

# Raymond®

## Nitrogen Gas Springs and Accessories



Associated Spring  
Raymond



BARNES  
GROUP INC

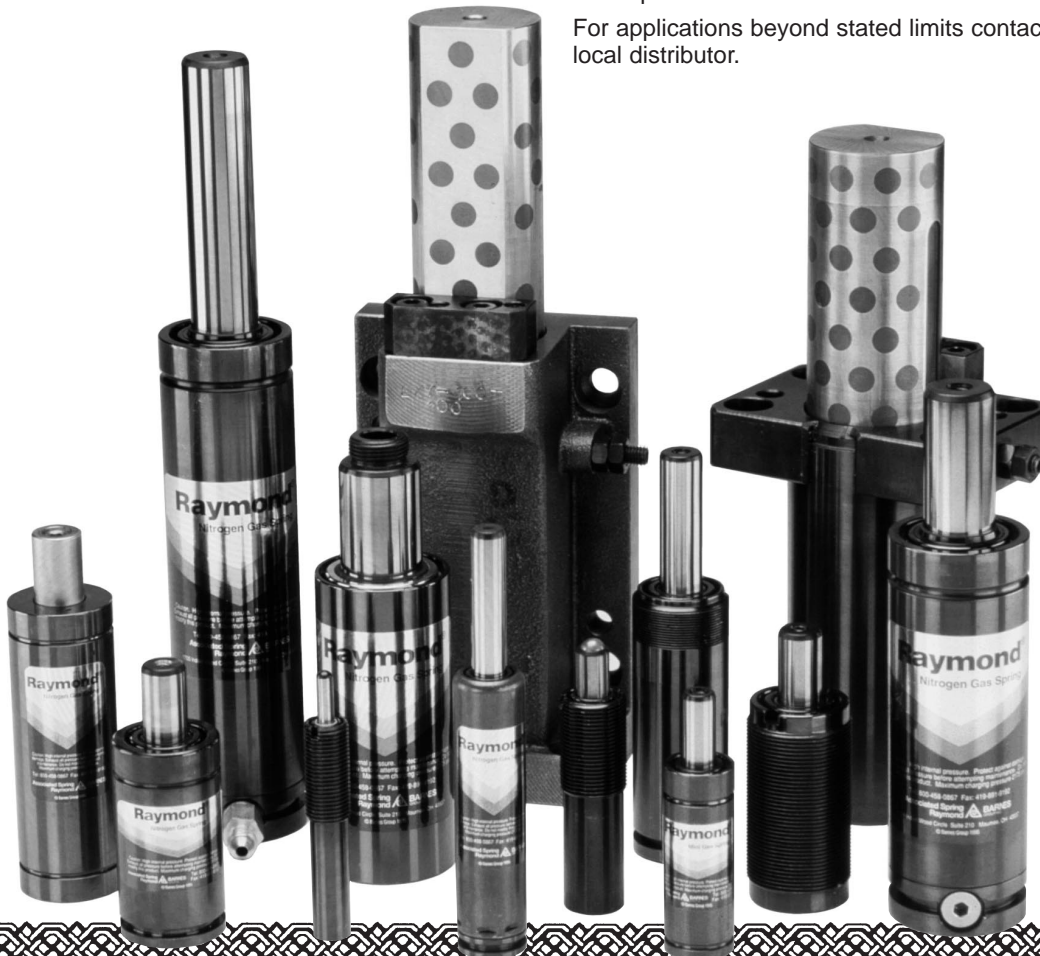
## Features

- Unchanging length overall (no growth)
- Unparalleled field safety record
- Manufactured from the finest materials available
- Component mountings
- Distributed worldwide
- Every critical tolerance measured and inspected
- Safety security device available on selected models
- Provide technical assistance in the selection and installation of all units
- Custom springs and accessories available
- Raymond® engineered and quality backed products

## Technical Data

- Manufacturer is ISO certified
- 100% Static leak tested
- Pressure medium: nitrogen
- Maximum initial pressure: 650 psi—2600 psi (45 to 179 bar) model dependent
- Range of operating temperature: -25°F to 180°F (-32°C to 82°C)
- Maximum recommended operating temperature: +180°F (80°C)
- Maximum piston rod speed: 115 ft/min (35 meters/min.)
- Pressure increases 4.1% every 25°F (14°C) temperature increase

For applications beyond stated limits contact Raymond or your local distributor.



### ISO CERTIFICATION & PRODUCT SAFETY APPROVALS



ISO Certified  
DIN EN ISO 9001



Certificate  
Registration No.  
09 100 4684

Departamento  
De Industria  
Y Energia  
Del Gobierno  
Vasco, Spain  
No. FBG-9119

Swedish Plant  
Inspectorate  
No. 1224  
No. 10471

# Raymond®

## Nitrogen Gas Springs and Accessories



### Installation and Use

Raymond gas springs can be installed with the piston rod in any position. However, gas springs should be installed in such a way as to avoid lateral pressures. Any substantial lateral force will shorten the springs service life.

Hardened striker plates are highly recommended to avoid erosion of the impact surface and also to permit sliding between the piston rod and the contact point.

Certain types of drawing fluids may have adverse effects on seals, O-rings, etc. Please consult Raymond if drawing fluids are used in large volume.

Data plates are supplied and should be mounted on the front and rear of die shoes. These plates serve as a reminder to maintenance personnel that the tool is equipped with nitrogen gas springs.

### A Spring for Every Application

We offer more than 20 unique models with strokes ranging from 6mm/.24" to 300mm/11.8" and initial contact forces from 15.0 lbs. to 41,000 lbs. All gas springs can be dropped into a pocket or mounted

using one of the several mounts pictured next to or following the spring model in the catalog. For custom mounts contact Associated Spring Raymond.

If you are designing a new product, or making improvements to an existing one, a Raymond nitrogen gas spring may be the answer. Call Associated Spring Raymond technical assistance to discuss new application ideas. Current non die applications include valve actuators, shock absorbing bumpers, mountain bike suspensions, etc.

If your application calls for a custom spring such as a special stroke length, shorter overall length, smaller diameter, high cycle rates or other differentiating specifications, call our technical assistance department and let us customize a spring or spring system for you.

### Raymond Quality Research & Testing

Raymond nitrogen gas springs and accessories are a quality engineered and tested product that you expect from the Raymond line of products. Our research teams are continuously working on product enhancement and new product development.

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# RD-12

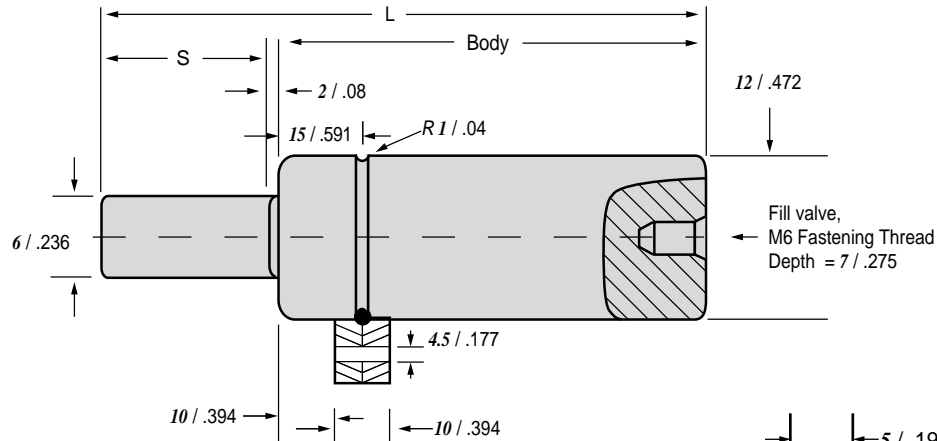
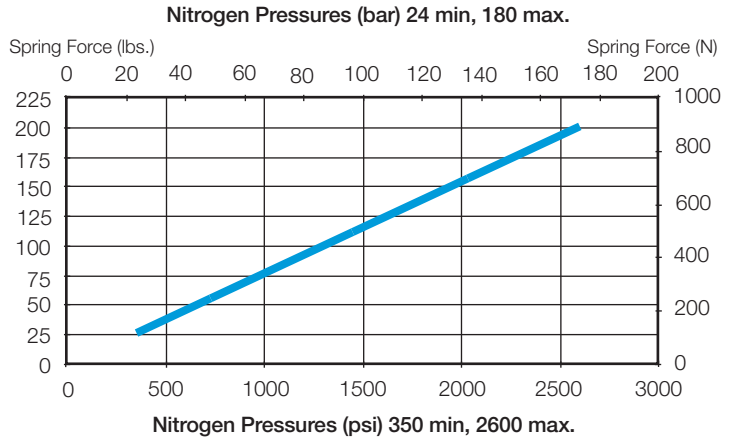
## Initial Force At Different Pressures for Model RD-12

### Disposable Mini Spring — Self Contained

The RD-12 is a disposable spring designed for smaller higher speed dies. This low cost, no maintenance spring is available in stroke lengths from .28" to 3.15" and with an initial force ranging from 15 lbs. to 112 lbs.

The spring can be dropped into a pocket, like a coiled spring, mounted using the tapped hole in the bottom, or mounted by attaching flange part number F-12B shown below. For strokes greater than 38 / 1.5 it is recommended to drop the spring into a pocket to guard against side loading.

This non-rebuildable model has a uni-directional valve allowing the user to add nitrogen only. Maximum charging pressure is 2600 psi. You must specify color, initial charging pressure or initial load at the time of order.

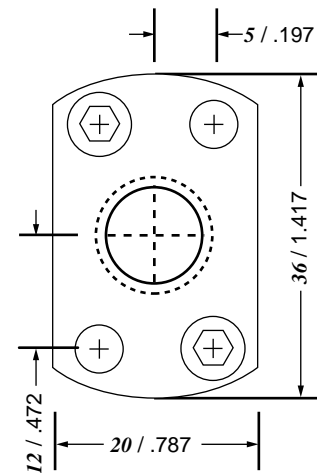


Color Code	Initial Spring Force		Spring Force @ Full Stroke		Initial Charge Pressure (psi)	Initial Charge Pressure (bar)
	(pounds)	(newtons)	(pounds)	(newtons)		
Green	45	200	63	280	1050	72
Blue	67	298	94	418	1560	108
Red	90	400	126	561	2100	145
Yellow	112	498	157	698	2600	179

Note: A black color code signifies a custom, user defined fill pressure.

### Ordering Information — RD-12

Order Number	Maximum Stroke S	L + 0.5-0 mm + 0.020-0 in	Body
RD 12-007	7 / 0.28	56 / 2.20	47 / 1.85
RD 12-015	15 / 0.59	72 / 2.83	55 / 2.17
RD 12-025	25 / 0.98	92 / 3.62	65 / 2.56
RD 12-038	38 / 1.50	118 / 4.65	78 / 3.07
RD 12-050	50 / 1.97	142 / 5.59	90 / 3.54
RD 12-080	80 / 3.15	205 / 8.07	123 / 4.84



Optional flange sold separately part number F12B. Mounting information shown on spring illustration above.

A complete part number for the gas spring consists of the order number and the color code, Example RD 12-007 Green. For a special fill pressure not indicated in the table, specify the color code of Black, Example RD 12-007 Black; fill pressure=1000 psi (69 bar).

Dimensions in *millimeters* / inches

# RD-19

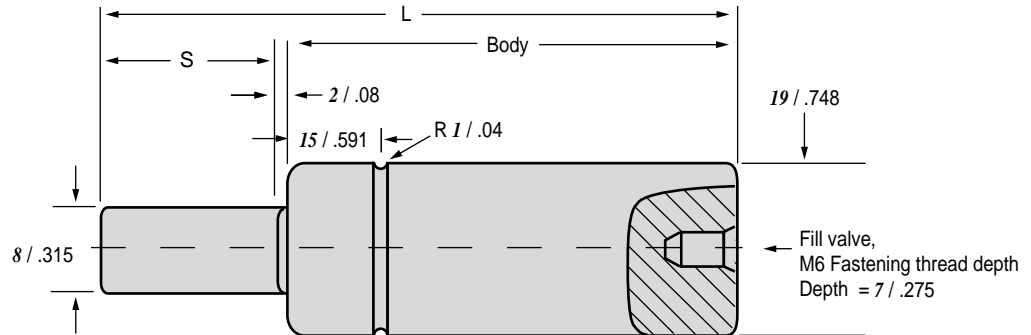
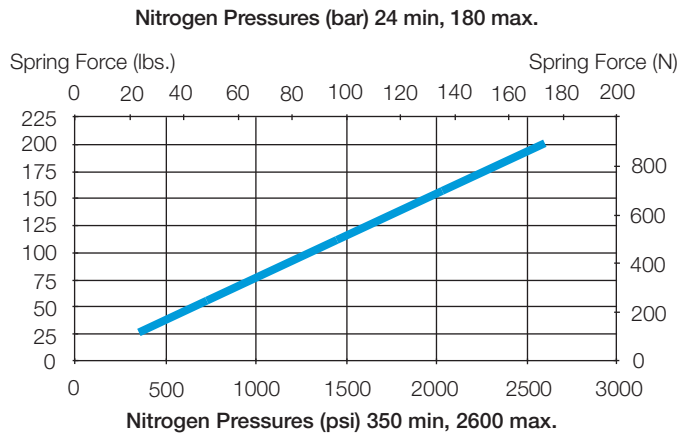
## Initial Force At Different Pressures for Model RD-19

### Disposable Mini Spring — Self Contained

The RD-19 is a disposable spring designed for smaller higher speed dies. This low cost, no maintenance spring is available in stroke lengths from .28" to 3.15" and with an initial force ranging from 27 lbs. to 202 lbs.

The spring can be dropped into a pocket, like a coiled spring, mounted using the tapped hole in the bottom, or mounted by attaching flange part numbers F19A or F19B shown below. For strokes greater than 38 / 1.5 it is recommended to drop the spring into a pocket to guard against side loading.

This non-rebuildable model has a uni-directional valve allowing the user to add nitrogen only. Maximum charging pressure is 2600 psi. You must specify color, initial charging pressure or initial load at the time of order.



Color Code	Initial Spring Force		Spring Force @ Full Stroke		Initial Charge Pressure (psi)	Initial Charge Pressure (bar)
	(pounds)	(newtons)	(pounds)	(newtons)		
Green	56	249	79	351	725	50
Blue	112	498	157	698	1450	100
Red	157	698	220	979	2030	140
Yellow	202	899	283	1259	2600	179

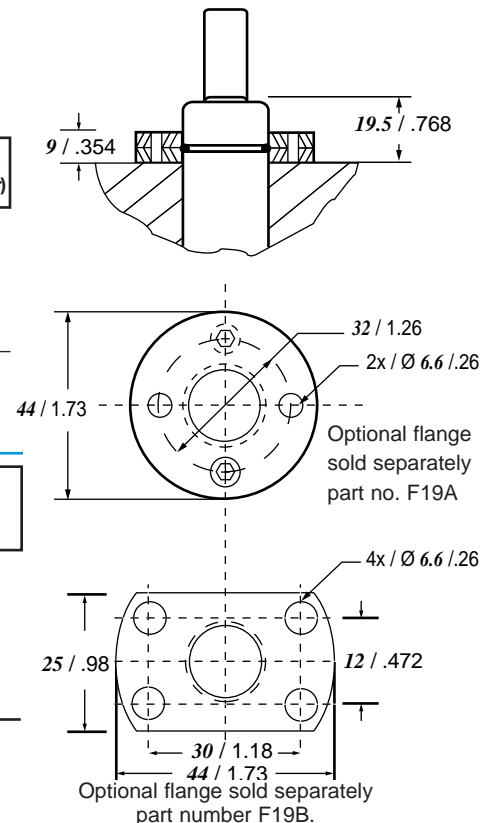
Note: A black color code signifies a custom, user defined fill pressure.

### Ordering Information — RD-19

Order Number	Maximum Stroke S	L + 0.5-0 mm + 0.020-0 in	Body
RD 19-007	7 / 0.28	56 / 2.20	47 / 1.85
RD 19-015	15 / 0.59	72 / 2.83	55 / 2.17
RD 19-025	25 / 0.98	92 / 3.62	65 / 2.56
RD 19-038	38 / 1.50	118 / 4.65	78 / 3.07
RD 19-050	50 / 1.97	142 / 5.59	90 / 3.54
RD 19-080	80 / 3.15	205 / 8.07	123 / 4.84

A complete part number for the gas spring consists of the order number and the color code, Example RD 19-007 Green. For a special fill pressure not indicated in the table, specify the color code of Black, Example RD 19-007 Black; fill pressure=1000 psi (69 bar).

Dimensions in *millimeters* / inches



# RD-25

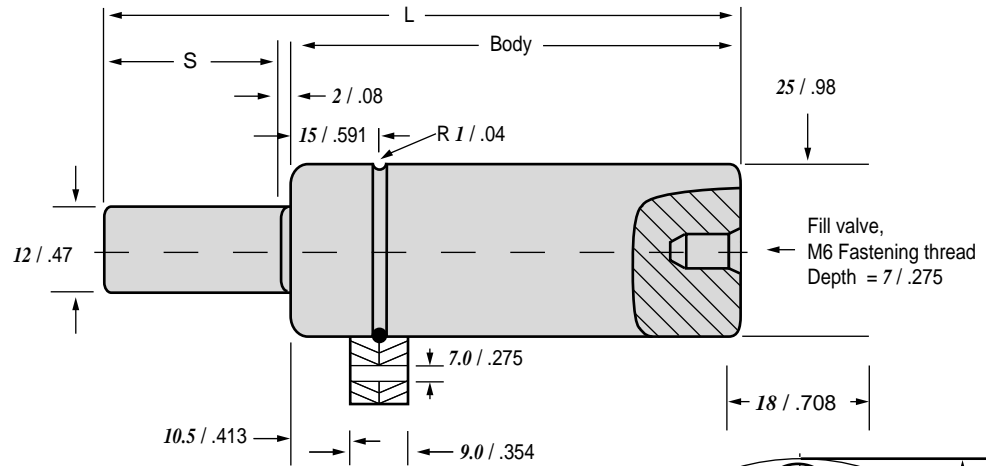
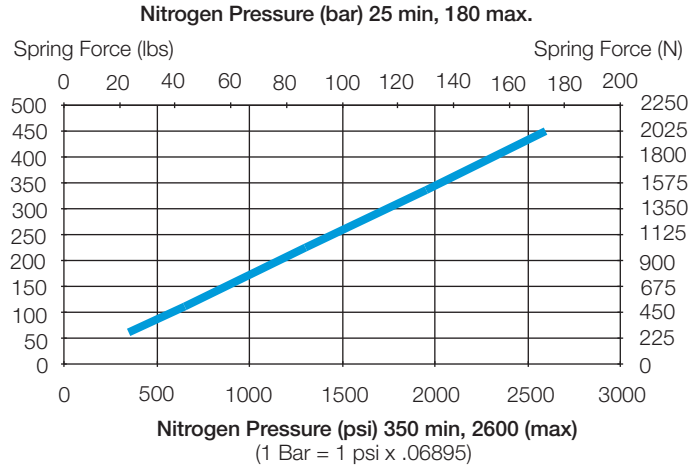
## Disposable Mini Spring — Self Contained

The RD-25 is a disposable spring designed for smaller higher speed dies. This low cost, no maintenance spring is available in stroke lengths from .28" to 3.15" and with an initial force ranging from 60 lbs. to 450 lbs.

The spring can be dropped into a pocket, like a coiled spring, mounted using the tapped hole in the bottom, or mounted by attaching flange part number F25B shown below. For strokes greater than 38 / 1.5 it is recommended to drop the spring into a pocket to guard against side loading.

This non-rebuildable model has a uni-directional valve allowing the user to add nitrogen only. Maximum charging pressure is 2600 psi. You must specify either color, initial charging pressure or initial load at the time of order.

## Initial Force At Different Pressures for Model RD-25



Color Code	Initial Spring Force		Spring Force @ Full Stroke		Initial Charge Pressure (psi)	Initial Charge Pressure (bar)
	(pounds)	(newtons)	(pounds)	(newtons)		
Green	112	498	157	698	650	45
Blue	225	1001	315	1401	1300	90
Red	337	1499	472	2100	1950	134
Yellow	450	2002	630	2803	2600	179

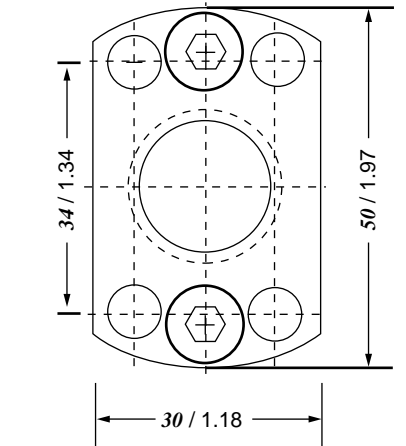
Note: A black color code signifies a custom, user defined fill pressure.

## Ordering Information — RD-25

Order Number	Maximum Stroke S	L + 0.5-0 mm + 0.020-0 in	Body
RD 25-007	7 / 0.28	56 / 2.20	47 / 1.85
RD 25-015	15 / 0.59	72 / 2.83	55 / 2.17
RD 25-025	25 / 0.98	92 / 3.62	65 / 2.56
RD 25-038	38 / 1.50	118 / 4.65	78 / 3.07
RD 25-050	50 / 1.97	142 / 5.59	90 / 3.54
RD 25-080	80 / 3.15	205 / 8.07	123 / 4.84

A complete part number for the gas spring consists of the order number and the color code, Example RD 25-007 Green. For a special fill pressure not indicated in the table, specify the color code of Black, Example RD 25-007 Black; fill pressure=1000 psi (69 bar).

Dimensions in *millimeters* / inches



Optional flange sold separately part number F25B. Mounting information shown on spring illustration above.

# RD-150

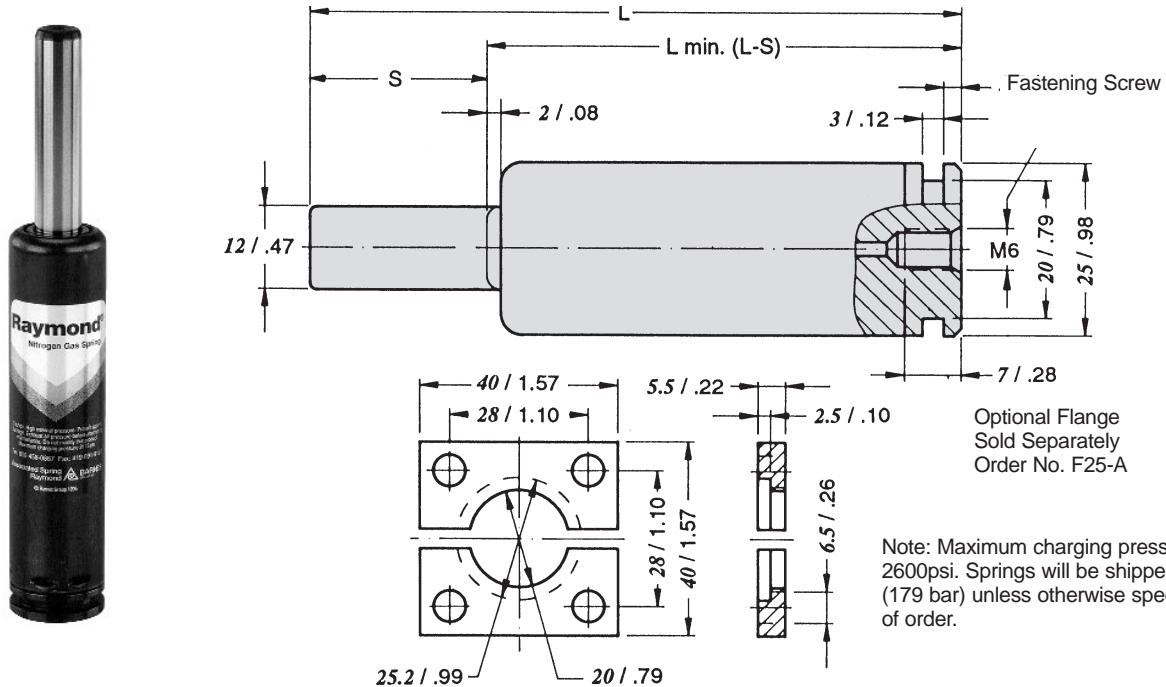
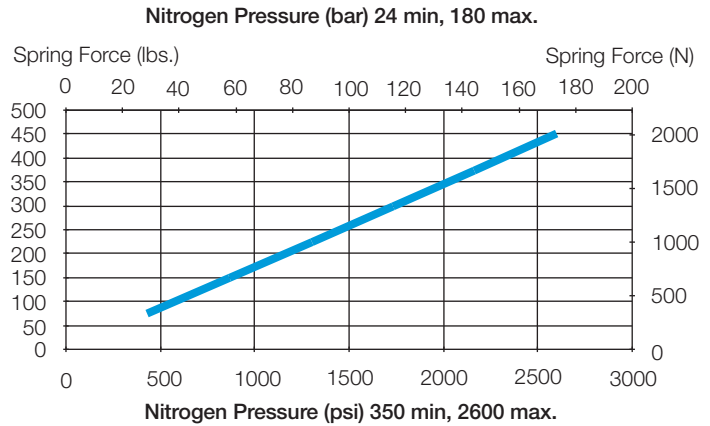
## Disposable Mini Spring — Self Contained

The RD-150 is a disposable spring designed for smaller higher speed dies. This low cost, no maintenance spring is available in stroke lengths from .39" to 4.92" and with an initial force ranging from 112 lbs to 450 lbs.

The spring can be dropped into a pocket, like a coiled spring, and mounted using the tapped hole in the bottom, or by attaching flange part number F25A shown below. For strokes greater than 38 / 1.5 it is recommended to drop the spring into a pocket to guard against side loading.

This non-rebuilt model has a uni-directional valve allowing the user to add nitrogen only. Therefore if a charging pressure less than 2600 psi is desired, you must specify at the time of order. Maximum charging pressure is 2600 psi.

## Initial Force At Different Pressures for Model RD-150



## Ordering Information — RD-150

Order Number	Spring Force @ 2600 psi (179 bar)		Maximum Stroke S	L	L min. L-S	
	Initial	Full Stroke				
RD 150-010	450 lbs. (2002 N)	585 lbs. (2602 N)	10 / .39	74 / 2.91	64 / 2.52	
RD 150-012			12.7 / .50	79.4 / 3.13	66.7 / 2.63	
RD 150-015			15 / .59	84 / 3.31	69 / 2.72	
RD 150-025			25 / .98	104 / 4.09	79 / 3.11	
RD 150-038			38 / 1.50	130 / 5.12	92 / 3.62	
RD 150-050			50 / 1.97	154 / 6.06	104 / 4.09	
RD 150-063			63.5 / 2.50	181 / 7.13	117.5 / 4.63	
RD 150-080			30% Force Increase	80 / 3.15	214 / 8.43	134 / 5.28
RD 150-100			100 / 3.94	254 / 10.00	154 / 6.06	
RD 150-125			125 / 4.92	304 / 11.97	179 / 7.05	

Dimensions in *millimeters* / inches

# RM-150

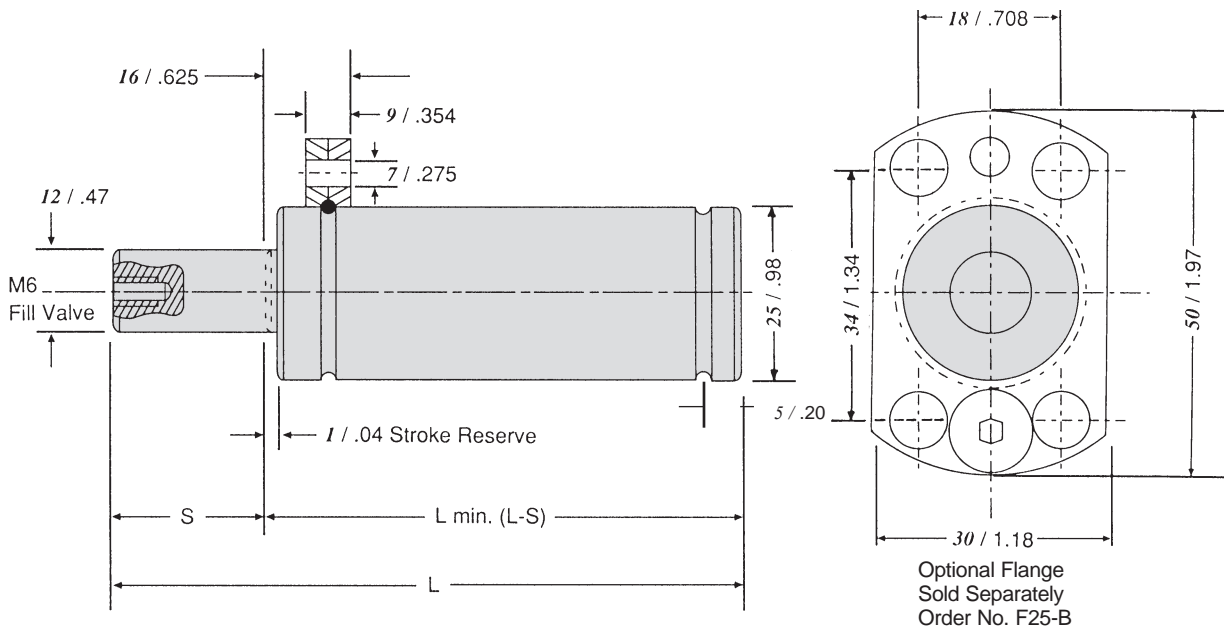
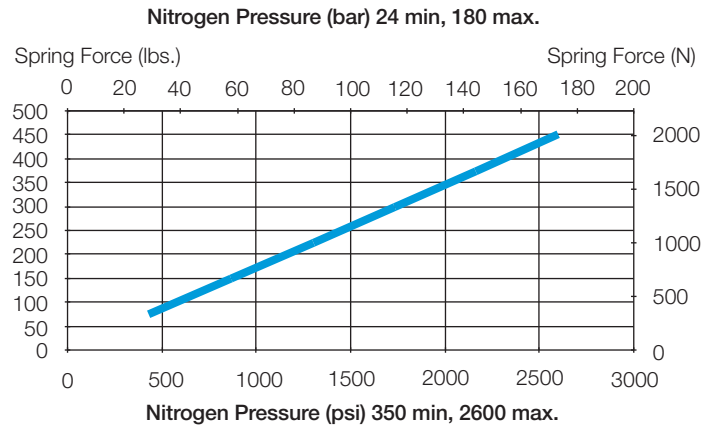
## Mini Spring — Self Contained Only

The RM 150 is designed for smaller higher speed dies. The Mini-Spring can be dropped into a spring pocket or flange mounted at the top or bottom of the body.

The RM 150 is both rechargeable and repairable.



## Initial Force At Different Pressures for Model RM-150



Note: Flange will be attached to the top groove unless specified at time of order.

Note: Maximum charging pressure is 2600psi. Springs will be shipped at 2600psi (179 bar) unless otherwise specified at time

## Ordering Information — RM-150

Order Number	Spring Force @ 2600 psi (179 bar)		Maximum Stroke S	L + 0-1mm + 0-.04"	L min. L-S
	Initial	Full Stroke			
RM 150-010	450 lbs. (2002 N)	630 lbs. (2803 N) 40% Force Increase	10 / .39	65 / 2.56	55 / 2.17
RM 150-012			12.7 / .50	70.4 / 2.77	57.7 / 2.27
RM 150-016			16 / .625	77 / 3.03	61 / 2.40
RM 150-025			25 / .98	95 / 3.74	70 / 2.76
RM 150-038			38 / 1.50	121 / 4.77	83 / 3.27
RM 150-050			50 / 1.97	145 / 5.71	95 / 3.74
RM 150-063			63.5 / 2.50	172 / 6.77	108.5 / 4.27
RM 150-080			80 / 3.15	205 / 8.07	125 / 4.92
RM 150-100			100 / 3.94	245 / 9.65	145 / 5.71

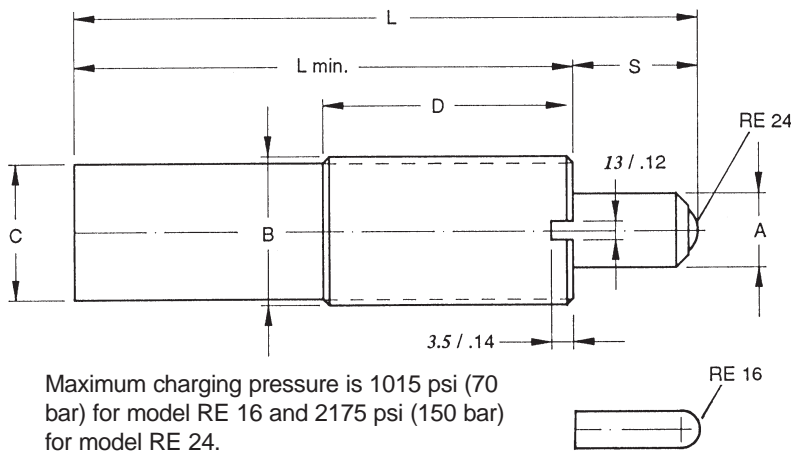
Dimensions in *millimeters* / inches



# RE

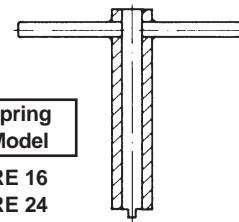
## Stripper Springs — Self Contained Only

The Raymond stripper springs are both rechargeable and repairable. The springs are available in two small diameters and a variety of stroke lengths. The RE 24 model has a roller ball on the top of the piston to help absorb axial forces. This feature allows the spring to apply a uniform force to a moving component. The RE 16 model has a rounded piston for point contact. Applications such as providing tension on a moving belt are ideal for the RE 24 model. The springs can handle rates up to 80 strokes/min. Minimum charging pressure is 290psi. For high cycle life it is advantageous to limit impact loading.



Maximum charging pressure is 1015 psi (70 bar) for model RE 16 and 2175 psi (150 bar) for model RE 24.

Installation Tool Sold Separately



Order Number	Spring Model
SP6	RE 16
SP7	RE 24

## Ordering Information — RE-16 and RE-24

Order Number	Spring Force		Maximum Stroke S	L	L min. L-S	A	B	C	D					
	Initial	Full Stroke												
RE 16-020	Spring Force @ 1015 psi (70 bar)		20 / 0.79	100 / 3.94	80 / 3.15	6 / 0.24	M16 X 1.5	14 / 0.55	35 / 1.38					
RE 16-030			30 / 1.18	120 / 4.72	90 / 3.54									
RE 16-040	44.5 lbs. (198 N) / 80.0 lbs (356 N)	40 / 1.57	140 / 5.51	100 / 3.94										
RE 16-050		50 / 1.97	160 / 6.30	110 / 4.33										
RE 16-060		60 / 2.36	180 / 7.09	120 / 4.72										
RE 16-070		70 / 2.76	200 / 7.87	130 / 5.12										
RE 16-080		80 / 3.15	220 / 8.66	140 / 5.51										
RE 16-100		100 / 3.94	260 / 10.24	160 / 6.30										
RE 24-020		Spring Force @ 2175 psi (150 bar)		20 / 0.79	100 / 3.94					80 / 3.15	12 / 0.47	M24 X 1.5	22 / 0.87	40 / 1.57
RE 24-030				30 / 1.18	120 / 4.72					90 / 3.54				
RE 24-040	380 lbs. (1690 N) / 513 lbs. (2282 N)	40 / 1.57	140 / 5.51	100 / 3.94										
RE 24-050		50 / 1.97	160 / 6.30	110 / 4.33										
RE 24-060		60 / 2.36	180 / 7.09	120 / 4.72										
RE 24-070		70 / 2.76	200 / 7.87	130 / 5.12										
RE 24-080		80 / 3.15	220 / 8.66	140 / 5.51										
RE 24-100		100 / 3.94	260 / 10.24	160 / 6.30										

Dimensions in *millimeters* / inches

# RCT-300 THROUGH RCT-5000

**A complete line of compact Gas Springs, from 1/3 to 5 Ton charge capabilities.**

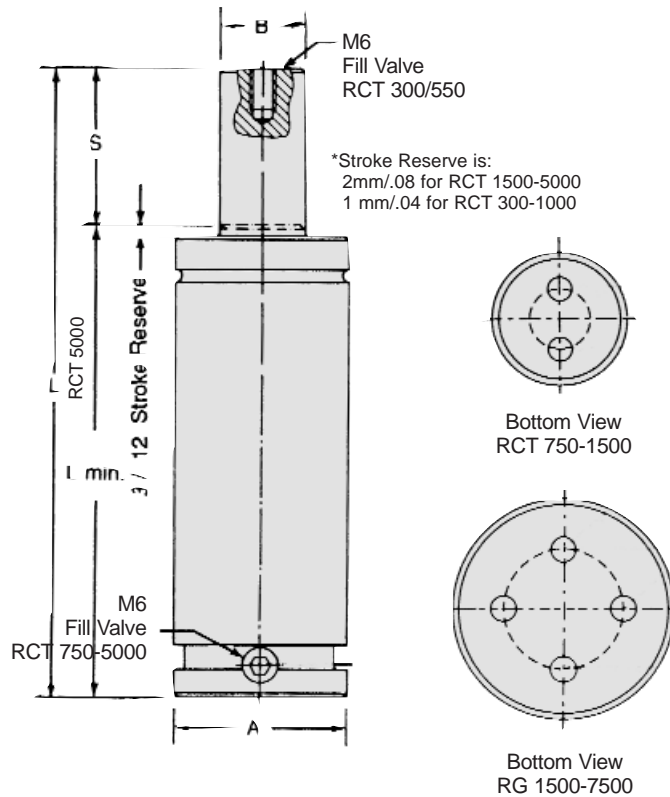
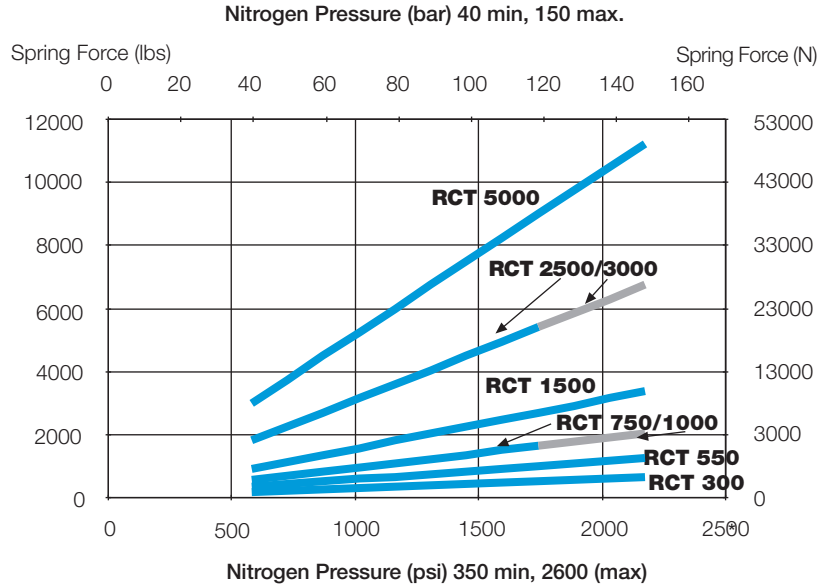
The RCT line was designed for stamping die sets and other applications that have a relatively short stroke height, and where limited vertical space and need for high pressure are major concerns.

All the RCT springs can be either top- or bottom-mounted (RCT 300 is top-mounted only) or dropped into a spring pocket.

All the RCT springs are rechargeable and repairable.



## Initial Force At Different Pressures



Base Thread is M8 for RCT 750 through 5000, M6 for RCT 300 (RCT 550 has no bottom hole).

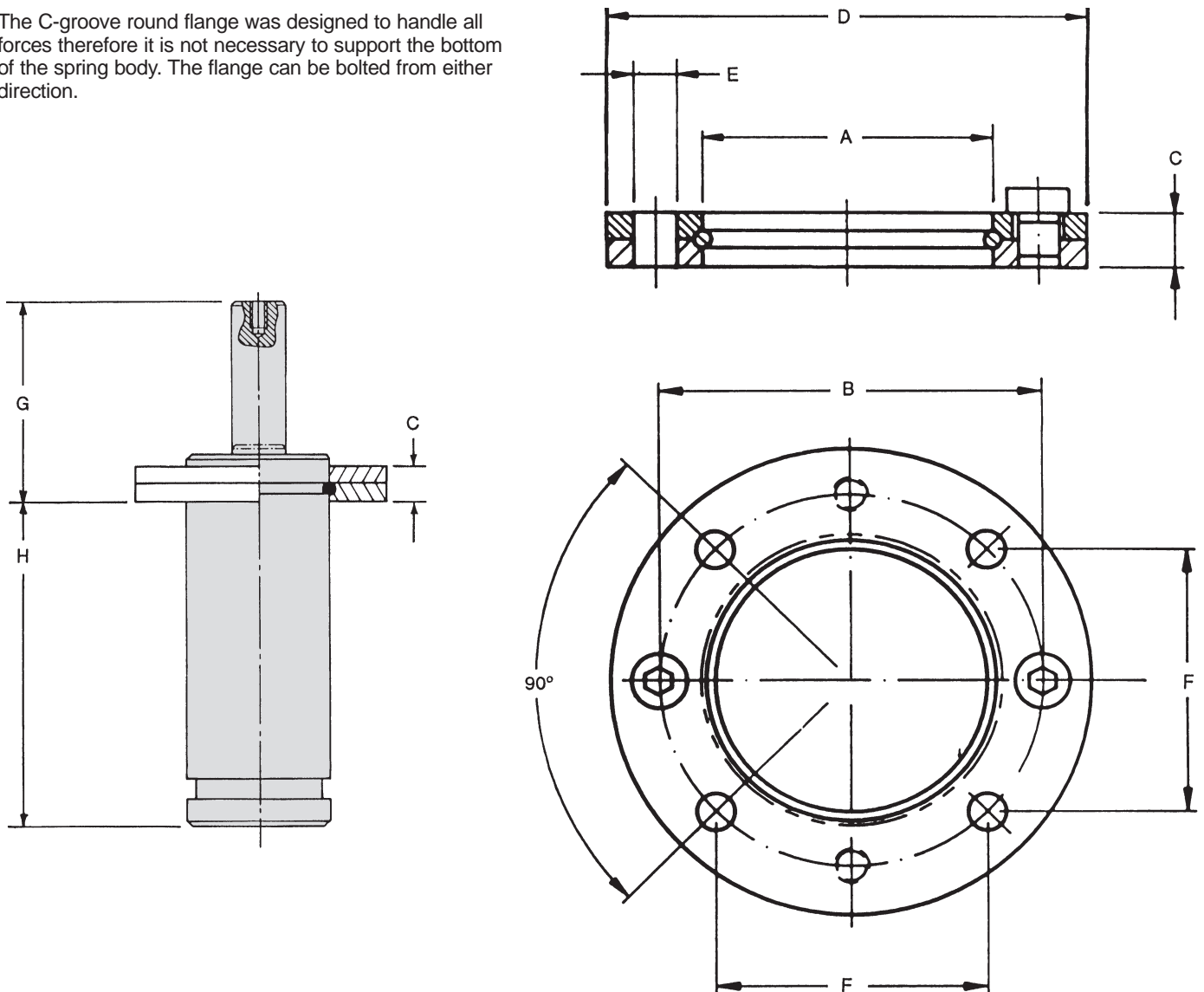
Ordering Information — RCT 300 through RCT-5000

Order Number	Spring Force @ 2175 psi (150 bar)		Spring Force @ 2175 psi (150 bar)		Maximum Stroke S	L min. L-S	L ±0-1mm ±/-0-.04"	A ±.1mm ±/-0.04"	B	M	R		
	Initial (lbs)	Initial (N)	Final (lbs)	Final (N)									
RCT 300-007	674	3000	1025	4560	7/0.28	44/1.69	51/2.00	32/1.25	16/.63	N/A	N/A		
RCT 300-012			1039	4620	12.7/0.50	48/1.89	61/2.40						
RCT 300-016			1059	4710	16/.625	52/2.05	69/2.72						
RCT 300-025			1072	4770	25/.98	61/2.40	87/3.43						
RCT 300-038			1093	4860	38/1.50	74/2.91	113/4.45						
RCT 300-050			1099	4890	50/1.97	86/3.39	137/5.39						
RCT 300-063			1113	4950	63/2.50	99/3.90	163/6.42						
RCT 300-080			1120	4980	80/3.15	116/4.57	197/7.76						
RCT 300-100			1131	5030	100/3.94	136/5.35	237/9.33						
RCT 550-012			1237	5500	2039	9070	12.7/0.50	43/1.69	56/2.20	38/1.50	22/.87	N/A	N/A
RCT 550-025	2077	9240			25/.98	56/2.20	82/3.23						
RCT 550-038	2113	9400			38/1.50	69/2.72	108/4.25						
RCT 550-050	2127	9460			50/1.97	81/3.19	132/5.20						
RCT 550-063	2163	9620			63/2.50	94/3.70	158/6.22						
RCT 550-080	2176	9680			80/3.15	111/4.37	192/7.56						
RCT 550-100	2188	9730			100/3.94	131/5.16	232/9.13						
RCT 550-125	2201	9790			125/4.92	156/6.14	282/11.10						
RCT 750-012	1686 (@ 1812 psi/ 125 bar)	7500 (@ 1812 psi/ 125 bar)			2646	11770	12.7/0.50	49/1.93	62/2.44	50/1.97	28/1.10	M8	20/.79
RCT 750-025					2732	12150	25/.98	62/2.44	88/3.46				
RCT 750-038			2741	12190	38/1.50	75/2.95	114/4.49						
RCT 750-050			2781	12370	50/1.97	87/3.43	138/5.43						
RCT 750-063			2833	12600	63/2.50	100/3.94	164/6.46						
RCT 750-080			2851	12680	80/3.15	117/4.61	198/7.80						
RCT 750-100			2882	12820	100/3.94	137/5.39	238/9.37						
RCT 750-125			2900	12900	125/4.92	162/6.38	288/11.34						
RCT 1000-012			2248	10000	3507	15600	12.7/0.50	49/1.93	62/2.44	50/1.97	28/1.10	M8	20/.79
RCT 1000-025					3620	16100	25/.98	62/2.44	88/3.46				
RCT 1000-038	3687	16400			38/1.50	75/2.95	114/4.49						
RCT 1000-050	3710	16500			50/1.97	87/3.43	138/5.43						
RCT 1000-063	3777	16800			63/2.50	100/3.94	164/6.46						
RCT 1000-080	3797	16890			80/3.15	117/4.61	198/7.80						
RCT 1000-100	3844	17100			100/3.94	137/5.39	238/9.37						
RCT 1000-125	3862	17180			125/4.92	162/6.38	288/11.34						
RCT 1500-012	3372	15000			5295	23550	12.7/0.50	62/2.44	76/2.99	63/2.48	36/1.42	M8	20/.79
RCT 1500-025					5463	24300	25/.98	75/2.95	102/4.02				
RCT 1500-038			5564	24750	38/1.50	88/3.46	128/5.04						
RCT 1500-050			5598	24900	50/1.97	100/3.94	152/5.98						
RCT 1500-063			5665	25200	63/2.50	113/4.45	178/7.01						
RCT 1500-080			5699	25350	80/3.15	130/5.12	212/8.35						
RCT 1500-100			5800	25800	100/3.94	150/5.91	252/9.92						
RCT 1500-125			5834	25950	125/4.92	175/6.89	302/11.89						
RCT 2500-012			5621 (@ 1812 psi/ 125 bar)	25000 (@ 1812 psi/ 125 bar)	10229	45500	12.7/0.50	64/2.52	78/3.07	75/2.95	50/1.97	M8	40/1.57
RCT 2500-025					10510	46750	25/.98	77/3.03	104/4.09				
RCT 2500-038	10567	47000			38/1.50	90/3.54	130/5.12						
RCT 2500-050	10623	47250			50/1.97	102/4.02	154/6.06						
RCT 2500-063	10672	47470			63/2.50	115/4.53	180/7.09						
RCT 2500-080	10735	47750			80/3.15	132/5.20	214/8.43						
RCT 2500-100	10791	48000			100/3.94	152/5.98	254/10						
RCT 2500-125	10848	48250			125/4.92	177/6.97	304/11.97						
RCT 2500-160	10960	48750			160/6.30	212/8.35	374/14.72						
RCT 2500-200	11072	49250			200/7.87	252/9.92	454/17.87						
RCT 3000-012	6745	30000	12275	54600	12.7/0.50	64/2.52	78/3.07	75/2.95	50/1.97	M8	40/1.57		
RCT 3000-025			12545	55800	25/.98	77/3.03	104/4.09						
RCT 3000-038			12612	56100	38/1.50	90/3.54	130/5.12						
RCT 3000-050			12680	56400	50/1.97	102/4.02	154/6.06						
RCT 3000-063			12747	56700	63/2.50	115/4.53	180/7.09						
RCT 3000-080			12882	57300	80/3.15	132/5.20	214/8.43						
RCT 3000-100			12950	57600	100/3.94	152/5.98	254/10						
RCT 3000-125			12983	57750	125/4.92	177/6.97	304/11.97						
RCT 3000-160			13152	58500	160/6.30	212/8.35	374/14.72						
RCT 3000-200			13287	59100	200/7.87	252/9.92	454/17.87						
RCT 5000-012	11241	50000	17648	78500	12.7/0.50	69/2.72	84/3.31	105/4.13	65/2.56	M8	60/2.36		
RCT 5000-025			18210	81000	25/.98	82/3.23	110/4.33						
RCT 5000-038			18323	81500	38/1.50	95/3.74	136/5.35						
RCT 5000-050			18548	82500	50/1.97	107/4.21	160/6.30						
RCT 5000-063			18885	84000	63/2.50	120/4.72	186/7.32						
RCT 5000-080			18997	84500	80/3.15	137/5.39	220/8.66						
RCT 5000-100			19222	85500	100/3.94	157/6.18	260/10.24						
RCT 5000-125			19335	86000	125/4.92	182/7.17	310/12.20						
RCT 5000-160			19559	87000	160/6.30	217/8.54	380/14.96						
RCT 5000-200			19784	88000	200/7.87	257/10.12	460/18.11						

Dimensions in millimeters / inches

## C-Groove Round Flange for Models RCT-300 through RCT-5000

The C-groove round flange was designed to handle all forces therefore it is not necessary to support the bottom of the spring body. The flange can be bolted from either direction.



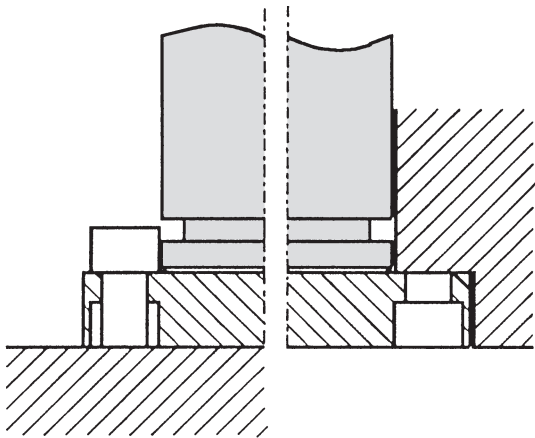
\* S=Stroke length of spring flange to which it is attached.  
 Example: For order number RCT32 A on spring order number RCT-300-007  
 $G=28\text{mm}+7\text{mm}=35\text{mm}$  OR  $G=1.10''+0.28''=1.38''$

### Ordering Information — “A” Style Flange

Order Number	Spring Model	A	B	C	D	E	F	G*	H*
RCT 32 A	RCT 300	32.5 / 1.28	46 / 1.81	9 / .35	60 / 2.36	7 / .27	35 / 1.38	28 / 1.10+S	L-G
F38 A	RCT 550	38.5 / 1.51	56.5 / 2.22	9 / .35	68 / 2.68	7 / .27	40 / 1.57	16 / .63+S	L-G
F50 A	RCT 750/1000	50.5 / 1.99	80 / 3.15	13 / .51	95 / 3.74	9 / .35	56.5 / 2.22	22 / .87+S	L-G
RCT 63 A	RCT 1500	63.5 / 2.5	104 / 4.09	13 / .51	122 / 4.80	11 / .43	73.5 / 2.89	28 / 1.10+S	L-G
F75 A	RCT 2500/3000	75.5 / 2.97	104 / 4.09	16 / .63	122 / 4.80	11 / .43	73.5 / 2.89	28 / 1.10+S	L-G
RCT 105 A	RCT 5000	105.5 / 4.15	140 / 5.51	16 / .63	160 / 6.30	13.5 / .53	99 / 3.90	33.5 / 1.32+S	L-G

Dimensions in *millimeters* / inches

Mounting plate "J" for Models RCT-750 through RCT-5000

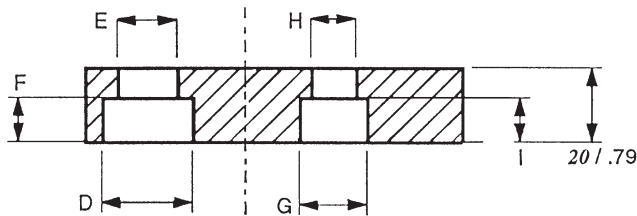


Mounting Possibilities

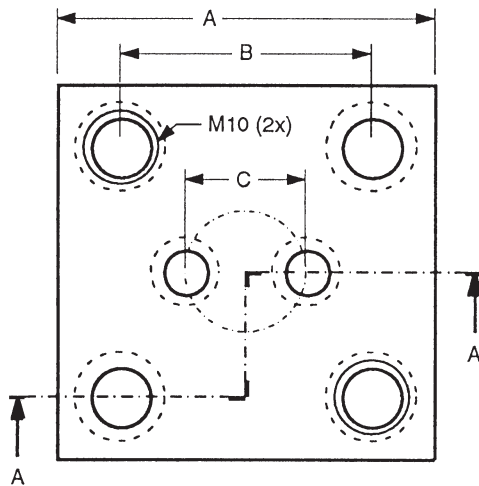
This mounting plate is to be attached under the spring by using the tapped holes in the bottom of the spring.

The plate can then be mounted to the tool, as shown in the figure to the left.

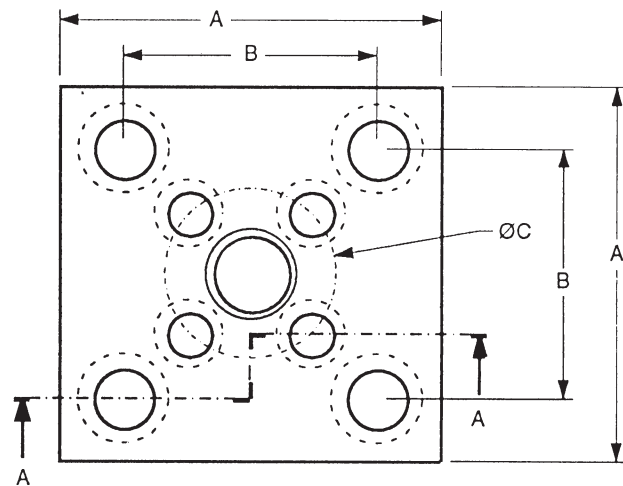
The plate can be used for RCT 750 through RCT 5000 series springs.



Section A-A



F50J



F75J/F95J

Ordering Information — RCT 50 J through RCT 95 J

Order Number	Spring Model	A	B	C	D	E	F	G	H	I
F50 J	RCT 750/1000	75 / 2.95	56.5 / 2.22	20 / .787	15 / .59	9 / .35	12 / .47	15 / .59	9 / .35	12 / .47
F50 J	RCT 1500	75 / 2.95	56.5 / 2.22	20 / .787	15 / .59	9 / .35	12 / .47	15 / .59	9 / .35	12 / .47
F75 J	RCT 2500/3000	100 / 3.94	73.5 / 2.89	40 / 1.58	18 / .71	11 / .43	15 / .59	15 / .59	9 / .35	12 / .47
F95 J	RCT 5000	120 / 4.72	92 / 3.62	60 / 2.36	20 / .79	13 / .51	13 / .51	15 / .59	9 / .35	12 / .47

Dimensions in *millimeters* / inches

# RG-250

## 1/3 Ton Gas Springs — Self-Contained Only

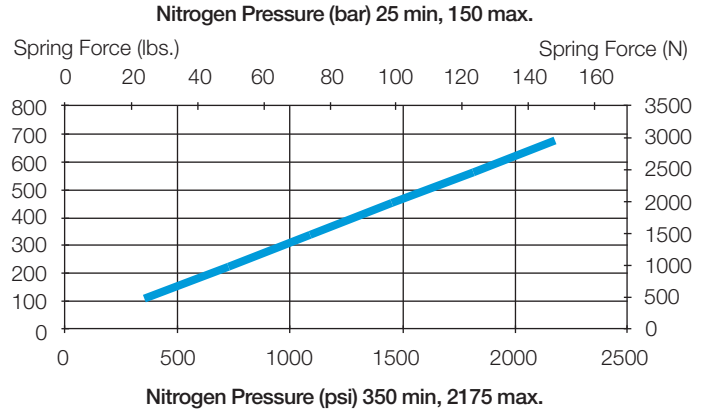
The RG-250 is designed for smaller types of press tools. The valve for checking and modifying the gas pressure is located in the piston rod, which keeps the overall length short in relation to its stroke capability. All RG-250 springs can be dropped into a pocket, like coil type springs, or can be mechanically attached by one of several methods.

The S model can be mechanically attached using the F38A, F38B, F38C or F38D flanges which are shown on pages 18, 20 and 23.

The T model, which is entirely threaded, can be threaded into the tool and locked with a check nut or passed through a thick plate secured on either side with check nut part number F38E.

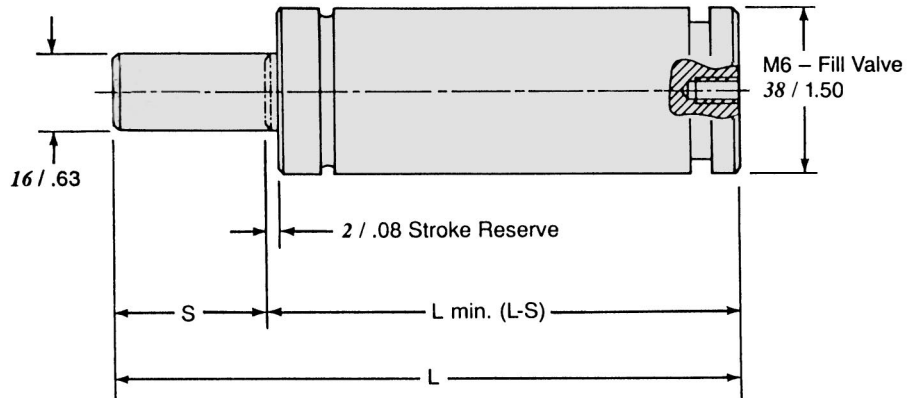
The P model, which is partially threaded, can be mounted using the adjustable flange part number F38F.

## Initial Force At Different Pressures for Model RG-250



## Model S

Drop-in Style



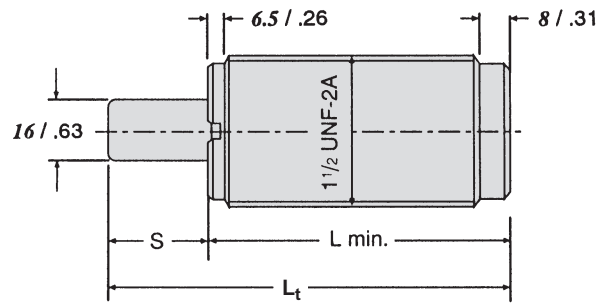
## Ordering Information — RG-250-S

Order Number	Spring Force @ 2175 psi (150 bar)		Maximum Stroke S	L min. L-S	L + 0-1mm + 0-.04"
	Initial	Full Stroke			
RG 250-010-SB	677 lbs. (3012 N)	880 lbs. (3915 N)	10 / .39	60 / 2.36	70 / 2.76
RG 250-012-SB			12.7 / .50	62.7 / 2.47	75.4 / 2.97
RG 250-016-SB			16 / .625	66 / 2.60	82 / 3.23
RG 250-025-SB			25 / .98	75 / 2.95	100 / 3.94
RG 250-038-SB			38 / 1.50	88 / 3.46	126 / 4.97
RG 250-050-SB			50 / 1.97	100 / 3.94	150 / 5.91
RG 250-063-SB			63.5 / 2.50	113.5 / 4.47	177 / 6.97
RG 250-080-SB			80 / 3.15	130 / 5.12	210 / 8.27
RG 250-100-SB			100 / 3.94	150 / 5.90	250 / 9.84
				30% Force Increase	

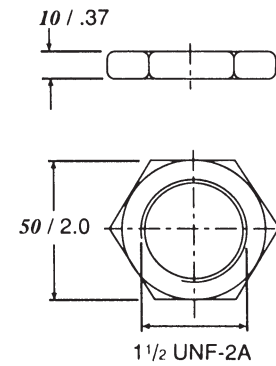
Dimensions in *millimeters* / inches

**Model T**

All Threaded (Also available, metric thread M-38 x 1.5 — specify at time of order)



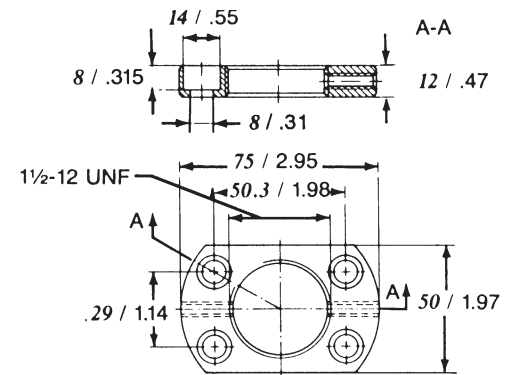
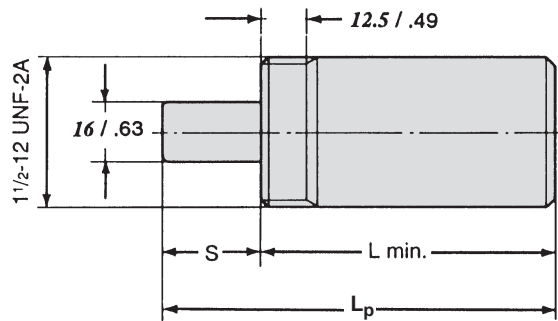
Installation Tool  
Sold Separately  
Order No. SP2



Optional Lock Nut  
Sold Separately  
Order No. F38E

**Model P**

Partially Threaded (Also available, metric thread M-38 x 1.5 — specify at time of order)



Optional Flange  
Sold Separately  
Order No. F38F

**Ordering Information — RG-250 T and RG-250 P**

RG-250 T Threaded	RG-250 P Partially Threaded	Spring Force @ 2175 psi (150 bar)		Maximum Stroke S	Lt	Lp
		Initial	Full Stroke			
RG 250-012-T	RG 250-012-P	677 lbs. (3012 N)	1000 lbs. (4450 N)	12.7 / .50	77.4 / 3.05	75.4 / 2.97
RG 250-025-T	RG 250-025-P			25 / .98	102 / 4.02	100 / 3.94
RG 250-038-T	RG 250-038-P			38 / 1.50	128 / 5.04	126 / 4.96
RG 250-050-T	RG 250-050-P			50 / 1.97	152 / 5.98	150 / 5.90
RG 250-063-T	RG 250-063-P			63.5 / 2.50	179 / 7.05	177 / 6.97
RG 250-080-T	RG 250-080-P			80 / 3.15	212 / 8.35	210 / 8.27

Dimensions in *millimeters* / inches

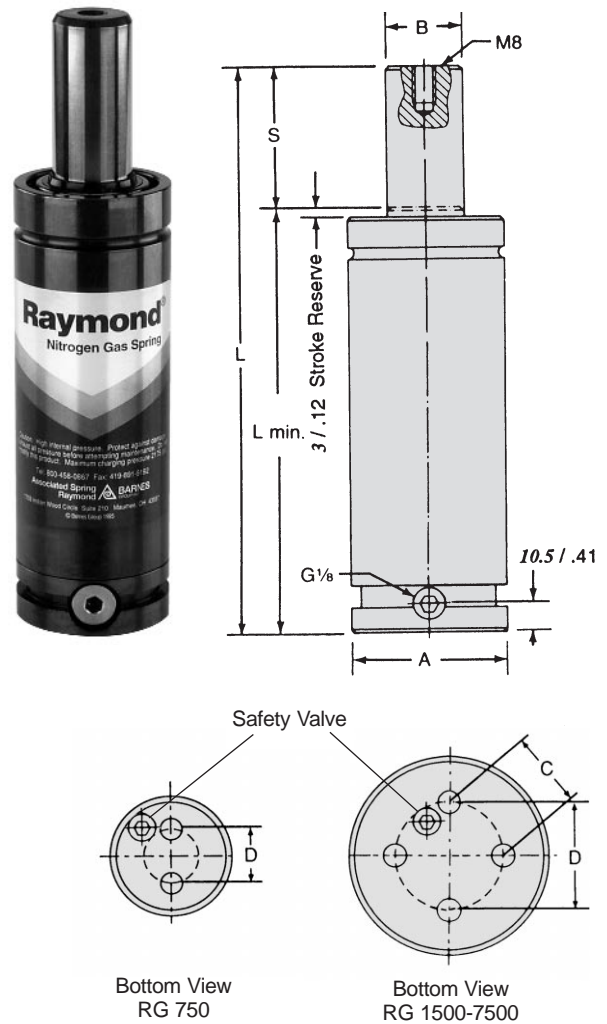
**Note:** Additional stroke lengths available on request.

# RG-750 THROUGH RG-7500

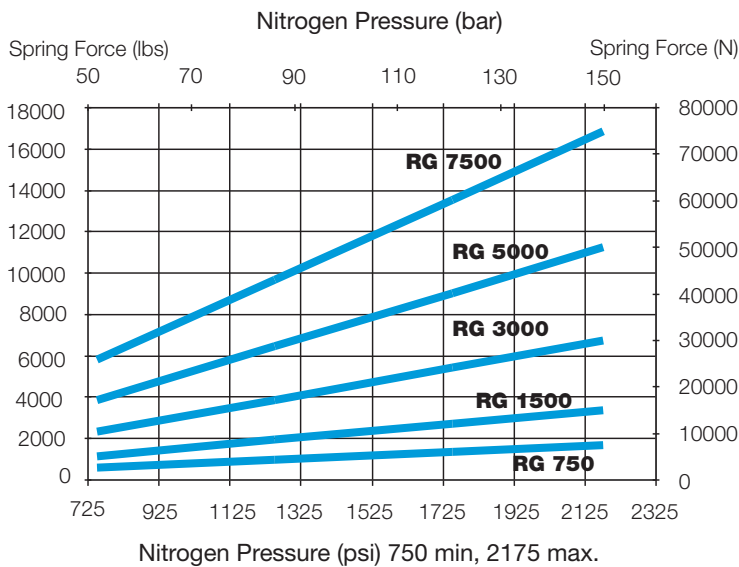
## Lock or Drop-in Mounting Types 3/4, 1-1/2, 3, 5 and 8 Ton Gas Springs Models RG-750 through RG-7500 Self-contained or Uniforce System

RG 750, 1500, 3000, 5000 and 7500 gas springs have been used in larger types of press tools with great success. They can be operated as self contained units or be holed together in a Uniforce System.

All RG type springs come with tapped holes in the base and a groove at the top and lower end to accommodate the mounts listed on pages 18, 19, 20 and 21.



### Initial Force At Different Pressures



### Ordering Information — RG-750 through RG-7500

Order Number	Spring Force @ 2175 psi (150 bar)		Maximum Stroke S	L min. L-S	L + 0-1mm + 0-.04"	A ± .1mm ± .004"	B	C	D	Base Thread
	Initial	Full Stroke								
RG 750-012			12.7 / .50	107.7 / 4.24	120.4 / 4.74					
RG 750-025			25 / .98	120 / 4.72	145 / 5.71					
RG 750-038			38 / 1.50	133 / 5.24	171 / 6.74					
RG 750-050	1690 lbs.	2700 lbs.	50 / 1.97	145 / 5.70	195 / 7.68	50 / 1.972	25 / .98	—	20 / .79	M8x1.25
RG 750-063	(7518 N)	(12011 N)	63.5 / 2.50	158.5 / 6.24	222 / 8.74					
RG 750-080			80 / 3.15	175 / 6.89	255 / 10.04					
RG 750-100		60% Force Increase	100 / 3.94	195 / 7.67	295 / 11.61					
RG 750-125			125 / 4.92	220 / 8.66	345 / 13.58					
RG 750-160			160 / 6.30	255 / 10.03	415 / 16.34					
RG 750-200			200 / 7.87	295 / 11.62	495 / 19.49					
RG 750-250			250 / 9.84	345 / 13.59	595 / 23.43					
RG 750-300			300 / 11.81	395 / 15.55	695 / 27.36					

Dimensions in millimeters / inches



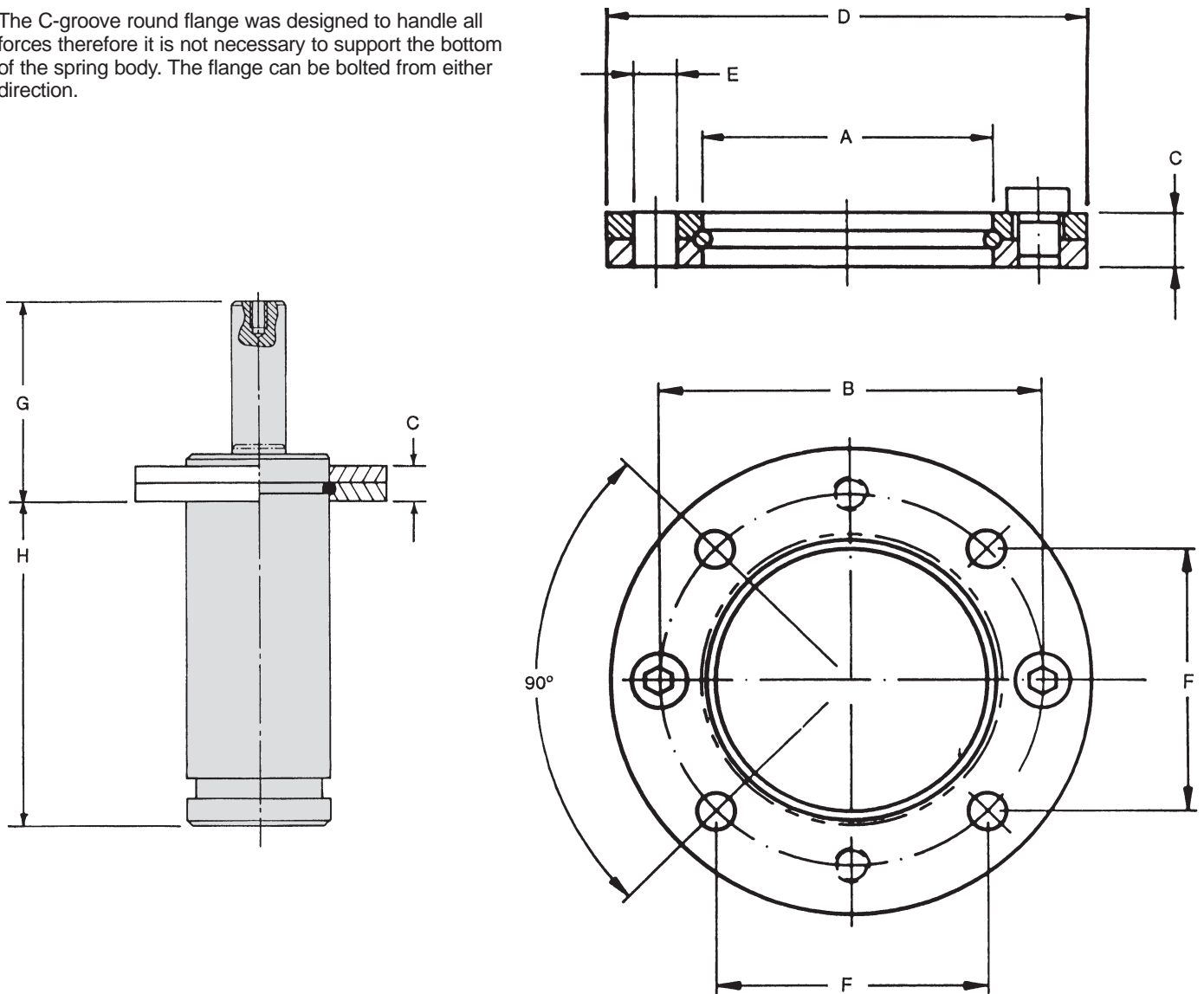
Ordering Information — RG-750 through RG-7500

Order Number	Spring Force @ 2175 psi (150 bar)		Maximum Stroke S	L min. L-S	L + 0-1mm + 0-.04"	A ± .1mm ± .004"	B	C	D	Base Thread
	Initial	Full Stroke								
RG 1500-025	3375 lbs. (15014 N)	5400 lbs. (24022 N)	25 / .98	135 / 5.31	160 / 6.30	75 / 2.956	36 / 1.42	28.3 / 1.11	40 / 1.57	M8x1.25  Depth 13 / .51
RG 1500-038			38 / 1.50	148 / 5.83	186 / 7.32					
RG 1500-050			50 / 1.97	160 / 6.30	210 / 8.27					
RG 1500-063			63.5 / 2.50	173.2 / 6.82	237 / 9.33					
RG 1500-080			80 / 3.15	190 / 7.48	270 / 10.63					
RG 1500-100			100 / 3.94	210 / 8.26	310 / 12.20					
RG 1500-125			125 / 4.92	235 / 9.25	360 / 14.17					
RG 1500-160			160 / 6.30	270 / 10.63	430 / 16.93					
RG 1500-200			200 / 7.87	310 / 12.21	510 / 20.08					
RG 1500-250			250 / 9.84	360 / 14.18	610 / 24.02					
RG 1500-300	300 / 11.81	410 / 16.14	710 / 27.95							
RG 3000-025	6740 lbs. (29983 N)	10790 lbs. (48000 N)	25 / .98	145 / 5.70	170 / 6.69	95 / 3.744	50 / 1.97	42.4 / 1.70	60 / 2.36	M8x1.25  Depth 13 / .51
RG 3000-038			38 / 1.50	158 / 6.22	196 / 7.72					
RG 3000-050			50 / 1.97	170 / 6.69	220 / 8.66					
RG 3000-063			63.5 / 2.50	183.5 / 7.22	247 / 9.72					
RG 3000-080			80 / 3.15	200 / 7.87	280 / 11.02					
RG 3000-100			100 / 3.94	220 / 8.66	320 / 12.60					
RG 3000-125			125 / 4.92	245 / 9.64	370 / 14.57					
RG 3000-160			160 / 6.30	280 / 11.02	440 / 17.32					
RG 3000-200			200 / 7.87	320 / 12.6	520 / 20.47					
RG 3000-250			250 / 9.84	370 / 14.57	620 / 24.41					
RG 3000-300	300 / 11.81	420 / 16.54	720 / 28.35							
RG 5000-025	11240 lbs. (50000 N)	18000 lbs. (80073 N)	25 / .98	165 / 6.49	190 / 7.48	120 / 4.728	65 / 2.56	56.6 / 2.23	80 / 3.15	M10x1.50  Depth 15 / .59
RG 5000-038			38 / 1.50	178 / 7.01	216 / 8.50					
RG 5000-050			50 / 1.97	190 / 7.48	240 / 9.45					
RG 5000-063			63.5 / 2.50	203.5 / 8.01	267 / 10.51					
RG 5000-080			80 / 3.15	220 / 8.66	300 / 11.81					
RG 5000-100			100 / 3.94	240 / 9.50	340 / 13.39					
RG 5000-125			125 / 4.92	265 / 10.43	390 / 15.35					
RG 5000-160			160 / 6.30	300 / 11.81	460 / 18.11					
RG 5000-200			200 / 7.87	340 / 13.39	540 / 21.26					
RG 5000-250			250 / 9.84	390 / 15.36	640 / 25.20					
RG 5000-300	300 / 11.81	440 / 17.32	740 / 29.13							
RG 7500-025	16,860 lbs. (75000 N)	26,900 lbs. (119,665 N)	25 / .98	180 / 7.09	205 / 8.07	150 / 5.91	80 / 3.15	70.7 / 2.783	100 / 3.94	M10x1.50  Depth 15 / .59
RG 7500-038			38 / 1.50	193 / 7.60	231 / 9.10					
RG 7500-050			50 / 1.97	205 / 8.07	255 / 10.04					
RG 7500-063			63.5 / 2.50	218 / 8.58	282 / 11.10					
RG 7500-080			80 / 3.15	235 / 9.25	315 / 12.40					
RG 7500-100			100 / 3.94	255 / 10.04	355 / 13.97					
RG 7500-125			125 / 4.92	280 / 11.02	405 / 15.94					
RG 7500-160			160 / 6.30	315 / 12.40	475 / 18.70					
RG 7500-200			200 / 7.87	355 / 13.98	555 / 21.85					
RG 7500-250			250 / 9.84	405 / 15.94	655 / 25.79					
RG 7500-300	300 / 11.81	455 / 17.91	755 / 29.72							

Dimensions in *millimeters* / inches

## C-Groove Round Flange for Models RG-250 through RG-7500

The C-groove round flange was designed to handle all forces therefore it is not necessary to support the bottom of the spring body. The flange can be bolted from either direction.



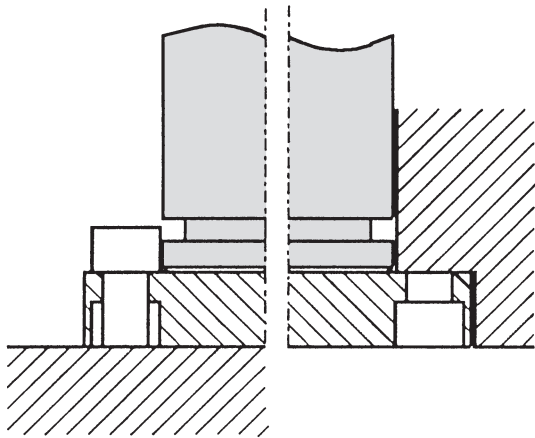
\* S=Stroke length of spring flange to which it is attached.  
 Example: For order number F38 A on spring order number RG 250-025-S.  
 $G = 17\text{mm} + 25\text{mm} = 42\text{mm}$  or  $G = .67" + .98" = 1.65"$

### Ordering Information — "A" Style Flange

Order Number	Spring Model	A	B	C	D	E	F	G*	H*
F38 A	RG-250	38.5 / 1.51	56.5 / 2.22	9 / .35	68 / 2.68	7 / .27	40 / 1.57	17 / .67+S	L-G
F50 A	RG-750	50.5 / 1.99	80 / 3.15	13 / .51	95 / 3.74	9 / .35	56.5 / 2.22	24 / .95+S	L-G
F75 A	RG-1500	75.5 / 2.97	104 / 4.09	16 / .63	122 / 4.80	11 / .43	73.5 / 2.89	29 / 1.14+S	L-G
F95 A	RG-3000	95.5 / 3.76	130 / 5.12	18 / .71	150 / 5.91	13 / .51	92 / 3.62	33 / 1.30+S	L-G
F120 A	RG-5000	120.5 / 4.74	155 / 6.10	21 / .83	175 / 6.89	13 / .51	109.5 / 4.31	36 / 1.42+S	L-G
F150 A	RG-7500	150.5 / 5.92	195 / 7.68	26 / 1.02	245 / 9.64	21 / .83	138 / 5.43	41 / 1.62+S	L-G

Dimensions in *millimeters* / inches

Mounting plate "J" for Models RG-750 through RG-7500

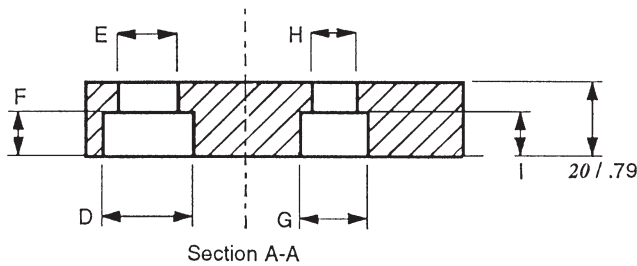


Mounting Possibilities

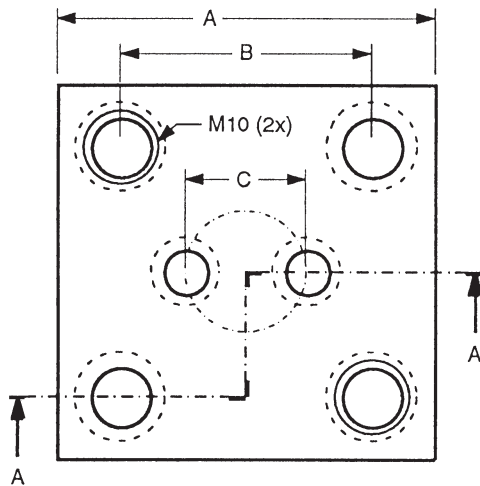
This mounting plate is to be attached under the spring by using the tapped holes in the bottom of the spring.

The plate can then be mounted to the tool, as shown in the figure to the left.

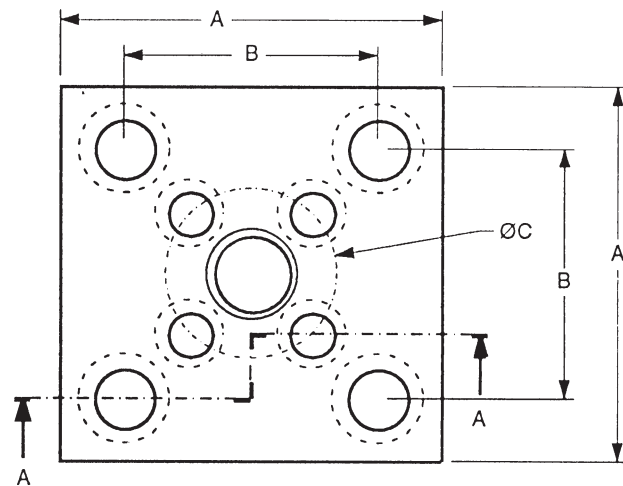
The plate can be used for RG 750 through RG 7500 series springs.



Section A-A



F50J



F75J through F150J

Ordering Information — F50 J through F150 J

Order Number	Spring Model	A	B	C	D	E	F	G	H	I
F50 J	RG 750	75 / 2.95	56.5 / 2.22	20 / .787	15 / .59	9 / .35	12 / .47	15 / .59	9 / .35	12 / .47
F75 J	RG 1500	100 / 3.94	73.5 / 2.89	40 / 1.575	18 / .71	11 / .43	15 / .59	15 / .59	9 / .35	12 / .47
F95 J	RG 3000	120 / 4.72	92 / 3.62	60 / 2.362	20 / .79	13 / .51	13 / .51	15 / .59	9 / .35	12 / .47
F120 J	RG 5000	140 / 5.51	109.5 / 4.31	80 / 3.150	20 / .79	13 / .51	18 / .71	18 / .71	11 / .43	15 / .59
F150 J	RG 7500	176 / 6.93	138 / 5.43	100 / 3.937	20 / .79	13 / .51	14 / .55	18 / .71	11 / .43	12 / .47

Dimensions in *millimeters* / inches

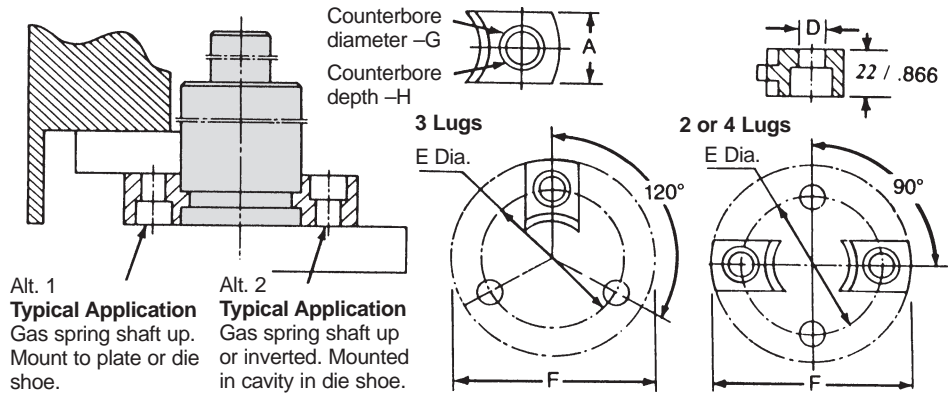
## Mounting Arrangements for RG 250 through RG 7500

### Type "H"

#### Reversible Lugs

The center-to-center dimensions of the bolts comply with Automotive OEM standards. If your application calls for the bolts to enter from the base end, the depth of recess machined into the tool for the mount should be  $22.6\text{mm} / .89"$ , with a tolerance of  $+0.55\text{mm} - 0.0\text{mm} / +02" - 0.0$ .

**Note:** Spring must be rigidly backed in both cases. Black oxide finish. For use with Self-contained and UniForce springs.

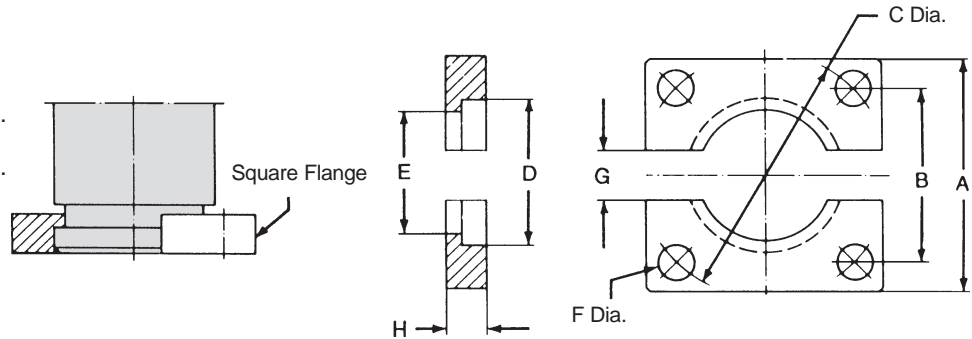


Order Number	Spring Model	A	D	E	F	G	H
<b>F50 H</b>	<b>RG 750</b>	31.7 / 1.25	10.5 / .41	88.9 / 3.50	107.9 / 4.25	18 / .70	10.4 / .41
<b>F75 H</b>	<b>RG 1500</b>	38.1 / 1.50	13.5 / .53	120.6 / 4.75	152.4 / 5.00	20 / .78	13.5 / .53
<b>F95 H</b>	<b>RG 3000</b>	38.1 / 1.50	13.5 / .53	146.0 / 5.75	177.8 / 7.00	20 / .78	13.5 / .53
<b>F120 H</b>	<b>RG 5000</b>	38.1 / 1.50	13.5 / .53	165.1 / 6.50	196.8 / 7.75	20 / .78	13.5 / .53

### Type "B"

#### Square Flange

The flange is divided into two equal halves and is secured with four bolts. Black oxide finish. For use with Self-contained and UniForce springs.

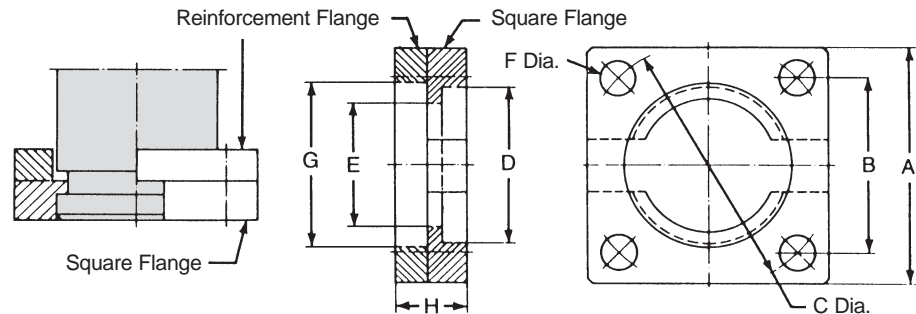


Order Number	Spring Model	A	B	C	D	E	F	G	H
<b>F38 B</b>	<b>RG 250</b>	55 / 2.17	40 / 1.57	56.6 / 2.23	38.5 / 1.51	34.5 / 1.36	7 / .28	5 / .20	7 / .27
<b>F50 B</b>	<b>RG 750</b>	75 / 2.95	56.5 / 2.22	79.9 / 3.14	50.5 / 1.99	44.5 / 1.75	9 / .35	24 / .94	12 / .47
<b>F75 B</b>	<b>RG 1500</b>	100 / 3.94	73.5 / 2.89	103.9 / 4.09	75.5 / 2.97	68.5 / 2.70	11 / .43	24 / .94	12 / .47
<b>F95 B</b>	<b>RG 3000</b>	120 / 4.72	92 / 3.62	130.1 / 5.12	95.5 / 3.76	88.5 / 3.48	13 / .51	24 / .94	12 / .47
<b>F120 B</b>	<b>RG 5000</b>	140 / 5.51	109.5 / 4.31	154.9 / 6.10	120.5 / 4.74	113.5 / 4.47	13 / .51	24 / .94	12 / .47
<b>F150 B</b>	<b>RG 7500</b>	190 / 7.48	138 / 5.43	195.2 / 7.68	150.5 / 5.93	143.5 / 5.65	17.5 / .69	24 / .94	12 / .47

### Type "C"

#### Reinforced Square Flange

This mounting is a reinforced version of standard Type "B". It is most commonly used on larger model gas springs which have a stroke of  $100\text{mm} / 4"$  or greater. Includes square flange "B" and reinforcing flange. Black oxide finish. For use with Self-contained springs only.



Order Number	Spring Model	A	B	C	D	E	F	G	H
<b>F38 C</b>	<b>RG 250</b>	55 / 2.17	40 / 1.57	56.5 / 2.22	38 / 1.50	33 / 1.30	7 / .275	40 / 1.57	17 / .65
<b>F50 C</b>	<b>RG 750</b>	75 / 2.95	56.4 / 2.22	80 / 3.15	50 / 1.97	43 / 1.69	13 / .51	52 / 2.05	22 / .87
<b>F75 C</b>	<b>RG 1500</b>	100 / 3.94	73.5 / 2.89	104 / 4.09	75 / 2.95	68 / 2.68	13 / .51	77 / 3.03	22 / .87
<b>F95 C</b>	<b>RG 3000</b>	120 / 4.72	92 / 3.62	130 / 5.12	95 / 3.74	87 / 3.42	17 / .67	97 / 3.82	24 / .95
<b>F120 C</b>	<b>RG 5000</b>	140 / 5.51	109.5 / 4.31	155 / 6.10	120 / 4.72	112 / 4.41	17 / .67	122 / 4.80	24 / .95

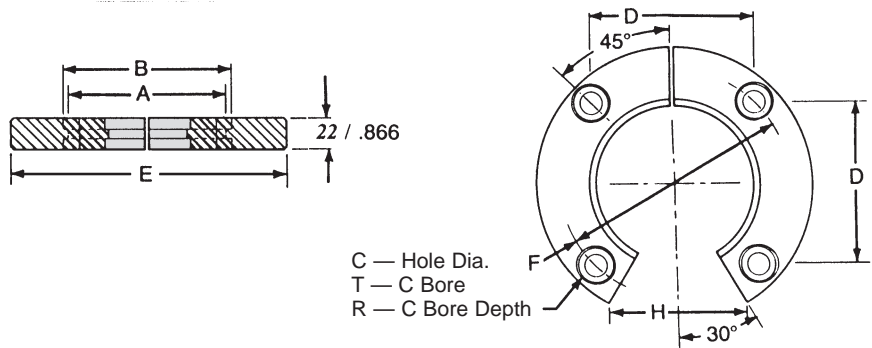
Dimensions in *millimeters* / inches

**Mounting Arrangements for RG 750 through RG 7500**

**Type "G"**

**General Mount — Round Flange**

This two piece mounting is reversible as long as the base or bottom of gas spring is rigidly backed in both cases. If your application calls for the bolts to enter from the base end, the depth of recess machined into the tool for the mount should be  $22.6\text{mm} / .89"$ , with a tolerance of  $+0.55\text{mm} - 0.0\text{mm} / +02" - 0.0$ . Black oxide finish. For use with Self-contained and UniForce springs.

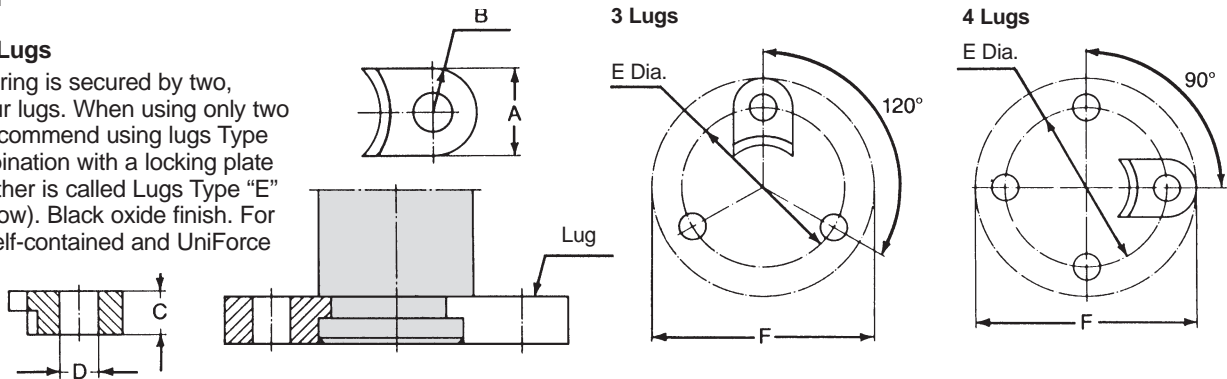


Order Number	Spring Model	A	B	C	D	E	F	H	T	R
F50 G	RG 750	43 / 1.69	50 / 1.97	10.7 / .42	63.0 / 2.48	107.9 / 4.25	88.9 / 3.50	53.8 / 2.12	17 / .67	10.4 / .41
F75 G	RG 1500	68 / 2.68	75.2 / 2.96	13.5 / .53	85.3 / 3.36	152.4 / 6.00	120.6 / 4.75	76.2 / 3.00	19.8 / .78	13.5 / .53
F95 G	RG 3000	87 / 3.42	95.2 / 3.75	13.5 / .53	98.8 / 3.89	171.4 / 6.75	139.6 / 5.50	85.6 / 3.37	19.8 / .78	13.5 / .53
F120 G	RG 5000	112.0 / 4.41	120.1 / 4.73	16.8 / .66	116.8 / 4.60	196.8 / 7.75	165 / 6.50	98.3 / 3.87	25.4 / 1.00	16.5 / .65
F150 G	RG 7500	142 / 5.59	150.2 / 5.91	16.8 / .66	134.6 / 5.30	222.2 / 8.75	190.5 / 7.50	110.5 / 4.35	25.4 / 1.00	16.5 / .65

**Type "F"**

**Mounting Lugs**

The gas spring is secured by two, three or four lugs. When using only two lugs, we recommend using lugs Type "F" in combination with a locking plate which together is called Lugs Type "E" (shown below). Black oxide finish. For use with Self-contained and UniForce springs.

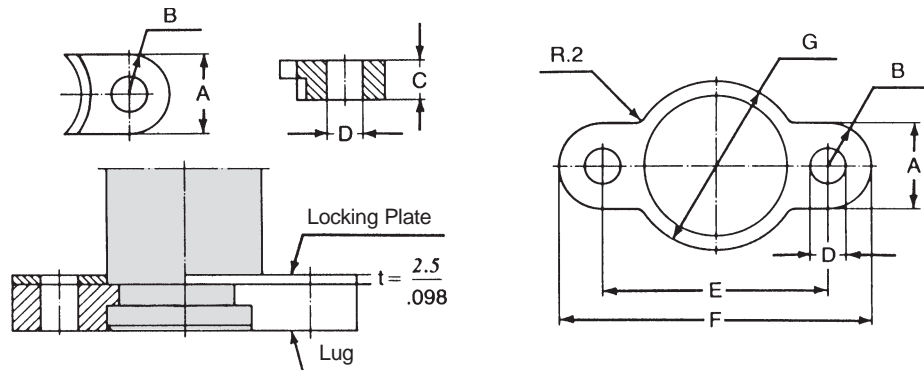


Order Number	Spring Model	A	B	C	D	E	F
F50 F	RG 750	30 / 1.18	R15 / R.59	14.5 / .57	13 / .51	80 / 3.15	110 / 4.33
F75 F	RG 1500	30 / 1.18	R15 / R.59	14.5 / .57	13 / .51	104 / 4.09	134 / 5.27
F95 F	RG 3000	40 / 1.57	R20 / R.79	14.5 / .57	17 / .67	130 / 5.12	170 / 6.69
F120 F	RG 5000	50 / 1.97	R25 / R.98	14.5 / .57	17 / .67	155 / 6.10	205 / 8.07

**Type "E"**

**Lugs with Locking Plate**

If the gas spring is fastened using only two Type "F" lugs, we recommend using the locking plate which secures the spring in the radial direction. The plate is not required however, if the lugs are recessed into the tool. For use with Self-contained springs only. Black oxide finish.



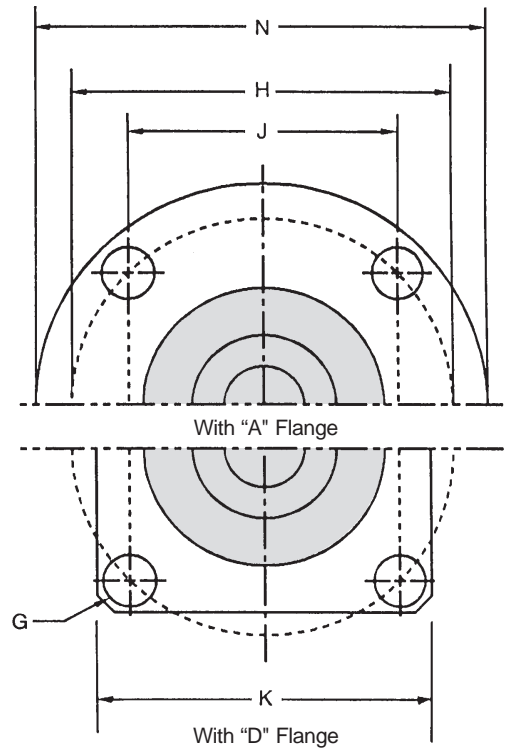
Order Number	Spring Model	A	B	C	D	E	F	G
F50 E	RG 750	30 / 1.18	R15 / R.59	14.5 / .57	13 / .51	80 / 3.15	110 / 4.33	61 / 2.40
F75 E	RG 1500	30 / 1.18	R15 / R.59	14.5 / .57	13 / .51	104 / 4.09	134 / 5.27	86 / 3.38
F95 E	RG 3000	40 / 1.57	R20 / R.79	14.5 / .57	17 / .67	130 / 5.12	170 / 6.69	106 / 4.17
F120 E	RG 5000	50 / 1.97	R25 / R.98	14.5 / .57	17 / .67	155 / 6.10	205 / 8.07	131 / 5.16

# RS

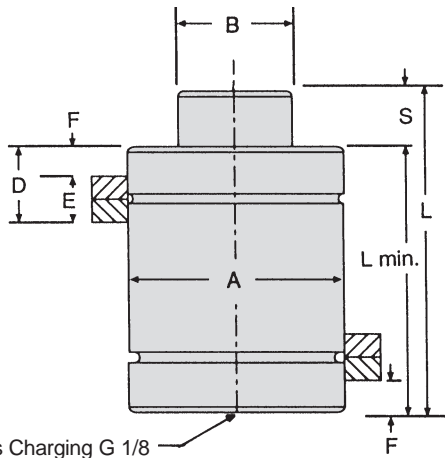
## Super Compact Springs Self-Contained or UniForce® Hose System

Designed for high force, short stroke applications.

All RS type springs come with tapped holes in the base, and an upper and lower groove for mounting. Since the "A" or "D" flange were designed to handle all forces, it is not necessary to support the bottom of the spring when using these mounts. The drawing below offers the dimensions of the spring with the "A" and "D" flange at both the upper and lower location.

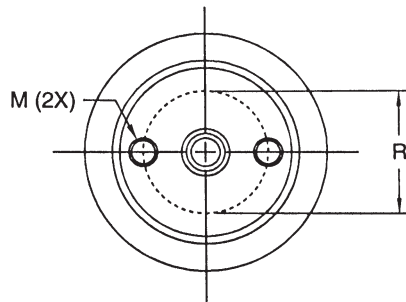


Optional Flange  
Sold Separately

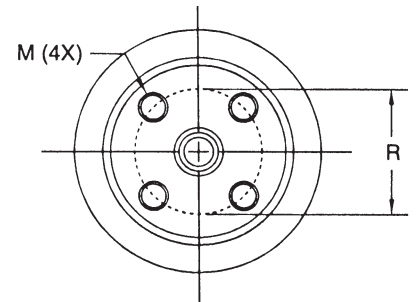


Gas Charging G 1/8  
(Model RS-1000 has M6 Fill Port)

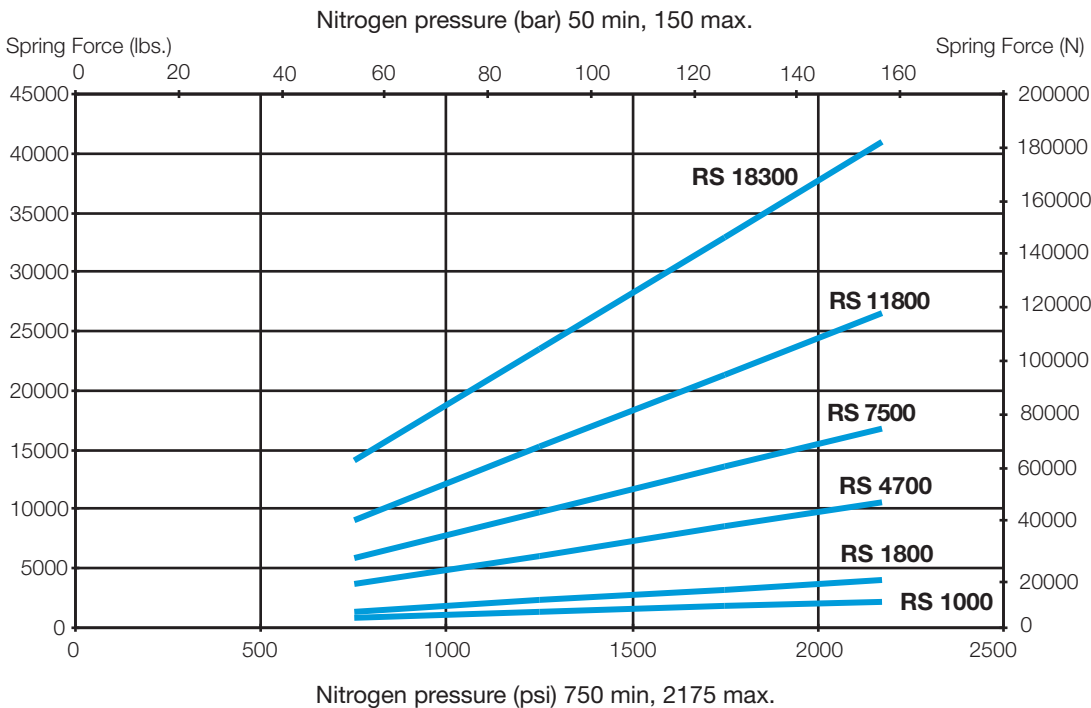
Bottom View  
For RS 1000 and RS 1800 Series



Bottom View  
For RS 4700 through RS 18300 Series



### Initial Force At Different Pressures



**Ordering Information — RS-1000 through RS-18300**

Order Number	Spring Force @ 2175 psi (150 bar)		Spring Force @ 2175 psi (150 bar)		Maximum Stroke S	L min. L-S	L ±0.1mm ±/-0.04"	A ±.1mm ±/-0.004"	B	M	R
	Initial (lbs)	Initial (N)	Final (lbs)	Final (N)							
RS 1000-006	2250	10005	4300	19125	6/.236	55/2.17	61/2.40	38/1.50	18/.71	M6 Depth = 7/.28	17/.67
RS 1000-010			4330	9260	10/.393	67/2.64	77/3.03				
RS 1000-016			4385	9500	16/.625	84/3.31	100/3.94				
RS 1000-025			4405	19590	25/.984	110/4.33	135/5.31				
RS 1000-032			4430	9700	32/1.259	132/5.20	167/6.57				
RS 1000-040			4460	9835	40/1.575	155/6.10	195/7.68				
RS 1000-050	4490	9970	50/1.968	180/7.09	230/9.05						
RS 1800-006	4045	17990	7195	32000	6/.236	60/2.36	66/2.60	50/1.97	30/1.18	M6 Depth = 8/.31	26/1.02
RS 1800-016			7710	34290	16/.625	90/3.54	106/4.17				
RS 1800-025			8205	36490	25/.984	110/4.33	135/5.31				
RS 1800-032			8725	38805	32/1.259	130/5.12	162/6.38				
RS 1800-040			9290	41315	40/1.575	150/5.91	190/7.48				
RS 1800-050			9780	43495	50/1.968	170/6.69	220/8.66				
RS 4700-010	10560	46965	21760	96775	10/.393	70/2.76	80/3.15	75/2.95	50/1.97	M8 Depth = 10/.39	40/1.57
RS 4700-016			19850	88280	16/.625	90/3.54	106/4.17				
RS 4700-025			21175	94175	25/.984	110/4.33	135/5.31				
RS 4700-032			22525	100175	32/1.259	135/5.31	167/6.57				
RS 4700-040			23855	106090	40/1.575	160/6.30	200/7.87				
RS 4700-050			25125	111740	50/1.968	190/7.48	240/9.45				
RS 7500-010	16800	74715	30170	134175	10/.393	80/3.15	90/3.54	95/3.74	63/2.48	M8 Depth = 12/.47	52/2.05
RS 7500-016			29495	131175	16/.625	100/3.94	116/4.57				
RS 7500-025			31695	140960	25/.984	120/4.72	145/5.71				
RS 7500-032			33270	147965	32/1.259	150/5.91	182/7.16				
RS 7500-040			34395	152970	40/1.575	170/6.69	210/8.27				
RS 7500-050			36215	161060	50/1.968	215/8.46	265/10.43				
RS 11800-010	26500	117855	49005	217945	10/.393	90/3.54	100/3.94	120/4.72	80/3.15	M10 Depth = 14/.55	68/2.68
RS 11800-016			47210	209960	16/.625	110/4.33	126/4.96				
RS 11800-025			51030	226950	25/.984	130/5.12	155/6.10				
RS 11800-032			52830	234955	32/1.259	155/6.10	187/7.36				
RS 11800-040			54535	242535	40/1.575	180/7.09	220/8.66				
RS 11800-050			57460	255545	50/1.968	210/8.27	260/10.24				
RS 18300-010	41000	182345	75490	335730	10/.393	100/3.94	110/4.33	150/5.91	100/3.94	M10 Depth = 17/.67	90/3.54
RS 18300-016			73060	324925	16/.625	120/4.72	136/5.35				
RS 18300-025			78565	349410	25/.984	140/5.51	165/6.50				
RS 18300-032			83515	371425	32/1.259	165/6.50	197/7.76				
RS 18300-040			88235	392415	40/1.575	195/7.68	235/9.25				
RS 18300-050			93425	415500	50/1.968	220/8.66	270/10.63				

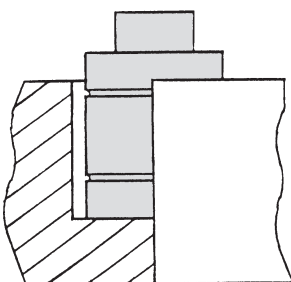
Dimensions in *millimeters* / inches

**Dimensions and Ordering Information — “A” and “D” Flanges**

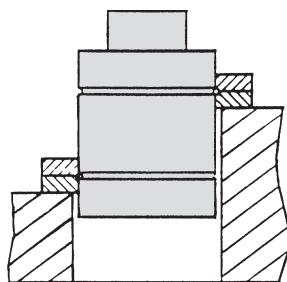
Order Number	F38A F38D	F50A F50D	F75A F75D	F95A F95D	F120A F120D	F150A F150D
Spring Model	RS 1000	RS 1800	RS 4700	RS 7500	RS 11800	RS 18300
D	15 / .59	21 / .83	26 / 1.02	30 / 1.18	33 / 1.30	38 / 1.50
E	9 / .35	13 / .51	16 / .63	18 / .71	21 / .83	26 / 1.02
F	6 / .24	8 / .31	10 / .39	12 / .47	12 / .47	11 / .43
G	7 / .28	9 / .35	11 / .43	13 / .51	13 / .51	21 / .83
H	56.5 / 2.22	80 / 3.15	104 / 4.09	130 / 5.12	155 / 6.10	195 / 7.68
J	40 / 1.57	56.5 / 2.22	73.5 / 2.89	92 / 3.62	109.5 / 4.31	138 / 5.43
K	52 / 2.05	70 / 2.76	90 / 3.54	110 / 4.33	130 / 5.12	168 / 6.61
N	68 / 2.68	95 / 3.74	122 / 4.80	150 / 5.91	175 / 6.89	245 / 9.65

Note: Flange will be attached to top groove unless otherwise specified time of order.

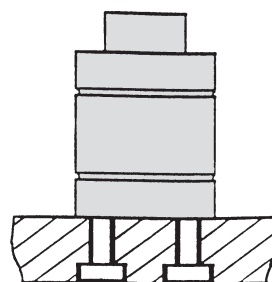
Mounting Examples



Drop-In



Flange Mount



Bottom Mount

Dimensions in *millimeters* / inches

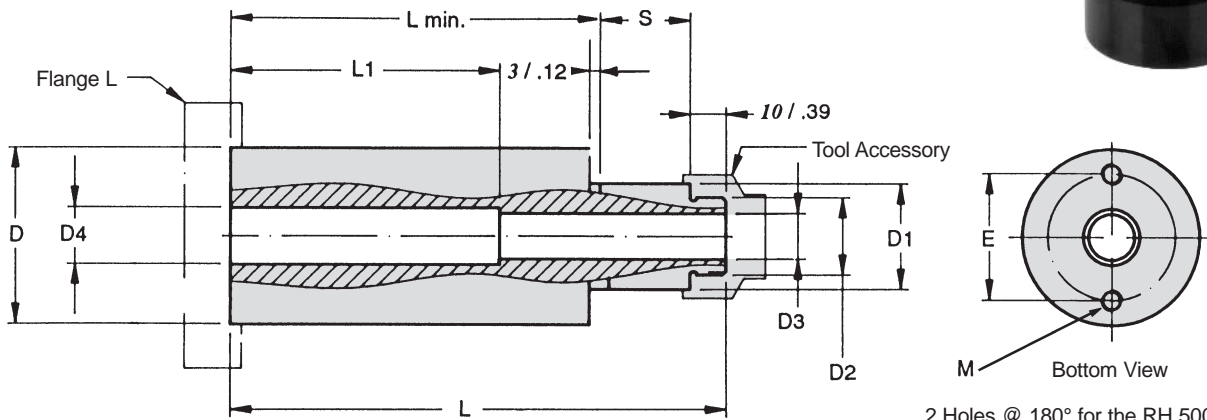
# RH

## Hollow Rod Spring—Self Contained Only

The “RH” hollow piston rod gas spring offers many new installation and design possibilities. Three models are offered in seven stroke lengths.

The spring can be mounted using flange “L”, secured to the tool using the tapped holes at the base of the cylinder, or installed over a shoulder bolt.

The tool accessory is a threaded guide which can be supplied to meet individual requirements such as mounting, piercing, punching and stamping tools. Max strokes recommended is 40 strokes/min.



2 Holes @ 180° for the RH 500

4 Holes @ 90° for the RH 1200 and RH 2200

## Ordering Information — RH-500 through RH-2200

Order Number	Spring Force @ 2175 psi (150 bar)		Maximum Stroke	L	L min.	L1	D	D1	D2	D3	D4	E	Thread M	
	Initial	Full Stroke												
RH 500-010	1326 lbs. (5900 N)	1640 lbs. (7300 N)	10 / 0.39	108 / 4.25	88 / 3.46	45 / 1.77	50 / 1.97	30 / 1.18	M22X1.5	13 / 0.51	16 / 0.63	26 / 1.02	M6X12	
RH 500-015			15 / 0.59	118 / 4.65	93 / 3.66	55 / 2.17								
RH 500-025			25 / 0.98	138 / 5.43	103 / 4.06	75 / 2.95								
RH 500-038			38 / 1.50	164 / 6.46	116 / 4.57	86 / 3.39								
RH 500-050			50 / 1.97	188 / 7.40	128 / 5.04	97 / 3.82								
RH 500-080			24% Force	80 / 3.15	248 / 9.76	158 / 6.22								127 / 5.00
RH 500-100			Increase	100 / 3.94	288 / 11.34	178 / 7.01								147 / 5.79
RH 1200-010	2700 lbs. (12010 N)	3300 lbs. (14680 N)	10 / 0.39	108 / 4.25	88 / 3.46	45 / 1.77	75 / 2.95	40 / 1.57	M30X1.5	16 / 0.63	19 / 0.75	40 / 1.57	M8X12	
RH 1200-015			15 / 0.59	118 / 4.65	93 / 3.66	55 / 2.17								
RH 1200-025			25 / 0.98	138 / 5.43	103 / 4.06	75 / 2.95								
RH 1200-038			38 / 1.50	164 / 6.46	116 / 4.57	86 / 3.39								
RH 1200-050			50 / 1.97	188 / 7.40	128 / 5.04	97 / 3.82								
RH 1200-080			22% Force	80 / 3.15	248 / 9.76	158 / 6.22								127 / 5.00
RH 1200-100			Increase	100 / 3.94	288 / 11.34	178 / 7.01								147 / 5.79
RH 2200-010	4945 lbs. (22000 N)	6000 lbs. (26690 N)	10 / 0.39	108 / 4.25	88 / 3.46	45 / 1.77	95 / 3.74	56 / 2.20	M36X1.5	20 / 0.79	24 / 0.94	50 / 1.97	M8X12	
RH 2200-015			15 / 0.59	118 / 4.65	93 / 3.66	55 / 2.17								
RH 2200-025			25 / 0.98	138 / 5.43	103 / 4.06	75 / 2.95								
RH 2200-038			38 / 1.50	164 / 6.46	116 / 4.57	86 / 3.39								
RH 2200-050			50 / 1.97	188 / 7.40	128 / 5.04	97 / 3.82								
RH 2200-080			21% Force	80 / 3.15	248 / 9.76	158 / 6.22								127 / 5.00
RH 2200-100			Increase	100 / 3.94	288 / 11.34	178 / 7.01								147 / 5.79

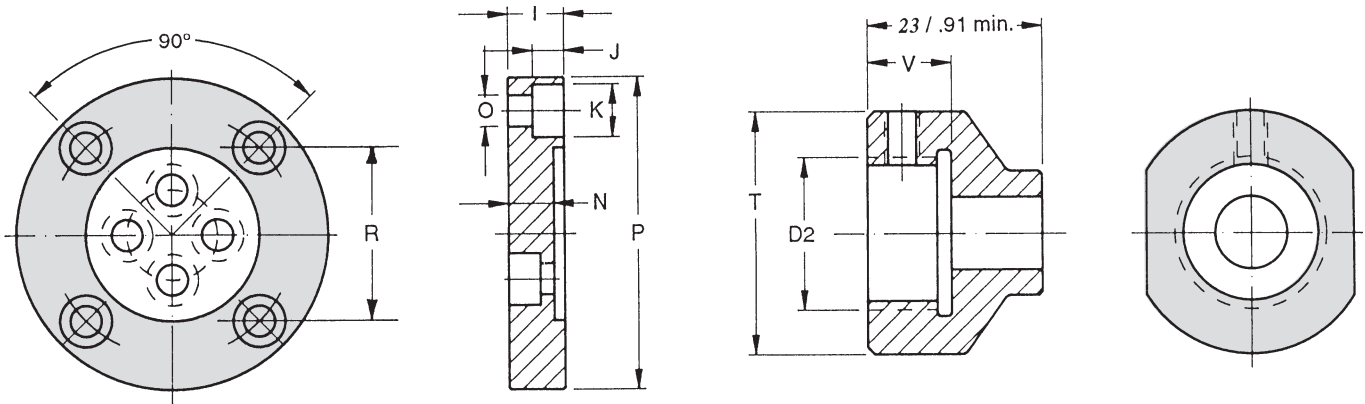
Dimensions in *millimeters* / inches



RH 500 through RH 2200 cont.

Flange "L"

Tool Accessory "Sp"

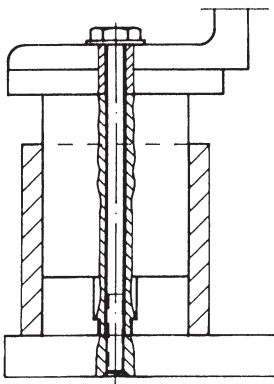


Ordering Information — "L" Flange and Tool Accessory

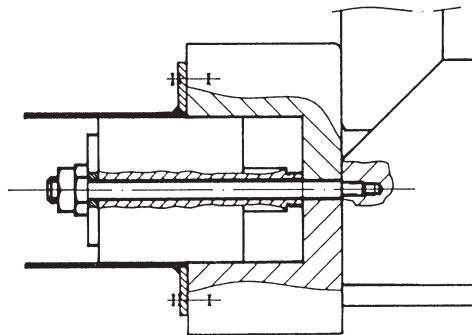
Order Number	Spring Model	N	P	R	O	I	J	K	Order Number	Spring Model	T	V	D2
F50 L	RH 500	13 / .51	90 / 3.54	50 / 1.97	9 / .35	16 / .63	9 / .35	15 / .59	SP8	RH 500	35 / 1.38	12 / .47	M22 X 1.5
F75 L	RH 1200	17 / .67	120 / 4.72	68 / 2.68	11 / .43	20 / .79	11 / .43	18 / .71	SP9	RH 1200	45 / 1.77	12 / .47	M30 X 1.5
F95 L	RH 2200	17 / .67	150 / 5.90	90 / 3.54	11 / .43	20 / .79	11 / .43	18 / .71	SP10	RH 2200	55 / 2.17	12 / .47	M36 X 1.5

Application Examples

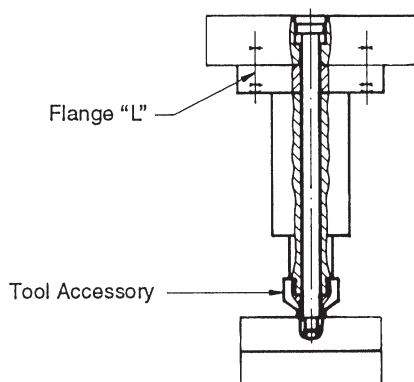
As a Shock Absorber



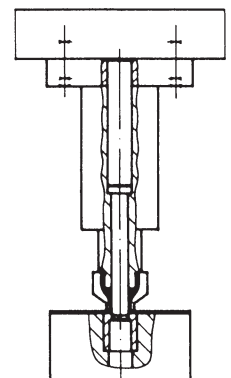
As a Return Spring in Cam Units



As a Spring Bolt in Blanking Dies



In Piercing Dies in Place of a Stripper Plate



Dimensions in *millimeters* / inches

# UniForce<sup>®</sup> SYSTEM

UniForce, as the name implies, delivers precisely the same force at each gas spring regardless of its location within the die. UniForce system gas springs are identical to the self-contained springs except the spring's internal valve is removed and a fitting is installed to permit the attachment of hoses or other types of adapters. All UniForce system springs will be delivered with the fitting already installed.

Every component part of the system, from the control panel to the spring itself, is rated for a working pressure of 5,000 psi (345 bar) or greater, with a safety factor of 4:1. A rupture disc, rated at 5000 psi  $\pm$ 10%, is located in each control panel thereby ensuring the pressure can never be greater than design pressure.

We offer one type of hose (in two sizes) and two different types of hose ends and adapters. The first is the standard 37° JIC swivel connectors (found on page 27), with metal-to-metal sealing; and the second type (found on page 28), offers O-ring sealing at every connection in the system. When properly installed, both types offer leak-free connections. However, the 37° type requires a more precise torque value during assembly. The O-ring face seal is more forgiving in this regard and may also be less inclined to unloosen during heavy, continuous vibration.

Not all mountings are compatible with the UniForce system. See each mounting type for details.

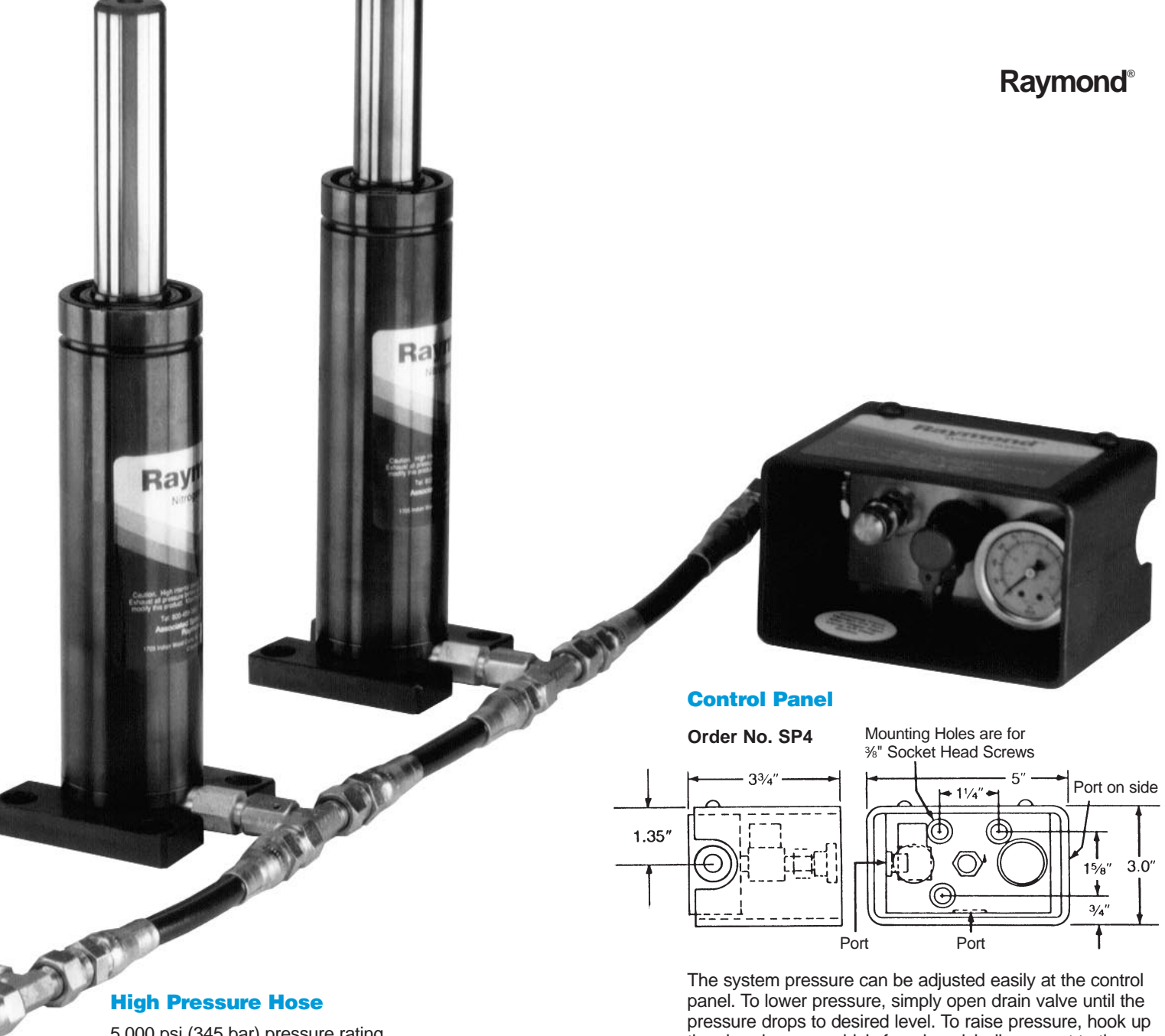
**Note:** Specify "U" for all springs used with UniForce system and which connector type, O-ring or JIC, to be installed.

**Examples:**

URG1500-025 - JIC

URG750-080 - O-ring

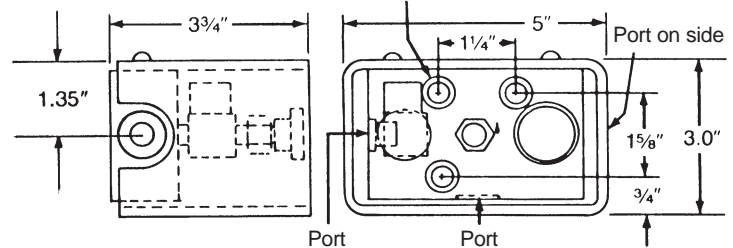




**Control Panel**

Order No. SP4

Mounting Holes are for 3/8" Socket Head Screws



**High Pressure Hose**

5,000 psi (345 bar) pressure rating  
Aramid Braided Fiber

Perforated outer cover  
for pneumatic service

Maximum working pressure—5,000 psi (345 bar)  
Minimum burst pressure—20,000 psi (1380 bar)



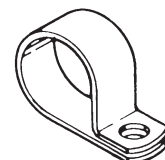
**Aramid Braided Fiber**

- Meets or exceeds SAE 100R8 specifications  
Aramid reinforcement for compact strength and flexibility
- Temperature range: -40°F to +200°F (-40°C to +93°C)
- Couplings: 55 series, swaged or crimped
- Hoses have permanently attached hose ends and cannot be assembled with normal hand tools.
- Minimum hose length from end of fitting to end of fitting is 150 mm / 6 inches.
- When ordering, specify length of hose in inches.

The system pressure can be adjusted easily at the control panel. To lower pressure, simply open drain valve until the pressure drops to desired level. To raise pressure, hook up the charging assembly's female quick disconnect to the male nipple of the control panel. Open the valve on the nitrogen bottle and open the valve of the charging assembly until desired pressure is reached. We do not however, recommend leaving the charging assembly hooked up when the die is running in the press.

**Hose Support Clamp**

Order No. SP3

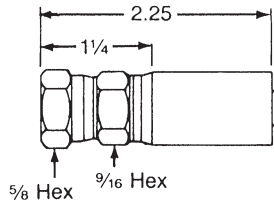


- Prevents damage to hose
- Provides support where long lengths are used
- Minimizes hose chafing problems
- Avoids twisting of hose lines
- Keeps hose away from other moving objects

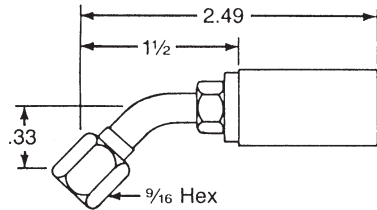
## Hose Fittings — 37° — Metal-to-Metal Sealing

Hose I.D. . . .3/16" Tube O.D. . . .7/16" Thread Size . . .7/16-20

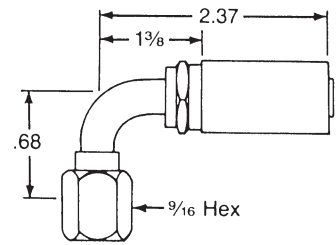
JIC 37° Swivel  
Part No. 10655-4-3



JIC 37° Swivel 45° Elbow  
Part No. 13755-4-3

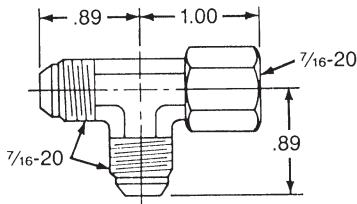


JIC 37° Female SAE  
Swivel—90° Elbow  
Part No. 13955-4-3

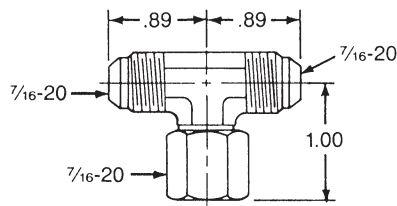


## Hose-to-Spring Fittings

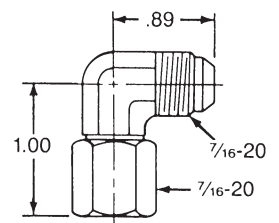
Swivel Nut Run Tee SAE  
Part No. 4R6X-S



Swivel Nut Branch Tee SAE  
Part No. 4S6X-S

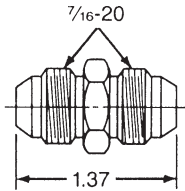


Swivel Nut 90° Elbow SAE  
Part No. 4C6X-S

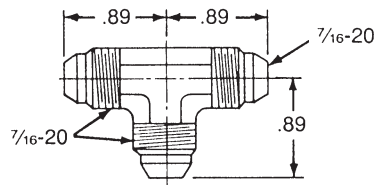


## Hose-to-Hose Fittings

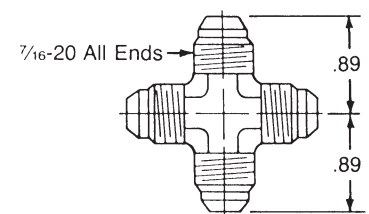
Union—Male SAE  
JIC 37° Flare Both Ends  
Part No. 4HTX-S



Union Tee—Male SAE  
JIC 37° Flare All Ends  
Part No. 4JTX-S



Union Cross—Male SAE  
JIC 37° Flare All Ends  
Part No. 4KTX-S



## Fitting Dimensions When Connected to Gas Springs

① Adapter  
BSPP 1/8 to 1/4 JIC

② Straight swivel  
hose end

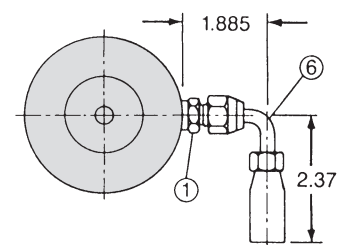
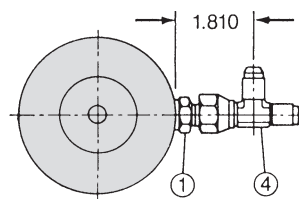
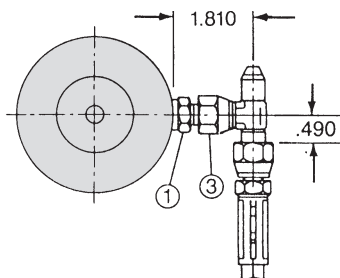
③ Swivel nut branch tee

④ Swivel nut run tee

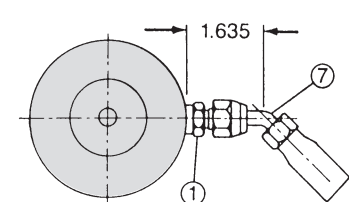
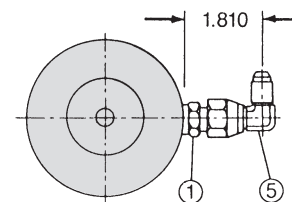
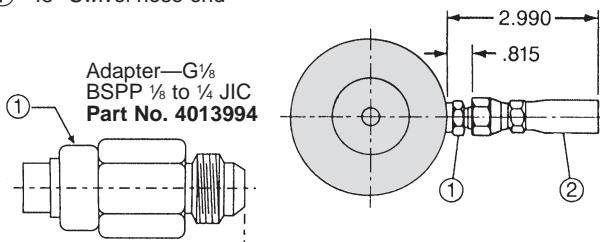
⑤ Swivel nut 90° elbow

⑥ 90° Swivel hose end

⑦ 45° Swivel hose end



① Adapter—G1/8  
BSPP 1/8 to 1/4 JIC  
Part No. 4013994

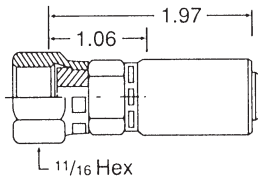


Minimum hose length from end of fitting to end of fitting is 150 mm / 6 inches.

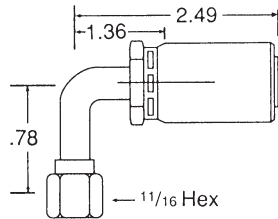
**Hose Fittings — 9/16"-18" — O-Ring Face Sealing**

Hose I.D. . . . 1/4"      Tube O.D. . . . .51"      Thread Size . . . 9/16-18

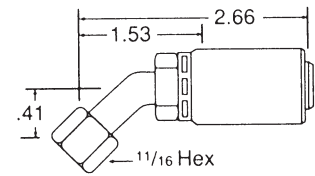
Seal-Lok Straight  
Part No. IJC55-4-4



Seal-Lok 90° Elbow  
Part No. IJ955-4-4

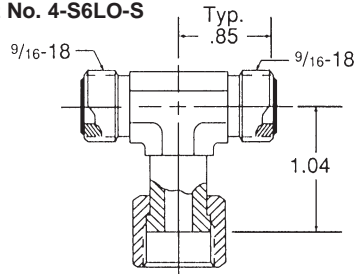


Seal-Lok 45° Elbow  
Part No. IJ755-4-4

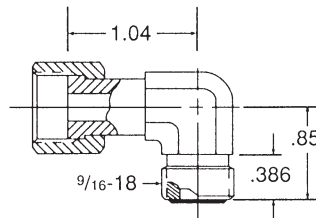


**Hose-to-Spring Fittings**

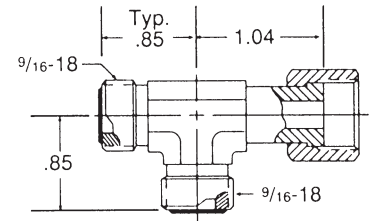
Swivel Nut Branch Tee  
Part No. 4-S6LO-S



Swivel Nut Elbow  
Part No. 4-C6LO-S

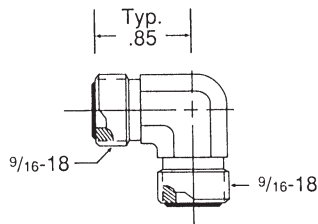


Swivel Nut Run Tee  
Part No. 4-R6LO-S

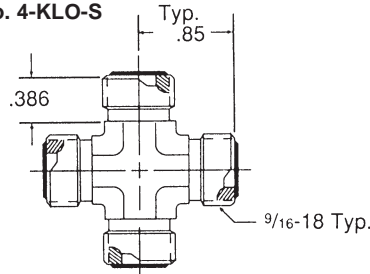


**Hose-to-Hose Fittings**

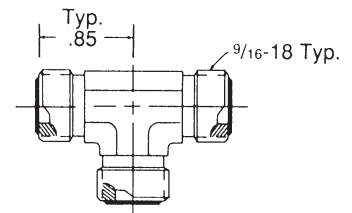
Union Elbow  
Part No. 4-ELO-S



Union Cross  
Part No. 4-KLO-S

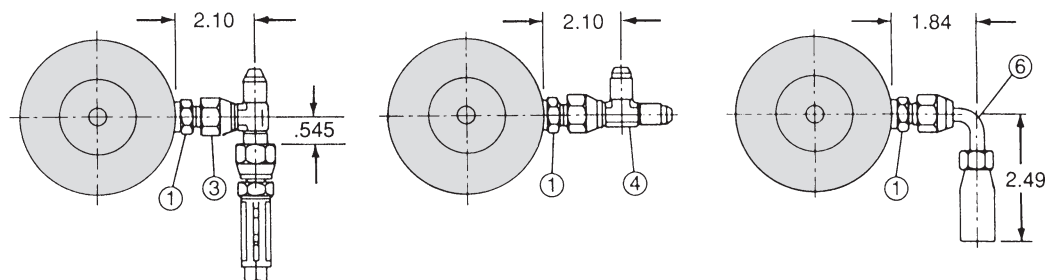


Union Tee  
Part No. 4-JLO-S

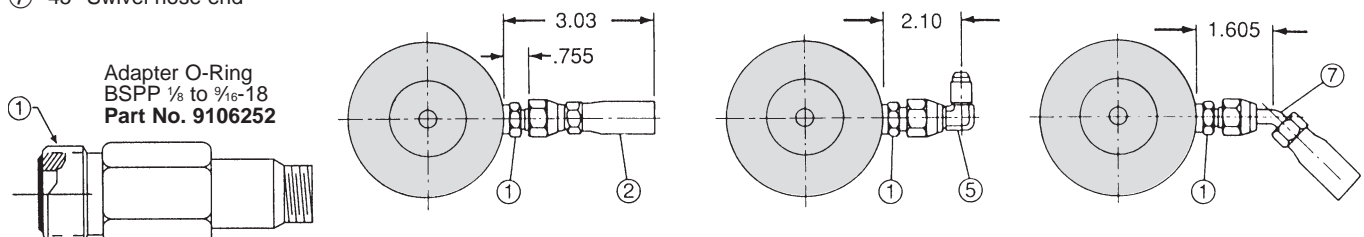


**Fitting Dimensions When Connected to Gas Springs**

- ① Adapter BSPP 1/8 to 9/16-18
- ② Straight swivel hose end
- ③ Swivel nut branch tee
- ④ Swivel nut run tee
- ⑤ Swivel nut 90° elbow
- ⑥ 90° Swivel hose end
- ⑦ 45° Swivel hose end



Adapter O-Ring  
BSPP 1/8 to 9/16-18  
Part No. 9106252



Minimum hose length from end of fitting to end of fitting is 150 mm / 6 inches.

# RX

## Flange Strippers

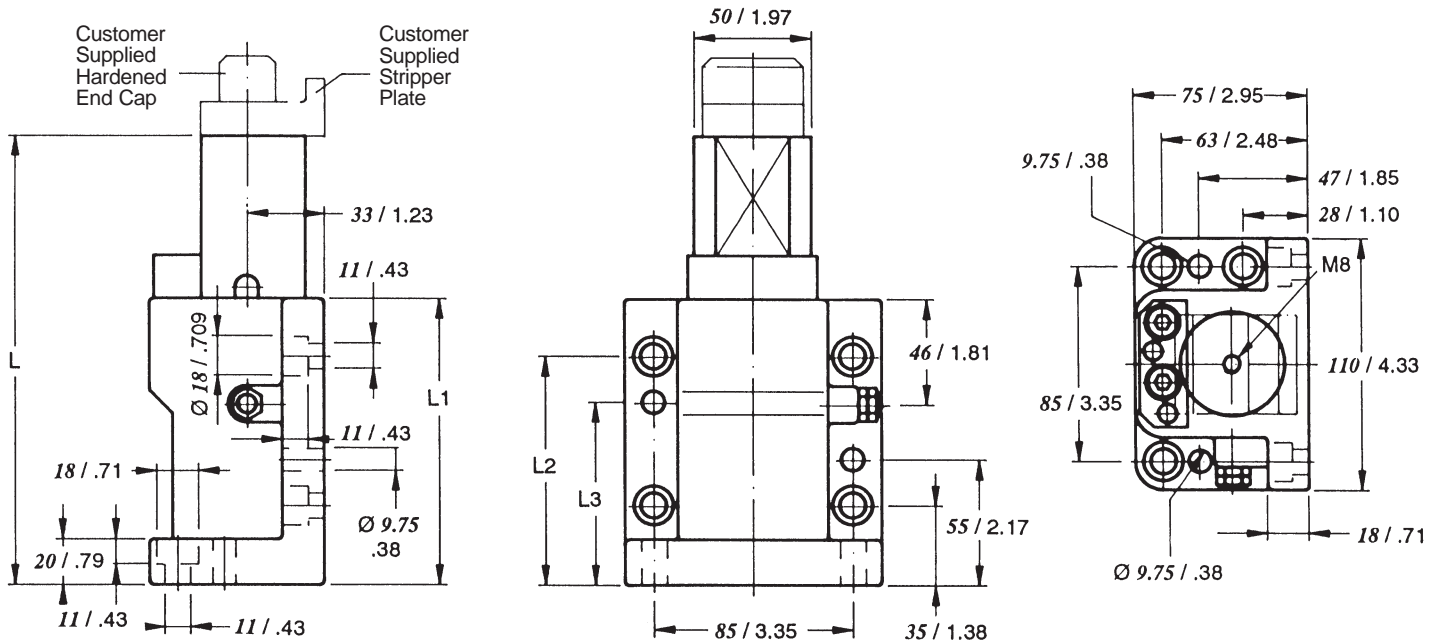
Flange strippers are engineered for use in flanging dies to strip and elevate parts after the flanging or flange-pierce operation. Two models are available in three strokes; 1.97" (50mm), 3.15" (80mm) and 3.95" (100mm). One model is designed to be mounted on either the top/wall or bottom/wall. The other model is attached using a top mount. The Raymond flange stripper provides an engineered stock component for use in your flanging die, eliminating costly in house design and manufacturing time. An adjusting stop is located on the side of each unit which allows the spring to be locked in place for easy set-up and installation.

The lifting force in the unit is supplied by a Raymond nitrogen gas spring with a maximum force of 450 lbs (2000N).

The slide surface is graphite impregnated bronze which requires no lubrication.



## Flange Stripper Top/Wall or Bottom/Wall Mount

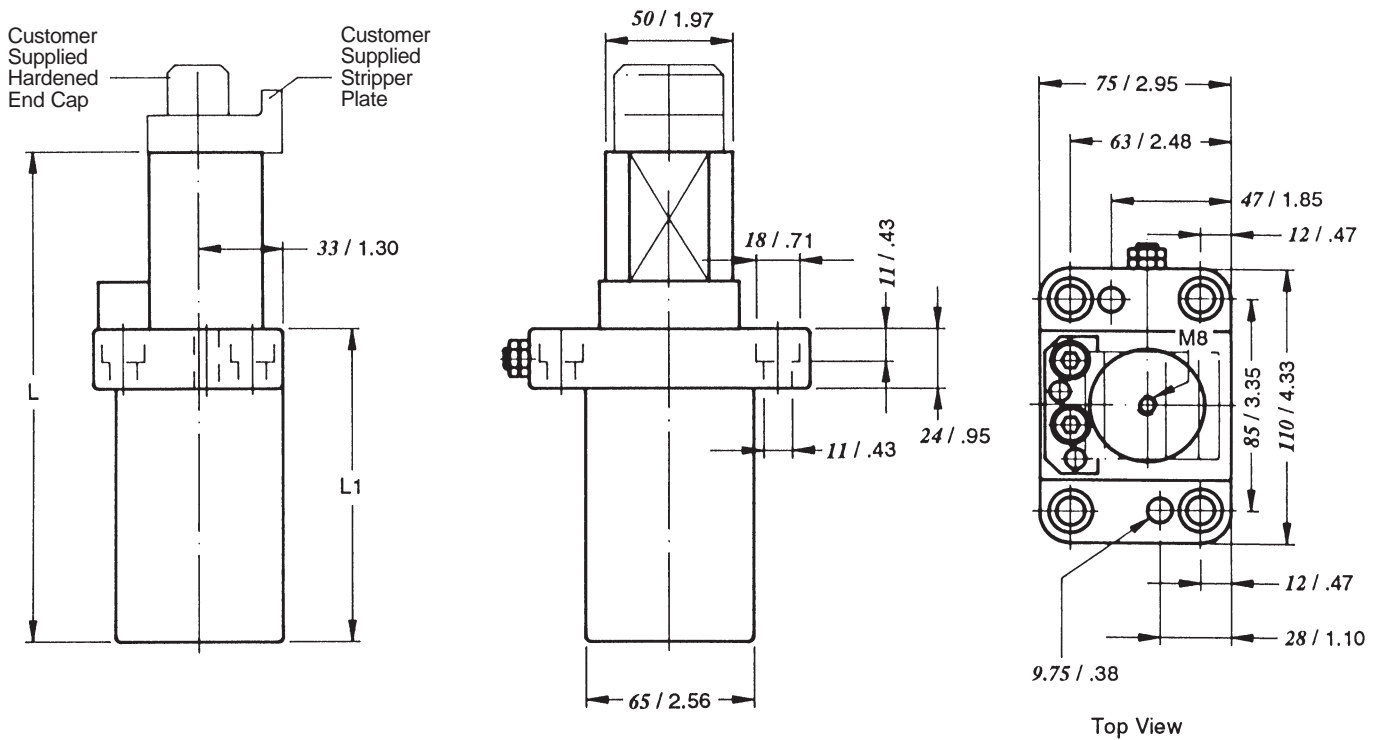


## Ordering Information — RX 050W through RX 100W

Order Number	Stroke	L	L1	L2	L3	* Extraction Force	
						Initial	Full Stroke
RX 050W	50 / 1.97	196 / 7.72	125 / 4.92	100 / 3.94	80 / 3.15	112 lbs. (498 N)	146 lbs. (649 N)
RX 080W	80 / 3.15	256 / 10.08	155 / 6.10	130 / 5.12	110 / 4.33	225 lbs. (1001 N)	281 lbs. (1250 N)
RX 100W	100 / 3.94	296 / 11.65	175 / 6.89	150 / 5.91	130 / 5.12	337 lbs. (1500 N)	438 lbs. (1948 N)
						450 lbs. (2002 N)	584 lbs. (2598 N)

\* Each model is available with four standard initial forces; 112 lbs, 225 lbs, 337 lbs, or 450 lbs. Please specify at time of order.  
Dimensions in *millimeters* / inches

Flange Stripper Top Mount

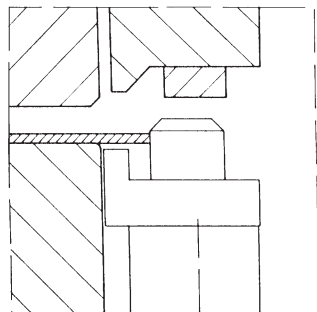


Ordering Information — RX 050F through RX 100F

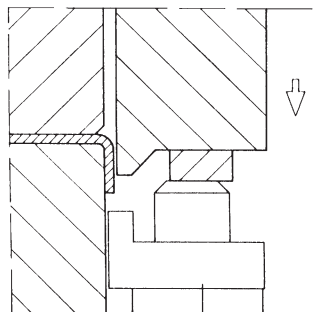
Order Number	Stroke	L	L1	* Extraction Force	
				Initial	Full Stroke
RX 050F	50 / 1.97	196 / 7.72	125 / 4.92	112 lbs. (498 N)	146 lbs. (649 N)
RX 080F	80 / 3.15	256 / 10.08	155 / 6.10	225 lbs. (1001 N)	292 lbs. (1299 N)
RX 100F	100 / 3.94	296 / 11.65	175 / 6.89	337 lbs. (1500 N)	438 lbs. (1948 N)
				450 lbs. (2002 N)	584 lbs. (2598 N)

\* Each model is available with four standard initial forces; 112 lbs, 225 lbs, 337 lbs, or 450 lbs. Please specify at time of order. Dimensions in *millimeters* / inches

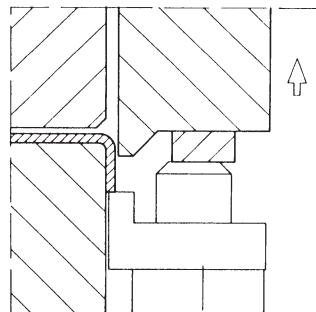
Centered Sheet



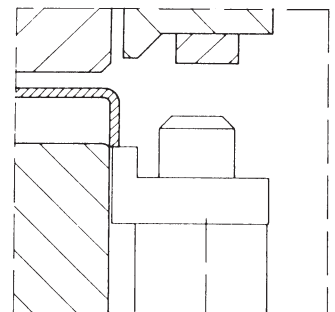
Bending The Flange



Press Return Stroke



Flange Removal



# RW

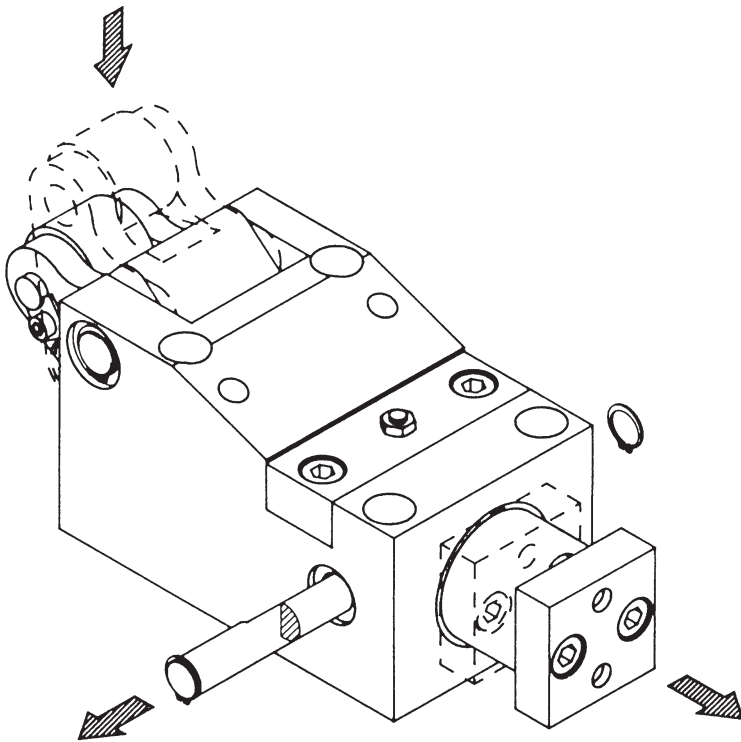
## Roller Cam Wedge Units

The Raymond Roller Cam Wedge Unit is a standard compact cam unit designed primarily for piercing. There are three models available. The RW-R is for use at a 90° angle from the direction of motion. The RW-S is also for use at a 90° angle from the direction of motion but has a unique pull back device which assures the unit returns to its base position. The RW-R45 is for use at a 45° angle from the direction of motion.

All of the Raymond Roller Cam Wedge Units are equipped with a Raymond Nitrogen Gas Spring for positive return. In addition, all units are equipped with a self adjustable anti-turn device that allows the user to manipulate or remove the punch without disassembling the unit.

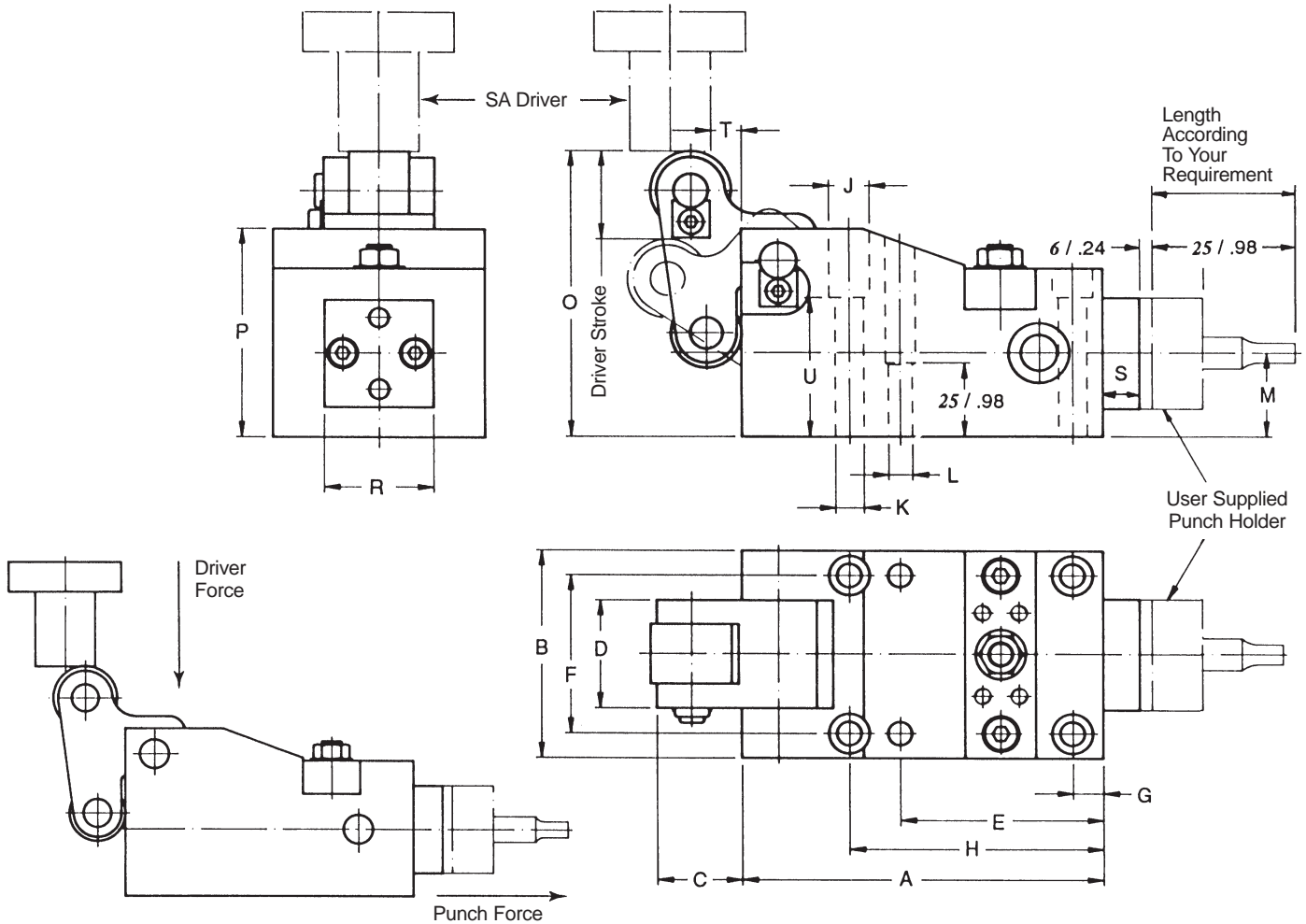
Easy to install, the Raymond Roller Cam Wedge Unit can be manually operated to obtain perfect alignment. Simply pull out the spring retaining bolt on the unit's side and actuate the unit manually, as shown below.

All Raymond Roller Cam Wedge Units' moving parts slide on self-lubricating graphite impregnated bronze guides which require no maintenance. The gas spring contained within each unit can easily be serviced by removing the spring retaining bolt and sliding out the spring.





**RW-R Roller Cam Wedge Unit**



**Ordering Information**

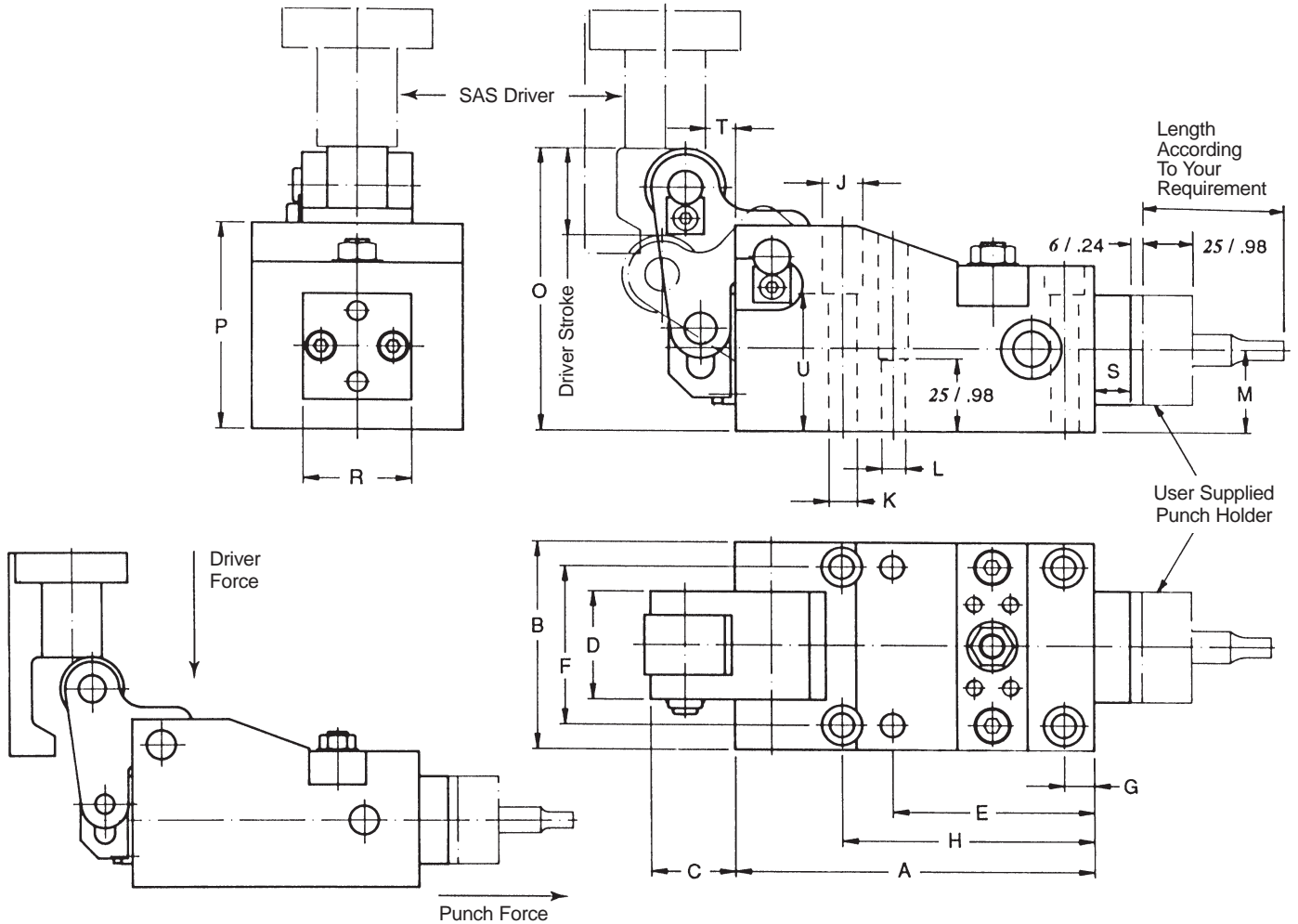
Order Number	Maximum Punch Stroke	Return Force (pounds)	Return Force (newtons)	Maximum Punch Diameter	Maximum Cutting Force (pounds)	Maximum Cutting Force (newtons)
<b>RW-R-089</b>	20/.79	331	1475	10/.39	6615	29424
<b>RW-R-159</b>	30/1.18	441	1962	16/.63	11025	49039
<b>RW-R-199</b>	40/1.57	551	2451	20/.79	15435	68655
<b>RW-R-320</b>	50/1.97	1103	4906	25/.98	22050	98078

**Dimensional Chart — RW-R Roller Cam Wedge Units**

Order Number	Max. Advisab. Stroke	Max. Punch Stroke	A	B	C	D	E	F	G	H	J	K	L	M	O	P	R	S	T	U	Optional Driver Model
<b>RW-R-089</b>	18 .71	20 .79	123 4.84	75 2.95	32 1.26	36 1.42	70 2.76	55 2.17	10 .39	90 3.54	15 .59	9 .35	7.75 .31	28.5 1.12	98 3.86	75 2.95	45 1.77	15 .59	7 .28	50 1.97	SA 1
<b>RW-R-159</b>	27 1.06	30 1.18	150 5.91	90 3.54	36 1.42	45 1.77	82 3.23	67 2.64	12 .47	102 4.01	18 .71	11 .43	9.75 .38	35 1.38	121 4.76	90 3.54	45 1.77	15 .59	11 .43	58 2.28	SA 1
<b>RW-R-199</b>	36 1.42	40 1.57	178 7.01	105 4.13	45 1.77	55 2.17	100 3.94	80 3.15	15 .59	125 4.92	20 .79	14 .55	11.75 .46	42 1.65	144 5.67	105 4.13	56 2.20	18 .71	15 .59	70 2.76	SA 2
<b>RW-R-320</b>	45 1.77	50 1.97	205 8.07	120 4.72	57 2.24	65 2.56	115 4.53	92 3.62	15 .59	140 5.51	20 .79	14 .55	11.75 .46	48 1.89	167 6.57	120 4.72	63 2.48	20 .79	27 1.06	82 3.23	SA 2

Dimensions in *millimeters* / inches

## RW-S Roller Cam Wedge Unit



### Ordering Information

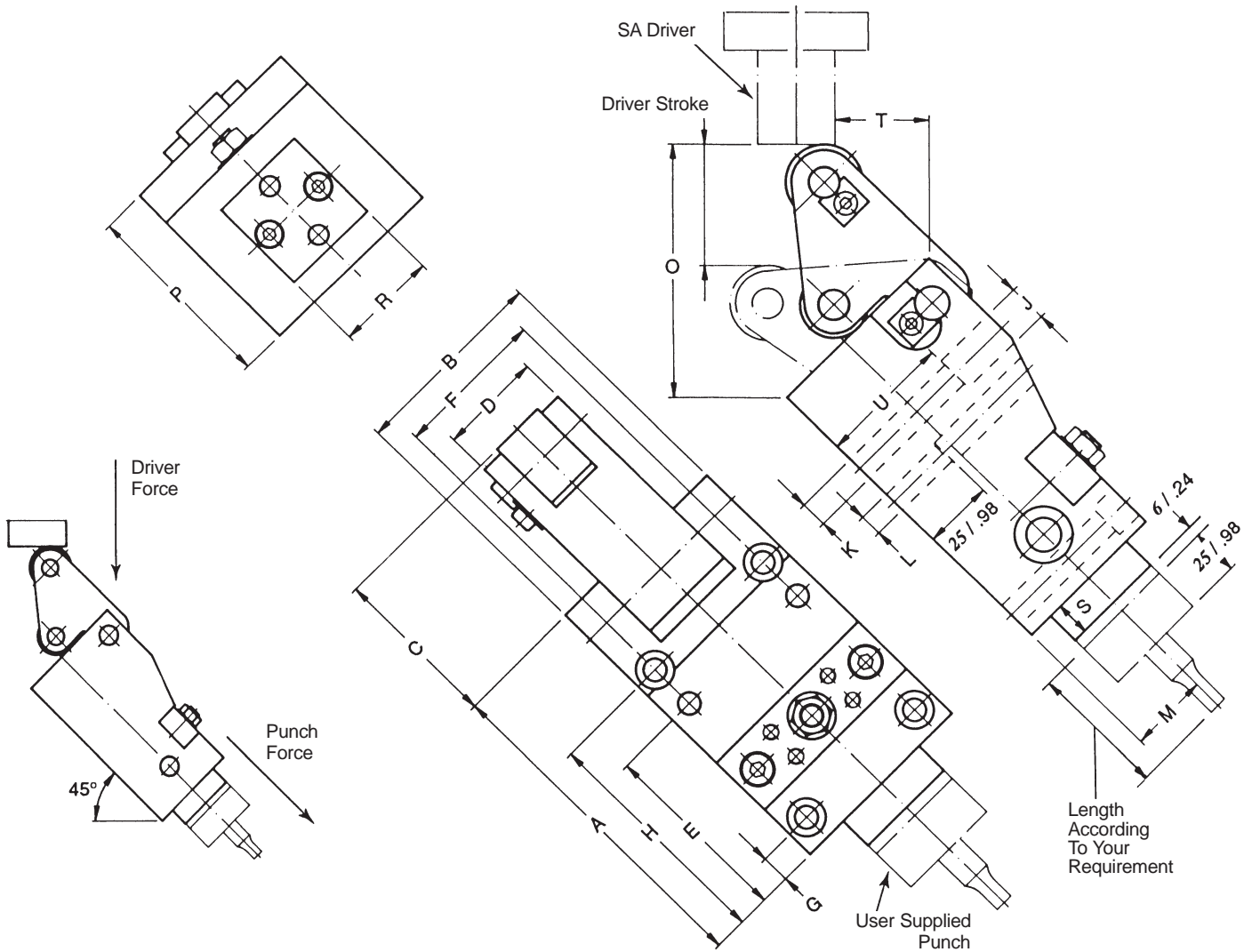
Order Number	Maximum Punch Stroke	Return Force (pounds)	Return Force (newtons)	Maximum Punch Diameter	Maximum Cutting Force (pounds)	Maximum Cutting Force (newtons)
<b>RW-S-089</b>	20/.79	331	1475	10/.39	6615	29424
<b>RW-S-159</b>	30/1.18	441	1962	16/.63	11025	49039
<b>RW-S-199</b>	40/1.57	551	2451	20/.79	15435	68655
<b>RW-S-320</b>	50/1.97	1103	4906	25/.98	22050	98078

### Dimensional Chart — RW-S Roller Cam Wedge Units

Order Number	Max. Advisab. Stroke	Max. Punch Stroke	A	B	C	D	E	F	G	H	J	K	L	M	O	P	R	S	T	U	Optional Driver Model
<b>RW-S-089</b>	18 .71	20 .79	123 4.84	75 2.95	32 1.26	36 1.42	70 2.76	55 2.17	10 .39	90 3.54	15 .59	9 .35	7.75 .31	28.5 1.12	98 3.86	75 2.95	45 1.77	15 .59	7 .28	50 1.97	SAS 089
<b>RW-S-159</b>	27 1.06	30 1.18	150 5.91	90 3.54	36 1.42	45 1.77	82 3.23	67 2.64	12 .47	102 4.01	18 .71	11 .43	9.75 .38	35 1.38	121 4.76	90 3.54	45 1.77	15 .59	11 .43	58 2.28	SAS 159
<b>RW-S-199</b>	36 1.42	40 1.57	178 7.01	105 4.13	45 1.77	55 2.17	100 3.94	80 3.15	15 .59	125 4.92	20 .79	14 .55	11.75 .46	42 1.65	144 5.67	105 4.13	56 2.20	18 .71	15 .59	70 2.76	SAS 199
<b>RW-S-320</b>	45 1.77	50 1.97	205 8.07	120 4.72	57 2.24	65 2.56	115 4.53	92 3.62	15 .59	140 5.51	20 .79	14 .55	11.75 .46	48 1.89	167 6.57	120 4.72	63 2.48	20 .79	27 1.06	82 3.23	SAS 320

Dimensions in *millimeters* / inches

**RW-A Roller Cam Wedge Unit**



**Ordering Information**

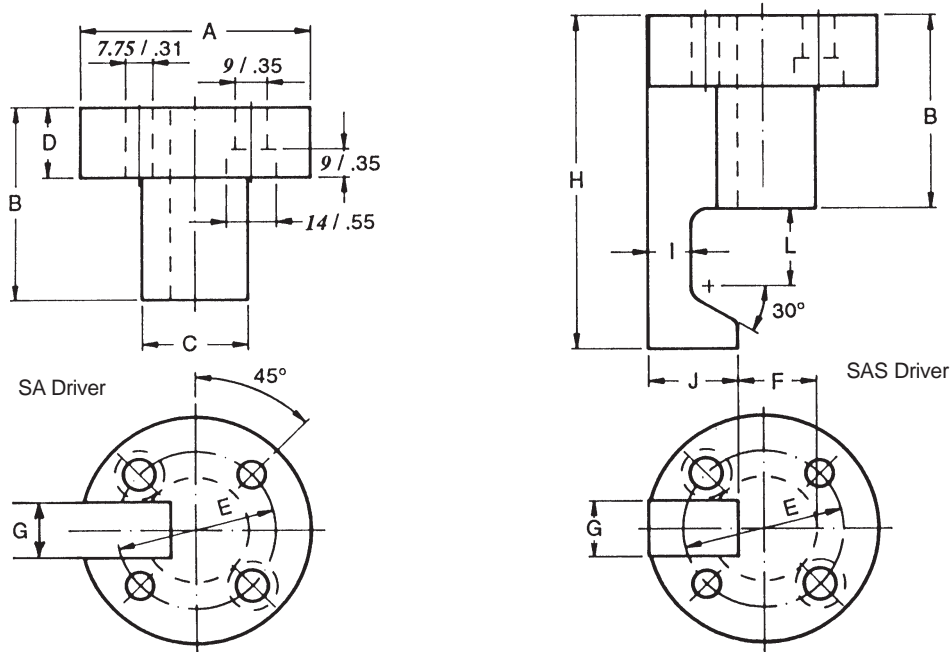
Order Number	Maximum Punch Stroke	Return Force (pounds)	Return Force (newtons)	Maximum Punch Diameter	Maximum Cutting Force (pounds)	Maximum Cutting Force (newtons)
<b>RW-A-089</b>	20/.79	331	1475	10/.39	6615	29424
<b>RW-A-159</b>	30/1.18	441	1962	16/.63	11025	49039
<b>RW-A-199</b>	40/1.57	551	2451	20/.79	15435	68655
<b>RW-A-320</b>	50/1.97	1103	4906	25/.98	22050	98078

**Dimensional Chart — RW-A Roller Cam Wedge Units**

Order Number	Max. Advisab. Stroke	Max. Punch Stroke	A	B	C	D	E	F	G	H	J	K	L	M	O	P	R	S	T	U	Optional Driver Model
<b>RW-A-089</b>	18 .71	20 .79	123 4.84	75 2.95	67 2.64	36 1.42	70 2.76	55 2.17	10 .39	90 3.54	15 .59	9 .35	7.75 .31	28.5 1.12	100 3.94	75 2.95	45 1.77	15 .59	34.5 1.36	50 1.97	SA1
<b>RW-A-159</b>	27 1.06	30 1.18	150 5.91	90 3.54	77 3.03	45 1.77	82 3.23	67 2.64	12 .47	102 4.01	18 .71	11 .43	9.75 .38	35 1.38	116 4.57	90 3.54	45 1.77	15 .59	43.5 1.71	58 2.28	SA1
<b>RW-A-199</b>	36 1.42	40 1.57	178 7.01	105 4.13	87 3.43	55 2.17	100 3.94	80 3.15	15 .59	125 4.92	20 .79	14 .55	11.75 .46	42 1.65	134.5 5.30	105 4.13	56 2.20	18 .71	49 1.93	70 2.76	SA2
<b>RW-A-320</b>	45 1.77	50 1.97	205 8.07	120 4.72	99 3.90	65 2.56	115 4.53	92 3.62	15 .59	140 5.51	20 .79	14 .55	11.75 .46	48 1.89	153.8 6.06	120 4.72	63 2.48	20 .79	57 2.24	82 3.23	SA2

Dimensions in *millimeters* / inches

## SA Driver for Roller Cam Wedge Units

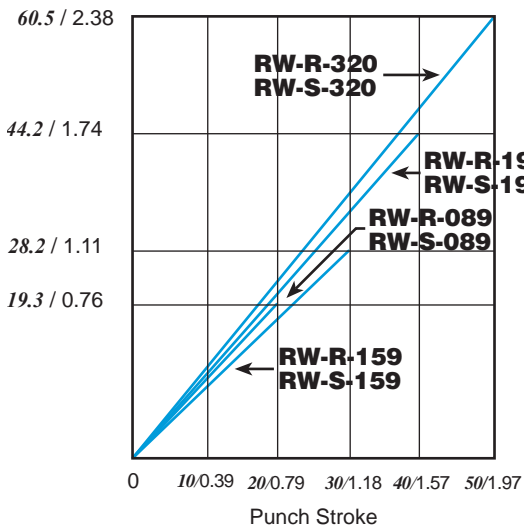


## Dimension and Ordering Information — Wedge Drivers

Order Number		A	B	C	D	E	F	G	H	I	J	K	L
SA1	SAS 089	70 / 2.76	55 / 2.17	35 / 1.38	20 / .79	50 / 1.97	27 / 1.06	20 / .79	95 / 3.74	12 / .47	25 / .98	8.5 / .33	22 / .87
	SAS 159									100 / 3.94			
SA2	SAS 199	75 / 2.95	70 / 2.76	40 / 1.57	20 / .79	55 / 2.17	32 / 1.26	22 / .87	125 / 4.92	15 / .59	30 / 1.18	13.5 / .53	30 / 1.18
	SAS 320									130 / 5.12			

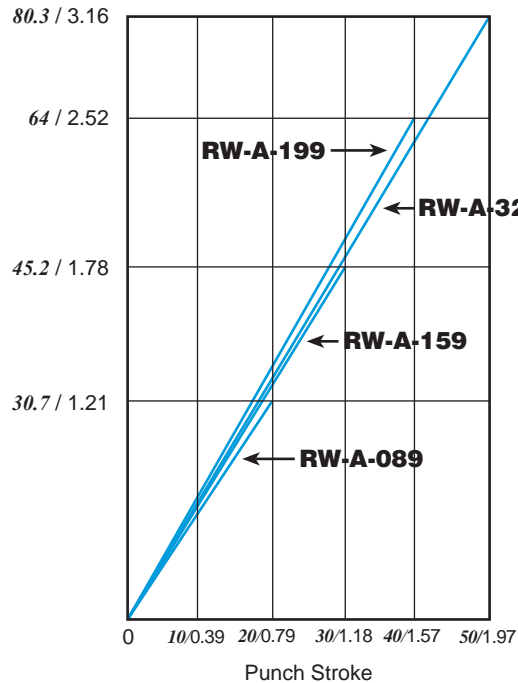
### Punch Stroke vs. Driver Stroke for Models RW-R and RW-S

Driver Stroke



### Punch Stroke vs. Driver Stroke for Models RW-A

Driver Stroke



Dimensions in *millimeters* / inches



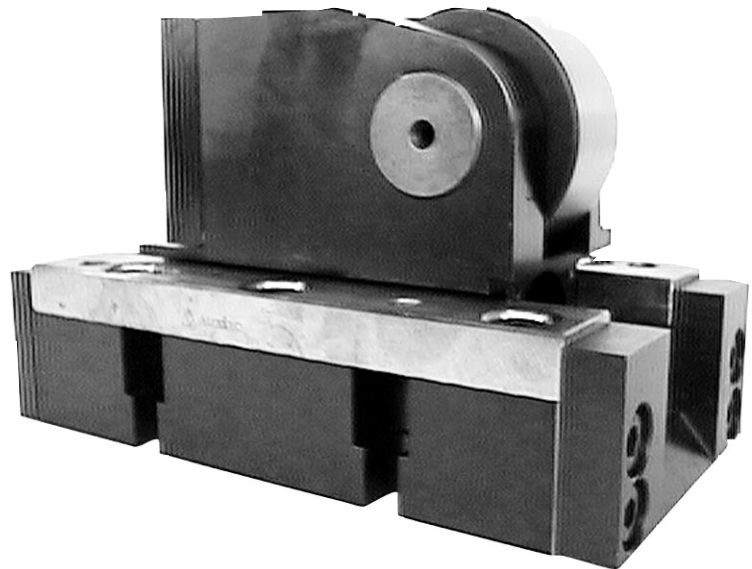
## Roller Cam

Raymond Roller Cams provide a standard unit that can be modified to your specific needs while keeping your in-house design work and costly manufacturing time to a minimum. Raymond Roller Cams provide a compact and cost effective unit for piercing, metal trimming or flanging.

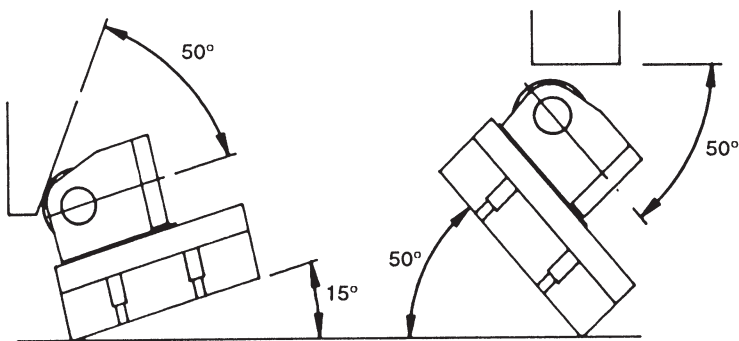
All the moving elements of the cam slide on graphite impregnated bronze guides eliminating lubrication maintenance. A Raymond Nitrogen Gas Spring powers the return of the unit with return force up to 1125 lbs. The force from the driver, dependent upon the model, can provide a maximum piercing force of 45,000 lbs.

The customer manufactured driver should be mounted at a 50° angle from the direction of motion.

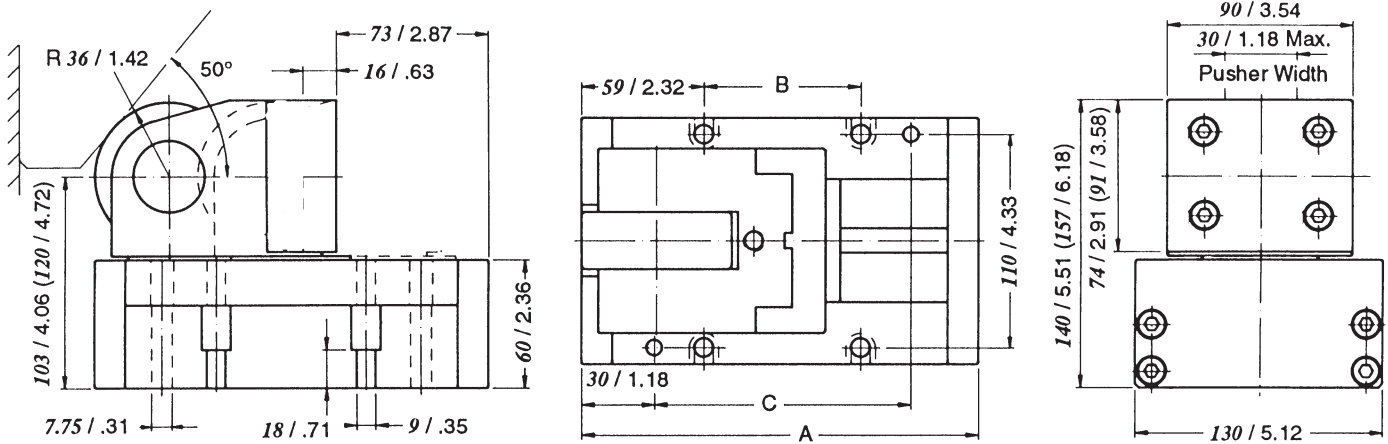
There are four models of Raymond cam units divided according to their maximum piercing force. The 3, 5, 15, and 20 ton units are available with strokes of *50mm / 1.97"*, *80mm / 3.15"* and *100mm / 3.94"*.



## Maximum Angle of Inclination



## Model RR 03 Roller Cam

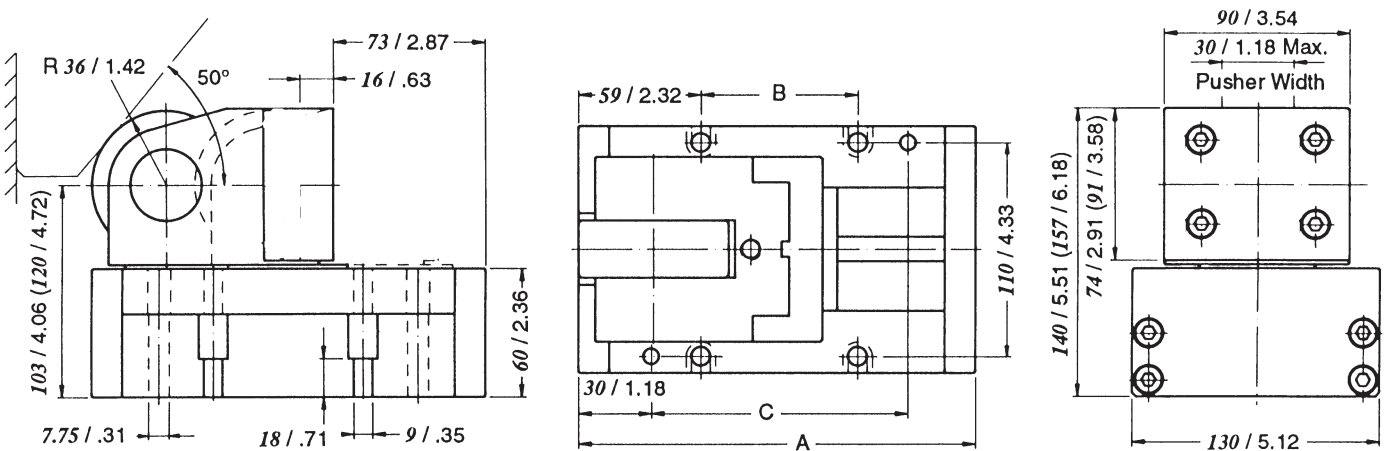


\* Sizes in parenthesis are for 100 mm stroke cam

### Ordering Information — RR 03

Cam Model	Full Stroke	Maximum Recommended Stroke	Maximum Piercing Force	Return Force	A	B	C
RR 03-050	50 / 1.97	45 / 1.77	6744 lbs. (4999 N)	337 lbs. (1500 N)	190 / 7.48	76 / 2.99	134 / 5.28
RR 03-080	80 / 3.15	72 / 2.83			220 / 8.66	106 / 4.17	164 / 6.46
RR 03-100	100 / 3.94	90 / 3.54			260 / 10.24	146 / 5.75	204 / 8.03

## Model RR 05 Roller Cam

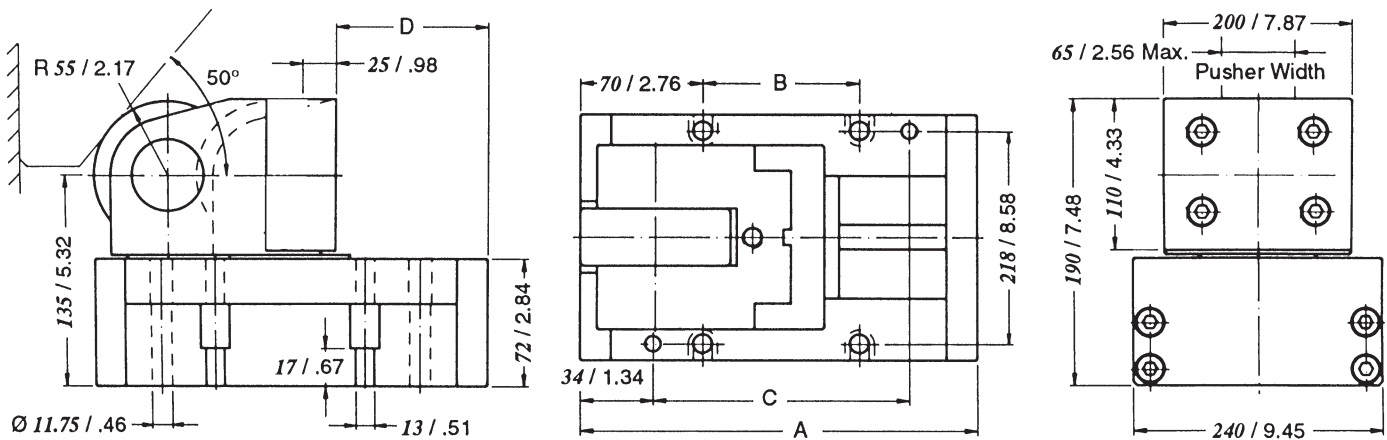


### Ordering Information — RR 05

Cam Model	Full Stroke	Maximum Recommended Stroke	Maximum Piercing Force	Return Force	A	B	C
RR 05-050	50 / 1.97	45 / 1.77	11240 lbs. (49996 N)	337 lbs. (1500 N)	190 / 7.48	76 / 2.99	134 / 5.28
RR 05-080	80 / 3.15	72 / 2.83			220 / 8.66	106 / 4.17	164 / 6.46
RR 05-100	100 / 3.94	90 / 3.54			260 / 10.24	146 / 5.75	204 / 8.03

Dimensions in *millimeters* / inches

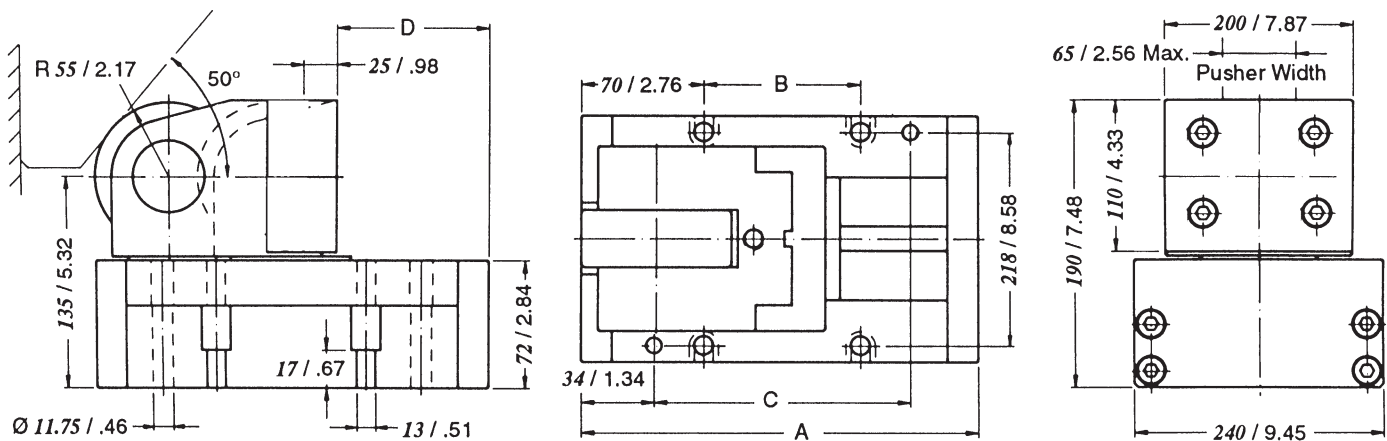
**Model RR 15 Roller Cam**



**Ordering Information — RR 15**

Cam Model	Full Stroke	Maximum Recommended Stroke	Maximum Piercing Force	Return Force	A	B	C	D
RR 15-050	50 / 1.97	45 / 1.77			190 / 7.48	67 / 2.64	131 / 5.16	43 / 1.69
RR 15-080	80 / 3.15	72 / 2.83	33720 lbs. (149987 N)	562 lbs. (2500 N)	220 / 8.66	97 / 3.82	161 / 6.34	73 / 2.87
RR 15-100	100 / 3.94	90 / 3.54			260 / 10.24	137 / 5.39	201 / 7.91	73 / 2.87

**Model RR 20 Roller Cam**



**Ordering Information — RR 20**

Cam Model	Full Stroke	Maximum Recommended Stroke	Maximum Piercing Force	Return Force	A	B	C	D
RR 20-050	50 / 1.97	45 / 1.77			215 / 8.46	80 / 3.15	152 / 5.98	43 / 1.69
RR 20-080	80 / 3.15	72 / 2.83	44960 lbs. (199982 N)	1124 lbs. (5000 N)	245 / 9.65	110 / 4.33	182 / 7.17	73 / 2.87
RR 20-100	100 / 3.94	90 / 3.54			265 / 10.43	130 / 5.12	202 / 7.95	73 / 2.87

Dimensions in *millimeters* / inches

# RV

## Pneumatic Vibrator

The Raymond Pneumatic Vibrator is an ideal solution for removing punchings, trimmings and scrap produced during press operations. The automatic and continuous removal keeps the press operator from interrupting production to clean away the punchings, trimmings and/or scraps by hand. The vibrator uses a pneumatic power source offering a cost effective alternative to electrically driven conveyor belts.

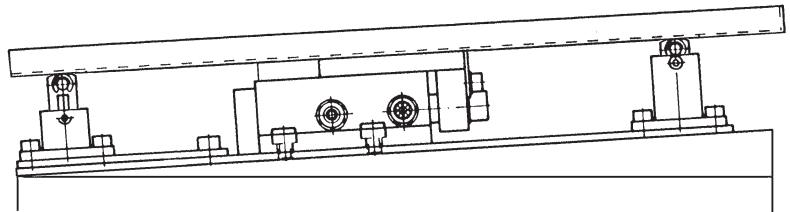
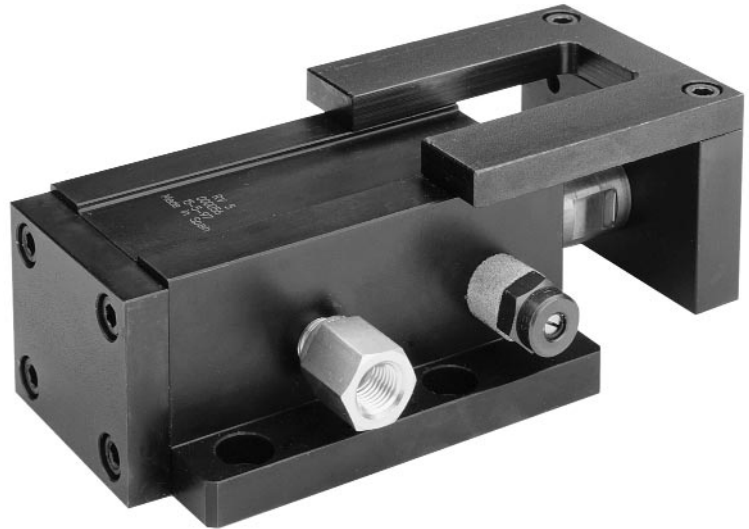
The pneumatic power source allows this unit to work in areas contaminated by lubricating fluids and oils. Unlike electrically driven systems with their inherent shock hazard, the Raymond Pneumatic Vibrator is safe to use as it consumes no electricity.

The compact design of the unit is made for working in the tight areas which are present on some presses. Easy to install, simply select the area for the unit, bolt in place and connect it to your air supply. The low air consumption and silent running Raymond Pneumatic Vibrator is the safe and economical solution for your scrap removal needs.

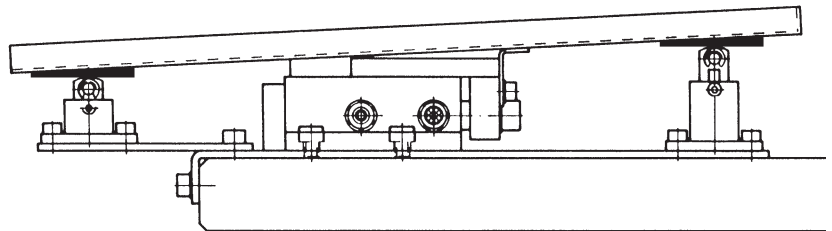
All units feature a standard NPT connection for easy hookup to lubricated shop air and an adjustable exhaust muffler. By varying the input pressure and exhaust flow, the cycle rate and stroke of the unit can be custom adjusted by the user in each application. Note that if a lubricator is not used in conjunction with the shop air, the piston rod of the vibrator unit should be lubricated monthly.

Standard transport trays are available. For balanced performance, all trays should use the RV12-S, RV25-S or RV50-S adjustable supports shown on page 40. For proper scrap removal, the tray should be sloped at an angle of 8 degrees or greater. The exact amount of inclination should be adjusted on-site based upon the scrap weight and shape as well as the amount of oil and grease that is likely to be present.

Sloping of the tray can be accomplished by mounting the tray parallel to the vibrator unit and sloping both the vibrator and the tray. Alternately, the tray can be mounted at an angle with respect to the unit. In both cases, care should be taken to assure that the tray supports are used and are in contact with the tray through the entire range of motion.

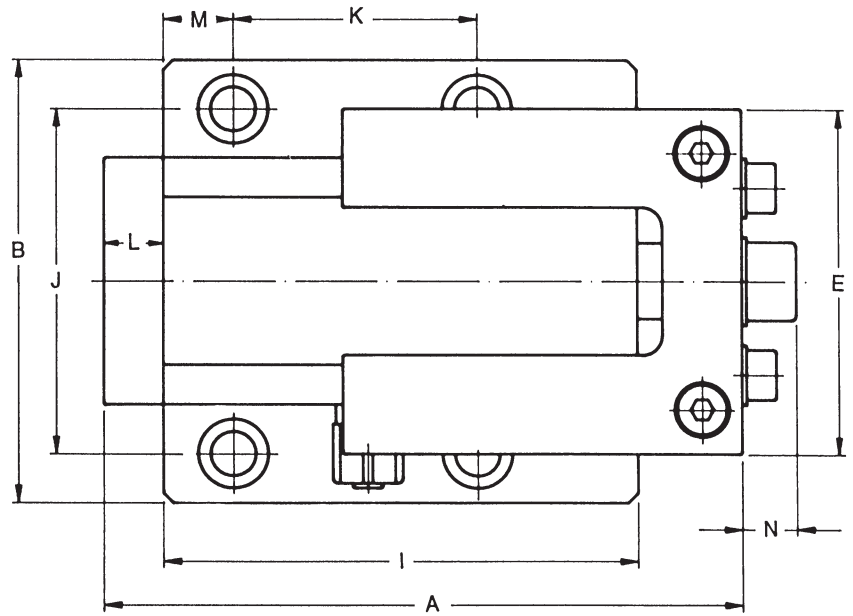
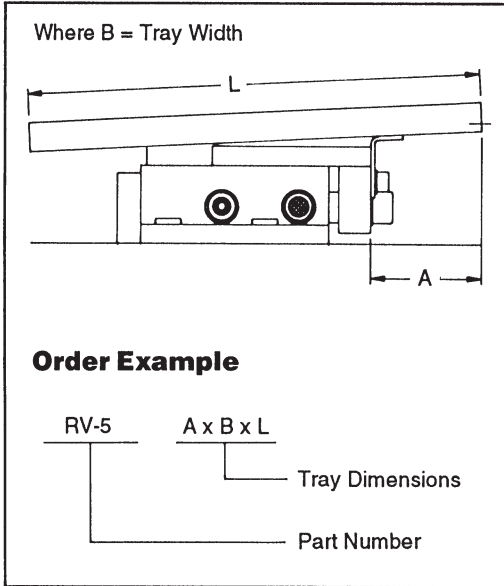
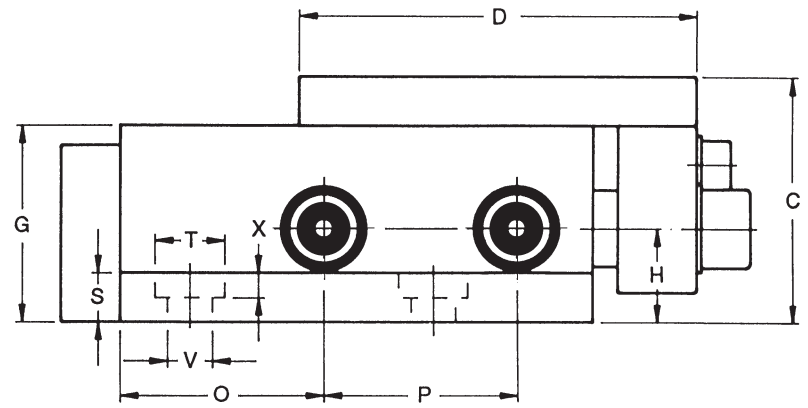
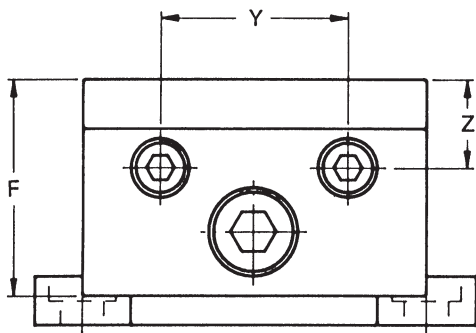


Mounting method with the tray parallel to the vibrator unit.



Mounting method with only the tray sloped. Note the use of flats on the base of the tray for proper contact with the supports.





**Ordering Information — RV 3 through RV 9**

Order Number	A	B	C	D	E	F	G	H	I	J	K	L
RV 3	128 / 5.04	90 / 3.54	48 / 1.89	80 / 3.15	70 / 2.76	44 / 1.73	38 / 1.50	19 / .75	95 / 3.74	70 / 2.76	49 / 1.93	12 / .47
RV 5	155 / 6.10	100 / 3.94	65 / 2.56	90 / 3.54	80 / 3.15	60 / 2.36	55 / 2.17	27 / 1.06	118 / 4.65	82 / 3.23	60 / 2.36	12 / .47
RV 7	158 / 6.22	122 / 4.80	88 / 3.47	100 / 3.94	100 / 3.94	80 / 3.15	78 / 3.07	36 / 1.42	118 / 4.65	104 / 4.09	60 / 2.36	12 / .47
RV 9	179 / 7.05	150 / 5.91	108 / 4.25	120 / 4.72	125 / 4.92	98 / 3.86	95 / 3.74	48 / 1.89	130 / 5.12	130 / 5.12	65 / 2.56	14 / .55

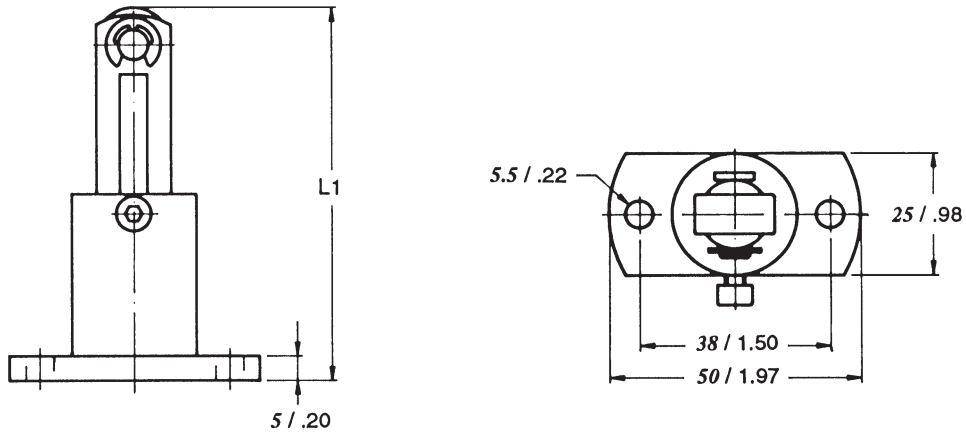
Order Number	M	N	O	P	S	T	V	X	Y	Z
RV 3	14 / .55	12.5 / .49	41 / 1.61	39 / 1.54	10 / .39	14 / .55	9 / .35	5 / .20	38 / 1.50	16 / .63
RV 5	15 / .59	19 / .75	47 / 1.85	49 / 1.93	12 / .47	14 / .55	9 / .35	8 / .32	48 / 1.89	16 / .63
RV 7	15 / .59	19 / .75	47 / 1.85	49 / 1.93	14 / .55	14 / .55	9 / .35	9 / .35	64 / 2.52	16 / .63
RV 9	20 / .79	24 / .95	52 / 2.05	56 / 2.21	18 / .71	17 / .67	11 / .43	11 / .43	75 / 2.95	23 / .91

**Technical Data**

Order Number	Air Fitting Female NPT	Typical Air Pressure	Air Consumption (ft <sup>3</sup> / min)	Typical Piston Stroke	Piston Speed (ft/min)	Typical Mounting Inclination	Maximum Load Inc. Tray	Noise Level (dB-A)	Working Temperature (°F)
RV 3	1/8	70	1.1	30 / 1.18	26-32	8°	13.2	50	32 -158
RV 5	1/4	70	2.1	33 / 1.30	26-32	8°	30.9	50	32 -158
RV 7	1/4	70	5.1	20 / .79	26-32	8°	79.4	50	32 -158
RV 9	3/8	70	7.6	28 / 1.10	26-32	8°	123.5	53	32 -158

## RV Pneumatic Vibrator

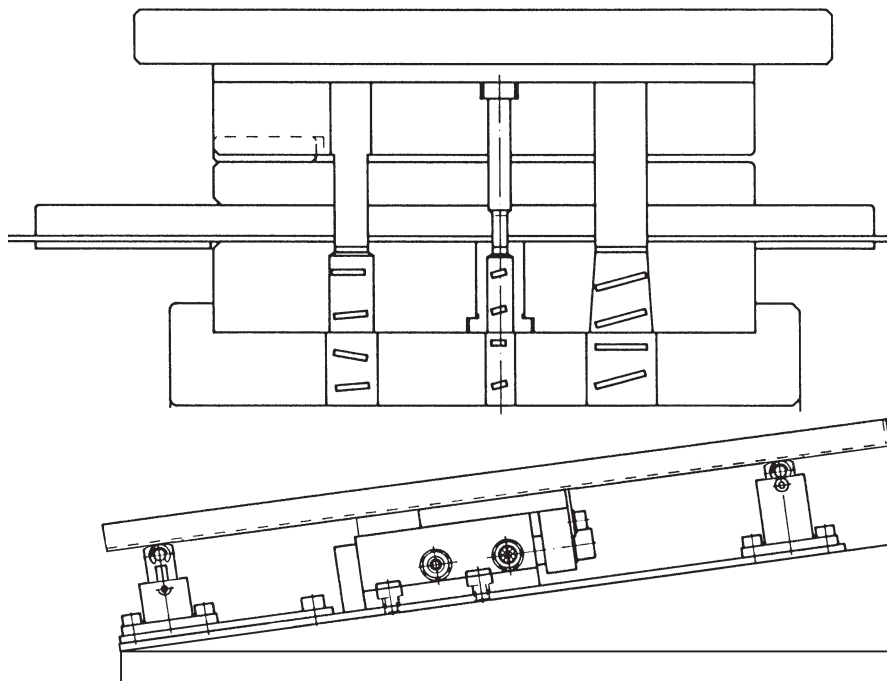
Adjustable Supports for trays greater than 2 ft. in length.



### Ordering Information — RV 12-S through RV 50-S

Order Number	L1 Min.	L1 Max.
RV 12-S	38.5 / 1.52	51 / 2.01
RV 25-S	51 / 2.01	76 / 2.99
RV 50-S	76 / 2.99	126 / 4.96

### Application Example



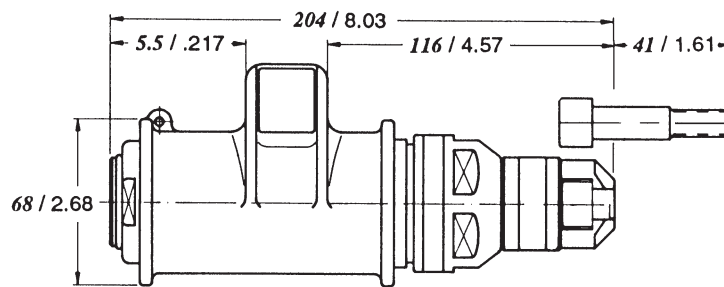
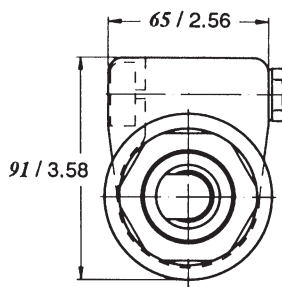
Dimensions in *millimeters* / inches

# RP

## Pneumatic Pin Extractor

The Raymond Pneumatic Pin Extractor is used to remove or insert die set pins. The extractor is ideal for high volume applications. It requires little maintenance and has low air consumption.

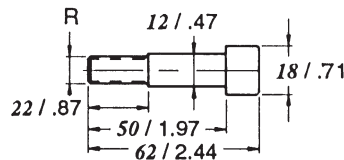
The unit can handle guide pins up to 0.63" (16mm) in diameter. Each pin extractor is supplied with 5 extraction screws and is compact, light weight and easy to handle. The unit also features a recessed on/off switch to help improve operator control and prevent accidental activation.



The Pin Extractor Is Supplied With Extraction Screws Listed Below.

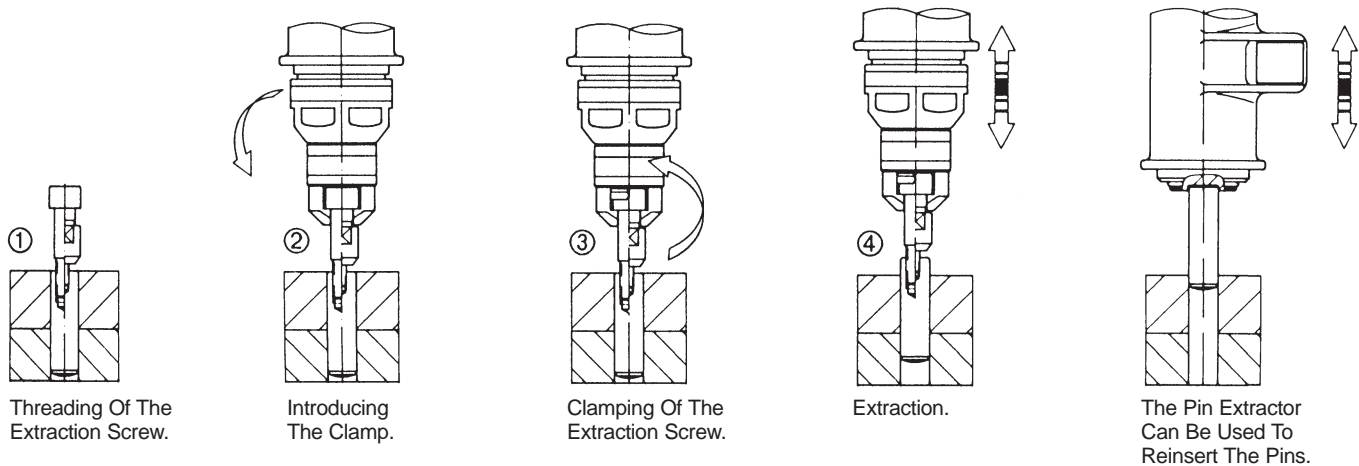
### Extraction Screws

R	Pin Diameter
M4	6
M5	8
M6	10



R	Pin Diameter
M8	12, 13, 14
M10	16

### Working Sequence



### Ordering Information — RP 20

Order Number	Maximum Extracting Pin Diameter	Hammering Frequency	Weight	Working Pressure	Air Consumption	Connection Thread
RP 20	16 / .63	3000 strokes/min.	4.85 lb/2.2 kg	85.3 psi/5.8 bar	17.7 ft <sup>3</sup> / min.	1/4" BSP

Dimensions in *millimeters* / inches

## Spare Parts and Accessories

### Test Fixture

#### Order No. SP11

This test fixture checks the strength of gas springs with an analog output in pounds/force. This can be an invaluable tool when initially charging gas springs or checking the force during routine maintenance. The force range is accurate from 500 to 12,000 lbs.



### Test Fixture for Lighter Loads

#### Order No. SP12

This testing fixture is similar to test fixture SP11 but with a force range from 50 to 1,000 lbs.



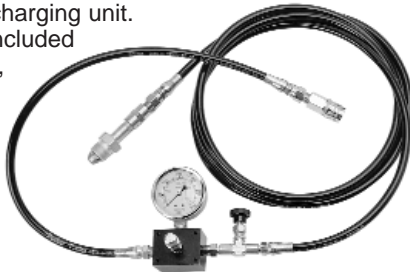
### Gas Charging Systems

#### Order No. SP13QC2

For charging self-contained gas springs

This system is capable of charging all self-contained gas springs in our line when used in conjunction with the appropriate charging adapters listed separately to the right. The adapters attach via a quick coupler provided with the charging unit.

Adapters are not included with the SP13QC2, they must be purchased separately. The end connection to customer supplied nitrogen bottle is a CGA 580.



#### Order No. SP14-580 or SP14-680

For charging UniForce System gas springs

Each unit consists of a regulator with output and bottle pressure gauges, 10 feet of high pressure hose, shutoff valve and a female quick coupler which connects to the control panel (see page 25). Two versions of the charging unit are available for connection to either a CGA580 (low pressure) or a CGA680 (high pressure) nitrogen bottle fitting. Charging adapters may be purchased separately, making the SP14 capable of filling self-contained gas springs.



#### Order No. SP13QC1

This unit adapts the SP14 UniForce Charging Unit for filling self-contained gas springs. The appropriate quick coupler adapters which snap into the spring fill port should be ordered separately.

### Charging Adapters and Quick Coupler

The adapters make it possible to charge Raymond gas springs with any of the Raymond charge assemblies shown at left or certain competitor charging systems. All adapters contain male quick couplers for easy end connections.



#### Order No. SP20

For G 1/8 fill ports;

**RG series:**

750-7500

**RS series:** all



#### Order No. SP21A

For non-counterbored M6 fill ports as follows;

**RD, RM and RE series:** all

**RG250 series:** non-counterbored fill ports



#### Order No. SP21B

For counterbored M6 fill ports;

**RG250 series:** counterbored fill ports

**RCT series**



#### Order No. SPQC

The female quick coupler permits use of the Raymond charging adapters with some competitor charging units. The coupler contains a 1/4" NPT female thread.

### Gas Draining Systems

The two gas draining accessories provide a quick, simple way to drain both the M6 and G 1/8 gas springs.



#### Order No. SP19

For all springs with G 1/8 fill ports



#### Order No. SP18

For all springs with M6 fill ports

**Spare Parts and Accessories**

**Repair Kits**

There is one repair kit for each model regardless of the stroke length. Order by quantity and model. Note that the RS series has two models, so please be sure to specify top or bottom fill.

**Example:** 5 RG750 Repair Kits



**Guide Driver Sleeves**

These are used to drive the guide or base downward to expose the retaining ring for removal during rebuilds. Select the appropriate sleeve based on the spring model independent of the stroke. Consult Raymond for RH and RE series springs.



Order No.	Spring Models
SPA1	RM150, RS1000
SPA2	RG250, RS1800
SPA3	RG750, RS4700
SPA4	RG1500, RS7500
SPA5	RG3000, RS11800
SPA6	RG5000, RS18300
SPA7	RG7500

**Tee Handles**

Used to extract internal components during rebuilding process.



**Order No. SP18A**  
For M6 piston rods;  
RM150 and RG250 series



**Order No. SP19**  
For M8 piston rods;  
RG750 to RG7500 series  
RCT series



**Order No. SP17A**  
For G 1/8 piston rods and base plates;  
RS series

**Valve Core Tool and Valve Pliers**

The valve core tool is used to unscrew and tighten the valve core contained in fill port of the spring.

The valve core pliers are used to remove the valve core after it has been unscrewed by the valve core tool or exposed by removing the valve set screw.



Order No. SP63



Order No. SP62

## Useful Tips for the Selection, Installation, Use and Servicing of Raymond Gas Springs

### Selection

The first step in proper spring selection is to identify the total force required for your application. The next step is to determine the number of springs needed to provide an even distribution of the pressure. Dividing the total force by the number of springs yields the force required per spring. It is good design practice to select a spring whose maximum initial contact force is 20% greater than the force actually needed. The reason is, if more pressure than originally calculated is needed, the spring's force can be increased instead of having to redesign the system using a larger model.

The UniForce System allows you to continually monitor and adjust the hosed system pressure. If the part to be produced is complicated and the force needed is not clear, the use of an adjustable hosed UniForce System can save time during tryout. Also, if the consistency of the stock material is poor, the UniForce System can quickly adjust the systems force as the stock material thickness varies.

### Installation

- Avoid side loading the piston rod. Maximum deviation is 9 minutes.
- Consult Raymond if die lubricants are to be used.
- Bore hole diameters about 2 mm larger than spring bodies.
- Ensure the bottom of the bore is flat and square to the sides.
- Springs can be mounted in any position as long as axial loads are avoided.
- Piston rods can be preloaded in their home position.
- Design using no more than 95% of the available stroke.
- Hardened striker plates are recommended for 3/4 tons and upward.
- Large springs installed using mountings should be safety wired.
- If hoses are used, watch sharp edges and hose minimum bend radius.
- Always provide ample clearances for spring bodies.
- Do not alter the piston rod, cylinder or guide in any manner.

### Usage Guidelines

- Always protect the surface of the piston rod from scratches, dents and fine grinding dust.
- Maximum velocity is 35 meters per minute. (115 ft per min).
- Maximum frequency varies by model and stroke length; consult Raymond technical assistance for maximum values.
- Maximum operating temperature is 180°F (80°C). If higher, consult Raymond technical assistance for maximum values.
- Static leakage is approximately 2-3% per year (self-contained).
- Continuous operation is permissible.
- If die lubricants are to be used, consult Raymond technical assistance.
- Periodically remove the spring from the application and check for unusual force gain or loss.

### Maintenance

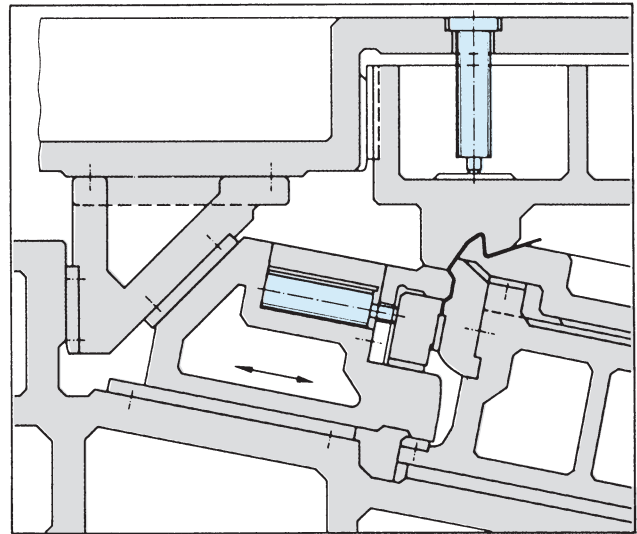
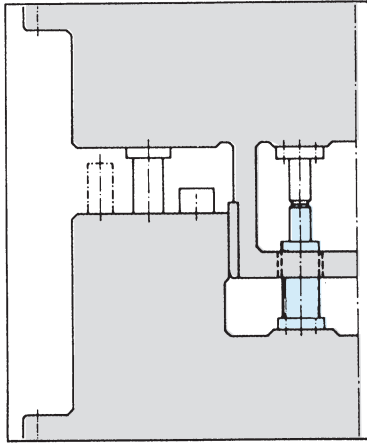
After a gas spring has exceeded its first life, it can be rebuilt to a "like new" condition. Raymond rebuilt versions yield a life equal to that of a new spring. Simply send back your used spring to Raymond and we will do the rebuild work for you! Repair kits and instructions can also be purchased which allows you to rebuild the springs. All Raymond nitrogen springs are rebuildable except the RD disposable models.

**For self-contained users:** It is recommended to keep a log of the spring part numbers used in each die. This log should also track the numbers of hits on the die since the spring was last serviced. The spring should be periodically removed and checked for force by either the test bench or the replenishing armature.

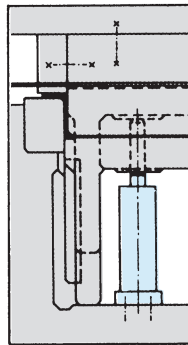
**UniForce system users:** Maintaining a hose system requires the same record keeping used for self-contained springs, except for the following differences. All springs connected in a system will have exactly the same pressure at all times. When a spring(s) suffers leakage, the entire system will indicate a loss of pressure. In order to correct the leakage problem, it will be necessary to remove the die from the press, drain the remaining pressure and remove the springs. If, before draining the remaining pressure, oil or soap and water is applied directly around the piston rods, the leaking springs will identify themselves. It is possible the system only leaks when the piston rods are depressed, but such a problem is normally detected by visually inspecting the surface of the piston rods. This method may not be as high-tech as a segregated modular control panel, but it will lower your initial investment. If springs must be segregated due to a required force variance in the same die, two or more standard control panels can be employed.

Typical Applications for Nitrogen Gas Springs

Raymond gas springs used for die separation in storage. This also promotes level die set and upper ram balance.

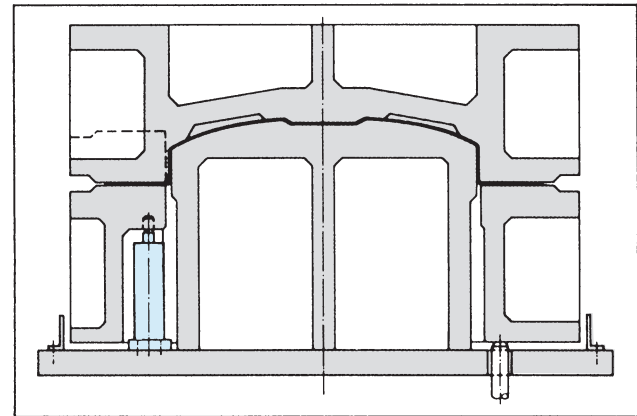
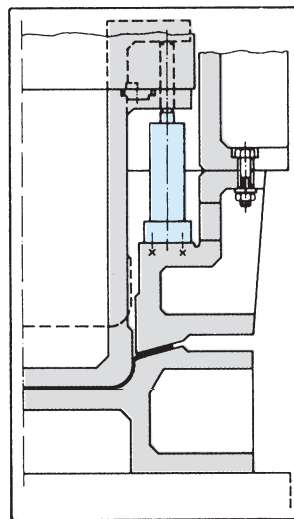


Bending tool in which the base plate is mounted on gas springs to provide holding and lifting functions.



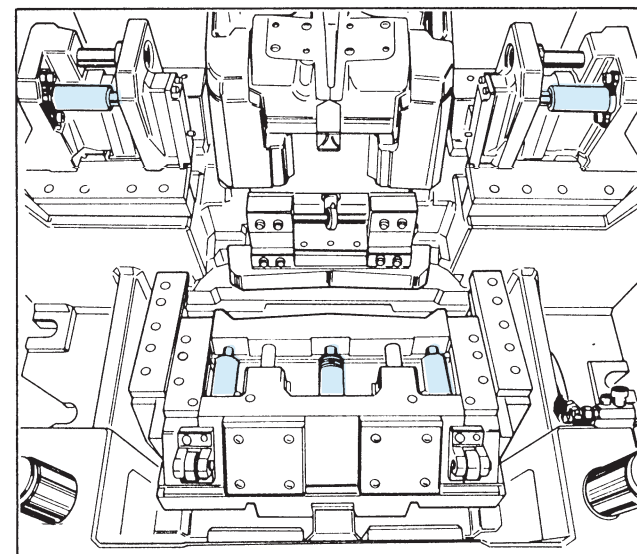
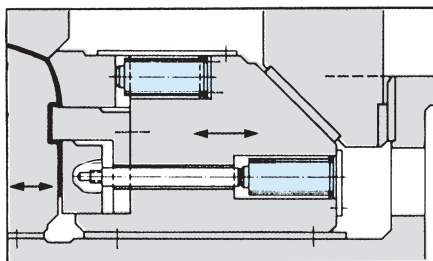
Part of a forming tool in which the holding function and the cam slide return make use of our Raymond gas springs.

Double-action deep draw tool with the punch mounted on Raymond gas springs to form a floating die.



Deep draw tools for single-action presses, where the blank can be held by Raymond gas springs instead of pressure pins.

Raymond gas springs in a slide tool, where considerable forming and holding forces are required to avoid wrinkles in the metal stamping.



The Raymond gas springs could provide the holding and cam slide return functions.

**Special Order Services**

Let Raymond custom design a spring for your applications. Fill in the information required below and let our engineers design a Nitrogen Gas Spring or Uniforce® System specifically for your application. Simply fax the completed form to:

**Raymond Special Order Department**

**Fax (419) 891-9192**

Your request will receive immediate attention

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Attn: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Self Contained \_\_\_\_\_ Hosed Uniforce \_\_\_\_\_

Quantity Required \_\_\_\_\_

Hole Size Available *Minimum* \_\_\_\_\_ *Maximum* \_\_\_\_\_

Overall Free Height Available *Minimum* \_\_\_\_\_ *Maximum* \_\_\_\_\_

Maximum Stroke *Minimum* \_\_\_\_\_ *Maximum* \_\_\_\_\_

Working Stroke *Minimum* \_\_\_\_\_ *Maximum* \_\_\_\_\_

Load at Maximum Stroke \_\_\_\_\_ at \_\_\_\_\_ Deflection

Load at Maximum Working Stroke \_\_\_\_\_ at \_\_\_\_\_ Deflection

Load at Minimum Working Stroke \_\_\_\_\_ at \_\_\_\_\_ Deflection

Load on Contact \_\_\_\_\_

Test Load \_\_\_\_\_ at \_\_\_\_\_ Deflection

Rod End Configuration \_\_\_\_\_

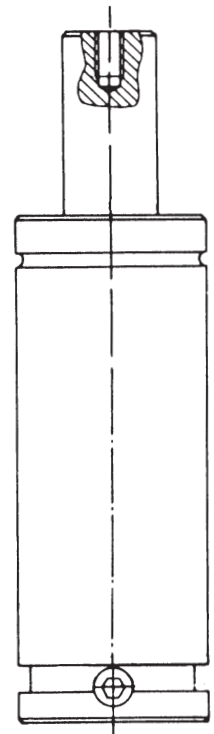
\_\_\_\_\_

\_\_\_\_\_

Base Mounting Configuration \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





## How to Order

### Nitrogen Gas Springs

Ordering Raymond Nitrogen Gas Springs is a simple procedure. The gas springs must be ordered separately from the mounts.

This example identifies the following:

Eight RG 250 gas springs with the stroke length of *50 mm / 2"*, model S, and a fill pressure of 2175 psi.

8	RG 250	50	S	2175	(self-contained drop-in)
Quantity	Series	Stroke (mm)	Model	Fill Pressure (psi)	

**Note:** All springs will be shipped at 2175 psi unless otherwise specified. Not all springs contain a model letter.

### Component Mountings

Order numbers for mountings are provided at the location they appear in the catalog. Simply order quantity and part number.

### Accessories

Order numbers for accessories are provided at the location they appear in the catalog. Simply order by quantity and part number.

### UniForce System

All nitrogen gas springs ordered for the UniForce System must carry the prefix "U". The springs then will be provided with the internal valve removed and size 4 (1/4") JIC 37° or 9/16"-18 O-ring fittings installed.



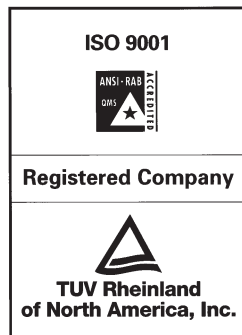


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# Raymond®

## Nitrogen Gas Springs And Accessories

Associated Spring  
Raymond  **BARNES**  
GROUP INC



**Inquiries and Order Entry**

Call **800-228-1156**, or write  
1705 Indian Wood Circle #210  
Maumee, Ohio 43537-0586  
419-891-9292  
Fax 419-891-9192

**For Technical Assistance**

Call **800-544-4358**

**On The Internet**

[www.asraymond.com](http://www.asraymond.com)