



BLADDER ACCUMULATOR PRODUCTS



High Pressure | Low Pressure | Carbon Steel | Stainless Steel

DESIGN • PRODUCTION • SERVICE

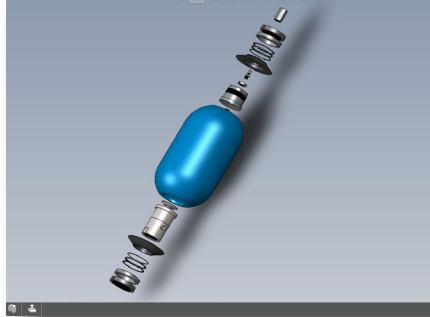
Reasontek...

Your Best Source for Hydraulic Bladder Accumulators!

Based in California, USA, Reasontek is the leading manufacturer of hydro-pneumatic accumulators with global supply. With one of the world's broadest accumulator product offerings, Reasontek has the products and application expertise to be your best source of accumulator and flow control solutions.

Reasontek's capabilities include:

- Wide variety of products to meet any application
- Custom design for global market
- Made in USA with global resources
- High quality materials with certificates
- Quick technical support and response
- Local onsite service
- Exclusive application and engineering resources
- Worldwide supply, large inventory with fast production



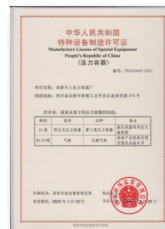
ASME Certified with U Stamp

Operating Pressure: 275-5,000 PSI.

Size: 1-15 Gallon (high pressure); 2.5-150 Gallon (low pressure)

High Quality Bladders Made in US/Europe

LUBE Oil, Water and Chemical Applications, Custom Design



ReasonTek[®]
engineering with style

Affordable American Made Products for the World

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Making the Right Choice

Hydro-pneumatic accumulators are the most widely used products in industrial and mobile hydraulic systems. They use compressed gas to apply force to hydraulic fluid, making it possible to store usable volumes of almost non-compressible hydraulic fluid under pressure.

A bladder accumulator is the most commonly used hydro-pneumatic accumulator. The bladder is filled with nitrogen and fitted in a welded or forged steel pressure vessel. The bladder is made of an elastic material (elastomer), e.g. rubber. The gas pre-charge pressure can be adapted via the gas inlet/outlet valve on top of the bladder accumulator.



Reasontek's bladder accumulators regulate the performance of a hydraulic system by providing an additional volume of system fluid, pressurized by an external gas supply.

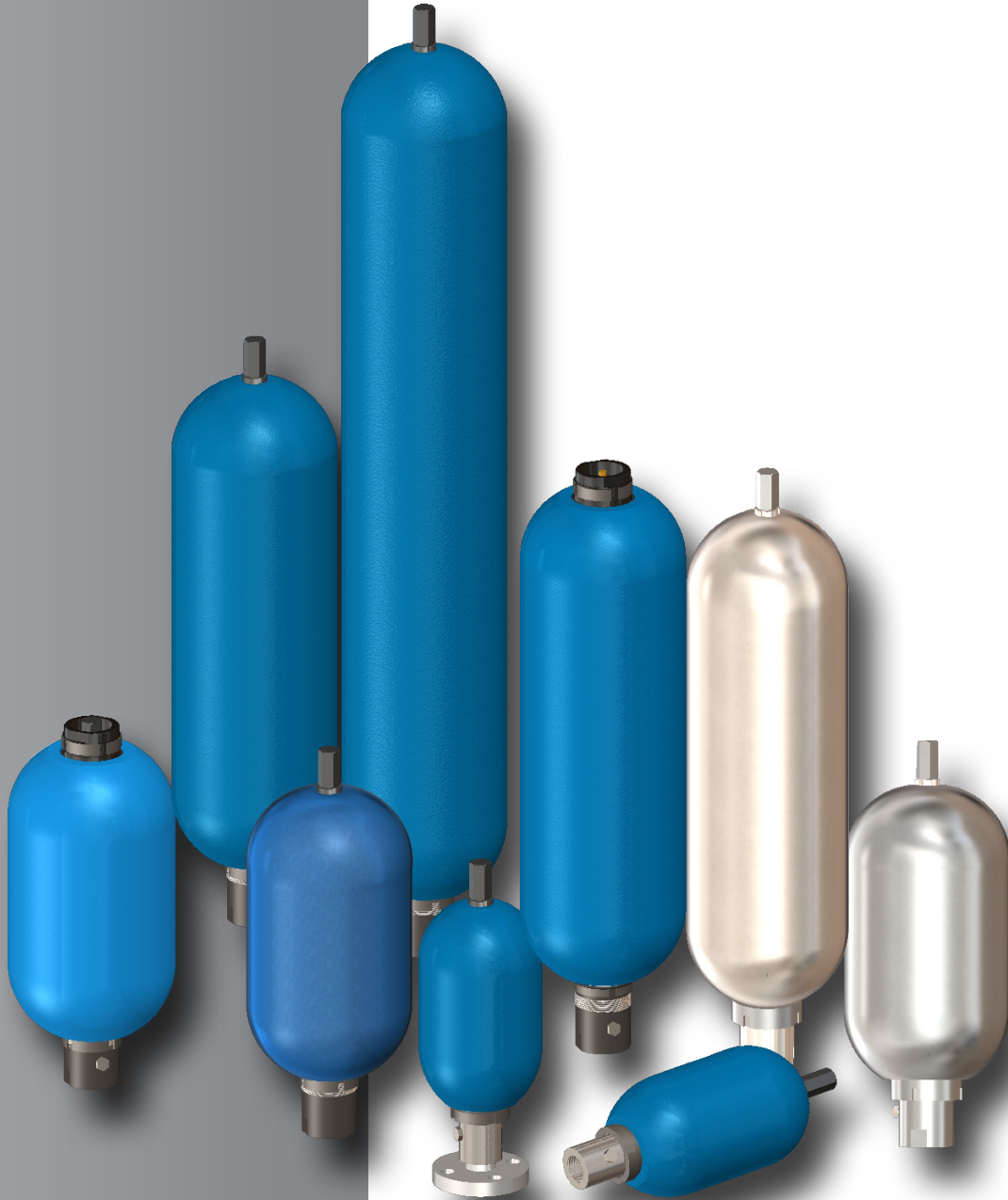
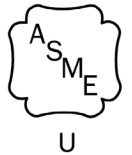
A correctly specified accumulator can:

- Reduce shock effects in a system resulting from inertia or external mechanical forces
- Maintain system pressure by compensating for pressure loss due to leakage
- Provide a back-up supply of hydraulic energy to keep constant flow when system demand is greater than pump delivery.

Our bladder accumulator products are widely used in hydraulic power units, blowout preventer (BOP) systems, surge suppressions, pump pulsation controls, etc. with the following advantages:

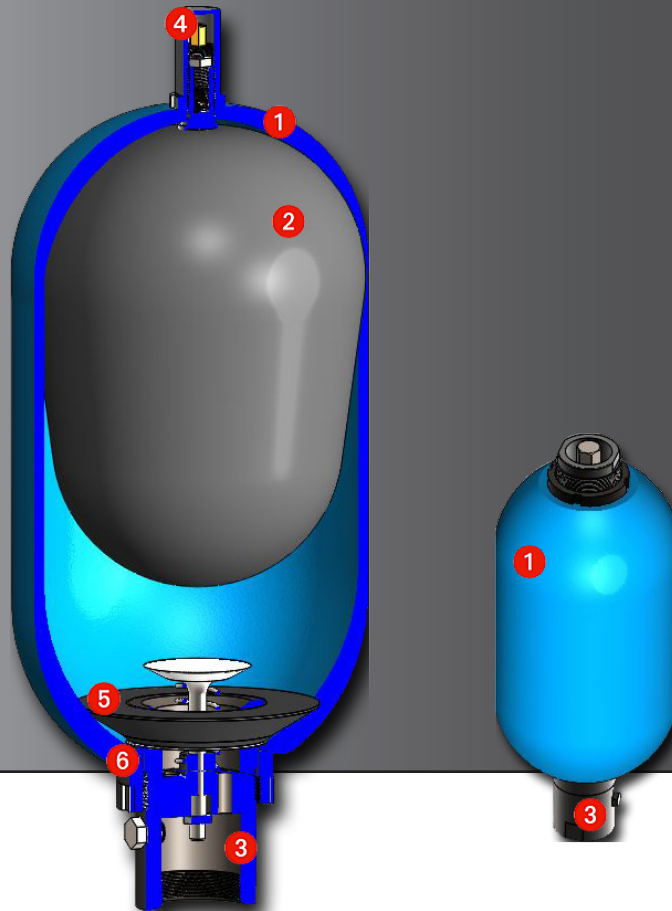
- Rapid response to pressure changes and work cycle
- Complete separation of gas and fluid
- Highly resistant to fluid contamination
- Low maintenance, trouble-free operation
- Readily available, low cost replacement parts
- Eliminates costly down time on expensive systems due to simple repair.

Lube Oil Services Water & Chemical Services



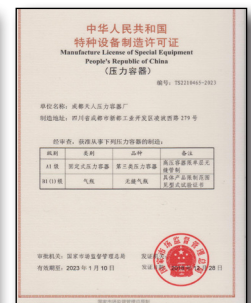
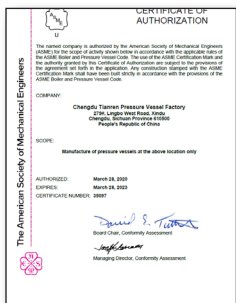
HIGH PRESSURE ACCUMULATORS

RAS



Our standard bladder accumulator is designed for energy storage, pulsation dampening, shock absorption in the hydraulic system, consisting of a molded rubber bladder inside a forged steel shell with a nitrogen gas valve on one end and a fluid port at the other. All of our bladder accumulators are ASME code stamped and interchangeable with major brands on the market. The bladders, anti-extrusion rings, O-rings and seals are all made in USA or Europe with the highest quality. They are widely used in hydraulic power units, blowout preventer (BOP) systems, surge suppressions, pump pulsation controls, etc. with the following major features:

- Rapid response to pressure changes and work**
- Complete separation of gas and fluid**
- Highly resistant to fluid contamination**
- Low maintenance, trouble-free operation**
- Readily available, low cost replacement parts**
- Eliminate costly down time on expensive systems due to simple repairs.**



CERTIFICATIONS:

Size	Standard ASME Certification			ASME Appendix 22	
	Status	Rating	D.F	Rating	D. F
1-15 Gallon 3,000 PSI	Standard	3,000 PSI	4 to 1	4,000 PSI	3 to 1
1-15 Gallon 5,000 PSI	Standard	5,000 PSI	4 to 1	6,600 PSI	3 to 1

SPECIFICATIONS:**Materials**

Shell-high strength alloy steel (SA372) with ASME Certification; Stainless steel 316 with ASME Certification. NB registered with U stamp.

Fluid Port-high strength alloy steel for oil and water services (with Nickel plate. Stainless steel 316 for water & chemical services.

Poppet & Spring - 304/316 stainless steel.

Gas Valve Protector - steel, stainless steel.

Bladder - various rubber compounds, see the bladder repair kit section.

Bladder Stem-steel, stainless steel

Maximum Flow Rates

1-gallon: 150 GPM or 568 LPM

2 ½-15-gallon Std.: 220 GPM or 833 LPM

2 ½-15-gallon High Flow: 600 GPM or 2271 LPM

Pressure Ratings

3000 and 5000 psi bladder accumulators are rated at minimum 4 to 1 design factors as standard. 4000 and 6000 psi (ASME Appendix 22) bladder accumulators are available as an option at minimum 3 to 1 design factors. For pressures over 6600 psi, consult the factory. Hydrostatic Test Pressure: Design Pressure x 1.5

Max. Recommended Compression Ratio

(Max. Working pressure/pre-charge pressure) 4 to 1.

Pre-charge

Units are shipped with nominal nitrogen pre-charge as standard. For specific pre-charge pressures, specify at time of order.

Services

Standard lube oil service

Water and chemical service

CONSTRUCTION:

❶ **The Accumulator Shell** is a seamless pressure vessel forged or fabricated from high grade steel designed and manufactured to meet various relevant international standards. The standard materials are Cr-Mo High Strength Alloy Steel SA372 and stainless steel 316. For special applications various surface coatings are available as well as stainless steel construction. See the Service Coating section for more details.

❷ **The Bladder** is made by the various high quality rubber compounds including Nitrile, Low Temp. Nitrile, High Temp Nitrile, Butyl, Viton/FKM, Hydrin, EPDM for different fluid media application. See the details on the Bladder Repair Kits section.

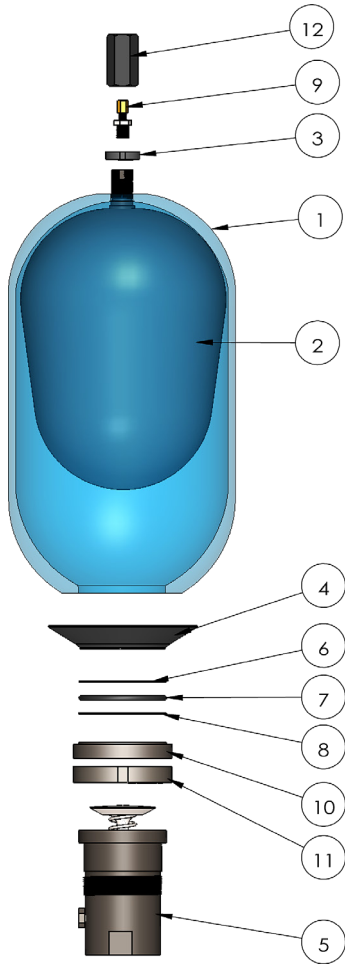
❸ **The Fluid Port** is specially designed and constructed by the flow and service line requirements. Various materials and coating as well as size and connection options are available for different services and installations. See the Fluid Port section for details.

❹ **The Gas Valve** is connected to the bladder by a rubber coated washer to ensure a gas tight joint. Two types of gas valves are available on bladder accumulators. Standard 3000 PSI and 4000 PSI rated models are offered with a cored gas valve cartridge; 5000 PSI and higher rated models are equipped with heavy duty military type metal seals.

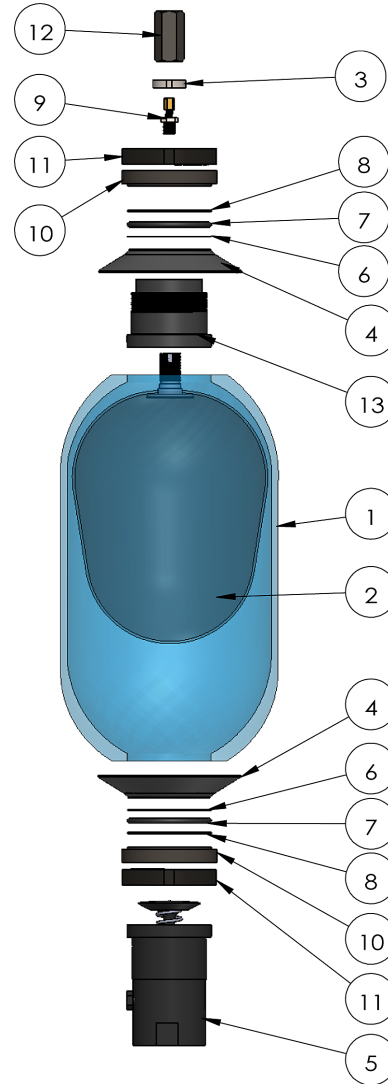
❺ **The Anti-Extrusion Ring** is made of various rubber compounds for different fluid media applications with Zinc plated or stainless steel metal rings.

❻ **The Seal Kit** consists of stainless steel metal back up ring, high quality rubber O-ring and washer.

STANDARD BILL OF MATERIALS: 3,000 PSI



BR- Bottom Repairable

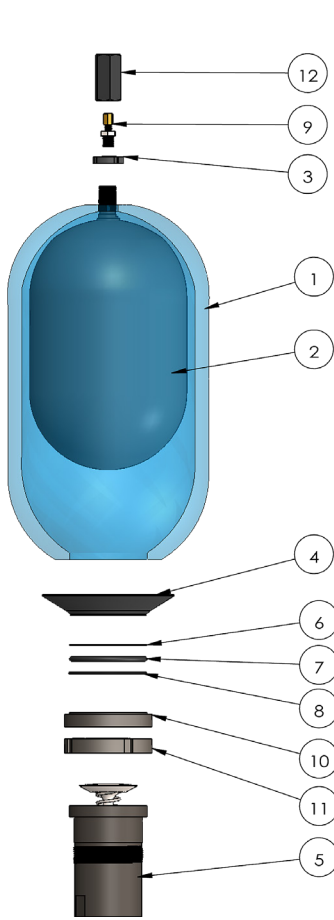


TR- Top Repairable

ITEM NO.	PART NO.		DESCRIPTION	QTY REQD	
	BR	TR		BR	TR
1	0010001-0010015	0020002-0020015	SHELL, 1-15 GALLON	1	1
2	700001-700015	700001-700015	BLADDER ASSY. , 1-15 GALLON	1	1
3	R20005	R20005	JAM NUT	1	1
4	AER01-02	AER01-02	ANTI-EXTRUSION RING	1	2
5	100001, 100002	100002	FLUID PORT ASSY, 1-1/4"NPT, 2"NPT	1	1
6	R225030,R225034	R225034	BACKUP RING, METAL	1	2
7	R225220, R225230	R225230	O-RING	1	2
8	R225400, R225420	R225420	WASHER	1	2
9	AVT500	AVT500	GAS VALVE	1	1
10	R300001, R300003	R300001, R300003	SPACER RING	1	2
11	R300002, R300004	R300002, R300004	LOCK NUT	1	2
12	R200006	R200006	VALVE GUARD	1	1
13	-	R400010	PLUG, GAS END	1	1

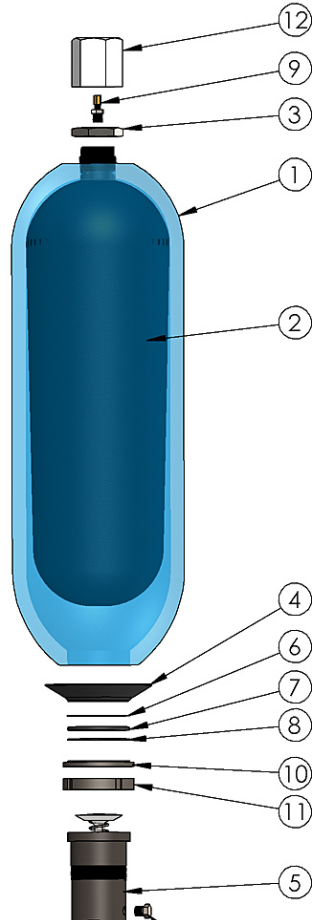
STANDARD BILL OF MATERIALS: 5,000/6,600 PSI

2" stem available for 5-15 gallon sizes bottom repairable 5,000/6,600 accumulators. Check the ordering code and bladder repair kit sections for different stem details.

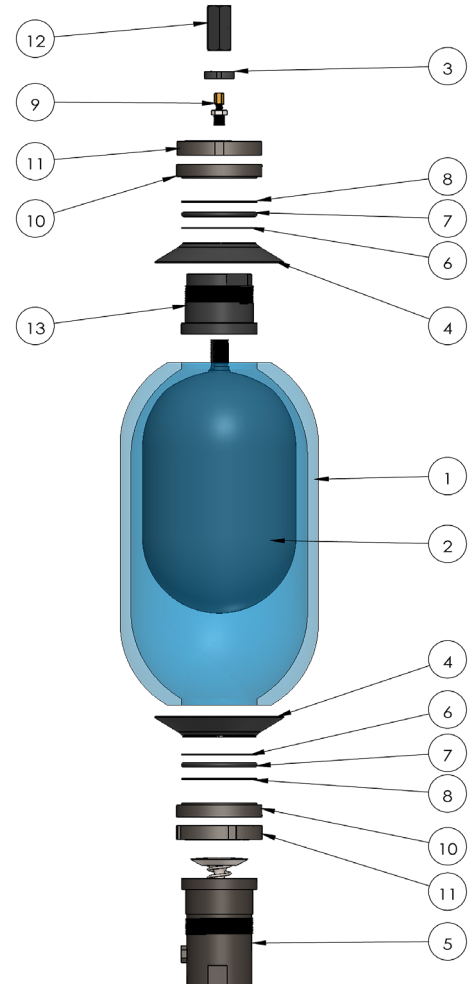


Type I-7/8" Stem B

BR- Bottom Repairable



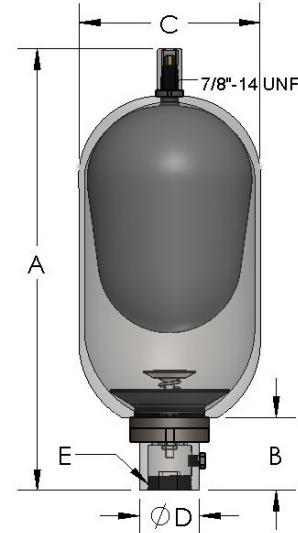
Type II-2" Stem D



TR- Top Repairable

ITEM NO.	PART NO.		DESCRIPTION	QTY REQD	
	BR (Type I)	TR		BR	TR
1	0010001-0010015	0020002-0020015	SHELL, 1-15 GALLON	1	1
2	700001-700015	700001-700015	BLADDER ASSY. , 1-15 GALLON	1	1
3	R20005	R20005	JAM NUT	1	1
4	AER01-02	AER01-02	ANTI-EXTRUSION RING	1	2
5	100101, 100102	100102	FLUID PORT ASSY, 1-1/4"NPT, 2"NPT	1	1
6	R225030, R225034	R225034	BACKUP RING, METAL, SS	1	2
7	R225220, R225230	R225230	O-RING, NITRILE	1	2
8	R225400, R225420	R225420	WASHER, NITRILE	1	2
9	G10026	G10026	GAS VALVE, 3K	1	1
10	R300001, R300003	R300001, R300003	SPACER RING	1	2
11	R300002, R300004	R300002, R300004	LOCK NUT	1	2
12	R200006	R200006	VALVE GUARD	1	1
13	-	R400110	PLUG, GAS END	1	1

The bottom repairable type is simple and cost effective design as industry standard bladder accumulator. Sizes range from 1 quart to 15 gallons



3000 PSI (207 Bar), 4000 PSI (275 Bar) Appendix 22, standard

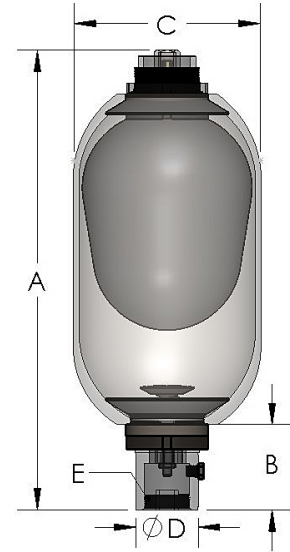
Models	Size Gallon (Liters)	Dimensions, inch (mm)				Fluid Port, Thread E ¹		Bleed Port	Weight lbs. (Kg.)
		A	B	C	D	SAE	NPT		
RAS-002C3B01N RAS-002C3B01NW1	1 Qt. (1)	11.12 (282)	2.00 (51)	4.5 (114)	1.62 (41)	SAE#12 1-1/16"-12	3/4"	-	10 (4.5)
RAS-01C3B01N RAS-01C3B01NW1	1 (3.8)	17 (432)	3.50 (89)	6.75 (171)	2.37 (60)	SAE#20 1-5/8"-12	1-1/4"	1/4" NPT	34 (15)
RAS-02C3B01N RAS-02C3B01NW1	2.5 (9.46)	21.38 (543)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	80 (36)
RAS-05C3B01N RAS-05C3B01NW1	5 (18.9)	33.38 (848)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	120 (55)
RAS-10C3B01N RAS-10C3B01NW1	10 (38)	54.38 (1382)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	220 (100)
RAS-11C3B01N RAS-11C3B01NW1	11 (41.6)	59.88 (1520)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	240 (109)
RAS-15C3B01N RAS-15C3B01NW1	15 (56.8)	77.88 (1978)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	305 (139)

5000 PSI (345 Bar), 6600 PSI (455 Bar) Appendix 22, standard

Models	Size Gallon (Liters)	Dimensions, inch (mm)				Fluid Port, Thread E ¹		Bleed Port	Weight lbs. (Kg.)
		A	B	C	D	SAE	NPT		
RAS-02C5(6)B01N RAS-02C5(6)B01NW1	2.5 (9.46)	22.55 (573)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	120 (55)
RAS-05C5(6)B01N RAS-05C5(6)B01NW1	5 (18.9)	34.80 (884)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	200 (91)
RAS-10C5(6)B01N RAS-10C5(6)B01NW1	10 (38)	55.30 (1405)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	335 (152)
RAS-11C5(6)B01N RAS-11C5(6)B01NW1	11 (41.6)	60.88 (1546)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	375 (209)
RAS-15C5(6)B01N RAS-15C5(6)B01NW1	15 (56.8)	79.80 (2027)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	485 (220)

1) Note: High flow fluid ports available, see fluid port section on page 10

The top repairable accumulator allows easy checking and maintenance of the bladder without removing the accumulator from the pipe line, saving time and cost. Sizes range from 2-1/2 to 15 gallons.



3000 PSI (207 Bar), 4000 PSI (275 Bar) Appendix 22, standard

Models	Size Gallon (Liters)	Dimensions, inch (mm)				Fluid Port, Thread E ¹		Bleed Port	Weight lbs. (Kg.)
		A	B	C	D	SAE	NPT		
RAS-02C3T01N RAS-02C3T01NW1	2.5 (9.46)	20.50 (521)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	80 (36)
RAS-05C3T01N RAS-05C3T01NW1	5 (18.9)	32.74 (832)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	120 (55)
RAS-10C3T01N RAS-10C3T01NW1	10 (38)	53.25 (1353)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	220 (100)
RAS-11C3T01N RAS-11C3T01NW1	11 (41.6)	59.00 (1499)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	240 (109)
RAS-15C3T01N RAS-15C3T01NW1	15 (56.8)	77.38 (1965)	3.62 (92)	9.06 (230)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	305 (139)

5000 PSI (345 Bar), 6600 PSI (455 Bar) Appendix 22, standard

Models	Size Gallon (Liters)	Dimensions, inch (mm)				Fluid Port, Thread E ¹		Bleed Port	Weight lbs. (Kg.)
		A	B	C	D	SAE	NPT		
RAS-02C5(6)T01N RAS-02C5(6)T01NW1	2.5 (9.46)	21.68 (551)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	120 (55)
RAS-05C5(6)T01N RAS-05C5(6)T01NW1	5 (18.9)	33.92 (862)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	200 (91)
RAS-10C5(6)T01N RAS-10C5(6)T01NW1	10 (38)	54.42 (1382)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	335 (152)
RAS-11C5(6)T01N RAS-11C5(6)T01NW1	11 (41.6)	59.98 (1523)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	375 (209)
RAS-15C5(6)T01N RAS-15C5(6)T01NW1	15 (56.8)	78.36 (1990)	3.88 (99)	9.63 (245)	3.00 (76)	SAE#24 1-7/8"-12	2"	1/4" NPT	485 (220)

1) Note: High flow fluid ports available, see fluid port section on page 10.

RAS-CARBON STEEL ACCUMULATORS

Standard lube oil service and water or chemical service

Specifications:

- Carbon steel shell, ASME Certified with U stamp, 9” diameter
- Operating Pressures: 3000PSI/5000PSI/6600PSI
- Standard sizes from 1 to 15 Gallons, Top/Bottom Repairable
- Highest quality US/European made bladders
- Various bladder compound options
- Multiple types of fluid port including Hi-flow
- Special coating option for water and chemical services
- Custom products are available by request

Services:

Standard Lube Oil Service-Carbon steel shell, corrosion protective lubrication interior; black primed exterior; carbon steel fluid components.

Standard Water Service-Carbon steel shell, Nickel plate coating interior; Polyester painting exterior, carbon steel fluid components with Nickel plate.

Extreme Water & Chemical Service, Subsea- Carbon steel shell epoxy coated interior, epoxy coated or 2-layer marine painting exterior; stainless steel fluid components.

See the coating section on page 12 for details



Std. Lube Oil Service



Water Service

RAS-STAINLESS STEEL ACCUMULATORS

Specially designed for water services, food industries, corrosive chemical medium, and other harsh environment applications



Water & Chemical Service

Specifications:

- SS316 shell, ASME Certified with U stamp, 9” diameter
- Wetted parts, SS316; other non-wetted parts, SS300 series
- Operating Pressures: 2000PSI
- Standard sizes from 1 to 15 Gallons, Top & Bottom Repairable
- Highest quality US/European made bladders
- Various bladder compound options
- Multiple types of fluid port including Hi-flow
- Custom products are available by request

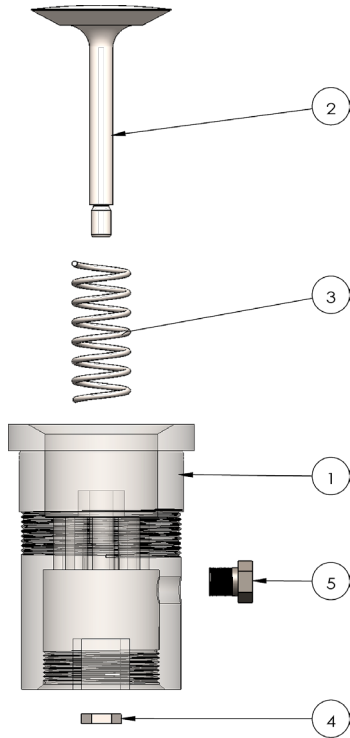
Services:

All Stainless Steel Accumulators-Seamless stainless steel shell 316, stainless steel fluid components in 300 series. Epoxy coating available on demand. Maximum corrosion protection for special applications.

See the coating section on page 12 for details

HYDRAULIC FLUID PORT ASSEMBLY

Standard flow, medium flow, high flow, carbon steel & stainless steel



FLUID PORT ASSEMBLY 3000 PSI, 5000/6600 PSI

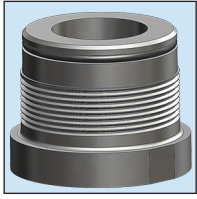
PART	DESCRIPTION	SERVICE	MATERIAL
1	Fluid Port	Lube Oil	Carbon Steel
		Water & Chemical	Carbon Steel + Nickel Plate (W1) ; Stainless Steel (W2, W3)
2	Poppet	Lube Oil	Carbon Steel
		Water & Chemical	Stainless Steel (W1, W2, W3)
3	Spring	Lube Oil	Carbon Steel
		Water & Chemical	Stainless Steel (W1, W2, W3)
4	Lock Nut	Lube Oil	Carbon Steel
		Water & Chemical	Carbon Steel
5	Bleed Plug	Lube Oil	Carbon Steel
		Water & Chemical	Carbon Steel + Nickel Plate (W1); Stainless Steel (W1, W2, W3)

Size	Standard Port	Optional Port				High Flow Port		Part Number (std.) NPT/SAE		
	NPT Thread	SAE Thread	NPT Undersized	Metric Thread	BSPP Thread	NPT Thread	Metric Thread	CS	Nickel Plate	Stainless Steel
3000 PSI ASSEMBLIES										
1 Qt	3/4" NPTF	SAE#12	-	M27X2	3/4-14	-	-	10000Q 10001Q	10000QW 10001QW	10000QS 10001QS
1 Gal.	1-1/4" NPTF	SAE#20	-	M42X2	1-1/4-11	-	-	100001 100011	100001W 100011W	100001S 100011S
2.5-15 Gal.	2" NPTF	SAE#24	1-1/4" NPTF	M48X2	2-11	4" NPTF	M95X2	100002 100012	100002W 100012W	100002S 100012S
5000/6600 PSI ASSEMBLIES										
1 Gal.	1-1/4" NPTF	SAE#20	-	M42X2	1-1/4-11	-	-	100101 100111	100101W 100111W	100101S 100111S
2.5-15 Gal.	2" NPTF	SAE#24	1-1/4" NPTF	M48X2	2-11	4" NPTF	M95X2	100102 100112	100102W 100112W	100102S 100112S

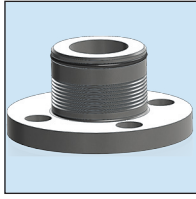


CUSTOM HYDRAULIC FLUID PORT

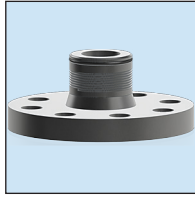
Custom fluid ports are available for international customers with special connections. See the following fluid ports with custom adapters and flanges. Contact us for your special requirements.



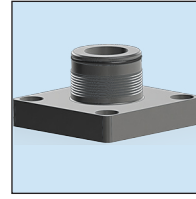
1/2" NPT



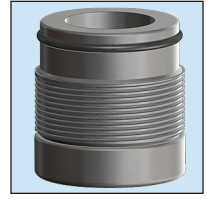
ANSI 1"-150#



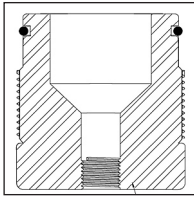
ANSI 2"-300#



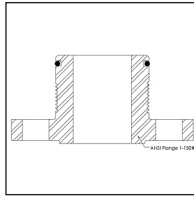
Flange, Square



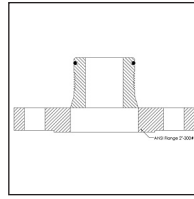
1/4" NPT



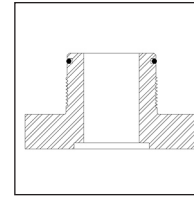
NPT Reducer



ANSI Flange 150#



ANSI Flange 300#



Square Flange



COATING AND SERVICE

We offer various coating and service options for different major applications. See the following major options and descriptions. Some of the coatings will need customer's approval before ordering. Please note, special coatings may take longer time to deliver.

Service Code	Shell Material	Fluid Port Material	Wetted Parts	Non-wetted Parts	Coating	Applications
Std. (-omit)	carbon steel	carbon steel	carbon steel	carbon steel	protective lubrication interior primed black exterior	lube oil service, hydraulic units.
W1	carbon steel	carbon steel+ Nickel plate	stainless steel 300	carbon steel+ Zinc plate	Nickel plate interior,	standard water service.
W2	carbon steel	stainless steel 316	stainless steel 300	stainless steel 300	Nickel plate interior,	high water and chemical service.
W3	carbon steel	stainless steel 316	stainless steel 300	stainless steel 300	Phenolic and epoxy coating interior and exterior, marine paint	harsh environment, offshore drilling, subsea.
S	stainless steel 316	stainless steel 316	stainless steel 316	stainless steel 300	(coating by demand)	best corrosion protection, food industry, highly corrosive water & chemical.

Contact us for other special coating options.

BLADDER RUBBER COMPOUNDS

The choice of the elastomer used for the bladder depends on the liquid to be used and on the operating temperatures (and at times, storage). Our accumulator products use high quality rubber materials to meet customer's different requirements. Check our website for the rubber compatibility file or contact us for any other special applications.

Code	Abbre.	Description	Temperature Range	Comments
01	N33	Standard Nitrile NBR, BUNA-N	-20 °C to +90 °C -4 °F to 194 °F	Mostly used, mineral, silicon and lubricating oils, industrial water, glycols, non-flammable liquids (HFA-HFB-HFC), aliphatic hydrocarbons, butane, diesel oil, kerosene, fuel oils etc.
02	N28	Low ACN content Nitrile	-40 °C to +80 °C -40 °F to 176 °F	Low Temp. Nitrile.
03	N40	High ACN content Nitrile	-10 °C to +105 °C 14 °F to 221 °F	High Temp. Nitrile, gasoline.
04	NH1	Hydrogenated Nitrile	-50 °C to +130 °C -58 °F to 266 °F	Better Behavior NBR with both extreme high and low temperature performance.
05	ECO	Hydrin	-30 °C to +115 °C -22 °F to 239 °F	Standard Hydrin.
06	EP1	EPDM	-20 °C to +120 °C -4 °F to 248 °F	For phosphate-ester media, brake fluids, hot water, leaching fluids, detergents, water-glycol (HFC), many acids and bases, saline solutions, skydrol, etc.
07	IIR	Butyl	-20 °C to +110 °C -4 °F to 230 °F	Phosphoric esters (HFD-R), fyrquel, hot water, ammonia, caustic soda, some kinds of Freon (22-31-502), glycolbased brake fluids, some acids, alcohols, ketones, esters, skydrol 7000, etc.
08	FKM	Flouroelastomer-Viton	-20 °C to +140 °C -4 °F to 284 °F	The same as with standard NBR with excellent performance at both high and low temperatures.

HOW TO ORDER RAS SERIES BLADDER ACCUMULATORS:

RAS series bladder accumulators can be specified by using the following symbols in the chart. Please note, not all the combinations are valid. For details about the bladder material selection, please visit our website at:

Contact us if you have special options not listed.

①	②	③	④	⑤	⑥
Series	Size	Shell Matl.	Pressure	Construction	Bladder/Seal Matl.
RAS	05	C	3	B	01

① Series
Standard High Pressure RAS

③ Shell Material
Carbon Steel C
Stainless Steel 316 S

⑤ Construction
Top Repairable T
Bottom Repairable B

② Nominal Size
1QT/1Liter 002
1 Gallon 01
2.5 Gallon 02
5 Gallon 05
10 Gallon 10
11 Gallon 11
15 Gallon 15
Others XX
<i>(use Liters+L on metric sizes)</i>

④ Pressure
2000 PSI/138 Bar <i>(for stainless steel shell only)</i> 2
3000 PSI/207 Bar 3
4000 PSI/276 Bar 4
5000 PSI/345 Bar 5
6600 PSI/455 Bar 6
Others X

⑥ Bladder/Seal Material
Nitrile/Buna-N, Std. 01
Low Temp. Nitrile 02
High Temp. Nitrile 03
Hydrogenated Nitrile 04
Hydrin 05
EPDM 06
Butyl 07
Viton/FKM 08
Others 09
<i>(see Bladder Repair Kits section for details)</i>

• Check the rubber compounds chart on page #12, the temperature range could be different by different applications.
 • See the rubber compatibility chart for different fluid media applications.
 • Non-standard materials may take longer lead time, check for the availability before order.

7	8	9	10	11 (Optional)
Bladder Type	Fluid Port	Service & Coating	Certificate	ACCESSORIES (OPTIONAL)
-	N	W1	-	-

7	Bladder Type
7/8" stem, Std.	-
2" stem	D
2" stem, Hydac type	E
Others	X
<i>(see Bladder Repair Kits section for details)</i>	

9	Service & Coating
Std. Lube Oil	-
Std. WS, Nickel Plate Shell+ Zinc Plated Components	W1
High WS, Nickel Plated Shell+ Stainless Steel Components	W2
Extreme WS, Interior/Exterior Epoxy, Marine Paint+ Stainless Steel Components	W3
All Stainless Steel	S
Others	X
<i>(see Service & Coating section for details)</i>	

8	Fluid Port
NPT Thread, Std	N
1 QT 3/4" NPT	
1 Gallon 1-1/4" NPT	
2.5-15 Gallon 2" NPT	
Other Sizes ("X" sizes)	NX
NPT Thread Undersized	U
2.5-15 Gallon, 1-1/4" NPT	
SAE Thread	S
1 QT SAE#12	
1 Gallon SAE#20	
2.5-15 Gallon SAE#24	
Other Sizes ("X" sizes)	SX
SAE 4-Bolt Split Flange	P
2.5-15G, 3K Code 61, 2"	
2.5-15G, 5K Code 62, 1.5"	
Other Sizes ("X" sizes)	PX
Metric Thread	M
1 QT M27*2	
1 Gallon M42*2	
2.5-15 Gallon M48*2	
Other Sizes ("X" sizes)	MX
BSPP Thread	B
1 QT 3/4-14	
1 Gallon 1 1/4-11	
2.5-15 Gallon 2-11	
Other Sizes ("X" sizes)	BX
High Flow Port	
4" NPTF, 2.5-15 Gallon	H
M95*2, 2.5-15 Gallon	I
Other Sizes ("X" sizes)	HX
Flange Adapter	F
pipe size + flange rating, eg. F3-300	
<i>(see Fluid Port section for details)</i>	

10	Certificate
Std. ASME	-
CE/PED	C
CRN	R
SELO	S
Others	X

11	Accessories
Single Bolt Clamp, 1G,3K	RMS-67
Double Bolt Clamp, 2.5-15G,3K	RMD-91
Single Bolt Clamp, 1G, 5K	RMS-71
Double Bolt Clamp, 2.5-15G, 5K	RMD-97
Single Bolt Clamp,1G, SS	RMS-67S
Double Bolt Clamp, 2.5-15G, SS	RMD-91S
Base Bracket, 1G	RBB-45
Base Bracket, 1G, SS	RBB-45S
Base Bracket, 2.5-15G	RBB-66
Base Bracket, 2.5-15G, SS	RBB-66S
Charging Kit, 3K	RGA-100-X
Service Kit, 3K (13pcs)	RMK-100
Valve Guard & Gaging	RGA-102X
Rupture Disc	RRD-
<i>(see Tools & Accessories section for details)</i>	

Standard High Pressure Low Pressure PulseKushon™ Komatsu Type



**BLADDER
REPAIR KITS**

The bladder is the core of the accumulator product. High quality bladders can extend the accumulator lifetime and operate smoothly in the hydraulic system. Our bladder repair kits are made in US and Europe with the best material quality on the market with the following features:

- High Quality Rubber Compound and Seals, Gas Valves
- Various Rubber Compound Options
- Two-piece bladder stem and gas valve design, saving cost for replacement
- Two Groups of Product as High Pressure (RK Series) and Low Pressure (RKL Series) by applications
- Both US sizes in Gallons and Metric sizes in Liters
- Custom stem and bladder sizes are available

CAPACITY:

RK SERIES	standard sizes: 1QT, 1G, 2.5G, 5G, 10G, 11G, 12.5G, 15G, 16.5G, or 1L, 2.5L, 4L, 5L, 6L, 10L, 12L, 20L, 24L, 32L, 42L, 50L, 57L
RKL SERIES	standard sizes: 150L/40G, 200L/53G, 275L/73G, 300L/80G, 375L/100G, 475L/125G, 530L/140G, 575L/150G

RUBBER COMPOUNDS:

We offer various high quality rubber materials for the different fluid media applications. Use the following chart for your reference. The performance can be different by different operations, storage, working time, etc.

Code	Abbre.	Description	Temperature Range	Comments
01*	N33	Standard Nitrile NBR, BUNA-N	-20 °C to +90 °C -4 °F to 194 °F	Mostly used, mineral, silicon and lubricating oils, industrial water, glycols, non-flammable liquids (HFA-HFB-HFC), aliphatic hydrocarbons, butane, diesel oil, kerosene, fuel oils etc.
02	N28	Low ACN content Nitrile	-40 °C to +80 °C -40 °F to 176 °F	Low Temp. Nitrile.
03	N40	High ACN content Nitrile	-10 °C to +105 °C 14 °F to 221 °F	High Temp. Nitrile, gasoline.
04	NH1	Hydrogenated Nitrile	-50 °C to +130 °C -58 °F to 266 °F	Better Behavior NBR with both extreme high and low temperatures performance.
05	ECO	Hydrin	-30 °C to +115 °C -22 °F to 239 °F	Standard Hydrin.
06	EP1	EPDM	-20 °C to +120 °C -4 °F to 248 °F	For phosphate-ester media, brake fluids, hot water, leaching fluids, detergents, water-glycol (HFC), many acids and bases, saline solutions, skydrol, etc.
07	IIR	Butyl	-20 °C to +110 °C -4 °F to 230 °F	Phosphoric esters (HFD-R), fyrquel, hot water, ammonia, caustic soda, some kinds of Freon (22-31-502), glycol-based brake fluids, some acids, alcohols, ketones, esters, skydrol 7000, etc.
08	FKM	Flouoroelastomer-Viton	-20 °C to +140 °C -4 °F to 284 °F	The same as with standard NBR with excellent performance at both high and low temperatures.

* Stocking materials

- Check our website for the rubber compatibility chart before selection.
- Special materials may take longer lead time with setup tooling fee, contact us before order.
- Contact us for other special materials not listed.

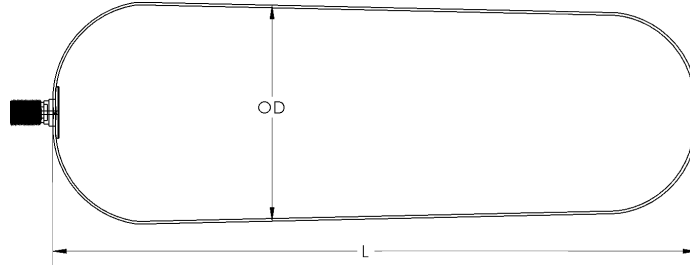
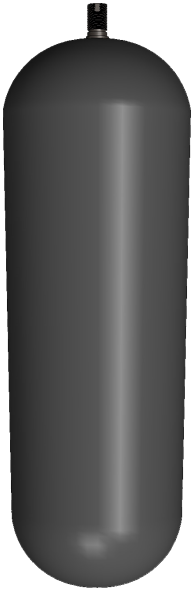
Bladder Repair Kit

Series & Specifications

Bladder Accumulators, RAS, RAL, RPK Series

RK SERIES:

RK series bladder repair kits are standard bladder repair kits used for Reasontek high pressure accumulators RAS series and low pressure accumulators RAL series with various rubber compound options. Different bladder stem types are available.



CAPACITY	1 QT	1 G	2.5 G	5 G	10 G	11 G	12.5 G*	15 G	16.5 G*
OD (in/mm)	3.94/100	5.90/150	7.88/200	7.88/200	7.88/200	7.88/200	7.88/200	7.88/200	7.88/200
L (in/mm)**	5.90/150	8.25/208	11.25/286	23.20/590	43.86/1115	49.0/1245	52.0/1320	68.20/1730	72.50/1830
Stem Std.	5/8"-18	7/8"-14	7/8"-14	7/8"-14	7/8"-14	7/8"-14	1 5/16"-12	7/8"-14	1 5/16"-12
Std. Part #	R702928	R702956	R702970	R702984	R702998	R703012	R703020	R703026	R703034

Stem Types A-F, Carbon Steel, Stainless Steel

<p>0.305-32 Thread Valve Core 5/8"-18</p> <p>A- 1QT Std.</p>	<p>1/2"-20 UNF SAE#5 7/8"-14 UNF</p> <p>B- 1-15G Std.</p>	<p>3/8"-24 UNF SAE#3 7/8"-14 UNF</p> <p>C- 1-15G</p>	<p>1/2"-20 UNF SAE#5 2"-12 UNF</p> <p>D- 10-15G</p>	<p>0.305-32 Thread Valve Core 7/8"-14 UNF 2"-12 UNF</p> <p>E- 10-15G HYDAC Type</p>	<p>1-5/16"-12 UNF SAE#16 2"-12 UNF</p> <p>F- 12.5/16.5G Komatsu Type</p>
-------------------------------------------------------------------------	----------------------------------------------------------------------	-----------------------------------------------------------------	----------------------------------------------------------------	----------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------

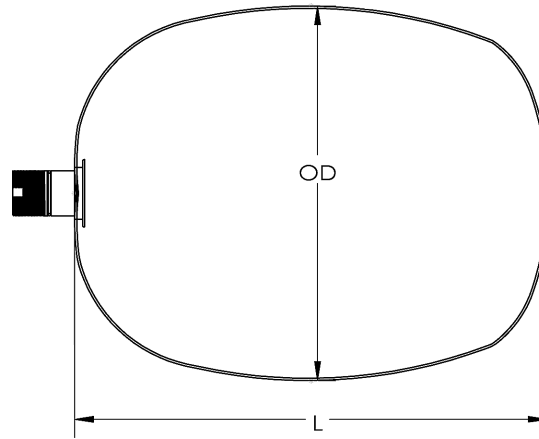
Not all the above materials are in stock, check the availability on your special order.

The RK series bladder repair kit includes the following parts:

- Bladder
- Metal Back Up Ring
- O-ring
- Washer
- High Pressure Gas Valve (1 to 15 G. only)

ITEM	SIZE	1 QT	1 G	2.5-15 G
Metal Back-up Ring (Stainless Steel)		R225010	R225020	R225030
O-ring (Nitrile)		R225210	R225220	R225230
Washer (Nitrile)		R225410	R225420	R225430
Gas Valve (3,000PSI)		-	G10026	G10026

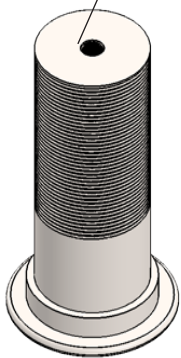
RKL SERIES:



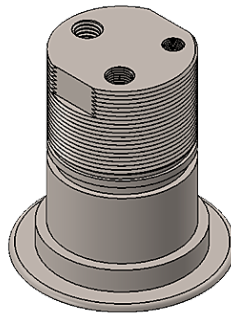
RKL series bladder repair kit is specially designed for Reasontek PluseKushon™ low pressure surge suppressors with various rubber compound options.

RKL series bladder uses 3-port 2.5” stem, which is especially designed for low pressure pressure tanks with both pressure charging and gauge monitoring functions.

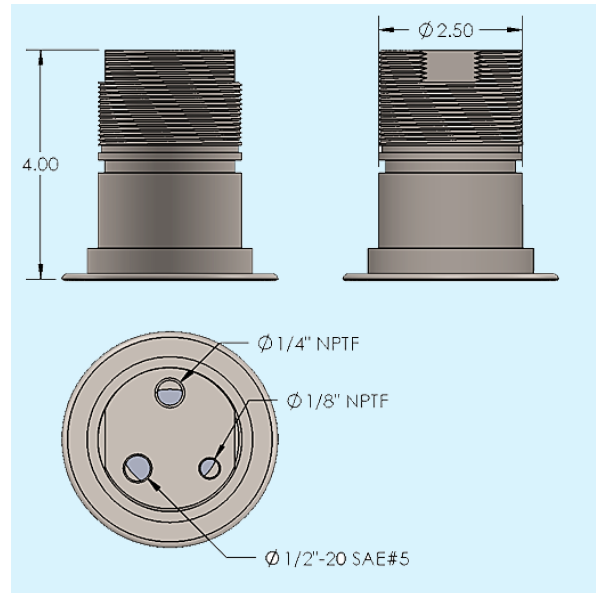
1/2”-20 UNF SAE#5



P1- 64mm



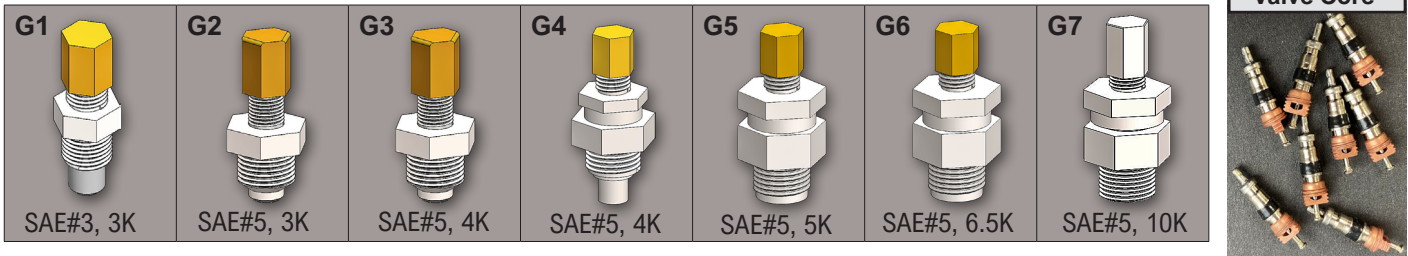
P2- standard 2.5”



CAPACITY	40G(150L)	53G(200L)	73G(275L)	80G(300L)	100G(375L)	125G(475L)	140G(530L)	150G(575L)
OD (in/mm)	21/533	21/533	21/533	21/533	21/533	21/533	21/533	21/533
L (in/mm)*	23.3/593	33.3/847	42.4/1077	46.3/1175	62.1/1578	75.1/1907	81.2/2062	89.2/2266
Stem Std.	P2/2.5”	P2/2.5”	P2/2.5”	P2/2.5”	P2/2.5”	P2/2.5”	P2/2.5”	P2/2.5”
Std. Part #	RKL04001	RKL05301	RKL07301	RKL08001	RKL10001	RKL12501	RKL14001	RKL15001

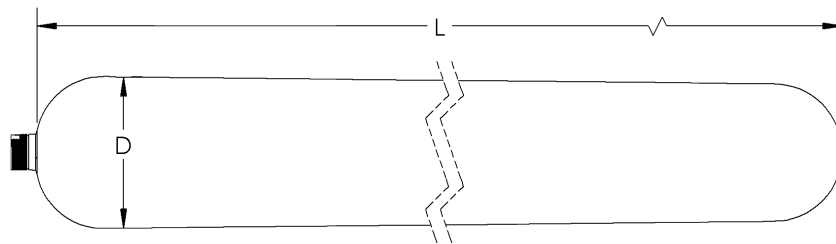
GAS VALVE OPTIONS:

Different Schrader type gas valves with pressure ranges from 3,000 PSI to 10,000 PSI. Also see the gas valve section below for more details.



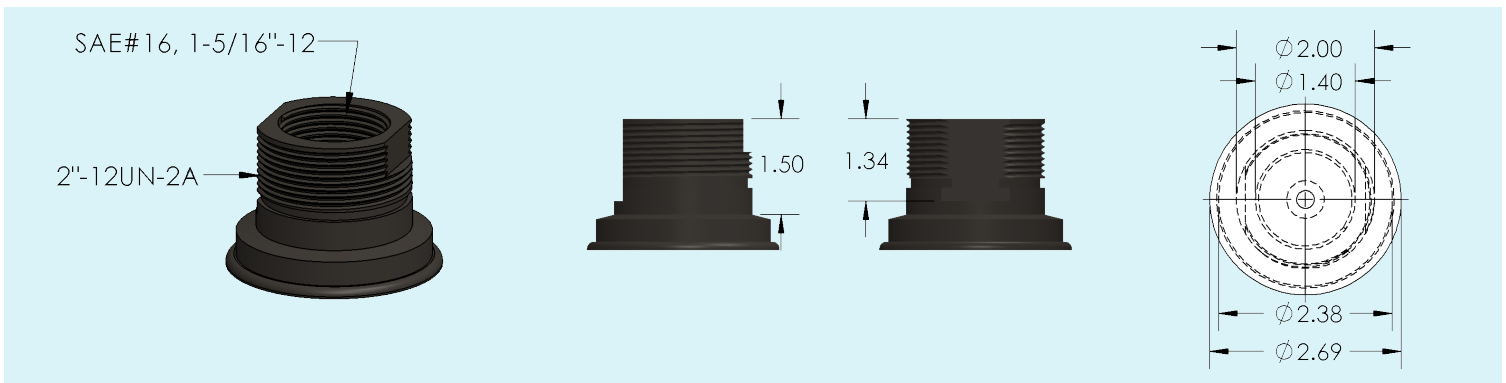
CODE	G1	G2	G3	G4	G5	G6	G7	Valve Core
Max. Pressure (PSI)	3,000	3,000	4,000	4,000	5,000	6,500	10,000	3,000/4,000
Thread, Bottom	3/8"-24	1/2"-20	1/2"-20	1/2"-20	1/2"-20	1/2"-20	1/2"-20	-
Type	valve core	valve core	valve core	valve core+ metal seal, military type	metal seal, military type	metal seal, military type	metal seal, military type	-
Part Number	G100025	G100026	G100027	G100028	G100029	G100030	G100031	G100003/G100004

RK SERIES, KOMATSU TYPE:



Part Number	Size	L in. (mm)	D in. (mm)	Stem #	Material
RK-125-01/R703020	12.5G	52(1320)	7.88(200)	324B031240	Nitrile
RK-125-01/PC2040*	12.5G	61(1560)	7.88(200)	324B031240	Nitrile
RK-165-01/R703034	16.5G	72(1830)	7.88(200)	324B031240	Nitrile

* New Komatsu 12.5G, Parker model: BA12BYT04X504/PC2040
 Dimensions are for reference only, special dimensions are made by orders.



Use the following chart to order accumulator bladder repair kit. To order the bladder only, use the prefix "X" in front.
example: RK-05-01B is standard 5-gallon bladder repair kit; XRK-05-01B is the 5-gallon bladder only.

①	②	③	④	⑤
Series	Size	Bladder/Seal Matl.	Stem Type	Stem Matl.
RK	05	01	B	-

① Series	
Standard High Pressure	RK
Standard Low Pressure	RKL
<i>(use prefix "X" for bladder only)</i>	

② Nominal Size	
RK Series	
1QT/1Liter	002
1 Gallon/4 Liter	01
2.5 Gallon/10 Liter	02
5 Gallon/20 Liter	05
10 Gallon/38 Liter	10
11 Gallon/42 Liter	11
12.5 Gallon	125
50 Liter	13
15 Gallon/57 Liter	15
16.5 Gallon	165
RKL Series	
40 Gallon/150 Liter	040
53 Gallon/200 Liter	053
73 Gallon/275 Liter	073
80 Gallon/300 Liter	080
100 Gallon/375 Liter	100
125 Gallon/475 Liter	125
140 Gallon/530 Liter	140
150 Gallon/575 Liter	150

③ Bladder/Seal Material	
Nitrile/Buna-N, Std.	01
Low Temp. Nitrile	02
High Temp. Nitrile	03
Hydrogenated Nitrile	04
Hydrin	05
EPDM	06
Butyl	07
Viton/FKM	08
Others	09
<i>(see Bladder Repair Kits section for details)</i>	

⑤ Stem Material	
Carbon Steel	-
Stainless Steel 316	S

④ Stem Type	
RK Series	
5/8"-18, 1QT Std.	A
7/8"-14 UNF Std.	B
7/8"-14 UNF, SAE#3	C
2"-12 UNF Std.	D
2"-12 UNF Hydac	E
2"-12 UNF Komatsu	F
Others	X
RKL Series	
64mm	P1
2-1/2"-12 UNF	P2

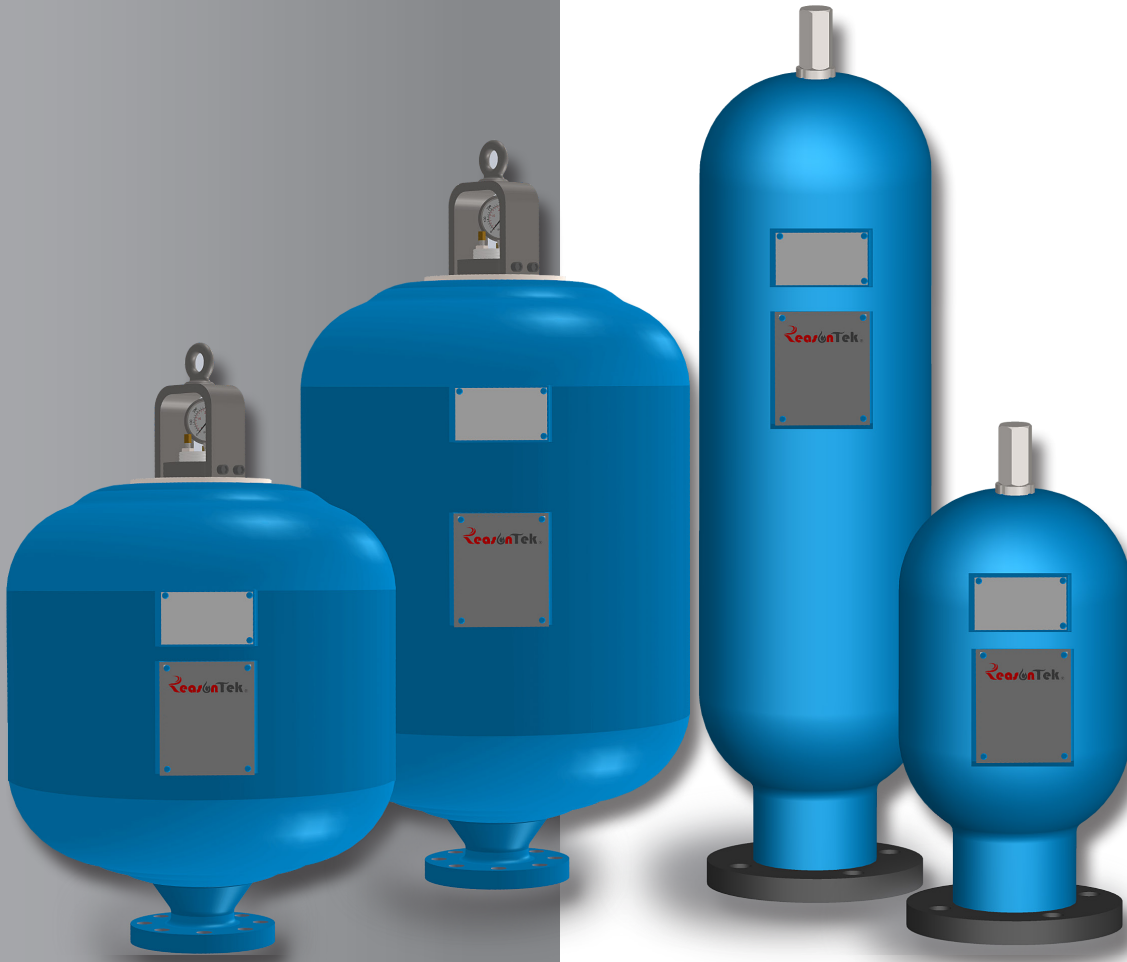
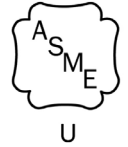
Not all the combinations are available. Not all the materials are in stock. Some special materials and designs may have long lead time with no cancellation, or return. Check our customer service for the availability.



PRESSURIZED VESSEL USE DRY NITROGEN ONLY!

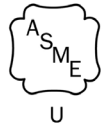
Please refer to Reasontek Bladder Replacement & Charging Instructions to avoid damage or failure due to improper operations.

PULSEKUSHON™



Pulsation Dampeners
Surge Suppressors

**LOW PRESSURE
ACCUMULATORS**

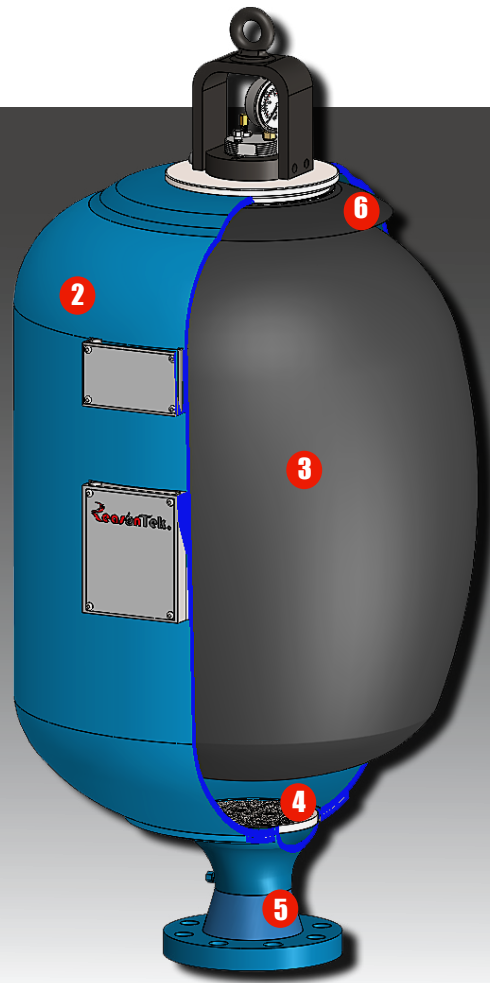


SURGE SUPPRESSORS, PULSEKUSHON™:

RAL



RPK



•LUBE OIL SERVICE •WATER & CHEMICAL SERVICE •SLURRY SERVICE •FIRE PROTECTION SERVICE

Why Use Suppressors?

In high volume fluid handling systems, shocks are experienced when the valves open or close, or when the pumps are started or stopped. The pressure spikes generated are four times greater than the system allowable pressure, causing the burst of the pipe, loosening fittings and damaging the meters and instruments.

PULSEKUSHON™ is designed as low-pressure accumulator products to control these shocks. Application include water sprinkling systems, water handling systems, refinery, refueling systems, chemical processing systems.

Surge Suppressor Benefits:

- Controls surges and water hammer
- Protects the meters and fittings, helps save the cost of repair or damage
 - Saves pump energy by holding consistent pressure
 - Keeps the system running smoothly and efficiently

CERTIFICATIONS:

Series	Size	Standard ASME(Section VIII, Div.1), NB Registered, U Stamp (other certificates are available by request)		
		Status	Rating	D.F
RAL	2.5-15 Gal. (10-57 Ltr.)	Standard	700 PSI	4 to 1
RPK	40-150 Gal. (150-575 Ltr.)	Standard	500 PSI	4 to 1

SPECIFICATIONS:

Materials

Shell-high strength alloy steel (SA372) with ASME Certification; Stainless steel 316 with ASME Certification. NB registered with U stamp.

RAL- seamless tube; RPK-welded

Screen-stainless steel.

Flanges - carbon steel, stainless steel

Bladders- various rubber compounds, see the bladder repair kit section.

Bladder Stem-steel, stainless steel

Gas Valve Guard- steel, stainless steel

Maximum Flow Rates

Flange Size	Max. Recommended Flow	
	GPM	LPM
3"	350	1325
4" & 6"	1000	3785
8" & 10"	1400	5300

Pressure Ratings

RAL Series: carbon steel up to 700 PSI; stainless steel up to 1500 PSI.

RPK Series: up to 500 PSI.

The pressure rating is based on the ASME certification code with 4: 1 design factors.

Fluids

Compatible with a wide variety of fluids. The standard use is petroleum-based industrial or water-based flame resistant fluids. Bladders for special fluids are available on special orders with temperature range from -60 °F to 400 °F (-53 °C to 204 °C)

Pre-charge

Units are shipped with nominal nitrogen pre-charge of 25 PSI. For specific pre-charge pressures, specify at time of order.

CONSTRUCTION:

1 The Shell (RAL Seamless) is a seamless pressure vessel forged or fabricated from high grade steel designed and manufactured to meet various relevant international standards. The standard materials are Cr-Mo High Strength Alloy Steel SA372 and stainless steel 316. For special applications various surface coatings are available as well as stainless steel construction. See the Service Coating section for more details.

2 The Shell (RPK Welded) is fabricated from carbon steel or stainless steel per ASME standard (Section VIII, Div. 1).

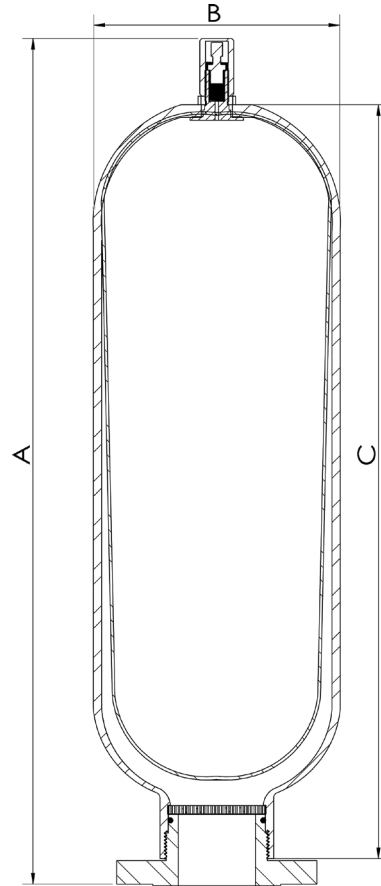
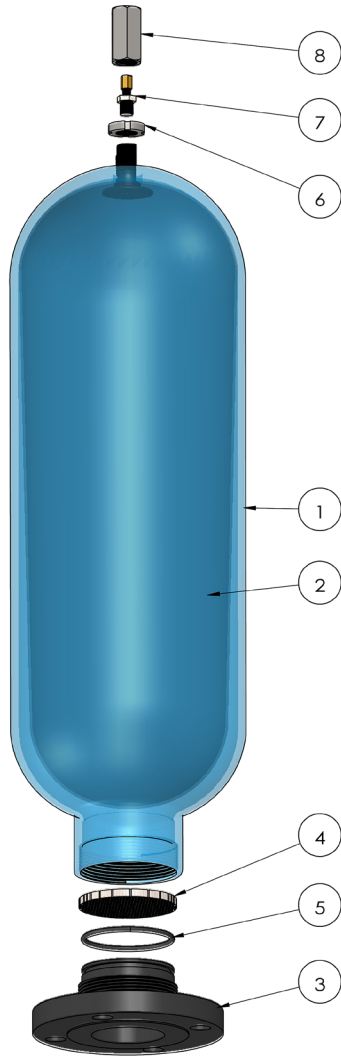
3 The Bladder is made by the various high quality rubber compounds including Nitrile, Low Temp. Nitrile, High Temp Nitrile, Butyl, Viton/FKM, Hydrin, EPDM for different fluid media application. See the details on the Bladder Repair Kits section.

4 The Anti-extrusion Screen is made by stainless steel material to prevent the bladder extrusion and for best corrosion resistance.

5 The Port Flange is standard ANSI RF type for the best pipeline solutions.

Serie	Type	Size	Rating	Material
RAL	Threaded	2"-4"	150#-600#	CS, SS
RPK	Welded	2"-10"	150#-300#	CS, SS

6 The Anti-extrusion Ring (RPK) is designed to prevent the bladder extrusion from the gas side when operated as top repairable type. Various rubber materials are available with stainless steel metal ring.



ITEM NO.	PART NO.		DESCRIPTION	QTY REQD
	Carbon Steel	Stainless Steel		
1	0030002-0030015	0030002S-0030015S	SHELL, LP, 2.5-15 GALLON, SEAMLESS	1
2	700002-700015	700002S-700015S	BLADDER ASSY. , 2.5-15 GALLON	1
3	RF2001, RF2003	RF2001S, RF2003S, RF2004S, RF2006S	ANSI FLANGE 2" CS: 150#, 300#; SS: 150#, 300#, 400#, 600#	1
	RF3001, RF3003	RF3001S, RF3003S, RF3004S, RF3006S	ANSI FLANGE 3" CS: 150#, 300#; SS: 150#, 300#, 400#, 600#	1
	RF4001, RF4003	RF4001S, RF4003S, RF4004S, RF4006S	ANSI FLANGE 4" CS: 150#, 300#; SS: 150#, 300#, 400#, 600#	1
4	L0002	L0002	ANTI EXTRUSION SCREEN	1
5	L0003	L0003	O-RING, NITRILE	1
6	R20005	R20005S	JAM NUT	1
7	G10026	G10026	GAS VALVE, 3K	1
8	R20006	R20006S	GAS VALVE GUARD	1

ASME Certified General Service RAL Series*

Nominal Size	Bladder Matl	Pressure Rating	Repair Kit	A Inch (mm)	B Inch (mm)	C Inch (mm)	Weight lbs.(kgs)
2.5 gallon (9.5 liters)	Buna-Nitrile	750 PSI (CS) 1500 PSI (SS)	R702970	18.25 (464)	8.6 (218)	13.75 (349)	63 (29)
5 gallon (19 liters)	Buna-Nitrile	750 PSI (CS) 1500 PSI (SS)	R702984	29.50 (749)	8.6 (218)	26.00 (660)	89 (40)
10 gallon (38 liters)	Buna-Nitrile	750 PSI (CS) 1500 PSI (SS)	R702998	50.63 (1286)	8.6 (218)	47.50 (1207)	137 (62)
15 gallon (57 liters)	Buna-Nitrile	750 PSI (CS) 1500 PSI (SS)	R703026	73.50 (1867)	8.6 (218)	69.50 (1765)	170 (77)

* The weight and dimensions are for standard 3"-150# RF flanges

RAL Series General Service Flange Types & Model Numbers

Nominal Size	FLANGE SIZE	FLANGE CLASS & MODEL NUMBER			
		150# (CS & SS)	300# (CS & SS)	400# (SS only)	600# (SS only)
2.5 gallon (9.5 Liters)	2"	RAL02-C01E1 RAL02-S01E1	RAL02-C01E2 RAL02-S01E2	RAL02-C01E3 RAL02-S01E3	RAL02-C01E4 RAL02-S01E4
	3"	RAL02-C01F1 RAL02-S01F1	RAL02-C01F2 RAL02-S01F2	RAL02-C01F3 RAL02-S01F3	RAL02-C01F4 RAL02-S01F4
	4"	RAL02-C01P1 RAL02-S01P1	RAL02-C01P2 RAL02-S01P2	RAL02-C01P3 RAL02-S01P3	RAL02-C01P4 RAL02-S01P4
5 gallon (19 Liters)	2"	RAL05-C01E1 RAL05-S01E1	RAL05-C01E2 RAL05-S01E2	RAL05-C01E3 RAL05-S01E3	RAL05-C01E4 RAL05-S01E4
	3"	RAL05-C01F1 RAL05-S01F1	RAL05-C01F2 RAL05-S01F2	RAL05-C01F3 RAL05-S01F3	RAL05-C01F4 RAL05-S01F4
	4"	RAL05-C01P1 RAL05-S01P1	RAL05-C01P2 RAL05-S01P2	RAL05-C01P3 RAL05-S01P3	RAL05-C01P4 RAL05-S01P4
10 gallon (38 Liters)	2"	RAL10-C01E1 RAL10-S01E1	RAL10-C01E2 RAL10-S01E2	RAL10-C01E3 RAL10-S01E3	RAL10-C01E4 RAL10-S01E4
	3"	RAL10-C01F1 RAL10-S01F1	RAL10-C01F2 RAL10-S01F2	RAL10-C01F3 RAL10-S01F3	RAL10-C01F4 RAL10-S01F4
	4"	RAL10-C01P1 RAL10-S01P1	RAL10-C01P2 RAL10-S01P2	RAL10-C01P3 RAL10-S01P3	RAL10-C01P4 RAL10-S01P4
15 gallon (57 Liters)	2"	RAL15-C01E1 RAL15-S01E1	RAL15-C01E2 RAL15-S01E2	RAL15-C01E3 RAL15-S01E3	RAL15-C01E4 RAL15-S01E4
	3"	RAL15-C01F1 RAL15-S01F1	RAL15-C01F2 RAL15-S01F2	RAL15-C01F3 RAL15-S01F3	RAL15-C01F4 RAL15-S01F4
	4"	RAL15-C01P1 RAL15-S01P1	RAL15-C01P2 RAL15-S01P2	RAL15-C01P3 RAL15-S01P3	RAL15-C01P4 RAL15-S01P4

RAL SURGE SUPPRESSORS

Standard lube oil service and water or chemical service

Features:

- Seamless spun shell, carbon steel, stainless steel
- Threaded removable flange, easy for pipeline interchange and maintenance
- Low pressure design, light weighted
- Highest quality US/European made bladders with various compound options
- Special coating options for water and chemical services
- Custom products are available by request

Specifications:

- Shell: carbon steel and stainless steel, ASME Certified with U stamp, 9” diameter
- Max. Pressure: 750PSI (carbon steel); 1,500 PSI (stainless steel)
- Capacities: from 2.5 to 15 Gallons, bottom threaded flange
- Bladder: highest quality US/European made bladders, standard Nitrile
- Fluids: compatible with a wide variety of fluids with temperature range from -60 °F to 440 °F (-53 °C to 230 °C)
- Flow Rate: 350 GPM (1325 LPM) for 3” flange
- Custom products are available by request

Services:

Standard Lube Oil Service-Carbon steel shell, corrosion protective lubrication interior; black primed exterior; carbon steel fluid components.

Extreme Water & Chemical Service, Subsea- Carbon steel shell epoxy coated interior, epoxy coated or 2-layer marine painting exterior; stainless steel fluid components.

All Stainless Steel-Maximum corrosion protection

See the coating section on page 12 for details



RAL Series Flange Options*

CODE	FLANGE-SIZE	CLASS			
		150# (CS & SS)	300# (CS & SS)	400# (SS only)	600# (SS only)
	2”	E1	E2	E3	E4
	3”	F1	F2	F3	F4
	4”	P1	P2	P3	P4
	Others	FX	FX	FX	FX

* Unless specially noted, all the types are RF flanges per ANSI B16.5 standard

Use the following chart to order RAL low pressure flange-type accumulator.

example: RAL-05C-01F1 is standard ASME 5-gallon surge suppressor with 3"-150# connection.

①	②	③	④	⑤	⑥	⑦
Series	Size	Shell Matl.	Bladder/Seal Matl.	Flange	Service	Cert.
RAL	05	C	01	F1	-	-

① Series	Low Pressure Accumulator	RAL
----------	--------------------------	------------

② Nominal Size	2.5 Gallon/10 Liter	02
5 Gallon/20 Liter	05	
10 Gallon/38 Liter	10	
15 Gallon/57 Liter	15	
Others	XX	

③ Shell Material	Carbon Steel	C
Stainless Steel 316	S	

⑥ Service	Std. Lube Oil	-
Epoxy Interior/Exterior	W	
Others	X	

④ Bladder/Seal Material	Nitrile/Buna-N, Std.	01
Low Temp. Nitrile	02	
High Temp. Nitrile	03	
Hydrogenated Nitrile	04	
Hydrin	05	
EPDM	06	
Butyl	07	
Viton/FKM	08	
Others	09	
<i>(see Bladder Repair Kits section for details)</i>		

⑦ Certificate	Standard ASME	-
Non-ASME	X	

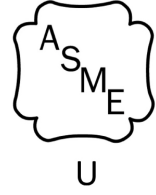
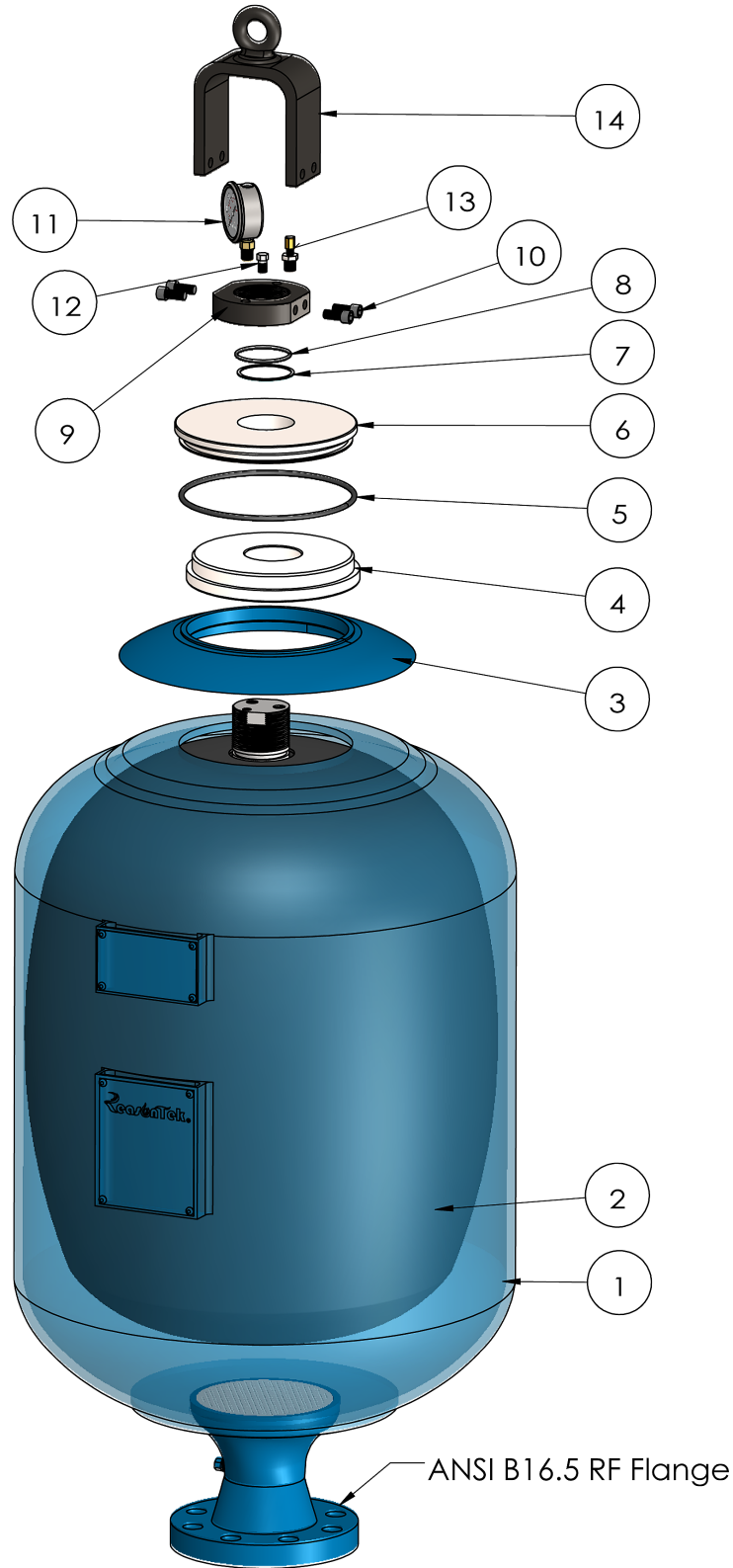
⑤ Flange	2"-150# (CS & SS)	E1
2"-300# (CS & SS)	E2	
2"-400# (SS only)	E3	
2"-600# (SS only)	E4	
3"-150# (CS & SS)	F1	
3"-300# (CS & SS)	F2	
3"-400# (SS only)	F3	
3"-600# (SS only)	F4	
4"-150# (CS & SS)	P1	
4"-300# (CS & SS)	P2	
4"-400# (SS only)	P3	
4"-600# (SS only)	P4	
Others	FX	

Not all the combinations are available. Not all the materials are in stock. Some special materials and designs may have long lead time with no cancellation, or return. Check our customer service for the availability.



PRESSURIZED VESSEL USE DRY NITROGEN ONLY!

Please refer to Reasontek Bladder Replacement & Charging Instructions to avoid damage or failure due to improper operations.



ITEM NO.	PART NO.		DESCRIPTION	QTY REQD	
	Carbon Steel	Stainless Steel			
1	-	-	SHELL ASSEMBLY, PK, 40-150 GALLON, WELDED	1	1
2	PK700040- PK700150	PK700040S- PK700150S	BLADDER ASSY. , 40-150 GALLON	1	1
3	PK0004	PK0004	ANTI-EXTRUSION RING, SS	1	1
4	PK0003	PK0003	GAS PLUG, SS	1	1
5	PK7501	PK7501	O-RING, PLATE, NITRILE	1	1
6	PK0006	PK0006	PLATE, GAS END, SS	1	1
7	PK2011	PK2011	SPACER, STEM, NITRILE	1	1
8	PK2001	PK2001	O-RING, STEM, NITRILE	1	1
9	PK0007	PK0007S	LOCK NUT	1	1
10	PK0008	PK0008S	CAP SCREW	1	4
11	G5001	G5001	PRESSURE GAUGE, 500 PSI	1	1
12	PK0009	PK0009S	BLEED PLUG	1	1
13	G10026	G10026	GAS VALVE, 3K	1	1
14	PK0010	PK0010S	VALVE GUARD	1	1

RPK Series Flange Options*

CODE	Flange SIZE	CLASS	
		150# (CS & SS)	300# (CS & SS)
	2"	E1	E2
	3"	F1	F2
	4"	P1	P2
	6"	T1	T2
	8"	N1	N2
	10"	S1	S2
	Others	FX	FX

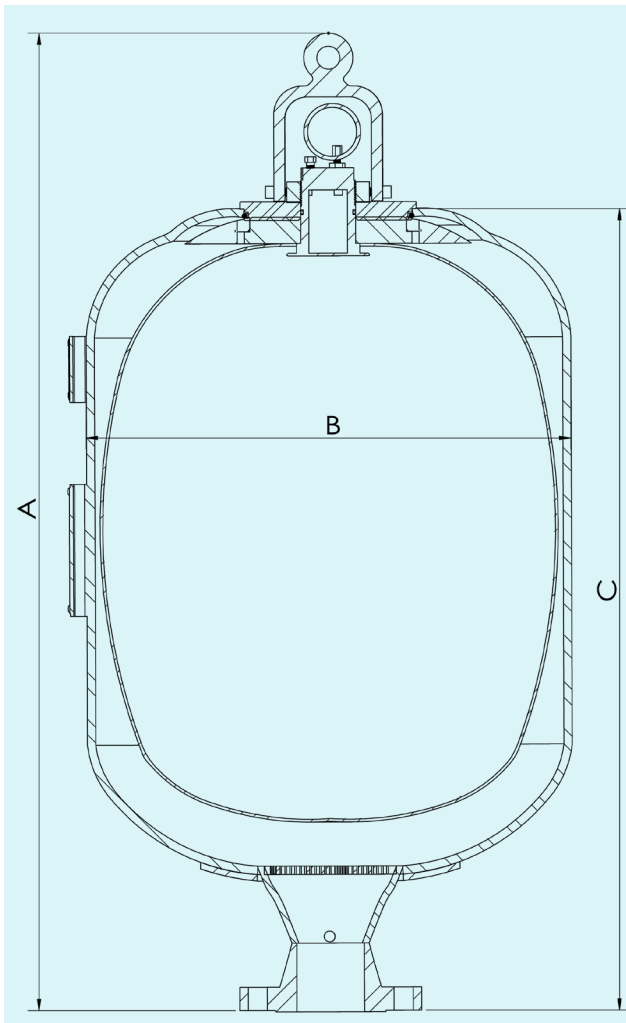
* Unless specially noted, all the types are RFWN flanges per ANSI B16.5 standard

RPK Series Shell Assembly

The shell assembly is a combination of welded entities, including the shell, the reducer, the flange and the anti-extrusion screen.

Custom mounting legs and brackets are available by special request and drawing approval.

Pipeline manifolds, fittings are available by special design request. See the last page of RPK section.



ASME Certified General Service RPK Series, PULSEKUSHON™, CS (SS)

example model number: RPK40-C01E1 (carbon steel); RPK40-S01E1 (stainless steel).

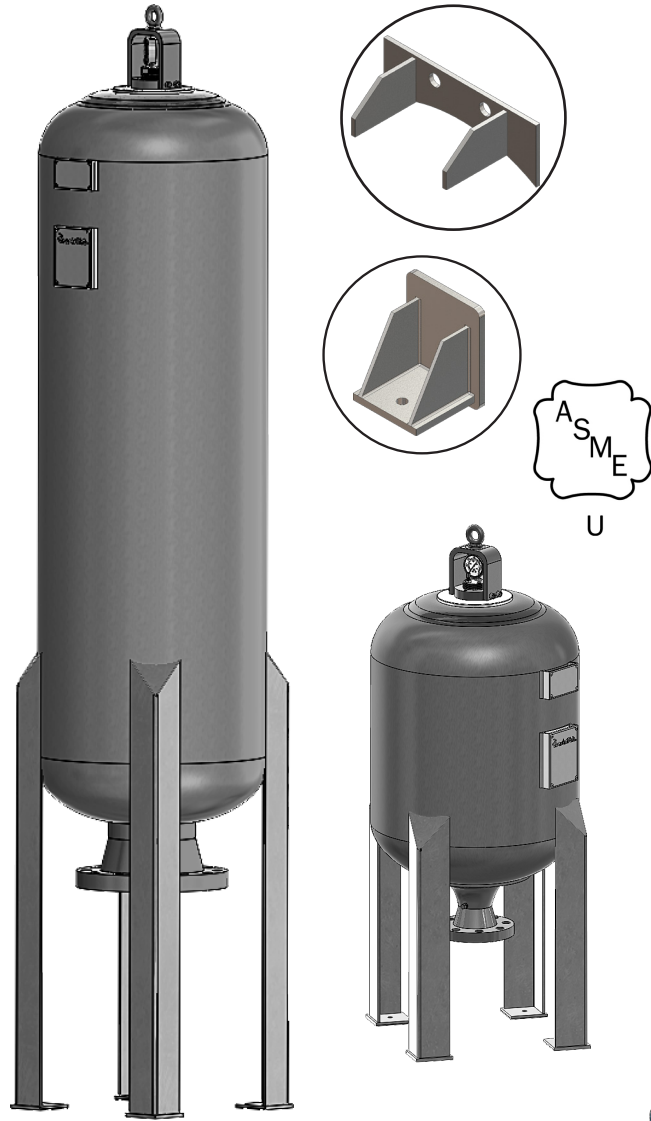
Nominal Size	B Inch (mm)	Flange Size	275 PSI Rated with 150# Flange				500 PSI Rated with 300# Flange				Est. Weight			
			Model Number	A		C		Model Number	A		C		lbs	(Kg)
				Inch	(mm)	Inch	(mm)		Inch	(mm)	Inch	(mm)		
40 gallon (150 L)	22.00 (559)	2"	RPK40-C(S)01E1	45.53 (1156)	37.53 (953)	RPK40-C(S)01E2	45.75 (1162)	37.75 (959)	346 (156)					
		3"	RPK40-C(S)01F1	45.72 (1161)	37.72 (958)	RPK40-C(S)01F2	46.00 (1168)	38.00 (965)	352 (158)					
		4"	RPK40-C(S)01P1	45.72 (1161)	37.72 (958)	RPK40-C(S)01P2	46.13 (1172)	38.13 (969)	360 (162)					
		6"	RPK40-C(S)01T1	45.78 (1163)	37.78 (960)	RPK40-C(S)01T2	46.32 (1177)	38.32 (973)	370 (167)					
		8"	RPK40-C(S)01N1	45.90 (1166)	37.90 (963)	RPK40-C(S)01N2	46.50 (1181)	38.50 (978)	385 (173)					
53 gallon (200L)	22.00 (559)	2"	RPK53-C(S)01E1	47.92 (1217)	39.92 (1014)	RPK53-C(S)01E2	48.14 (1223)	40.14 (1020)	461 (207)					
		3"	RPK53-C(S)01F1	48.11 (1222)	40.11 (1019)	RPK53-C(S)01F2	48.39 (1229)	40.39 (1026)	467 (210)					
		4"	RPK53-C(S)01P1	48.11 (1222)	40.11 (1019)	RPK53-C(S)01P2	48.52 (1232)	40.52 (1029)	475 (214)					
		6"	RPK53-C(S)01T1	48.17 (1224)	40.17 (1020)	RPK53-C(S)01T2	48.71 (1237)	40.71 (1034)	485 (218)					
		8"	RPK53-C(S)01N1	48.29 (1227)	40.29 (1023)	RPK53-C(S)01N2	48.89 (1242)	40.89 (1039)	500 (225)					
73 gallon (275L)	22.00 (559)	2"	RPK73-C(S)01E1	58.19 (1478)	50.19 (1275)	RPK73-C(S)01E2	58.41 (1484)	50.41 (1280)	584 (263)					
		3"	RPK73-C(S)01F1	58.38 (1483)	50.38 (1280)	RPK73-C(S)01F2	58.66 (1490)	50.66 (1287)	590 (266)					
		4"	RPK73-C(S)01P1	58.38 (1483)	50.38 (1280)	RPK73-C(S)01P2	58.79 (1493)	50.79 (1290)	598 (269)					
		6"	RPK73-C(S)01T1	58.44 (1484)	50.44 (1281)	RPK73-C(S)01T2	58.98 (1498)	50.98 (1295)	608 (274)					
		8"	RPK73-C(S)01N1	58.56 (1487)	50.56 (1284)	RPK73-C(S)01N2	59.16 (1503)	51.16 (1299)	623 (280)					
80 gallon (300L)	22.00 (559)	2"	RPK80-C(S)01E1	66.53 (1690)	58.53 (1487)	RPK80-C(S)01E2	66.75 (1695)	58.75 (1492)	640 (288)					
		3"	RPK80-C(S)01F1	66.72 (1695)	58.72 (1491)	RPK80-C(S)01F2	67.00 (1702)	59.00 (1499)	646 (291)					
		4"	RPK80-C(S)01P1	66.72 (1695)	58.72 (1491)	RPK80-C(S)01P2	67.13 (1705)	59.13 (1502)	654 (294)					
		6"	RPK80-C(S)01T1	66.78 (1696)	58.78 (1493)	RPK80-C(S)01T2	67.32 (1710)	59.32 (1507)	664 (299)					
		8"	RPK80-C(S)01N1	66.90 (1699)	58.90 (1496)	RPK80-C(S)01N2	67.50 (1715)	59.50 (1511)	680 (306)					
100 gallon (375L)	22.00 (559)	2"	RPK100-C(S)01E1	87.02 (2210)	79.02 (2007)	RPK100-C(S)01E2	87.24 (2216)	79.24 (2013)	866 (390)					
		3"	RPK100-C(S)01F1	87.21 (2215)	79.21 (2012)	RPK100-C(S)01F2	87.49 (2222)	79.49 (2019)	872 (392)					
		4"	RPK100-C(S)01P1	87.21 (2215)	79.21 (2012)	RPK100-C(S)01P2	87.62 (2226)	79.62 (2022)	880 (396)					
		6"	RPK100-C(S)01T1	87.27 (2217)	79.27 (2013)	RPK100-C(S)01T2	87.81 (2230)	79.81 (2027)	890 (401)					
		8"	RPK100-C(S)01N1	87.39 (2220)	79.39 (2017)	RPK100-C(S)01N2	87.98 (2235)	79.98 (2031)	914 (411)					
125 gallon (475L)	22.00 (559)	2"	RPK125-C(S)01E1	98.08 (2491)	90.08 (2288)	RPK125-C(S)01E2	98.30 (2497)	90.30 (2294)	996 (448)					
		3"	RPK125-C(S)01F1	98.27 (2496)	90.27 (2293)	RPK125-C(S)01F2	98.55 (2503)	90.55 (2300)	1002 (451)					
		4"	RPK125-C(S)01P1	98.27 (2496)	90.27 (2293)	RPK125-C(S)01P2	98.68 (2506)	90.68 (2303)	1010 (455)					
		6"	RPK125-C(S)01T1	98.33 (2498)	90.33 (2294)	RPK125-C(S)01T2	98.87 (2511)	90.87 (2308)	1020 (459)					
		8"	RPK125-C(S)01N1	98.45 (2501)	90.45 (2297)	RPK125-C(S)01N2	99.05 (2516)	91.05 (2313)	1035 (466)					
140 gallon (530L)	22.00 (559)	2"	RPK140-C(S)01E1	105.75 (2686)	97.75 (2483)	RPK140-C(S)01E2	105.91 (2690)	97.91 (2487)	1087 (489)					
		3"	RPK140-C(S)01F1	105.88 (2689)	97.88 (2486)	RPK140-C(S)01F2	106.16 (2696)	98.16 (2493)	1093 (492)					
		4"	RPK140-C(S)01P1	105.88 (2689)	97.88 (2486)	RPK140-C(S)01P2	106.29 (2700)	98.29 (2497)	1101 (495)					
		6"	RPK140-C(S)01T1	105.94 (2691)	97.94 (2488)	RPK140-C(S)01T2	106.48 (2705)	98.48 (2501)	1111 (500)					
		8"	RPK140-C(S)01N1	106.06 (2694)	98.06 (2491)	RPK140-C(S)01N2	106.66 (2709)	98.66 (2506)	1126 (507)					
150 gallon (575L)	22.00 (559)	2"	RPK150-C(S)01E1	114.49 (2908)	106.49 (2705)	RPK150-C(S)01E2	114.71 (2914)	106.71 (2710)	1192 (536)					
		3"	RPK150-C(S)01F1	114.68 (2913)	106.68 (2710)	RPK150-C(S)01F2	114.96 (2920)	106.96 (2717)	1198 (539)					
		4"	RPK150-C(S)01P1	114.68 (2913)	106.68 (2710)	RPK150-C(S)01P2	115.09 (2923)	107.09 (2720)	1206 (543)					
		6"	RPK150-C(S)01T1	114.74 (2914)	106.74 (2711)	RPK150-C(S)01T2	115.28 (2928)	107.28 (2725)	1216 (547)					
		8"	RPK150-C(S)01N1	114.86 (2917)	106.86 (2714)	RPK150-C(S)01N2	115.46 (2933)	107.46 (2729)	1231 (554)					

RPK Series Custom Mounting Solutions

Custom mounting solutions are available by the approved drawings including supporting legs, supporting lugs, etc.

For the group surge suppressor application, pipeline manifold and skid are available by request.

Custom mounting requirements need to be mentioned on the order and may not change or cancel during the production.



Services & Coating

Standard-protective lubrication interior and primer paint exterior on carbon steel shells for oil services or stainless steel shells with no paint.

Epoxy Coating Interior and Exterior-Epoxy NSF-61, 10-12 MILS for water and chemical services.

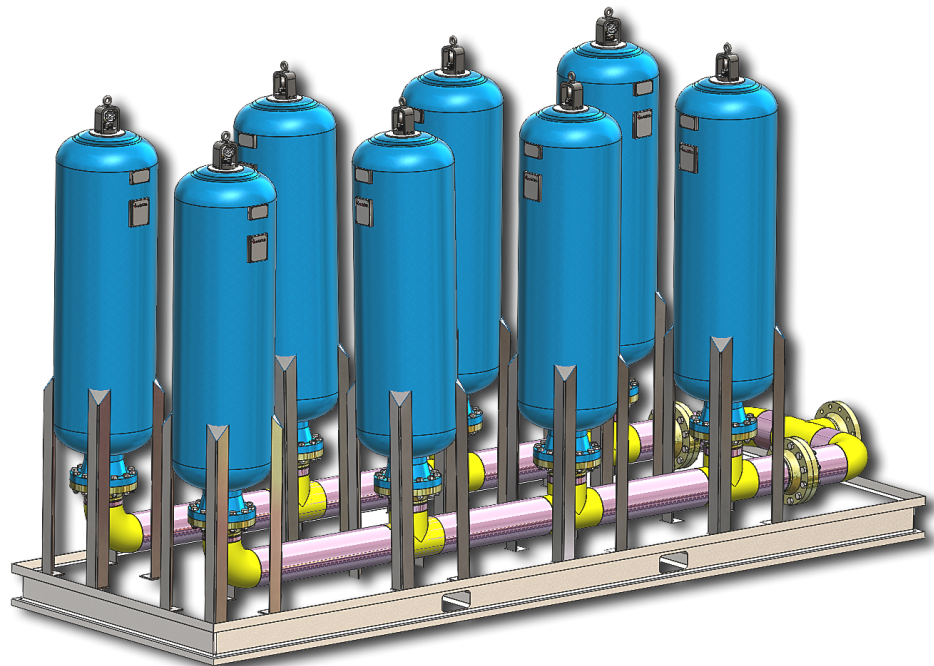
Other custom coating requirements are available by request.

Bladder Repair Kit

High quality rubber materials with various compound options . See the Bladder Repair Kits section on page 17 .

Nitrogen Charging Kit

RPK series use the same nitrogen charging kit as standard RAS series. See the details of the Charging Kit section on page 31 .



Use the following chart to order RPK SURGEKUSHON™ low pressure flange-type accumulator.

example: RAL-05C-01F1 is standard ASME 5-gallon surge suppressor with 3"-150# connection.

①	②	③	④	⑤	⑥	⑦	⑧
Series	Size	Shell Matl.	Bladder/Seal Matl.	Flange	Service	Cert.	Mounting
RPK	40	C	01	F1	W	-	-

① Series
Low Pressure Accumulator RPK

② Nominal Size
40 Gallon/150 Liter 40
53 Gallon/200 Liter 53
73 Gallon/275 Liter 73
80 Gallon/300 Liter 80
100 Gallon/375 Liter 100
125 Gallon/475 Liter 125
140 Gallon/530 Liter 140
150 Gallon/575 Liter 150
Others XXX

③ Shell Material
Carbon Steel C
Stainless Steel 316 S

⑧ Mounting
Supporting Legs M1
Supporting Lugs M2
Legs & Lugs M3
Manifold Skid MS

④ Bladder/Seal Material
Nitrile/Buna-N, Std. 01
Low Temp. Nitrile 02
High Temp. Nitrile 03
Hydrogenated Nitrile 04
Hydrin 05
EPDM 06
Butyl 07
Viton/FKM 08
Others 09
<i>(see Bladder Repair Kits section for details)</i>

⑥ Service
Std. Lube Oil -
Epoxy Interior/Exterior W
<i>(see Coating & Service section for details)</i>
Others X

⑤ Flange
2"-150# E1
2"-300# E2
3"-150# F1
3"-300# F2
4"-150# P1
4"-300# P2
6"-150# T1
6"-300# T2
8"-150# N1
8"-300# N2
10"-150# S1
10"-300# S2
Others FX

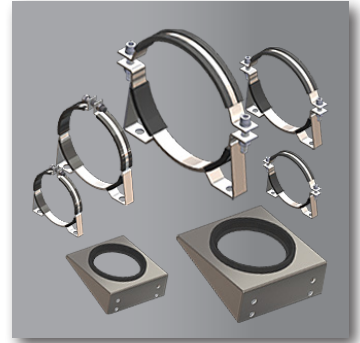
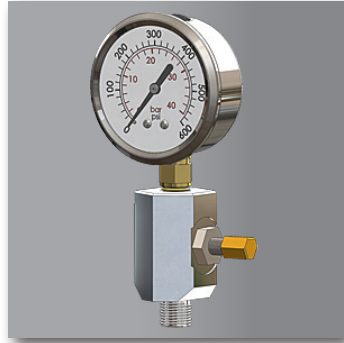
⑦ Certificate
Standard ASME -
Non-ASME X

Not all the materials are in stock. Some special materials and designs may have long lead time with no cancellation, or return. Check our customer service for the availability.



PRESSURIZED VESSEL USE DRY NITROGEN ONLY!
Please refer to Reasontek Bladder Replacement & Charging Instructions to avoid damage or failure due to improper operations.

Tools & Accessories



Charging & Gauging Kits
Service & Repair Kits
Mounting Components
Gas Valves
Hand Tools & Accessories

RGA-100-X Series

Charging & Gauging Assembly, 3,000 PSI.



RGA-100-X/C with case



The RGA-100X series Charging and Gauging Assembly from Reasontek are standard tools for maintaining the Nitrogen pre-charge in hydro-pneumatic accumulators. It can be used for all types of accumulators or pressure tanks with standard Schrader gas valve connection.

Gauges are available in different pressure ranges up to 3000 PSI. Other pressures and metric gauge markings are also available. Replace "X" with pressure gauge readings ranging from 100 PSI to 5,000 PSI (A-F). See the ordering code below.

RGA-100-X can be used for Reasontek RAS, RAL, RPK series bladder accumulators.

Ordering Code:

RGA-100- **(without case)**

RGA-100- **/C (with case)**

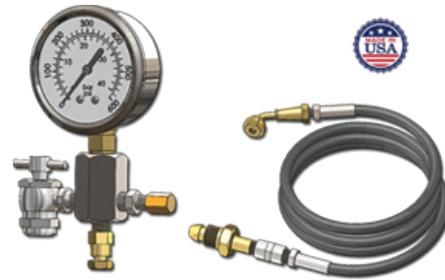
RGA-100-X Parts List:

Series	Pressure Gauge	Item #	Description & Qty.	Part Number
RGA-100-		1	Body, Portable Mount, 1 pc	RGA-001
		2	Air Chuck, 5,000 PSI, Scharder type, 0.305"-32, 1 pc	RGA-002
		3	Bleed Valve, 1/8" NPT, 1 pc	RGA-003
		4	Tank Valve, 1/8" NPT, 1 pc	RGA-004
		5	Pressure Gauge, 1 pc	RGA-005
		6	Swivel Connector, 1/8" NPT, 1 pc	RGA-006
		7	Hose Assembly (10 feet), 1 pc	RGA-007
		8	Coupler, 1/4" NPT 1 pc	RGA-008
		9	Gland, 1/4" NPT, 1 pc	RGA-009
		10	Nut, CGA-580, 1 pc	RGA-010

example: RGA-100-E, charging kit with 3,000 PSI pressure gauge.

Features:

- 10' Parker 3,000 PSI hydraulic hose with standard right-hand thread nitrogen fitting (CGA-580).
- Easy to install and operate.
- No external leakage.
- Maximum versatility.
- All hardware included, made in US
- High quality stainless steel pressure gauge.
- Easy to repair or interchange with parts list.



RGA-100-X without case

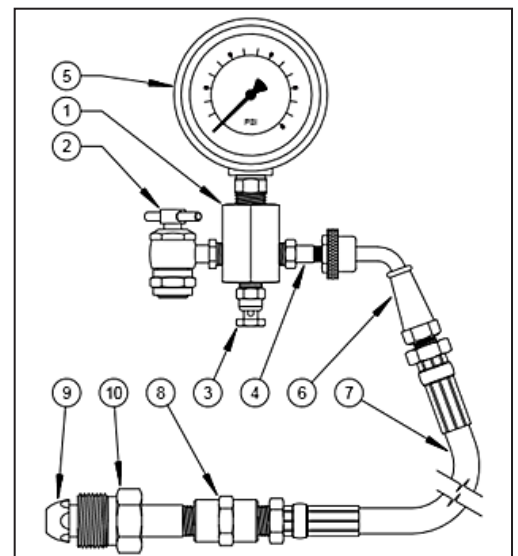


Gas valve charging extension, for our top repairable accumulators, PN: T800200 (sold separately)



CAUTION: Accumulator charging can be dangerous, fully trained professionals only. Read our accumulator charging instructions carefully before operation. Always wear safety protections.

Check the RGA-100-X instructions on our website for the details.



RGA-200-X Series

Charging & Gauging Assembly, 3,000 PSI.



RGA-200-X/C with case

The RGA-200X series Charging and Gauging Assembly from Reasontek are standard tools for diaphragm accumulator charging with metric M28X1.5 connection.

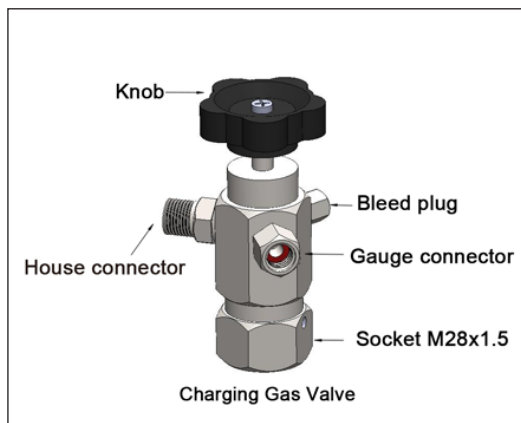
Gauges are available in different pressure ranges up to 3000 PSI. Other pressures and metric gauge markings are also available. Replace "X" with pressure gauge readings ranging from 100 PSI to 5,000 PSI (A-F). See the ordering code below.

RGA-200-X is used for Reasontek RAD series diaphragm accumulators only.

Ordering Code:

RGA-200- **(without case)**

RGA-200- **/C (with case)**



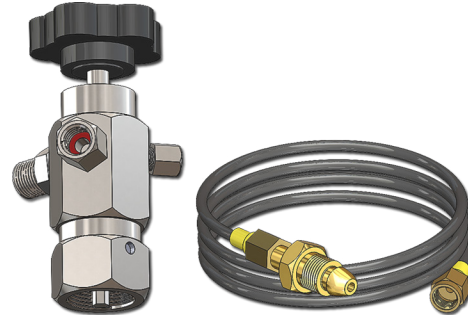
Check the RGA-200-X instructions on our website for the details.



CAUTION: Accumulator charging can be dangerous, fully trained professionals only. Read our accumulator charging instructions carefully before operation. Always wear safety protections.

Features:

- 10 feet 4,000 PSI hydraulic hose with standard right-hand thread Nitrogen fitting (CGA-580).
- Easy to install and operate.
- No external leakage.
- Maximum versatility.
- High quality stainless steel pressure gauge.

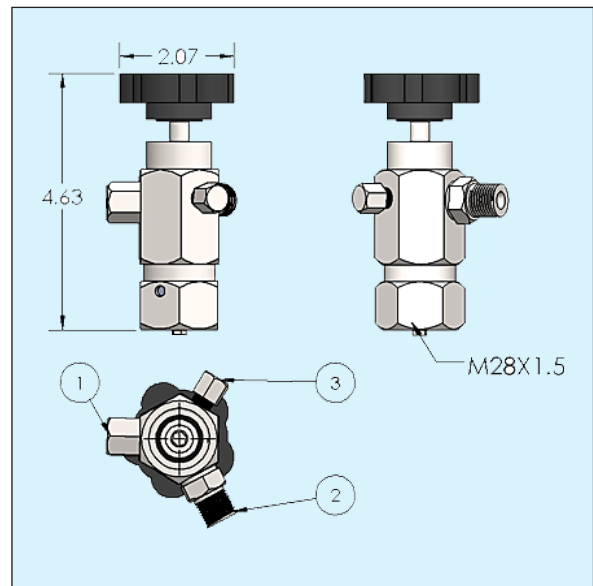


RGA-200-X without case

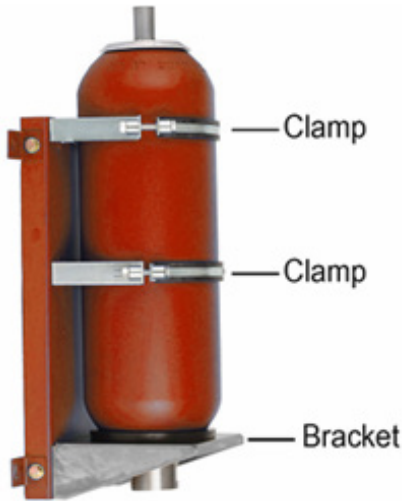
RGA-200-X Parts List:

Series	Pressure Gauge	Item #	Specifications
RGA-200-	A-0-100 PSI	1	Connection, Pressure Gauge 1/4" NPT
	B-0-300 PSI		
	C-0-600 PSI		
	D-0-1,500 PSI	2	Connection, Hose, M14X1.5
	E-0-3,000 PSI		
	F-0-5,000 PSI		
		3	Bleed Plug, M10

example: RGA-200-E, charging kit with 3,000 PSI pressure gauge.



Mounting Clamps and Brackets for Accumulators, Cylinders

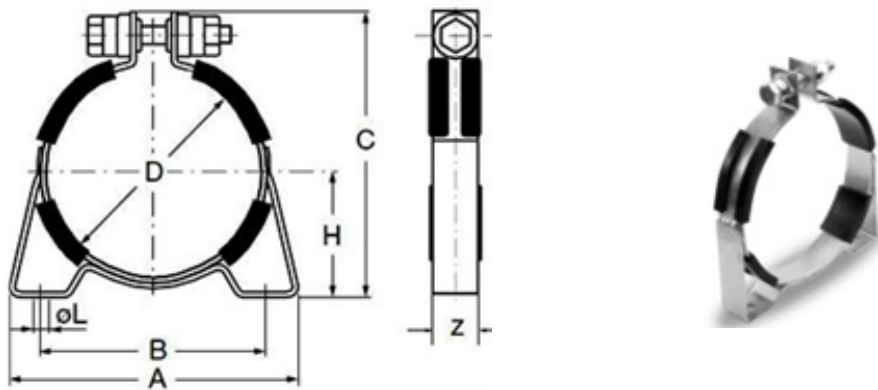


Our accumulator mounting clamps and brackets are designed to provide simple and secure mounting for accumulators, cylinders and filter housings.

Features:

- Rubber cushioning to reduce vibration and noise.
- Compensation for thermal expansion and contraction.
- Exclusively designed for all types of accumulators, cylinders and filter housings.
- White paint or clear Zinc plated to resist corrosion.
- Material: carbon steel and stainless steel.
- Special sizes, designs and materials available upon request.

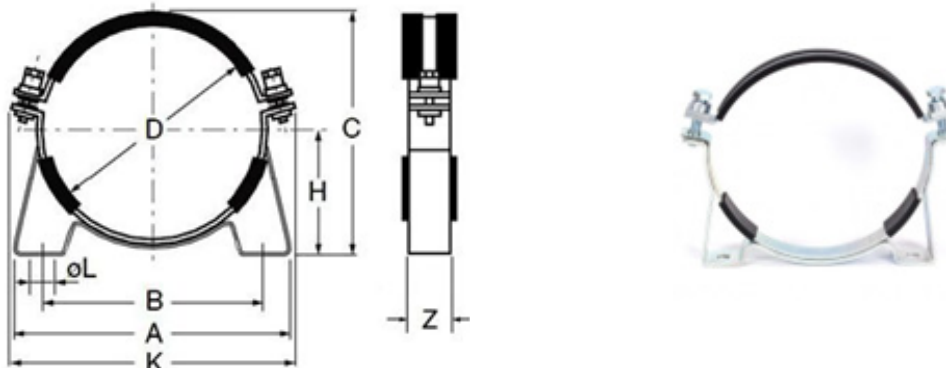
Single Bolt Clamps, RMS Series:



Mounting Clamps, Single Bolt								
Model	A in. (mm)	B in. (mm)	C in. (mm)	D (Dia.) in. (mm)	H in. (mm)	L (Slot) in. (mm)	Width Z in. (mm)	Wt. lbs. (kg)
RMS-45	5.26 (134)	3.94 (100)	6.68 (170)	4.51 (115)	2.87 (73)	.38 x .50 (9.7 x 12.7)	1.25 (32)	1.8 (.82)
RMS-50	6.89 (175)	5.35 (136)	7.12 (181)	5.00 (126)	3.03 (77)	.38 x .50 (9.7 x 12.7)	1.25 (32)	1.8 (.82)
RMS-57	6.63 (168)	5.35 (136)	7.75 (197)	5.75 (146)	3.50 (89)	.38 x .50 (9.7 x 12.7)	1.25 (32)	2.0 (.91)
RMS-67	7.50 (191)	6.02 (153)	9.00 (229)	6.75 (171)	3.94 (100)	.38 x .50 (9.7 x 12.7)	1.25 (32)	2.3 (1.0)
RMS-71	8.18 (208)	6.31 (160)	9.38 (238)	7.12 (189)	4.18 (106)	.38 x .50 (9.7 x 12.7)	1.25 (32)	2.2 (1.0)
RMS-91	10.12 (257)	8.50 (216)	11.38 (289)	9.12 (232)	5.00 (127)	.38 x .50 (9.7 x 12.7)	1.25 (32)	2.8 (1.3)

-Add "S" at the end of model number for stainless steel materials
 -Dimensions are for reference only, contact us for non-standard accumulators or cylinder applications.

Double Bolt Clamps, RMD Seris:

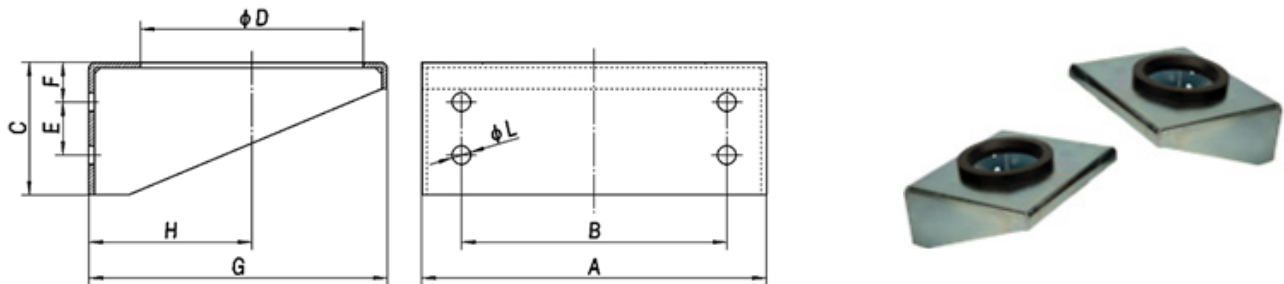


Mounting Clamps, Double Bolt

Model	A in. (mm)	B in. (mm)	C in. (mm)	D (Dia.) in. (mm)	H in. (mm)	K in. (mm)	L in. (mm)	Width Z in. (mm)	Wt. lbs. (kg)
RMD-91	10.00 (254)	8.50 (216)	9.89 (251)	9.12 (232)	4.95 (126)	12.48 (317)	.59 (15)	1.50 (38)	3.4 (1.5)
RMD-97	10.40 (264)	8.50 (216)	10.50 (267)	9.75 (248)	5.31 (135)	12.99 (330)	.59 (15)	1.50 (38)	3.4 (1.5)
RMD-141	16.81 (260)	14.37 (365)	15.08 (383)	14.13 (359)	7.68 (195)	16.69 (424)	.59 (15)	1.50 (38)	5.5 (2.4)

-Add "S" at the end of model number for stainless steel materials
-Dimensions are for reference only, contact us for non-standard accumulators or cylinder applications.

Base Brackets (with Rubber Ring), RBB Seris:



Base Brackets with Rubber Ring

Model	A in. (mm)	B in. (mm)	C in. (mm)	D (Dia.) in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	L (Dia.) in. (mm)	Wt. lbs. (kg)
RBB-45	7.03 (179)	5.55 (141)	3.45 (100)	4.53 (115)	1.56 (39.6)	1.10 (28)	6.90 (175)	3.65 (93)	.53 (13.5)	3.5 (1.9)
RBB-66	9.75 (248)	7.15 (182)	3.60 (91)	6.63 (170)	1.76 (45)	1.36 (35)	9.75 (248)	5.15 (131)	.53 (13.5)	5.0 (2.8)
RBB-83	15.35 (390)	10.63 (270)	9.45 (240)	8.31 (211)	7.09 (180)	2.36 (60)	15.35 (390)	7.68 (195)	.87 (22)	16.9 (7.7)

-Add "S" at the end of model number for stainless steel materials
-Dimensions are for reference only, contact us for non-standard accumulators or cylinder applications.



Mounting Components Compatibility:

Compatibility chart is based on Reasontek standard RAS, RAL series accumulators. Check the dimensions in the catalog for any questions.

For other brands or non-standard accumulators or cylinders, please check with our technical help.

For 3,000 PSI Bladder Accumulators				
Accumulator Size	Nominal Diameter in. (mm)	Clamp Model	Qty.	Base Bracket Model
1 quart	4.5 (114)	RMS-45	1	None
2-quart	4.5 (114)	RMS-45	1	None
1 gallon	6.7 (170)	RMS-67	1	RBB-45
2-1/2-gallon	9.1 (231)	RMD-91	1	RBB-66
5-gallon	9.1 (231)	RMD-91	2	RBB-66
10-gallon	9.1 (231)	RMD-91	2	RBB-66
15-gallon	9.1 (231)	RMD-91	3	RBB-66
25-gallon	14.25 (362)	RMD-141	3	RBB-83
40-gallon	14.25 (362)	RMD-141	3	RBB-83

For 5,000 PSI Bladder Accumulators				
Accumulator Size	Nominal Diameter in. (mm)	Clamp Model	Qty.	Base Bracket Model
1 gallon	7.12 (181)	RMS-71	1	RBB-45
2-1/2-gallon	9.75 (248)	RMD-97	1	RBB-66
5-gallon	9.75 (248)	RMD-97	2	RBB-66
10-gallon	9.75 (248)	RMD-97	2	RBB-66
15-gallon	9.75 (248)	RMD-97	3	RBB-66

Quick Order Guide:

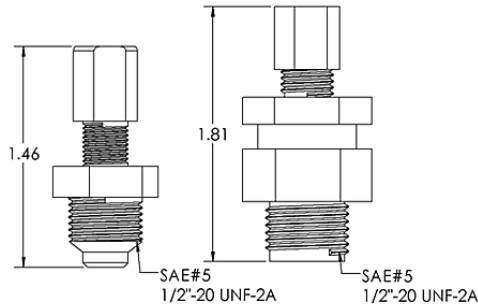
- 1G Accumulator, 3,000 PSI:** RMS-67 or RMS-67S; RBB-45 or RBB-45S
- 2.5-15G Accumulators, 3,000 PSI:** RMD-91 or RMD-91S; RBB-66 or RBB-66S
- 1G Accumulator, 5,000 PSI:** RMS-71 or RMS-71S; RBB-45 or RBB-45S
- 2.5-15G Accumulators, 5,000 PSI:** RMD-97 or RMD-97S; RBB-66 or RBB-66S



Nitrogen Gas Valves

Schrader type 3,000 to 10,000 PSI.

Two types of gas valves are available on our bladder accumulator products. 3,000 and 4,000 PSI rated models are offered with a cored valve cartridge. 5,000 to 10,000 PSI models are equipped with a heavy duty military type metal seal (poppet type) cartridge. *(4,000 PSI model has both types design)*



standard gas valve military gas valve



G100025, 3,000 PSI.

Code	Thread, Bottom	Type
G1	3/8"-24, SAE#3	standard valve core



G100026, 3,000 PSI.

Code	Thread, Bottom	Type
G2	1/2"-20, SAE#5	standard valve core



G100027, 3,000 PSI.

Code	Thread, Bottom	Type
G3	1/2"-20, SAE#5	standard valve core



G100028, 3,000 PSI.

Code	Thread, Bottom	Type
G4	1/2"-20, SAE#5	valve core+metal seal/military



G100029, 3,000 PSI.

Code	Thread, Bottom	Type
G5	1/2"-20, SAE#5	metal seal, military type



G100030, 3,000 PSI.

Code	Thread, Bottom	Type
G6	1/2"-20, SAE#5	metal seal, military type



G100031, 3,000 PSI.

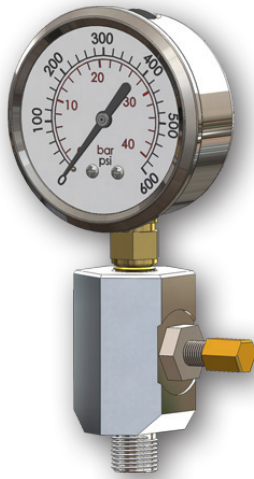
Code	Thread, Bottom	Type
G7	1/2"-20, SAE#5	metal seal, military type

Valve Core

G10003, 3,000 PSI.
G10004, 4,000 PSI.



Gauging Adapter RGA-102

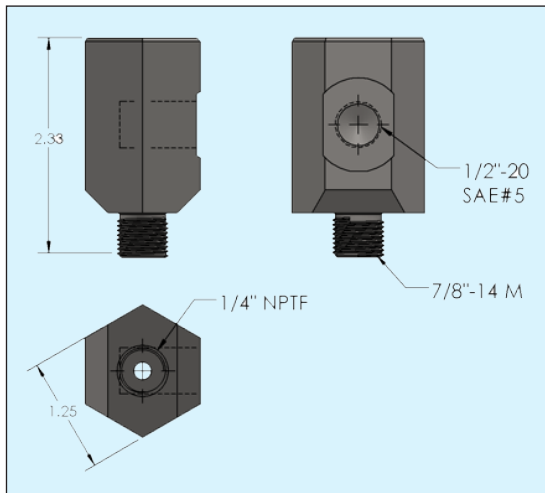


Gauging adapter RGA-102 is designed for the 3,000 PSI bladder accumulators with standard 7/8"-14 bladder stem.

By connecting the pressure gauge on the top port of the adapter, the users can monitor the accumulator's pressure in real time.

The port can also be used to connect rupture disks for additional safety use.

(adapter only, not including the gas valve, pressure gauge in the picture.)

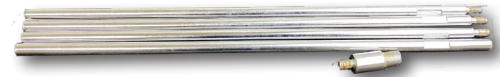


How to Order

- RGA-102, gauging adapter, carbon steel
- RGA-102S, gauging adapter, stainless steel

Hand Tools & Accessories

BLADDER PULL RODS WITH ADAPTER, T800125



Bladder Pull Rods, for 1-15G accumulators service; 64" long. Dual connections design with adapter connecting to:

- Schrader valve, 0.305-32
- standard bladder stem 1/2"-20 UNF (strong pull, recommended).

Length: 16" each rod, 4 pieces. *(this tool is included in service kit RMK-100X)*

SPANNER WRENCH, T800124



Used for accumulator assembly/disassembly, fluid port and top repairable gas end adapter lock nut replacement.

Size: 2"-4-3/4" *(this tool is included in service kit RMK-100X)*

GAS VALVE EXTENSION, T800200



Used for 3,000 PSI top repairable accumulator pre-charging connection along with our charging kit RGA-100-X.

VALVE CORE TOOL, T800126



Used to remove or install the valve core, depress the valve core for gas release. It also includes ID and OD thread chasing capabilities. *(this tool is included in service kit RMK-100X)*

VALVE CORE TORQUE WRENCH, T800127



Used to install the valve core precisely with correct torque. Do not under-tighten or over-tighten the valve ore.



DESIGN • PRODUCTION • SERVICE



On-site

Accumulator Repair and diagnosis, technical assistance.
Save time and money.

Call 323-800-6566 to speak with our accumulator specialist to schedule an appointment.

Appendix

Accumulator service manual, technical instructions. Check our website on-line technical section for the new updated information and resources.

A1- Accumulator Maintenance & Service Manual



High Pressure RAS- Series Bladder Accumulators

Maintenance & Service Instructions



Caution:

To safeguard against the potential source of danger which can occur in bladder accumulators, we would like you to pay special attention to the following instructions.

Always wear safety shoes, goggles, gloves, and other necessary safety protections during accumulator maintenance.

Bottom Repairable Bladder Accumulators

Disassembly:

WARNING!

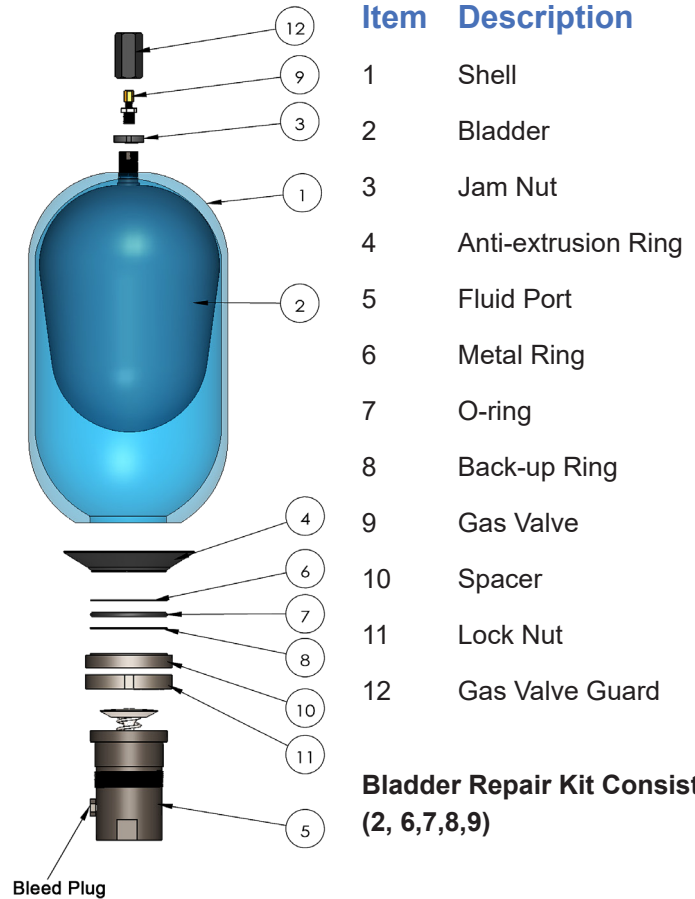
Hydraulic accumulators are pressurized vessels and only qualified technicians should perform the repairs. Never weld, braze or perform any type of mechanical work on the accumulator shell. Always drain the fluid completely from the accumulator before performing any work.

After the accumulator is removed from the equipment, it must be completely depressurized before work is carried out. Take off the gas end valve guard, loose the valve core inside the gas valve slowly using valve core wrench (included in our accumulator service kit RMK-100). DO NOT take out the valve core quickly under high pressure. Wait until the all the gas comes out.

A- Secure the accumulator on the table, remove the bleed plug. Using a spanner wrench (included in our accumulator service kit RMK-100), remove the lock nut and spacer from the fluid port.

B- Push the fluid port inside the shell, remove the anti-extrusion ring and seals. Take out the fluid port.

C- Loose and remove the gas end jam nut from the bladder stem. Push the bladder stem inside the shell. Remove the bladder from the shell.



Item Description

- 1 Shell
- 2 Bladder
- 3 Jam Nut
- 4 Anti-extrusion Ring
- 5 Fluid Port
- 6 Metal Ring
- 7 O-ring
- 8 Back-up Ring
- 9 Gas Valve
- 10 Spacer
- 11 Lock Nut
- 12 Gas Valve Guard

**Bladder Repair Kit Consists of:
(2, 6,7,8,9)**



Caution:

Use Dry Nitrogen Only

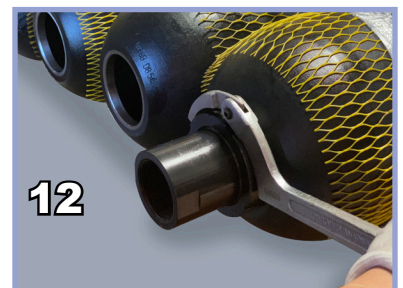
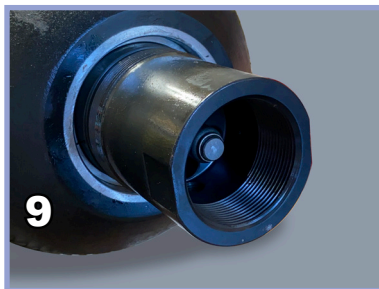
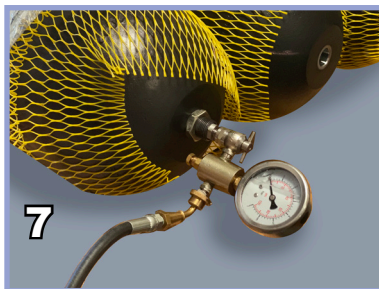
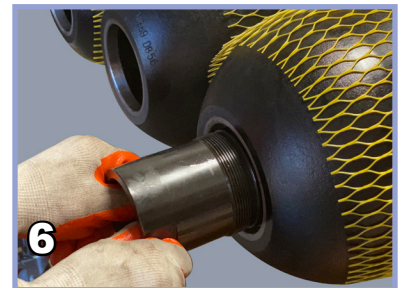
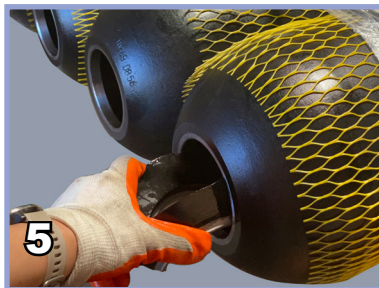
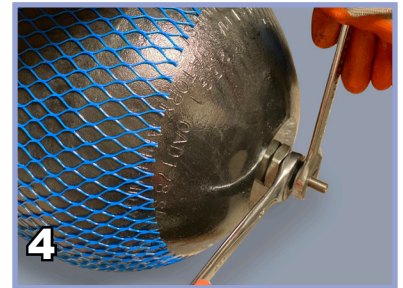
Min. Charging: 25% of maximum working pressure
Max. Charging: 90% of minimum working pressure

Check Reasontek accumulator charging instructions

Assembly:

Secure the accumulator on the table. The interior of the shell must be cleaned and free of any contamination or debris.

1. Spray the inside of the accumulator shell with clean system fluid to lubricate the entire shell. **Fig.1**
2. Lubricate the bladder. With all gas completely exhausted from the bladder, collapse it, and insert the bladder pull rod on the gas stem. **Fig.2**
3. Fold the bladder longitudinally in a compact roll, insert the bladder and pull rod in the shell and through the gas end opening. Push the bladder little by little, do not twist the bladder. **Fig.3**
4. Pull the bladder pull rod from the gas end until all the bladder goes in the shell. Install the jam nut on the bladder gas stem. Then install the gas valve on the stem and fasten it with wrenches. **Fig.4**
5. From the fluid end, insert the fluid port (with bleed plug taken off) and anti-extrusion ring into the shell completely. **Fig.5**
6. Inside the shell, use hand to take the fluid port out of the shell through the anti-extrusion ring. Make sure the anti-extrusion ring's metal part faces outside as shown in the above drawing. **Fig.6**
7. At the gas end, connect the charging kit (model RGA-100-X) to the gas valve. **Fig.7**
8. Holding the fluid port straight in position, open the gas cylinder valve to charge the accumulator slowly. **Fig.8**
9. During the pressure charging, bladder expands. The poppet valve inside the fluid port presses the spring and extends out. **Fig.9** (! Do not watch inside the fluid port directly or very closely during charging, this can be very dangerous if bladder charging failure happens.)
10. Stop the pressure charging when the pressure gauge reaches 20psi. Disconnect the charging kit. (Check our website for bladder charging instructions using RGA-100-X)
11. Install the seals at the fluid end by the following order: metal ring first, then the O-ring and back-up ring. **Fig.10**
12. Use blunt tool to push the seals inside the fluid port. Make sure the O-ring and back-up ring installed are smooth, flat, and evenly distributed with no twist or curl. Check with light if necessary. **Fig.11**
13. Install the spacer and lock nut (spacer's lip side facing the shell). Use spanner wrench to tighten the locknut. **Fig.12**
14. Install the bleed plug on the fluid port.
15. Install the gas valve guard at the gas end.



Additional Tools used in the instructions (sold separately):



Valve Core Torque Wrench
(PN: T800126)



Gas Valve Extension 3K
(PN: T800200)



Bladder Pull Rod
(PN: T800125)



Spanner Wrench
(PN: T800124)



Accumulator Charging Kit 3K
RGA-100-X/C



Accumulator Service Kit 3K
RMK-100-X

Top Repairable Bladder Accumulators

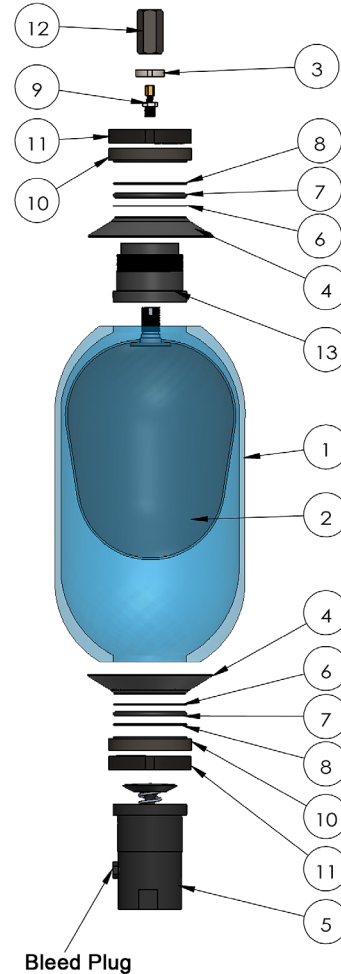
Disassembly:

Follow the disassembly instructions for bottom repairable accumulators above to remove the accumulator from the equipment and depressurize completely.

- A. Secure the accumulator on the table, remove the bleed plug. Using a spanner wrench (included in our accumulator service kit RMK-100), remove the lock nut and spacer from the top adapter.
- B. Remove the gas valve guard and jam nut from the bladder stem.
- C. Push the top adapter with bladder inside the shell. Separate the anti-extrusion ring from the top adapter.
- D. Take out the anti-extrusion ring, top adapter, and seals from the shell.
- E. Remove the bladder from the shell.

Assembly:

Secure the accumulator on the table. The interior of the shell must be cleaned and free of any contamination or debris.



Item Description

- | | |
|----|---------------------|
| 1 | Shell |
| 2 | Bladder |
| 3 | Jam Nut |
| 4 | Anti-extrusion Ring |
| 5 | Fluid Port |
| 6 | Metal Ring |
| 7 | O-ring |
| 8 | Back-up Ring |
| 9 | Gas Valve |
| 10 | Spacer |
| 11 | Lock Nut |
| 12 | Gas Valve Guard |
| 13 | Top Adapter |

Bladder Repair Kit Consists of:
(2, 6, 7, 8, 9)

Check and download service instructions on-line.

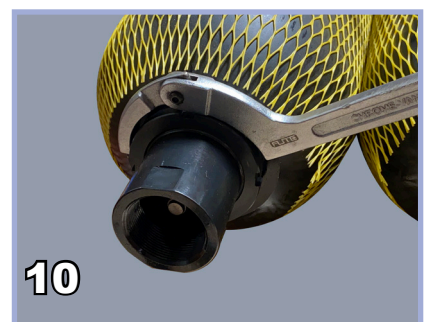
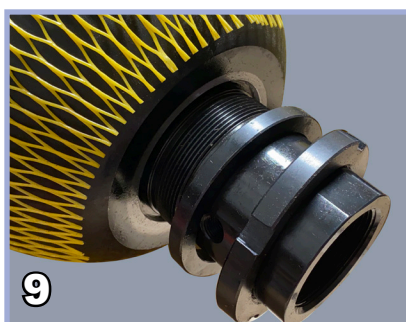
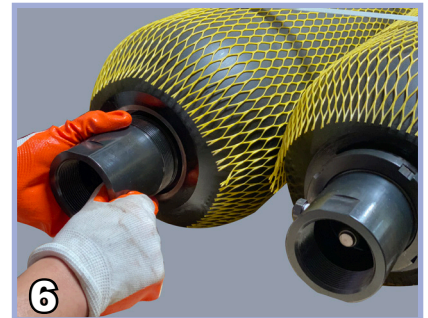
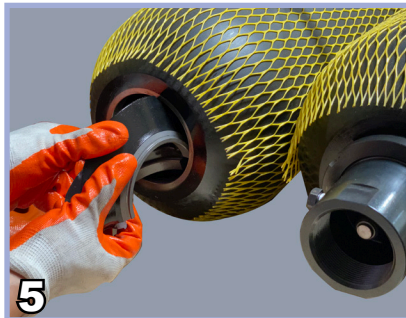
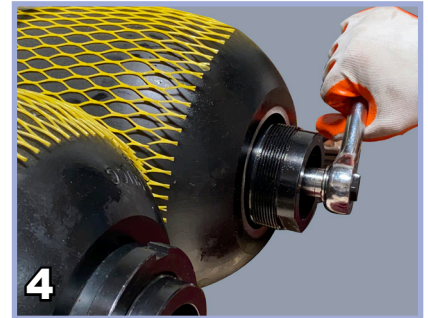
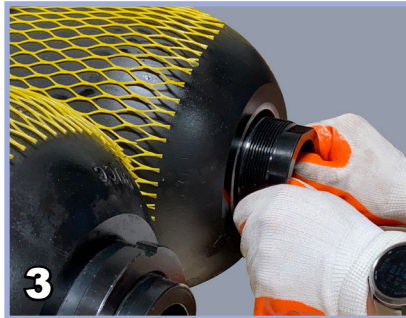
Accumulator Disassembly/
Assembly Instructions:



Accumulator Charging
Instructions:



1. Spray the inside of the accumulator shell with clean system fluid to lubricate the entire shell.
2. Lubricate the bladder. Install the top adapter through the bladder stem. Install the jam nut on the stem, use wrench to fasten it. **Fig.1**
3. Fold the bladder longitudinally in a compact roll, insert the bladder in the shell at the fluid end towards the other side. **Fig.2**
4. Insert the anti-extrusion ring at the gas end. Take the top adapter out of the shell through the anti-extrusion ring. **Fig.3**
5. Insert the gas valve on the bladder stem, use wrench to fasten it. **Fig.4**
6. From the fluid end, insert the fluid port and anti-extrusion ring to the shell completely into the shell. **Fig.5**
7. Take the fluid port out of the shell through the anti-extrusion ring. Make sure the anti-extrusion ring's metal part faces outside as shown in the above drawing. **Fig.6**
8. Connect the charging kit to the gas valve, using charging valve extension. **Fig.7**
9. Holding both top adapter and fluid port straight in position, open the gas cylinder valve to charge the bladder slowly. See the charging section above for bottom bladder accumulators. (steps 8,9,10)
10. Stop the pressure charge when the pressure gauge reaches 20psi. Disconnect and take off the charging kit.
11. Install the seals on both top adapter and fluid port by the order: metal ring, O-ring, and back-up ring. See the seals installation instructions above for bottom bladder accumulators (steps 11,12). **Fig.8**
12. Install the spacer and lock nut for both top adapter and fluid port (spacer lip side facing the shell). Use spanner wrench to tighten. **Fig.9 & Fig.10**
13. Install the bleed plug on the fluid port.
14. Install the gas valve guard on the gas end.



Appendix

Accumulator service manual, technical instructions. Check our website on-line technical section for the new updated information and resources.

A2- Accumulator Sizing Form

Accumulator Sizing Request

Please select from the following applications and fill out (type or print) the information required. We'll help you calculate the proper accumulator size you need.

Auxiliary Power Source

The most common application of hydraulic accumulators is as an auxiliary power source. In this application, the accumulator stores the hydraulic fluid delivered by the pump during a portion of the work cycle; then, releases this stored fluid on demand to complete the cycle, thereby functioning as a secondary source of power and assisting the pump.

System maximum pressure, P_2 : _____

System minimum pressure, P_3 : _____

Pre-charge pressure of the accumulator, P_1 : _____

The volume of the fluid required to the system (from the accumulator), V_x : _____

Pump Pulsation Dampener

Pressure pulsations are frequently caused by the reciprocating action of piston-type pumps which produce periodic pressure and flow variations at their discharge ports. Installing proper accumulators in the pumping equipment to reduce pulsations can greatly minimize the incidence of failure of vibration sensitive instruments, as well as damage of to pipelines, couplings and valves.

Pump displacement, V_1 ; or Bore size of the cylinder and length of stroke: _____

System mean pressure, P_2 : _____

Permissible fluctuation (5% by default), %: _____

Pump Type, select one:

- Simplex Single-Acting
- Simplex Double-Acting
- Duplex Single-Acting
- Duplex Double-Acting
- Triplex Single-Acting
- Triplex Double-Acting

Hydraulic Surge Suppressor

Hydraulic line shock, or “water hammer” as it’s commonly called, is caused by the sudden stoppage or fast deceleration of fluid flowing in a pipe line that results from the quick closure of a valve in the line. The installation of a properly sized accumulator close to the source of shock can eliminate or significantly minimize the shock and vibration in the system.

I.D. of pipe (specify if different pipes), D: _____

Length of pipe line (with each I.D.), L: _____

Flow Rate, Q: _____

System pressure at normal flow rate: P_1 : _____

Maximum allowable shock pressure: P_2 : _____

Fluid Media: _____

Others in Comments

Terms and Conditions

This website is operated by Reasontek. Throughout the site, the terms “we”, “us” and “our” refer to Reasontek. Reasontek offers this website, including all information, tools and services available from this site to you, the user, conditioned upon your acceptance of all terms, conditions, policies and notices stated here.

By visiting our site and/ or purchasing something from us, you engage in our “Service” and agree to be bound by the following terms and conditions (“Terms of Service”, “Terms”), including those additional terms and conditions and policies referenced herein and/or available by hyperlink. These Terms of Service apply to all users of the site, including without limitation users who are browsers, vendors, customers, merchants, and/ or contributors of content.

Please read these Terms of Service carefully before accessing or using our website. By accessing or using any part of the site, you agree to be bound by these Terms of Service. If you do not agree to all the terms and conditions of this agreement, then you may not access the website or use any services. If these Terms of Service are considered an offer, acceptance is expressly limited to these Terms of Service.

Any new features or tools which are added to the current store shall also be subject to the Terms of Service. You can review the most current version of the Terms of Service at any time on this page. We reserve the right to update, change or replace any part of these Terms of Service by posting updates and/or changes to our website. It is your responsibility to check this page periodically for changes. Your continued use of or access to the website following the posting of any changes constitutes acceptance of those changes.

Our store is hosted on Shopify Inc. They provide us with the online e-commerce platform that allows us to sell our products and services to you.

SECTION 1 - ONLINE STORE TERMS

By agreeing to these Terms of Service, you represent that you are at least the age of majority in your state or province of residence, or that you are the age of majority in your state or province of residence and you have given us your consent to allow any of your minor dependents to use this site.

You may not use our products for any illegal or unauthorized purpose nor may you, in the use of the Service, violate any laws in your jurisdiction (including but not limited to copyright laws).

You must not transmit any worms or viruses or any code of a destructive nature.

A breach or violation of any of the Terms will result in an immediate termination of your Services.

SECTION 2 - GENERAL CONDITIONS

We reserve the right to refuse service to anyone for any reason at any time.

You understand that your content (not including credit card information), may be transferred unencrypted and involve (a) transmissions over various networks; and (b) changes to conform and adapt to technical requirements of connecting networks or devices. Credit card information is always encrypted during transfer over networks.

You agree not to reproduce, duplicate, copy, sell, resell or exploit any portion of the Service, use of the Service, or access to the Service or any contact on the website through which the service is provided, without express written permission by us.

The headings used in this agreement are included for convenience only and will not limit or otherwise affect these Terms.

SECTION 3 - ACCURACY, COMPLETENESS AND TIMELINESS OF INFORMATION

We are not responsible if information made available on this site is not accurate, complete or current. The material on this site is provided for general information only and should not be relied upon or used as the sole basis for making decisions without consulting primary, more accurate, more complete or more timely sources of information. Any reliance on the material on this site is at your own risk.

This site may contain certain historical information. Historical information, necessarily, is not current and is provided for your reference only. We reserve the right to modify the contents of this site at any time, but we have no obligation to update any information on our site. You agree that it is your responsibility to monitor changes to our site.

SECTION 4 - MODIFICATIONS TO THE SERVICE AND PRICES

Prices for our products are subject to change without notice. We reserve the right at any time to modify or discontinue the Service (or any part or content thereof) without notice at any time.

We shall not be liable to you or to any third-party for any modification, price change, suspension or discontinuance of the Service.

SECTION 5 - PRODUCTS OR SERVICES (if applicable)

Certain products or services may be available exclusively online through the website. These products or services may have limited quantities and are subject to return or exchange only according to our Return Policy.

We have made every effort to display as accurately as possible the colors and images of our products that appear at the store. We cannot guarantee that your computer monitor's display of any color will be accurate.

We reserve the right, but are not obligated, to limit the sales of our products or Services to any person, geographic region or jurisdiction. We may exercise this right on a case-by-case basis. We reserve the right to limit the quantities of any products or services that we offer. All descriptions of products or product pricing are subject to change at anytime without notice, at the sole discretion of us. We reserve the right to discontinue any product at any time. Any offer for any product or service made on this site is void where prohibited.

We do not warrant that the quality of any products, services, information, or other material purchased or obtained by you will meet your expectations, or that any errors in the Service will be corrected.

SECTION 6 - ACCURACY OF BILLING AND ACCOUNT INFORMATION

We reserve the right to refuse any order you place with us. We may, in our sole discretion, limit or cancel quantities purchased per person, per household or per order. These restrictions may include orders placed by or under the same customer account, the same credit card, and/or orders that use the same billing and/or shipping address. In the event that we make a change to or cancel an order, we may attempt to notify you by contacting the e-mail and/or billing address/phone number provided at the time the order was made. We reserve the right to limit or prohibit orders that, in our sole judgment, appear to be placed by dealers, resellers or distributors.

You agree to provide current, complete and accurate purchase and account information for all purchases made at our store. You agree to promptly update your account and other information, including your email address and credit card numbers and expiration dates, so that we can complete your transactions and contact you as needed.

For more detail, please review our Returns Policy.

SECTION 7 - OPTIONAL TOOLS

We may provide you with access to third-party tools over which we neither monitor nor have any control nor input.

You acknowledge and agree that we provide access to such tools "as is" and "as available" without any warranties, representations or conditions of any kind and without any endorsement. We shall have no liability whatsoever arising from or relating to your use of optional third-party tools.

Any use by you of optional tools offered through the site is entirely at your own risk and discretion and you should ensure that you are familiar with and approve of the terms on which tools are provided by the relevant third-party provider(s). We may also, in the future, offer new services and/or features through the website (including, the release of new tools and resources). Such new features and/or services shall also be subject to these Terms of Service.

SECTION 8 - THIRD-PARTY LINKS

Certain content, products and services available via our Service may include materials from third-parties.

Third-party links on this site may direct you to third-party websites that are not affiliated with us. We are not responsible for examining or evaluating the content or accuracy and we do not warrant and will not have any liability or responsibility for any third-party materials or websites, or for any other materials, products, or services of third-parties.

We are not liable for any harm or damages related to the purchase or use of goods, services, resources, content, or any other transactions made in connection with any third-party websites. Please review carefully the third-party's policies and practices and make sure you understand them before you engage in any transaction. Complaints, claims, concerns, or questions regarding third-party products should be directed to the third-party.

SECTION 9 - USER COMMENTS, FEEDBACK AND OTHER SUBMISSIONS

If, at our request, you send certain specific submissions (for example contest entries) or without a request from us you send creative ideas, suggestions, proposals, plans, or other materials, whether online, by email, by postal mail, or otherwise (collectively, 'comments'), you agree that we may, at any time, without restriction, edit, copy, publish, distribute, translate and otherwise use in any medium any comments that you forward to us. We are and shall be under no obligation (1) to maintain any comments in confidence; (2) to pay compensation for any comments; or (3) to respond to any comments.

We may, but have no obligation to, monitor, edit or remove content that we determine in our sole discretion are unlawful, offensive, threatening, libelous, defamatory, pornographic, obscene or otherwise objectionable or violates any party's intellectual property or these Terms of Service.

Terms and Conditions

You agree that your comments will not violate any right of any third-party, including copyright, trademark, privacy, personality or other personal or proprietary right. You further agree that your comments will not contain libelous or otherwise unlawful, abusive or obscene material, or contain any computer virus or other malware that could in any way affect the operation of the Service or any related website. You may not use a false e-mail address, pretend to be someone other than yourself, or otherwise mislead us or third-parties as to the origin of any comments. You are solely responsible for any comments you make and their accuracy. We take no responsibility and assume no liability for any comments posted by you or any third-party.

SECTION 10 - PERSONAL INFORMATION

Your submission of personal information through the store is governed by our Privacy Policy. To view our Privacy Policy.

SECTION 11 - ERRORS, INACCURACIES AND OMISSIONS

Occasionally there may be information on our site or in the Service that contains typographical errors, inaccuracies or omissions that may relate to product descriptions, pricing, promotions, offers, product shipping charges, transit times and availability. We reserve the right to correct any errors, inaccuracies or omissions, and to change or update information or cancel orders if any information in the Service or on any related website is inaccurate at any time without prior notice (including after you have submitted your order).

We undertake no obligation to update, amend or clarify information in the Service or on any related website, including without limitation, pricing information, except as required by law. No specified update or refresh date applied in the Service or on any related website, should be taken to indicate that all information in the Service or on any related website has been modified or updated.

SECTION 12 - PROHIBITED USES

In addition to other prohibitions as set forth in the Terms of Service, you are prohibited from using the site or its content: (a) for any unlawful purpose; (b) to solicit others to perform or participate in any unlawful acts; (c) to violate any international, federal, provincial or state regulations, rules, laws, or local ordinances; (d) to infringe upon or violate our intellectual property rights or the intellectual property rights of others; (e) to harass, abuse, insult, harm, defame, slander, disparage, intimidate, or discriminate based on gender, sexual orientation, religion, ethnicity, race, age, national origin, or disability; (f) to submit false or misleading information; (g) to upload or transmit viruses or any other type of malicious code that will or may be used in any way that will affect the functionality or operation of the Service or of any related website, other websites, or the Internet; (h) to collect or track the personal information of others;

(i) to spam, phish, pharm, pretext, spider, crawl, or scrape; (j) for any obscene or immoral purpose; or (k) to interfere with or circumvent the security features of the Service or any related website, other websites, or the Internet. We reserve the right to terminate your use of the Service or any related website for violating any of the prohibited uses.

SECTION 13 - DISCLAIMER OF WARRANTIES; LIMITATION OF LIABILITY

We do not guarantee, represent or warrant that your use of our service will be uninterrupted, timely, secure or error-free.

We do not warrant that the results that may be obtained from the use of the service will be accurate or reliable.

You agree that from time to time we may remove the service for indefinite periods of time or cancel the service at any time, without notice to you.

You expressly agree that your use of, or inability to use, the service is at your sole risk. The service and all products and services delivered to you through the service are (except as expressly stated by us) provided 'as is' and 'as available' for your use, without any representation, warranties or conditions of any kind, either express or implied, including all implied warranties or conditions of merchantability, merchantable quality, fitness for a particular purpose, durability, title, and non-infringement.

In no case shall Reasontek, our directors, officers, employees, affiliates, agents, contractors, interns, suppliers, service providers or licensors be liable for any injury, loss, claim, or any direct, indirect, incidental, punitive, special, or consequential damages of any kind, including, without limitation lost profits, lost revenue, lost savings, loss of data, replacement costs, or any similar damages, whether based in contract, tort (including negligence), strict liability or otherwise, arising from your use of any of the service or any products procured using the service, or for any other claim related in any way to your use of the service or any product, including, but not limited to, any errors or omissions in any content, or any loss or damage of any kind incurred as a result of the use of the service or any content (or product) posted, transmitted, or otherwise made available via the service, even if advised of their possibility. Because some states or jurisdictions do not allow the exclusion or the limitation of liability for consequential or incidental damages, in such states or jurisdictions, our liability shall be limited to the maximum extent permitted by law.

SECTION 14 - INDEMNIFICATION

You agree to indemnify, defend and hold harmless Reasontek and our parent, subsidiaries, affiliates, partners, officers, directors, agents, contractors, licensors, service providers, subcontractors, suppliers, interns and employees, harmless from any claim or demand, including reasonable attorneys' fees, made by any third-party due to or arising out of your breach of these Terms of Service or the documents they incorporate by reference, or your violation of any law or the rights of a third-party.

SECTION 15 - SEVERABILITY

In the event that any provision of these Terms of Service is determined to be unlawful, void or unenforceable, such provision shall nonetheless be enforceable to the fullest extent permitted by applicable law, and the unenforceable portion shall be deemed to be severed from these Terms of Service, such determination shall not affect the validity and enforceability of any other remaining provisions.

SECTION 16 - TERMINATION

The obligations and liabilities of the parties incurred prior to the termination date shall survive the termination of this agreement for all purposes.

These Terms of Service are effective unless and until terminated by either you or us. You may terminate these Terms of Service at any time by notifying us that you no longer wish to use our Services, or when you cease using our site. If in our sole judgment you fail, or we suspect that you have failed, to comply with any term or provision of these Terms of Service, we also may terminate this agreement at any time without notice and you will remain liable for all amounts due up to and including the date of termination; and/or accordingly may deny you access to our Services (or any part thereof).

SECTION 17 - ENTIRE AGREEMENT

The failure of us to exercise or enforce any right or provision of these Terms of Service shall not constitute a waiver of such right or provision.

These Terms of Service and any policies or operating rules posted by us on this site or in respect to The Service constitutes the entire agreement and understanding between you and us and govern your use of the Service, superseding any prior or contemporaneous agreements, communications and proposals, whether oral or written, between you and us (including, but not limited to, any prior versions of the Terms of Service).

Any ambiguities in the interpretation of these Terms of Service shall not be construed against the drafting party.

SECTION 18 - GOVERNING LAW

These Terms of Service and any separate agreements whereby we provide you Services shall be governed by and construed in accordance with the laws of United States.

SECTION 19 - CHANGES TO TERMS OF SERVICE

You can review the most current version of the Terms of Service at any time at this page. We reserve the right, at our sole discretion, to update, change or replace any part of these Terms of Service by posting updates and changes to our website. It is your responsibility to check our website periodically for changes. Your continued use of or access to our website or the Service following the posting of any changes to these Terms of Service constitutes acceptance of those changes.

SECTION 20 - CONTACT INFORMATION

Questions about the Terms of Service should be sent to us at: sales@reasontek.com.

Terms of Sale

GENERAL

The following terms and conditions shall constitute the entire Agreement for the purchase and sale of products and services offered by Reasontek Corporation (DBA. Reasontek). Any terms and conditions contained in other communications between Purchaser and Reasontek, including, without limitation, Purchaser's emails, purchase orders, or requests for quotation which are different from, in addition to, or vary Reasontek's terms and conditions shall not be binding upon Reasontek unless agreed upon in a writing dated and executed by Purchaser and by an officer of Reasontek.

CHANGES

Prior to the date of delivery of any product, products, service, or services hereunder, the Purchaser shall have the right to make changes in its order provided that Reasontek receives written notice of the desired changes and accepts the same in a signed writing and provided further that the Purchaser accepts the additional charge therefor as determined by Reasontek in a signed writing. Changes that interfere with or alter Reasontek's production or service schedules will not be accepted unless the time for performance is extended for such a period as deemed necessary by Reasontek. Failure of Reasontek to accept a Purchaser's request to change its purchase order shall not be cause for Purchaser's cancellation of its order except upon payment of a cancellation charge to be determined by Reasontek. Reasontek reserves the right to modify prices at any time to adjust for market price fluctuations.

CANCELLATION

Reasontek shall have the absolute right to cancel this Agreement upon breach thereof by the Purchaser, failure by the Purchaser to make any payment required by this Agreement, or the insolvency or bankruptcy of the Purchaser.

A purchase order or any part thereof which is hereby accepted by Reasontek may not be cancelled unless and until Reasontek receives written notice of the cancellation, has determined the additional charge to be made and the same has been accepted and paid by the Purchaser. Upon receipt of a notice of cancellation, Reasontek shall be entitled to take whatever action it deems necessary and advisable to minimize cancellation charges.

WARRANTY

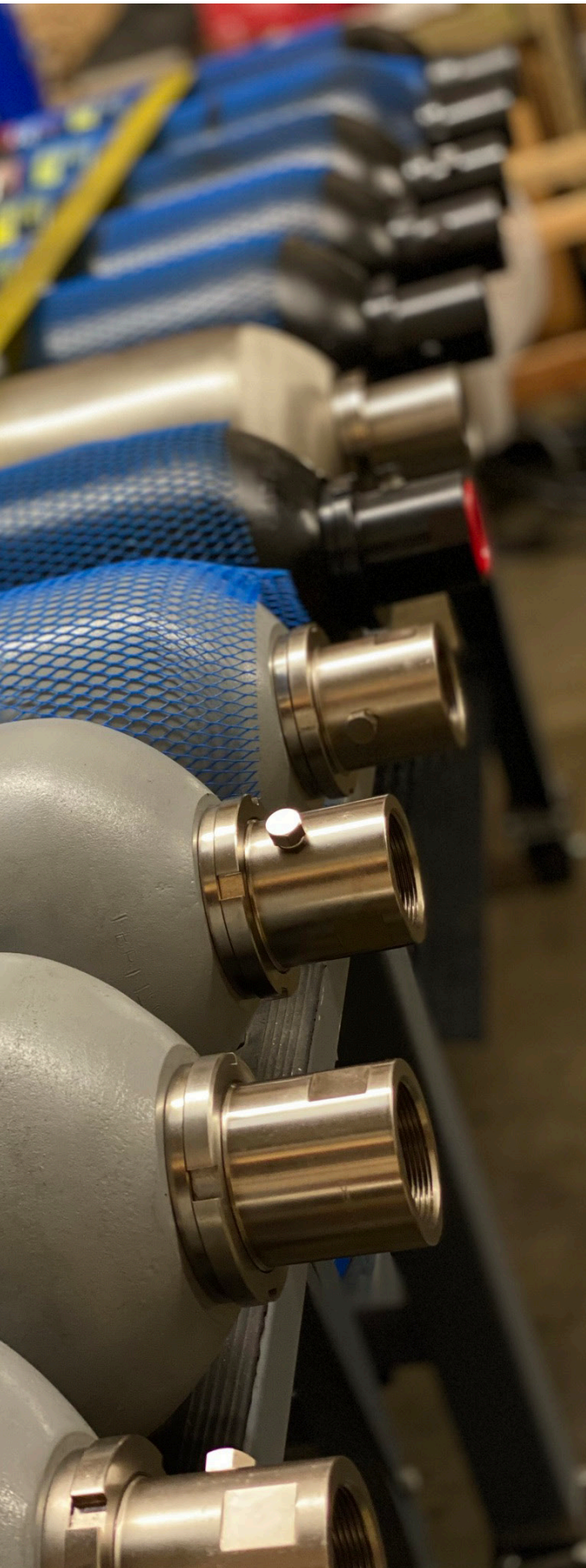
a. Reasontek warrants, except as hereinafter provided, each product sold hereunder which is assembled by it to be free from defects in assembly under normal use and service, in the manner originally intended, for a period of one year after shipment thereof to the original purchaser.

b. REASONTEK'S WARRANTY EXTENDS ONLY TO THE PRODUCTS ASSEMBLED BY IT AND IS, TO THE EXTENT PERMITTED BY LAW, IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY PRIOR WRITTEN OR ORAL REPRESENTATIONS REGARDING SUCH PRODUCTS MADE BY REASONTEK, ITS EMPLOYEES, AGENTS OR REPRESENTATIVES.

c. PRODUCTS, OR COMPONENTS THEREOF, SUPPLIED BY ANY OTHER PARTY TO MFCP WHICH ARE NOT ASSEMBLED BY REASONTEK ARE COVERED ONLY BY THE INDIVIDUAL WARRANTY OF SUCH OTHER PARTY, AND COPIES OF SUCH WARRANTIES WILL BE FURNISHED UPON REQUEST.

d. Reasontek reserves the right to inspect products claimed defective under warranty either at the Purchaser's location or at Reasontek. A defective product is not to be returned to Reasontek's plant unless





authorized by Reasontek. Products so returned shall be returned to Reasontek's facility, freight prepaid. Any product proving defective due to faulty assembly within one year from date of shipment will be replaced or repaired free of charge, F.O.B. Reasontek's facility. Reasontek assumes no liability for labor charges incidental to the adjustment, service, repair, removal or replacement of the product or other costs, or for the expense of repairs made outside of its facility except when made pursuant to Reasontek's prior written consent. Reasontek, at its option, may ship a replacement or replacements immediately under standard billing and make warranty adjustments after inspection of the defective product by means of a credit memorandum.

e. THIS WARRANTY SPECIFICALLY EXCLUDES ALL PURCHASER COSTS INCURRED IN REMOVAL AND HANDLING THE ALLEGED DEFECTIVE PRODUCT AS WELL AS ALL PURCHASER COSTS IN INSTALLATION OF REPLACEMENT PRODUCTS WHETHER TEMPORARY OR PERMANENT.

DELAYS

Reasontek shall not be liable for any damages, costs, or expenses, or for delays in performance due to circumstances beyond its reasonable control, including without limiting the generality of the foregoing, any priority system established by any agency of the United States Government, fires, floods, storms, and other acts of God, accidents, strikes, insurrections, war, shortages of materials, lack of transportation and failure of performance of subcontractors and/or suppliers for similar reasons. Failure of Reasontek to perform for these reasons aforesaid shall not be grounds for Purchaser's cancellation of its order but the delivery date shall be extended accordingly.

LIMITATION OF LIABILITY

No claim made hereunder by the Purchaser, whether as to goods delivered or for non-delivery shall be greater than the purchase price of the goods in respect of which such claim is made, and Reasontek shall under no circumstances be liable for any damages including consequential, incidental, ancillary, special or punitive damages. Reasontek assumes no responsibility for bodily harm resulting from improper use of goods. To the fullest extent of the law, Purchaser shall defend and hold harmless Reasontek, including its affiliates, parents, and subsidiaries, from and against all claims, damages, loss, and expenses including but not limited to attorney's fees and disbursements incurred by Reasontek as part of a loss or damage arising out of or resulting from Purchaser's negligent acts in handling all products purchased, sold, resold, distributed, installed or maintained by Purchaser or its agents.

If, from the time of quote or order acceptance through delivery, manufacturing, material or item costs increase, through no fault of Reasontek, sale prices shall be increased in line with the cost increase. Changes in pricing will be communicated with as much notice as possible. All returns subject to a restocking charge, only as authorized.

SELLER DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL SELLER BE LIABLE FOR INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES RESULTING DIRECTLY OR INDIRECTLY FROM THE USE OR OPERATION OF GOODS SELLER SELLS TO BUYER. SELLER'S LIABILITY TO BUYER, IF ANY, SHALL BE LIMITED TO THE NET SALES PRICE BUYER HAS PAID TO SELLER. BUYER'S SOLE AND EXCLUSIVE WARRANTY IS THAT PROVIDED BY THE MANUFACTURER, IF ANY.



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