

## How to Build An E-Vac System:

### 1. Select the E-Vac type.

- A. Determine if the part to be lifted is porous or non-porous (page 132 and 133).
- B. Select a style - In-Line Low Vacuum, In-Line High Vacuum, or Adjustable (pages 132, 133 and 135).  
The E-Vac type determines max. vacuum available for lifting the part and vacuum cup selection.

Porous	low vacuum generators max. vacuum = 21" Hg (71 kPa)
Non-porous	high vacuum generators max. vacuum = 27" Hg (91 kPa)
Adjustable E-Vac	vacuum generators max. vacuum = 25" Hg (85 kPa)

### Need Help Selecting the Correct E-Vac?

Our Application Engineers can assist you in determining the correct model E-Vac and vacuum cups (if required). Call 1-800-903-9247 or visit [www.exair.com/appassist.htm](http://www.exair.com/appassist.htm)

### 2. Determine the weight of the part.

### 3. Multiply the weight by the vacuum cup safety factor (see page 137) for the total vacuum cup capacity needed.

### 4. Determine the number of vacuum cups needed by considering the following:

- A. How many cups are needed to distribute the weight for stable lifting and placement?
- B. What is the weight that each vacuum cup can lift based on maximum vacuum available (E-Vac type)?
- C. Select vacuum cups from chart on page 137 based on max. vacuum available (E-Vac type) and holding weight/cup.

### 5. To choose an E-Vac model number, consider the entire vacuum system from the E-Vac to the part.

- A. Number of vacuum cups per E-Vac.
- B. Length and size of vacuum tubing.
- C. Vacuum cup size and type.

- The volume of air to evacuate from your vacuum system and the vacuum flow of the E-Vac you've selected (pages 132, 133 and 136) will determine the time it takes from E-Vac activation to vacuum cup holding the part. As the vacuum level in the system increases, the volume of evacuating air decreases.
- A lower volume of air in the vacuum system and/or a higher capacity (SCFM/SLPM) E-Vac will give faster pick-up times. An exact pick-up time cannot be calculated.
- If the E-Vac vacuum generator doesn't meet your needs, return it for a different model, with no restocking charge (U.S. and Canada only).

## Here is an example using the steps outlined above:

A sheet of material measures 3' x 3' (.91m x .91m) and weighs 25 lbs (11.3kg). Each sheet is in a stack and will be placed on a conveyor.

### If it is porous like wood and positioned vertically:

1. Choose a porous, low vacuum In-Line E-Vac. The maximum vacuum is 21" Hg (71 kPa).
2. The weight is 25 lbs (11.3kg).
3. Since the part is picked-up and hung on an overhead conveyor vertically, the safety factor is 4. The vacuum cup capacity needed is  $4 \times 25 = 100$  lbs (45.4kg).
4. Four vacuum cups will be used for stability when lifting the sheet. Each cup will need at least a 25 lb (11.3kg) capacity. In the table on page 137, at 21" Hg (71 kPa), the Model 900755 Vacuum Cup will hold up to 25.3 lbs (11.5kg).
5. There are 4 small round vacuum cups that are positioned close to one another. The vacuum system has a small to medium volume and pick-up and release time is not critical. To reduce the sound level, use the straight through muffler.

**Order:** (1) Model 800008M In-Line E-Vac  
(4) Model 900755 Vacuum Cups

See Page 139 for other accessories.

### If it is non-porous like glass and positioned horizontally:

1. Choose a non-porous, high vacuum In-Line E-Vac. The maximum vacuum is 27" Hg (91 kPa).
2. The weight is 25 lbs (11.3kg).
3. Since the part is picked-up and placed on a belt conveyor horizontally, the safety factor is 2. The vacuum cup capacity needed is  $2 \times 25 = 50$  lbs (22.7kg).
4. Four vacuum cups will be used for stability when lifting the sheet. Each cup will need at least a 12.5 lb (5.7kg) capacity. In the table on page 137, at 27" Hg (91 kPa), the Model 900754 Vacuum Cup will hold up to 20.8 lbs (9.4kg).
5. There are 4 small round vacuum cups that are positioned close to one another. The vacuum system has a small to medium volume and pick-up and release time is not critical. To reduce the sound level, use the straight through muffler.

**Order:** (1) Model 810006M In-Line E-Vac  
(4) Model 900754 Vacuum Cups

See Page 139 for other accessories.

The Model 840008M Adjustable E-Vac can be substituted for picking up the wood or the glass since the vacuum level and vacuum flow is easily adjusted to suit the porous or non-porous application. The Adjustable E-Vac is especially useful for loads that vary.

# E-Vac® Vacuum Generators

## Low Vacuum Generators For Porous Applications

Low vacuum units up to 21" Hg (71 kPa) with vacuum flows up to 18.5 SCFM (524 SLPM) are typically used for porous materials such as cardboard and delicate materials. The low level vacuum prevents any warping, marring, dimpling or disfiguring of the surface due to excessive vacuum. This style generates more vacuum flow to overcome porosity and leakage. There are 7 In-Line models that vary by flow and vacuum level.

Choose the E-Vac by the SCFM (SLPM) flow that best suits the performance needed for your application (see *Performance Table below*).

**E-Vac Kits** give you the ability to experiment with an assortment of vacuum cups. Kits include a muffler, an assortment of (4) pairs of vacuum cups (closely matched to the performance of that E-Vac), (2) straight, (2) elbow and (1) tee vacuum fittings, 10' (3m) of vacuum tubing and a mounting clip.

**E-Vac Deluxe Kits** include the same items as the standard kit with the addition of an automatic drain filter separator for the compressed air supply and pressure regulator (with coupler).



In-Line E-Vac Vacuum Generators for porous applications.



Create your own vacuum system!

In-Line E-Vac with Straight Through Muffler, push-in connectors, vacuum tubing and a round vacuum cup (shown).

In-Line E-Vac Low Vacuum Generators For Porous Applications	Model 1.5 SCFM 43 SLPM	Model 2.1 SCFM 60 SLPM	Model 3.1 SCFM 88 SLPM	Model 5.4 SCFM 153 SLPM	Model 8.4 SCFM 238 SLPM	Model 12.6 SCFM 357 SLPM	Model 16.8 SCFM 476 SLPM
In-Line E-Vac Only	800001	800002	800003	800005	800008	800013	800017
In-Line E-Vac with Straight Through Muffler	800001M	800002M	800003M	800005M	800008M	800013M	800017M
In-Line E-Vac Kit with Straight Through Muffler	801001M	801002M	801003M	801005M	801008M	801013M	801017M
In-Line E-Vac Deluxe Kit with Straight Through Muffler	802001M	802002M	802003M	802005M	802008M	802013M	802017M

Note: Replace 'M' with 'H' for Standard Muffler

In-Line E-Vac Low Vacuum Generator Performance (Porous)																							
In-Line E-Vac Model	Air Consumption SCFM @ 80 PSIG SLPM @ 5.5 BAR		Sound Level in dBA			Vacuum Flow (SCFM/SLPM) vs. Vacuum Level ("Hg/ kPa)																	
			No Muffler	Standard Muffler	Straight Through Muffler	0	3/10	6/20	9/31	12/41	15/51	18/61	21/71	Max Vac									
800001	1.5	42.5	80	72	60	1.52	43.0	1.41	3.99	1.25	35.4	1.10	31.1	0.95	26.9	0.85	24.1	0.56	15.9	0.00	0.0	21	71
800002	2.1	59.5	80	72	63	2.22	62.9	2.05	5.80	1.91	54.1	1.77	50.1	1.45	41.1	0.95	26.9	0.56	15.9	0.00	0.0	21	71
800003	3.1	87.8	89	74	70	3.75	106.2	3.52	99.7	3.15	89.2	2.75	77.9	2.15	60.9	1.20	34.0	0.56	15.9	0.00	0.0	21	71
800005	5.4	152.9	92	83	66	5.59	158.3	5.23	148.1	4.51	127.7	3.75	106.2	3.34	94.6	2.51	71.1	1.25	35.4	0.00	0.0	21	71
800008	8.4	237.9	97	88	74	7.70	218.0	6.95	196.8	6.30	178.4	5.30	150.1	4.23	119.8	3.15	89.2	1.31	37.1	0.00	0.0	21	71
800013	12.6	356.8	99	91	78	15.50	438.9	14.50	410.6	13.15	372.4	11.35	321.4	8.70	246.3	4.03	114.1	0.00	0.0	0.00	0.0	18	61
800017	16.8	475.7	101	91	81	18.50	523.8	17.20	487.0	14.70	416.2	12.40	351.1	9.80	277.5	5.00	141.6	0.00	0.0	0.00	0.0	18	61

## High Vacuum Generators For Non-Porous Applications

High vacuum units up to 27" Hg (91 kPa) with vacuum flows up to 15.8 SCFM (447 SLPM) are typically used for non-porous materials such as glass, steel sheet, and plastic. There are 7 In-Line models that vary by flow and vacuum level.

Choose the E-Vac by the SCFM (SLPM) flow that best suits the performance needed for your application (see *Performance Table below*).

**E-Vac Kits** give you the ability to experiment with an assortment of vacuum cups. Kits include a muffler, an assortment of (4) pairs of vacuum cups (closely matched to the performance of that E-Vac), (2) straight, (2) elbow and (1) tee vacuum fittings, 10' (3m) of vacuum tubing and a mounting clip.

**E-Vac Deluxe Kits** include the same items as the standard kit with the addition of an automatic drain filter separator for the compressed air supply and pressure regulator (with coupler).

EXAIR E-Vacs are available in other materials upon request. Contact an application engineer for an alternate material quote.



In-Line E-Vac Vacuum Generators for non-porous applications.



The In-Line E-Vac with Standard Muffler (shown above) is also available with your choice of accessories that can be found on page 139.

In-Line E-Vac High-Vacuum Generators For Non-Porous Applications	Model 2.3 SCFM 65 SLPM	Model 3.3 SCFM 93 SLPM	Model 6.2 SCFM 176 SLPM	Model 8.4 SCFM 238 SLPM	Model 13.2 SCFM 374 SLPM	Model 23.1 SCFM 654 SLPM	Model 30.8 SCFM 872 SLPM
In-Line E-Vac Only	810002	810003	810006	810008	810013	810023	810031
In-Line E-Vac with Straight Through Muffler	810002M	810003M	810006M	810008M	810013M	810023M	810031M
In-Line E-Vac Kit with Straight Through Muffler	811002M	811003M	811006M	811008M	811013M	811023M	811031M
In-Line E-Vac Deluxe Kit with Straight Through Muffler	812002M	812003M	812006M	812008M	812013M	812023M	812031M

Note: Replace 'M' with 'H' for Standard Muffler

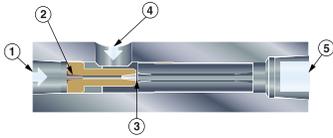
In-Line E-Vac High Vacuum Generator Performance (Non-Porous)																											
In-Line E-Vac Model	Air Consumption SCFM @ 80 PSIG SLPM @ 5.5 BAR		Sound Level in dBA			Vacuum Flow (SCFM/SLPM) vs. Vacuum Level ("Hg/ kPa)																					
			No Muffler	Standard Muffler	Straight Through Muffler	Vacuum Level ("Hg/ kPa)																					
						0	3/10	6/20	9/31	12/41	15/51	18/61	21/71	24/81	27/91	Max Vac											
810002	2.3	65.1	86	81	70	1.22	34.5	1.16	33.0	1.00	28.3	0.90	25.5	0.87	24.6	0.74	21.0	0.56	16.0	0.46	13.0	0.20	5.7	0.00	0.0	27	91
810003	3.3	93.4	87	82	73	1.73	49.0	1.59	45.0	1.48	41.9	1.24	35.1	1.09	30.9	1.02	28.9	0.78	22.1	0.67	19.0	0.49	13.9	0.00	0.0	27	91
810006	6.2	175.6	91	82	77	2.75	78.0	2.65	75.0	2.26	64.0	2.05	58.0	1.87	53.0	1.59	45.0	1.13	32.0	0.92	26.0	0.77	21.7	0.00	0.0	27	91
810008	8.4	237.9	97	90	78	4.40	124.6	4.10	116.1	3.75	106.2	3.15	89.2	2.75	77.9	2.39	67.7	1.75	49.6	1.27	36.0	0.99	28.0	0.00	0.0	27	91
810013	13.2	373.8	100	92	83	6.85	194.0	6.50	184.1	5.81	164.5	4.89	138.5	4.12	116.7	3.51	99.4	2.61	73.9	1.92	54.4	1.31	37.1	0.00	0.0	27	91
810023	23.1	654.1	102	92	84	11.95	338.4	11.80	334.1	10.45	295.9	9.02	255.4	8.10	229.4	6.52	184.6	4.54	128.6	3.65	103.4	2.67	75.6	0.00	0.0	27	91
810031	30.8	872.1	105	92	87	15.75	446.0	15.25	431.8	12.67	358.8	11.12	314.9	10.25	290.2	7.97	225.8	5.98	169.3	5.04	142.7	3.41	96.6	0.00	0.0	27	91

# E-Vac® Vacuum Generators

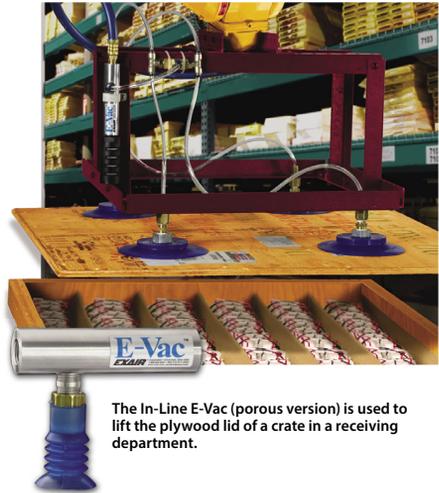
## In-Line E-Vacs

EXAIR manufactures two versions of the In-Line E-Vac – Low Vacuum and High Vacuum. The application will dictate which type of vacuum is most suitable. The dimensions and performance for each model are shown.

### How The In-Line E-Vac Works



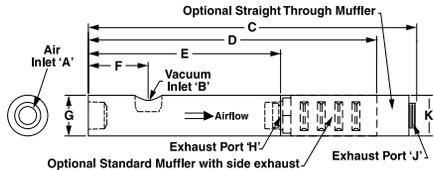
Compressed air flows through the inlet (1), then through a single directed nozzle (2). As the airstream exhausts, it expands and increases in velocity prior to passing through the venturi (3). A vacuum inlet tangential to the primary airflow (4) is located at the suction point between the orifice and the venturi. The airflow that is drawn through the vacuum inlet mixes with the primary airstream, then exhausts on the opposite end (5).



The In-Line E-Vac (porous version) is used to lift the plywood lid of a crate in a receiving department.

### In-Line E-Vac Dimensions

DOWNLOAD 3 drawings at EXAIR.com



### Need Help Selecting the Correct E-Vac?

Not sure how much vacuum is required for your application? Our Application Engineers can assist you in determining the correct model E-Vac and vacuum cups (if required). Call 1-800-903-9247 or visit [www.exair.com/appassist.htm](http://www.exair.com/appassist.htm)

### In-Line Vacuum Generator Dimensions

Model	Air Inlet A	Vacuum Inlet B		C	D	E	F	G	H	J	K
800001, 800002, 800003, 810002, 810003, 810006	1/8 NPT	1/8 NPT	in	N/A	N/A	3.00	0.88	0.75	1/4 NPT	N/A	N/A
			mm	N/A	N/A	76	22	19		N/A	N/A
800001H, 800002H, 800003H, 810002H, 810003H, 810006H	1/8 NPT	1/8 NPT	in	N/A	5.00	3.00	0.88	0.75	1/4 NPT	N/A	0.81
			mm	N/A	127	76	22	19		N/A	21
800001M, 800002M, 800003M, 810002M, 810003M, 810006M	1/8 NPT	1/8 NPT	in	5.25	N/A	3.00	0.88	0.75	1/4 NPT	1/4 NPS	0.75
			mm	133	N/A	76	22	19		1/4 NPS	19
800005, 800008, 810008, 810013	1/4 NPT	3/8 NPT	in	N/A	N/A	4.50	1.50	1.00	3/8 NPT	N/A	N/A
			mm	N/A	N/A	114	38	25		N/A	N/A
800005H, 800008H, 810008H, 810013H	1/4 NPT	3/8 NPT	in	N/A	7.50	4.50	1.50	1.00	3/8 NPT	N/A	1.25
			mm	N/A	191	114	38	25		N/A	32
800005M, 800008M, 810008M, 810013M	1/4 NPT	3/8 NPT	in	7.75	N/A	4.50	1.50	1.00	3/8 NPT	3/8 NPS	1.00
			mm	197	N/A	114	38	25		3/8 NPS	25
800013, 800017, 810023, 810031	1/2 NPT	1/2 NPT	in	N/A	N/A	6.00	1.88	1.25	1/2 NPT	N/A	N/A
			mm	N/A	N/A	152	48	32		N/A	N/A
800013H, 800017H, 810023H, 810031H	1/2 NPT	1/2 NPT	in	N/A	9.00	6.00	1.88	1.25	1/2 NPT	N/A	1.25
			mm	N/A	229	152	48	32		N/A	32
800013M, 800017M, 810023M, 810031M	1/2 NPT	1/2 NPT	in	10.25	N/A	6.00	1.88	1.25	1/2 NPT	1/2 NPS	1.25
			mm	260	N/A	152	48	32		1/2 NPS	32

## Adjustable E-Vac® Vacuum Generators

**A simple turn can increase or decrease vacuum and flow!**

### What Is The Adjustable E-Vac?

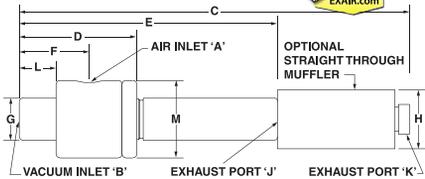
EXAIR's Adjustable E-Vac is a series of low cost, compressed air powered vacuum generators where the vacuum and flow rates can be easily adjusted to suit the application requirements. These vacuum pumps are ideal for a wide variety of pick and place, box opening, clamping, lifting, chucking, and surface mounting applications. They are maintenance free and have no moving parts to wear out.

### Why The Adjustable E-Vac?

Engineered for high efficiency, the Adjustable E-Vac minimizes compressed air use by allowing it to be tuned to the application. With a simple turn of the unit, the vacuum and flow levels can be changed to overcome porosity and increase or decrease the lifting power. The straight-through, single stage aluminum construction requires no vacuum filter and simply passes contaminants from dirty environments through the unit so there is no clogging or loss of suction.

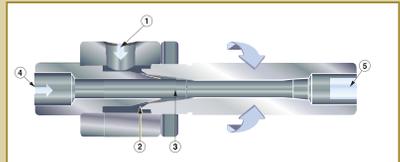
Adjustable E-Vac is available in 4 sizes that have adjustable vacuum rates up to 25" Hg (85 kPa) and flow rates up to 81 SCFM (2,294 SLPM). Kit configurations that include vacuum cups, fittings, tubing and a mounting clip are available.

### Adjustable E-Vac Dimensions



The vacuum level of the Adjustable E-Vac can quickly be changed from lifting lightweight pavers to heavy cement blocks.

### How The Adjustable E-Vac Works



Compressed air flows through the inlet (1), then through an adjustable annular nozzle (2). As the airstream enters the vacuum flow, it expands and increases in velocity (3). A vacuum flow is induced, creating suction (4). The airflow that is drawn through the vacuum inlet mixes with the primary airstream, then exhausts on the opposite end (5).

Vacuum Generators

### Adjustable Vacuum Generator Dimensions

Model	Air Inlet A	Vacuum Inlet B		C	D	E	F	G	H	L	M	Exhaust Port J	Exhaust Port K
840008	1/8 NPT	1/4 NPT	in	N/A	2.00	4.38	1.19	0.72	N/A	0.63	1.31	1/4 NPT	N/A
			mm	N/A	51	111	30	18	N/A	16	33		
840008M	1/8 NPT	1/4 NPT	in	6.63	2.00	4.38	1.19	0.72	0.75	0.63	1.31	1/4 NPT	1/4 NPS
			mm	168	51	111	30	18	19	16	33		
840015	3/8 NPT	1/2 NPT	in	N/A	2.38	5.44	1.31	0.97	N/A	0.63	1.56	1/2 NPT	N/A
			mm	N/A	60	138	33	25	N/A	16	40		
840015M	3/8 NPT	1/2 NPT	in	9.69	2.38	5.44	1.31	0.97	1.25	0.63	1.56	1/2 NPT	1/2 NPS
			mm	246	60	138	33	25	32	16	40		
840030	3/8 NPT	1/2 NPT	in	N/A	2.50	6.19	1.44	1.22	N/A	0.75	1.94	3/4 NPT	N/A
			mm	N/A	64	157	37	31	N/A	19	49		
840030M	3/8 NPT	1/2 NPT	in	13.63	2.50	6.19	1.44	1.22	2.00	0.75	1.94	3/4 NPT	3/4 NPS
			mm	346	64	157	37	31	51	19	49		
840060	1/2 NPT	3/4 NPT	in	N/A	2.75	6.50	1.56	1.47	N/A	0.75	2.19	1 NPT	N/A
			mm	N/A	70	165	40	37	N/A	19	56		
840060M	1/2 NPT	3/4 NPT	in	13.94	2.75	6.50	1.56	1.47	2.00	0.75	2.19	1 NPT	1 NPS
			mm	354	70	165	40	37	51	19	56		