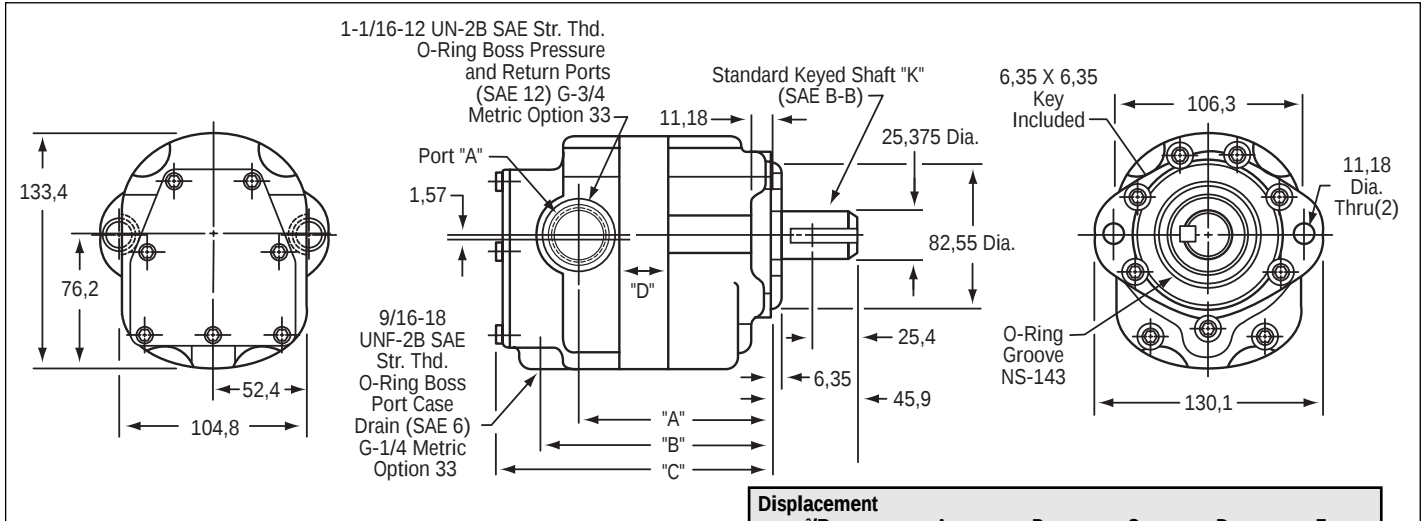
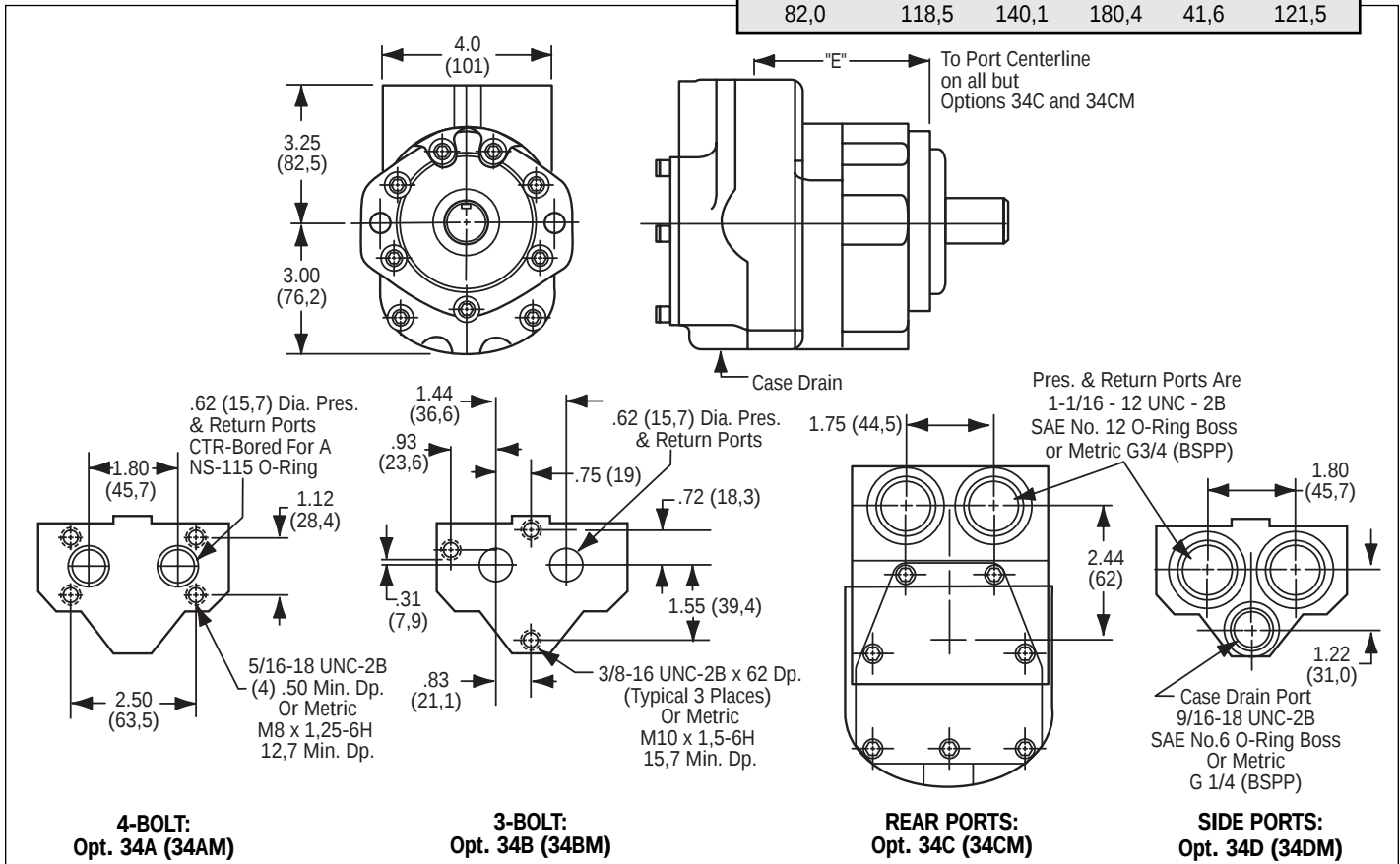


Hydraulic Motors, Rol-Seal® Units RSA Series – DIMENSIONS & PERFORMANCE DATA

WITH SAE A 2-BOLT FLANGE & SIDE PORTS @ 180°



WITH MANIFOLD MOUNT and END OR SIDE PORTS – English & (Metric)



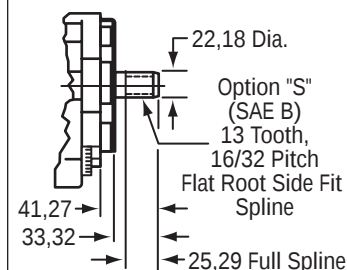
Note: 1. All dimensions in mm and subject to change without notice. Always confirm with us that you are working with the most current data.
2. Consult factory for specific machining tolerances.

Hydraulic Motors, Rol-Seal Units

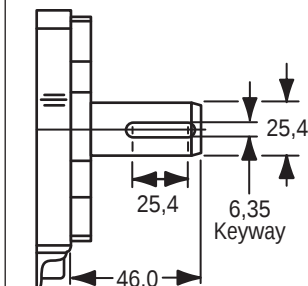
RSA Series – DIMENSIONS & PERFORMANCE DATA

OUTPUT SHAFT OPTIONS

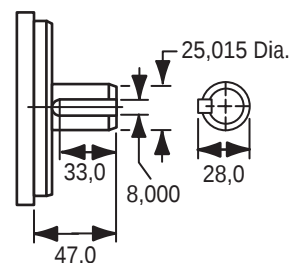
RSA "S" Option Spline Output Shaft



RSA Captured Key Option Output Shaft

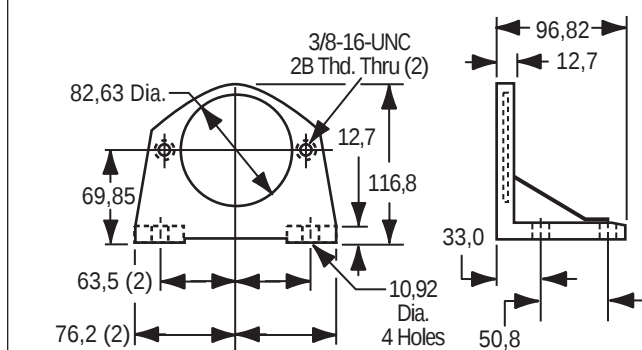


RSA Metric "M" Option



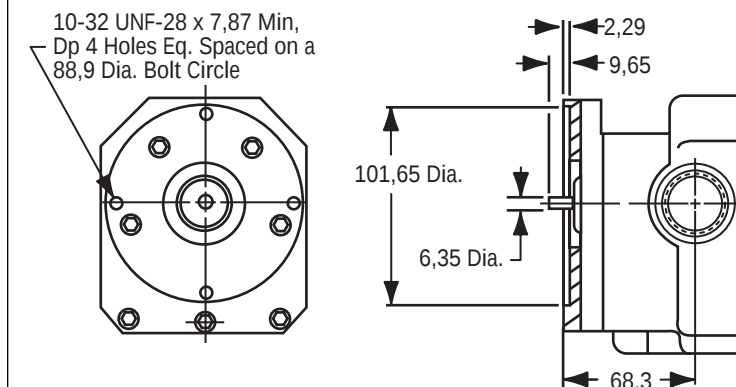
AVAILABLE FOOT MOUNTING BRACKET

Part # 63021



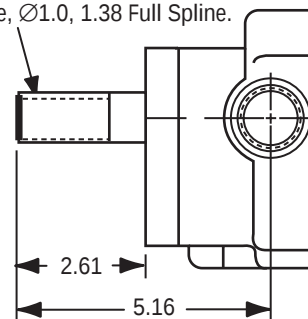
REAR SHAFT EXTENSION OPTIONS

Tachometer/Encoder Shaft (Option 28)



Rear Shaft Spline Extension (Option 49)

RSA/RSB - 15 Tooth, 16/32 Pitch, Flat Root Side Fit Spline, Ø1.0, 1.38 Full Spline.



Note: 1. All dimensions in mm and subject to change without notice. Always confirm with us that you are working with the most current data.
2. Consult factory for specific machining tolerances.

Hydraulic Motors, Rol-Seal Units

RSA Series – DIMENSIONS & PERFORMANCE DATA

PERFORMANCE OVERVIEW FOR ROL-SEAL MOTORS

		DISPLACEMENT (cm ³ /rev.)						
		Models RSA & RSB				Model RSC		
		32,8	49,2	65,2	82,0	98,4	131,2	164,0
Flow (LPM)	Continuous	68	76	67	65	148	159	148
	Intermittent	118	148	167	148	197	224	231
Max. Speed (RPM)	Continuous	2000	1500	1000	750	1500	1200	900
	Intermittent	3500	3000	2500	1800	2000	1700	1400
ΔPressure (BAR)	Continuous	172	155	138	138	138	138	138
	Intermittent	207	207	207	207	207	207	207
	Peak	258	258	241	241	241	241	241
Max. Theoretical Torque (daNm)	Continuous	9,0	12,1	14,4	18,0	21,6	28,8	36,0
	Intermittent	10,8	16,2	21,6	27,0	32,0	43,2	54,0
Weight (KG)		5,9	6,3	6,8	7,2	16,2	17,6	18,9

Notes:

1. Intermittent conditions are to be less than 10% of every minute.
2. Peak conditions are to be less than 1% of every minute.
3. Intermittent speed and peak pressure must not occur simultaneously.
4. Inlet and return pressures are not to exceed ratings listed above.

Shaft Radial and Thrust Load Capacity

Model	Radial	Thrust
RSA & RSB*	267 daN	267 daN
RSC*	445 daN	445 daN

Radial load capacity is based on load located 2,54 cm from mounting flange for RAS/RSB and 3,81 cm from mounting flange for RSC.

Rotational Moment of Inertia (WK²)

Model	Displacement (cm ³ /rev)	Kgm ²
RSA & RSB*	32,8	,0003
RSA & RSB*	49,2	,00041
RSA & RSB*	65,6	,00046
RSA & RSB*	85,0	,00052
RSC*	98,4	,000021
RSC*	131,2	,00023
RSC*	164,0	,00026

* Regarding RSB and RSC Series Motors:

Though dimensioned differently, RSB motors have the same performance characteristics as the RSA motors described on these pages. RSC motors are designed for heavier applications. If the RSA motors detailed on these pages do not fit your application's dimensional or performance criteria, please access the comparable RSB & RSC data from our web site or from your local Von Ruden representative.

Torque Ranges Shown as “daNm @ rpm” for 32,8 cm³/revolution displacement RSA & RSB units

Continuous Operation

Intermittent Operation – Less than Six Sec. / Min.

		17,2 BAR	34,5 BAR	69 BAR	103,4 BAR	137,9 BAR	172,4 BAR	206,8 BAR
FLOW RATE	0,95 LPM	0,76 @ 9						
	1,9 LPM	0,76 @ 38	1,65 @ 23					
	3,8 LPM	0,75 @ 95	1,65 @ 81	3,31 @ 57	4,97 @ 28			
	7,6 LPM	0,75 @ 210	1,63 @ 196	3,27 @ 156	4,94 @ 140	6,61 @ 99	8,31 @ 56	10,00 @ 6
	15,1 LPM	0,72 @ 440	1,56 @ 431	3,22 @ 389	4,90 @ 376	6,57 @ 330	8,26 @ 289	9,94 @ 237
	30,3 LPM	0,67 @ 902	1,50 @ 869	3,16 @ 857	4,84 @ 830	6,51 @ 785	8,20 @ 742	9,90 @ 694
	45,4 LPM	0,62 @ 1360	1,46 @ 1320	3,11 @ 1299	4,80 @ 1282	6,46 @ 1227	8,15 @ 1182	9,85 @ 1133
	60,6 LPM	0,58 @ 1812	1,41 @ 1772	3,07 @ 1750	4,75 @ 1734	6,41 @ 1679	8,11 @ 1634	9,81 @ 1585
	75,7 LPM	0,53 @ 2264	1,36 @ 2224	3,03 @ 2202	4,71 @ 2186	6,37 @ 2130	8,06 @ 2085	9,76 @ 2035
	94,6 LPM	0,47 @ 2829	1,31 @ 2789	2,97 @ 2767	4,65 @ 2750	6,31 @ 2694	8,01 @ 2650	9,71 @ 2599
	113,6 LPM	0,42 @ 3393	1,25 @ 3353	2,91 @ 3331	4,59 @ 3314	6,26 @ 3258	7,96 @ 3213	9,65 @ 3165
	132,5 LPM							
	151,4 LPM							

- Notes: 1. Performance data shown above is typical at 33cSt fluid viscosity. Actual data may vary slightly from unit to unit in production.
2. All numbers subject to change without notice. Always confirm with us that you are working with the most current data.

Hydraulic Motors, Rol-Seal Units

RSA Series – DIMENSIONS & PERFORMANCE DATA

**Torque Ranges Shown as “daNm @ rpm” for
49,2 cm³/revolution displacement RSA & RSB units**

Continuous Operation

Intermittent Operation – Less than Six Sec. / Min.

	17,2 BAR	34,5 BAR	69 BAR	103,4 BAR	137,9 BAR	172,4 BAR	206,8 BAR
0,95 LPM	1,22 @ 4						
1,9 LPM	1,22 @ 23	2,55 @ 10					
3,8 LPM	1,21 @ 61	2,54 @ 48	5,10 @ 29				
7,6 LPM	1,18 @ 137	2,51 @ 125	5,06 @ 96	7,62 @ 67	10,15 @ 39	12,66 @ 10	
15,1 LPM	1,12 @ 291	2,45 @ 279	5,01 @ 250	7,56 @ 220	10,09 @ 192	12,60 @ 163	15,12 @ 134
30,3 LPM	1,01 @ 598	2,34 @ 587	4,89 @ 558	7,45 @ 528	9,98 @ 500	12,49 @ 470	15,01 @ 442
45,4 LPM	0,89 @ 907	2,23 @ 895	4,78 @ 865	7,33 @ 835	9,86 @ 808	12,37 @ 778	14,89 @ 750
60,6 LPM	0,78 @ 1217	2,11 @ 1203	4,67 @ 1172	7,22 @ 1140	9,75 @ 1114	12,26 @ 1085	14,78 @ 1055
75,7 LPM	0,67 @ 1523	2,00 @ 1510	4,55 @ 1481	7,11 @ 1450	9,64 @ 1422	12,15 @ 1394	14,67 @ 1361
94,6 LPM	0,52 @ 1907	1,85 @ 1895	4,41 @ 1864	6,96 @ 1832	9,49 @ 1800	12,00 @ 1775	14,52 @ 1745
113,6 LPM	0,37 @ 2290	1,75 @ 2279	4,26 @ 2245	6,81 @ 2216	9,35 @ 2182	11,85 @ 2155	14,37 @ 2128
132,5 LPM	0,23 @ 2675	1,56 @ 2664	4,11 @ 2627	6,67 @ 2595	9,20 @ 2565	11,71 @ 2538	14,22 @ 2509
151,4 LPM	0,08 @ 3061	1,41 @ 3048	3,97 @ 3010	6,52 @ 2978	9,05 @ 2946	11,56 @ 2919	14,07 @ 2890

**Torque Ranges Shown as “daNm @ rpm” for
65,5 cm³/revolution displacement RSA & RSB units**

Continuous Operation

Intermittent Operation – Less than Six Sec. / Min.

	17,2 BAR	34,5 BAR	69 BAR	103,4 BAR	137,9 BAR	172,4 BAR	206,8 BAR
0,95 LPM	1,67 @ 2						
1,9 LPM	1,67 @ 17	3,54 @ 8					
3,8 LPM	1,65 @ 45	3,51 @ 37	6,92 @ 16				
7,6 LPM	1,62 @ 102	3,48 @ 94	6,88 @ 80	10,28 @ 61	13,68 @ 42	17,09 @ 29	
15,1 LPM	1,54 @ 216	3,40 @ 207	6,80 @ 195	10,22 @ 179	13,62 @ 157	17,02 @ 139	20,42 @ 105
30,3 LPM	1,39 @ 442	3,25 @ 433	6,66 @ 418	10,06 @ 399	13,46 @ 380	16,86 @ 360	20,26 @ 325
45,4 LPM	1,24 @ 669	3,11 @ 660	6,51 @ 639	9,91 @ 620	13,31 @ 601	16,71 @ 581	20,11 @ 546
60,6 LPM	1,10 @ 891	2,96 @ 881	6,36 @ 860	9,76 @ 840	13,16 @ 821	16,57 @ 802	19,97 @ 766
75,7 LPM	0,95 @ 1113	2,81 @ 1104	6,22 @ 1081	9,62 @ 1060	13,02 @ 1042	16,42 @ 1023	19,82 @ 987
94,6 LPM	0,77 @ 1392	2,63 @ 1382	6,03 @ 1357	9,44 @ 1337	12,84 @ 1318	16,24 @ 1299	19,64 @ 1263
113,6 LPM	0,59 @ 1668	2,45 @ 1657	5,85 @ 1633	9,25 @ 1613	12,66 @ 1594	16,06 @ 1575	19,46 @ 1539
132,5 LPM	0,41 @ 1944	2,27 @ 1934	5,67 @ 1909	9,07 @ 1889	12,48 @ 1870	15,88 @ 1850	19,28 @ 1815
151,4 LPM	0,23 @ 2220	2,09 @ 2209	5,49 @ 2184	8,89 @ 2165	12,29 @ 2146	15,70 @ 2126	19,10 @ 2091

Notes: 1. Performance data shown above is typical at 33cSt fluid viscosity. Actual data may vary slightly from unit to unit in production.
2. All numbers subject to change without notice. Always confirm with us that you are working with the most current data.

Hydraulic Motors, Rol-Seal Units

RSA Series – DIMENSIONS & PERFORMANCE DATA

**Torque Ranges Shown as “daNm @ rpm” for
81,9 cm³/revolution displacement RSA & RSB units**

Continuous Operation

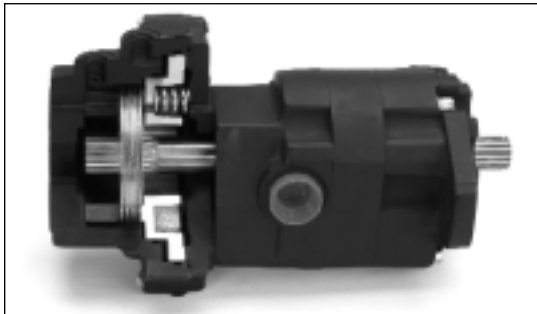
Intermittent Operation – Less than Six Sec. / Min.

	17,2 BAR	34,5 BAR	69 BAR	103,4 BAR	137,9 BAR	172,4 BAR	206,8 BAR
0,95 LPM							
1,9 LPM	2,03 @ 11	4,16 @ 6					
3,8 LPM	2,03 @ 34	4,18 @ 29	8,53 @ 2				
7,6 LPM	2,01 @ 79	4,14 @ 74	8,54 @ 49	12,69 @ 30	16,95 @ 9		
15,1 LPM	1,98 @ 169	4,05 @ 165	8,48 @ 144	12,60 @ 123	16,90 @ 102	21,02 @ 83	25,09 @ 59
30,3 LPM	1,80 @ 350	3,86 @ 344	8,29 @ 324	12,42 @ 303	16,72 @ 283	20,84 @ 261	24,91 @ 239
45,4 LPM	1,62 @ 530	3,68 @ 522	8,08 @ 507	12,24 @ 486	16,54 @ 465	20,70 @ 444	24,72 @ 422
60,6 LPM	1,44 @ 712	3,50 @ 705	7,93 @ 688	12,06 @ 667	16,36 @ 646	20,52 @ 625	24,54 @ 602
75,7 LPM	1,25 @ 895	3,33 @ 885	7,75 @ 867	11,88 @ 848	16,18 @ 827	20,34 @ 806	24,36 @ 784
94,6 LPM	1,03 @ 1120	3,11 @ 1110	7,53 @ 1094	11,65 @ 1073	15,96 @ 1053	20,11 @ 1033	24,13 @ 1009
113,6 LPM	0,79 @ 1345	2,88 @ 1334	7,30 @ 1321	11,42 @ 1301	15,73 @ 1279	19,89 @ 1258	23,91 @ 1235
132,5 LPM	0,58 @ 1570	2,66 @ 1558	7,07 @ 1546	11,20 @ 1526	15,50 @ 1505	19,66 @ 1484	23,67 @ 1462
151,4 LPM	0,34 @ 1795	2,43 @ 1785	6,85 @ 1773	10,97 @ 1751	15,28 @ 1731	19,42 @ 1710	23,46 @ 1687

Note: Performance data shown on chart at top is typical at 33cSt fluid viscosity. Actual data may vary slightly from unit to unit in production.

POWER TRAIN ACCESSORIES

Motor Brakes



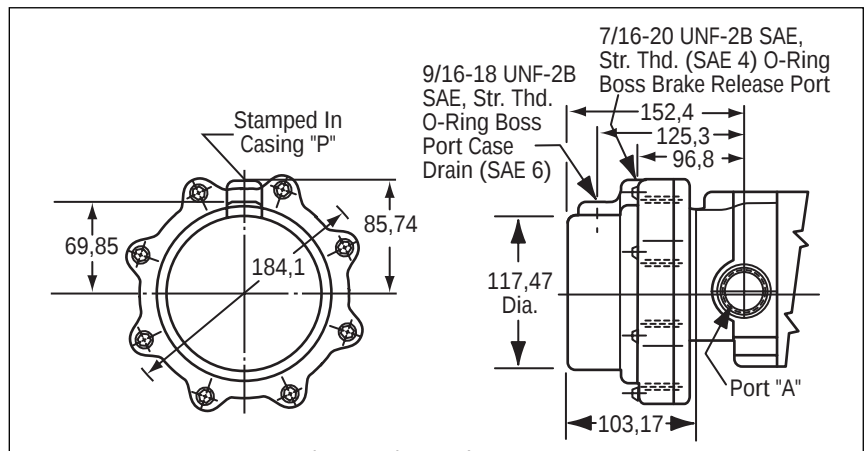
All Rol-Seal® motors can be equipped with a rear-mounted, normally on, wet friction disc type brakes. They will prevent creep under high static loads which might result from system leakage. They also should be used where positive locking of the motor shaft is required.

Maximum Release Pressure: 206,85 BAR

Oil Volume: 9,8 cm³ for full release

Minimum Holding Capacity: See chart. Note that chart data assumes the use of mineral-based oil with no back pressure in release line .

In applications where excessive holding torque is a concern, please consult factory.



Brake Model	Minimum Holding Capacity at 17,2 BAR Release Pressure	Brake Model	Minimum Holding Capacity at 8,61 BAR Release Pressure
222	10,62 daNm	232	5,3 daNm
223	15,9 daNm	233	7,9 daNm
224	21,3 daNm	234	10,6 daNm
226	31,8 daNm	236	15,9 daNm
228	42,4 daNm	238	31,3 daNm
220	58,4 daNm	230	29,2 daNm

Notes: 1. Dimensions shown are in mm. Always confirm with us that you are working with the most current data.

2. All numbers are subject to change without notice.

Hydraulic Motors, Rol-Seal Units

RSA Series – DIMENSIONS & PERFORMANCE DATA

Planetary Gear Boxes

In addition to brakes, Von Ruden also can equip any of our Rol-Seal motors with a wide variety of Planetary Gearboxes. As you can see from the chart below, RSA Series units can be configured to meet virtually any application.

For those where space is a primary consideration, please take special note of our Series 200 offering. By incorporating the available Gear Reduction option, a 32,8, 49,2, 65,5, or 81,9 in³ displacement RSA motor and Series 200 gearbox can produce amazing torques from a surprisingly small overall package.

Complete dimensional and performance data for all our planetary gearboxes is available in either English or Metric on our web site:

www.vonruden.com/gearboxes/planetary/planetary.html

If you prefer, your Von Ruden representative or our factory engineers will also provide whatever you request.



Gearbox Series	Maximum Output Torque N-M	Maximum Input Speed at No Load RPM	Maximum Shaft Radial Load/Inward Thrust Load in KG, (Reference Only)	Reduction Stages	Available Gear Reduction Ratios				
	Continuous/Intermittent								
200	1412/2372	2,000	2,948/1,814	SINGLE	5.19	5.86			
	1638/2711	2,500			7.07				
	1694/2824	2,000			8.06	9.95			
220	1130/2260	3,000	6,350/4,536	SINGLE	4.08	5.05			
		3,000		DOUBLE	16.65	20.62	25.53		
		3,000		TRIPLE	67.91	84.1	104.51	128.98	
		(Other ratios available up to 3284:1)							
280	1582/3164	3,000	6,350/4,536	SINGLE	4.08	5.05			
		3,000		DOUBLE	16.65	20.62	25.53		
		3,000		TRIPLE	67.91	84.1	104.51	128.98	
		(Other ratios available up to 3284:1)							
500	2825/5649	3,000	9,979/6,804	SINGLE	4.08	5.05			
		3,000		DOUBLE	16.65	20.62	25.53		
		3,000		TRIPLE	67.91	84.1	104.51	128.98	
		(Other ratios available up to 3284:1)							
616	2824/3728	1,800	8,165/3,538	SINGLE	5.2				
1300	7344/14689	3,000	20,412/13,608	SINGLE	4.42	6.00			
		3,000		DOUBLE	19.54	26.32	33.15	36	45
		3,000		TRIPLE	86.35	47.21	159.12	216	
(Other ratios available up to 2276:1)									
2500	14,125/28,250	3,000	16,330/17,690	DOUBLE	20.25	25.88	29.58		
					37.80	40.25	51.43		
(Other ratios available up to 6630:1)									
2520	14,125/28,250	3,000	23,134/19,958	DOUBLE	20.25	25.88	29.58		
					37.80	40.25	51.43		
(Other ratios available up to 6630:1)									
6000	33894/67788	4,000	25,855/40,824	DOUBLE	24.66	38.56	60.29		
		4,000			70 .39	89.38			
		4,000			110 .08	139.76			
(Other ratios available up to 90,000:1)									
10000	56480/112980	4,000	25,855/40,824	DOUBLE	26.48	41.41			
		4,000			75.60	96.00			
(Other ratios available up to 62,000:1)									

Notes: All data subject to change without notice. Always confirm with us that you are working with the most current data.

Hydraulic Motors, Rol-Seal Units

RSA Series – DIMENSIONS & PERFORMANCE DATA

A FEW WORDS ABOUT OUR ROL-SEAL MOTOR DESIGN

When Von Ruden introduced the first hydraulic motors built on our Rotary Abutment principle, their performance and durability advantages were obvious. Today, that same set of benefits are just as valid. Regardless of size, each model delivers:

1. **High Starting Torque:** Typically this is in the 92-94% range. That means overall hydraulic systems savings because designers can use smaller motors. Higher starting torque also means increased vehicle gradeability and more drawbar pull.

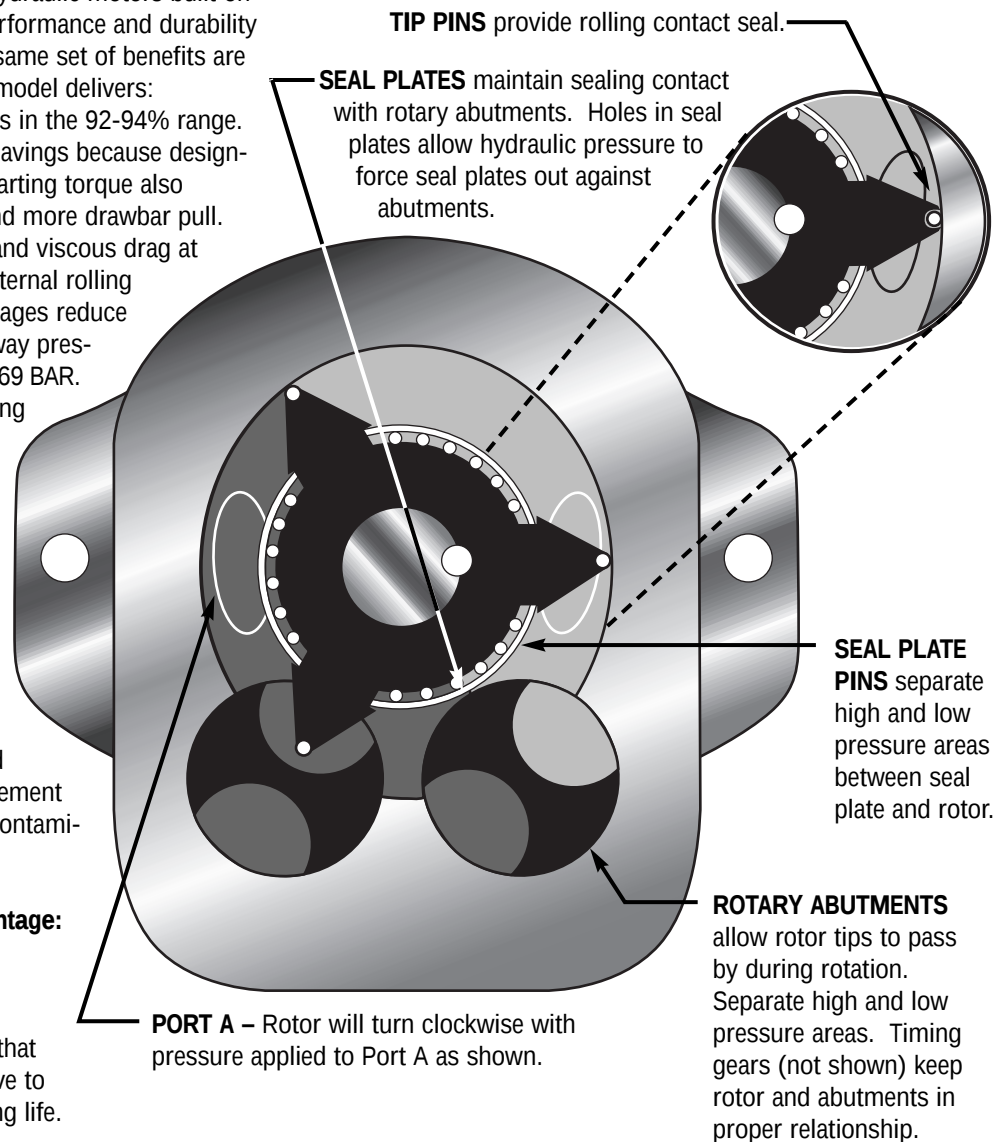
2. **High Running Torque:** Friction loss and viscous drag at high speed are both lower due to the internal rolling contact seal elements. Large flow passages reduce internal pressure drop. Typical breakaway pressure at a no load condition is less than 0,69 BAR.

3. **More Useable Speed:** Smooth running at low speed (less than 10 RPM) with minimal performance loss at high speeds (up to 3,500 RPM). Smooth performance over an unusually wide speed range. Low speed characteristics often eliminate the need for additional speed reduction.

4. **Long Life:** Performance stays relatively constant over the motor's working life. The internal rolling seal elements are essentially frictionless and wear compensating. The rolling seal element design also tolerates a high degree of contamination so the motors perform well in free-wheeling applications.

The Rol-Seal's Rotary Abutment Advantage:

The positive contact provided by rolling seals between rotor and housing and between abutments and seal plates creates relatively frictionless operation that makes these motors relatively insensitive to wear over their exceedingly long working life.



Low Pressure Hi Pressure Rotor & Abutment Valve Cross Section

RSA GENERAL MAINTENANCE ISSUES

Fluids:

We recommend a premium quality, anti-wear type mineral based hydraulic fluid with a minimum oil viscosity of 70 ssu. Maximum operating temperature is 96 degrees C.

Filtration:

A fluid cleanliness level of ISO 17/14 should be maintained at all times. Nominal filtration must be 25 micron or better.

Case Drain:

These motors are provided with a case drain port that must be connected to the reservoir with no more than 17,2 BAR surge pressure. Internal cross port check valves (option-24) can be provided when motors are not subject to instantaneous shock pressures (such as with dynamic braking).

Hydraulic Motors, Rol-Seal Units

RSA Series – MODEL CODES/ORDERING

ROL-SEAL MOTORS/BRAKES/SAE GEAR BOXES

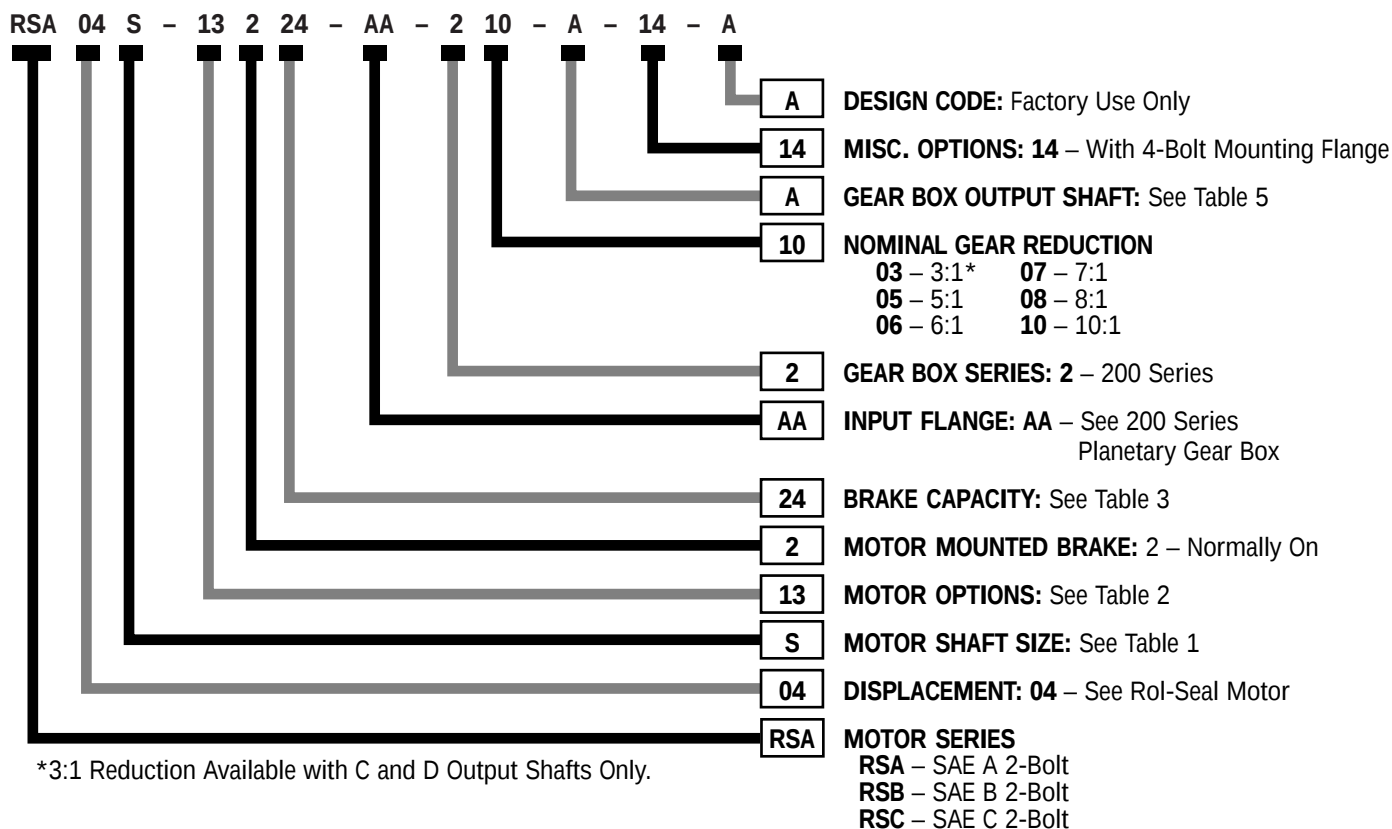


Table 1
MOTOR SHAFT SIZES

RSA
K – ø 25,4 Keyed (6,35 key)
S – 13 Tooth 16/32 Pitch Spline ø 22,2

RSB
K – ø 25,4 Keyed (6,35 key)
S – 13 Tooth 16/32 Pitch Spline ø 22,2

RSC
K – ø 38,1 Keyed (9,52 key)
S – 14 Tooth 12/24 Pitch Spline ø 31,75

METRIC
M – 25mm Keyed – RSA/B (8x7x32)
35mm Keyed – RSC (10x8x36)

KEYS INCLUDED

Table 2
MOTOR OPTIONS

13 – Viton Seals
24 – Internal Drain
27 – Front Sealing Cap (RSB & RSC Only)
28 – Tach. Adapter
33 – Side Ports 180° Metric (BSPP)
RSA/B Work Ports G 3/4
Drain Port G 1/4
RSC Work Ports G 1
Drain Port G 1/2

34A – Manifold, .62" Ports, 4 Bolt
34B – Manifold, .62" Ports, 3 Bolt
34C – Rear Ports, SAE 12
34D – Side Ports, SAE 12
34AM – Manifold, Metric 15,7 Ports, 4 Bolt
34BM – Manifold, Metric 15,7 Ports, 3 Bolt
34CM – Metric Rear Ports G 3/4
34DM – Metric Side Ports Ports G 3/4
49 – Splined Rear Shaft Extension
50 – Steel Timing Gears (RSA/RSB, Standard on RSC Series)
52 – For 95/5 Fluids

Table 3
BRAKE CAPACITY

17,2 BAR Release		8,61 BAR Release	
22	10,62 daNM	32	5,3 daNM
23	15,9 daNM	33	7,9 daNM
24	21,3 daNM	34	10,6 daNM
26	31,8 daNM	36	15,9 daNM
28	42,4 daNM	38	31,3 daNM
20	58,4 daNM	30	29,2 daNM

Table 5
GEAR BOX OUTPUT SHAFTS

A – ø 53,97 Straight Keyed (12,7 key)
B – 16 Tooth 8/16 Pitch Spline ø 53,97
C – ø 47,6 Straight Keyed (12,7 key)
D – 13 Tooth 8/16 Pitch Spline ø 44,4