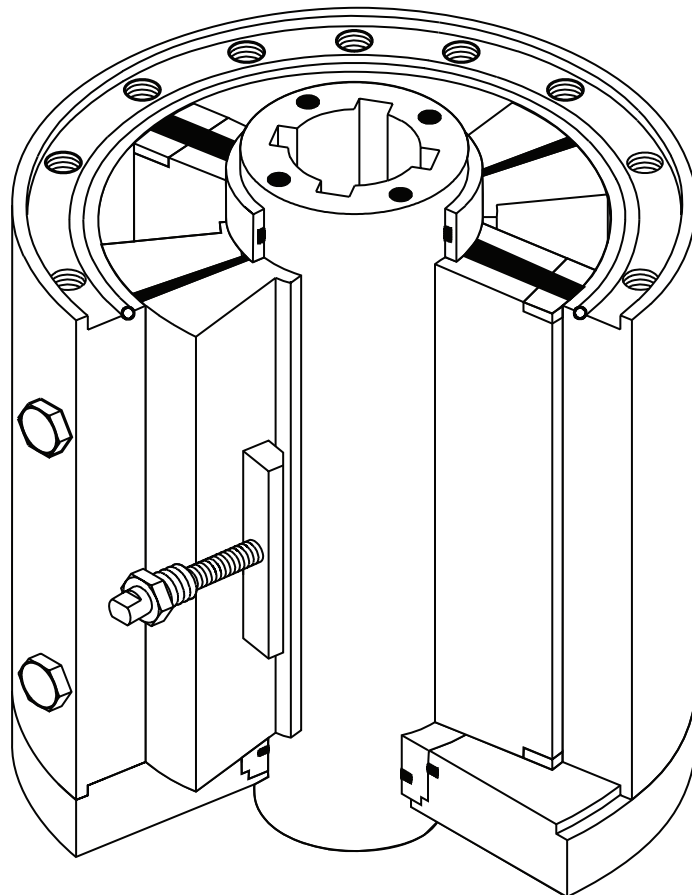


Shafer RV-Series

Rotary Vane Valve Actuators



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Actuator Specifications

Note: Gas hydraulic and central hydraulic maximum operating pressures may vary based on control configuration. Bolt circle, rotor bore, keyway quantity and size of mounting holes for RV-Series actuators will be custom fitted to specific valve. All dimension data is subject to change. All dimensions shown in centimeters.

6-1/2 x 2 Rotary Vane Actuator

- Torque expression: 18.84 Nm/bar
- Maximum operating pressure: 207 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 6.67 cm diameter
- Maximum wrench square: 5.08 cm across flats
- Weight of actuator including hydraulic fluid: 17.7 kg
- Actual fluid displacement per 90° stroke equals 0.34 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 0.6 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ hand pump per 90° stroke equals 6

6-1/2 x 3-1/2 Rotary Vane Actuator

- Torque expression: 32.8 Nm/bar
- Maximum operating pressure: 207 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 6.67 cm diameter
- Maximum wrench square: 5.08 cm across flats
- Weight of actuator including hydraulic fluid: 42.6 kg
- Actual fluid displacement per 90° stroke equals 0.60 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 0.2 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ handpump per 90° stroke equals 9

6-1/2 x 8 Rotary Vane Actuator

- Torque expression: 77.56 Nm/bar
- Maximum operating pressure: 207 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 6.67 cm diameter
- Maximum wrench square: 5.08 cm across flats
- Weight of actuator including hydraulic fluid: 63.5 kg
- Actual fluid displacement per 90° stroke equals 1.34 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 0.2 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ hand pump per 90° stroke equals 21

Figure 1.

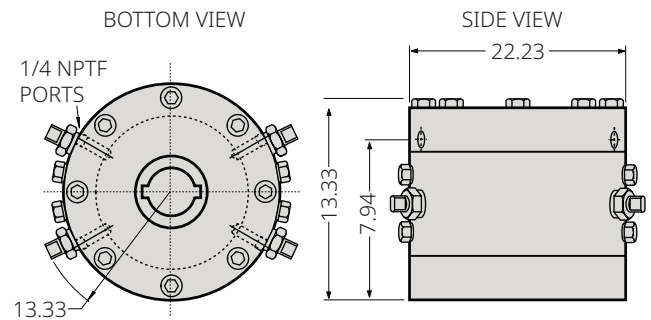


Figure 2.

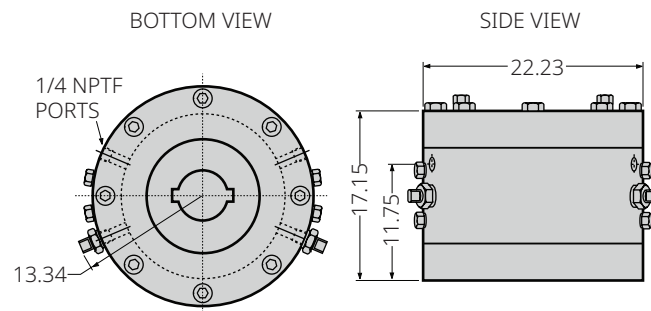
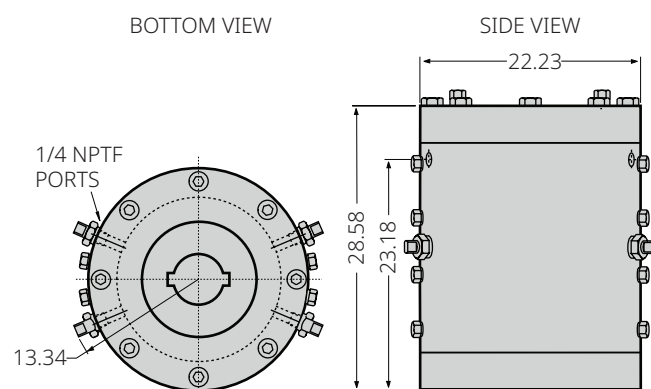


Figure 3.



9 x 7 Rotary Vane Actuator

- Torque expression: 118.06 Nm/bar
- Maximum operating pressure: 207 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 9.53 cm diameter
- Maximum wrench square: 6.35 cm across flats
- Weight of actuator including hydraulic fluid: 104.3 kg
- Actual fluid displacement per 90° stroke equals 2.05 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 0.4 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ hand pump per 90° stroke equals 32

9 x 12 Rotary Vane Actuator

- Torque expression: 210.72 Nm/bar
- Maximum operating pressure: 207 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 9.53 cm diameter
- Maximum wrench square: 6.35 cm across flats
- Weight of actuator including hydraulic fluid: 157.4 kg
- Actual fluid displacement per 90° stroke equals 3.7 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 0.6 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ hand pump per 90° stroke equals 57

12-1/2 x 8 Rotary Vane Actuator

- Torque expression: 306 Nm/bar
- Maximum operating pressure: 138 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 11.43 cm diameter
- Maximum wrench square: 8.26 cm across flats
- Weight of actuator including hydraulic fluid: 226.8 kg
- Actual fluid displacement per 90° stroke equals 5.36 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 0.92 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ hand pump per 90° stroke equals 82

Figure 4.

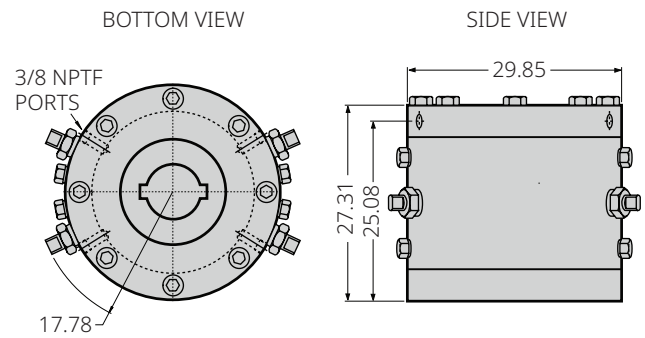


Figure 5.

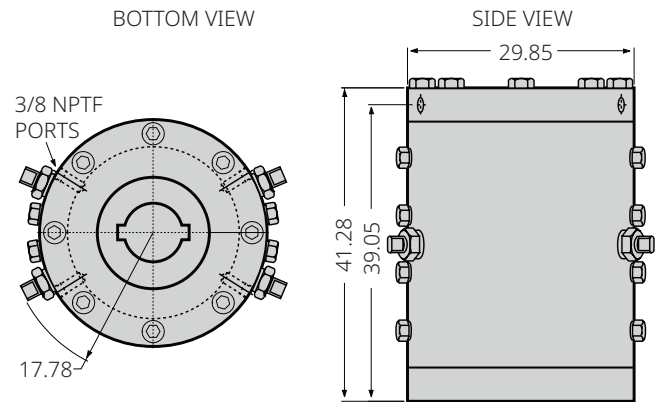
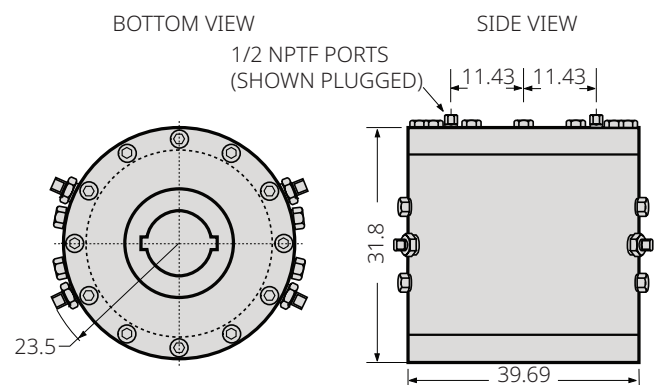


Figure 6.



12-1/2 x 12 Rotary Vane Actuator

- Torque expression: 472.28 Nm/bar
- Maximum operating pressure: 138 bar
- **Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 11.43 cm diameter
- Maximum wrench square: 8.26 cm across flats
- Weight of actuator including hydraulic fluid: 299.4 kg
- Actual fluid displacement per 90° stroke equals 8.03 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 1.4 standard m³ @ 69 bar
 - Number of strokes of standard 66 cm³ hand pump per 90° stroke equals 123

14-1/2 x 16 Rotary Vane Actuator

- Torque expression: 855.32 Nm/bar
- Maximum operating pressure: 138 bar
- **Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 13.97 cm diameter
- Weight of actuator including hydraulic fluid: 483 kg
- Actual fluid displacement per 90° stroke equals 14.96 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 2.58 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 76

16-1/2 x 16 Rotary Vane Actuator

- Torque expression: 1129.02 Nm/bar
- Maximum operating pressure: 138 bar
- **Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 15.24 cm diameter
- Weight of actuator including hydraulic fluid: 601 kg
- Actual fluid displacement per 90° stroke equals 20.98 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 3.6 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 107

Figure 7.

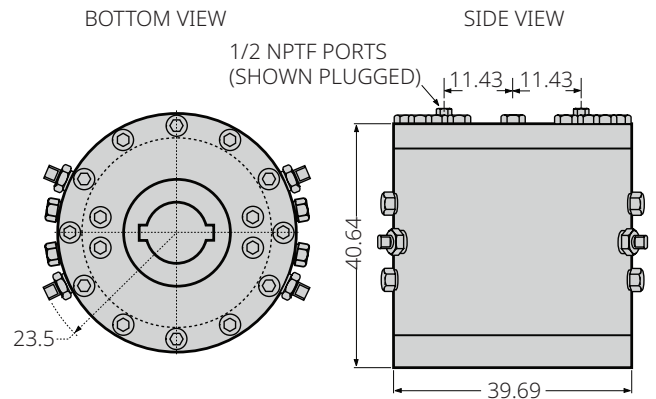


Figure 8.

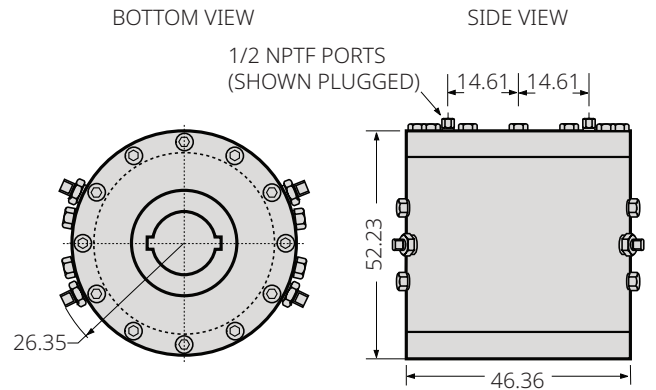
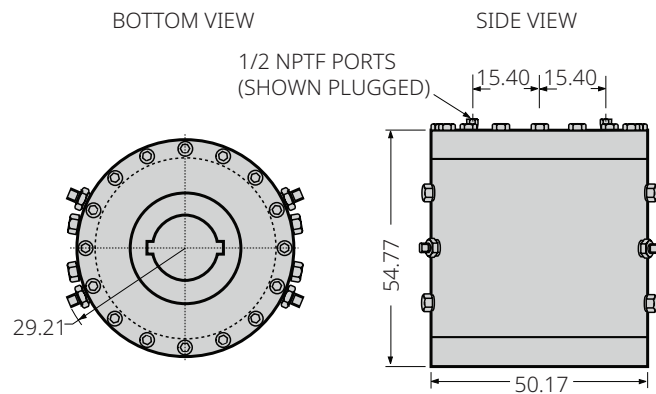


Figure 9.



20 x 16 Rotary Vane Actuator

- Torque expression: 1883.18 Nm/bar
- Maximum operating pressure: 103 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 15.24 cm diameter
- Weight of actuator including hydraulic fluid: 852.8 kg
- Actual fluid displacement per 90° stroke equals 32.98 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 5.7 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 168

25 x 16 Rotary Vane Actuator

- Torque expression: 3038.78 Nm/bar
- Maximum operating pressure: 103 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 16.51 cm diameter
- Weight of actuator including hydraulic fluid: 1324.5 kg
- Actual fluid displacement per 90° stroke equals 52.96 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 9.1 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 270

26 x 22 Rotary Vane Actuator

- Torque expression: 4413.63 Nm/bar
- Maximum operating pressure: 103 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 18.73 cm diameter
- Weight of actuator including hydraulic fluid: 1837 kg
- Actual fluid displacement per 90° stroke equals 76.98 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 13.3 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 392

Figure 10.

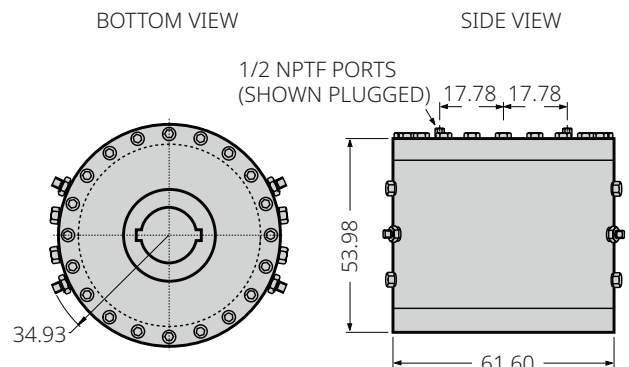


Figure 11.

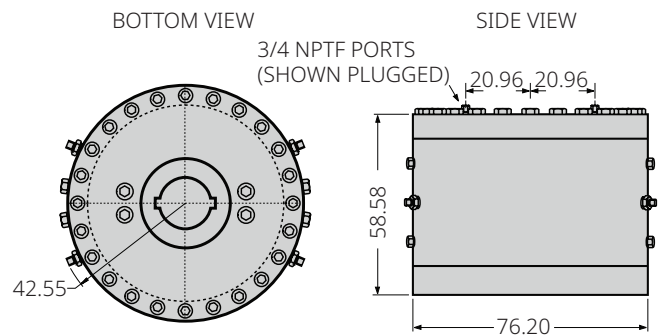
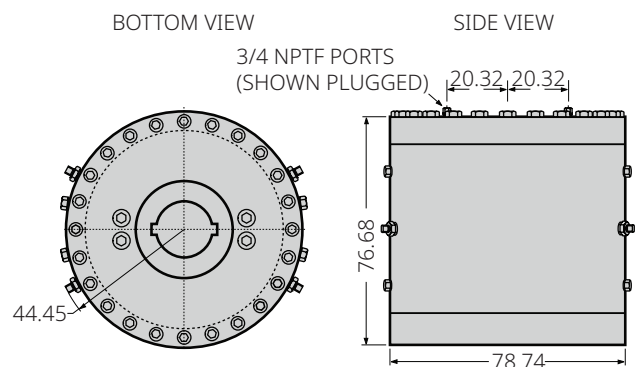


Figure 12.



26 x 36 Rotary Vane Actuator

- Torque expression: 7113.63 Nm/bar
- Maximum operating pressure: 103 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 18.73 cm diameter
- Weight of actuator including hydraulic fluid: 3486.8 kg
- Actual fluid displacement per 90° stroke equals 126 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 21.7 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 641

33 x 32 Rotary Vane Actuator

- Torque expression: 9622.58 Nm/bar
- Maximum operating pressure: 103 bar
 - Note:** Consult factory if higher pressure rating required
- Minimum working pressure: 17.2 bar
- Maximum acceptable valve stem: 24.13 cm diameter
- Weight of actuator including hydraulic fluid: 4037 kg
- Actual fluid displacement per 90° stroke equals 178 L
- On all units equipped with gas hydraulic tanks:
 - Gas consumption per 90° stroke equals 29.7 standard m³ @ 69 bar
 - Number of strokes of standard 197 cm³ hand pump per 90° stroke equals 905

Figure 13.

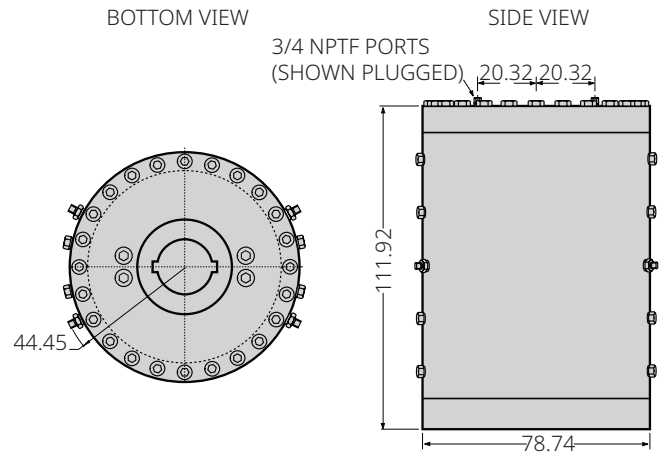


Figure 14.

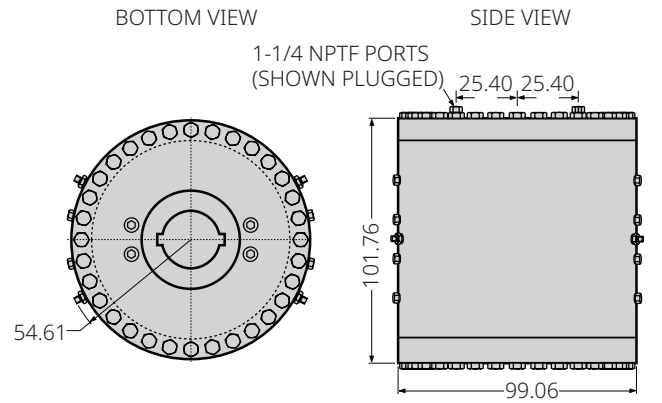


Table 1. Speed of Operation in Seconds Per 90° Rotation*

Actuator Size	Operating Pressure (bar)											
	21	28	35	41	48	55	62	69	76	83	90	97
6-1/2 x 2	4	4	3	3	3	2	2	2	2	2	1	1
6-1/2 x 3-1/2	5	5	4	3	3	3	2	2	2	2	1	1
6-1/2 x 8	6	6	5	4	4	4	3-1/2	3-1/2	3	3	2	1
9 x 7	9	8	8	7	5	5	5	3	3	3	2	2
9 x 12	11	10	9	9	8	7	6	6	5	4	4	3
12-1/2 x 8	12	11	11	10	9	9	8	8	7	6	6	6
12-1/2 x 12	18	16	15	13	10	10	10	10	9	9	9	9
14-1/2 x 16	20	18	16	14	14	12	12	12	12	11	11	11
16-1/2 x 16	28	23	20	19	17	16	15	15	15	15	15	14
20 x 16	30	25	24	22	20	20	20	19	19	19	19	18
25 x 16	43	37	33	30	25	25	24	24	24	24	22	22
26 x 22	50	40	35	30	25	25	25	25	25	25	25	25
26 x 36	70	50	45	40	38	35	35	35	-	-	-	-
33 x 32	146	125	111	102	95	88	83	79	-	-	-	-

NOTE:

* Stroking speeds above are approximate as speed may be affected by fluid viscosity or the flow capacities of the individual control components. The listed speeds are based on actuators with gas hydraulic tanks, hand pump and the standard poppet type control block in the power supply circuit. Adjustable speed control valves may be specified so that the stroking speed may be fine tuned to the field operating conditions. If faster speeds are required, please consult a factory representative.

Table 2. Approximate Weights for Shafer Rotary Operators, Hydraulic Tanks and Power Storage Tanks

Size	Operator Weight (kg)	Hydraulic Tank Weight (kg) (per pair)	Power Storage Tank (standard) Weight (kg)
6-1/2 x 2	18	16	9
6-1/2 x 3-1/2	45	16	9
6-1/2 x 8	68	34	18
9 x 7	125	50	24
9 x 12	181	77	39
12-1/2 x 8	227	120	57
12-1/2 x 12	299	184	79
14-1/2 x 16	484	307	125
16-1/2 x 16	601	397	204
20 x 16	853	578	314
25 x 16	1325	1229	536
26 x 22	204	1519	658
26 x 36	3488	2433	1050
33 x 32	4038	3379	1434

Table 3. Approximate Weights for Shafer Hand Pumps, 2-Way Electric Controls and Limit Switches

Pumps	Control (Two-Way Electric)	Limit Switch
4 in. = 9 kg	1/4 in. = 27 kg	LARGE = 12 kg
12 in. = 20 kg	1/2 in. = 34 kg	-

4 in. Pump, 1/4 Poppet Block = 24 kg + Cover 13 kg = Total 37 kg
 12 in. Pump, 1/4 Poppet Block = 46 kg + Cover 19 kg = Total 65 kg
 Linebreak Small Plate with Lockout = 19 kg + Cover 10 kg = 29 kg

4 in. Pump/D.H.V. = 23 kg
 12 in. Pump/D.H.V. = 50 kg

Limit Valve (ESD) with Plate 5 kg
 1-08672 Terminal Box = 5 kg
 1-09027 Terminal Box = 6 kg
 1/4 Poppet Block, 4 cu. in. pump and linebreak with cover = 43 kg

Dimensional Data

Gas/Hydraulic Rotary Vane - Horizontal Stem, Vertical Line

Note: All dimensional data is for reference only and subject to change. Depending on the application, specific actuator controls may or may not be located inside of the control box. Where specified, there may be additional pressure vessels or power storage tanks which are not shown.

Figure 15.

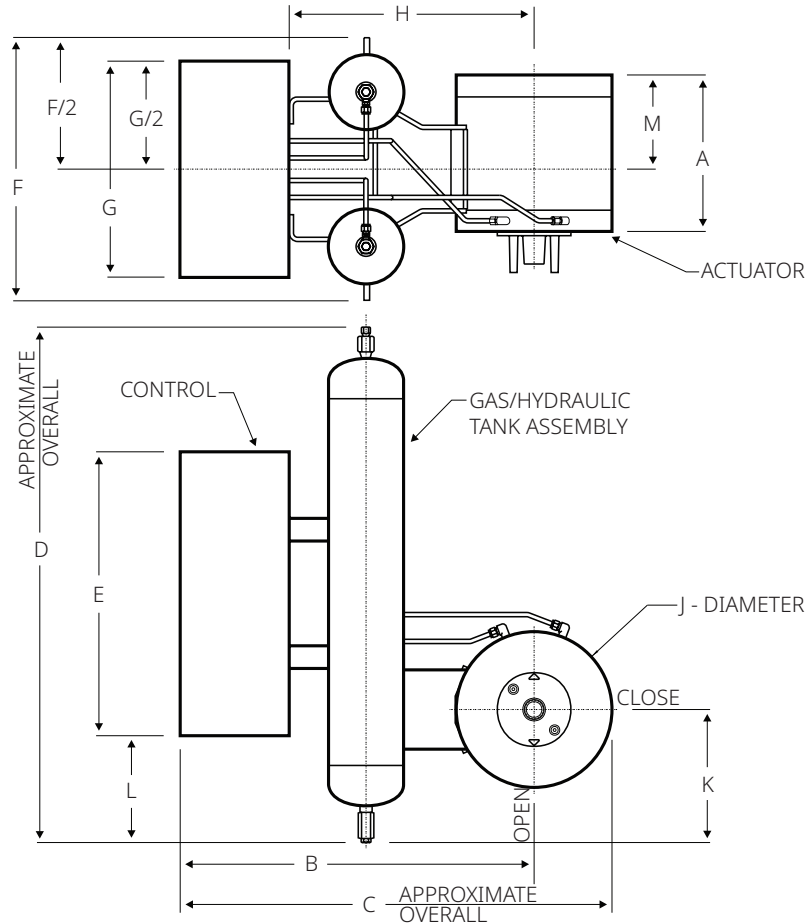


Table 4.

Size	A	B	C	D	E	F	G	H	J	K	L	M
6-1/2 x 2	13.34	62.23	73.66	59.69	64.14	46.36	48.90	41.28	22.23	23.50	1.27	5.72
6-1/2 x 3-1/2	17.15	62.23	73.66	59.06	64.14	46.36	48.90	41.28	22.23	23.50	1.27	9.53
6-1/2 x 8	28.58	62.23	73.66	76.20	64.14	46.36	48.90	41.28	22.23	23.50	12.07	16.51
9 x 7	27.31	75.57	90.17	78.11	64.14	53.98	48.90	53.98	29.85	27.31	10.80	13.97
9 x 12	41.28	77.47	92.08	95.25	64.14	59.06	48.90	55.88	29.85	29.85	19.05	27.94
12-1/2 x 8	31.75	82.55	99.70	114.94	64.14	59.06	48.90	60.96	40.01	29.85	29.21	19.05
12-1/2 x 12	43.18	85.73	105.41	106.68	64.14	69.22	48.90	64.14	40.01	31.12	25.40	27.31
14-1/2 x 16	52.23	113.03	135.89	119.38	82.55	85.09	58.42	81.28	46.36	41.28	17.78	23.50
16-1/2 x 16	57.15	116.21	141.61	153.04	82.55	85.09	58.42	85.09	50.17	41.28	33.66	27.31
20 x 16	59.06	125.73	156.21	147.32	82.55	101.60	58.42	93.98	61.60	44.45	31.12	26.67
25 x 16	62.87	130.18	168.28	172.09	81.92	111.76	64.14	95.25	76.20	29.21	43.82	26.67
26 x 22	81.92	*	*	*	81.92	*	64.14	*	78.74	*	*	*
26 x 36	115.57	*	*	*	81.92	*	64.14	*	78.74	*	*	*
33 x 32	104.78	*	*	*	81.92	*	64.14	*	99.06	*	*	*

NOTE:

* Indicates this particular size of actuator has not been used in this type of application. All dimensions shown in centimeters.

Gas/Hydraulic Rotary Vane - Vertical Stem, Horizontal Line

Note: All dimensional data is for reference only and subject to change. Depending on the application, specific actuator controls may or may not be located inside of the control box. Where specified, there may be additional pressure vessels or power storage tanks which are not shown.

Figure 16.

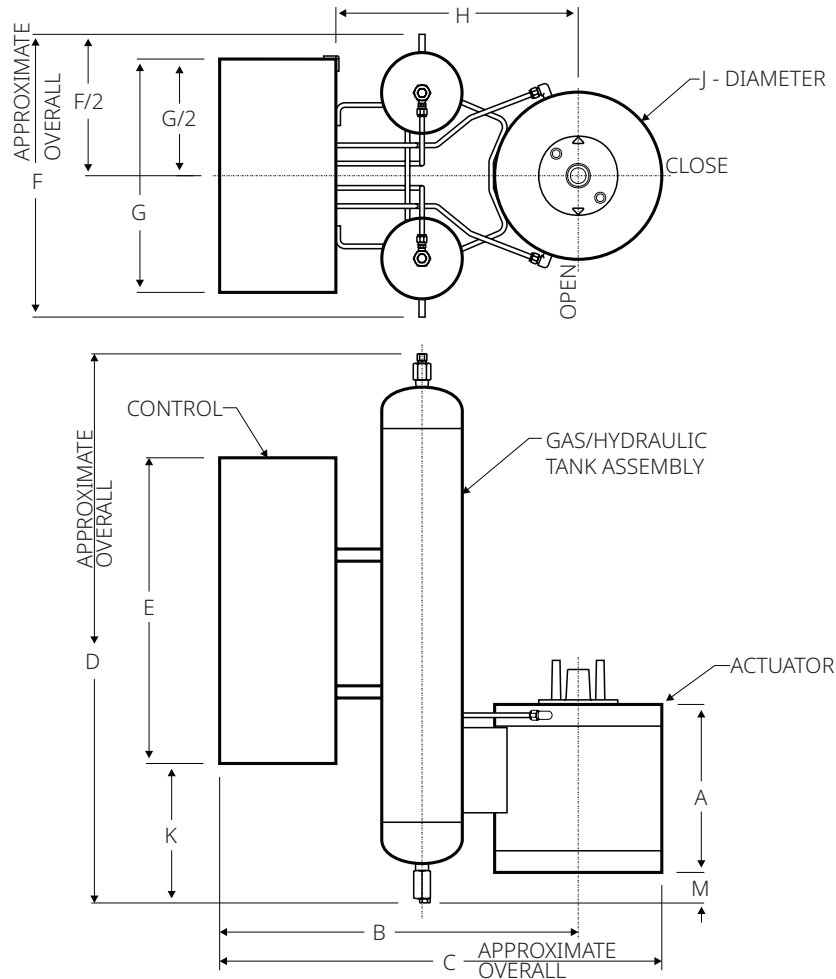


Table 5.

Size	A	B	C	D	E	F	G	H	J	K	M
6-1/2 x 2	13.34	62.23	72.39	59.06	64.14	46.36	48.90	40.01	22.23	1.27	13.34
6-1/2 x 3-1/2	17.15	61.60	72.39	59.06	64.14	46.36	48.90	40.01	22.23	1.27	12.70
6-1/2 x 8	28.58	61.60	72.39	76.20	64.14	46.36	48.90	40.01	22.23	12.07	8.26
9 x 7	27.31	69.85	85.09	78.11	64.14	53.98	48.90	48.90	29.85	10.80	12.70
9 x 12	41.28	72.39	87.00	95.25	64.14	59.06	48.90	50.80	29.85	19.05	8.89
12-1/2 x 8	31.75	81.28	100.97	114.94	64.14	59.06	48.90	59.69	40.01	22.86	6.35
12-1/2 x 12	43.18	81.28	100.97	106.68	64.14	69.22	48.90	59.69	40.01	25.40	1.91
14-1/2 x 16	52.23	98.43	121.29	119.38	82.55	85.09	58.42	66.68	46.36	17.78	13.34
16-1/2 x 16	57.15	101.60	127.00	153.04	82.55	85.09	58.42	70.49	50.17	33.66	3.18
20 x 16	59.06	112.40	142.88	147.32	82.55	101.60	58.42	80.65	61.60	31.12	16.51
25 x 16	62.23	129.54	167.64	172.09	92.71	111.76	64.14	92.71	76.20	34.29	23.50
26 x 22	81.28	93.98	172.72	214.00	92.71	121.92	64.14	96.52	78.74	55.25	17.15
26 x 36	114.94	147.32	186.69	176.53	92.71	144.78	64.14	110.49	78.74	33.66	21.59
33 x 32	104.78	158.12	207.65	247.65	93.35	144.78	64.14	121.29	99.06	71.76	27.31

NOTE:

* Indicates this particular size of actuator has not been used in this type of application. All dimensions shown in centimeters.

Central Hydraulic System - Horizontal Stem, Vertical Line

Note: All dimensional data is for reference only and subject to change. Depending on the application, specific actuator controls may or may not be located inside of the control box. Where specified, there may be additional pressure vessels or power storage tanks which are not shown.

Figure 17.

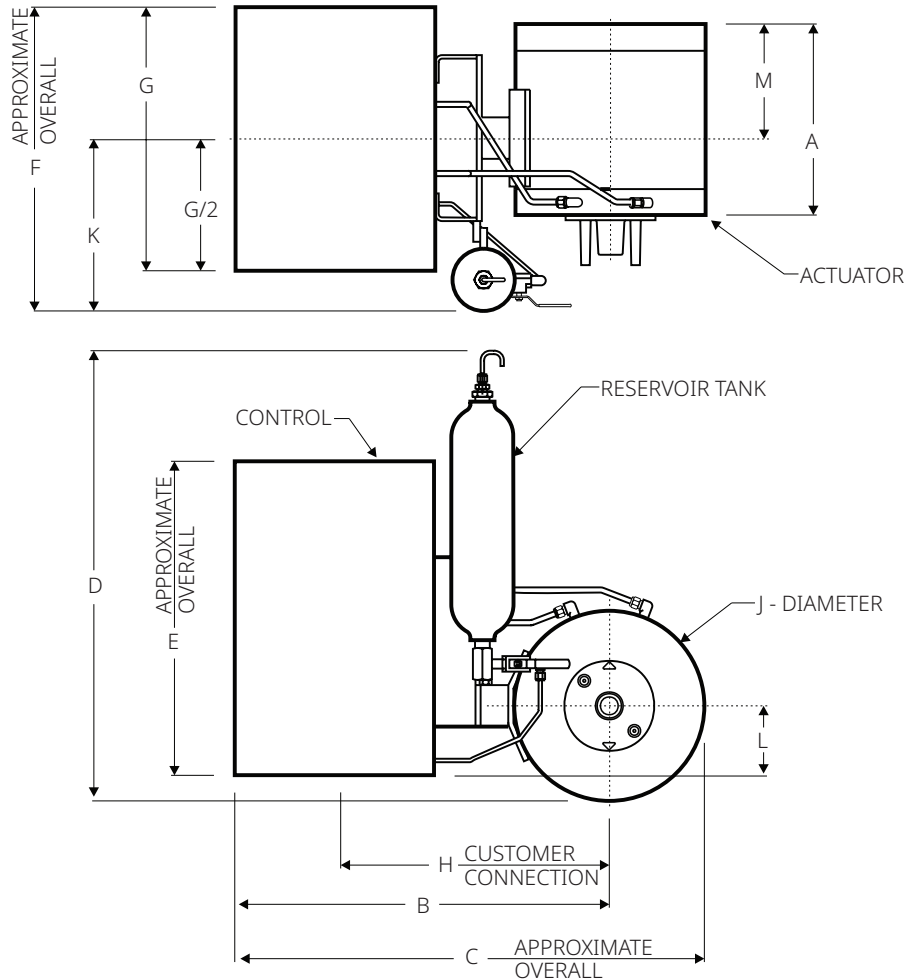


Table 6.

Size	A	B	C	D	E	F	G	H	J	K	L	M
6-1/2 x 2	13.34	59.69	68.58	78.11	57.79	55.88	48.90	43.18	22.23	31.75	11.43	5.72
6-1/2 x 3-1/2	17.15	62.87	73.66	78.11	57.79	55.88	48.90	43.18	22.23	31.75	11.43	9.53
6-1/2 x 8	28.58	62.87	73.66	78.11	57.79	55.88	48.90	43.18	22.23	31.75	11.43	16.51
9 x 7	27.31	66.68	81.28	80.01	57.79	55.88	48.90	46.99	29.85	31.75	12.70	13.34
9 x 12	41.28	66.68	81.28	80.01	57.79	57.15	48.90	46.99	29.85	31.75	12.70	27.31
12-1/2 x 8	31.75	71.12	91.44	82.55	57.79	59.06	48.90	52.07	40.01	31.75	12.70	22.23
12-1/2 x 12	43.18	71.12	91.44	85.09	57.79	59.06	48.90	52.07	40.01	31.75	12.70	27.31
14-1/2 x 16	52.22	87.00	109.86	88.27	82.55	67.31	71.76	59.06	46.36	31.75	22.86	23.50
16-1/2 x 16	57.15	88.90	114.30	90.17	82.55	67.31	71.76	60.96	50.17	31.75	22.86	27.31
20 x 16	59.06	95.25	126.37	95.89	82.55	67.31	71.76	67.31	61.60	31.75	22.86	26.67
25 x 16	62.23	93.35	131.45	116.84	92.71	63.50	64.14	73.03	76.20	31.75	13.97	31.12
26 x 22	81.28	*	*	*	92.71	*	64.14	0.00	78.74	*	*	*
26 x 36	114.94	*	*	*	92.71	*	64.14	0.00	78.74	*	*	*
33 x 32	104.78	*	*	*	92.71	*	64.14	0.00	99.06	*	*	*

NOTE:

* Indicates this particular size of actuator has not been used in this type of application. All dimensions shown in centimeters.

Central Hydraulic System - Vertical Stem, Horizontal Line

Note: All dimensional data is for reference only and subject to change. Depending on the application, specific actuator controls may or may not be located inside of the control box. Where specified, there may be additional pressure vessels or power storage tanks which are not shown.

Figure 18.

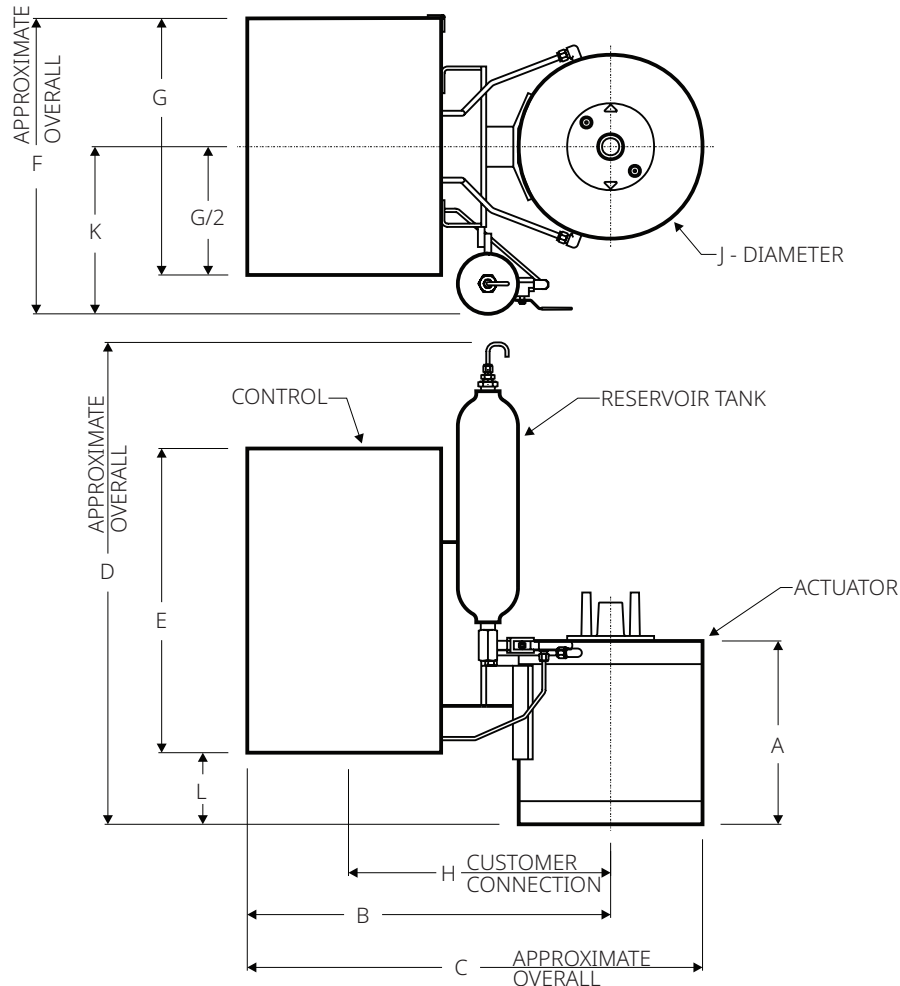


Table 7.

Size	A	B	C	D	E	F	G	H	J	K	L
6-1/2 x 2	13.34	62.87	73.66	76.84	57.79	55.88	48.90	43.18	22.23	31.75	1.27
6-1/2 x 3-1/2	17.15	62.87	73.66	80.65	57.79	55.88	48.90	43.18	22.23	31.75	2.54
6-1/2 x 8	28.58	62.87	73.66	87.63	57.79	55.88	48.90	43.18	22.23	31.75	9.53
9 x 7	27.31	66.04	81.28	83.82	57.79	55.88	48.90	46.99	29.85	31.75	6.35
9 x 12	41.28	66.04	81.28	97.79	57.79	55.88	48.90	46.99	29.85	31.75	20.32
12-1/2 x 8	31.75	69.22	86.36	87.63	57.79	55.88	48.90	49.53	40.01	31.75	3.81
12-1/2 x 12	43.18	71.76	91.44	97.79	57.79	55.88	48.90	52.71	40.01	31.75	19.69
14-1/2 x 16	52.22	87.00	109.86	102.87	82.55	67.31	71.76	59.06	46.36	31.75	10.16
16-1/2 x 16	57.15	88.90	114.30	104.14	82.55	67.31	71.76	60.96	50.17	31.75	16.51
20 x 16	59.06	95.25	126.37	103.51	82.55	67.31	71.76	67.31	61.60	31.75	15.24
25 x 16	62.23	93.35	131.45	128.91	92.71	63.50	64.14	72.39	76.20	31.75	36.20
26 x 22	81.28	94.62	133.99	135.26	92.71	63.50	64.14	73.03	78.74	31.75	42.55
26 x 36	114.94	*	*	*	92.71	*	64.14	*	*	*	*
33 x 32	104.78	*	*	*	92.71	*	64.14	*	*	*	*

NOTE:

* Indicates this particular size of actuator has not been used in this type of application. All dimensions shown in centimeters.

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