

MECHANICAL INSTALLATION

Air Quality

The quality of the air supply to the Model RA aerators can affect their operation and longevity. The air supply must be clean and dry. A minimum of a filter and moisture trap should be installed on the aerator feed lines to prevent fouling. Consult with a supplier of air conditioning equipment to ensure your supplied air to the aerators is “clean and dry”.

Air Volume

A large volume of air may be required, depending upon the number of aerators employed to resolve the specific material flow problem. A positive displacement blower system may be required for large quantities of aerators. However, a small quantity of aerators may be able to be operated using a compressor.

Air Supply

The aerators will be most effective when operated continuously to promote and maintain the flow of material within the bin. The aerators should also be operated whenever there is a rise in internal pressure within the bin, such as what occurs during vessel filling using a pneumatic conveying system.



The operating pressure of the aerators must exceed the internal bin pressure to prevent possible material back flow.

Table 1: Air Manifold Sizing and Air Consumption Guide

Manifold Piping Size Guide		Air Consumption Guide Per Aerator	
Piping Size	Number of Aerators Per Row	Air Pressure (psi)	Cubic Feet / Minute
¾"	1-5	1	4.2
		2	5.7
1"	6-9	3	6.5
		4	7.1
1-¼"	10-12	5	7.6

Operating pressure is typically 3-5 psid (psi above internal vessel pressure) with air consumption of 4-7 scfm per aerator. Refer to Table 1 for specific rates.

Air Connections

A 1/8" NPT air inlet nipple is used to connect each aerator to its air supply. Each aerator will need to be connected to an air supply using this fitting. Multiple aerators should be fed from a properly sized manifold as shown in Table 1. The air manifold will ensure that each aerator is fed a reasonably uniform air pressure and volume.

Bin Shape

Vessels with a diameter of less than 12' may require additional gasket material to seal the flat, low profile design of the Model RA aerator against the interior walls of the round bin. The use of industrial vibrators or other types of flow-aids may also be considered on small diameter bins.

Location

For best results, locate the aerators as close to the discharge outlet as possible. If the powder material is held within the bin for long periods of time and/or is compacted during transport, we recommend the aerators be located on 12" centers. The typical effective area of a single aerator is 10" radius around the center of the aerator.

The aerators should be spaced and located in the problem area accordingly. Understanding the source and root cause of the material flow problem is beneficial to the effective application of the Model RA aerators. Once the location of an obstruction within the bin is known, a small number of aerators can be installed to fluidize the material, and promote and maintain material flow.

Generally four rows of aerators on 12" or 15" centers are recommended. Refer to Figure 1. On round bins these rows will be equally spaced. On rectangular bins with pyramidal cone sections, rows are spaced equally on sloping sides or in valleys if the material tends to hang up in these areas. Refer to Table 2 for a guide to determining the number of aerator rows required.

Table 2: Aerator Rows

Aerators on 12" Centers		Aerators on 15" Centers	
Length of Sloping Bin Wall	Number of Aerators Per Row	Length of Sloping Bin Wall	Number of Aerators Per Row
1' 8" – 2' 7"	2	1' 11" – 3' 1"	2
2' 8" – 3' 7"	3	3' 2" – 4' 4"	3
3' 8" – 4' 7"	4	4' 5" – 5' 7"	4
4' 8" – 5' 7"	5	5' 8" – 6' 10"	5
5' 8" – 6' 7"	6	6' 11" – 8' 1"	6
6' 8" – 7' 7"	7	8' 2" – 9' 4"	7
7' 8" – 8' 7"	8	9' 5" – 10' 7"	8
8' 8" – 9' 7"	9	10' 8" – 11' 10"	9
9' 8" – 10' 7"	10	11' 1" – 13' 1"	10

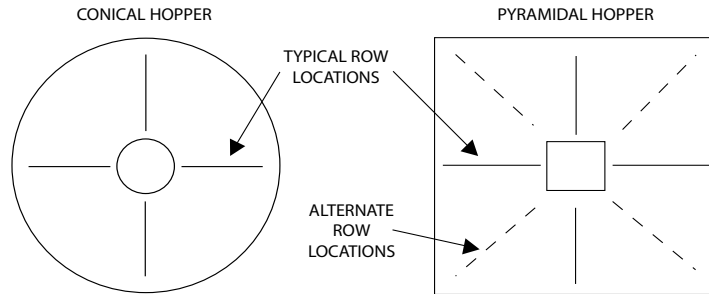


Figure 1: Typical Row Location Layouts

Internal Installation

The Model RA rectangular aerator is designed to be mounted from within the bin. Alternately, the accessory external mounting kit may be used to allow for installation and replacement from outside of the bin. Refer to the section titled “External Installation”.

Drill a 7/16” diameter hole through the bin wall for each aerator on predetermined centers (12” or 15” or your preference). The aerator is supplied with hardware for use in mounting it from inside of the bin, including a 1/8” air inlet nipple, a washer/gasket, two flat washers and a jam nut. Refer to Figure 2 for the assembly sequence. Insert the air inlet nipple into the back side of the aerator and tighten. The end with the fewer threads goes into the aerator.

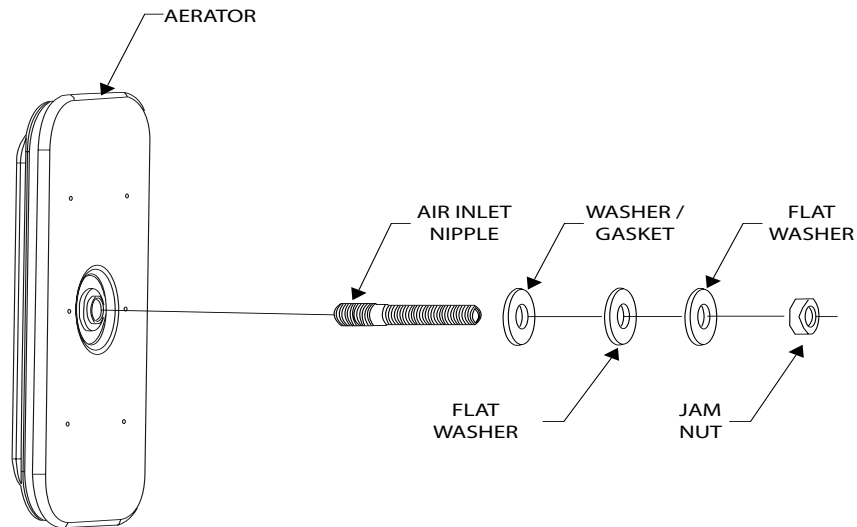


Figure 2: Internal Mounting Assembly Sequence

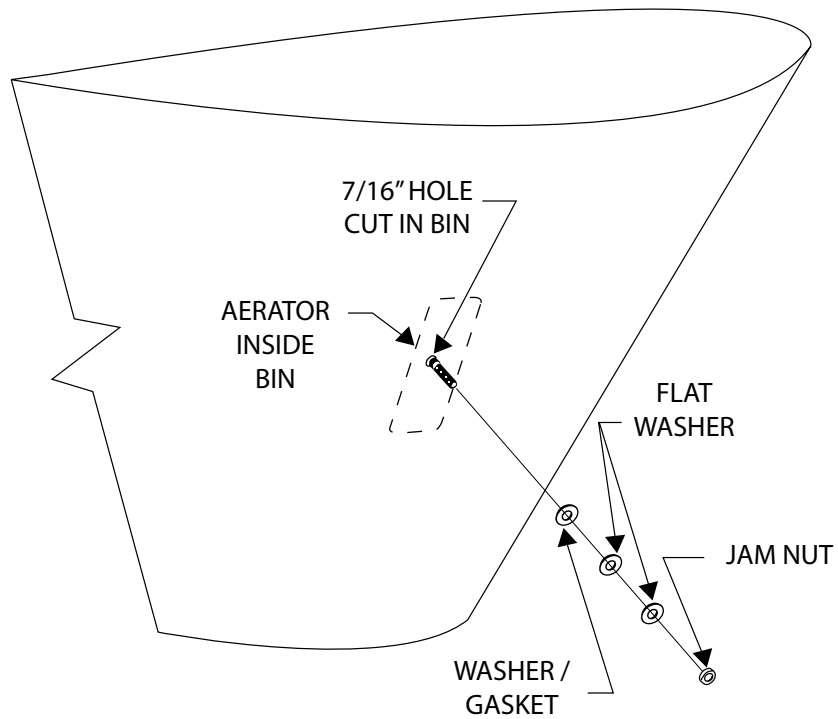


Figure 3: Internal Mounting Assembly

With air inlet nipple installed to the back of the aerator, put the aerator in place and insert the air inlet nipple through the 7/16" diameter hole and secure it in place with the washer/gasket, the flat washers and jam nut. Figure 3 illustrates the assembled aerator mounted in the bin wall.

External Installation

The Model RA aerator can be mounted and replaced from outside of the bin. This requires the use of an external mounting kit accessory item for each aerator. This simplifies the installation. Once the initial rectangular hole is cut, the aerator can be assembled with the external mounting bracket and installed on the bin within a couple of minutes. Refer to Figure 4 for the overall assembly sequence of the aerator and external mounting kit. The air inlet nipple and jam nut from the mounting hardware provided with the aerator will be used to plumb and secure the aerator using the external mounting kit.

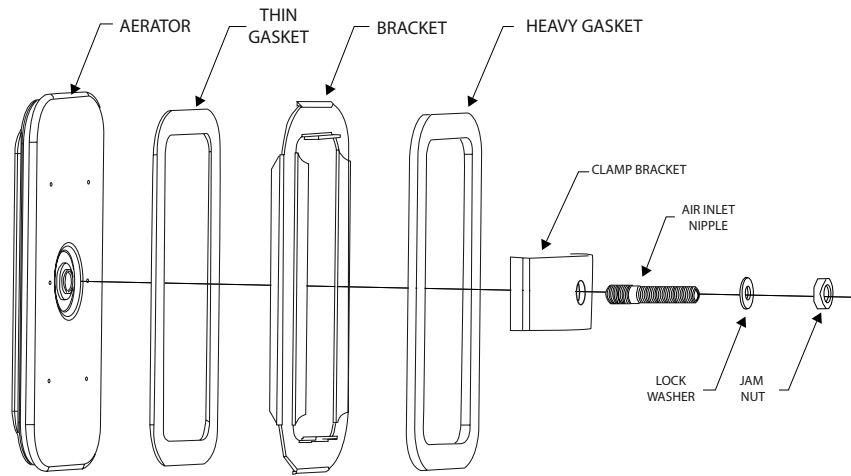


Figure 4: Aerator and External Mounting Assembly Kit Sequence

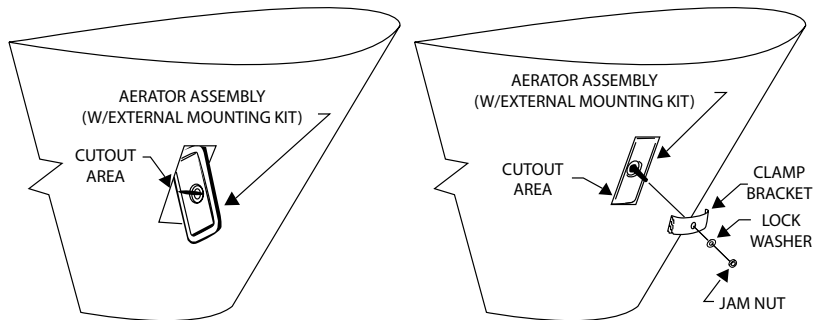


Figure 5: Aerator assembly mounting with external mounting kit accessory

The external mounting kit accessory includes the following components; aerator mounting bracket, clamp, thin gasket, heavy gasket and lockwasher. To install the aerator using the external mounting kit:

1. Cut a rectangular opening 2- $\frac{5}{8}$ " wide x 6- $\frac{3}{8}$ " high in the bin wall for each aerator. Cut the opening where each aerator location is desired.
2. Peel off the protective tape on one side of the thin gasket and attach it to the front side of the external mounting bracket. Refer to Figure 4.
3. Peel off the protective tape on the other side of the thin gasket and place the aerator on the gasket. The upturned edges of the mounting bracket will keep the aerator from turning within the bin.
4. Peel off the protective tape on the thick gasket and attach it to the back side of the external mounting bracket. The longer legs on this side of the mounting bracket will keep the bracket itself from turning when placed in the bin wall cutout. Do NOT insert this assembly into the bin wall cutout.
5. Insert the air inlet nipple into the back side of the Model RA aerator and tighten. The end with the fewer number of threads goes into the aerator. If the air inlet nipple is not tightened securely in the aerator, it may unthread when the aerator is removed from the bin. However, do not over-tighten or damage may be caused to the aerator.
6. Slip the clamp over the air inlet nipple with the clamp legs toward the aerator. Place the lockwasher onto the air inlet nipple and thread the jam nut in place.
7. Holding the aerator/mounting kit assembly by the air inlet nipple, slip the entire assembly through the cutout in the bin wall and into position. Rotate the clamp to bridge the opening and tighten the jam nut. The aerator assembly will be securely held in place and the cutout in the bin wall will be sealed. Refer to Figure 5.

TECHNICAL DATA

Air Supply: Clean, dry air, 3-5 psi
 Air Consumption: 4.2scfm @ 1psi (1.2m3/min @ 0.07bar)
 5.7scfm @ 2psi (1.6m3/min @ 0.14bar)
 6.5scfm @ 3psi (1.8m3/min @ 0.21bar)
 7.1scfm @ 4psi (2.0m3/min @ 0.28bar)
 7.6scfm @ 5psi (2.2m3/min @ 0.35bar)

Materials of Construction:
 Body Zinc-plated steel
 Diffuser Cotton (Up to 180°F/82°C) or
 Fiberglass (Up to 650°F/343°C)
 Diffuser Screens Zinc-plated steel
 Air Inlet Nipple/Nut Brass
 Spacer Washers Zinc-plated steel
 Washer/Gasket Buna-N (Up to 180°F/82°C)
 External Mount Kit:
 Brackets/Lockwashers Zinc-plated steel
 Gaskets Neoprene (Up to 180°F/82°C)

DIMENSIONS

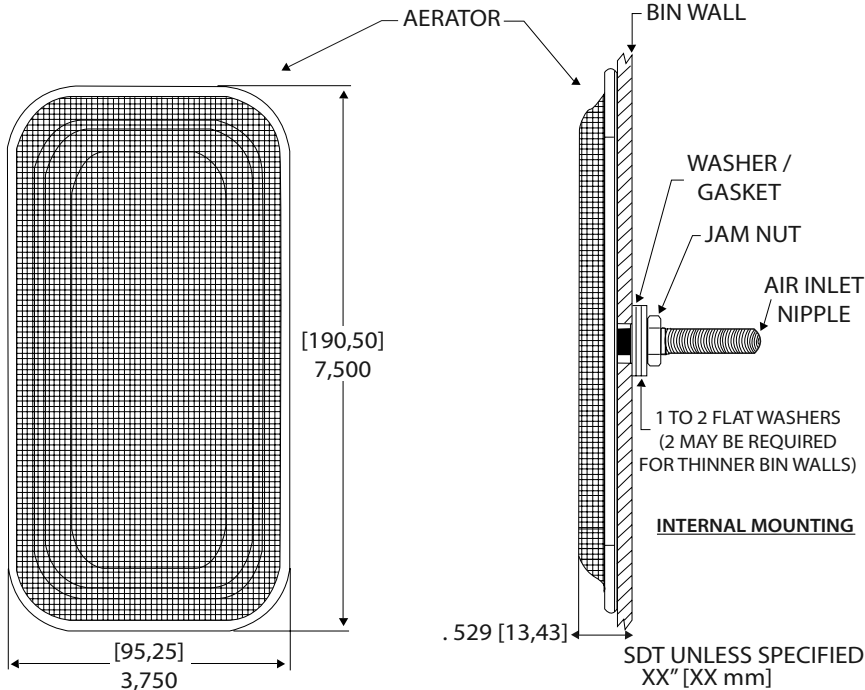


Figure 6: Aerator Dimensions (internal mounting)

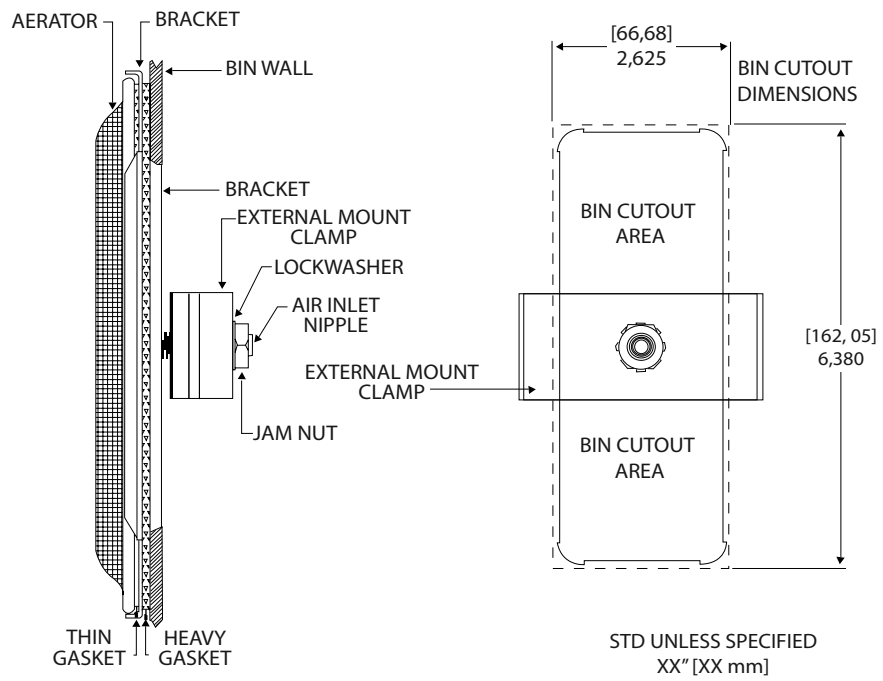


Figure 7: Aerator Dimensions w/ External Mounting Kit