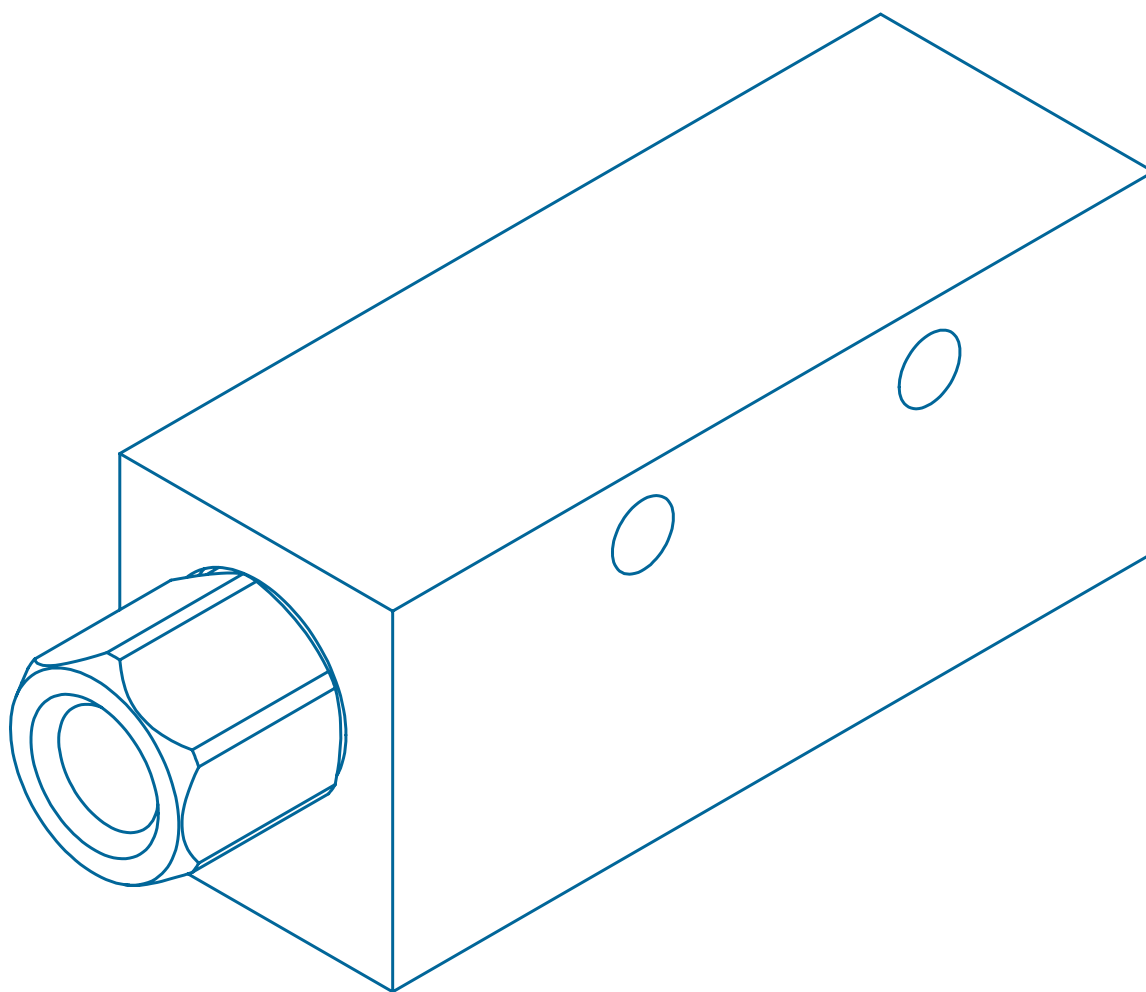
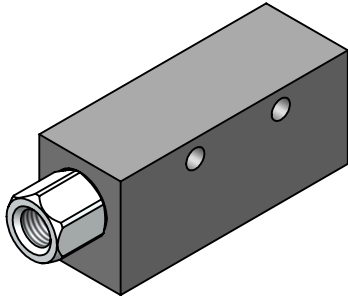


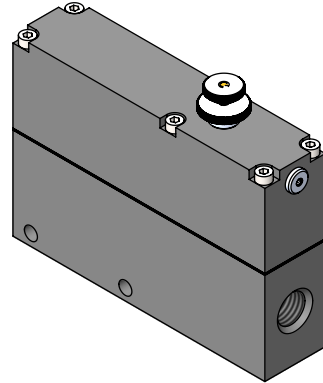
Single-Stage Vacuum Pumps

Section 14

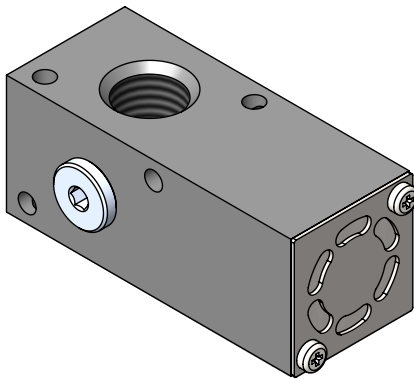




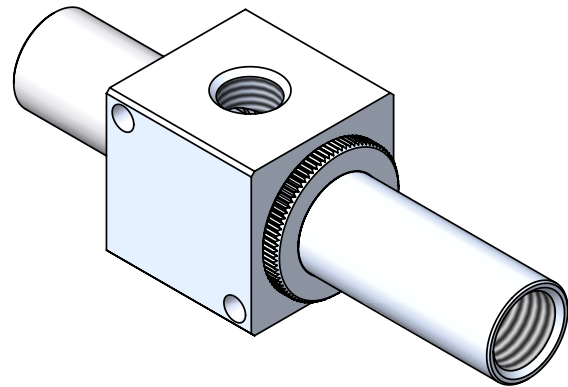
EV Series



V Series



SM Series



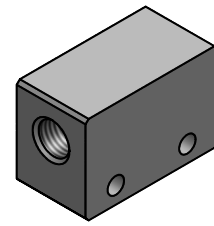
Variable Displacement

EV Series	3
V Series	8
SM Series	15
Variable Displacement Pumps	17

EV Series Vacuum Pump

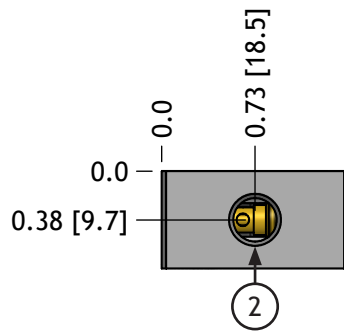
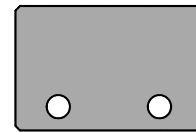
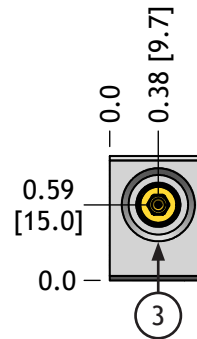
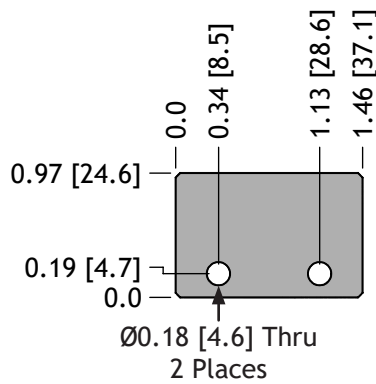
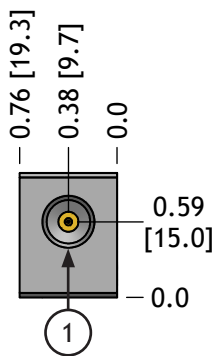
EV single-stage vacuum generators provide a compact, lightweight, low-cost vacuum source for pick & place and material handling applications. The simple two-piece design allows ingested debris to exit the exhaust port. The optional "ST" straight-through exhaust silencer is a no-clog design that will pass ingested debris to atmosphere.

A G 1/8 NPSF auxiliary vacuum port is included so a gauge or vacuum switch can be easily added to complete a system. Construction is aluminum with anodized pump body and electroless-nickel plated primary nozzle.

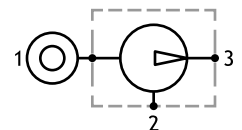


Weight: 1.56 oz [44.2 g]

EV05HS		Silencer
(Blank)	None	
-ST	STA14M	
-AA	AA14M	



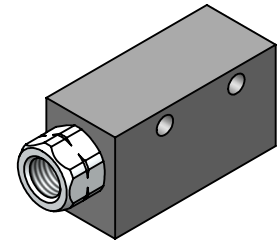
Code	Function	Ports
1	Air-Supply	G 1/8 NPSF
2	Vacuum	G 1/8 NPSF
3	Exhaust	G 1/4



EV Series Vacuum Pump

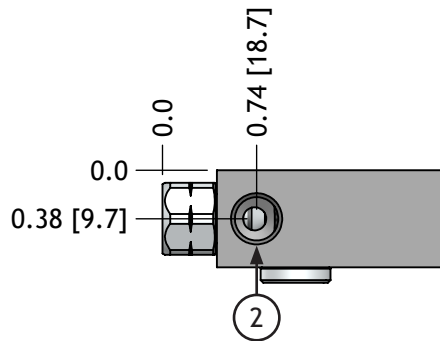
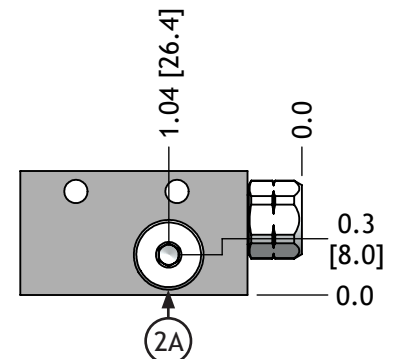
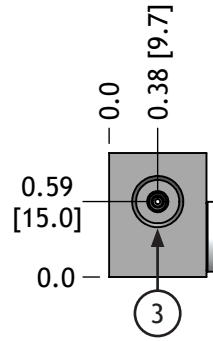
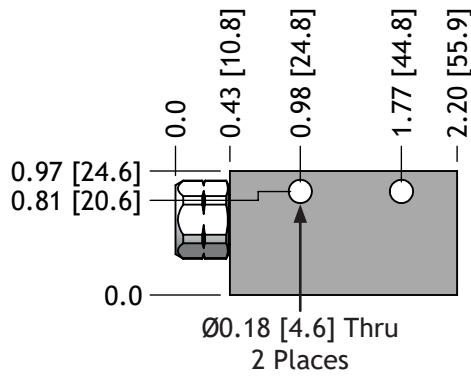
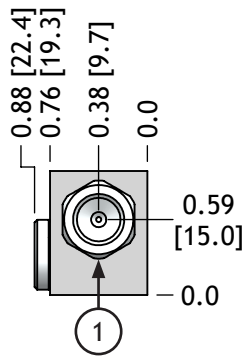
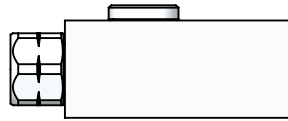
EV single-stage vacuum generators provide a compact, lightweight, low-cost vacuum source for pick & place and material handling applications. The simple two-piece design allows ingested debris to exit the exhaust port. The optional "ST" straight-through exhaust silencer is a no-clog design that will pass ingested debris to atmosphere.

A G 1/8 NPSF auxiliary vacuum port is included so a gauge or vacuum switch can be easily added to complete a system. Construction is aluminum with anodized pump body and electroless-nickel plated primary nozzle.

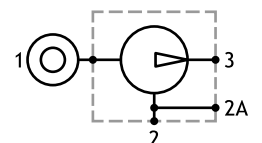


Weight: 1.98 oz [56.0 g]

Silencer	
EV10HS	(Blank)
-ST	STA18M
-AA	AA18M



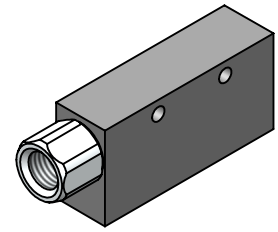
Code	Function	Ports
1	Air-Supply	G 1/8 NPSF
2	Vacuum	G 1/8 NPSF
2A	Vacuum - Auxiliary	G 1/8 NPSF
3	Exhaust	G 1/8 NPSF



EV Series Vacuum Pump

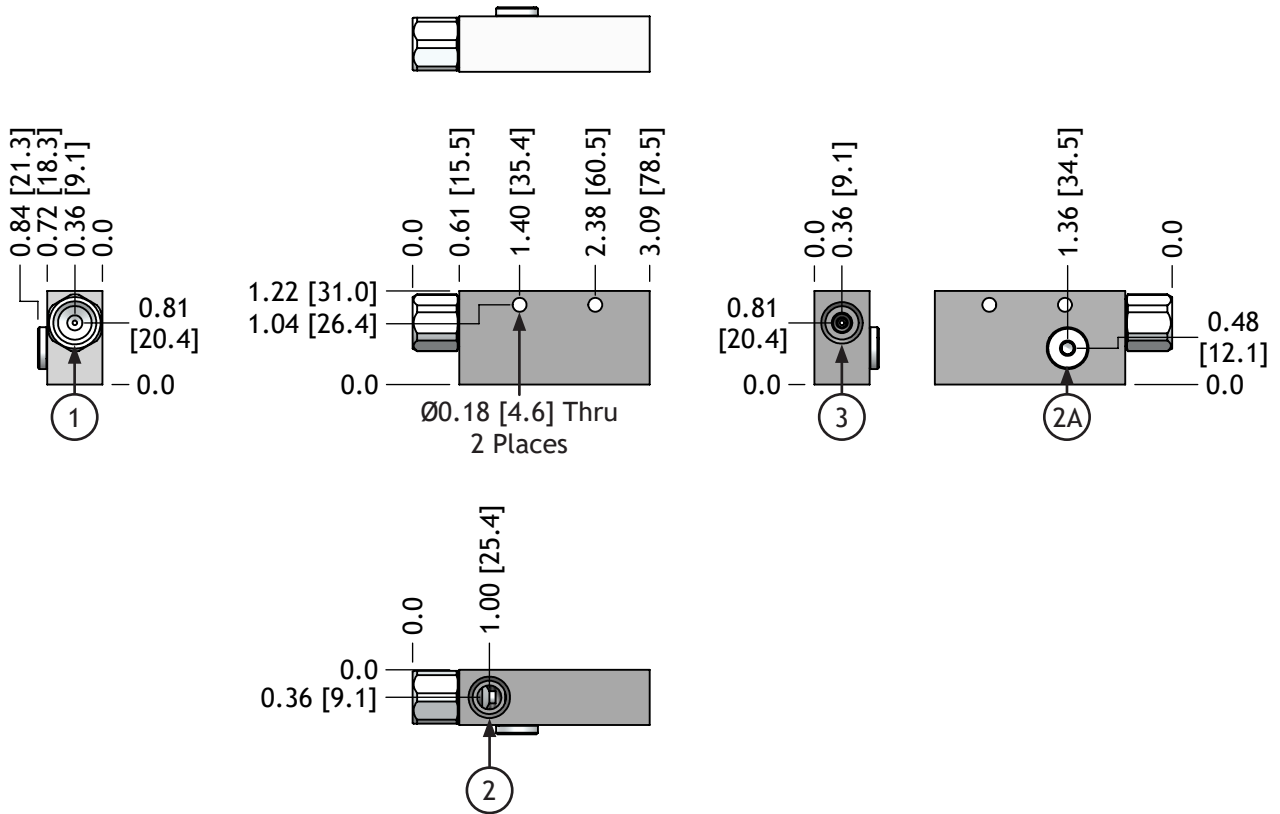
EV single-stage vacuum generators provide a compact, lightweight, low-cost vacuum source for pick & place and material handling applications. The simple two-piece design allows ingested debris to exit the exhaust port. The optional "ST" straight-through exhaust silencer is a no-clog design that will pass ingested debris to atmosphere.

A G 1/8 NPSF auxiliary vacuum port is included so a gauge or vacuum switch can be easily added to complete a system. Construction is aluminum with anodized pump body and electroless-nickel plated primary nozzle.

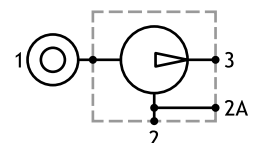


Weight: 3.27 oz [92.8 g]

	Threads		Silencer	
EV15HS	(Blank)	NPT Threads	(Blank)	None
	-G	G Threads	-ST	STA14M
			-AA	AA14M



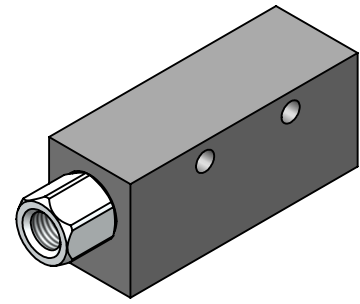
Code	Function	NPT	G
1	Air-Supply	1/4 NPTF	G 1/4
2	Vacuum	1/4 NPTF	G 1/4
2A	Vacuum - Auxiliary	G 1/8 NPSF	
3	Exhaust	1/4 NPTF	G 1/4



EV Series Vacuum Pump

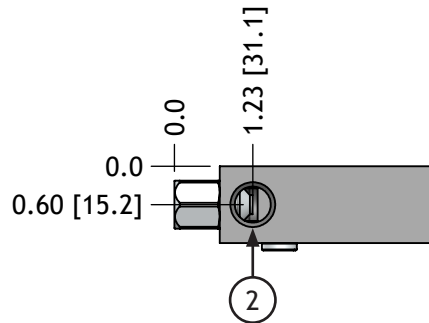
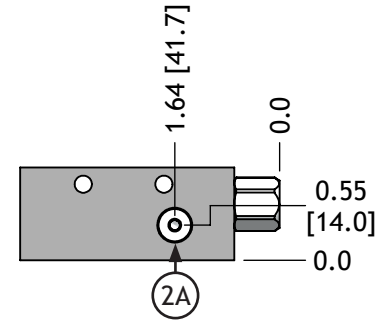
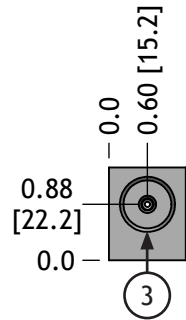
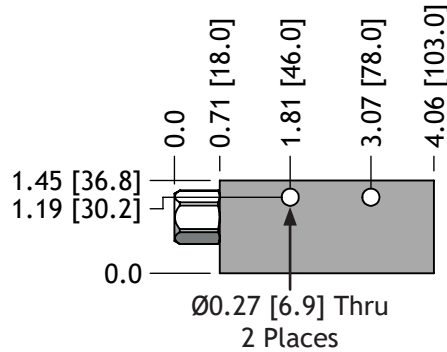
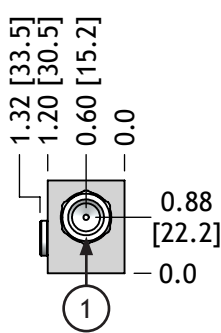
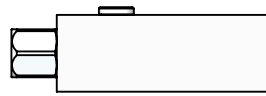
EV single-stage vacuum generators provide a compact, lightweight, low-cost vacuum source for pick & place and material handling applications. The simple two-piece design allows ingested debris to exit the exhaust port. The optional "ST" straight-through exhaust silencer is a no-clog design that will pass ingested debris to atmosphere.

A G 1/8 NPSF auxiliary vacuum port is included so a gauge or vacuum switch can be easily added to complete a system. Construction is aluminum with anodized pump body and electroless-nickel plated primary nozzle.

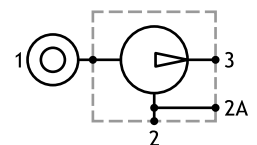


Weight: 8.45 oz [239.6 g]

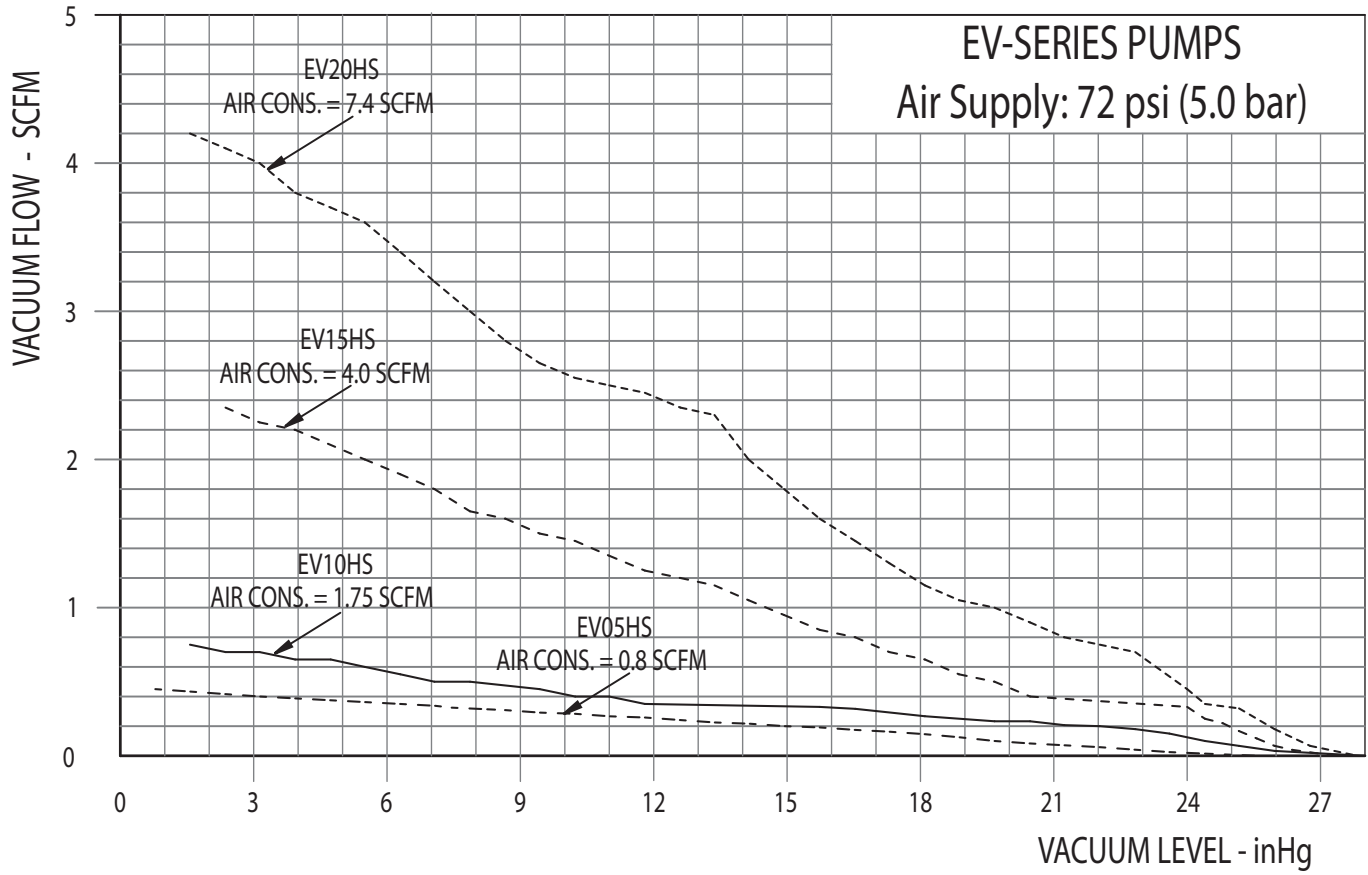
	Threads		Silencer	
EV20HS	(Blank)	NPT Threads	(Blank)	None
	-G	G Threads	-ST	STC12M
			-AA	AA12M



Code	Function	NPT	G
1	Air-Supply	1/4 NPTF	G 1/4
2	Vacuum	3/8 NPTF	G 3/8
2A	Vacuum - Auxiliary	G 1/8 NPSF	
3	Exhaust	G 1/2 NPSF	



EV Series Performance



Vacuum Flow - SCFM

Model	Air-Supply PSI	Air Cons SCFM	Max Vac inHg	SCFM at Vacuum Level							
				3 inHg	6 inHg	9 inHg	12 inHg	15 inHg	18 inHg	21 inHg	24 inHg
EV05HS	72	0.4	26.7	0.25	0.22	0.20	0.15	0.12	0.7	0.03	0.01
EV10HS	72	1.8	28	0.70	0.57	0.46	0.35	0.33	0.27	0.22	0.13
EV15HS	72	4.0	27.3	2.27	1.94	1.56	1.24	0.94	0.66	0.39	0.33
EV20HS	72	7.4	27.8	4.01	3.48	2.74	2.42	1.78	1.17	0.83	0.45

SCFM X 28.32 = nl / m

Evacuation Time - sec / 100 in³

Model	Air-Supply PSI	Air Cons SCFM	Max Vac inHg	SCFM at Vacuum Level							
				3 inHg	6 inHg	9 inHg	12 inHg	15 inHg	18 inHg	21 inHg	24 inHg
EV05HS	72	0.4	26.7	1	2.5	4.5	7.5	12.5	20	35	-
EV10HS	72	1.8	28	0.36	0.44	1.6	2.8	4.6	7.6	12.6	23.6
EV15HS	72	4.0	27.3	0.11	0.27	0.5	0.86	1.4	2.3	4.1	7.8
EV20HS	72	7.4	27.8	0.06	0.15	0.3	0.5	0.8	1.3	2.2	4.2

sec / 100 in³ X 0.61 = sec / l

All performance data presented is a representation of production pumps but is not a guarantee due to variations in local barometric pressure and of mass produced components.

V Series Vacuum Pumps

V-Series vacuum pumps are available in 24 models with anodized aluminum bodies plus 12 cartridge models for integration into custom vacuum manifold systems.

EDCO Single-Stage Pumps provide the instantaneous response common to air operated devices in addition to being compact, light, and cost-effective. Rugged, all-metal construction will provide years of trouble-free service.

Our no-clog, flow-through design is perfectly suited for packaging and other applications involving paper fibers or other debris that can be ingested into the vacuum system. Our optional straight-through silencer passes the exhaust directly to atmosphere after absorbing high-frequency noise from the air stream. Many of our competitors use closed-end plastic exhaust mufflers where the exhaust is passed

Principles of Operation

To generate vacuum, compressed air is supplied to the inlet of a shaped primary nozzle to concentrate the air stream so that it increases in velocity as it passes through the nozzle throat. As velocity increases, pressure decreases until it is below atmospheric pressure (vacuum) and the high-velocity air stream is passed into a second nozzle that is spaced away from the end of the primary nozzle. The gap between the two nozzles occurs within a chamber with a threaded port for connecting to a system requiring a vacuum source. As evacuated air flows into the vacuum port, it is drawn into a second nozzle where it is mixed with air from the primary nozzle and combined flow is exhausted to atmosphere after passing through a silencer where expansion continues and noise is absorbed by an acoustic media.

To stop the vacuum, the compressed air supply is removed and vented by a 3-way supply valve. When air flow stops, vacuum is no longer generated and ambient air flows into the exhaust and into the vacuum line to dissipate the residual vacuum thereby releasing work pieces from vacuum cups or other vacuum holders in the system.

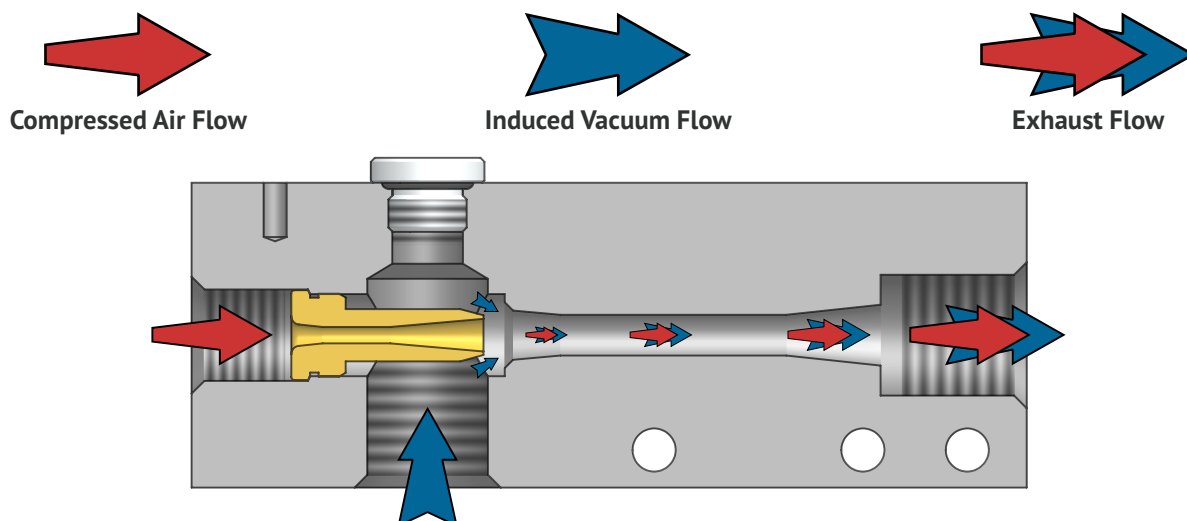
through a filter media that will accumulate debris, eventually causing a loss of pump performance. In systems where conditions are very dirty, such as woodworking, a vacuum filter should be used to remove dust and debris so they will not be dispersed in the exhaust and breathed by workers.

As always, to obtain maximum benefits of EDCO compressed air powered vacuum pumps, they should be mounted close to the point of vacuum usage to minimize line losses, reduce vacuum system volume, and minimize system evacuation time.

For ease of mounting, V-Series Pump bodies feature square or rectangular cross-sections and include mounting holes. This results in a much simpler installation with a better appearance than with cylindrical body vacuum pumps.

Geometry of the primary and secondary nozzles determines the shape of the pump performance curve and the depth of vacuum that can be achieved. Nozzles are optimized for operation at specific pressure but can be used at other supply pressures to suit an application. When operating at some non-optimum air pressure, a rapid popping noise may be heard in the exhaust which is caused when air velocity achieves unstable, supersonic / subsonic velocity and can be eliminated by slightly increasing or decreasing the air supply pressure.

There are many terms for these devices included generator, ejector, and venturi. They are commonly called vacuum pumps in the industry, so that is the term we use. No matter what the name is, they are very useful for providing fast, reliable, compact, low-cost vacuum sources for all manners of application.

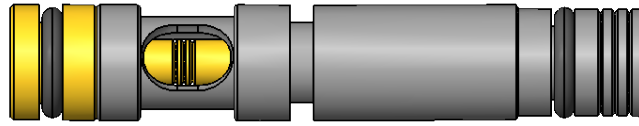


V Series Venturi Cartridges

V10 and V20 Series Nozzle Sets can be ordered on their own for use in your custom applications.

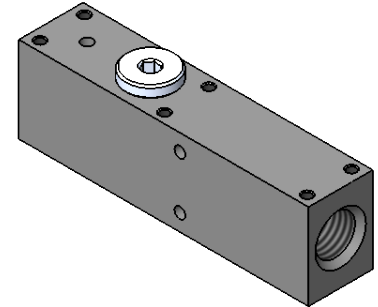
Contact EDCO USA for cavity detail drawing.

Nozzle Set	Series
V- 60	H
60	H
90	H-60
100	M
150	M-60

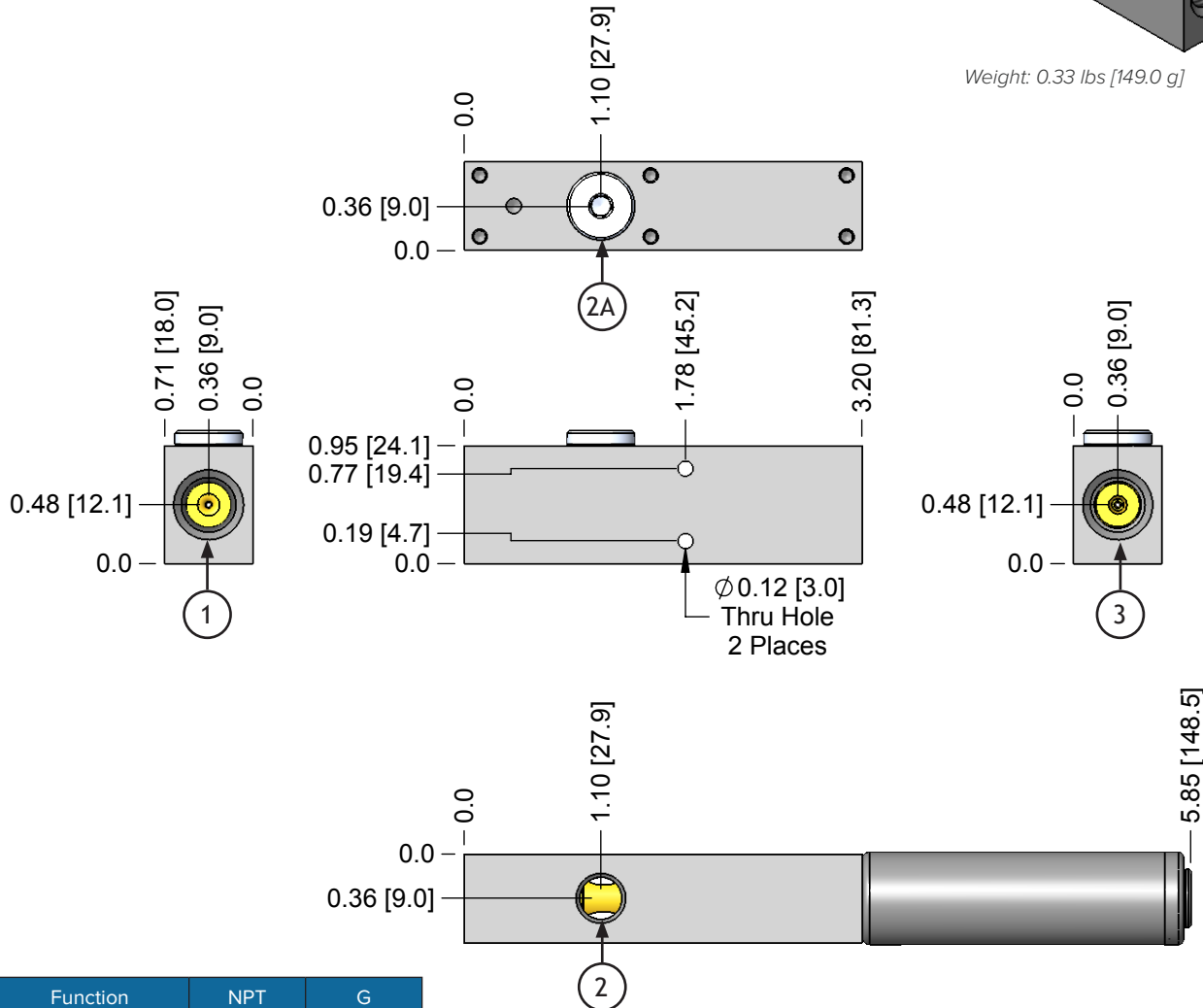


V10 Vacuum Pumps

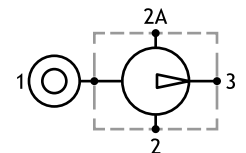
Blow-Off Options		Nozzle Set	Series	Threads		Silencer	
V10	-	60	H	(Blank)	NPT	(Blank)	None
(Blank)	None	60	H	(Blank)	NPT	(Blank)	None
-X	Blow-Off	90	H-60	-G	G Threads	-ST	STA14M
		100	M				
		150	M-60				



Weight: 0.33 lbs [149.0 g]

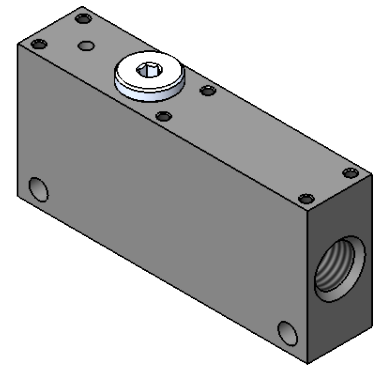


Code	Function	NPT	G
1	Air-Supply	1/4 NPTF	G 1/4
2	Vacuum	G 1/8 NPSF	
2A	Vacuum - Auxiliary	G 1/8 NPSF	
3	Exhaust	1/4 NPTF	G 1/4

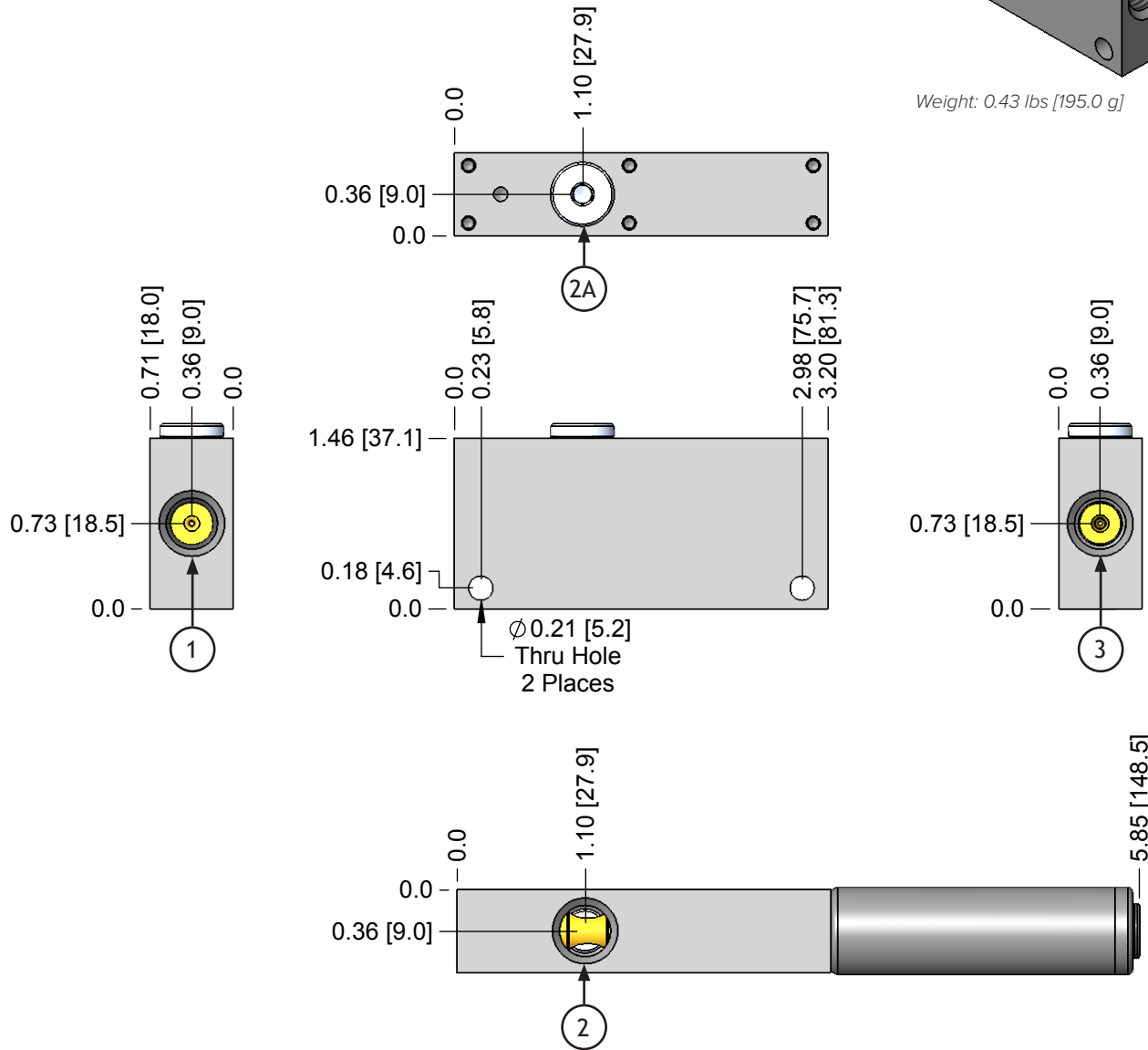


V20 Vacuum Pumps

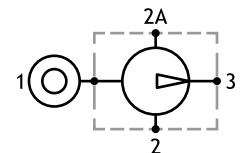
Blow-Off Options		Nozzle Set	Series	Threads		Silencer	
V20		60	H				
(Blank)	None	60	H	(Blank)	NPT	(Blank)	None
-X	Blow-Off	90	H-60	-G	G Threads	-ST	STA14M
		100	M				
		150	M-60				



Weight: 0.43 lbs [195.0 g]



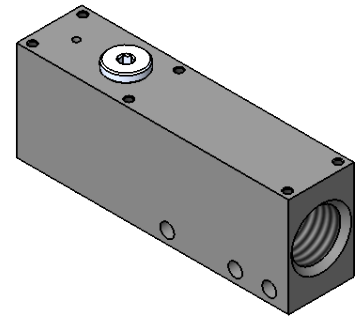
Code	Function	NPT	G
1	Air-Supply	1/4 NPTF	G 1/4
2	Vacuum	1/4 NPTF	G 1/4
2A	Vacuum - Auxiliary	G 1/8 NPSF	
3	Exhaust	1/4 NPTF	G 1/4



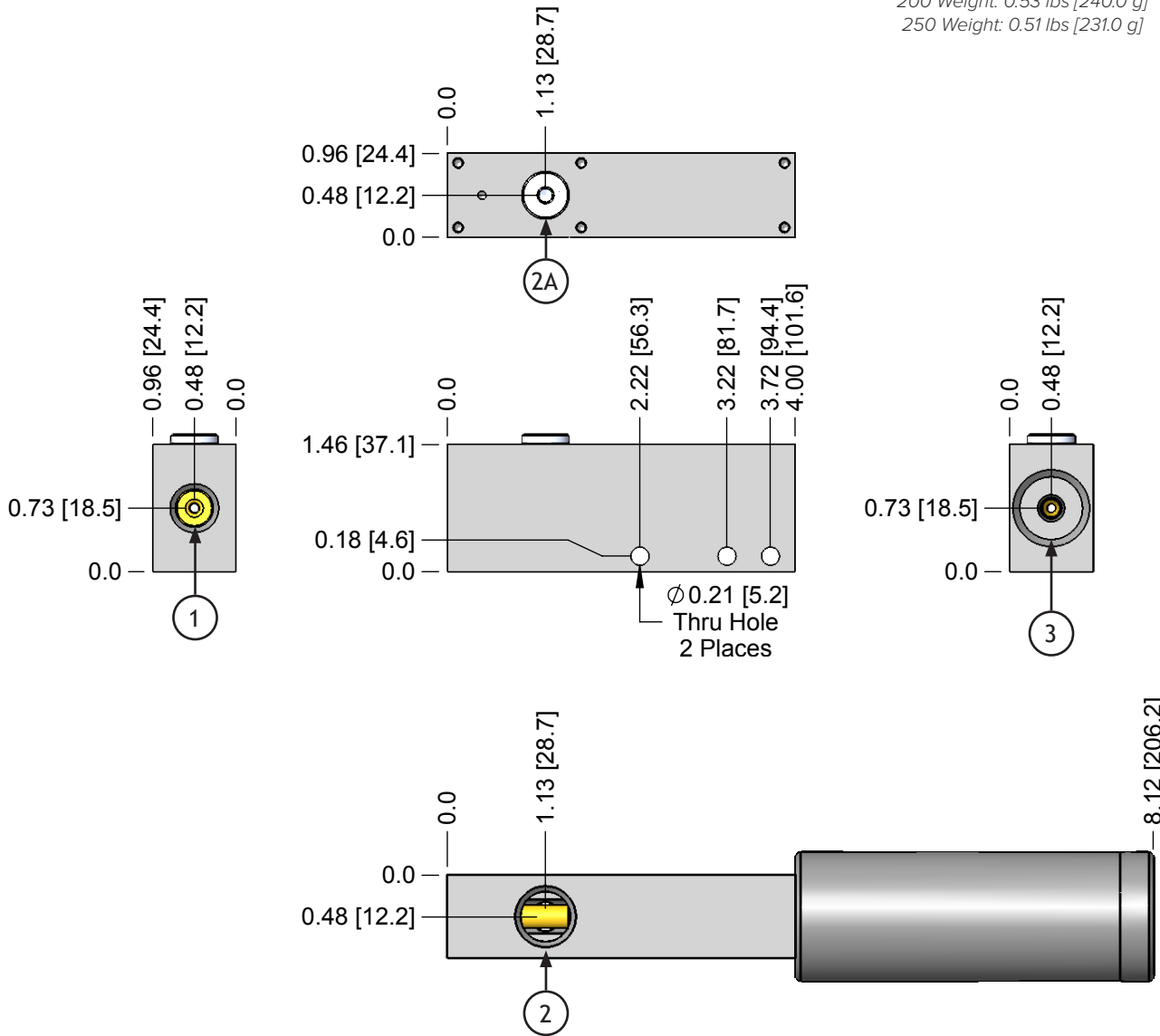
V80 Vacuum Pumps

Blow-Off Options		Nozzle Set	Series	Threads		Silencer ¹	
V80		200	H				
(Blank)	None	200	H	(Blank)	NPT	(Blank)	None
-X	Blow-Off	250	H-60	-G	G Threads	-ST	ST Silencer
			M				
			M-60				

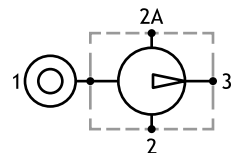
¹Pumps with 200 Nozzle Sets use STB38M Silencers.
¹Pumps with 250 Nozzle Sets use STC12M Silencers.



200 Weight: 0.53 lbs [240.0 g]
 250 Weight: 0.51 lbs [231.0 g]

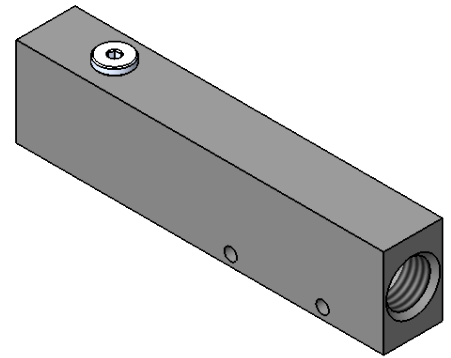


Code	Function	200 - NPT	200 - G	250 - NPT	250 - G
1	Air-Supply	1/4 NPTF	G 1/4	1/4 NPTF	G 1/4
2	Vacuum	3/8 NPTF	G 3/8	3/8 NPTF	G 3/8
2A	Vacuum - Auxiliary	G 1/8 NPSF			
3	Exhaust	3/8 NPTF	G 3/8	1/2 NPTF	G 1/2



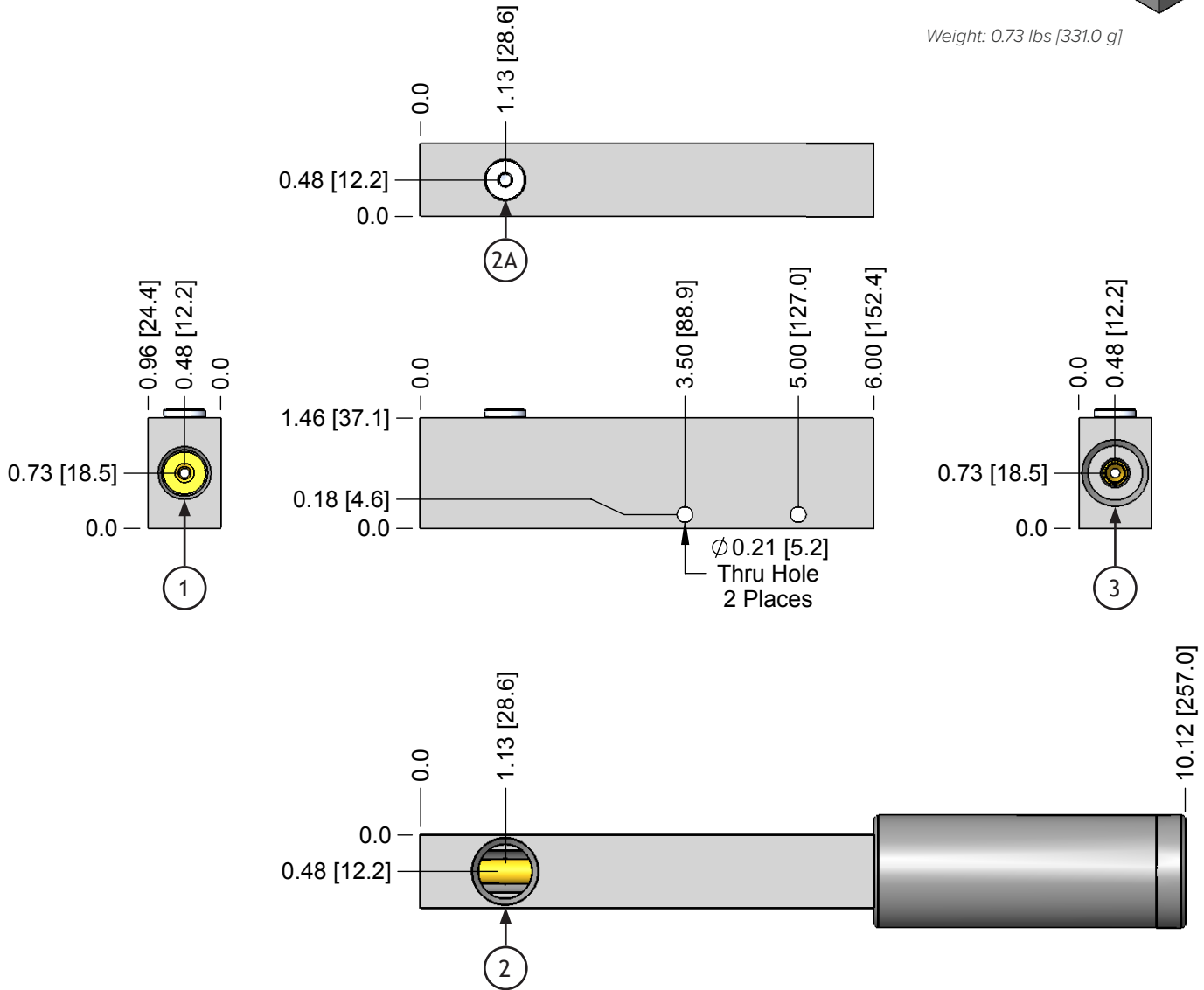
V90 Vacuum Pumps

Blow-Off Options		Nozzle Set	Series	Threads		Silencer ¹	
V90		300	H	(Blank)	NPT	(Blank)	None
(Blank)	None	300	H	(Blank)	NPT	(Blank)	None
-X	Blow-Off	350	H-60	-G	G Threads	-ST	ST Silencer
			M				
			M-60				

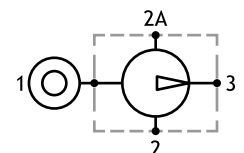


Weight: 0.73 lbs [331.0 g]

¹Pumps with 300 Nozzle Sets use STC12M Silencers.
¹Pumps with 350 Nozzle Sets use STC12M-6 Silencers.



Code	Function	NPT	G
1	Air-Supply	3/8 NPTF	G 3/8
2	Vacuum	1/2 NPTF	G 1/2
2A	Vacuum - Auxiliary	G 1/8 NPSF	
3	Exhaust	1/2 NPTF	G 1/2



VX: V Series Vacuum Pumps w/ Automatic Blow-Off

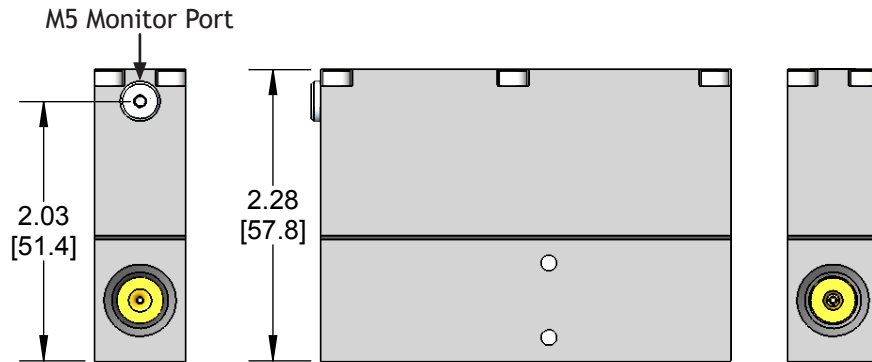
Same performance as a standard V-series but with automatic quick-release blow-off module. Air supply to the pump fills a volume chamber via an integral quick exhaust valve.

When the pump air supply is turned off and pressure drops about 5 psi (0,3 bar), the quick exhaust valve shifts and passes the stored volume directly into the pump vacuum port to quickly dissipate system vacuum for a faster cycle time.

V10X

Storage Volume: 1.0 in³ [16.4 ml]

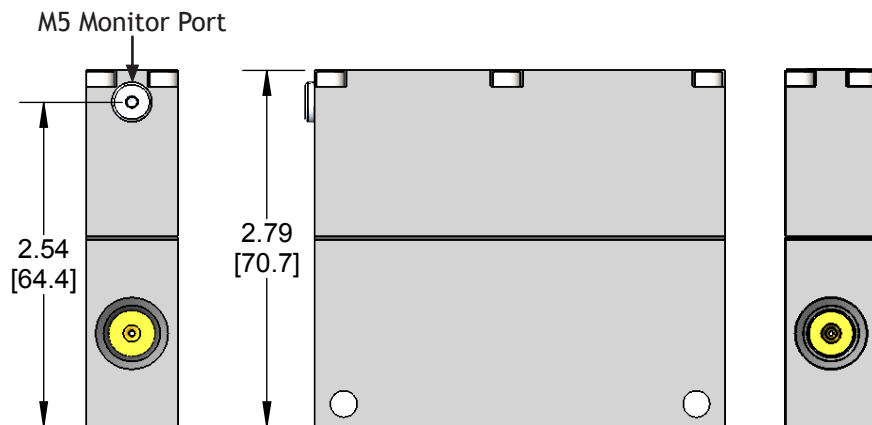
Weight: 0.33 lbs [149.0 g]



V20X

Storage Volume: 1.0 in³ [16.4 ml]

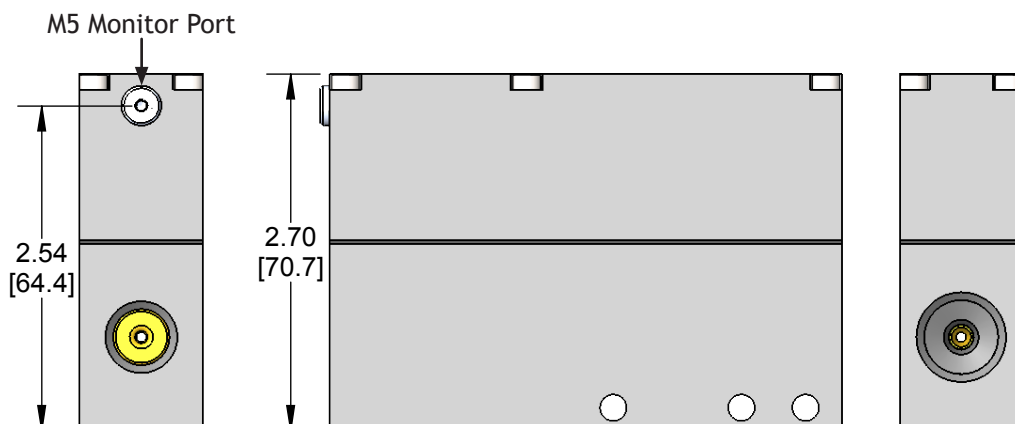
Weight: 0.43 lbs [195.0 g]



V80X

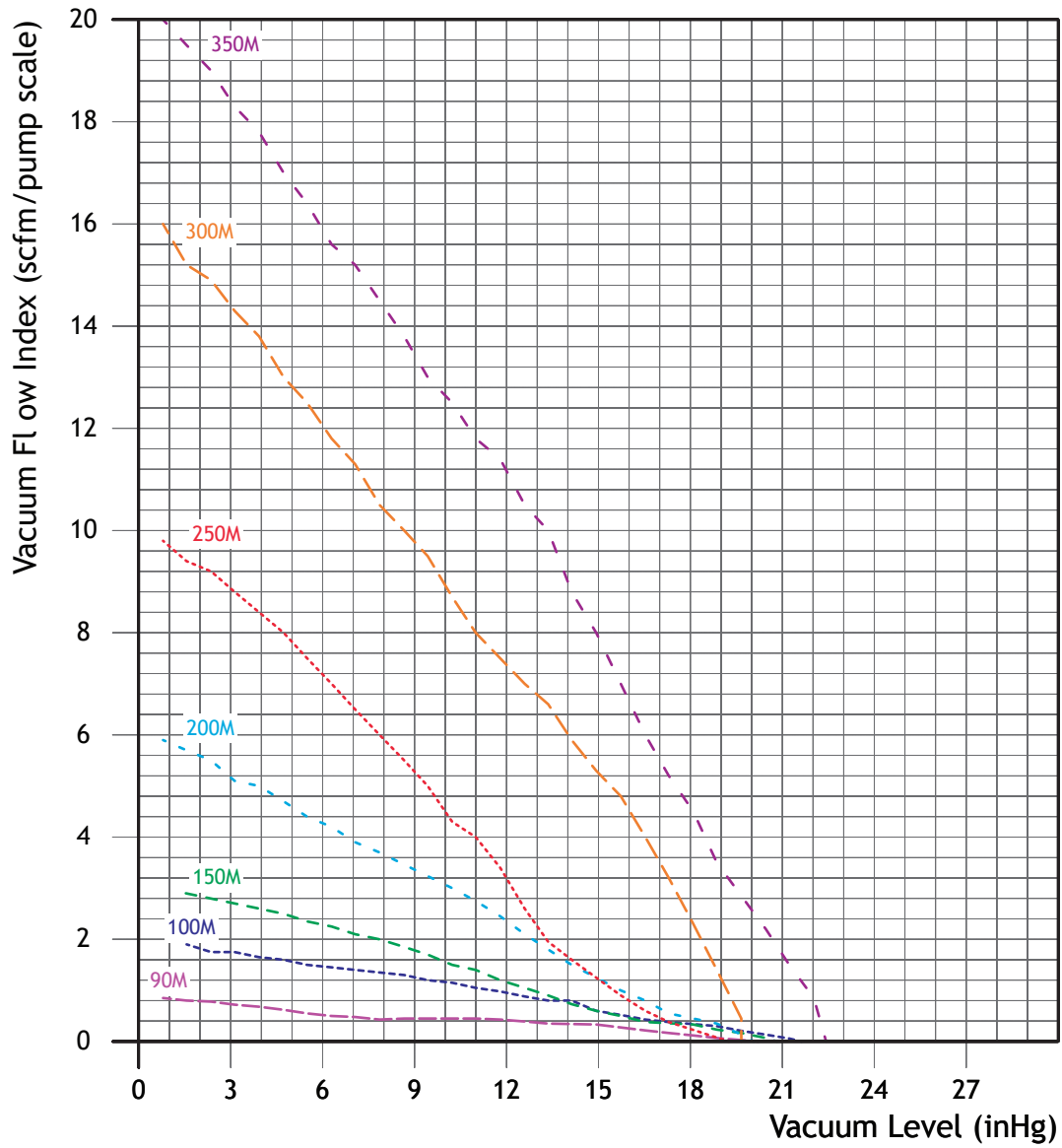
Storage Volume: 2.8 in³ (45 ml)

Weight: 0.71 lbs [322.0 g]



V Series Performance - M Series

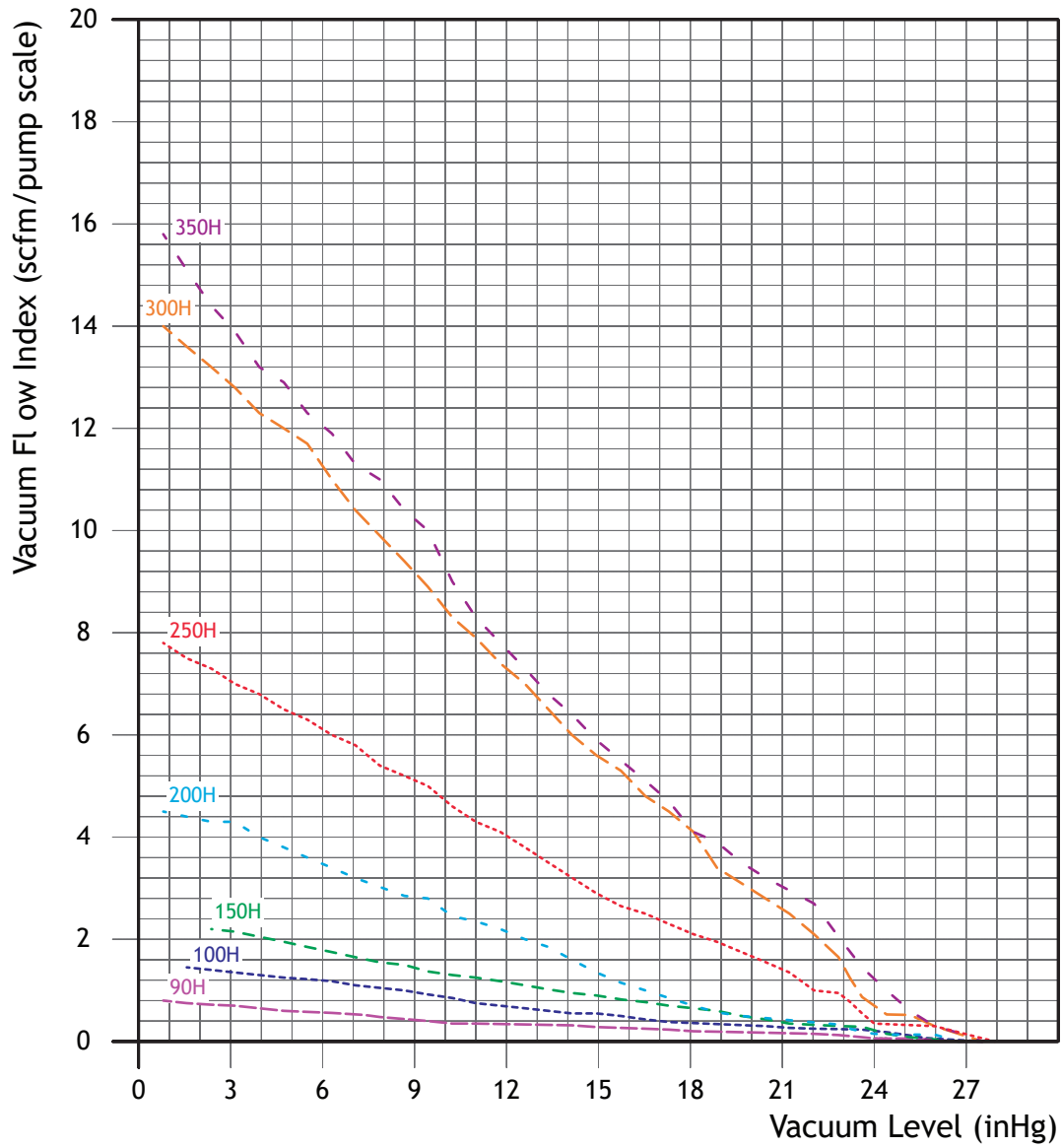
- High Flow
- 20 inHg Maximum Vacuum



All performance data presented is a representation of production pumps but is not a guarantee due to variations in local barometric pressure and of mass produced components.

V Series Performance - H Series

- High Vacuum
- 28 inHg Maximum Vacuum



All performance data presented is a representation of production pumps but is not a guarantee due to variations in local barometric pressure and of mass produced components.

V Series Performance - All Series

Vacuum Flow - SCFM

Model	Air Cons SCFM @ 80 PSI	Max Vac inHg	SCFM at Vacuum Level									
			3 inHg	6 inHg	9 inHg	12 inHg	15 inHg	18 inHg	21 inHg	24 inHg	27 inHg	
60H	0.8	27	0.38	0.32	0.3	0.27	0.23	0.2	0.13	0.05	0.02	
90H	1.7	26.7	0.7	0.6	0.4	0.35	0.3	0.21	0.17	0.06	0	
100H	2.5	27.5	1.4	1.2	1	0.7	0.55	0.36	0.28	0.21	0.02	
150H	4.7	26.7	2.1	1.8	1.4	1.2	0.9	0.66	0.37	0.22	0	
200H	7.9	26.7	4.3	3.5	2.8	2.1	1.3	0.72	0.43	0.15	0	
250H	13.4	27.5	7.1	6.1	5.1	4	2.9	2.1	1.4	0.35	0.12	
300H	20.0	27.5	12.9	11.3	9.2	7.3	5.6	4.1	2.6	0.7	0.1	
350H	27.0	27.5	14	12	10.2	7.7	5.9	4.2	3	1.2	0.14	
60M	0.5	20	0.4	0.3	0.22	0.15	0.08	0.03	-	-	-	
90M	1.8	20.2	0.73	0.52	0.45	0.42	0.33	0.12	0	-	-	
100M	1.9	21.6	1.8	1.5	1.3	1	0.6	0.34	0.08	-	-	
150M	2.9	20.8	2.7	2.3	1.8	1.1	0.6	0.34	0	-	-	
200M	5.2	20	5.1	4.3	3.4	2.4	1.2	0.46	0	-	-	
250M	8.6	19.2	8.9	7.2	5.3	3.2	1.2	0.24	0	-	-	
300M	13.3	19.6	14.4	12	9.8	7.4	5.3	2.4	0	-	-	
350M	20.4	22.4	18.4	15.9	13.5	11.2	7.9	4.6	1.7	-	-	

$$SCFM \times 28.32 = nl / m$$

Evacuation Time - sec / 1,000 in³

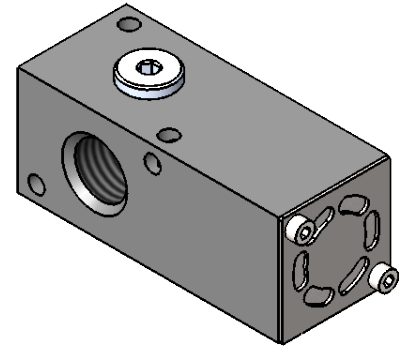
Model	Air Cons SCFM @ 80 PSI	Max Vac inHg	SCFM at Vacuum Level									
			3 inHg	6 inHg	9 inHg	12 inHg	15 inHg	18 inHg	21 inHg	24 inHg	27 inHg	
60H	0.8	27	15	30	51	75	103	136	183	246	410	
90H	1.7	26.7	3.5	13	17	29	48	79	135	255	-	
100H	2.5	27.5	1.9	4.5	8.3	14	24	39	68	129	325	
150H	4.7	26.7	1.2	2.9	5.4	9.3	15	25	43	82	-	
200H	7.9	26.7	0.64	1.5	2.9	4.6	8.1	13	24	46	-	
250H	13.4	27.5	0.36	0.87	1.6	2.7	4.5	7.3	13	24	62	
300H	20.0	27.5	0.2	0.48	0.87	1.5	2.4	4	6.9	13	34	
350H	27.0	27.5	0.18	0.44	0.81	1.2	2.3	3.7	6.4	12	31	
60M	0.5	20	12.5	25.0	44	69	99	154	-	-	-	
90M	1.8	20.2	3.4	12	17	28	46	76	-	-	-	
100M	1.9	21.6	1.7	3.5	6.4	11	18	31	54	-	-	
150M	2.9	20.8	0.93	2.3	4.2	7.3	13	22	-	-	-	
200M	5.2	20	0.48	1.2	2.2	3.8	6.4	12	-	-	-	
250M	8.6	19.2	0.29	0.69	1.3	2.3	4.1	7.2	-	-	-	
300M	13.3	19.6	0.18	0.43	0.81	1.4	2.3	3.8	-	-	-	
350M	20.4	22.4	0.14	0.34	0.64	1	1.7	2.8	4.9	-	-	

$$sec / 1,000 in^3 \times 0.61 = sec / l$$

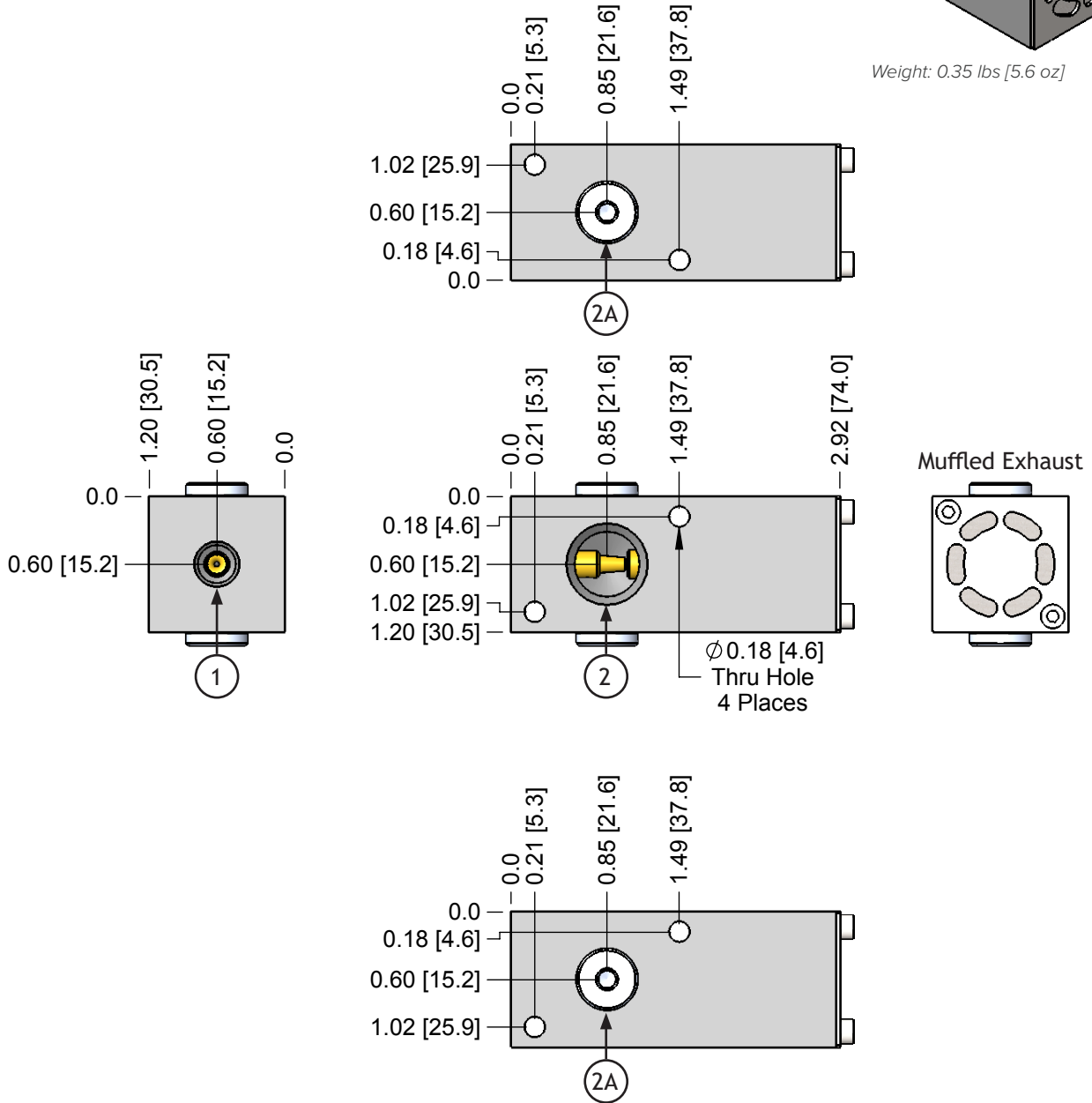
All performance data presented is a representation of production pumps but is not a guarantee due to variations in local barometric pressure and of mass produced components.

SM24-38: Compact Vacuum Pump

The SM24-38 is a multi-characteristic pump with three operating pressures. It is compact, light-weight, economical, maintenance free, energy efficient, and quiet. Made of brass nozzles and an anodized aluminum body, the SM24-38 has a high flow rate with a maximum air supply of 100 psi. With its metal construction and stainless steel fasteners, the SM24-38 is also a very rugged pump.



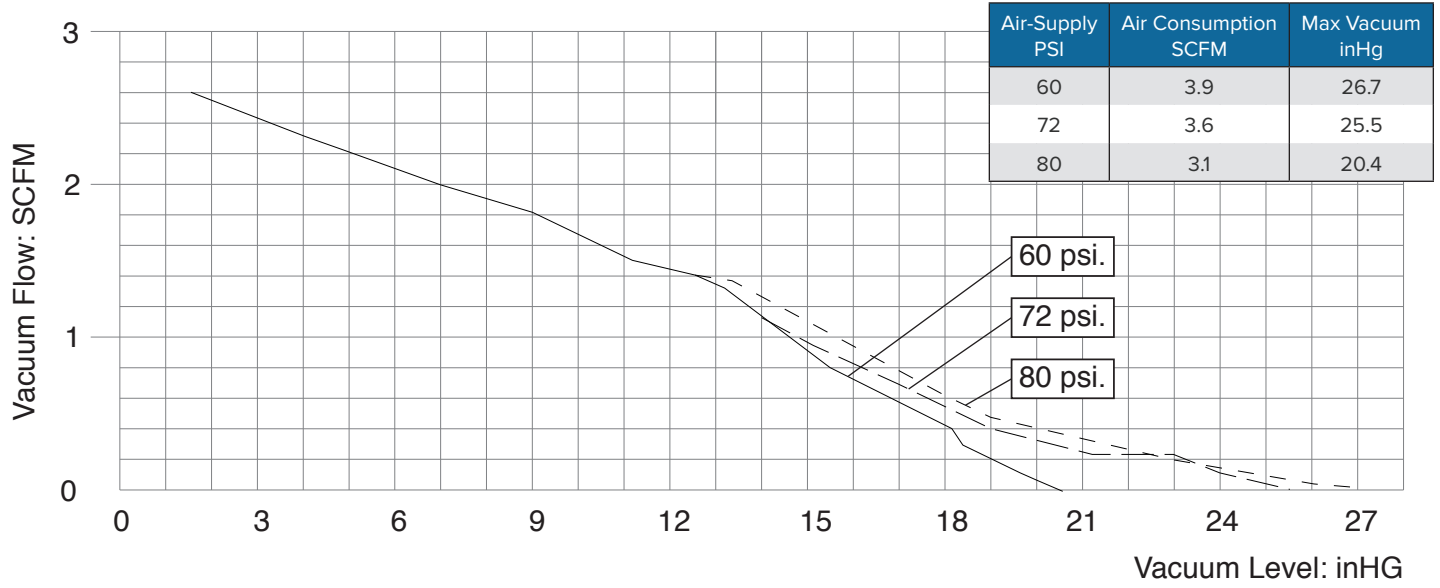
Weight: 0.35 lbs [5.6 oz]



Code	Function	Ports
1	Air-Supply	G 1/8 NPSF
2	Vacuum	3/8 NPS
2A	Vacuum - Auxiliary	G 1/8 NPSF

SM Series Performance

Vacuum Flow - SCFM

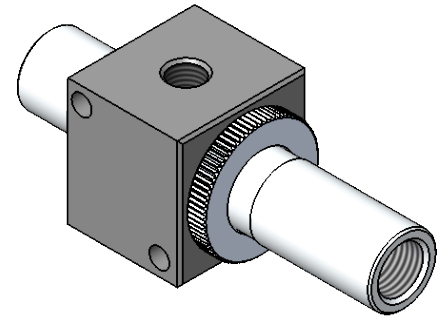


SCFM X 28.32 = nl / m

All performance data presented is a representation of production pumps but is not a guarantee due to variations in local barometric pressure and of mass produced components.

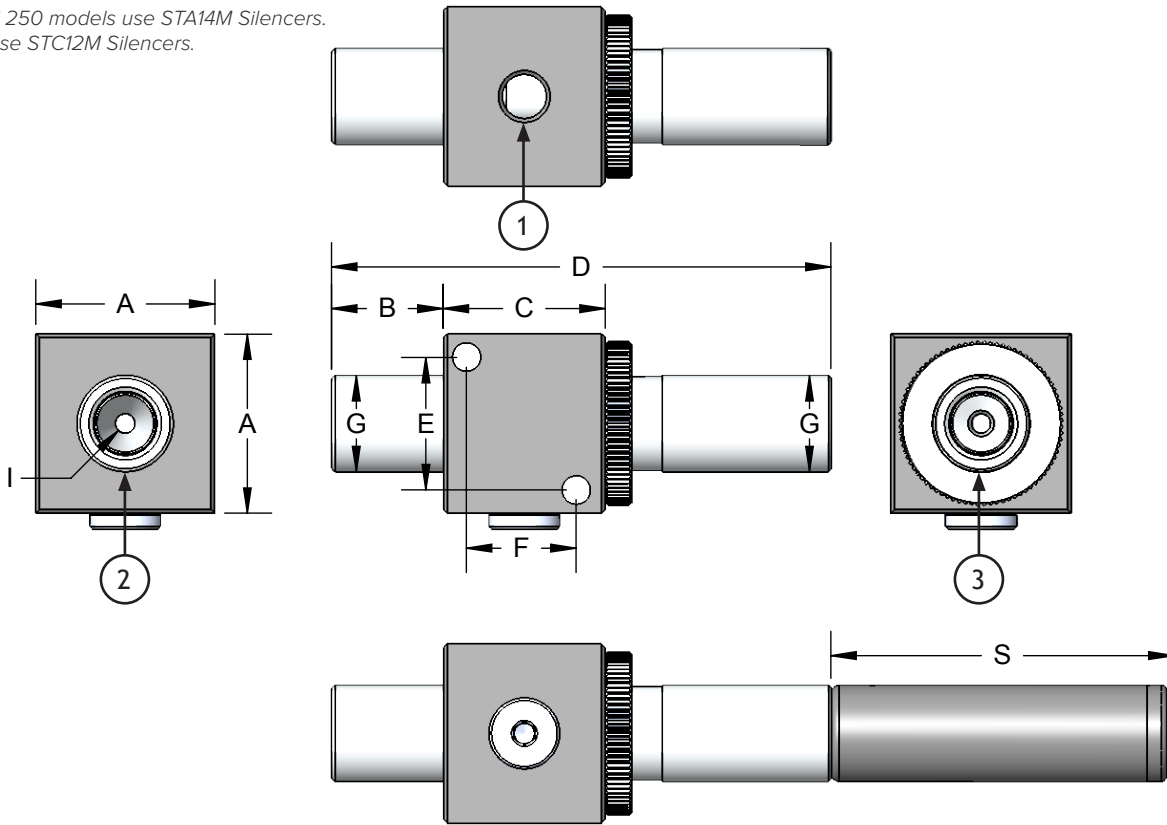
Variable Displacement Pumps

VDS vacuum pumps can provide over 20" Hg (68 kPa) and their straight through non-clog design is ideal for very dusty and dirty applications such as bag filling or handling ceramics or masonry products. The square body and two mounting holes makes the VDS pump easy to attach to any flat surface. An ST Straight Thru silencer will not accumulate debris and will pass it out with the exhaust air. For less critical applications where cost is more of an issue, a conventional AA silencer may be used.



Model	Threads		Silencer ¹	
VDS-150	(Blank)	NPT Threads	(Blank)	None
200	-G	G Threads	-ST	ST Silencer
250				
375				

¹150, 200, and 250 models use STA14M Silencers.
¹375 models use STC12M Silencers.



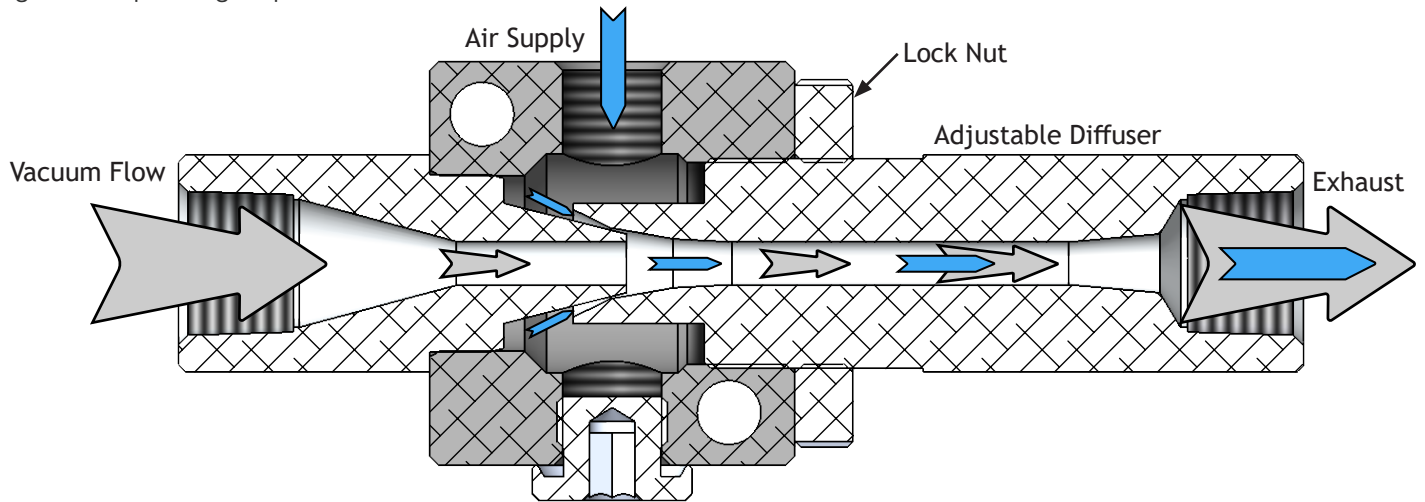
MODEL	1 - Air-Supply	2 - Vacuum	3 - Exhaust	A	B	C	D	E	F	G	H	I	S
VDS-150	G 1/8 NPSF	1/4 G 1/4	1/4 G 1/4	1.38 [35.0]	0.86 [21.8]	1.25 [31.8]	3.81 [96.7]	1.02 [25.9]	0.84 [21.3]	0.74 [18.8]	0.22 [5.5]	0.15 [3.8]	2.65 [67.3]
VDS-200	G 1/8 NPSF	1/4 G 1/4	1/4 G 1/4	1.38 [35.0]	0.86 [21.8]	1.25 [31.8]	3.81 [96.7]	1.02 [25.9]	0.84 [21.3]	0.74 [18.8]	0.22 [5.5]	0.2 [5.1]	2.65 [67.3]
VDS-250	G 1/8 NPSF	1/4 G 1/4	1/4 G 1/4	1.38 [35.0]	0.86 [21.8]	1.25 [31.8]	3.81 [96.7]	1.02 [25.9]	0.84 [21.3]	0.74 [18.8]	0.22 [5.5]	0.25 [6.3]	2.65 [67.3]
VDS-375	3/8 NPSF	G 1/2 NPSF	G 1/2 NPSF	1.72 [43.7]	1.5 [38.1]	1.75 [44.5]	5.99 [152.0]	1.32 [33.5]	1.35 [34.3]	0.98 [24.9]	0.26 [6.6]	0.38 [9.5]	4.12 [104.6]

Variable Displacement Pumps

Operation

Loosen the jam nut and turn the diffuser nozzle clockwise, by hand, until it contacts the inlet nozzle. With the work piece against the suction cup or holding fixture, supply regulated compressed air to the side air supply port and gradually rotate the diffuser nozzle to adjust the annular gap between the two nozzles until the desired vacuum level or vacuum flow is achieved. To minimize air consumption, use the lowest pressure air supply that will yield the desired results. Turning the diffuser too far open will suddenly cause a decrease in performance and this point will vary depending on the operating air pressure.

Ingested debris passes directly from end-to-end through the pump bore without any turns and without passing through the annular venturi created by the inlet and diffuser nozzles, so there is no opportunity for clogging as long as the pump bore is large enough to pass the largest debris particle. As the pump bore size is increased, it can also generate more vacuum flow to overcome porosity and leakage.



Performance

Model	Max Vac Flow SCFM	Air Consumption vs Vacuum Level @ 80 PSI				
		5 inHg	10 inHg	15 inHg	20 inHg	25 inHg
VDS-150	3.2	1.3	1.7	2.4	3.2	4.5
VDS-200	6	2.4	3.7	4.7	6	6.8
VDS-250	10	4	6	8.3	9.7	12
VDS-375	30	6.2	11.5	17	21	29

All performance data presented is a representation of production pumps but is not a guarantee due to variations in local barometric pressure and of mass produced components.