

Suspensions Overview

Vacuum Suspensions p.316

These suspensions have a self adjusting stroke and are available in both rotating and non-rotating.



New! Vacuum Generators p.1020

New clampable vacuum generators are available for a convenient in-line solution



Suspensions with Brake p.300



New! Micro Series Ø6mm / M6 p.281



EMI offers a wide range of suspensions

Smooth Body for Mounting in Clamps



Threaded Body for Thru-hole Mounting



Rotating

Non-Rotating

Adjustable Angle



External Spring



Internal Spring

Suspensions Overview

Vacuum Accessories

p.280



Suspension for Actuators

p.312



G1/8"

p.282



M10 / Ø10mm

p.283



M14 / Ø14mm

p.304



M16

p.306



M20 / Ø20mm

p.308



VSR / VSRT

p.286



VSNG / VSNTG

p.290



VVX - High Load Stainless Steel

p.294



VSE / VSET

p.296



Suspensions with Clamp

p.314



Vacuum Elbow

- Mount between the vacuum cup and suspension or extension tube.
- Sets the angle of a vacuum cup between 0° and ± 90°.
- Tighten one screw to set the angle in a fixed position.
- Integrated vacuum channel.
- For vacuum circuits only.
- See page 259 for dimensional drawings and more application examples.

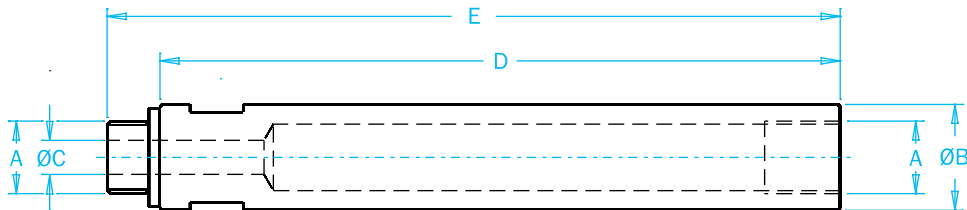


Elbow Arm for Suspensions

Quick#	Part#	Ports	Price	Wt.
5754	VAC05F05F	M5	\$13.35	10g
5755	VAC18F18F	G1/8"	\$14.38	15g
5756	VAC14F14F	G1/4"	\$20.09	40g



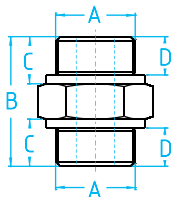
Vacuum Extension Tube



Vacuum Extension Tube

Quick#	Part#	Price	A	ØB	ØC	D	E	Wt.
5748	MFI-A154	\$9.48	M5	10	2	45	50	10g
5749	MFI-A155	\$9.98	M5	10	2	90	95	15g
5750	MFI-A150	\$10.93	G1/8"	14	4.5	45	52	15g
5751	MFI-A151	\$12.20	G1/8"	14	4.5	90	97	25g
5752	MFI-A152	\$12.44	G1/4"	20	6.5	45	53	30g
5753	MFI-A153	\$13.33	G1/4"	20	6.5	90	98	55g
7803	MFI-A506	\$34.32	G3/8"	30	10	150	159	210g

Fittings Available on page 1043



Adaptor Fittings

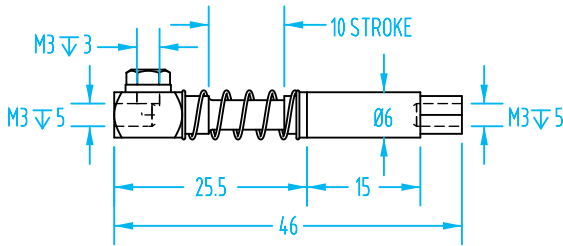
Quick#	Part#	Price	A	B	C	D	Wt.
5782	AF05M05M	\$3.23	M5	11.5	4	3	3g
5783	AF18M18M	\$2.33	G1/8"	17	7	5.5	3g
5784	AF14M14M	\$4.27	G1/4"	22	8	6.5	7g



Use Quick#s for easy online ordering.

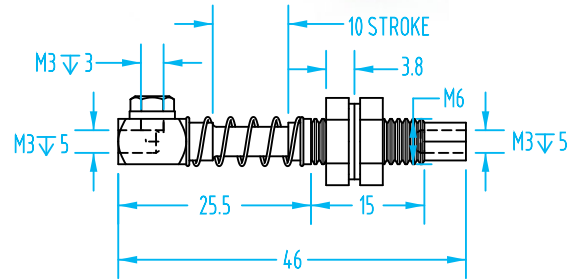
Ø6mm / M6 Suspensions

- See pages 222–223 for Micro Series framing components.
- See pages 412–416 for Mini Vacuum Cups and M3 Fittings.
- See page 486 for Micro Series Sprue Grippers.
- For rotationally symmetrical vacuum cups. (Do not use with Oval cups)
- Two options for fitting placement. It can either be fed through the side port (plugged initially) or it can pass through the vacuum channel which extends through the suspension body.
- It is recommended to use soft tubing and barb fittings on micro sized suspensions to prevent suspension binding.



Micro Series Clampable Suspension

Quick#	Part#	>ASS< #	Type	Price	Wt.
3790	GAF6-U-10	1-355-01-00	Rotate	\$23.63	6g



Micro Series Threaded Suspension

Quick#	Part#	>ASS< #	Type	Price	Wt.
3791	GAF6-M-10	1-355-02-00	Rotate	\$24.68	9g

Self-Retracting Suspension

- The VHE pulls the vacuum cup in as soon as the vacuum cup seals and vacuum is engaged.
- The internal spring extends the arm as soon as vacuum is disengaged.
- G1/8" air ports.
- Extendable reach with M17x1 thread and VLR Extension tubes.
- Anodized aluminum Ø20mm clampable body.
- Dimensional drawing can be found online.



NEW

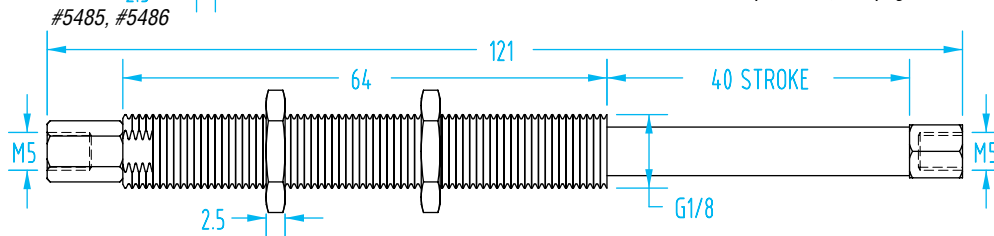
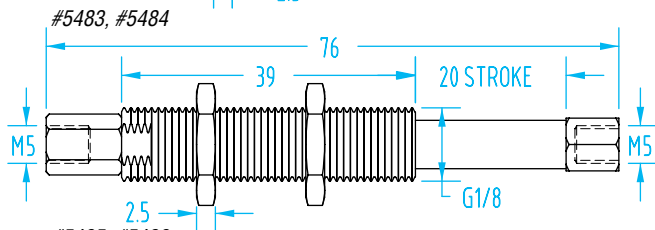
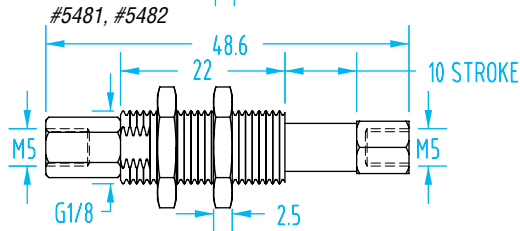
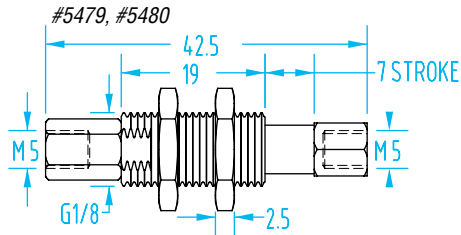
Ø20mm Clampable Self-Retracting Suspension

Quick#	Part#	>ASS< #	Stroke	Style	Price	Wt.
3948	VHE-20	1-775-00-00	20mm	Rotate	\$174.30	48g
3953	VHE-20-VG	1-775-00-00-1	20mm	Non-Rotate	\$174.30	48g

G1/8" Suspensions

(Dimensioned drawings shown full scale)

Internal Spring Versions

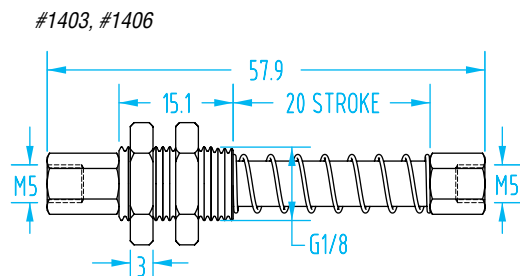
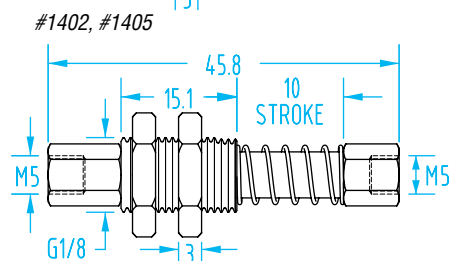
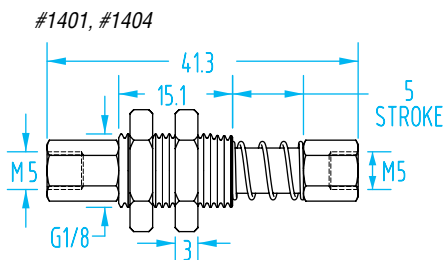


Quick#	Part#	Type	Stroke	Weight	Price
5479	GSS-C7-G8M5	Rotate	7mm	14g	\$20.76
5481	GSS-C10-G8M5	Rotate	10mm	19g	\$22.62
5483	GSS-C20-G8M5	Rotate	20mm	26g	\$28.27
5485	GSS-C40-G8M5	Rotate	40mm	37g	\$31.50

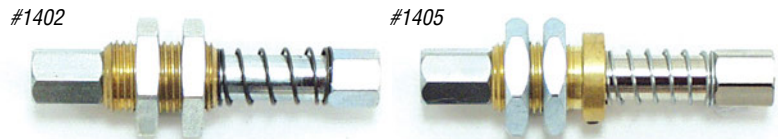
Quick#	Part#	Type	Stroke	Weight	Price
5480	GSS-C7R-G8M5	Non-Rotate	7mm	15g	\$30.19
5482	GSS-C10R-G8M5	Non-Rotate	10mm	21g	\$31.24
5484	GSS-C20R-G8M5	Non-Rotate	20mm	27g	\$39.38
5486	GSS-C40R-G8M5	Non-Rotate	40mm	39g	\$45.68

We recommend using an appropriately sized lock washer with threaded body suspensions, see page 1076.

External Spring Versions



Quick#	Part#	Type	Stroke	Weight	Price
1401	GSS-40-G8M5	Rotate	5mm	14g	\$36.05
1404	GSS-40R-G8M5	Non-rotate	5mm	14g	\$93.95



Quick#	Part#	Type	Stroke	Weight	Price
1402	GSS-47-G8M5	Rotate	10mm	16g	\$70.11
1405	GSS-47R-G8M5	Non-rotate	10mm	16g	\$51.66

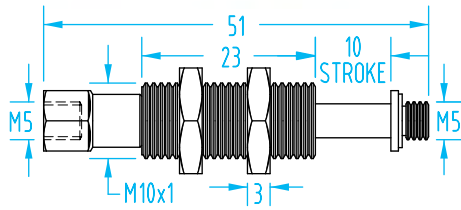


Quick#	Part#	Type	Stroke	Weight	Price
1403	GSS-59-G8M5	Rotate	20mm	18g	\$72.17
1406	GSS-59R-G8M5	Non-rotate	20mm	18g	\$95.84

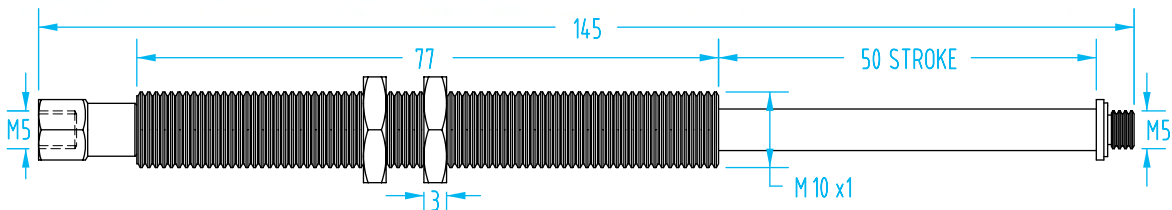
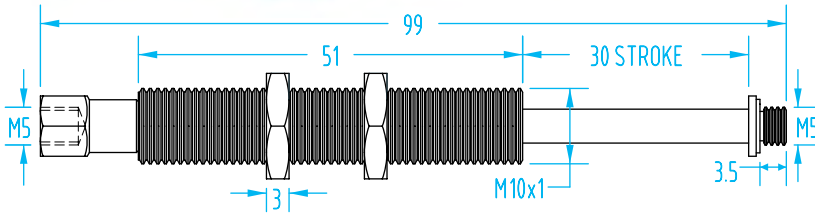
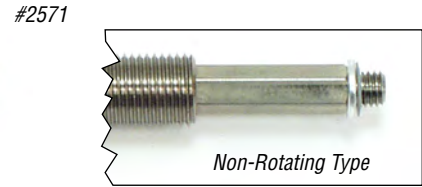
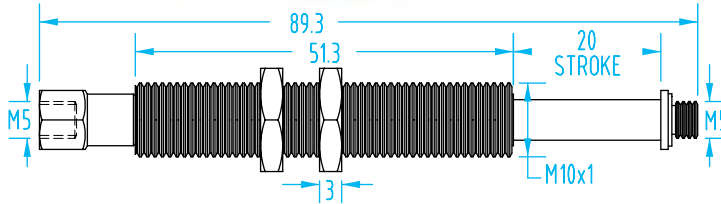
M10 Suspensions

(Dimensioned drawings shown full scale)

Quick#	Part#	Type	Stroke	Weight	Price
336	GSS-53-M10M5	Rotate	10mm	19g	\$19.75
337	GSS-53R-M10M5	Non-rotate	10mm	21g	\$22.34
2569	GSS-80-M10M5	Rotate	20mm	26g	\$23.64
2571	GSS-80R-M10M5	Non-rotate	20mm	26g	\$33.92
443	GSS-99-M10M5	Rotate	30mm	32g	\$24.68
1870	GSS-99R-M10M5	Non-rotate	30mm	32g	\$34.96
2576	GSS-119-M10M5	Rotate	50mm	43g	\$37.85
5444	GSS-119R-M10M5	Non-Rotate	50mm	46g	\$34.75



We recommend using an appropriately sized lock washer with threaded body suspensions, see page 1076.



Suspensions

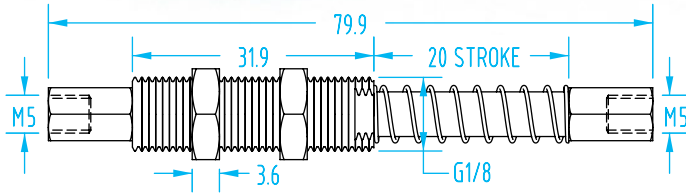
(Dimensioned drawings shown full scale)

G1/8"

#333



#454



Quick#	Part#	Type	Stroke	Weight	Price
333	GSS-60-G8M5	Rotate	20mm	19g	\$36.00
454	GSS-60R-G8M5	Non-rotate	20mm	18g	\$45.00

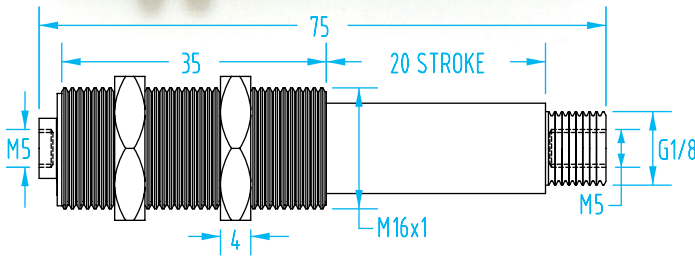
We recommend using an appropriately sized lock washer with threaded body suspensions, see page 1076.

Mounting Brackets Available on page 244



Lightweight Suspensions

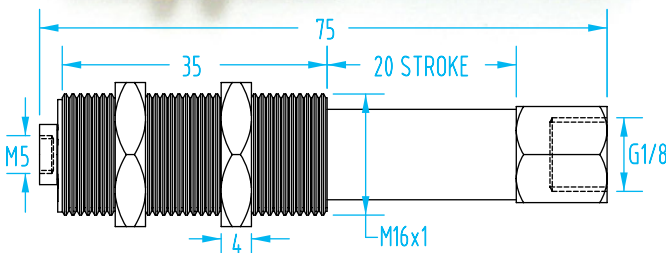
#1822



Fittings Available on page 1043



#1824



Quick#	Part#	Type	Stroke	Weight	Price
1822	GSS-75L-M16M5	Rotate	20mm	20g	\$21.30
1823	GSS-75L-M16N	Rotate	20mm	20g	\$25.30
1824	GSS-75L-M16G8	Rotate	20mm	18g	\$21.30

#1823



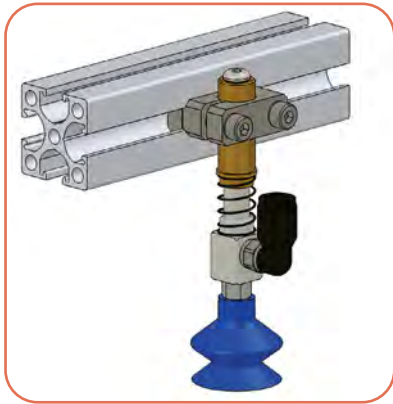
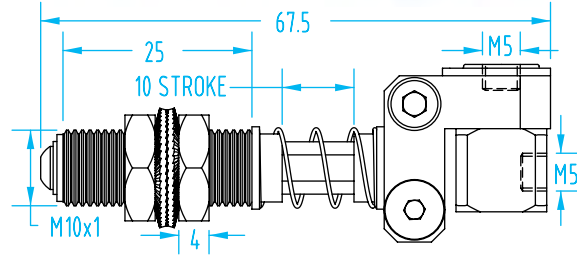
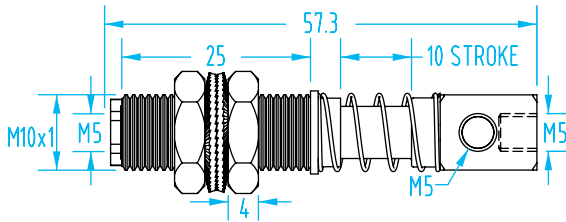
M10 Suspensions

(Dimensioned drawings shown full scale)

#3607



#3166



Quick#	Part#	>ASS< #	Type	Stroke	Weight	Price
3607	GAF10-M-10	1-356-09-00	Rotate	10mm	41g	\$33.08
3166	GGG10-M-10	1-360-06-00	Non-rotate	10mm	41g	\$36.75

Use Quick#s for easy online ordering.

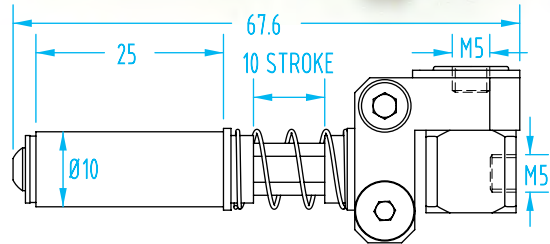
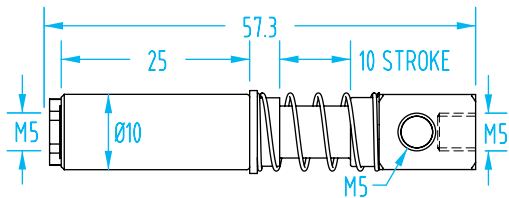
- Two options for fitting placement. It can either be fed through the side port (plugged initially) or it can pass through the vacuum channel which extends through the suspension body.

Ø10mm Suspensions

#3603



#3165



Quick#	Part#	>ASS< #	Type	Stroke	Weight	Price
3603	GAF10-U-10	1-356-00-00	Rotate	10mm	33g	\$28.88
3165	GGG10-C-10	1-360-03-00	Non-rotate	10mm	35g	\$36.75

- Two options for fitting placement. It can either be fed through the side port (plugged initially) or it can pass through the vacuum channel which extends through the suspension body.

Rotating Suspensions – VSR

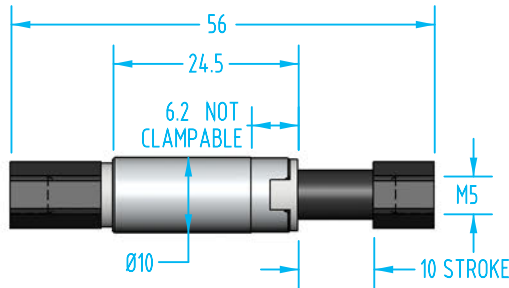
(Dimensioned drawings shown full scale)

- Body and rod are made of anodized aluminum.
- High-load capability
- Clampable smooth body
- FDA-H1 food-grade lubricant

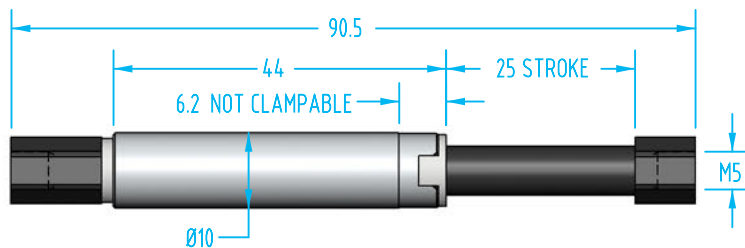
New Bushing and shaft design provides more reliable compensation and a more robust vacuum connection. Check online product pages for current dimensional drawings and photos. www.EMlcorp.com and search by Q#.



#6602



#6603



Fittings Available on page 1043

Mounting Brackets Available on page 248

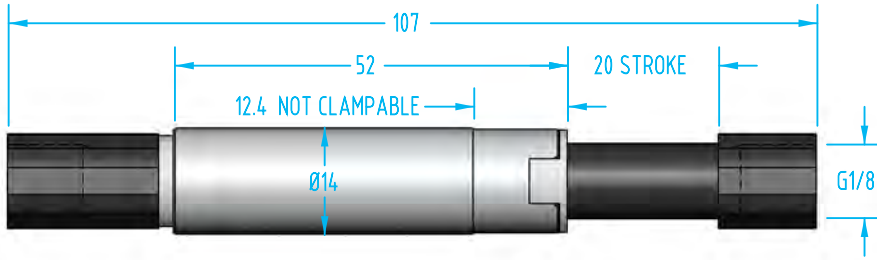
Quick#	Part#	Price	Air Port	ØD	Stroke	Wt.
6602	VSR-1010	\$19.95	M5	10	10mm	7g
6603	VSR-1025	\$26.20	M5	10	25mm	11g
6604	VSR-1420	\$31.45	G1/8"	14	20mm	28g
6605	VSR-1435	\$36.70	G1/8"	14	35mm	37g
6606	VSR-2025F18	\$40.90	G1/8"	20	25mm	64g
6607	VSR-2050F18	\$46.15	G1/8"	20	50mm	93g
7782	VSR-2025F14	\$40.90	G1/4"	20	25mm	60g
7783	VSR-2050F14	\$46.15	G1/4"	20	50mm	90g

Suspension Reactive Spring Force data for all suspensions is available online, [click here!](#)

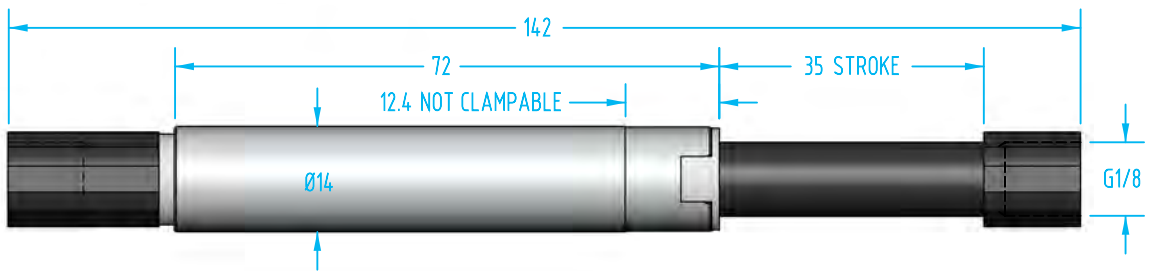
Rotating Suspensions – VSR

(Dimensioned drawings shown full scale)

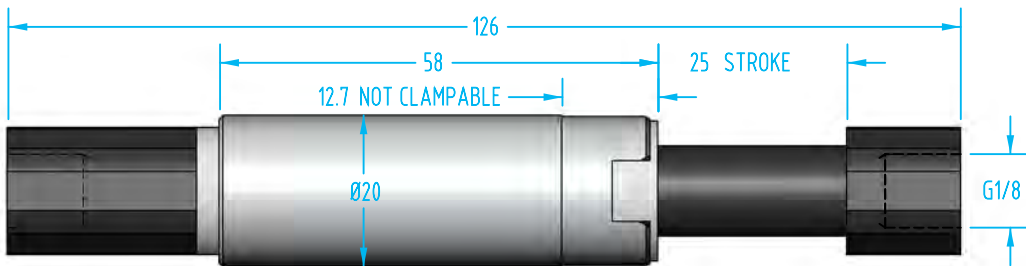
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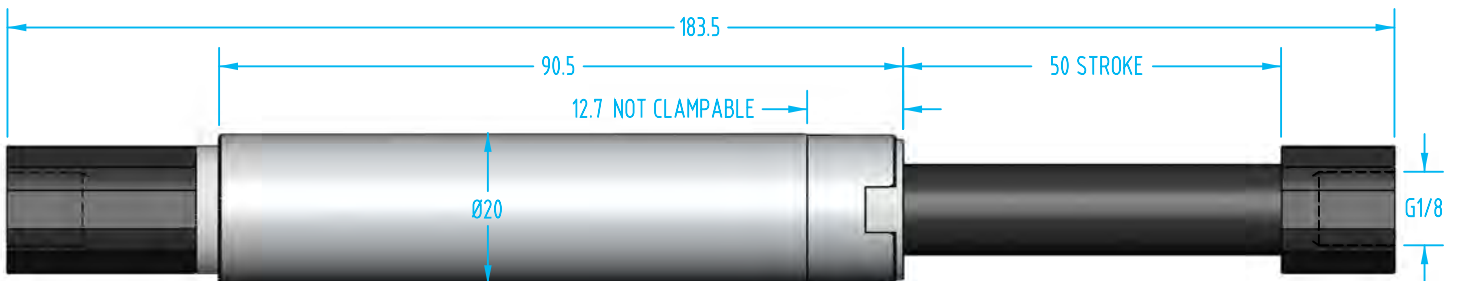
#6605



#6606



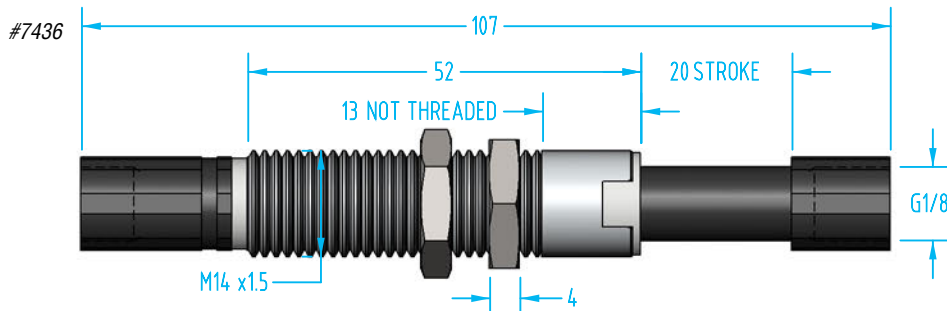
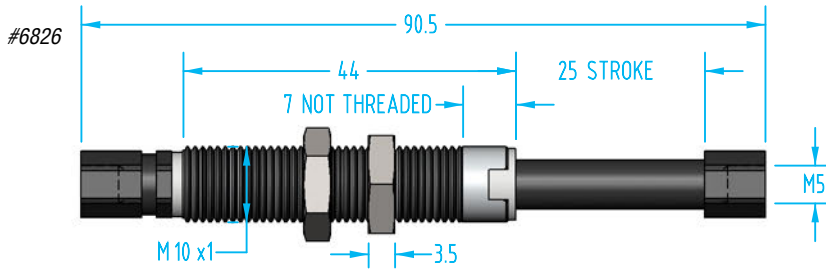
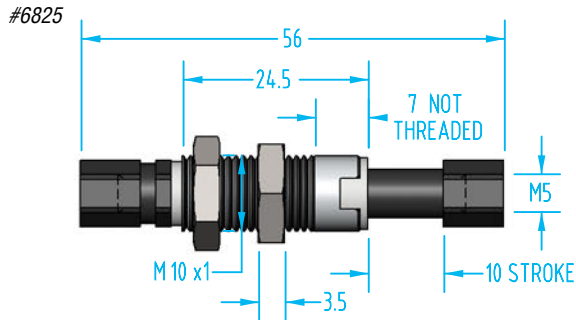
#6607



Rotating Suspensions – VSRT

(Dimensioned drawings shown full scale)

- Body and rod are made of anodized aluminum.
- High-load capability
- Threaded body
- We recommend using an appropriately sized lock washer with threaded body suspensions.
- New Bushing and shaft design provides more reliable compensation and a more robust vacuum connection.



Quick#	Part#	Price	Air Port	Mount	Stroke	Wt.
6825	VSRT1010	\$22.60	M5	M10x1	10mm	12g
6826	VSRT1025	\$26.30	M5	M10x1	25mm	16.5g
7436	VSRT1420	\$32.60	G1/8"	M14x1.5	20mm	37g
7437	VSRT1435	\$36.30	G1/8"	M14x1.5	35mm	47g
6827	VSRT1620	\$33.80	G1/8"	M16x1	20mm	46.5g
6828	VSRT1635	\$37.60	G1/8"	M16x1	35mm	58g
6829	VSRT2025F18	\$40.10	G1/8"	M20x1.5	25mm	85g
6830	VSRT2050F18	\$45.10	G1/8"	M20x1.5	50mm	110g
7784	VSRT2025F14	\$40.10	G1/4"	M20x1.5	25mm	82g
7785	VSRT2050F14	\$45.10	G1/4"	M20x1.5	50mm	111g
7788	VSRT2540*	\$64.40	G3/8"	M25x1.5	40mm	200g
7789	VSRT2580*	\$89.85	G3/8"	M25x1.5	80mm	271g

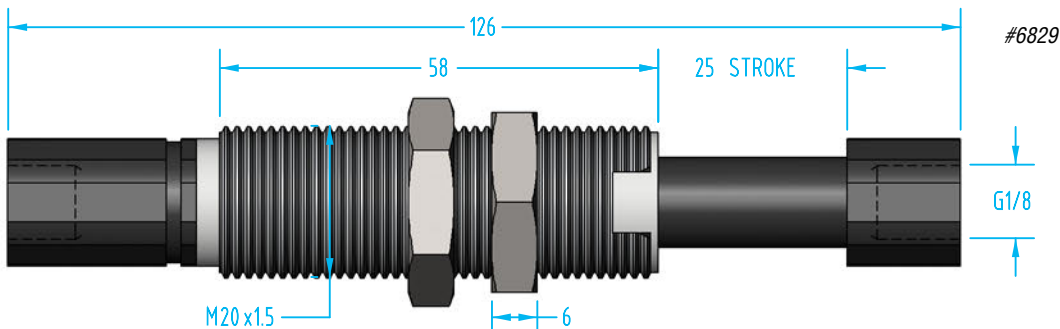
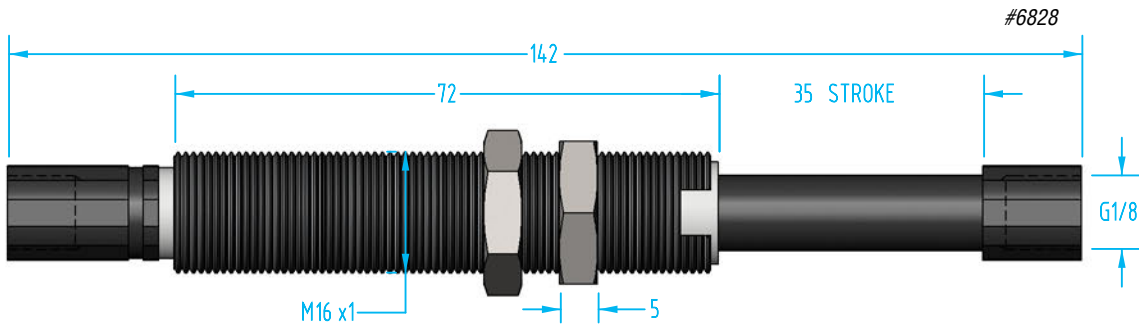
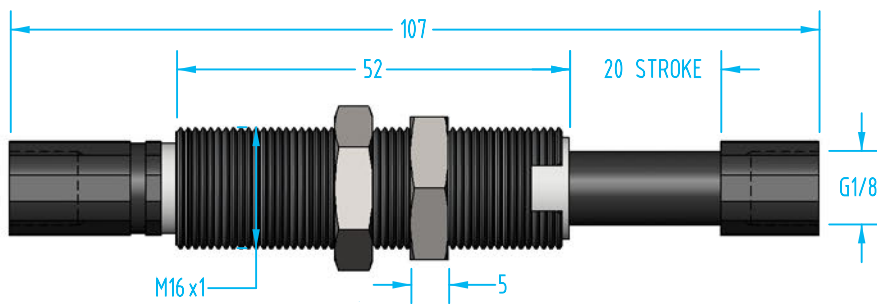
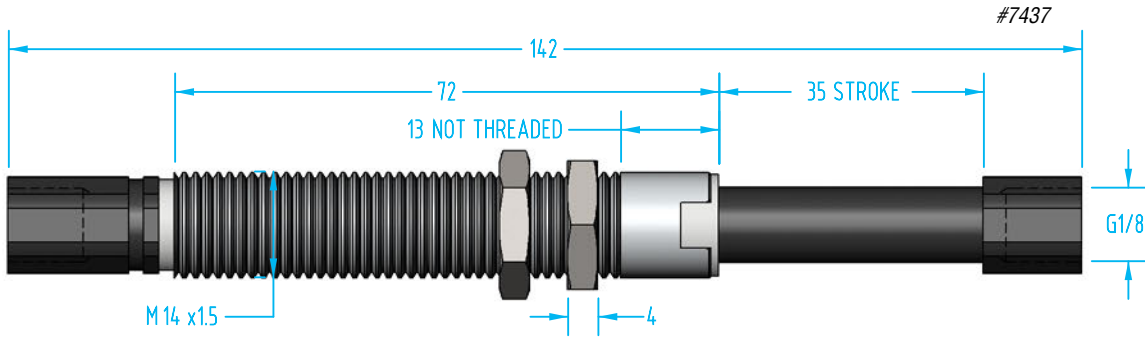
*Dimensional information available online.

Lock Washers

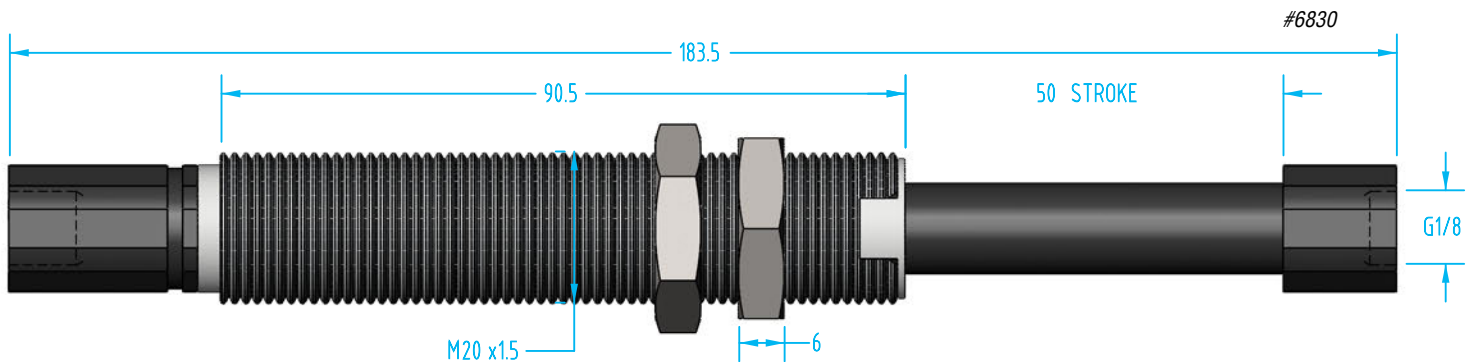
Quick #	Part #	Description	Price
948	GSC-M10-LW	M10 Thin lock washer	\$0.25
2347	GSC-M14-LW	M14 Thin lock washer	\$0.40
939	GSC-M16-LW	M16 Thin lock washer	\$0.60
928	GSC-M20-LW	M20 Thin lock washer	\$1.25
985	GSC-M25-LW	M25 Thin lock washer	\$2.25

Rotating Suspensions – VSRT

(Dimensioned drawings shown full scale)



Note: Quick #7884 has the same dimensions except with G1/4" air ports



Note: Quick #7785 has the same dimensions except with G1/4" air ports

Non-Rotating Suspensions – VSNG

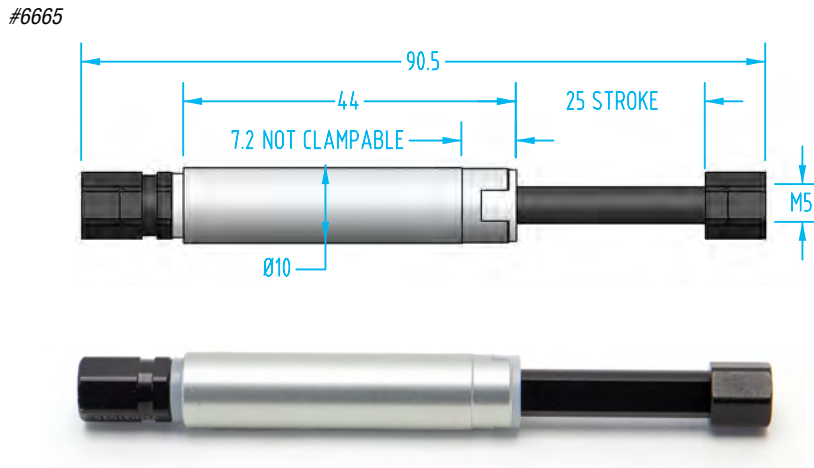
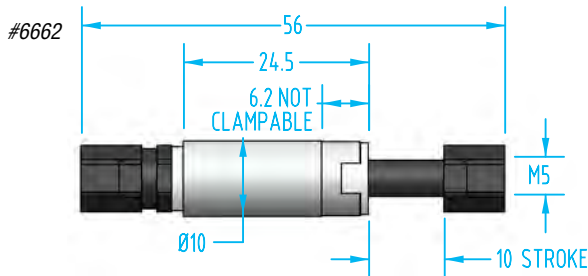
(Dimensioned drawings shown full scale)

- Body and rod made of anodized aluminum.
- Non-rotating rod with high-load capability.
- Clampable smooth body.
- FDA-H1 food-grade lubricant.



New Design Changes!

New Bushing and shaft design provides more reliable compensation and a more robust vacuum connection.



Quick#	Part#	Price	Air Port	ØD	Stroke	Wt.
6662	VSNG-1010	\$24.25	M5	10	10mm	7g
6665	VSNG-1025	\$26.90	M5	10	25mm	11g
6668	VSNG-1420	\$31.50	G1/8"	14	20mm	27g
6671	VSNG-1435	\$35.70	G1/8"	14	35mm	36g
6674	VSNG-2025-F18	\$39.90	G1/8"	20	25mm	63g
6677	VSNG-2050-F18	\$46.20	G1/8"	20	50mm	91g
7252	VSNG-2025-F14	\$39.90	G1/4"	20	25mm	60g
7253	VSNG-2050-F14	\$46.20	G1/4"	20	50mm	88g

Mounting Brackets
Available on page 248

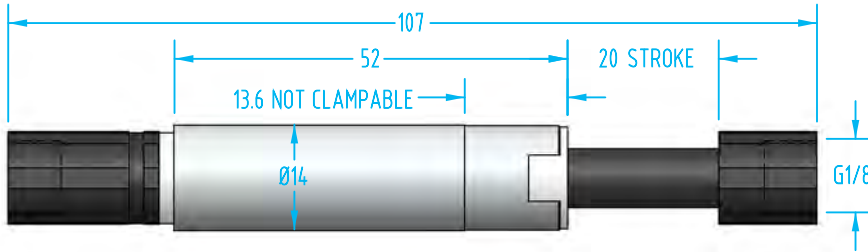


Use Quick#s for easy online ordering.

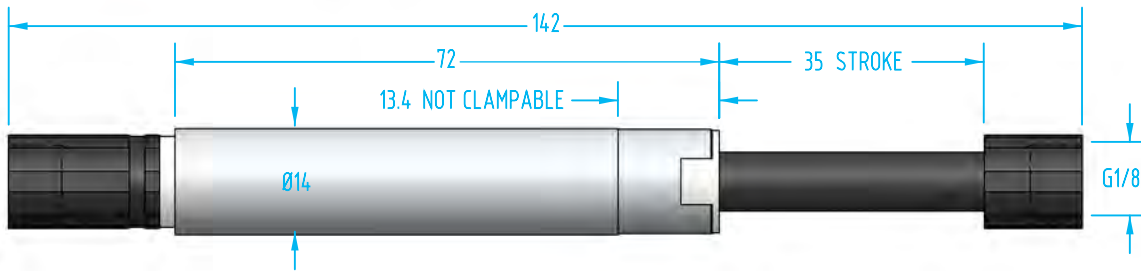
Non-Rotating Suspensions – VSNG

(Dimensioned drawings shown full scale)

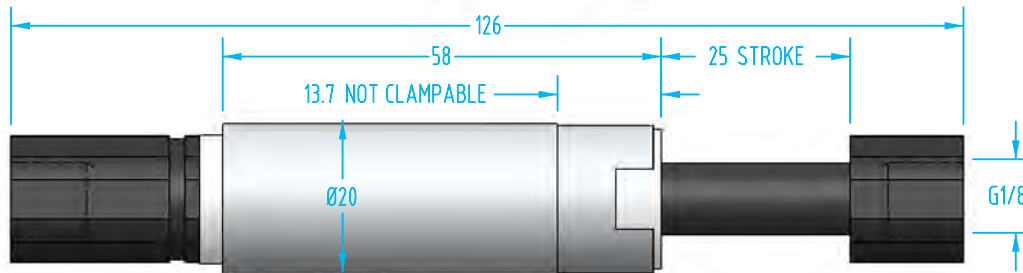
#6668



#6671

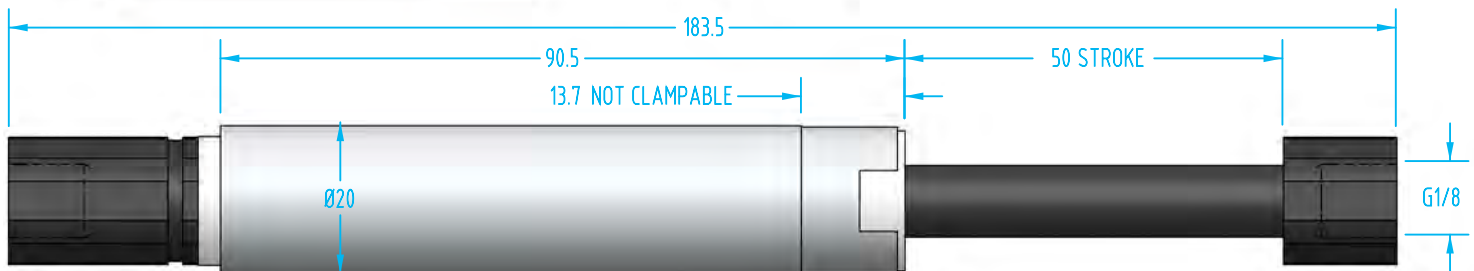


#6674



Note: Quick #7252 has the same dimensions except with G1/4" air ports

#6677



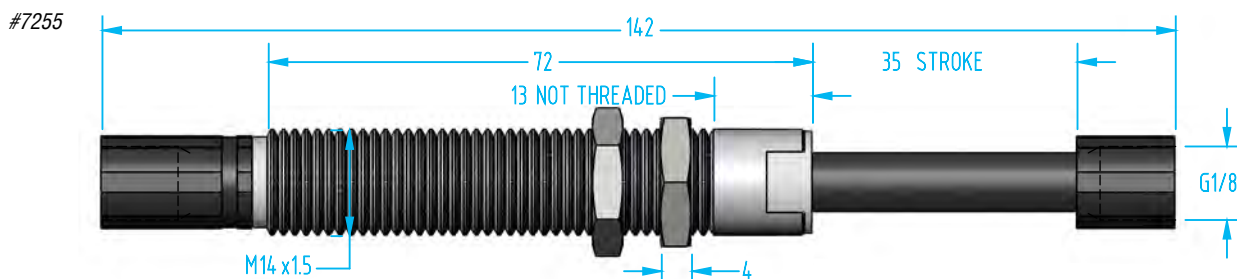
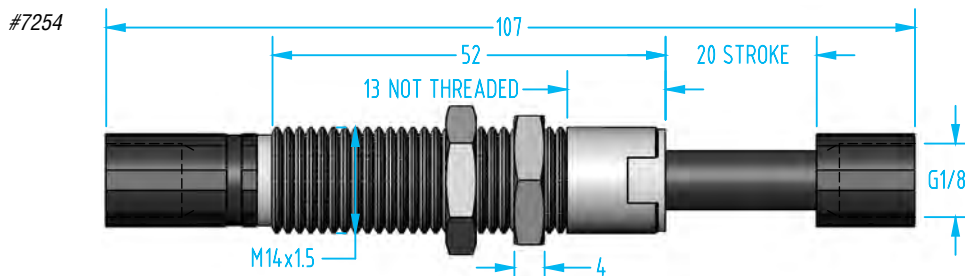
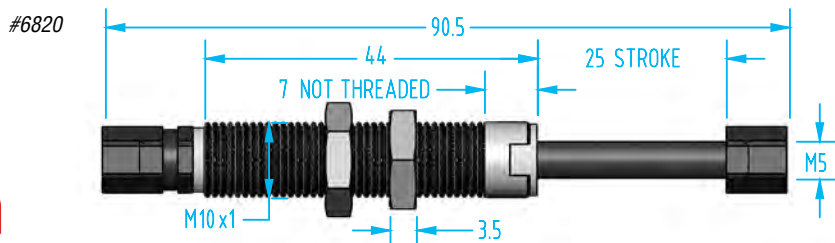
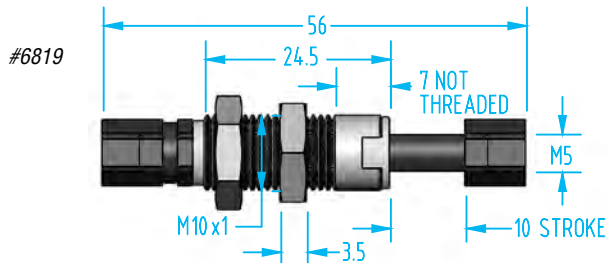
Note: Quick #7253 has the same dimensions except with G1/4" air ports

Non-Rotating Suspensions – VSNTG

(Dimensioned drawings shown full scale)

- Body and rod are made of anodized aluminum.
- High-load capability
- Threaded body
- FDA-H1 food-grade lubricant.
- We recommend using an appropriately sized lock washer with threaded suspensions, see page 288.

New Design Changes!
Phased in though 2021-2022



New Bushing and shaft design provides more reliable compensation and a more robust vacuum connection. Check online product pages for current dimensional drawings and photos. www.EMlcorp.com and search by Q#.

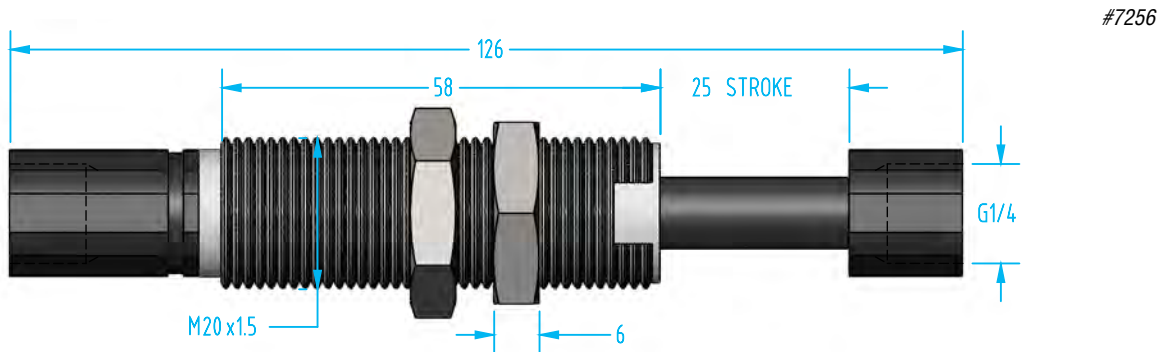
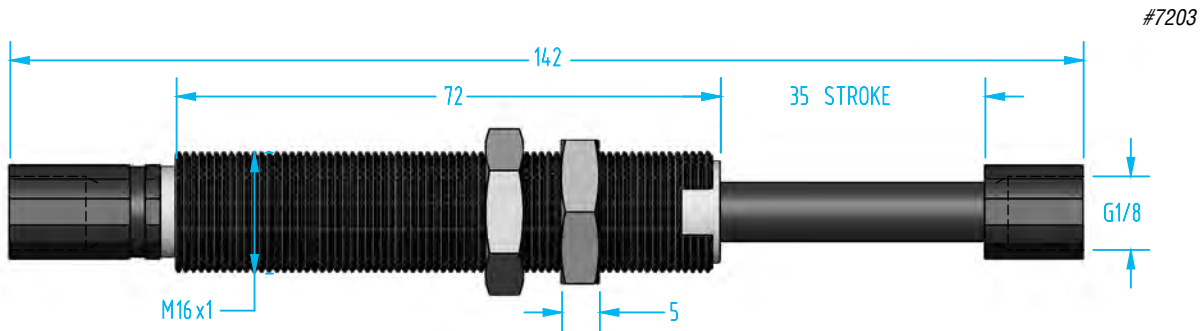
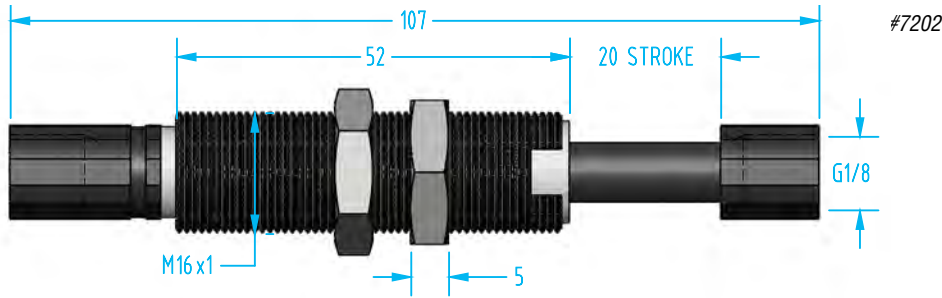
Quick#	Part#	Price	Air Port	ØD	Stroke	Wt.
6819	VSNTG-1010	\$27.60	M5	M10x1	10mm	7g
6820	VSNTG-1025	\$30.10	M5	M10x1	25mm	11g
7254	VSNTG-1420	\$38.00	G1/8"	M14x1.5	20mm	22g
7255	VSNTG-1435	\$44.00	G1/8"	M14x1.5	35mm	33g
7202	VSNTG-1620	\$38.80	G1/8"	M16x1	20mm	35g
7203	VSNTG-1635	\$44.00	G1/8"	M16x1	35mm	45g
7256	VSNTG-2025-F18	\$46.40	G1/8"	M20x1.5	25mm	54g
7257	VSNTG-2050-F18	\$49.00	G1/8"	M20x1.5	50mm	80g
7204	VSNTG-2025-F14	\$46.40	G1/4"	M20x1.5	25mm	65g
7205	VSNTG-2050-F14	\$49.00	G1/4"	M20x1.5	50mm	90g
7206	VSNTG-2540*	\$70.00	G3/8"	M25x1.5	40mm	170g
7207	VSNTG-2580*	\$89.00	G3/8"	M25x1.5	80mm	235g

*Dimensional information available online.

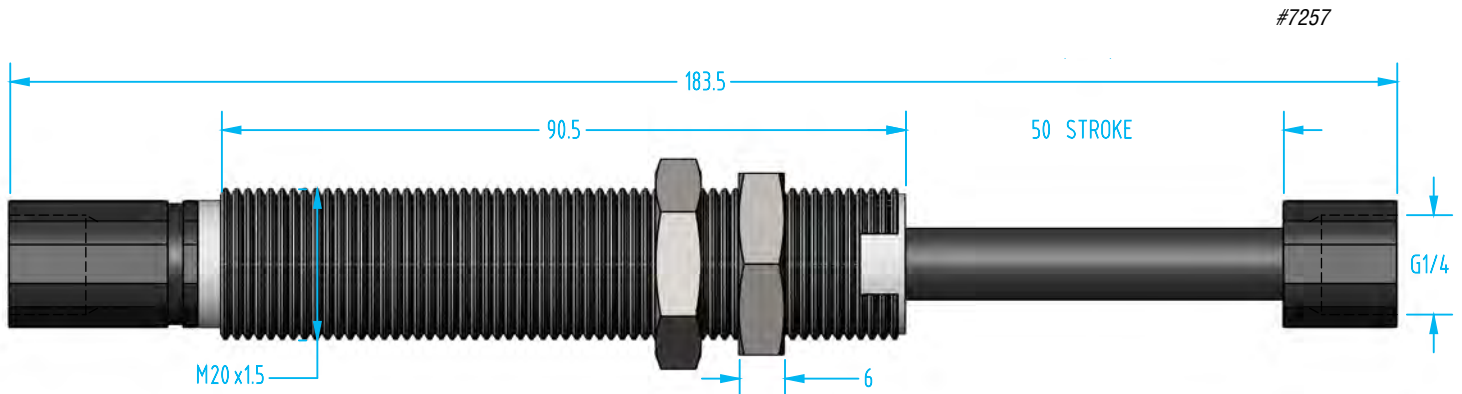


Non-Rotating Suspensions – VSNTG

(Dimensioned drawings shown full scale)



Note: Quick #7204 has the same dimensions except with G1/4" air ports



Note: Quick #7205 has the same dimensions except with G1/4" air ports

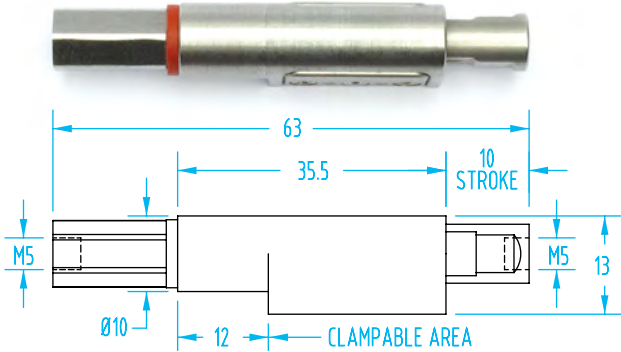
Non-Rotating Ball Bearing Suspensions – VVX

(Dimensioned drawings shown full scale)

- Body, rod and spring in stainless steel.
- Ball bearings for a smooth operation and exceptionally high load capability.
- Zero backlash
- FDA-H1 food-grade lubricant.

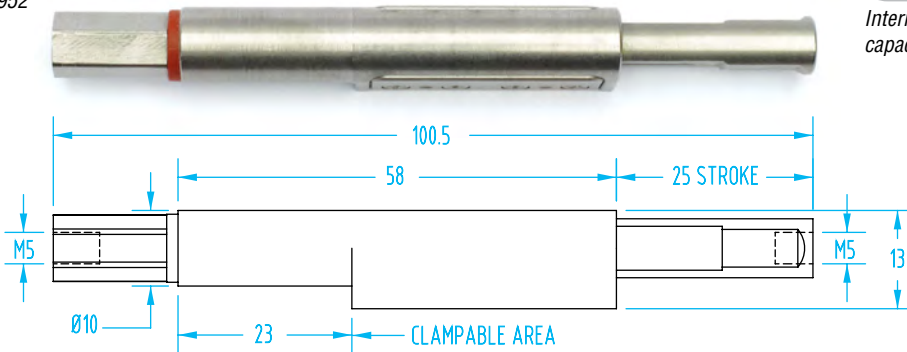


#6951

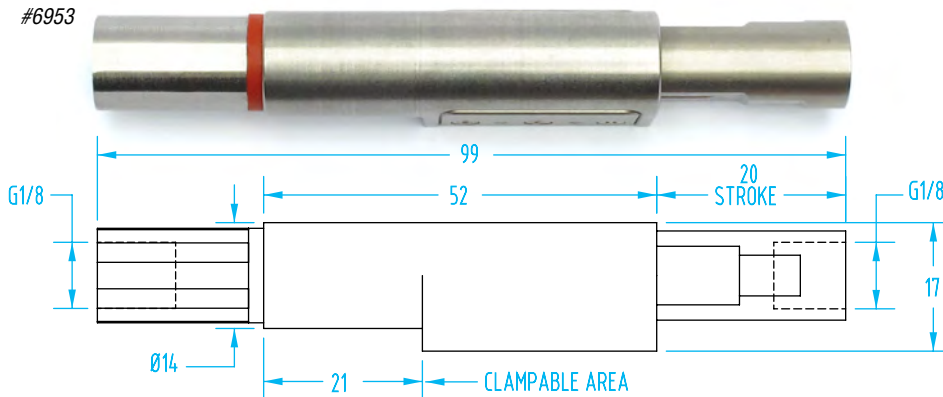


Internal spring and ball bearings for high load capacity and very smooth operation.

#6952



#6953



Fittings Available on page 1043

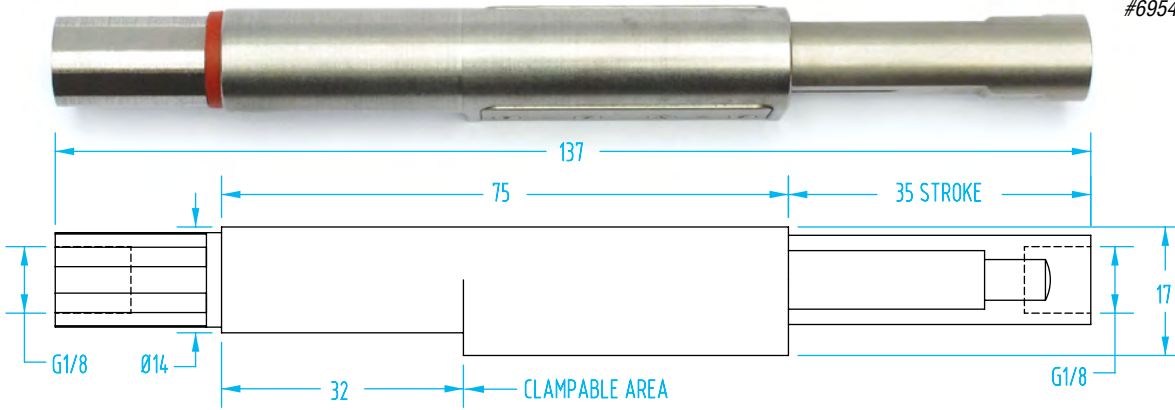
Mounting Brackets Available on page 248

Quick#	Part#	Price	ØD	Air Port	Stroke	Wt.
6951	VVX1010F	\$188.00	10	M5	10mm	30g
6952	VVX1025F	\$192.00	10	M5	25mm	45g
6953	VVX1420F	\$214.00	14	G1/8"	20mm	80g
6954	VVX1435F	\$219.00	14	G1/8"	35mm	110g
6955	VVX2025F	\$227.00	20	G1/8"	25mm	150g
6956	VVX2050F	\$232.00	20	G1/8"	50mm	235g

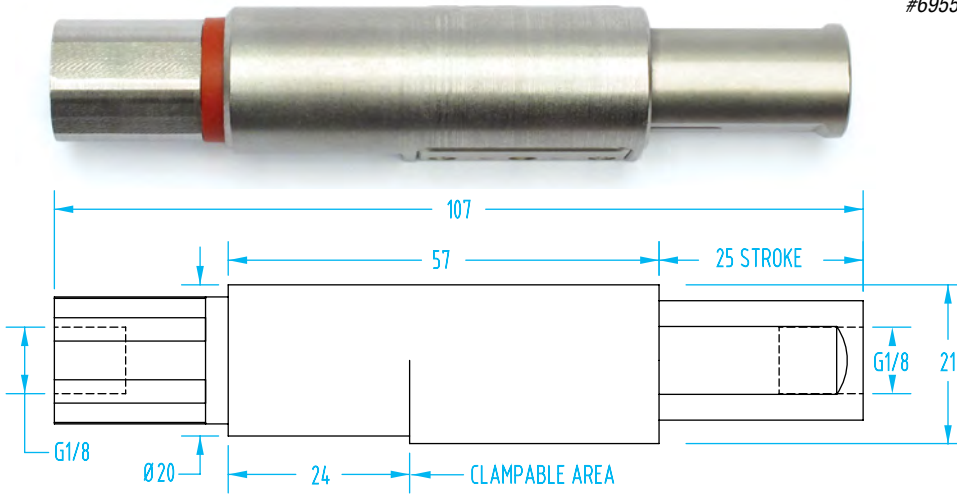
Non-Rotating Ball Bearing Suspensions – VVX

(Dimensioned drawings shown full scale)

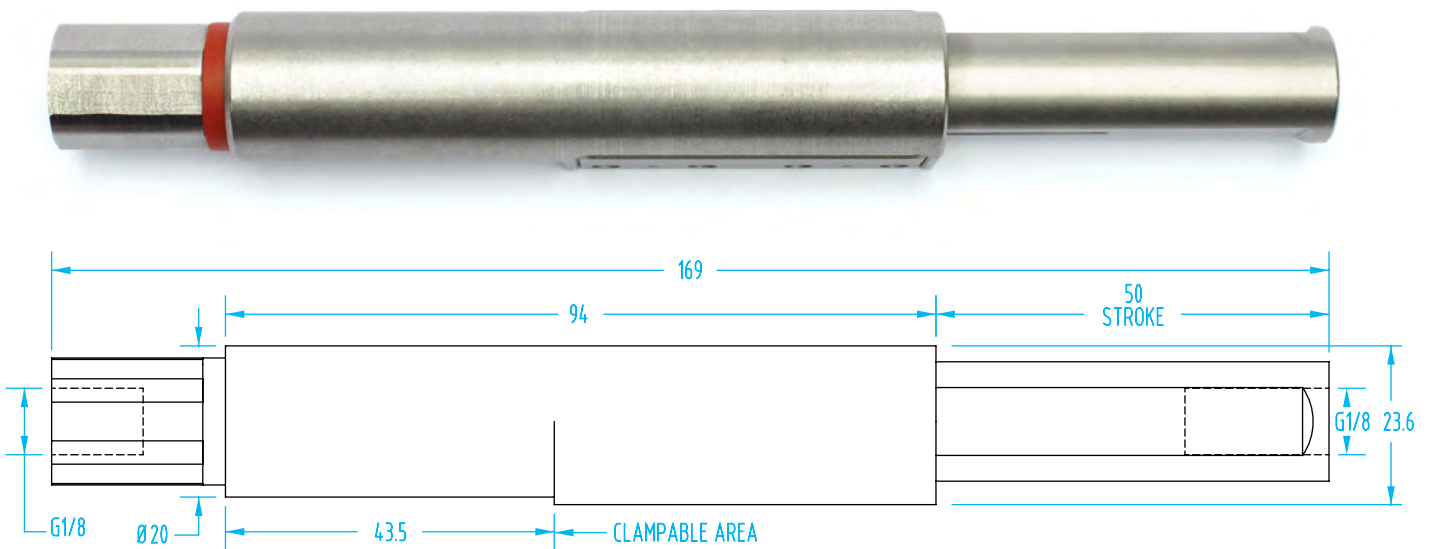
#6954



#6955



#6956

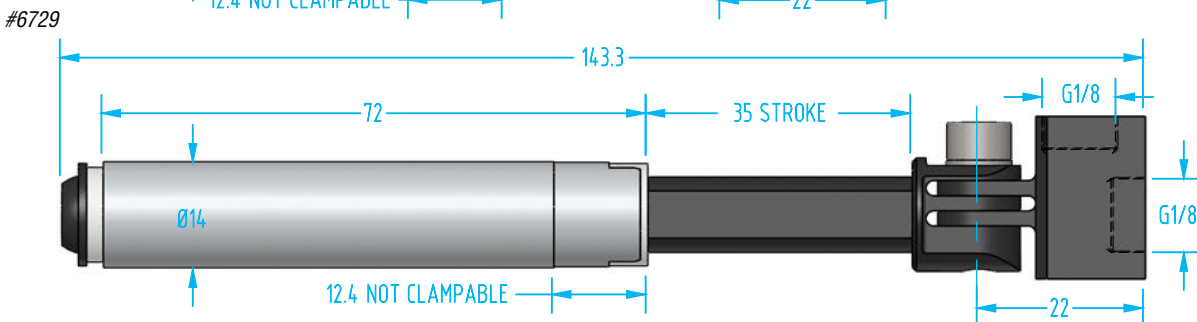
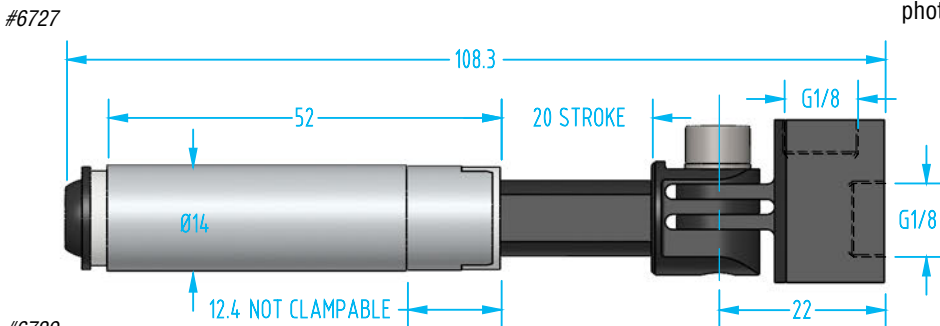
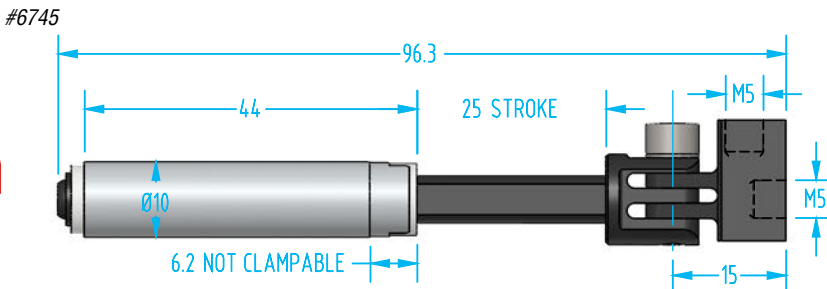
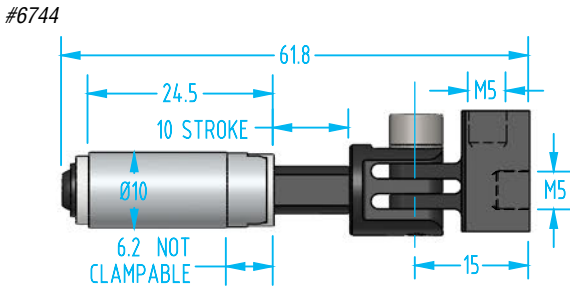


Suspensions with Integrated Elbow Arms – VSE

(Dimensioned drawings shown full scale)

- Adjustable angle from 0° and +/- 90°.
- Body and rod are made of anodized aluminum.
- Non-rotating
- Clampable, smooth body

New Design Changes!
 Phased in though 2021-2022



New Bushing and shaft design provides more reliable compensation. Check online product pages for current dimensional drawings and photos. www.EMlcorp.com and search by Q#.

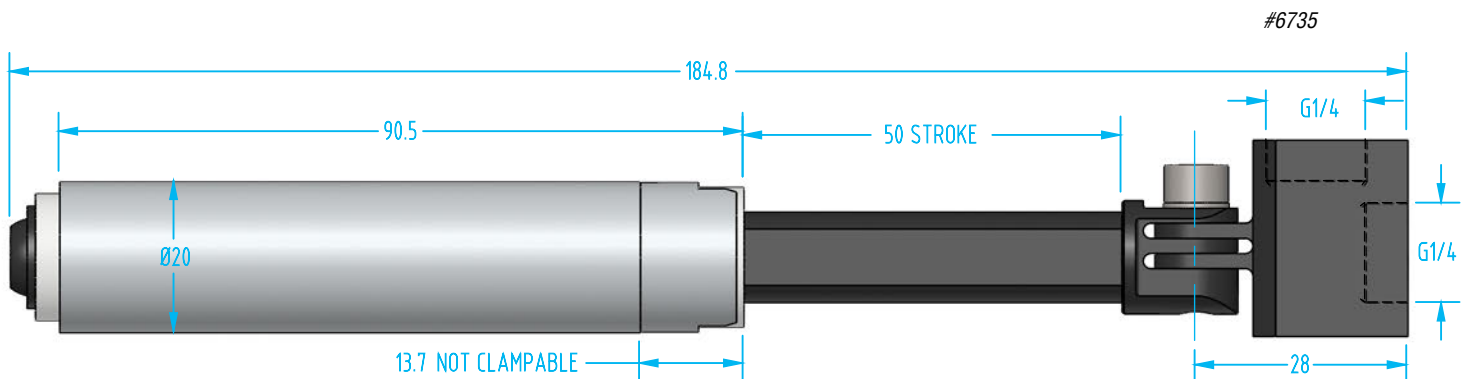
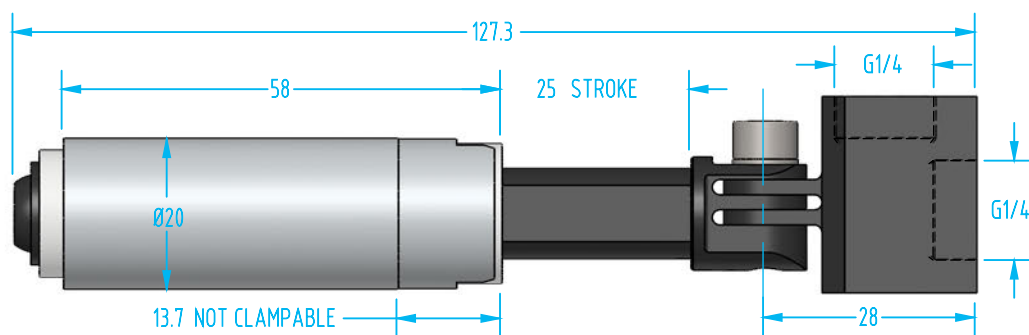
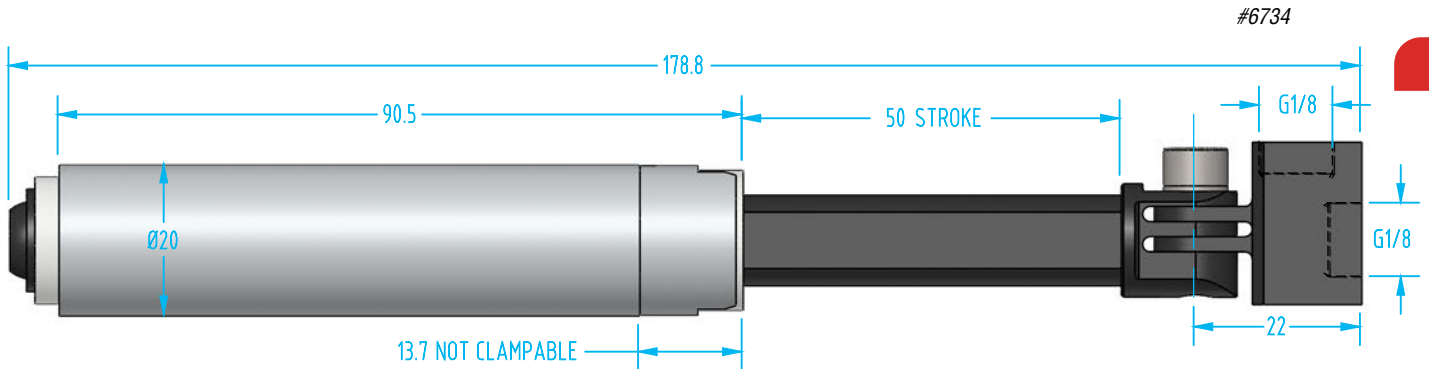
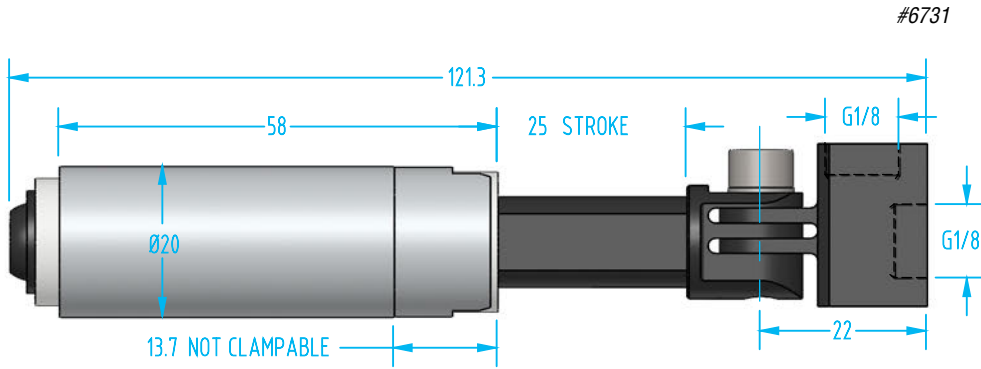
Quick#	Part#	Price	Air Port	ØD	Stroke	Wt.
6744	VSE1010F05	\$34.40	M5	10	10mm	15g
6745	VSE1025F05	\$38.10	M5	10	25mm	20g
6727	VSE1420F18	\$47.25	G1/8"	14	20mm	45g
6729	VSE1435F18	\$51.10	G1/8"	14	35mm	55g
6731	VSE2025F18	\$52.35	G1/8"	20	25mm	70g
6734	VSE2050F18	\$55.55	G1/8"	20	50mm	105g
6732	VSE2025F14	\$52.35	G1/4"	20	25mm	90g
6735	VSE2050F14	\$55.55	G1/4"	20	50mm	120g

Fittings Available
 on page 1043



Suspensions with Integrated Elbow Arms – VSE

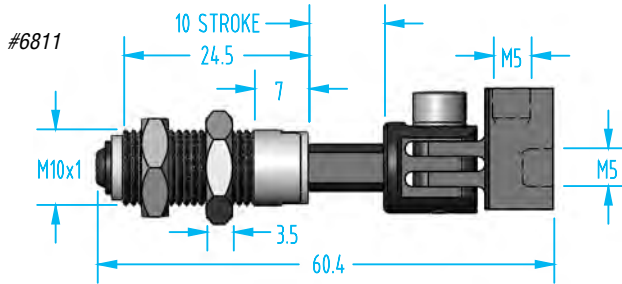
(Dimensioned drawings shown full scale)



Suspensions with Integrated Elbow Arms – VSET

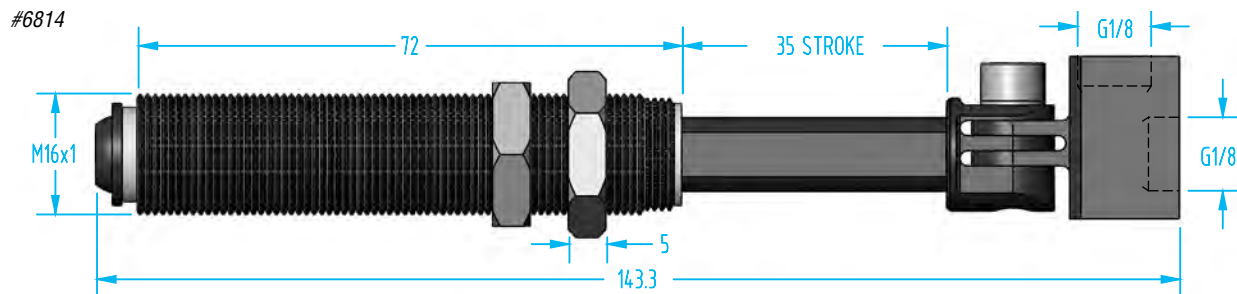
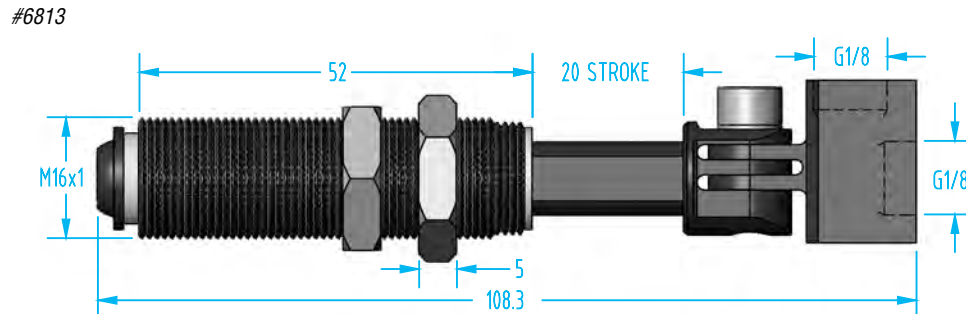
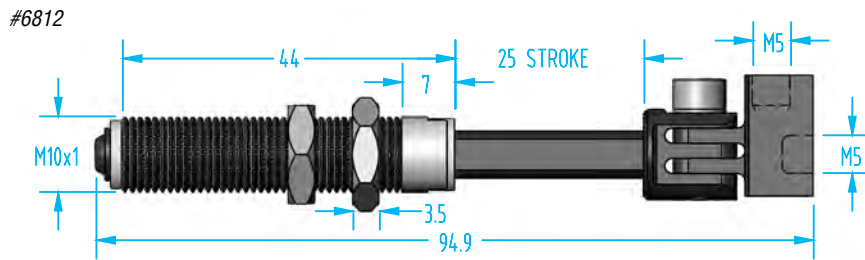
(Dimensioned drawings shown full scale)

- Adjustable angle from 0° and +/- 90°.
- Body and rod are made of anodized aluminum.
- Non-rotating, threaded body.
- We recommend using an appropriately sized lock washer with threaded body suspensions.



New Design Changes!

New bushing and shaft design provides more reliable compensation.



Quick#	Part#	Price	Air Port	Mount	Stroke	Wt.
6811	VSET1010F05	\$42.10	M5	M10x1	10mm	18g
6812	VSET1025F05	\$45.40	M5	M10x1	25mm	23g
6813	VSET1620F18	\$52.10	G1/8"	M16x1	20mm	57g
6814	VSET1635F18	\$55.60	G1/8"	M16x1	35mm	70g
6816	VSET2025F18	\$59.40	G1/8"	M20x1.5	25mm	88g
6815	VSET2025F14	\$59.40	G1/4"	M20x1.5	25mm	109g
6818	VSET2050F18	\$62.70	G1/8"	M20x1.5	50mm	125g
6817	VSET2050F14	\$62.70	G1/4"	M20x1.5	50mm	142g

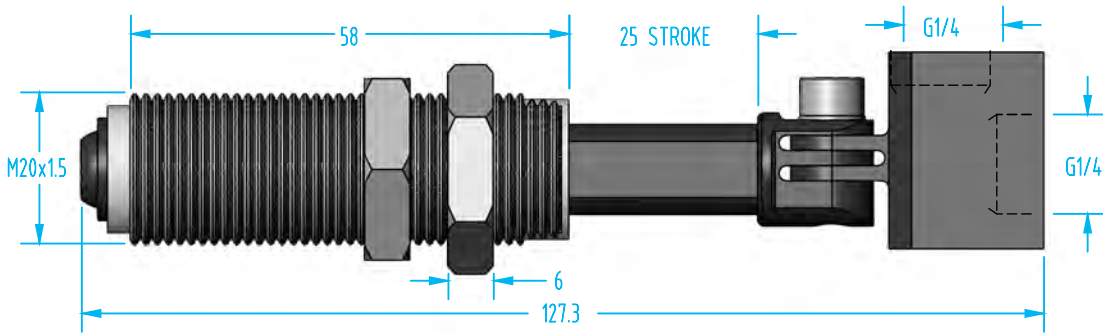
Lock Washers

Quick #	Part #	Description	Price
948	GSC-M10-LW	M10 Thin lock washer	\$0.20
939	GSC-M16-LW	M16 Thin lock washer	\$0.30
928	GSC-M20-LW	M20 Thin lock washer	\$1.00

Suspensions with Integrated Elbow Arms – VSET

(Dimensioned drawings shown full scale)

#6816



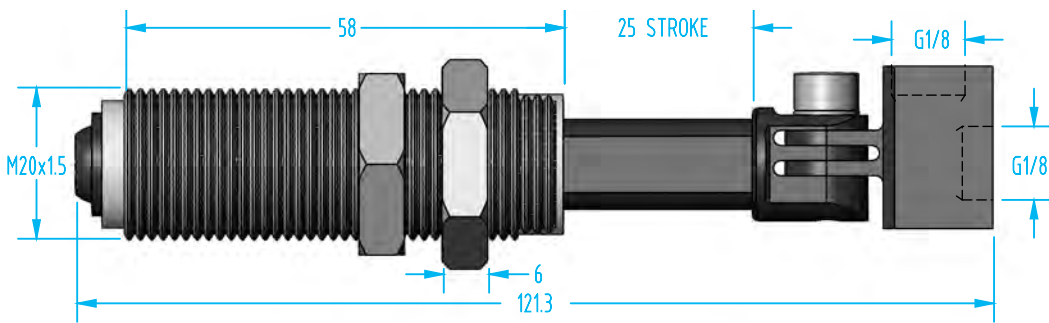
Fittings Available on page 1043



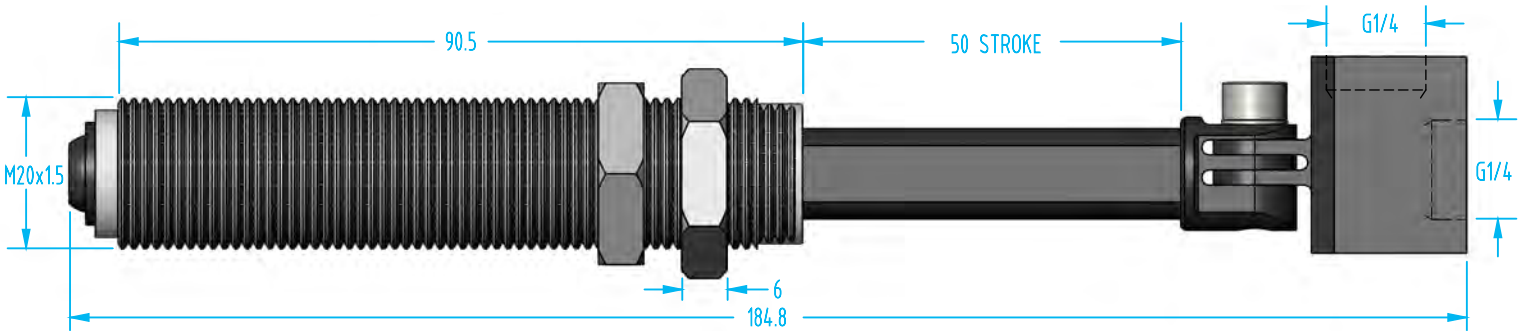
Mounting Brackets Available on page 244



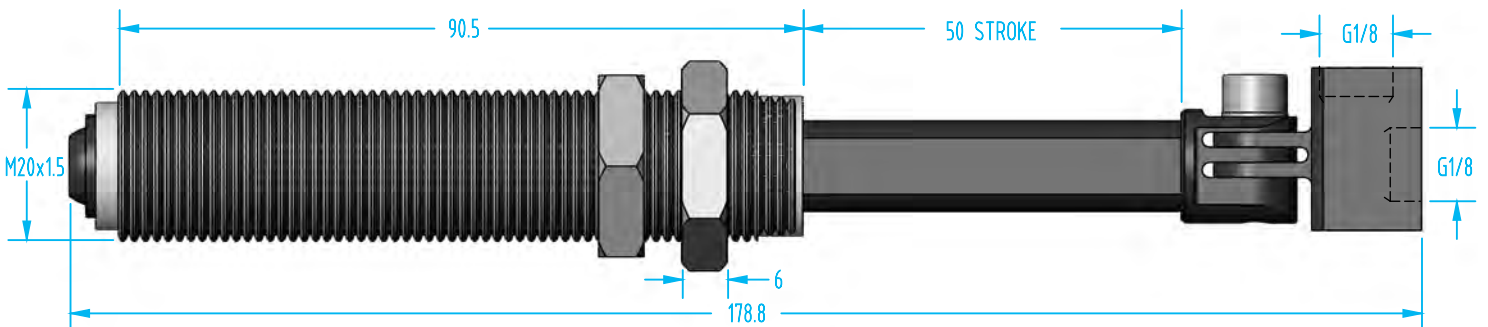
#6815



#6818



#6817



Suspensions with Brake – Clampable Body

- Aluminum body and steel rod.
- Pneumatic brake available in two options:
Normally Open (NO) = Supply pressure to engage brake, and
Normally closed (NC) = Supply pressure to unlock brake.
- Available in both rotating (VSRF) and non-rotating (VSNF) shafts.
- SS Sensors (for all models), SI Inductive Sensors (for NC models only) detects when the brake is engaged, not shaft position. See page 1007.

Pneumatic brake suspensions combine the compliance of a traditional suspension with the rigidity of a fixed location mount. They can be used in applications where height compensation is needed but then the suspension position must be maintained until the part is released. When locked, this prevents the suspension from exerting force which could affect part position or part integrity.

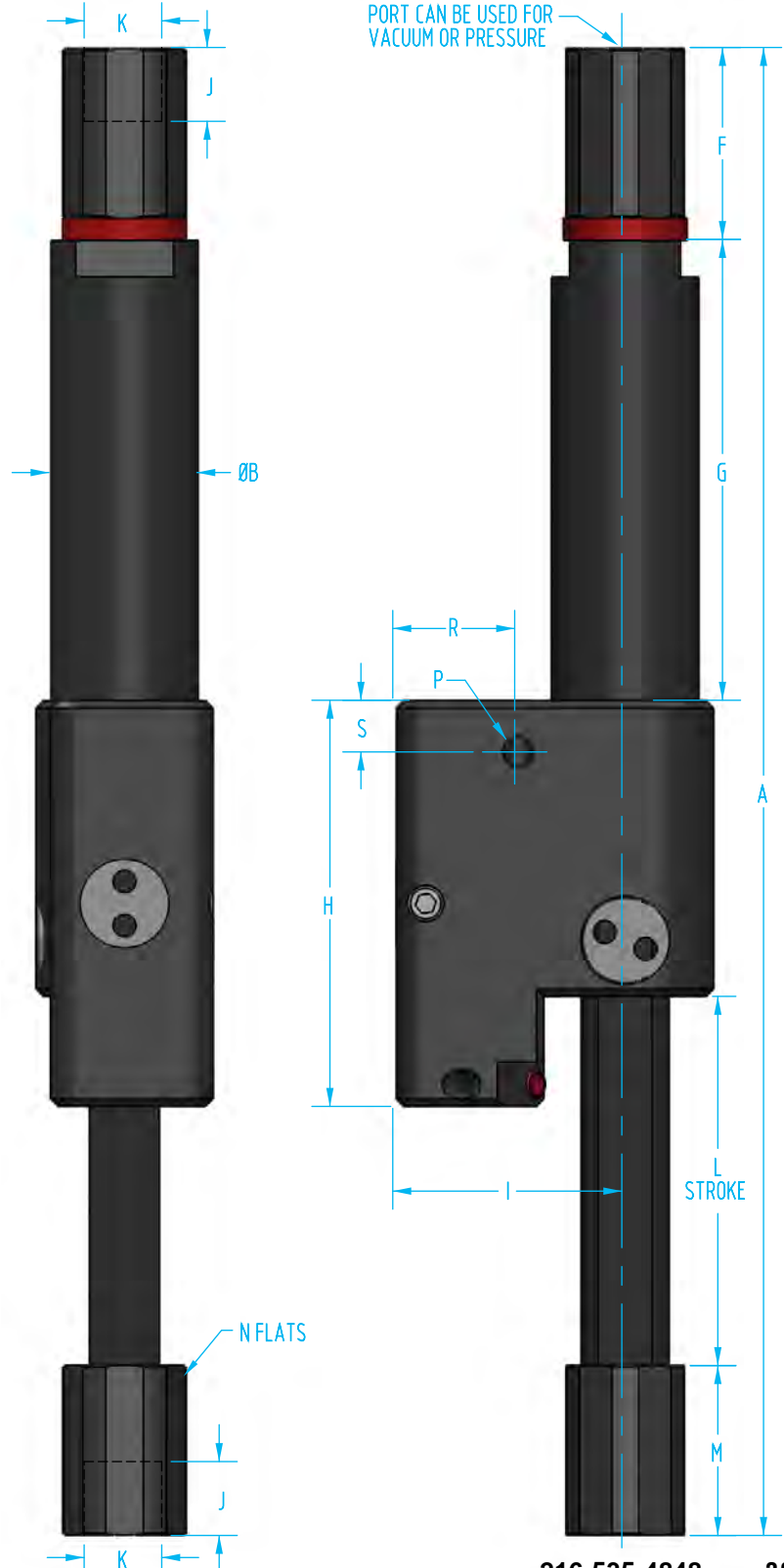
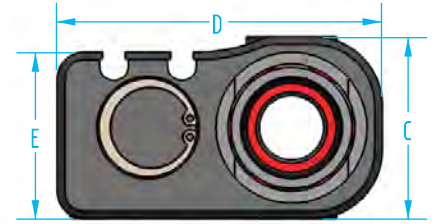
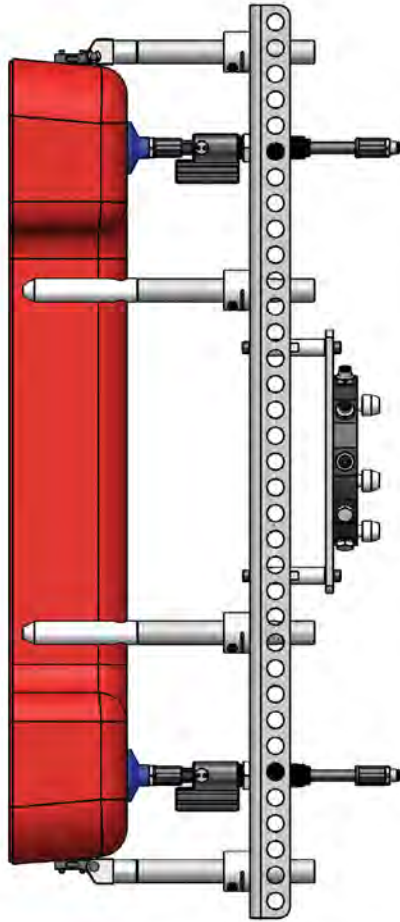
Also, by locking the suspension in place, this can reduce the occurrence of overcoming the spring force sometimes experienced in fast moving applications where part inertia is a factor.



Quick#	Part#	Price	Style	Pass Through Air Port (K)	Break Air Port (P)	ØD	Stroke	Operating Pressure for Locking (P1)	Operating Pressure for Unlocking (P2)	Braking Force	Wt.
7417	VSNF2050-NC	\$444.00	Non Rotating Shaft	G1/4"	M5	20	50mm	-	58-116psi	45lbf	254g
7418	VSNF2050-NO	\$444.00						58-101psi	-	1.24lbf x P1 – 34lbf	254g
7419	VSNF30100-NC	\$499.00		G3/8"	M5	30	100mm	-	58-116psi	112lbf	820g
7420	VSNF30100-NO	\$499.00						43-116 psi	-	3.1lbf x P1 – 90lbf	820g
7425	VSRF2050-NC	\$395.00	Rotating Shaft	G1/4"	M5	20	50mm	-	58-116psi	45lbf	254g
7426	VSRF2050-NO	\$395.00						58-101psi	-	1.24lbf x P1 – 34lbf	254g
7427	VSRF30100-NC	\$458.00		G3/8"	M5	30	100mm	-	58-116psi	112lbf	820g
7428	VSRF30100-NO	\$458.00						43-116 psi	-	3.1lbf x P1 – 90lbf	820g

Suspensions with Brake – Clampable Body

(Dimensioned drawings show full scale Size 20)



Pneumatic brake suspensions can absorb an ejection stroke and then be locked in place for degating as shown in the above application.

	Size 20 #7417 / 7418 #7425 / 7426	Size 30 #7419 / 7420 #7427 / 7428
A	201.5	324.5
B	20	30
C	24	35
D	43	57
E	22	32.2
F	26	28
G	62.4	113
H	55	65.5
I	31	40
J	10	13
K	G1/4"	G3/8"
L	50	100
M	23	18
N	16	24
P	M5	M5
R	16.5	18
S	7	8

Suspensions with Brake – Threaded Body

- Aluminum body and steel rod.
- Pneumatic brake available in two options:
Normally Open (NO) = Supply pressure to engage brake, and Normally closed (NC) = Supply pressure to unlock brake.
- Available in both rotating (VSRTF) and non-rotating (VSNTF) shafts.
- SS Sensors (for all models), SI Inductive Sensors (for NC models only) detects when the brake is engaged, not shaft position. See page 1007.

Pneumatic brake suspensions combine the compliance of a traditional suspension with the rigidity of a fixed location mount. They can be used in applications where height compensation is needed but then the suspension position must be maintained until the part is released. When locked, this prevents the suspension from exerting force which could affect part position or part integrity.

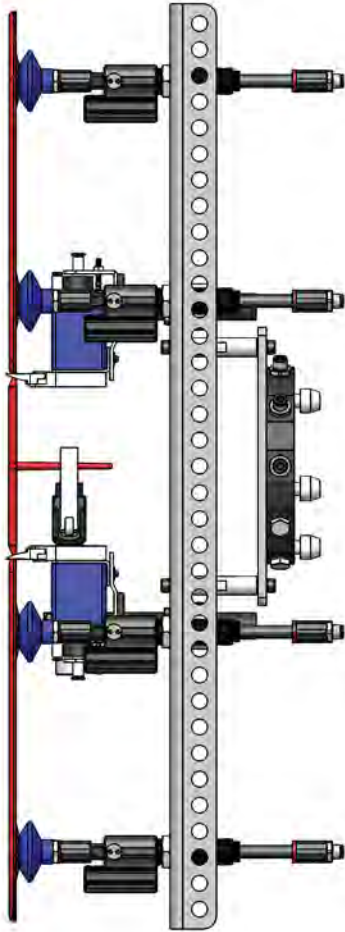
Also, by locking the suspension in place, this can reduce the occurrence of overcoming the spring force sometimes experienced in fast moving applications where part inertia is a factor.



Quick#	Part#	Price	Style	Pass Through Air Port (K)	Break Air Port (P)	Mount	Stroke	Operating Pressure for Locking (P1)	Operating Pressure for Unlocking (P2)	Braking Force	Wt.
7421	VSNTF2050-NC	\$444.00	Non Rotating Shaft	G1/4"	M5	M20x1.5	50mm	-	58-116psi	45lbf	270g
7422	VSNTF2050-NO	\$444.00		58-101psi	-	1.24lbf x P1 – 34lbf	270g				
7423	VSNTF30100-NC	\$522.00		G3/8"	M5	M30x1.5	100mm	-	58-116psi	112lbf	890g
7424	VSNTF30100-NO	\$522.00		43-116 psi	-	3.1lbf x P1 – 90lbf	890g				
7429	VSRTF2050-NC	\$395.00	Rotating Shaft	G1/4"	M5	M20x1.5	50mm	-	58-116psi	45lbf	270g
7430	VSRTF2050-NO	\$395.00		58-101psi	-	1.24lbf x P1 – 34lbf	270g				
7431	VSRTF30100-NC	\$489.00		G3/8"	M5	M30x1.5	100mm	-	58-116psi	112lbf	890g
7432	VSRTF30100-NO	\$489.00		43-116 psi	-	3.1lbf x P1 – 90lbf	890g				

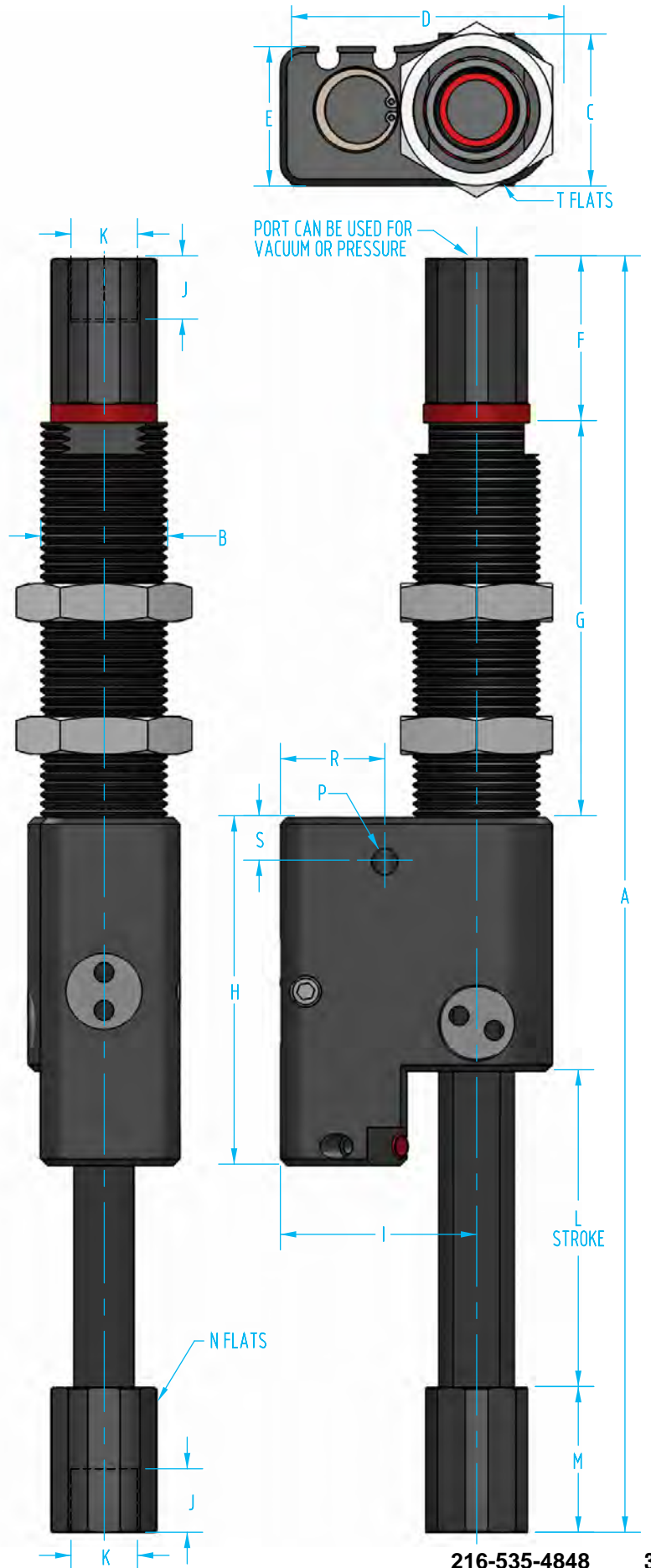
Suspensions with Brake – Threaded Body

(Dimensioned drawings show full scale Size 20)



Pneumatic brake suspensions can absorb an ejection stroke and then be locked in place for degating as shown in the above application.

	Size 20 #7421 / 7422 #7429 / 7430	Size 30 #7423 / 7424 #7431 / 7432
A	201.5	324.5
B	M20x1.5	M30x1.5
C	24	35
D	43	57
E	22	32.2
F	26	28
G	62.4	113
H	55	65.5
I	31	40
J	10	13
K	G1/4"	G3/8"
L	50	100
M	23	18
N	16	24
P	M5	M5
R	16.5	18
S	7	8
T	24	36

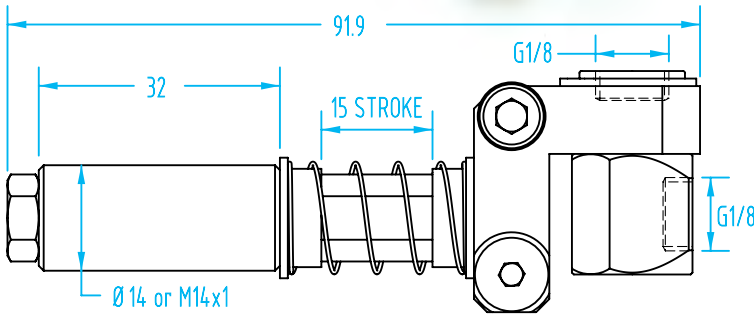
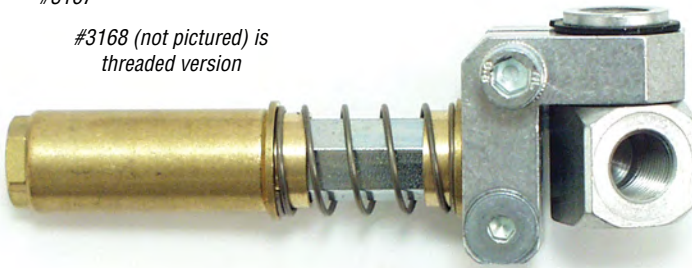


M14 / Ø14mm Suspensions

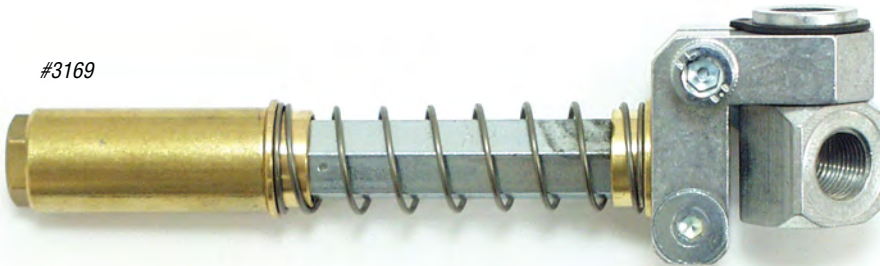
(Dimensioned drawings shown full scale)

#3167

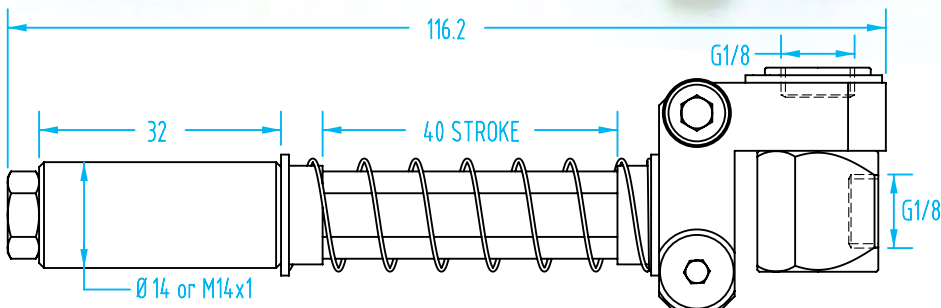
#3168 (not pictured) is threaded version



#3169



#3170



Quick#	Part#	>ASS< #	Style	Stroke	Weight	Price
3167	GGs14-C-15	1-360-09-00	Clampable, Non-rotate	15mm	81g	\$47.78
3168	GGs14-M-15	1-360-12-00	Threaded, Non-rotate	15mm	91g	\$49.35
3169	GGs14-C-40	1-360-15-00	Clampable, Non-rotate	40mm	90g	\$51.98
3170	GGs14-M-40	1-360-18-00	Threaded, Non-rotate	40mm	101g	\$53.03

We recommend using an appropriately sized lock washer with threaded body suspensions, see page 1076.

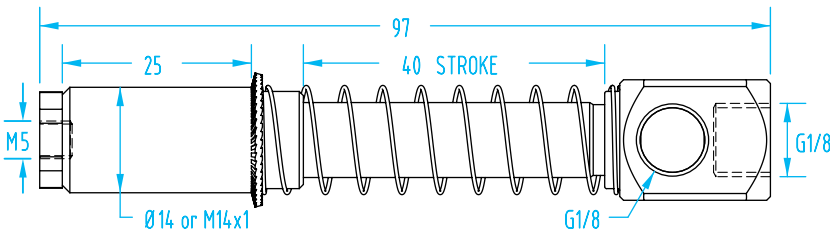
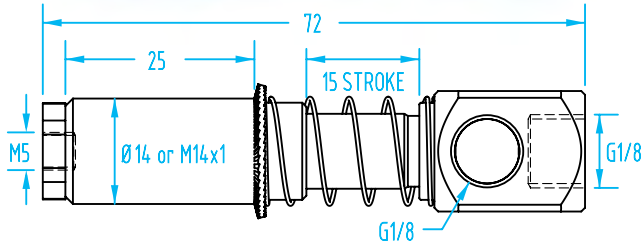
M14 / Ø14mm Suspensions

(Dimensioned drawings shown full scale)

#3601



#3606



- Two options for fitting placement. It can either be fed through the side port (plugged initially) or it can pass through the vacuum channel which extends through the suspension body.

Fittings Available on page 1043



Mounting Brackets Available on page 244

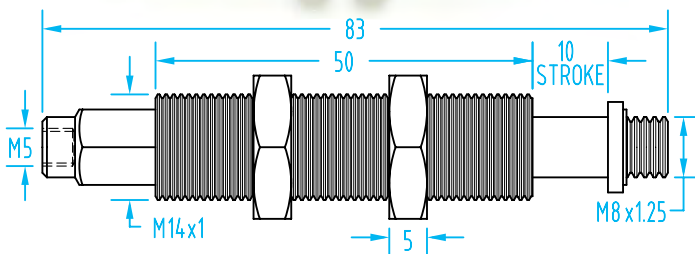


Quick#	Part#	>ASS< #	Style	Stroke	Weight	Price
3601	GAF14-U-15	1-356-02-00	Clampable, Rotate	15mm	51g	\$39.90
3606	GAF14-M-15	1-356-11-00	Threaded, Rotate	15mm	69g	\$45.15
3602	GAF14-U-40	1-356-03-00	Clampable, Rotate	40mm	55g	\$43.58
3608	GAF14-M-40	1-356-12-00	Threaded, Rotate	40mm	73g	\$54.08

#339



#340

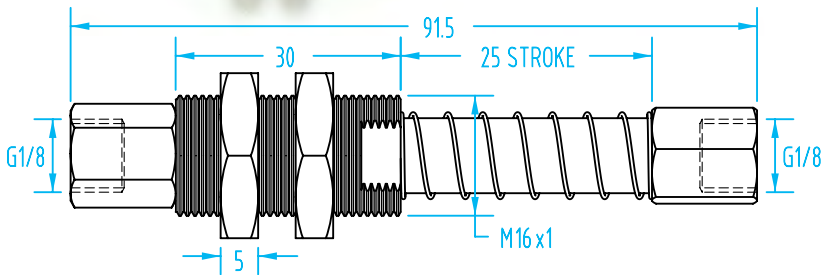


Quick#	Part#	Style	Stroke	Weight	Price
339	GSS-88-M14M5	Rotate	10mm	69g	\$18.39
340	GSS-88R-M14M5	Non-Rotate	10mm	67g	\$28.69

M16 Suspensions

(Dimensioned drawings shown full scale)

#457



Quick#	Part#	Style	Stroke	Weight	Price
457	GSS-85-M16G8F	Rotate	25mm	97g	\$36.90
458	GSS-85R-M16G8F	Non-Rotate	25mm	95g	\$46.80

#458 and #460 Non-rotating style are similar to #1409, on page 308.

Use Quick#s for easy online ordering.

Mounting Brackets Available on page 244

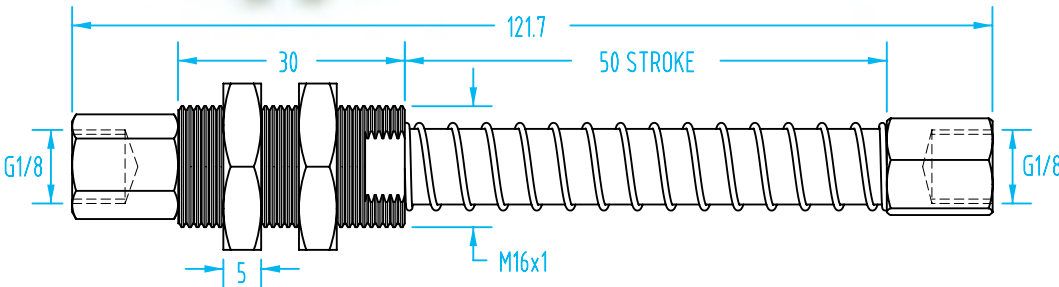
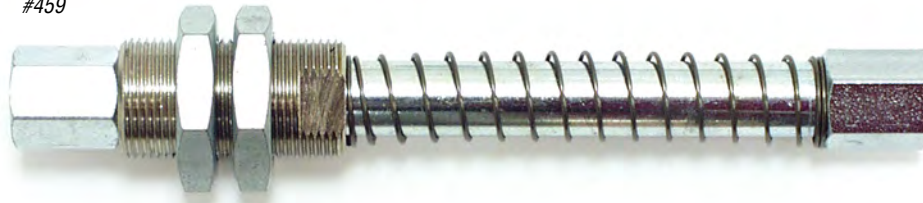


Fittings Available on page 1043



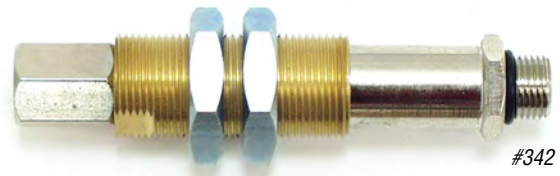
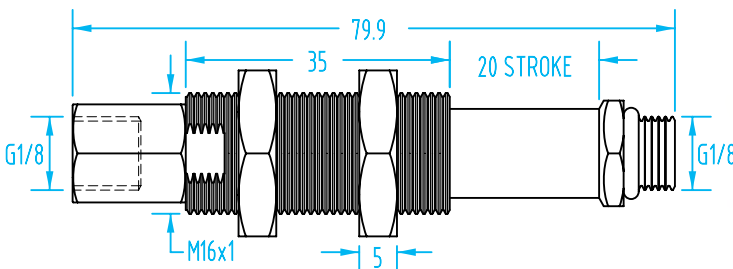
We recommend using an appropriately sized lock washer with threaded body suspensions, see page 1076.

#459



Quick#	Part#	Style	Stroke	Weight	Price
459	GSS-115-M16G8F	Rotate	50mm	114g	\$41.60
460	GSS-115R-M16G8F	Non-Rotate	50mm	110g	\$52.80

#458 and #460 Non-rotating style are similar to #1409, on page 308.

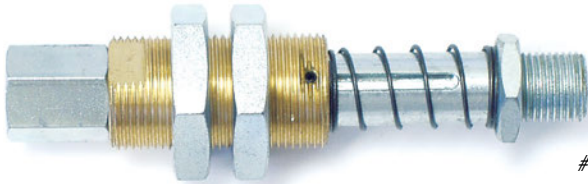


#342

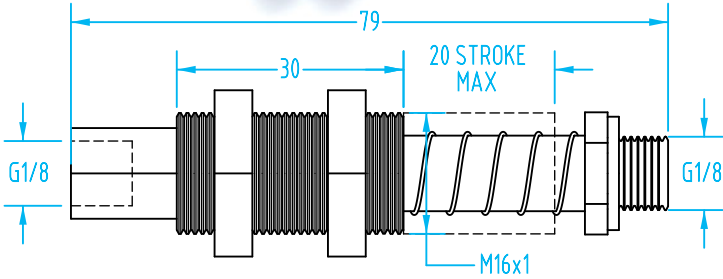
Quick#	Part#	Style	Stroke	Weight	Price
342	GSS-80-M16G8	Rotate	20mm	72g	\$50.99

M16 Suspensions

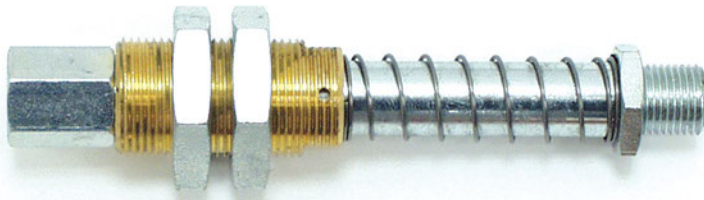
(Dimensioned drawings shown full scale)



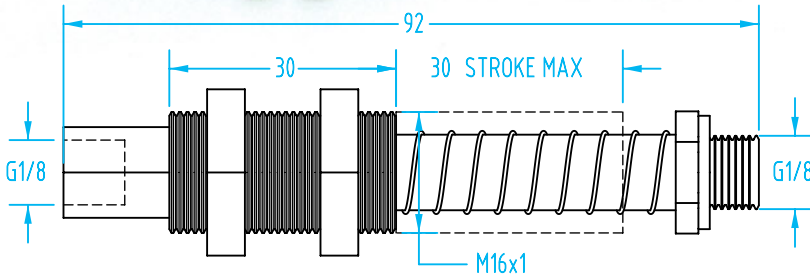
#338



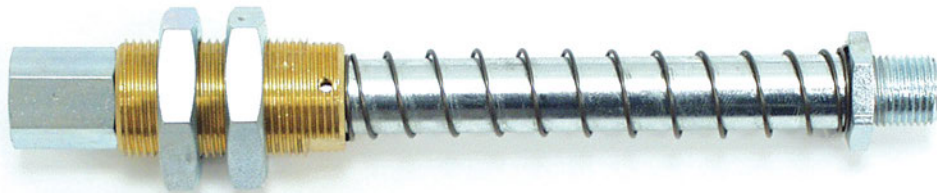
Quick#	Part#	Style	Stroke	Weight	Price
338	GSS-80R-M16G8	Non-Rotate	20mm	90g	\$101.07



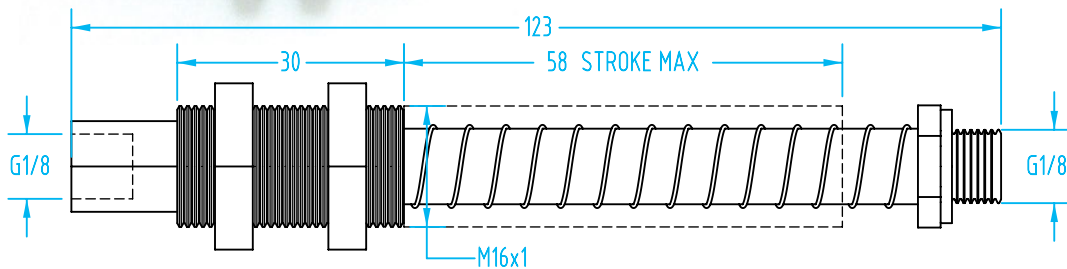
#334



Quick#	Part#	Style	Stroke	Weight	Price
334	GSS-85-M16G8	Rotate	30mm	92g	\$82.70



#335



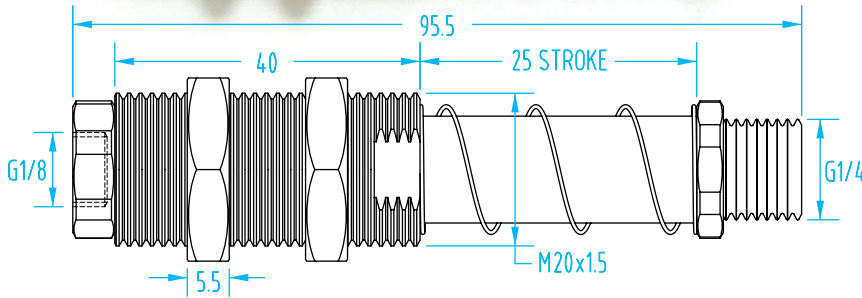
Quick#	Part#	Style	Stroke	Weight	Price
335	GSS-115-M16G8	Rotate	50mm	109g	\$85.67
455	GSS-115R-M16G8	Non-Rotate	50mm	105g	\$100.83

#455 Non-rotating style is similar to #1409, on page 308.

M20 Suspensions

(Dimensioned drawings shown full scale)

#1407



Quick#	Part#	Style	Stroke	Weight	Price
1407	GSS-85-M20G4	Rotate	25mm	136g	\$60.53
1409	GSS-85R-M20G4	Non-rotate	25mm	134g	\$121.84

Fittings Available on page 1043



Mounting Brackets Available on page 244

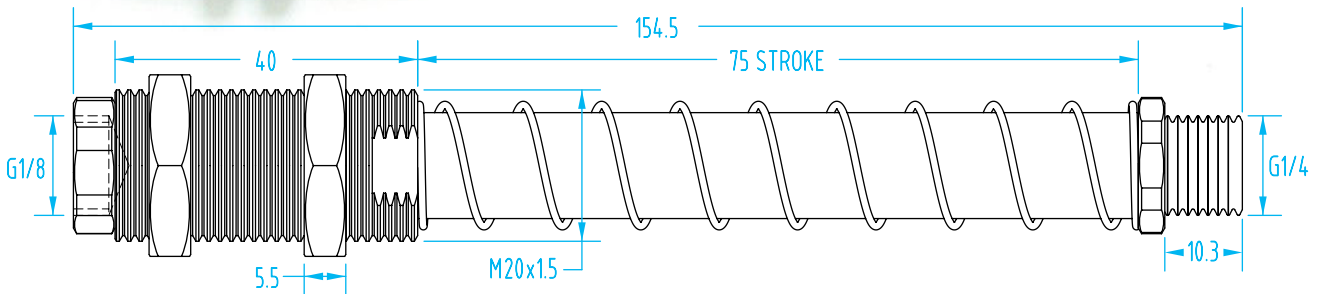


We recommend using a lock washer with threaded body suspensions, see page 1076.

#1410



Non-rotating



Quick#	Part#	Style	Stroke	Weight	Price
1408	GSS-145-M20G4	Rotate	75mm	192g	\$103.11
1410	GSS-145R-M20G4	Non-rotate	75mm	186g	\$162.58

- Bottom-side G1/8" air port, eliminating any interference.
- G1/4" air port for vacuum attachments.
- Anodized aluminum Ø20mm clampable body.
- Extendable reach with M17x1 thread and VLR Extension tubes.
- Dimensional drawing can be found online.



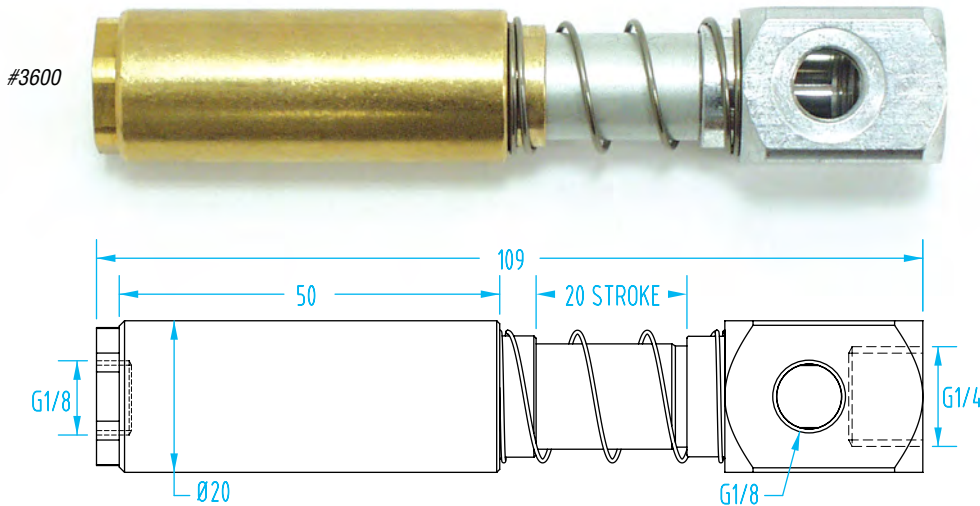
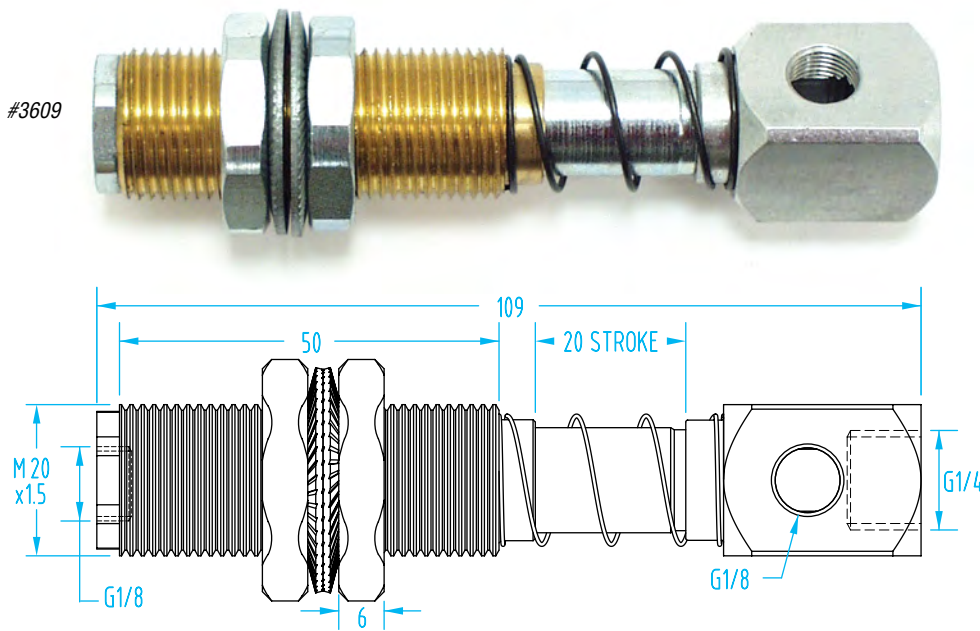
NEW

Non-Rotating Ø20mm Suspension with Internal Spring

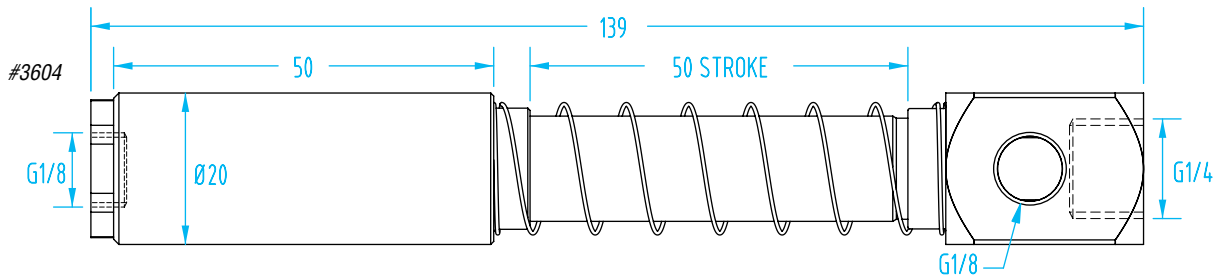
Quick#	Part#	>ASS< #	Style	Stroke	Wt.	Price
3950	GIF-UT-20-1/4-1/8-20	1-359-15-00	Non-rotate	20mm	55g	\$56.70

M20 / Ø20mm Suspensions

(Dimensioned drawings shown full scale)



- Two options for fitting placement. It can either be fed through the side port (plugged initially) or it can pass through the vacuum channel which extends through the suspension body.



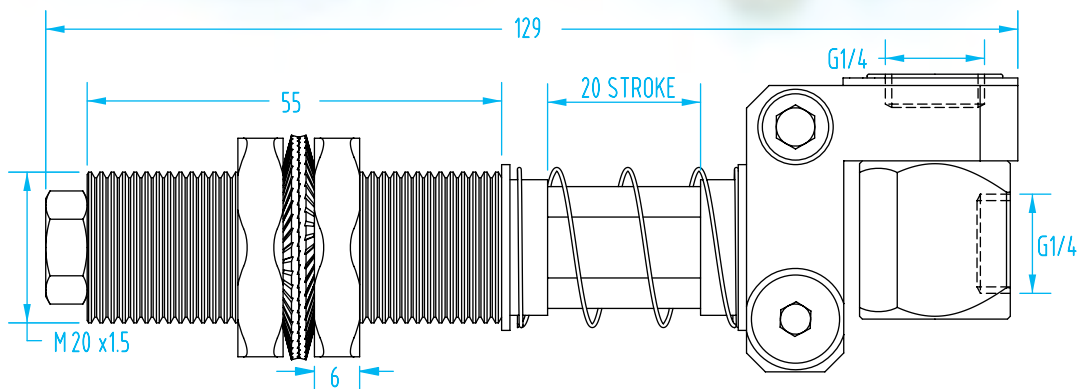
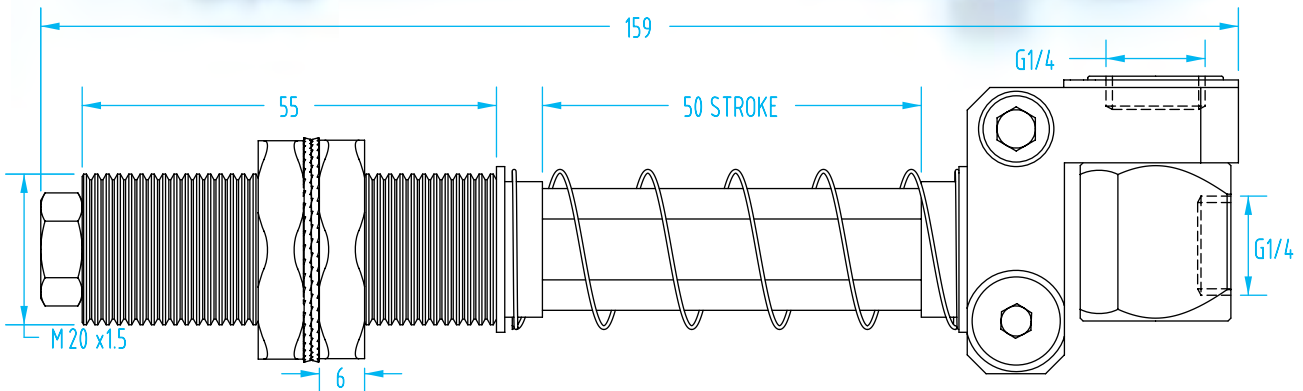
#3610 (not pictured) is threaded version

Quick#	Part#	>ASS< #	Style	Stroke	Weight	Price
3609	GAF20-M-20	1-356-13-00	Threaded, Rotate	20mm	167g	\$48.83
3600	GAF20-U-20	1-356-04-00	Clampable, Rotate	20mm	126g	\$43.05
3610	GAF20-M-50	1-356-14-00	Threaded, Rotate	50mm	175g	\$51.45
3604	GAF20-U-50	1-356-05-00	Clampable, Rotate	50mm	134g	\$45.68

Use Quick#s for easy online ordering.

M20 Suspensions

(Dimensioned drawings shown full scale)



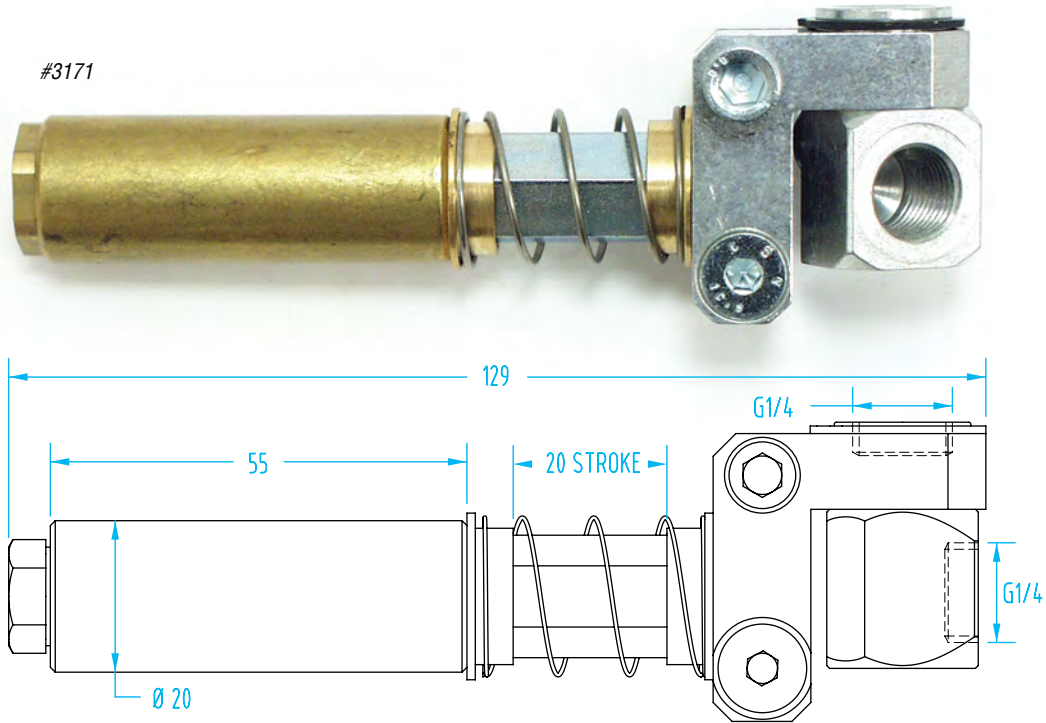
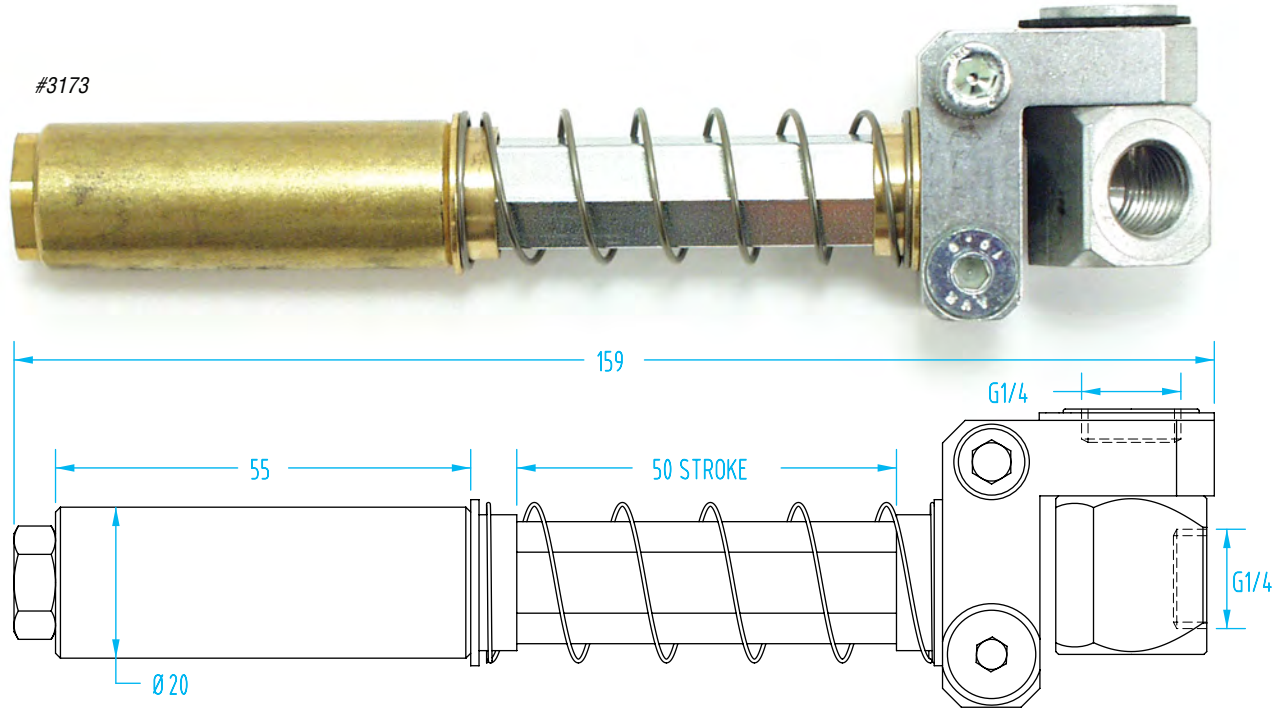
Quick#	Part#	>ASS< #	Style	Stroke	Weight	Price
3174	GG20-M-50	1-360-30-00	Non-rotate	50mm	231g	\$58.28
3172	GG20-M-20	1-360-24-00	Non-rotate	20mm	212g	\$55.65

Fittings Available
on page 1043



Ø20mm Suspensions

(Dimensioned drawings shown full scale)



Mounting Brackets
Available on
page 244

Quick#	Part#	>ASS< #	Style	Stroke	Weight	Price
3173	GGS20-C-50	1-360-27-00	Non-rotate	50mm	209g	\$56.70
3171	GGS20-C-20	1-360-21-00	Non-rotate	20mm	191g	\$53.55

Suspension Reactive Spring Force data is available on each online product page: www.EMlcorp.com

Non-Rotating Suspension for Actuators – VMK

- Heavy-duty, non-rotative
- For all actuators and brackets with Ø14mm, Ø20mm and Ø30mm.
- The compressed position of the suspension can be detected by a sensor (inductive sensors for VMK-20 & VMK-30 only).
- With through hole for air hoses.
- Clampable



VMK Suspension

Optional Spring

Quick#	Part#	Stroke	Spring force (lbs)	Clamp	Actuator	Price	Wt.	Quick#	Increased force with optional spring (lbs)
7135	VMK14	10mm	1.12–1.34	Ø20	Ø14	\$165.00	55g		not available
7136	VMK20	13mm	1.57–2.24	Ø30	Ø20	\$188.00	160g	5347	6.29–8.99
7137	VMK30	16mm	1.57–2.24	Ø30	Ø30	\$218.00	250g	5347	6.29–8.99

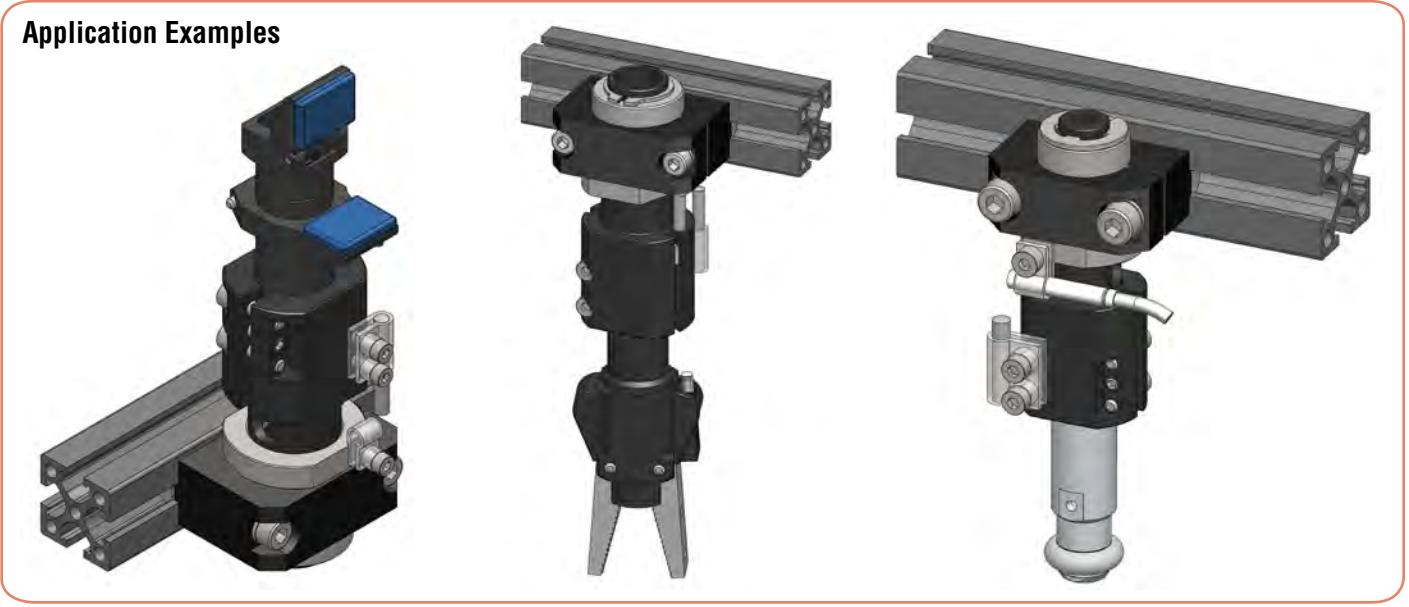
C-Slot, 3-wire Sensors

Quick#	Part#	Signal	Description	Price
1882	SS4N225G	PNP	2.5m Cable	\$27.20
1883	SS4M225G	NPN	2.5m Cable	\$27.20
6282	SS3N203G	PNP	0.3m Cable & M8 male connector	\$31.16
1884	SS3M203G	NPN	0.3m Cable & M8 male connector	\$31.16

Inductive Sensors Only for VMK-20 & VMK-30

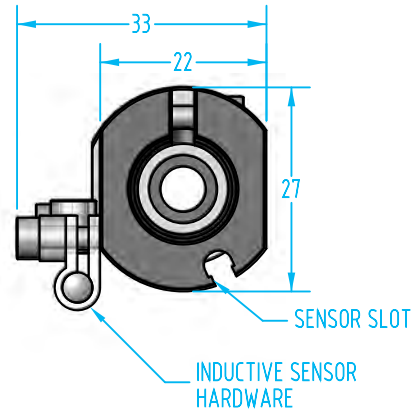
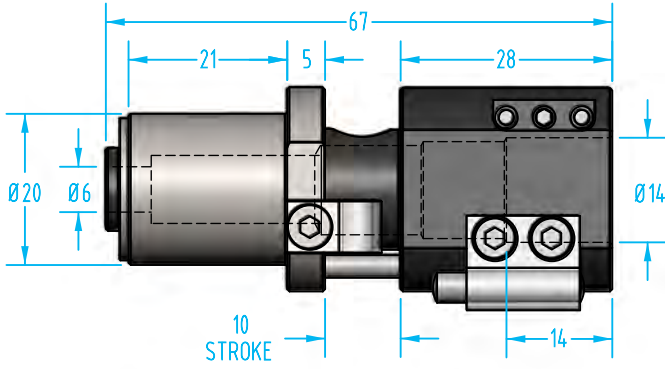
2429	GSG-IS-NPN	NPN	4mm Normally open, 3-wire	\$62.00
2430	GSG-IS-PNP	PNP	4mm Normally open, 3-wire	\$62.00

Application Examples

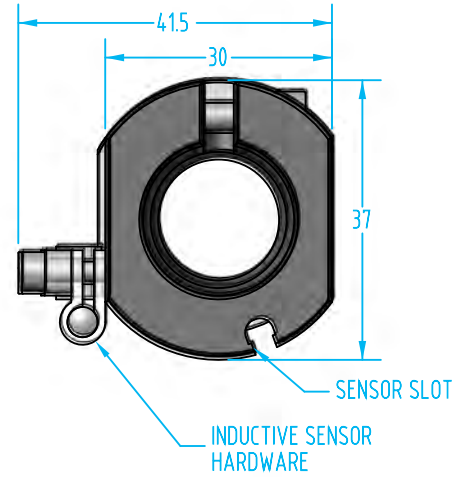
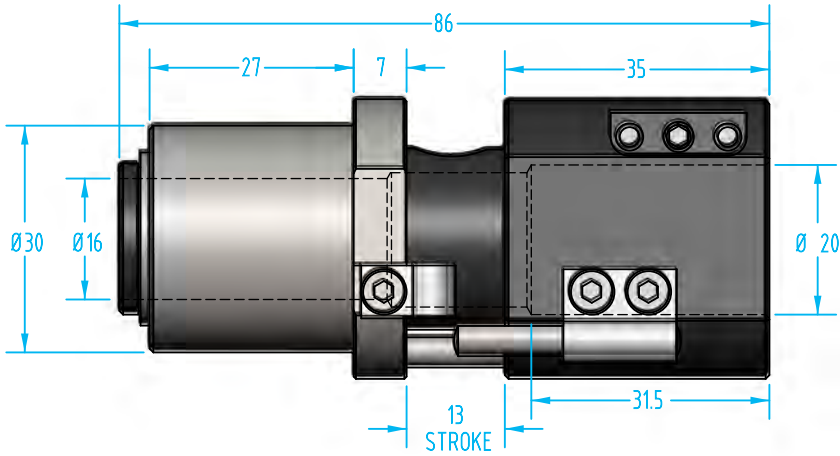


Non-Rotating Suspension for Actuators – VMK

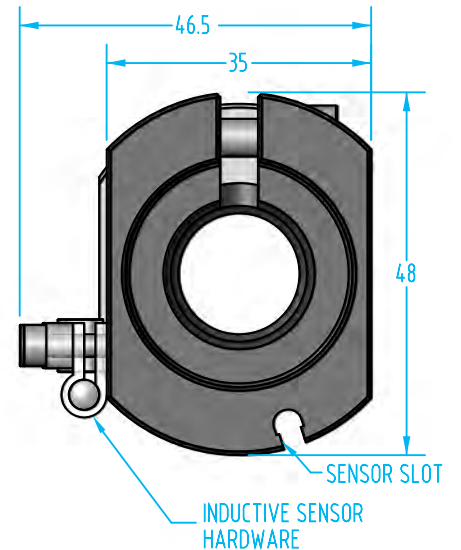
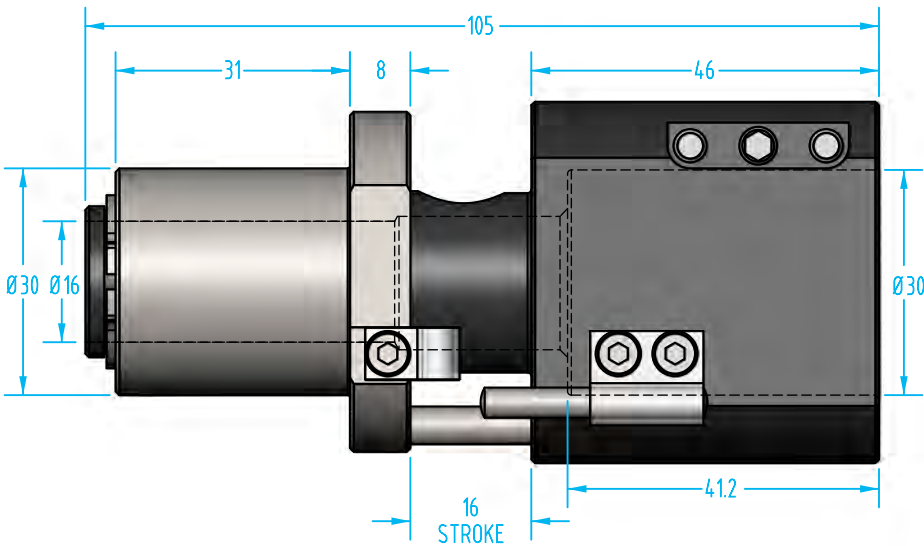
(Dimensioned drawings shown full scale)



#7135



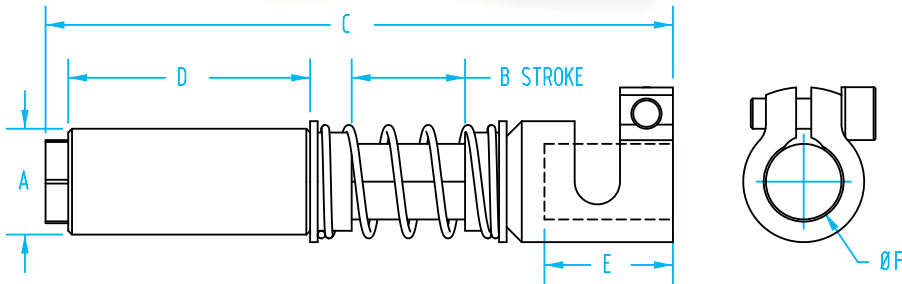
#7107



Non-Rotating Suspension with Gripper Arm



#3650 (shown at 100% scale)

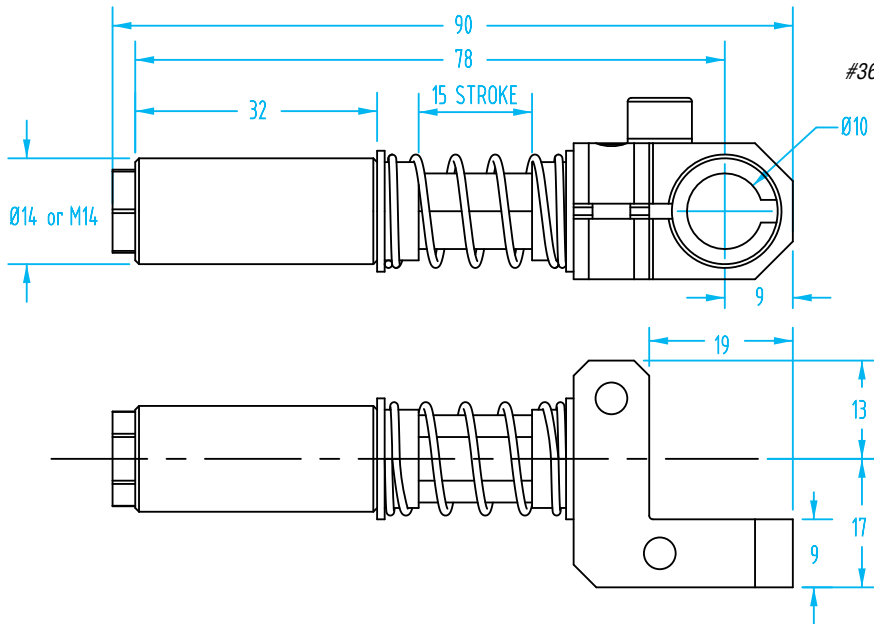


Spring Loaded Elbow Arm
on page 216

NEW

NEW

Quick#	Part#	>ASS< #	Style	ØA	B (Stroke)	C	D	E	ØF	Price	Wt.
3650	GGG-14-10-15	1-363-09-00	Clampable	14	15mm	83	32	17	10	\$116.55	44g
3651	GGG-20-20-20	1-363-21-00		20	20mm	130	55	37	20	\$119.18	138g
3367	GGG-20-20-50	1-363-27-00		20	50mm	160	55	32	20	\$121.15	138g
3690	GGG-M14-10-15	1-363-12-00	Threaded	M14x1	15mm	83	32	17	10	\$116.55	62g
3691	GGG-M20-20-20	1-363-24-00		M20x1.5	20mm	130	55	37	20	\$119.18	179g
3368	GGG-M20-20-50	1-363-30-00		M20x1.5	50mm	160	55	32	20	\$121.15	179g

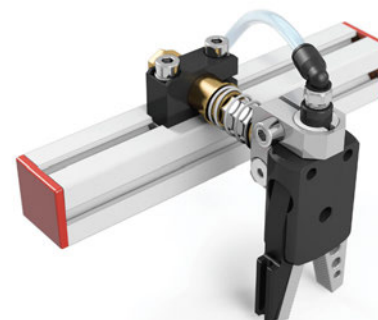
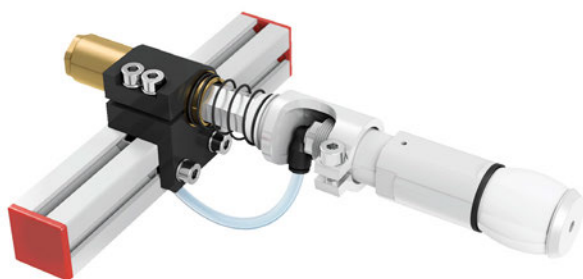


#3648 (shown at 100% scale)



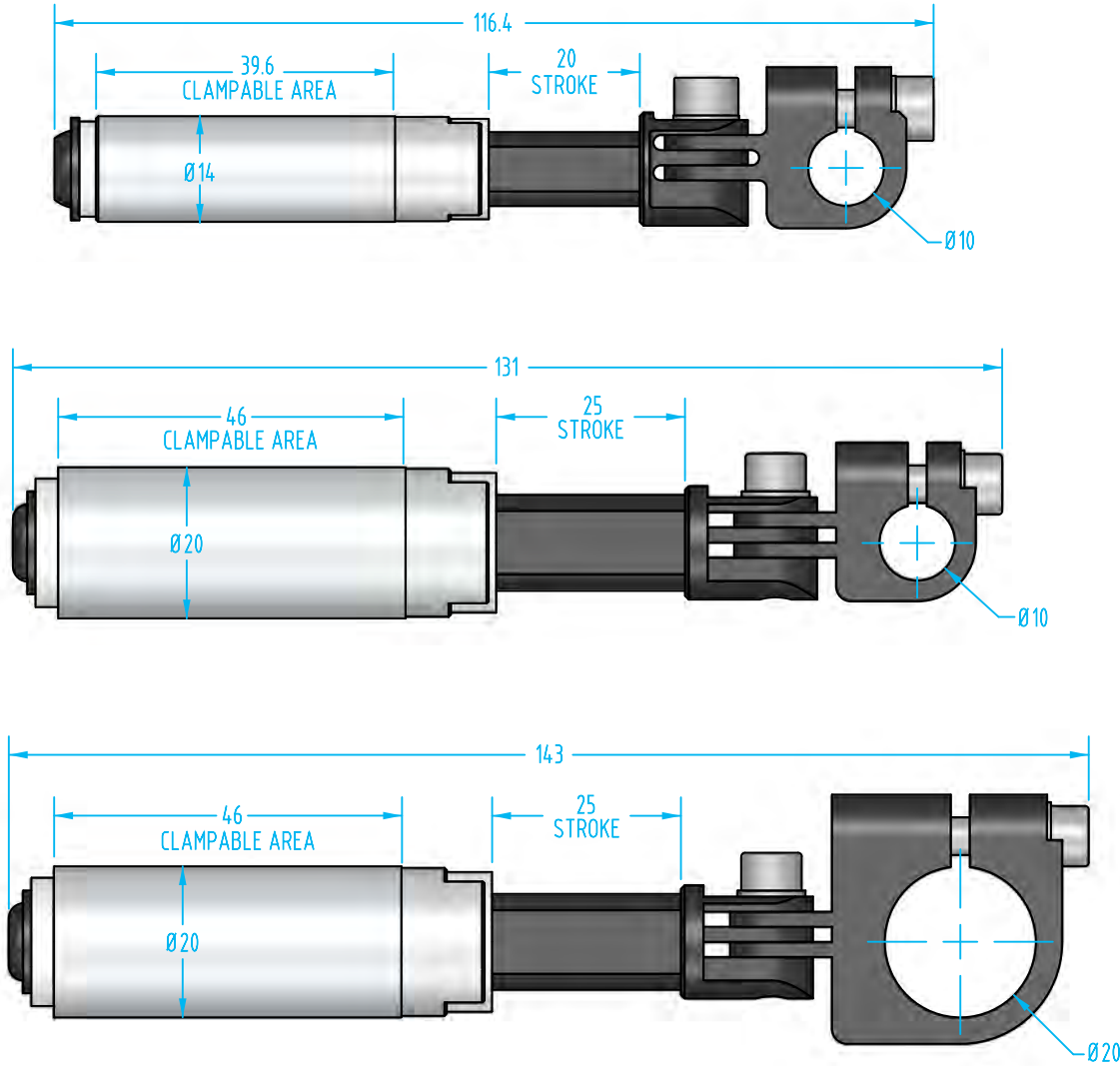
Quick#	Part#	>ASS< #	Style	Stroke	Ø	Price	Wt.
3648	GGG-90-14-10-15	1-364-09-00	Clampable	15mm	14	\$57.75	57g
3649	GGG-90-M14-10-15	1-364-12-00	Theaded	15mm	M14x1	\$59.85	75g

Application Example



Non-Rotating Suspension with Adjustable Clamp

(Dimensioned drawings shown full scale)

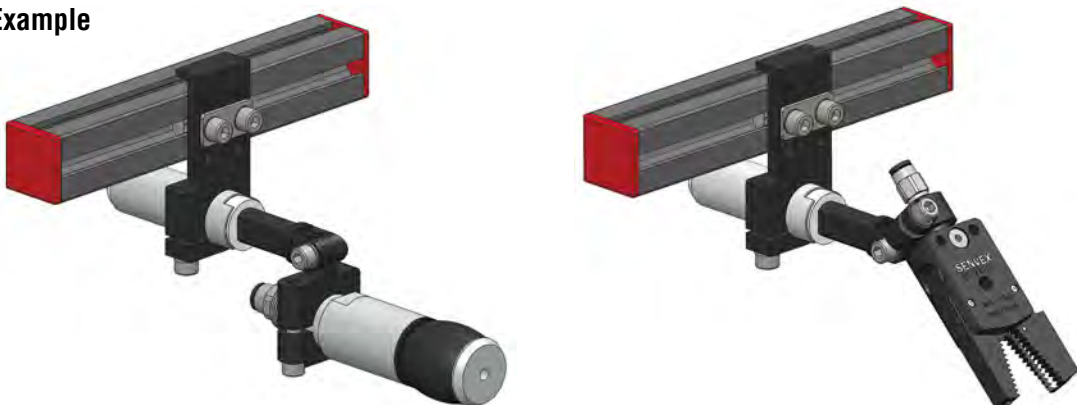


Mounting Brackets Available on page 244

Fittings Available on page 1043

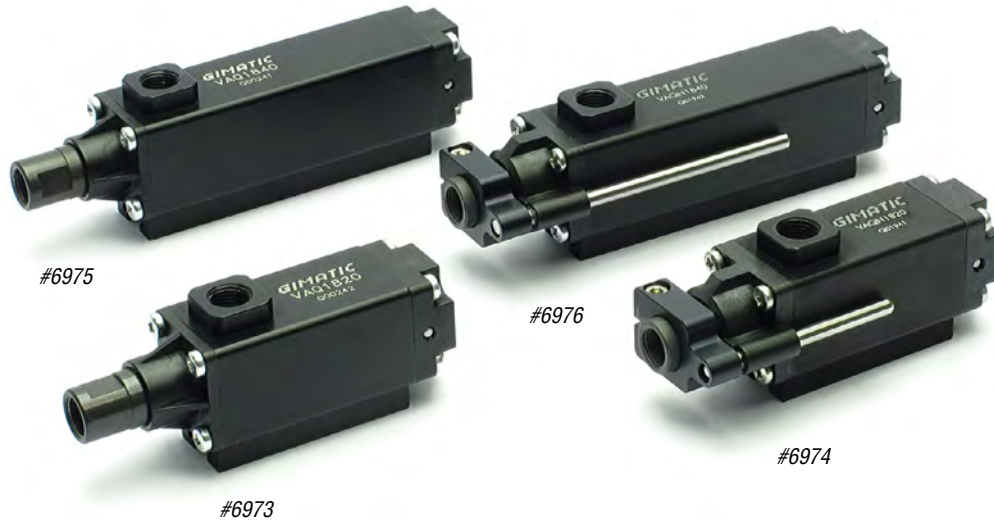
Quick#	Part#	Stroke	Price	Wt.
7453	VSD1420D10	20mm	\$60.40	43g
7454	VSD2025D10	25mm	\$62.50	69g
7455	VSD2025D20	25mm	\$65.60	85g

Application Example



Vacuum Suspensions – VAQ

- Operated by vacuum only.
- The extension and the retraction movements are automatically actuated.
- The stroke is self-adjusting.
- Temperature range from 50° to 104°F.



Quick#	Part#	Price	Style	Total Stroke	Stroke with Full Force	Max. Vertical Load	Min. Vacuum Flow	Min. Vacuum Level	Weight
6973	VAQ1820	\$99.00	Rotating	25mm	20mm	500g	1.06 SCFM	30%	90g
6975	VAQ1840	\$107.00		55mm	40mm				125g
6974	VAQN1820	\$129.00	Non-Rotating	25mm	20mm	500g	1.06 SCFM	30%	105g
6976	VAQN1840	\$140.00		55mm	40mm				145g

Use Quick#s for easy online ordering.



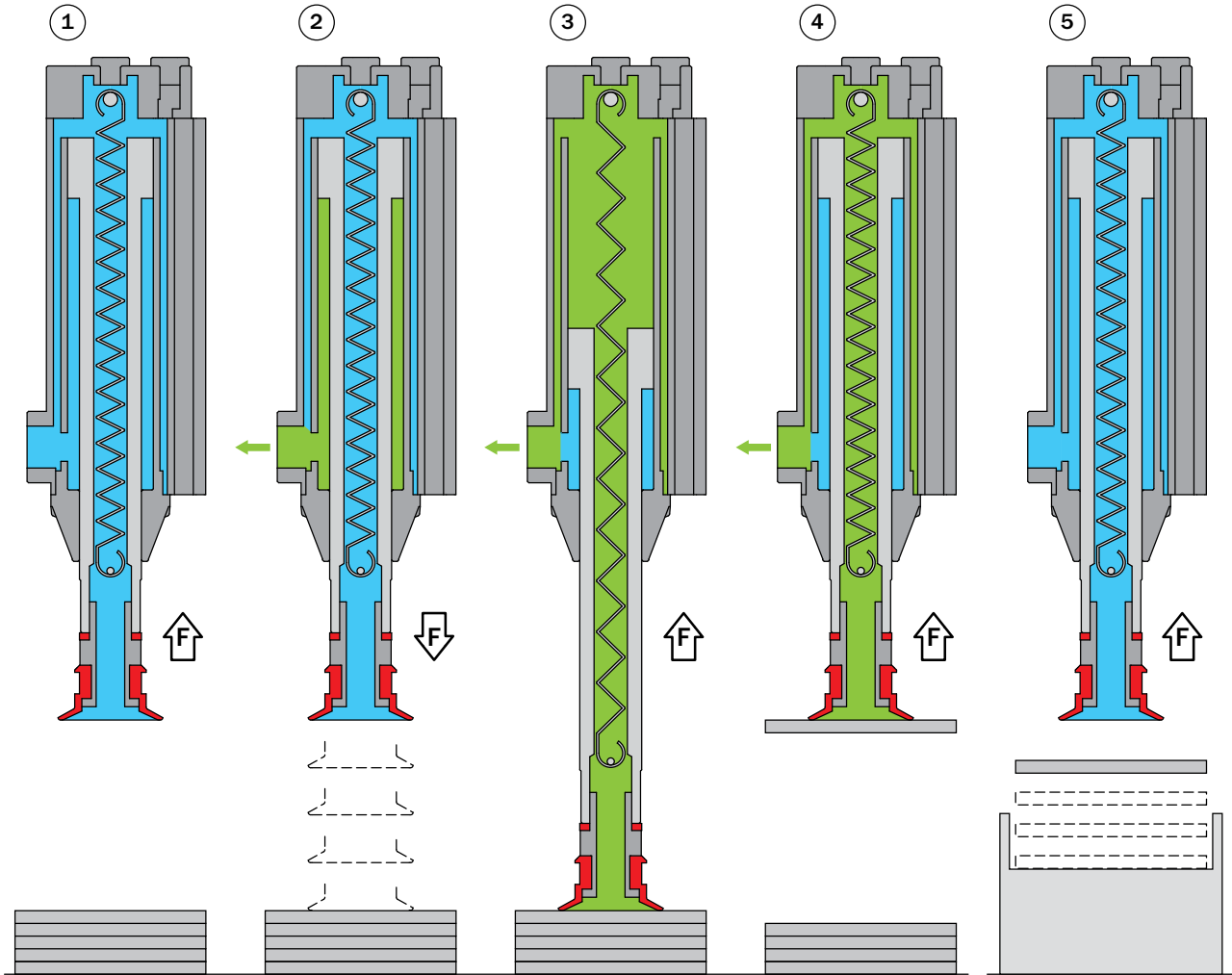
View EMI's video for more information on how the VAQ works!

www.youtube.com/emiacorpvideo

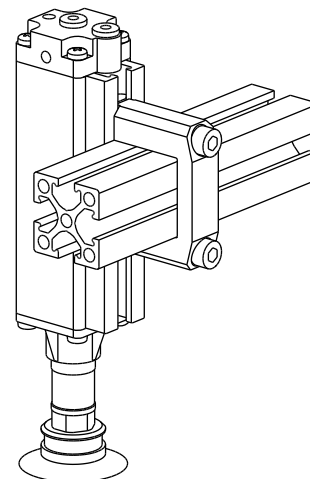
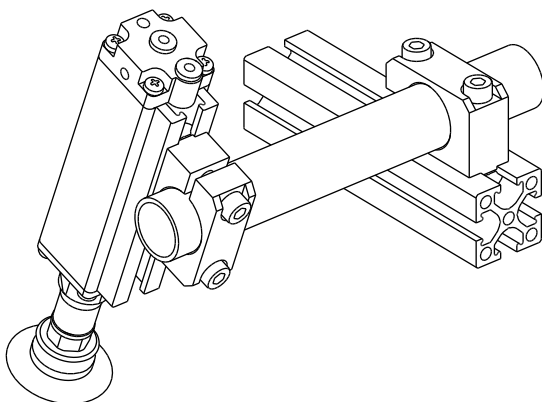
Vacuum Suspensions – VAQ

Working Principle:

1. Without vacuum, the rod is retracted by the spring force.
2. When vacuum is applied, the pressure under the piston is lower than the pressure over the piston and the rod travels forward.
3. The pressures invert as soon as the vacuum cup makes contact with an object.
4. Thus the rod retracts immediately, lifting the object.
5. When the vacuum is removed, the object is released, but the spring holds the rod retracted. (Accurately, instead of removing vacuum, a pressure impulse can be provided by the air port over the piston.)



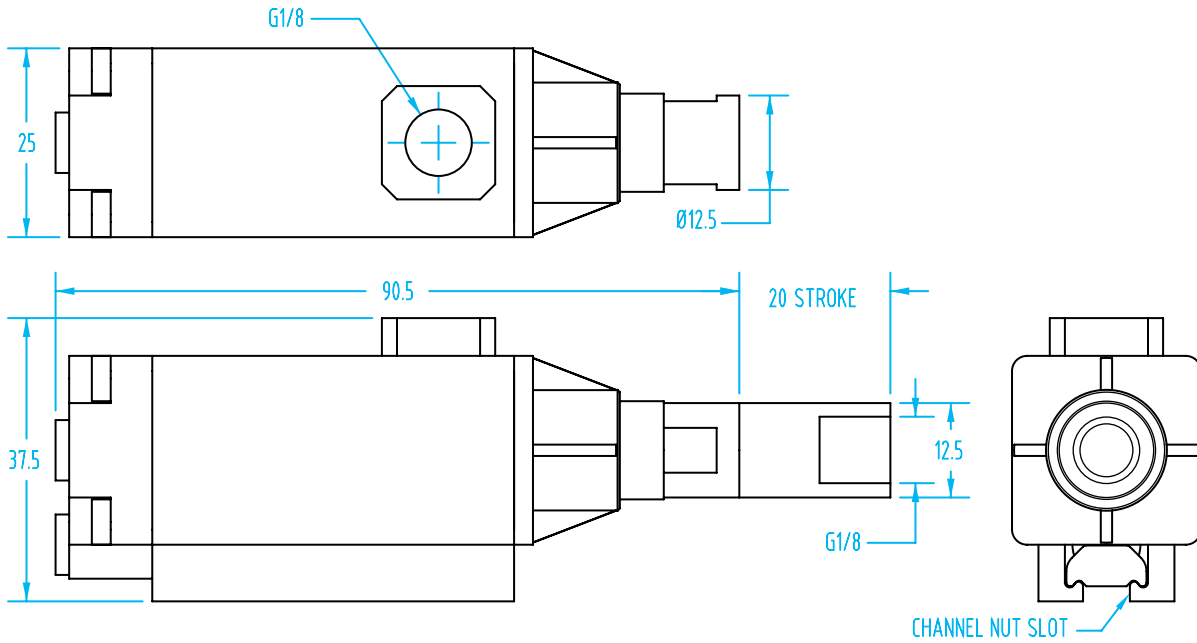
Mounting Examples



Vacuum Suspensions – VAQ

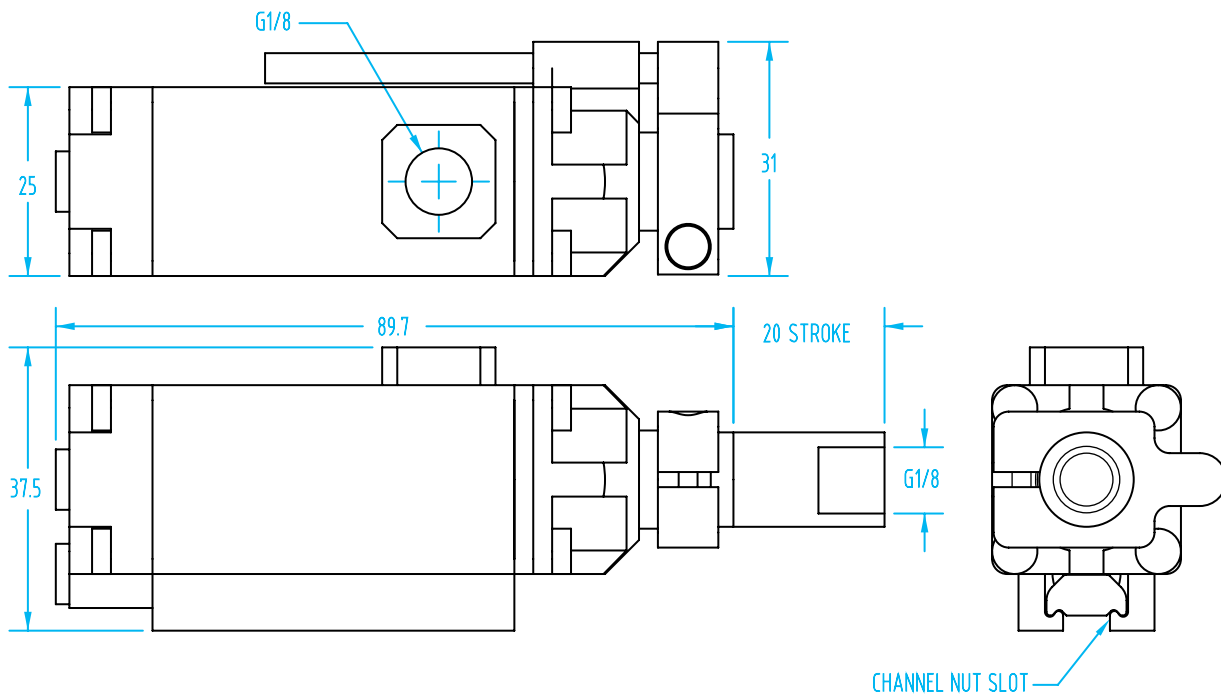
(Dimensioned drawings shown full scale)

#6973



Non-Rotating Version

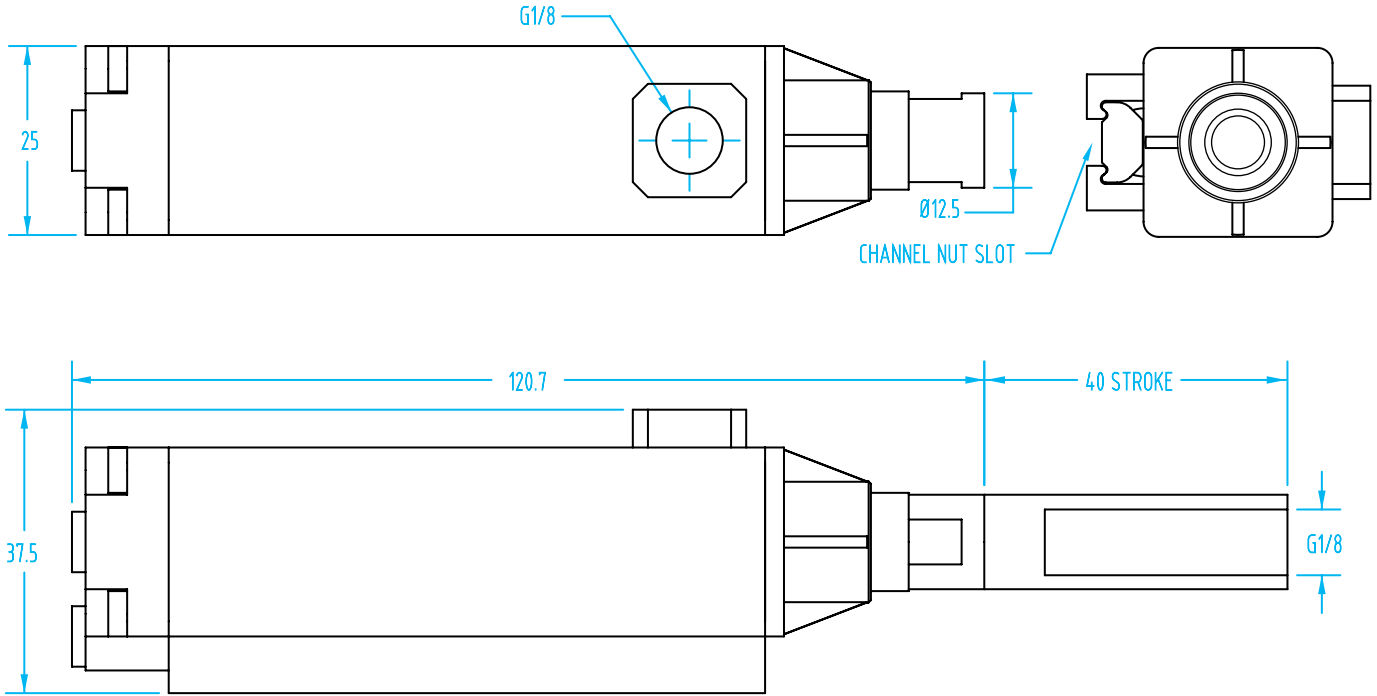
#6974



Vacuum Suspensions – VAQ

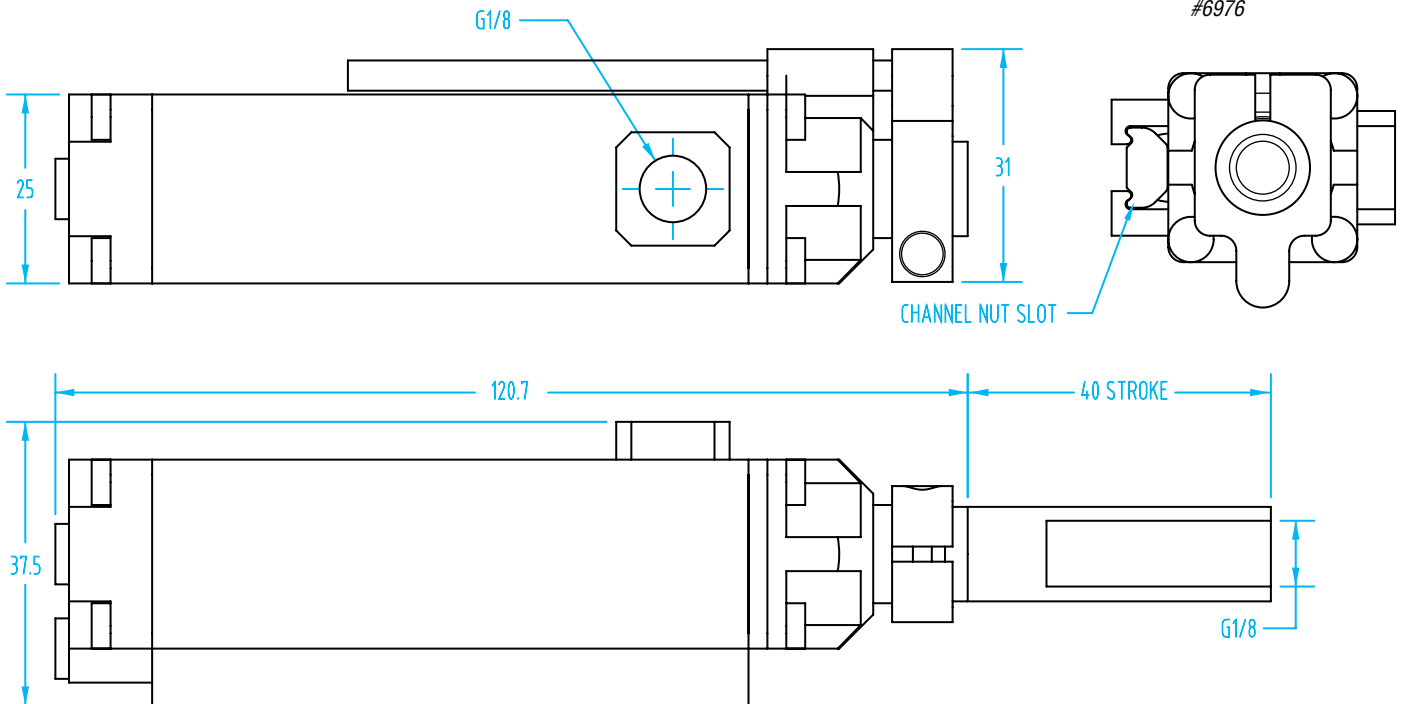
(Dimensioned drawings shown full scale)

#6975

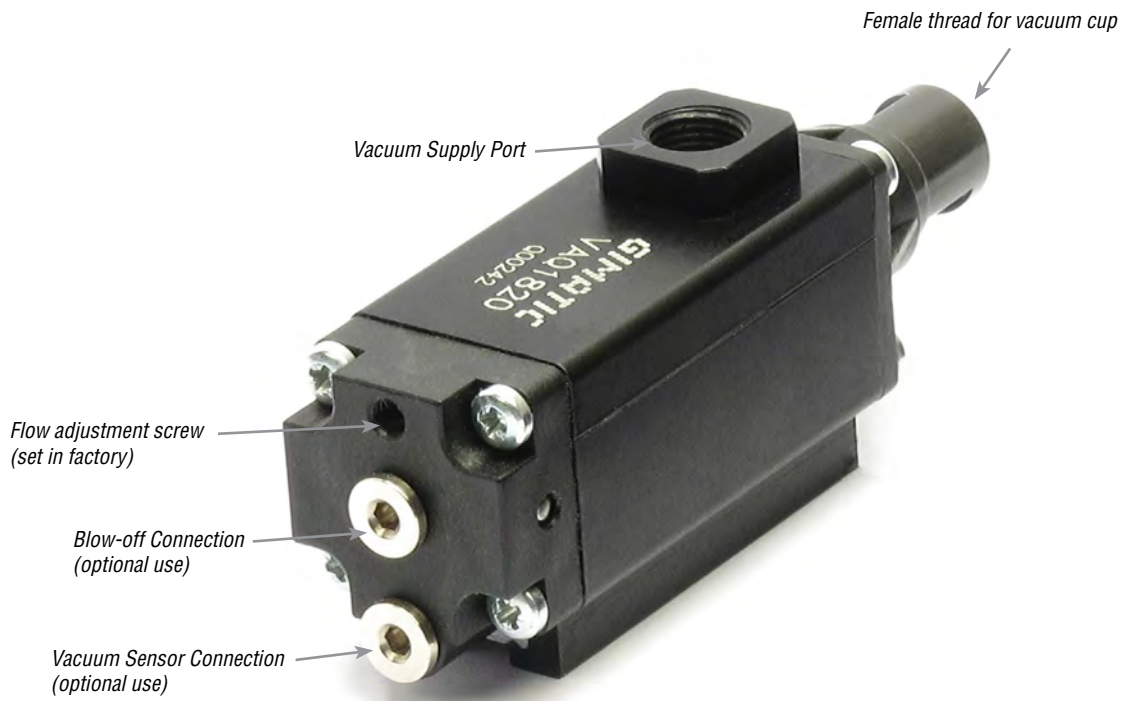


Non-Rotating Version

#6976

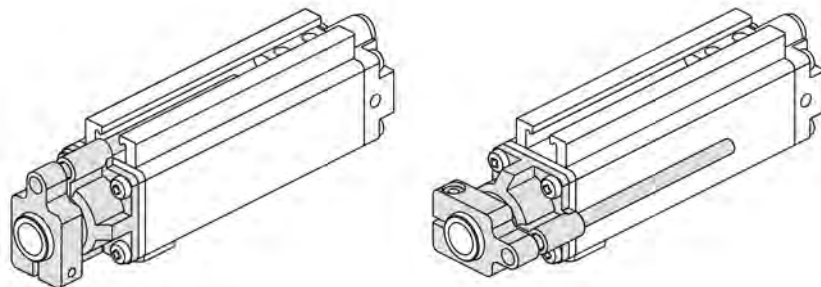


Vacuum Suspensions – VAQ



Mounting Examples

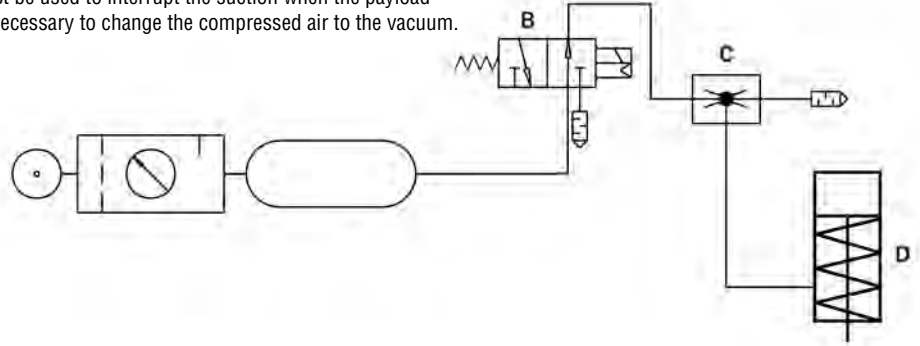
The non-rotation assembly can be positioned on 3 sides.



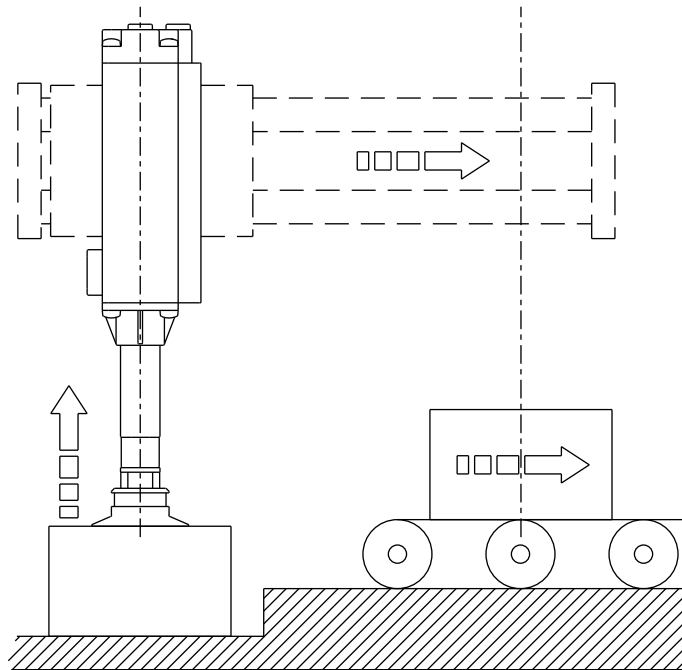
Vacuum Suspensions – VAQ

Pneumatic circuit:

To command the actuator (D), a 3/2 valve (B) must be used to interrupt the suction when the payload must be released and a vacuum generator (C) is necessary to change the compressed air to the vacuum.



Application Example: Pick & Placing at different levels.



Warning! When using multiple VAQ on a single vacuum circuit, each VAQ will increase the vacuum losses, which increases the minimum flow rate required to operate properly. As a result it is recommended to use only 1 vacuum circuit per VAQ.

Minimum Flow Rate for proper operation is 1.06 SCFM (see vacuum generator chart on page 1023 for options).

