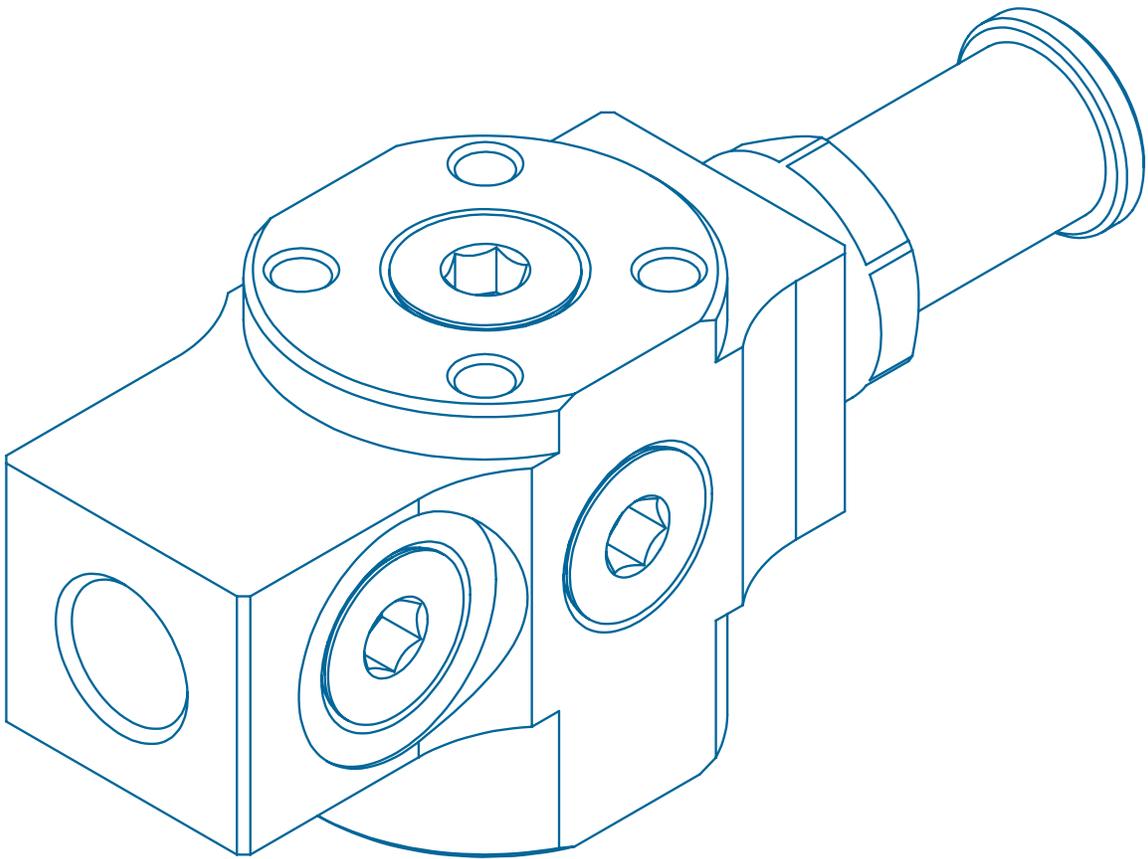
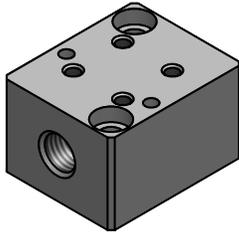


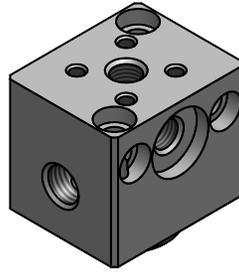
Vacuum Grippers

Section 11

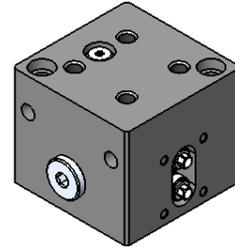




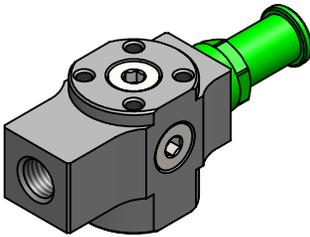
VG18



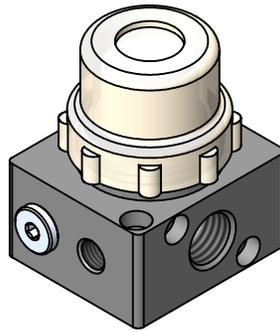
VG38



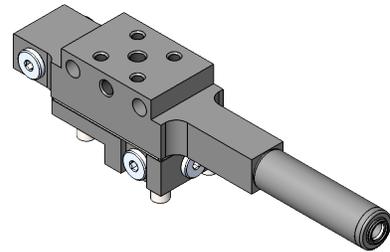
DVG38



VGP



VGIF



VG-G12

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Basic Information

Coaxial Venturi Technology

The ER L-series nozzles have been specifically tuned and optimized to provide the high-flow mid-range vacuum that a typical industrial system requires. This vacuum pump can efficiently handle a wide variety of both porous and non-porous applications at only 72 psi (5 bar) air supply.

Additional benefits of EDCO ER L-series venturis are rugged metal nozzles, no internal flap valves to foul and a large nozzle throat gap that allows ingested debris to pass through and out the exhaust. When coupled with the PP or LP purge options, debris too large to pass can be expelled between cycles.

Centralized System

A centralized system has one “central” vacuum pump supplying all vacuum cups in the system so all cups operate at the same system vacuum level. This vacuum level is affected by the flow capacity of the vacuum pump and the aggregate system leakage. System internal volume is increased by the necessary vacuum hoses, manifolds and tubing in a centralized system. The increased volume results in a longer evacuation time for the system to attain a safe vacuum level.

Centralized vacuum pumps are necessarily oversized to provide enough extra vacuum flow capacity to overcome normal porosity and cup wear. However, in instances where there is gross leakage caused by non-sealing vacuum cups due to missing or damaged work pieces, pump capacity can't overcome the leakage and system vacuum level can be reduced to the point where it is unsafe or impossible to pick up the work pieces. Interdependence of all suction cups in a system is not desirable so EDCO has developed components such as Flow Sensor Valves and Dual-Flow valves to make centralized systems perform better by limiting the flow loss from non-sealing suction cups.

Part quick-release, or blow-off, is accomplished by injecting a blast of compressed air through an isolation check valve and into the centralized vacuum system somewhere prior to the suction cups. This pulse of air quickly dissipates system vacuum. Since flow follows the path of least resistance, most of the air can flow out of the pump exhaust instead of to the suction cups.

Operating Pressure

Operating a vacuum generator at a lower pressure will not result in reduced energy consumption. Energy usage of air-powered devices is measured by the volume flow rate of compressed air. Operating one machine device at 45 psi, for example, will not reduce the overall energy consumption of a manufacturing plant because of all the other machine devices that still require higher air pressures to function properly. The central compressed air system must be tuned to continuously provide at least the minimum air pressure required by any device in the plant.

To make direct comparisons possible, air consumption at different operating pressures must be converted to a “standard” or “naturalized” volume at standardized atmospheric conditions. For example, either 1.0 SCFM (28.3 NI/m) at 87 psi (6 bar) or 1.36 SCFM (38.5 NI/m) at 60 psi (4 bar) are equivalent to 6.9 SCFM (195 NI/m) at standard atmospheric conditions and are thus equivalent compressor loads.

Compressed air systems are designed with receivers (storage tanks) that are charged with high pressure air to serve as accumulators that can supply air flow in addition to what the compressor can produce for short periods of time. During extreme peak demands, the stored high pressure air may be drawn down, or depleted, causing the delivered system pressure to dip below optimum pressure. For this reason industrial machines are commonly designed to operate at only 80 psi, but some plants with marginal air systems may require machines to operate at only 60 psi. Systems that are optimized to operate at reduced air pressure should include air regulators set to deliver the proper minimum design pressure otherwise air consumption (energy costs) will be increased substantially whenever the system air pressure is higher.

Basic Information

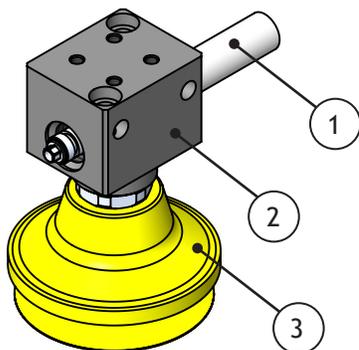
Discrete Systems

A discrete system is made up of several mini-system units. Each unit consists of a small vacuum pump coupled to a single suction cup so that each unit operates independently of the others. Leakage at a non-sealing cup can only affect the vacuum level of that single cup so any leakage problems are automatically isolated. This gives the overall system the best possible chance to operate reliably even with a reduced number of active cups.

An EDCO Vacuum Gripper integrates a vacuum pump and suction cup into one compact unit to eliminate all excess system volume so that evacuation time is minimized.

A discrete system may be split into several zones that are each controlled by separate air supply valves to allow operation of one, several, or all zones as the application requirements change. All discrete units in a zone are simultaneously turned on or off via the compressed air supply - however, each mini-system unit still operates independently on the vacuum side.

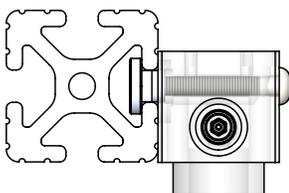
Part quick-release is accomplished by blocking the pump exhaust with an air piloted piston which causes the pump air supply to flow directly into the vacuum cup because there is no other possible flow path. This positive pressure reverse flow not only provides a very fast part release but also provides a cleaning action to purge any debris that was ingested into the suction cup.



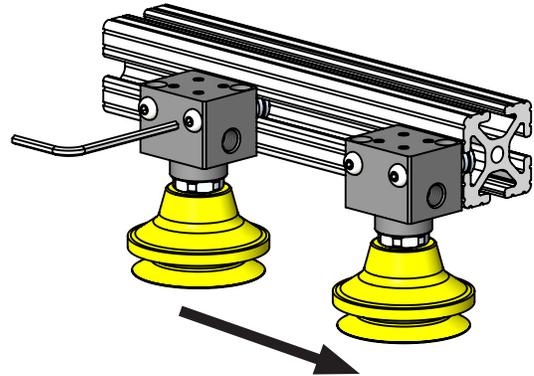
- 1) Compressed Air Line
- 2) Vacuum Generator
- 3) Vacuum Cup

Optional Rugged Shear Key Mount

Two-point mount with shear keys eliminates the possibility of the pumps shifting out of position during operation. Work loads are efficiently and directly transferred to the mounting profile so that mounting screws carry only tensile loads.



Vacuum Grippers mount easily to extrusion profiles having 5/16" (8mm) T-slots so they can be easily repositioned to accommodate changing handling conditions. The two-point mount provides security and rigidity.



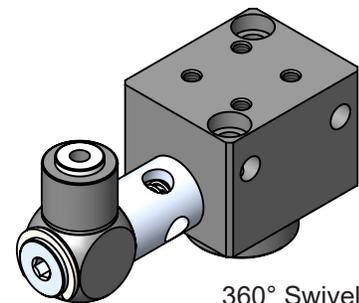
Loosen two screws, and slide the vacuum gripper to the desired location.

Positive Pressure Purge (PP)

Air pressure supplied to the venturi is diverted to the vacuum port by blocking the venturi exhaust with a piston operated by a pilot pressure signal. Push-in tube connector swivel accepts 5/32 (4MM) tubing. Tool separation movement must begin immediately (no dwell) when purge signal is initiated to prevent excessive positive pressure inside suction cups due to forces pressing the tool onto the work surface. Do not use PP option with vacuum switches due to the limited over-pressure capability of switches.

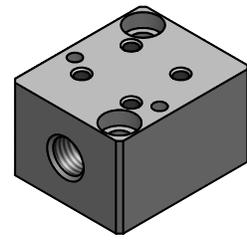
Limited Pressure Purge (LP)

Similar to Positive Purge except includes an orifice in the purge piston. Purge air flow is not as robust as with the PP option, but air pressure is limited inside the suction cups.



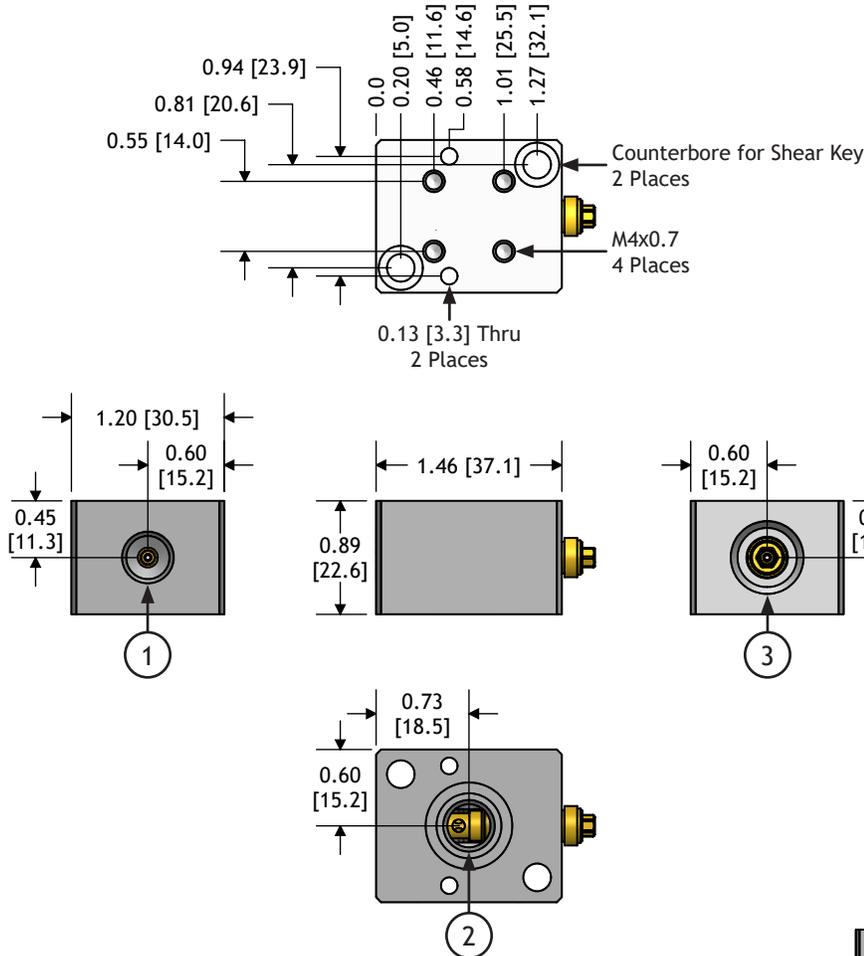
VG18: G 1/8 NPSF

	Venturi	Purge ¹		Sensor Port		Silencer	
VG18-	10L						
	05	(Blank)	None	(Blank)	None	(Blank)	None
	07	-LP	Limited Pressure	-A5F	M5 Sensor Port, A Side	-AA	AA14M
	09	-PP	Positive Pressure	-B5F	M5 Sensor Port, B Side	-ST	STA14M
	10						
	08L						
	10L						



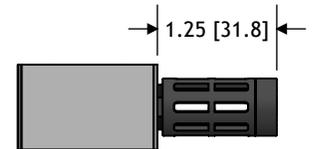
Weight: 2.24 oz [63.6 g]

¹Only available with 08L or 10L venturi series. Cannot be used with a silencer.



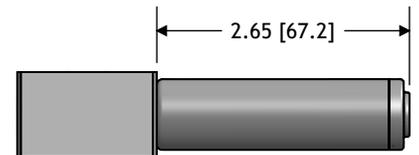
Groove accepts -014 standard O-Ring
EDCO Part # N70-014 (o-ring not included)

Optional AA Silencer



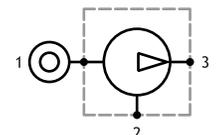
Additional Weight: 0.14 oz [4.0 g]

Optional ST Silencer



Additional Weight: 0.25 oz [71 g]

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



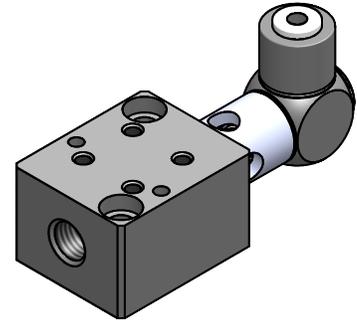
VG18 Options

-PP / -LP: Purge Options

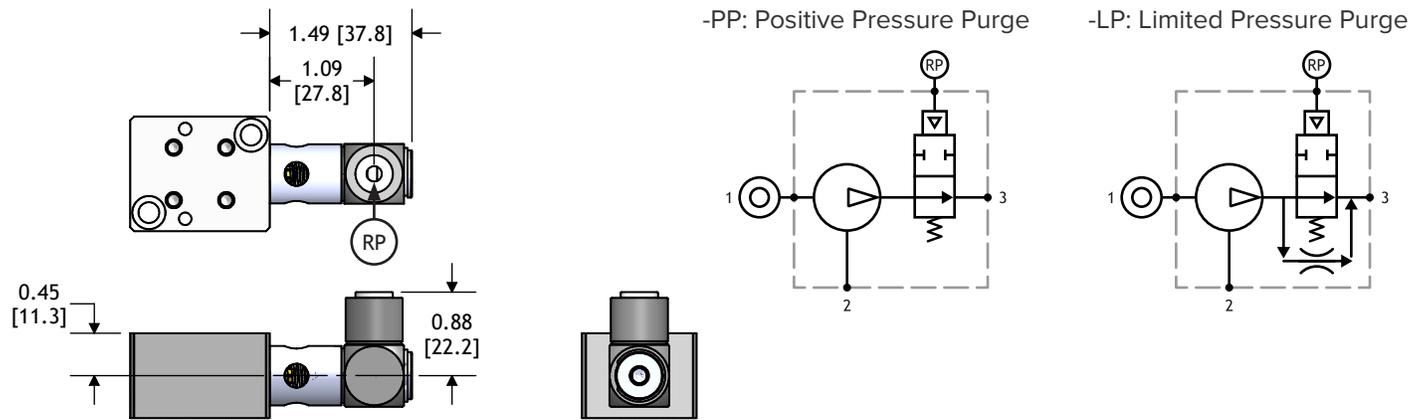
Air pressure supplied to the venturi is diverted to the vacuum port by blocking the venturi exhaust with a piston operated by a pilot pressure signal. Push-in tube connector swivel accepts 5/32 [4 mm] tubing. Tool separation movement must begin immediately (no dwell) when purge signal is initiated to prevent excessive positive pressure inside vacuum cups due to forces pressing the tool onto the work surface. Do not use PP option with vacuum switches due to the limited over-pressure capability of switches.

Limited Purge is similar to Positive Purge except includes an orifice in the purge piston. Purge air flow is not as robust as with the PP option, but air pressure is limited inside the suction cups.

The differences between LP and PP options are internal and do not affect outward appearance or overall size and weight.



Additional Weight: 0.83 oz [23.5 g]

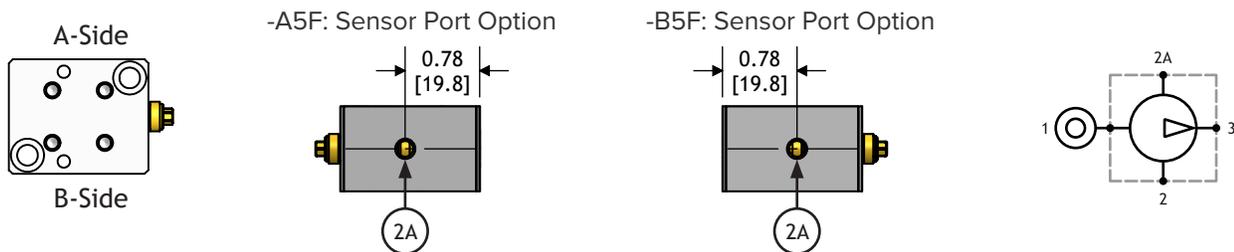
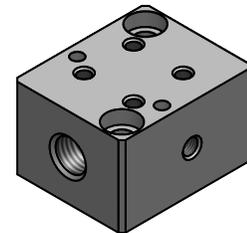


Pilot can be rotated 360 degrees.

-A5F / -B5F: M5 Vacuum Sensor Port Options

An additional M5x0.8 port is added for use as an auxiliary vacuum port. Choose the side best suited for your application.

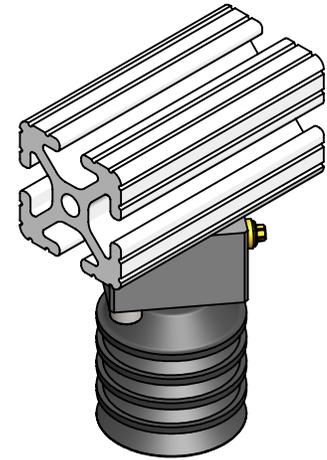
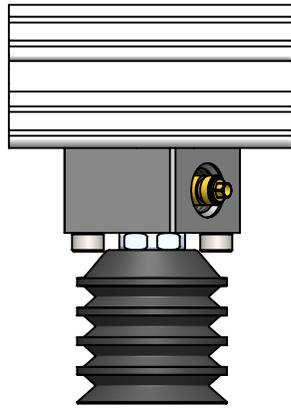
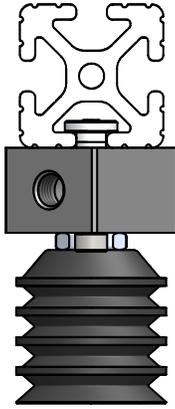
Any of our vacuum sensors that use an M5 male connection thread can be used with the M5 sensor port options.



VG18 Accessories

VG18-TKIT: T-Nut Mount Kit

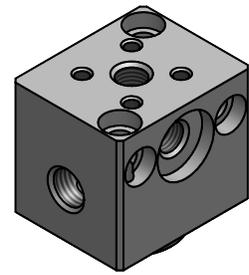
EDCO Vacuum Gripper T-Nut kits include two t-nuts and the appropriate M5 screws for your pump model.



Additional Weight: 0.61 oz [17.4 g]

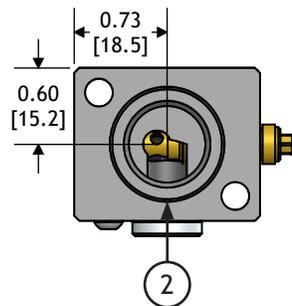
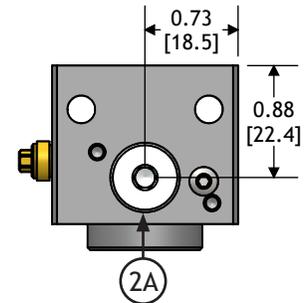
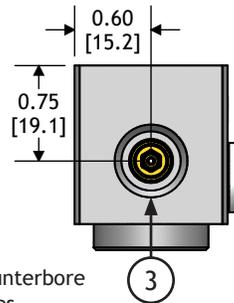
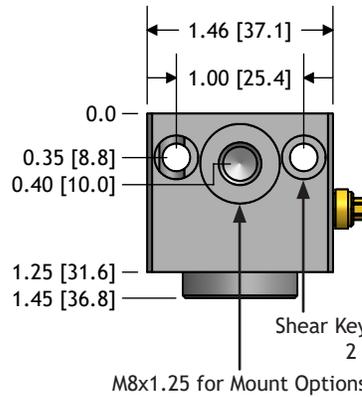
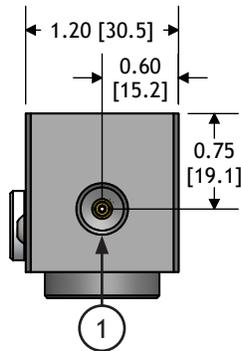
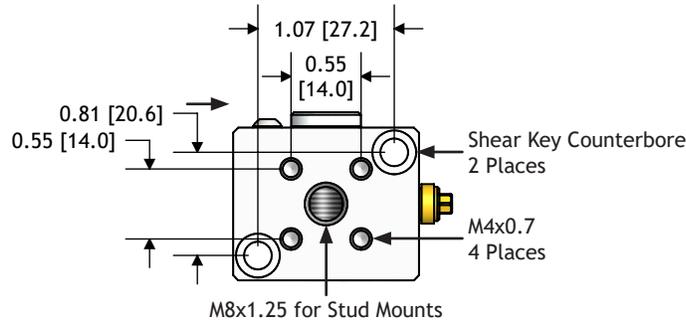
VG38: G 3/8

Venturi	Release Options		Mount Options		Silencer ¹	
VG38-	10L					
05	(Blank)	None	(Blank)	None	(Blank)	None
07	-AQR	Atmospheric Quick Release	-A	Pin	-AA	AA14M
09	-LP ¹	Limited Purge	-B	Ball	-ST	STA14M
10	-PP ¹	Positive Purge				
08L						
10L						

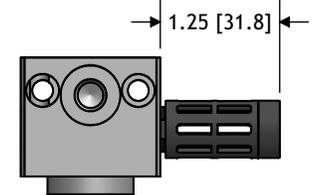


Weight: 2.95 oz [83.5 g]

¹Only available with 08L or 10L venturi series. Cannot be used with a silencer.

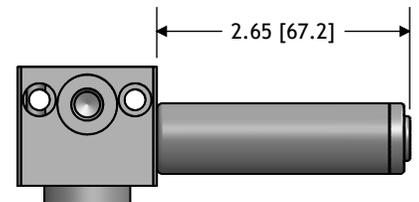


Optional AA Silencer



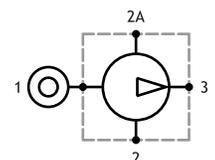
Additional Weight: 0.14 oz [4.0 g]

Optional ST Silencer



Additional Weight: 0.25 oz [7.1 g]

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

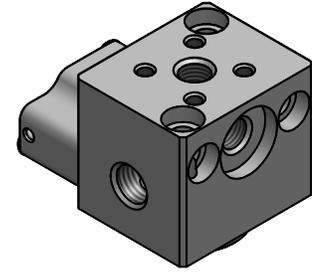


VG38 Options

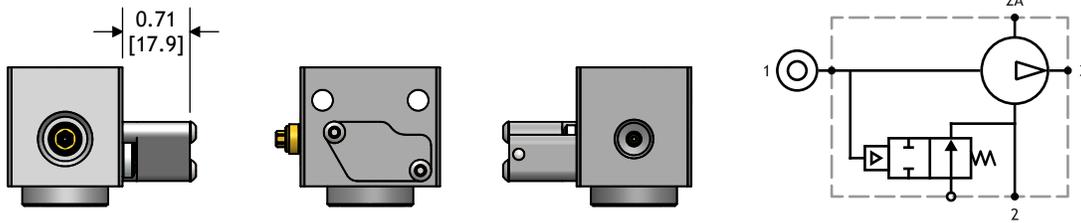
-AQR: Atmospheric Quick Release

Vacuum generators, or vacuum pumps, are powered by compressed air to create vacuum. When the air source is turned off, vacuum is dissipated by atmospheric air entering the exhaust port and reverse flowing through the last venturi nozzle. This works well for slow cycle speeds and small cups but when relatively large cups are used with small vacuum generators then reverse air flow may not be sufficient to dissipate residual vacuum fast enough.

The AQR valve is spring-biased open but is held closed by air pressure supplied to the vacuum generator. When the air supply is turned off, vacuum is no longer generated and the AQR valve opens a large passage to atmosphere so that vacuum is quickly dissipated to release the work object.



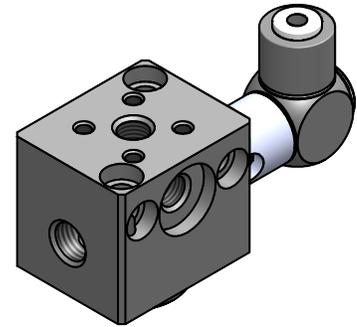
Additional Weight: 0.55 oz [15.5 g]



-PP / -LP: Purge Options

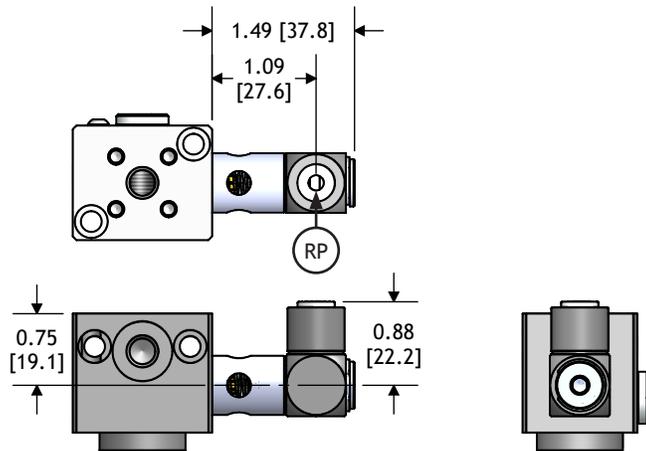
Air pressure supplied to the venturi is diverted to the vacuum port by blocking the venturi exhaust with a piston operated by a pilot pressure signal. Push-in tube connector swivel accepts 5/32 [4 mm] tubing. Tool separation movement must begin immediately (no dwell) when purge signal is initiated to prevent excessive positive pressure inside vacuum cups due to forces pressing the tool onto the work surface. Do not use -PP option with vacuum switches due to the limited over-pressure capability of switches.

Limited Purge is similar to Positive Purge except includes an orifice in the purge piston. Purge air flow is not as robust as with the -PP option, but air pressure is limited inside the suction cups.

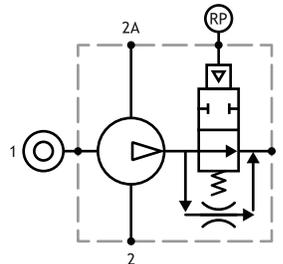


Additional Weight: 0.83 oz [23.5 g]

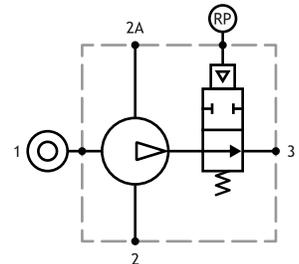
The differences between LP and PP options are internal and do not affect outward appearance or overall size and weight.



-PP: Positive Pressure Purge



-LP: Limited Pressure Purge



Pilot can be rotated 360 degrees.

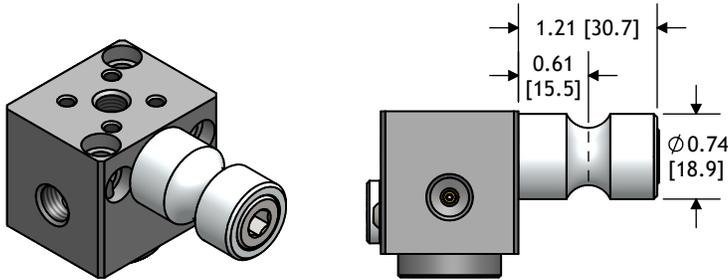
VG38 Options

Swivel Mount Options

There are two types of swivel mount options available for the VG38 vacuum gripper. Both types of mounts connect with EDCO USA Modular Automation Tooling Arms.

-A : Pin Mount

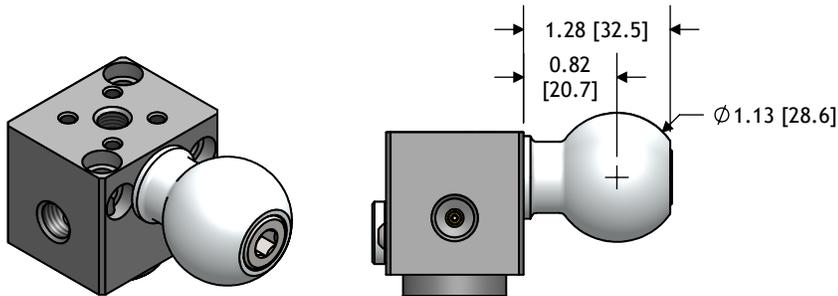
Allows rotational adjustment of a vacuum cup about a single axis. These are also known as lock-pin or apple-core mounts.



Additional Weight: 1.37 oz [38.9 g]

-B : Ball Mount

Allows universal adjustment of a vacuum cup about a single suspension point. These are also known as a swivel joint.



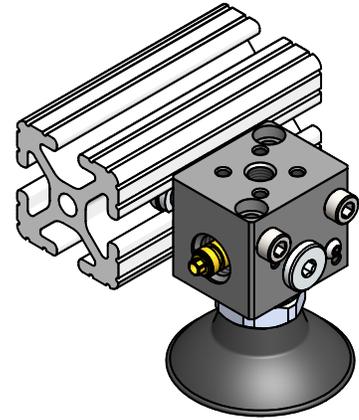
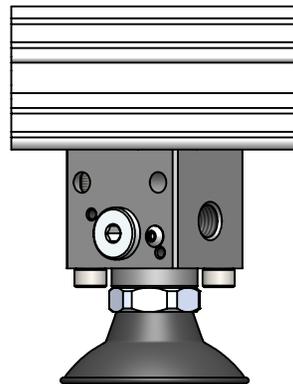
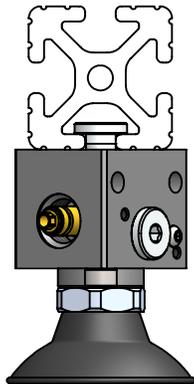
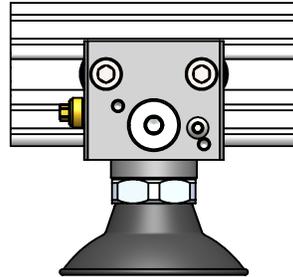
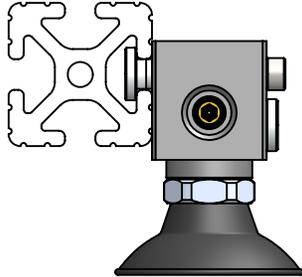
Additional Weight: 1.96 oz [55.6 g]

VG38 Accessories

VG38-TKIT: T-Nut Mount Kit

EDCO Vacuum Gripper T-Nut kits include two t-nuts and the appropriate M5 screws for your pump model.

Use either top or side mount positions.



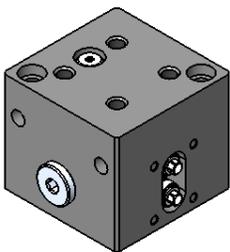
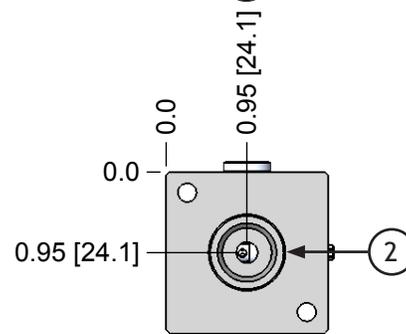
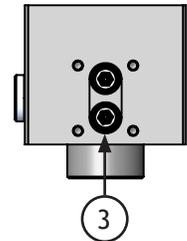
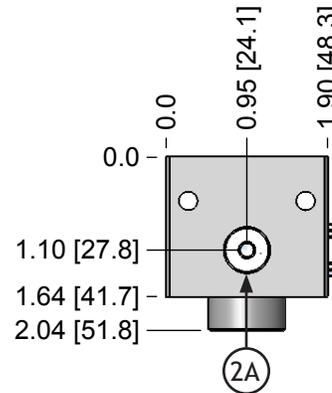
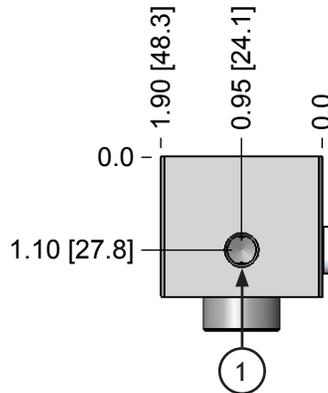
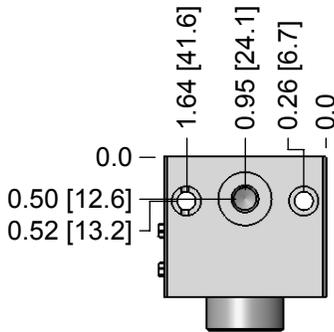
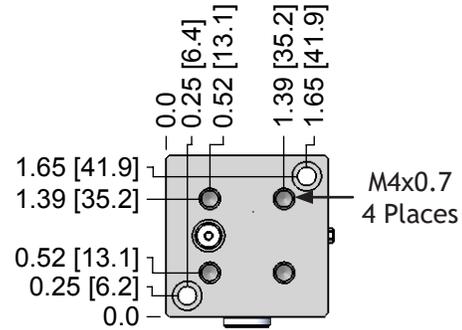
Additional Weight: 0.67 oz [19.0 g]

DVG38: Dual Venturi, G 3/8

	Venturi		Options	Mount Options	Silencer Options
DVG38-	10L	X2	-PP	-A	
	05		(Blank) None	(Blank) None	(Blank) None
	07		-EA Exhaust Adapter	-A Apple Core Pin	-AA ² AA38M
	09		-PP ¹ Positive Pressure Purge	-B Ball Swivel	-ST ² STB38M
	10		-LP ¹ Limited Pressure Purge		
	08L				
	10L				

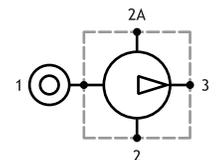
¹Only available with 08L & 10L venturis.

²Exhaust adapter option required when selecting a silencer option.



Weight: 0.20 lbs [90.7 g]

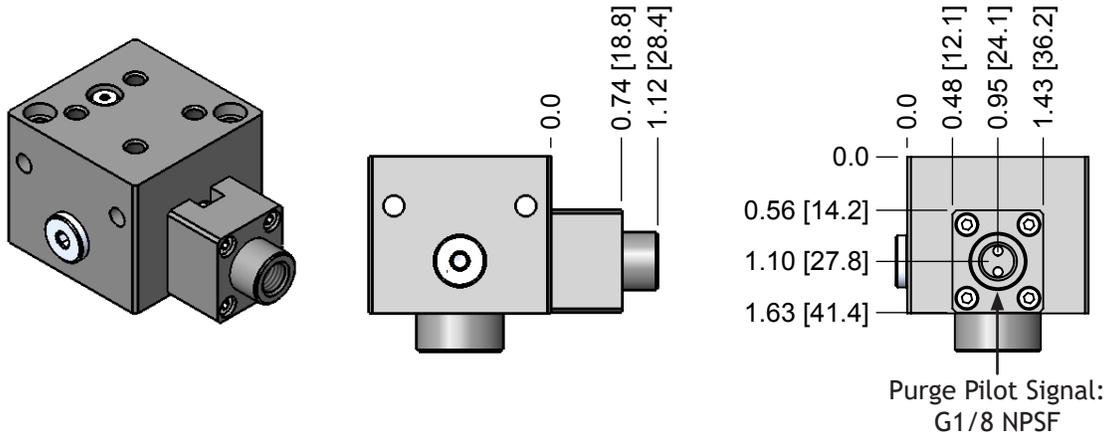
Code	Function	Ports
1	Air Supply	G 1/8 NPSF
2	Vacuum - Main	G 3/8
2A	Vacuum - Alternate	G 1/8 NPSF
3	Exhaust	-



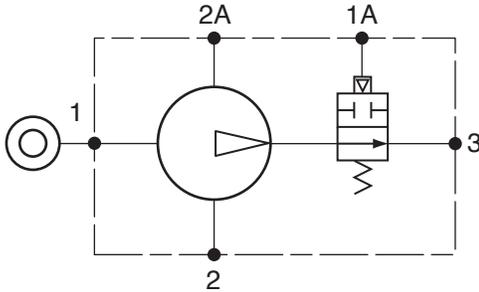
DVG38 Options

Purge Options

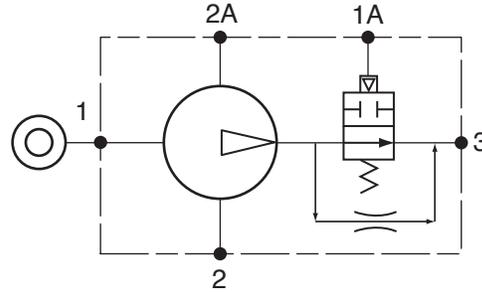
Differences between positive pressure and limited pressure purge options are internal.



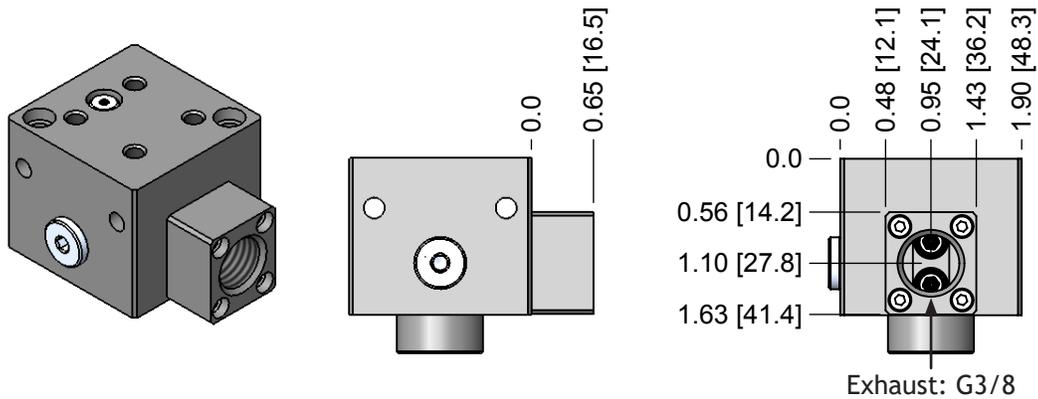
PP: Positive Pressure Purge



LP: Limited Pressure Purge



EA: Exhaust Adapter

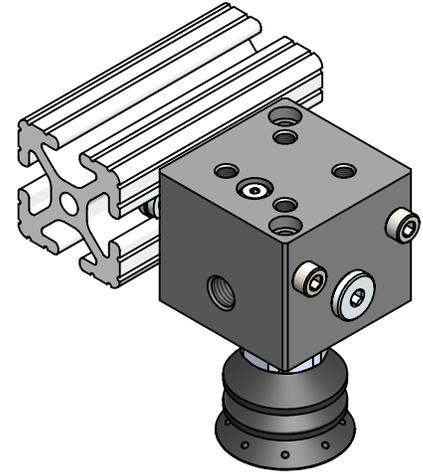
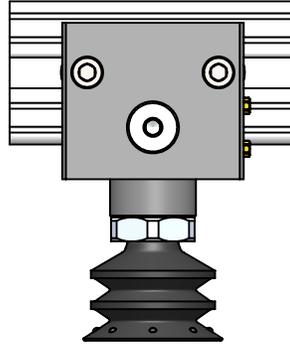
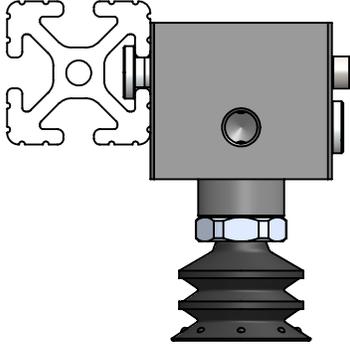


DVG38 Accessories

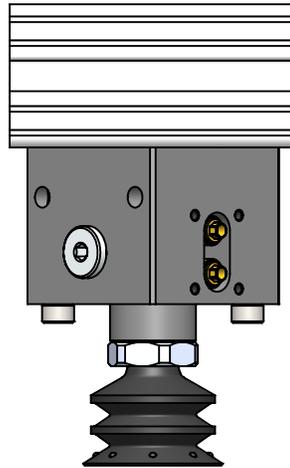
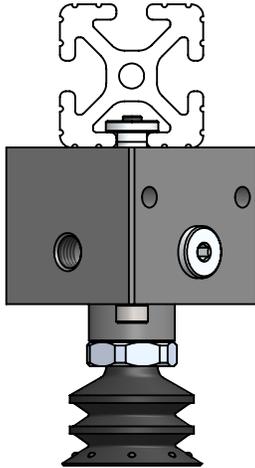
DVG38-TKIT: T-Nut Mount Kit

EDCO Vacuum Gripper T-Nut kits include two t-nuts and the appropriate M5 screws for your pump model.

Use either top or side mount positions.



Additional Weight: 0.89 oz [23.3 g]

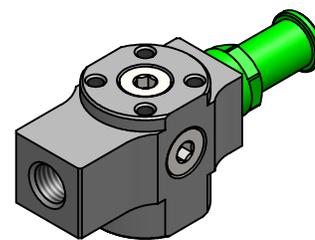


VGP38: Low-Profile Vacuum Gripper, G 3/8

EDCO VGP pumps are a direct interchange with competitor brands but provide improved vacuum flow (10L) and better reliability because there are no flapper valves or filter screens to collect ingested debris.

Exhaust extension may be removed to add LP or PP purge options for faster part release or for a true reverse-flow cleaning mode to blow out ingested debris.

M6 or M8 stud mounting hardware may be installed in any of the three locations.

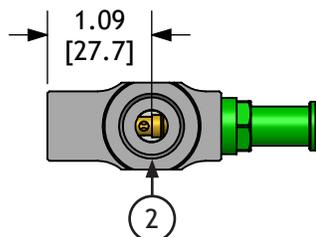
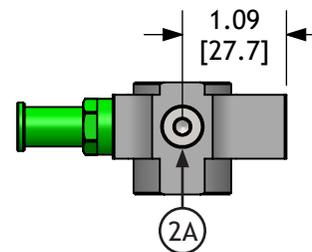
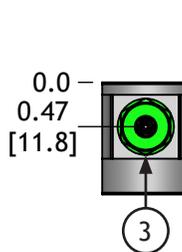
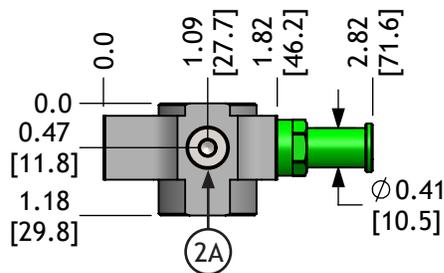
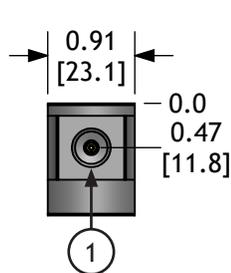
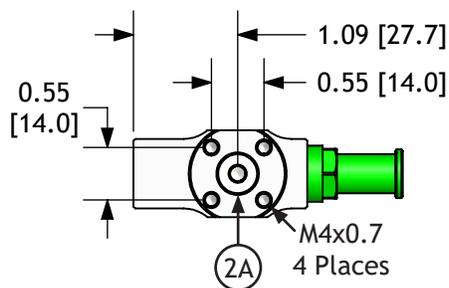


Weight: 2.20 oz [62.4 g]

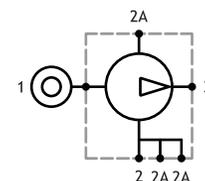
	Venturi	Purge Options		Mount Options ²		Mount Position ²		Mount Type	
VGP38-	10L	-PP		-M6X22		-T		E	
	08L	(Blank)	None	(Blank)	None	(Blank)	None	(Blank)	Standard
	10L	-LP	Limited Pressure ¹	-M6X22	M6X22 Stud	-T	Top	E	Extrusion
	10	-PP	Positive Pressure ¹	-M8X16	M8X16 Stud	-L	Left		
	09			-M8X27	M8X27 Stud	-R	Right		
	07								
	05								

¹Only available on 08L & 10L Venturi

²When selecting a mount option, mount position selection is required.



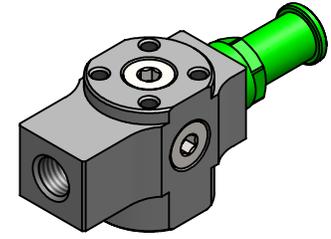
Code	Function	Port
1	Air-Supply	G 1/8 NPSF
2	Vacuum	G 3/8
2A	Vacuum, Alternate	G 1/8 NPSF
3	Exhaust	-



VGP38 Options

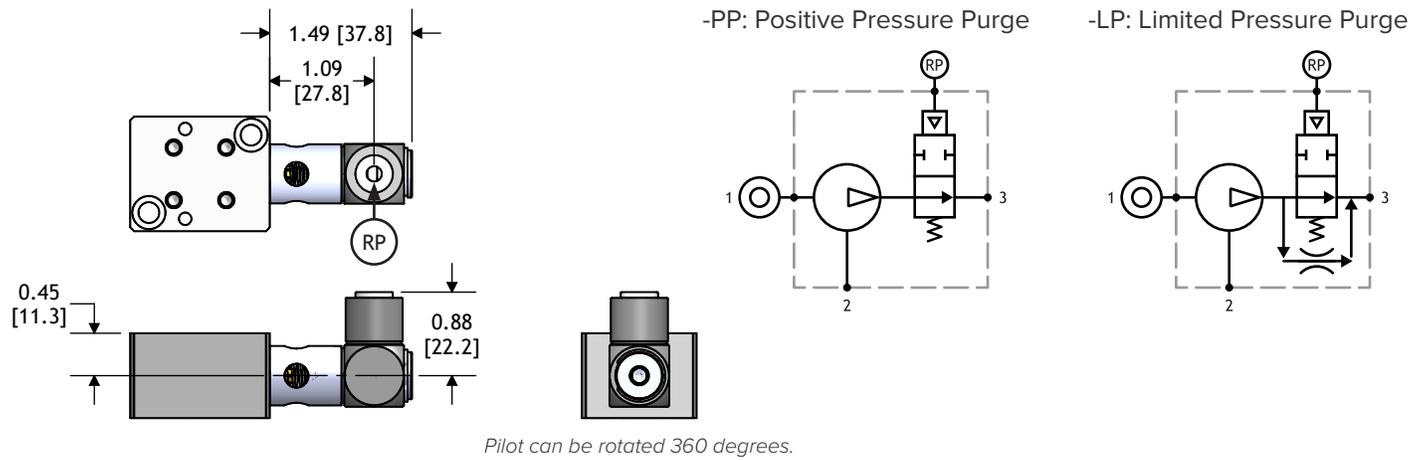
-PP / -LP: Purge Options

Air pressure supplied to the venturi is diverted to the vacuum port by blocking the venturi exhaust with a piston operated by a pilot pressure signal. Push-in tube connector swivel accepts 5/32 [4 mm] tubing. Tool separation movement must begin immediately (no dwell) when purge signal is initiated to prevent excessive positive pressure inside vacuum cups due to forces pressing the tool onto the work surface. Do not use PP option with vacuum switches due to the limited over-pressure capability of switches.

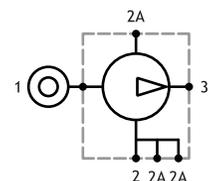


Limited Purge is similar to Positive Purge except includes an orifice in the purge piston. Purge air flow is not as robust as with the PP option, but air pressure is limited inside the suction cups.

The differences between LP and PP options are internal and do not affect outward appearance or overall size and weight.



Code	Function	Port
1	Air-Supply	G 1/8 NPSF
2	Vacuum	G 3/8
2A	Vacuum, Alternate	G 1/8 NPSF
3	Exhaust	-

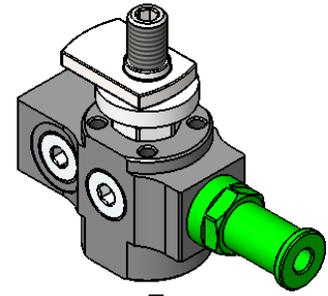


VGP Options

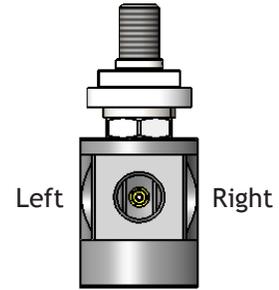
Stud Mounts

We offer M6 threads by 22 MM length, and M8 threads by 16 and 27 MM lengths. The extrusion mounts come with a T-Nut for mounting to an extrusion.

The mounting kits are made to fit into any of the three alternate vacuum ports designated by the Top, A-Side, and B-Side positions.

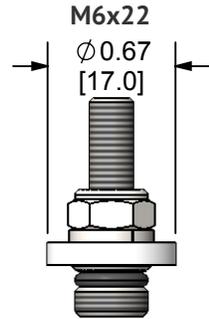


Top

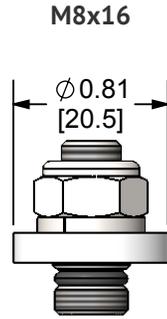


Left

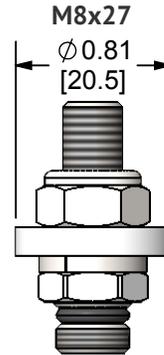
Right



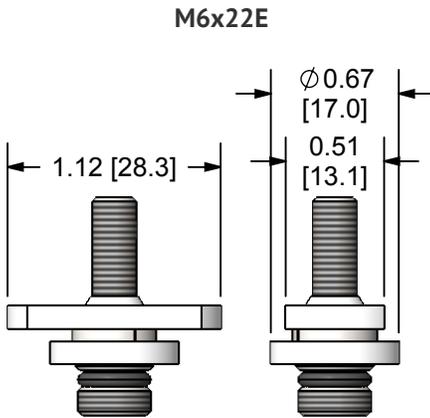
Weight: 0.03 lbs [11.6 g]



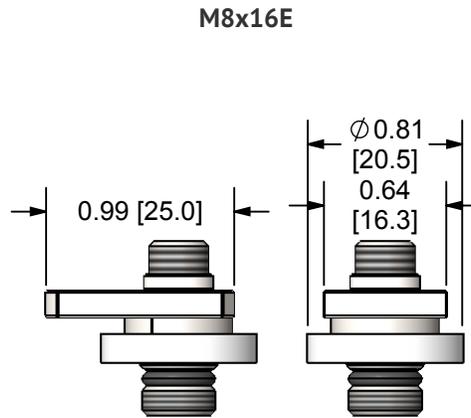
Weight: 0.04 lbs [17.4 g]



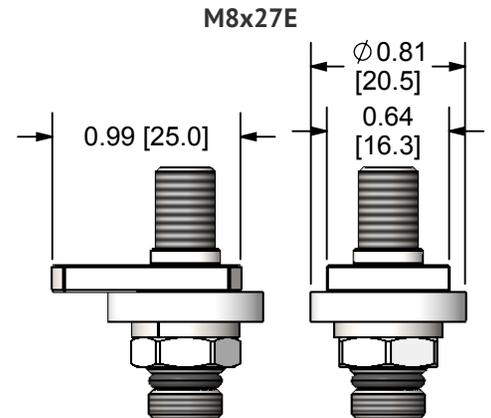
Weight: 0.05 lbs [22.1 g]



Weight: 0.02 lbs [10.3 g]



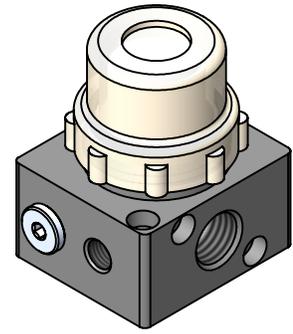
Weight: 0.05 lbs [22.1 g]



Weight: 0.06 lbs [26.6 g]

VGIF: Integrated Filter, G 3/8

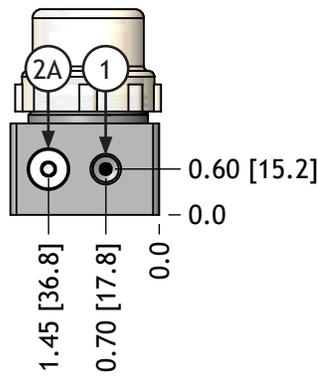
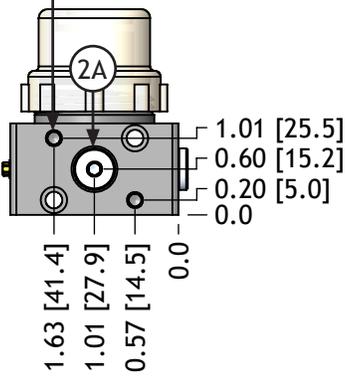
The integrated filter vacuum grippers work in the same way as the VG38. The body of the VGIF vacuum gripper includes a variety of holes for mounting. Two M5 x 0.8 holes are located on the face opposite the vacuum port while clearance holes for M5 socket head cap screws can be used from a total of 4 faces. This pump incorporates the bowl, gasket, and filter element of our t-style filters directly into the pump base eliminating the necessity of incorporating an external filter into the vacuum system.



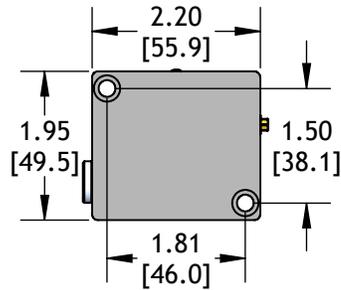
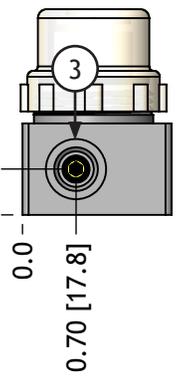
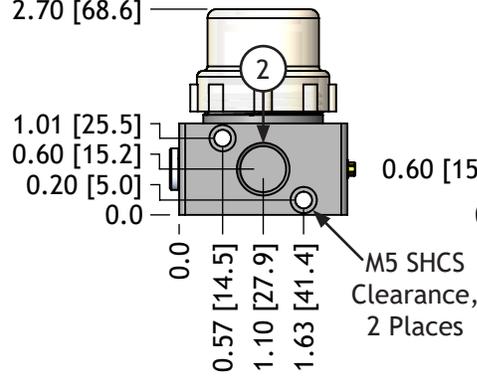
Weight: 8.50 oz [240.9 g]

	Venturi	Silencer Option	
VGIF-38F-	10L		
	05	(Blank)	None
	07	-AA	AA14M
	09	-ST	STA14M
	10		
	08L		
	10L		

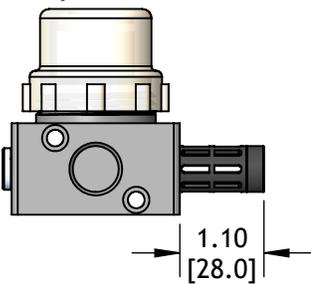
M5x0.8
2 Places



M5 SHCS
Clearance,
2 Places

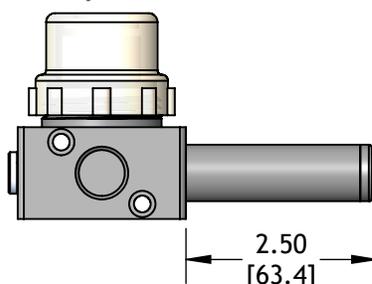


Optional AA Silencer



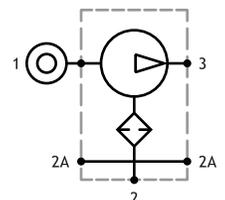
Additional Weight: 0.14 oz [4.0 g]

Optional ST Silencer



Additional Weight: 0.25 oz [7.1 g]

Code	Function	Port
1	Air-Supply	G 1/8 NPSF
2	Vacuum	G 3/8
2A	Vacuum, Alternate	G 1/8 NPSF
3	Exhaust	G 1/4



VG-G12: Multi-Stage, G 1/2 NPSF

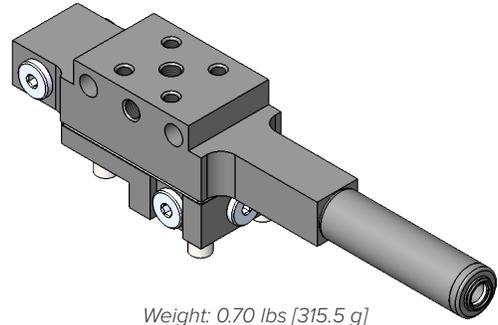
VG12 has the vacuum flow capacity required for larger diameter cups, especially when they are used on porous surfaces. Multi-stage nozzles have the same flow capacity as EDCO Classic pumps and provide quick evacuation times for bellows cups with large internal volumes.

Multiple 1/8" vacuum accessory ports allow adding vacuum sensors or an air-assisted quick release circuit.

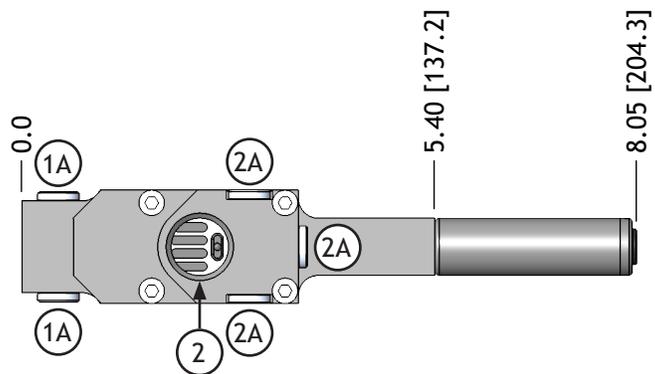
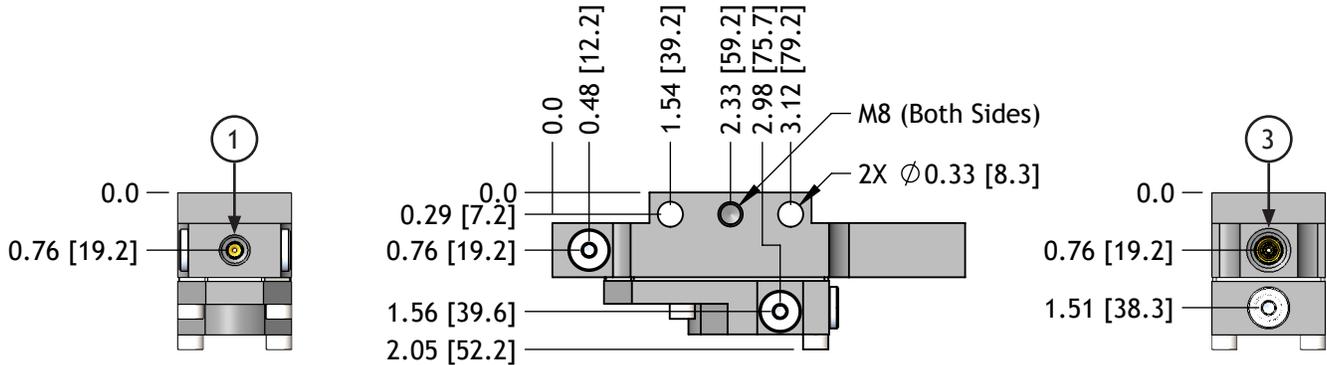
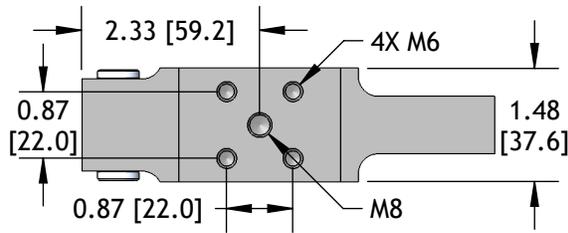
For performance data, see Classic Pump performance.

Nozzle Series	Options	
VG-G12	A25	
	A25	(Blank) None
	E25	-NR Non-Return
	M25	
	ML25	
	X40	

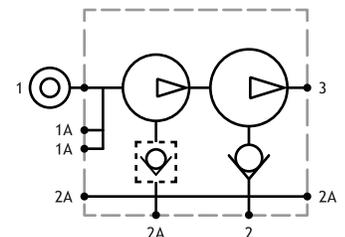
Viton is a registered trademark of DuPont Dow.



Weight: 0.70 lbs [315.5 g]



Code	Function	Port
1	Air Supply	G 1/8 NPSF
1A	Alternate Air Supply	G 1/8 NPSF
2	Vacuum	G 1/2
2A	Alternate Vacuum	G 1/8 NPSF
3	Exhaust	G 1/4



VG-G12 Mount Options

The pump body comes standard with through-holes for mounting to a vertical surface or to the side of an extrusion profile, or optional M8 or M12 stud mounts may be installed in the top or on either side of the pump body (Loctite is recommended).

Our versatile mounting bracket kit may be used to position the pump in 45-degree increments either alongside or underneath an extrusion profile to suit your application.

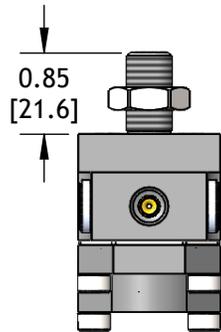
Stud Mounts

Kits include stainless steel stud and jam nut.

Weight: 0.03 lbs [14.2 g]

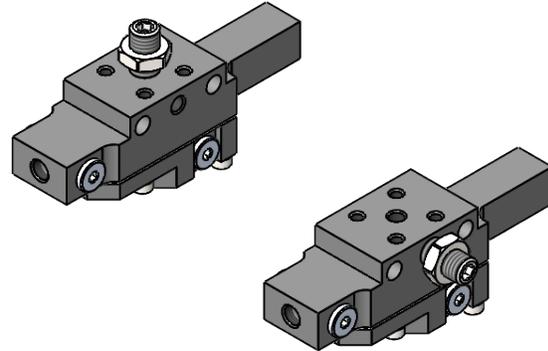
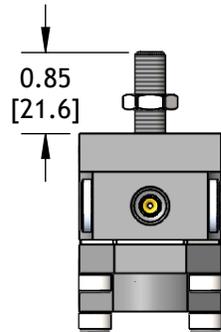
VG-G12-M12

M12X1.75 Stud & Jam Nut



VG-G12-M8

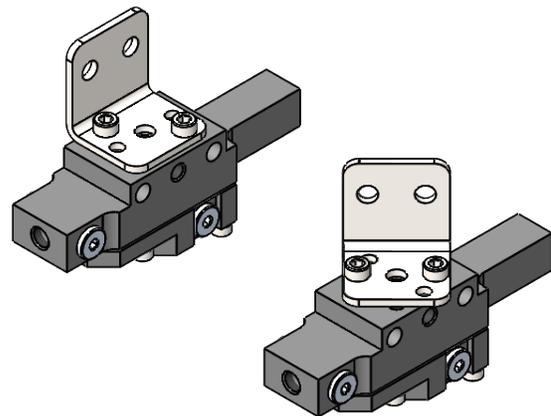
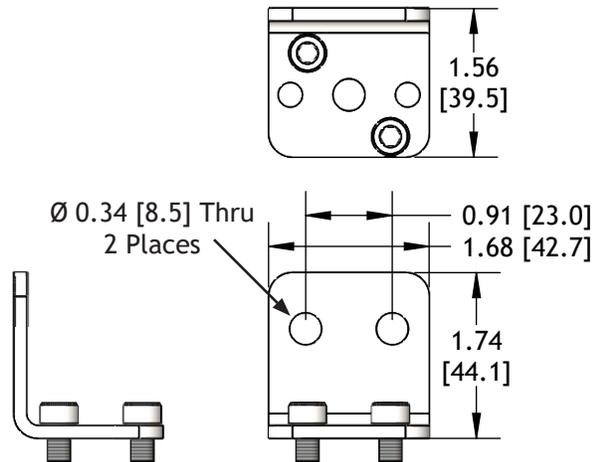
M8X1.25 Stud & Jam Nut



VG-G12-BKT-90: Mounting Bracket

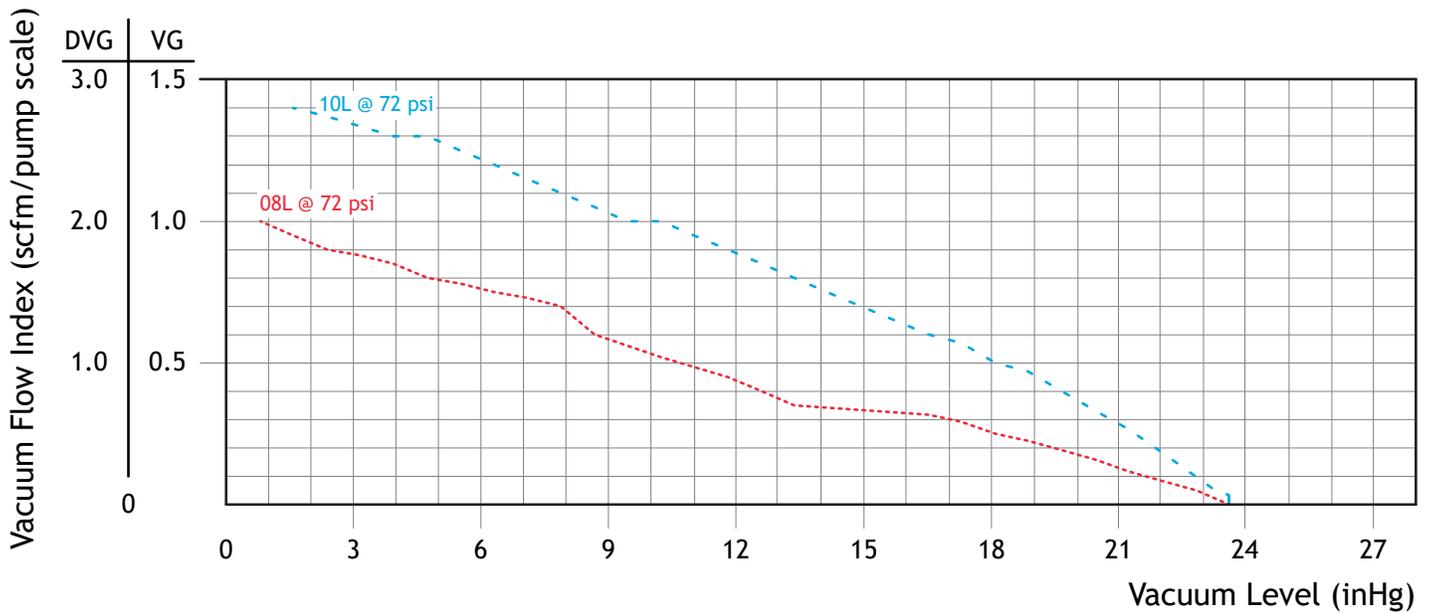
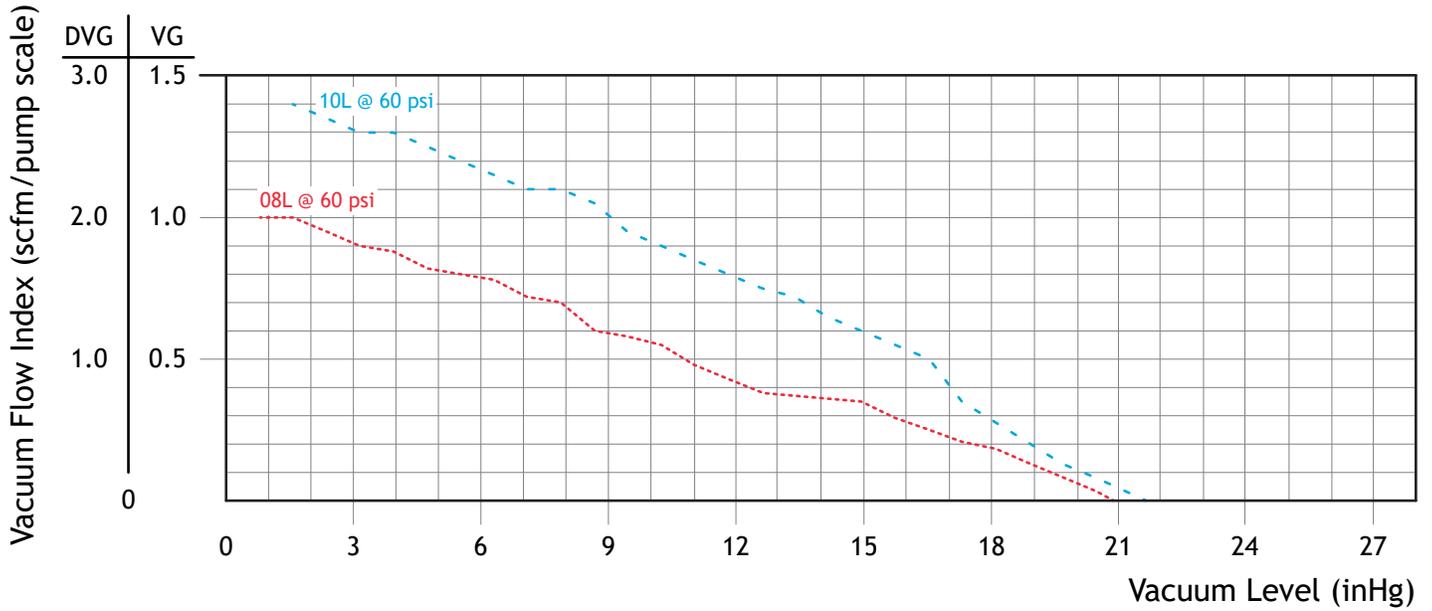
Kit includes stainless steel bracket and M6X10 socket head cap screws (2).

Weight: 0.20 lbs [90.6 g]



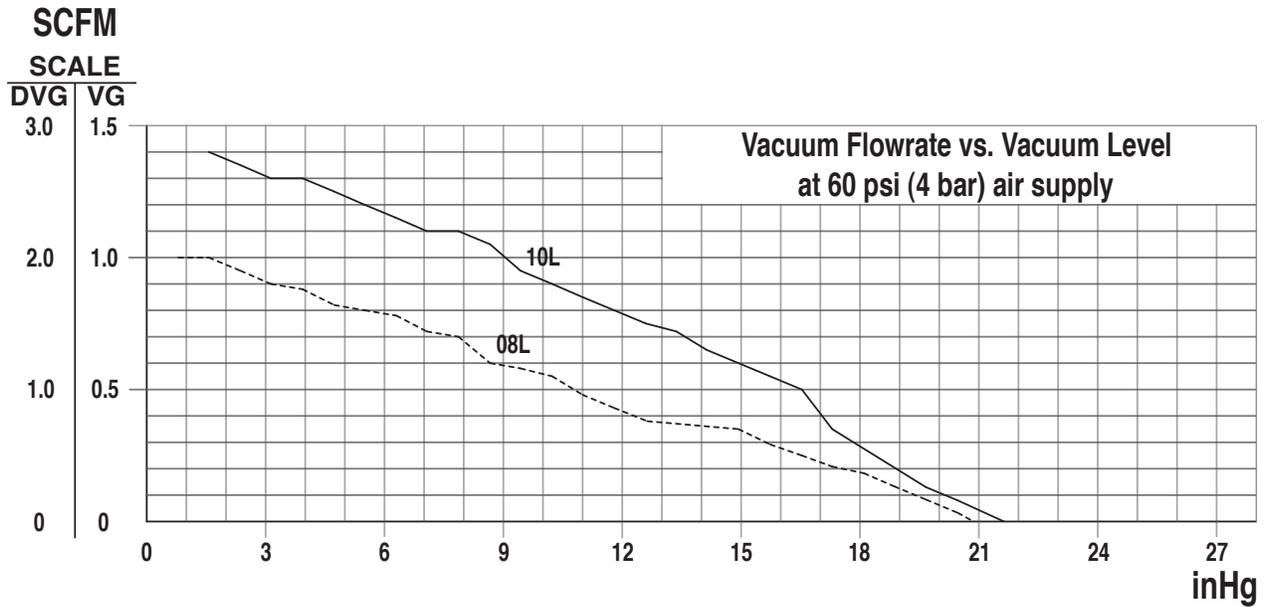
Performance

For information regarding the performance of our ER-10, ER-09, ER-07, and ER-05 venturis, please refer to ER Series Vacuum Pump performance (Section 10).



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.

Performance



Evacuation Time

In a non-porous system, evacuation time for any vacuum cup is calculated by multiplying the internal cup volume by the time factor for the desired vacuum level from the Evacuation Time Calculation Table.

Example: XP-B75 @ 15 inHg [50.8 kPa]

$$\frac{\text{Volume}}{6.7 \text{ in}^3} \times \frac{\text{Time Factor}}{0.022 \text{ sec / in}^3} = \frac{\text{Evacuation Time}}{0.15 \text{ sec}}$$

Vacuum Level: inHG (-kPa)	9 (30.5)	12 (40.6)	15 (50.8)	18 (61)	21 (71)
Time Factor: sec/in ³	0.008	0.014	0.022	0.022	0.061

ER-10L Performance in a Non-Porous System

	B30	B40	B50	B75	B110	BF80	BF100	F75	F110	FC75	FC100
Volume: in ³ [cc]	0.61 [10]	0.9 [14.7]	2.0 [32.8]	6.7 [110]	19.0 [311]	1.8 [29.5]	4.9 [80.3]	1.2 [19.7]	4.3 [70.5]	2.3 [37.6]	4.9 [80.3]
Evacuation Time ¹ : sec	0.013	0.02	0.04	0.15	0.42	0.04	0.11	0.03	0.1	0.05	0.11
Force @ 15 inHG: lb [N]	4.1 [18.2]	7.3 [32.5]	12.1 [53.8]	30.8 [137]	64.1 [285]	35.0 [156]	65.0 [289]	37.5 [167]	78.3 [348]	29.1 [129]	53.3 [237]

¹Evacuating to 15 inHG (50.8 -kPa) at 72 psi (5 bar)

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.