the fence to roughly the same size as the insulation and fasten with small pieces of plywood and a 3-inch screw. The plywood will hold the fence in place to ensure the draft does not pull the insulation apart.



6. WIRING, INSTALL SIDING

To avoid paying an electrician to perform your electrical work, you may choose to run an outdoor extension cord to the fan-side of the box and simply plug it in from the inside, whenever needed. Or you can choose to hardwire the unit to a switch inside the brewery. A convenient location for the fan switch would be on either side of the boil kettle. Be sure to have an electrician perform the wiring. Pay close attention to the barn siding displays at the hardware store. There are only two types of trim required for some builds and the 36-inch (91-cm) siding is one "ridge" larger for overlap. Ensure the rubber seal disk on the screw compresses just enough to seal to the metal around the screw hole. To finish it off, install a mesh screen to the inside of the damper to prevent birds and other critters from nesting inside the box. 