

**A C U M E N   T E C H N O L O G I E S ,   I N C .**

51445 Celeste Drive • Shelby Township, MI 48315  
(810) 566-8600 • Fax (810) 566-4062

**Welcome to Precision Lubrication  
by ACUMEN**

**Spindle/Bearing Lubrication Systems**



*All of the employees here at Acumen Technologies, Inc. work together as a team and as individuals to provide the highest level of customer service and the most advanced products we can offer. Attitude is an important factor in this equation. When attitude is right, great things will happen !*

### **Company Profile**

Acumen Technologies, Inc. was established in November, 1997. We began as a group dedicated to the manufacture of high quality, precision fluid delivery systems. Our employees have extensive experience in this discipline and are driven to be the finest supplier of these systems in the world.

Acumen Technologies, Inc. has a distributor network where strategically located, technically trained personnel are available to provide field support for the products we offer.

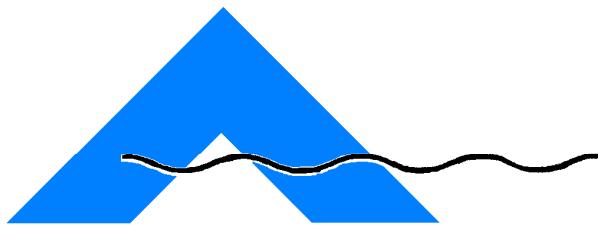
There exists countless applications in these industries where Acumen Technologies, Inc. either has, or is developing, solutions to manufacturing problems. Acumen's product offering solves fluid delivery and lubrication problems in such areas as:

- Mechanical and motion control devices - air motors, power tools, actuators
- Conveyors / Chain
- Assembly Systems

It is our mandate to deliver the proper amount of fluid, where it is required, when it is required, every time it is required. It is imperative that the products we offer satisfy current industry needs, and that we remain focused on the identification of opportunities for the future. Engineered solutions to process and manufacturing problems, in the arena of fluid delivery, is our foundation.

### **Manufacturing Facility**

Our plant is located in Shelby Township, Michigan. While we have the ability to expand, we currently utilize 10,750 square feet of a modern, three-year-old facility approximately twenty-five miles northeast of Detroit. Here we produce fluid delivery systems satisfying the requirements of numerous markets including Automotive, Textile, Product Assembly, Food Processing, Primary Metals, Plastics, Power Generation .....and more.

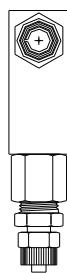
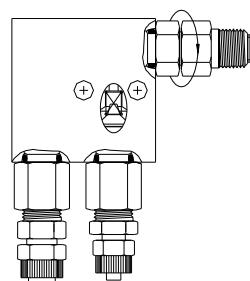
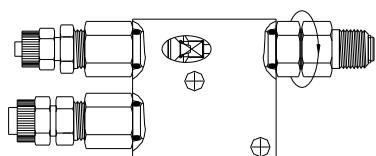


## ACUMEN TECHNOLOGIES, INC. SERIES 2000 SPINDLE LUBRICATION SYSTEM

ACUMEN TECHNOLOGIES' State-of-the-art SERIES 2000 Spindle Lubrication System uses **Thin Film Technology** to deliver a continuous, consistent, thin film of oil directly to the rolling element in the bearing. The system utilizes a precision positive displacement pump. This pump delivers a known quantity of fluid through a captive column of oil (1/8" OD tubing) to a precision mixing nozzle. Air is also directed to the nozzle (1/4" OD tubing) through a precision air regulator.

The mixing cavity of the nozzle uses the airflow to migrate the fluid, in a solid, non-atomized, film to the end orifice of the spindle bearing spacer. At this point the oil is sheared into large droplets and propelled to the rolling element. The air moves the oil film through the bearing to the drain, eliminating pooling or trapped oil in the bearing area that can super heat and result in a bearing failure. The air also provides positive pressure in the spindle to keep contaminates and moisture out. An increase in the firing frequency of the pump determines the volume of lubricant at the end orifice of the spindle bearing spacer. Delivery of Lubricant can be as low as .005 ml per minute. The delivery of lubricant to the bearing is **continuous**, even though the pump is cyclical. Each bearing has it's own dedicated pump and nozzle.

Independent adjustment of oil to each bearing is possible. Under lubrication as well as over lubrication can result in bearing failures. The Acumen system provides controlled, accurate amounts of oil and airflow to the spindle in a reliable, simple package.



## FEATURES

- Positive displacement pumps
- Independent pump for each nozzle
- Captive column of oil, tubing runs up to 60 ft
- Precision control of oil and air volume
- Available in a variety of AC and DC voltages
- External clear reservoir provides visual fluid level indication
- Low reservoir level switch and indicator light
- Low air pressure switch and indicator light
- Fully monitored systems available
- Nema 12 electrical enclosure
- Durable powder coated finish on back plate and housing
- Can be configured for any number of nozzles or lubrication points
- Filtered air supply – 5 micron
- Standard nozzles with 1/8 NPTF or 3/8-24 SAE swivel threads
- Custom nozzles available to fit your application
- OEM versions available
- Multiple control and communication options
- Systems are expandable

## SPECIFICATIONS

### Panel Size:

Typical Back Plate: 18" Wide X 27.75" High X 10" Deep

### Electrical:

NEMA 12/13 Enclosure  
110/120 VAC 50/60 Hz  
24 VDC

### Pneumatic:

Inlet: 3/8 NPT to be supplied with 3/8" pipe or 1/2" steel tubing  
Pressure: 60PSIG min / 120PSIG max  
Filter: High Capacity 5 Micron

### Oil Reservoir:

2000ml Standard with Central Fill Adapter  
One, Five, and Ten Gallon Available  
30 Gallon Central Fill Available  
Low/High Reservoir Level Float Switch  
Max switching power 70VA  
Switch contact: SPST NO  
Voltage: 120 VAC or 24 VDC

### Fluids Delivered:

Oil and similar fluids 70 SSU - 3000 SSU

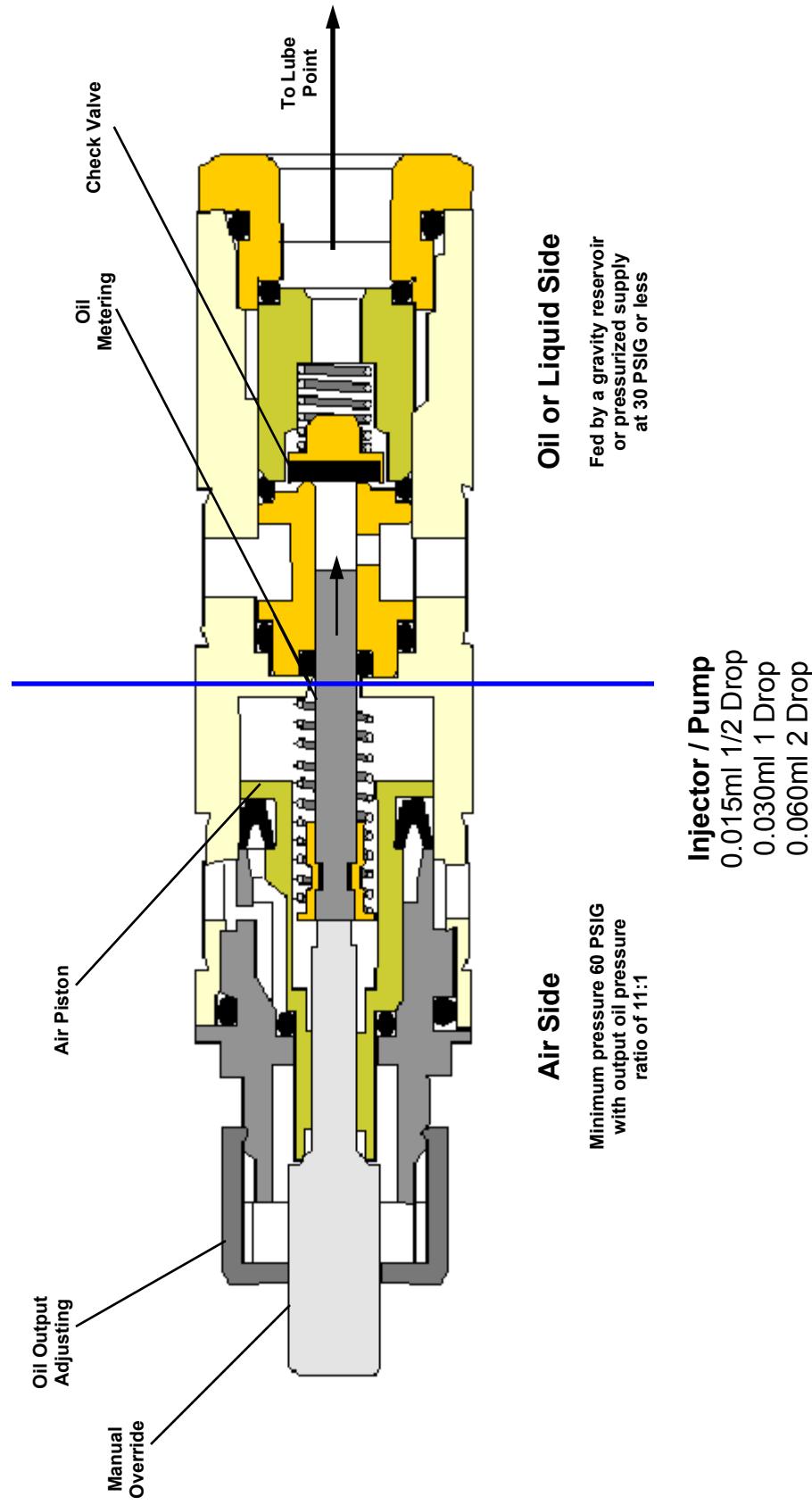
### Nozzles:

Acumen nozzles are available in a wide variety of configurations:  
1/8" NPTF Straight and 90 Degree body  
3/8-24 SAE Straight and 90 Degree body  
Custom Designs

### Injector Pump Displacement:

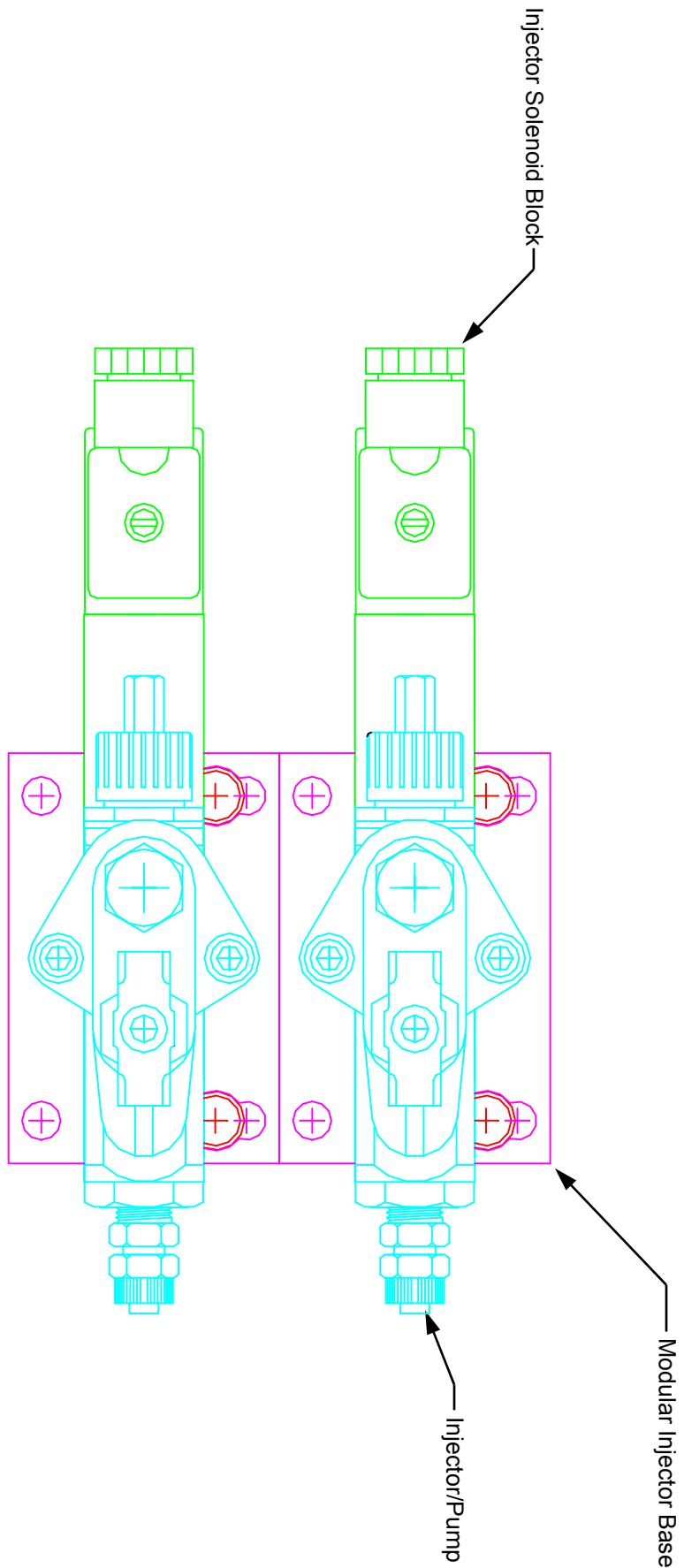
Full Volume per stroke 0.015ml (1/2 Drop)

## Technical Information

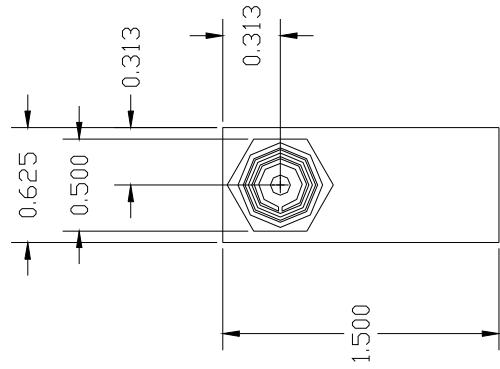
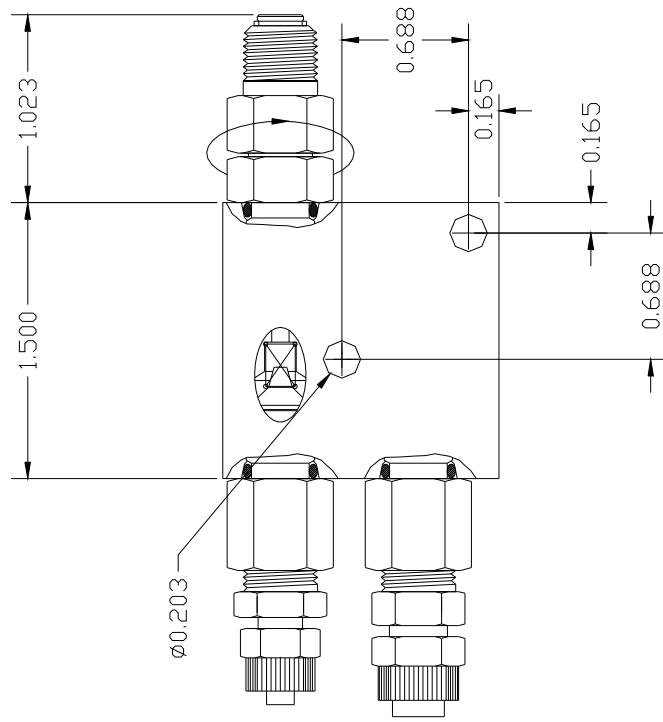


## Technical Information

### Injector Manifold Base

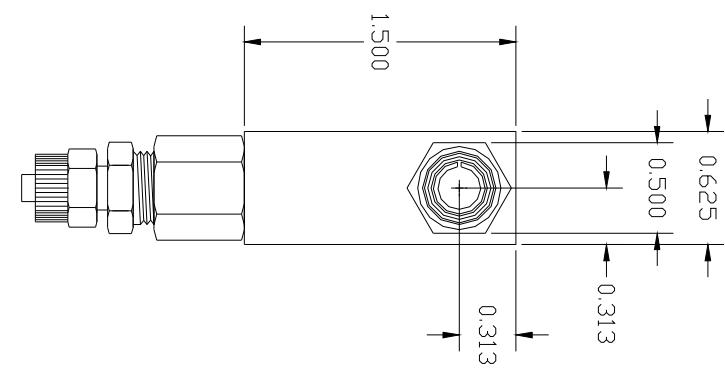
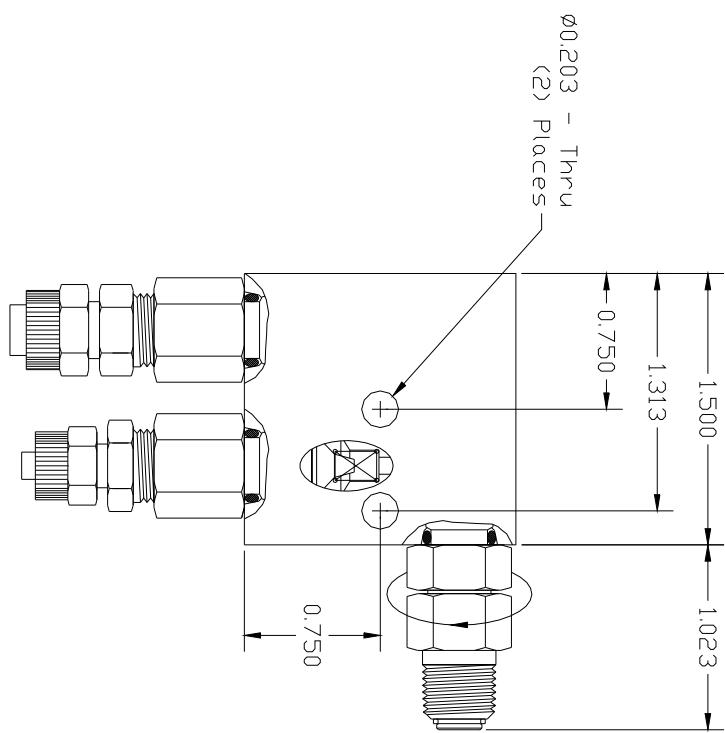


## Technical Information



**Nozzle Assembly 1 1/2" Straight Body**  
1/8" NPTF Swivel Tip  
Part Number 500 000302 00

## Technical Information



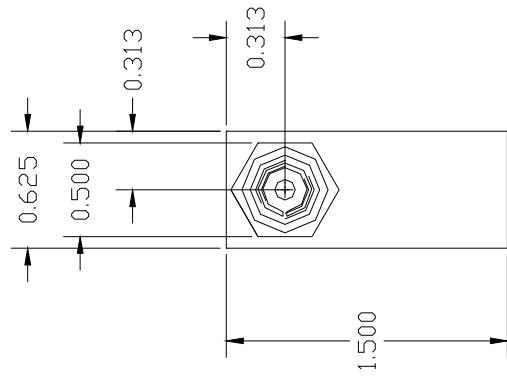
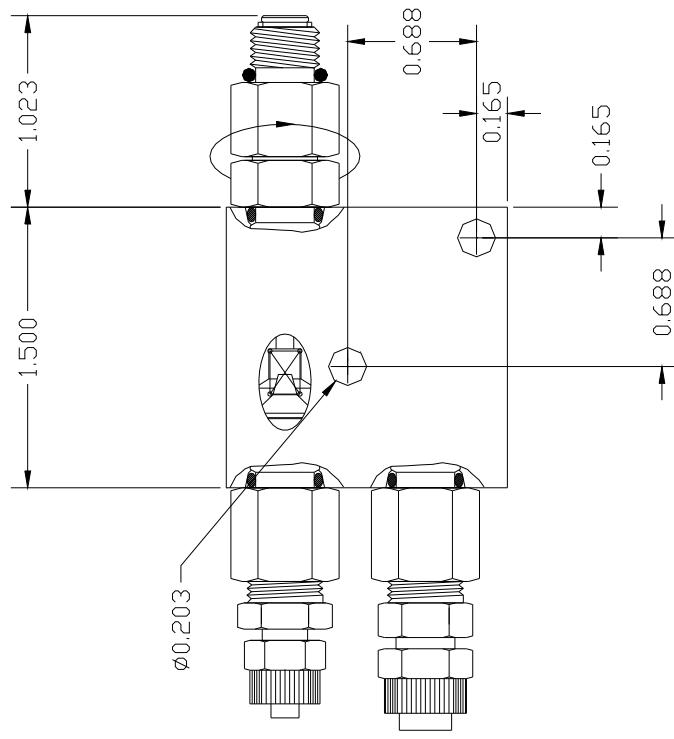
### Nozzle Assembly 1 1/2" 90 Degree Body

1/8" NPTF Swivel Tip

Part Number 500 001084 00

## Technical Information

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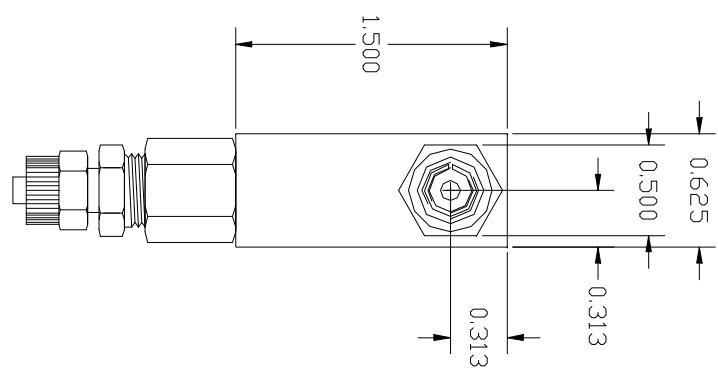
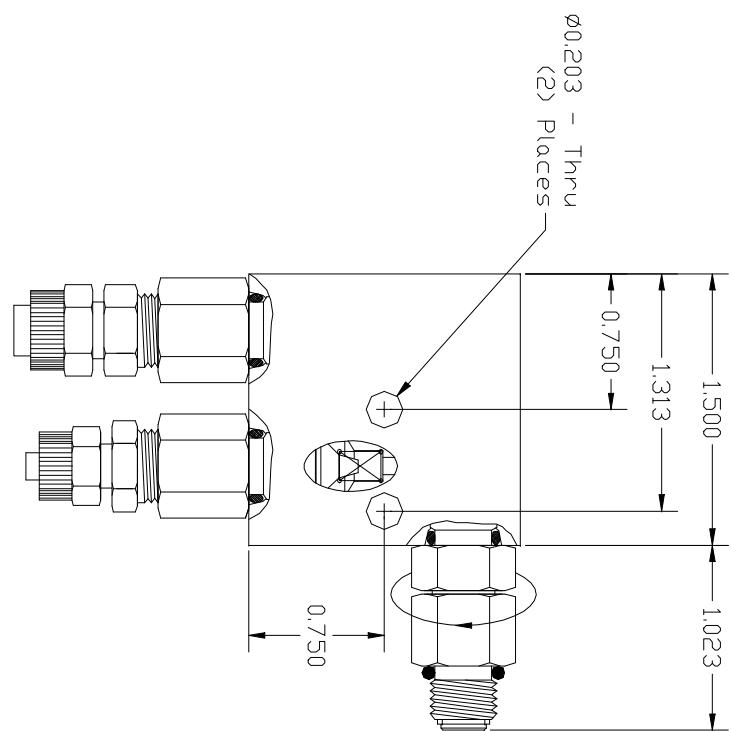


### Nozzle Assembly 1 1/2" 90 Degree Body

3/8-24 SAE Swivel Tip

Part Number 500 001724 00

## Technical Information

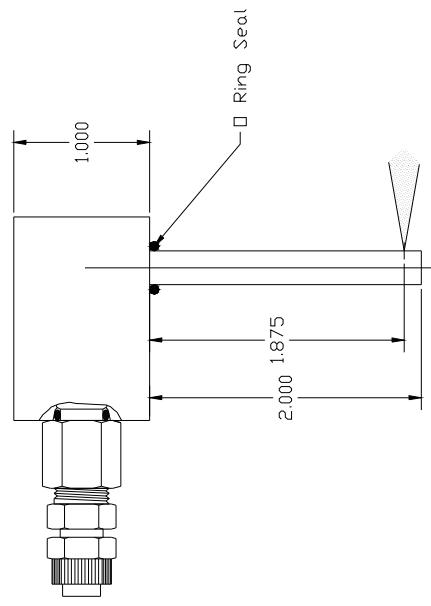
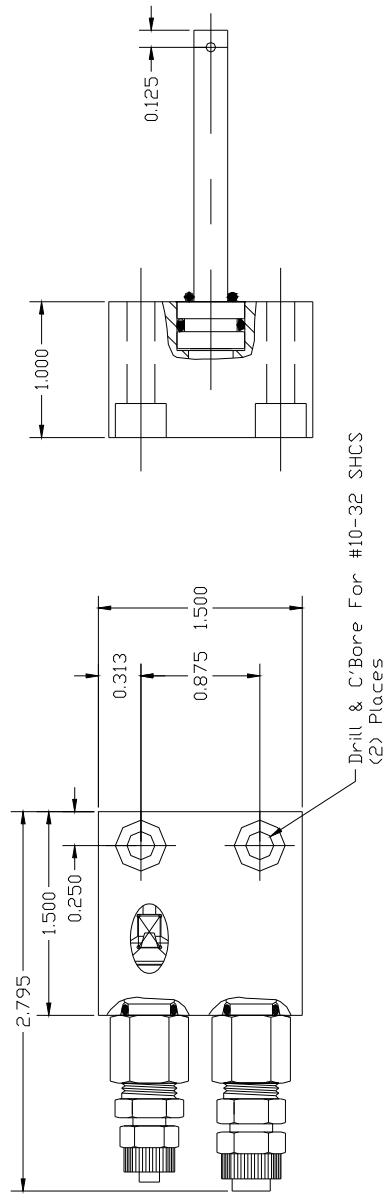


### Nozzle Assembly 1 1/2" 90 Degree Body

3/8-24 SAE Swivel Tip

Part Number 500 001725 00

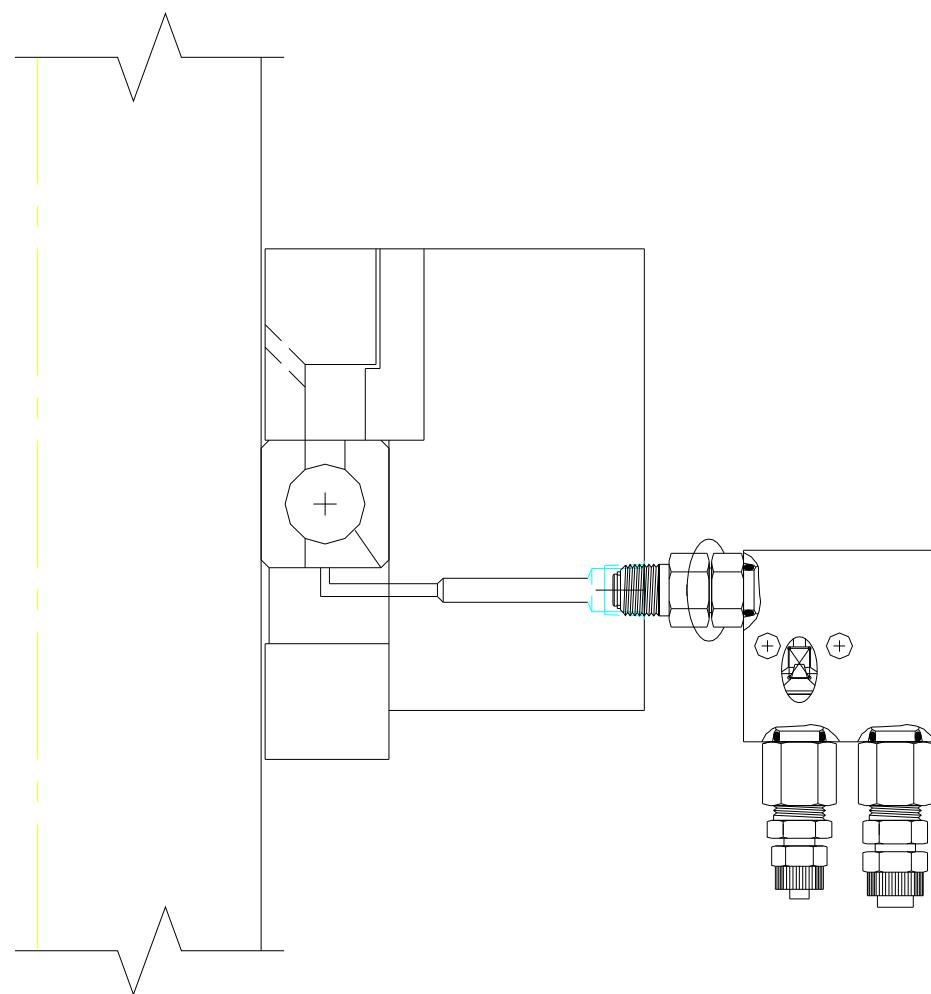
## Technical Information



**Nozzle Assembly 1 1/2" Low Profile Body**  
With Spindle Orifice Extension  
Part Number 500 002218 00



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**Single Bearing**



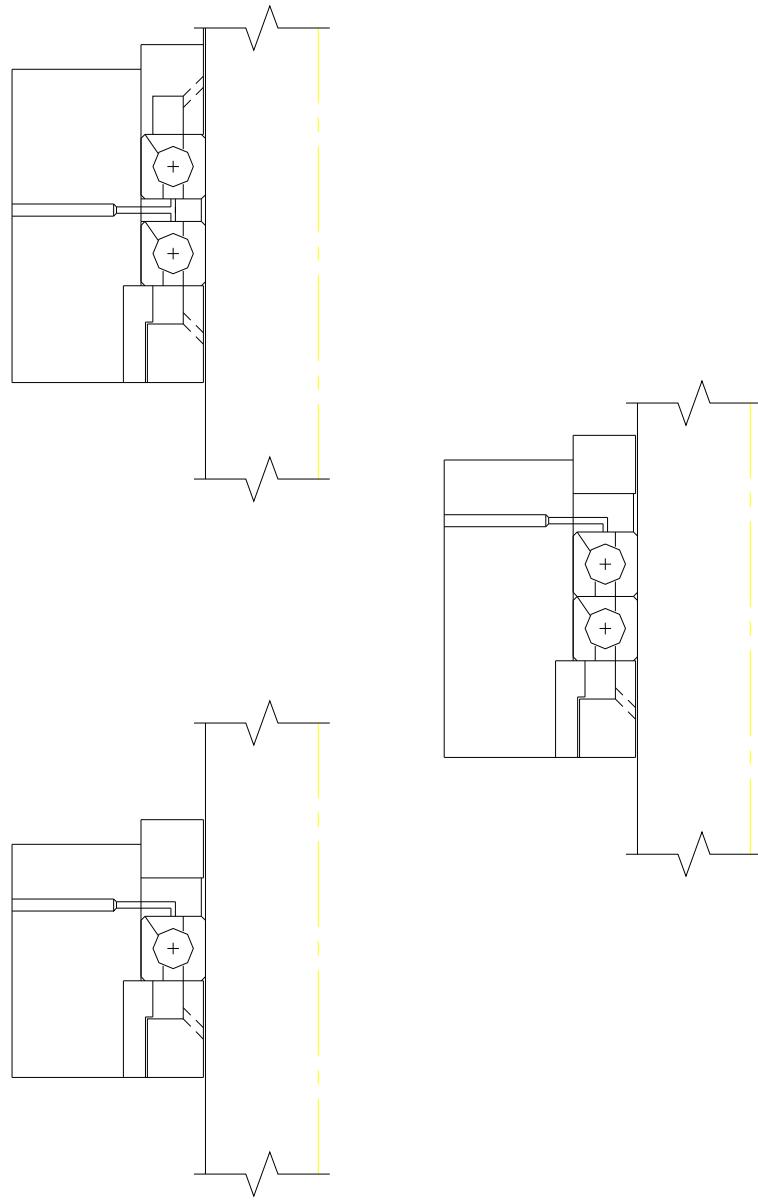
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## Technical Information

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## Typical Applications

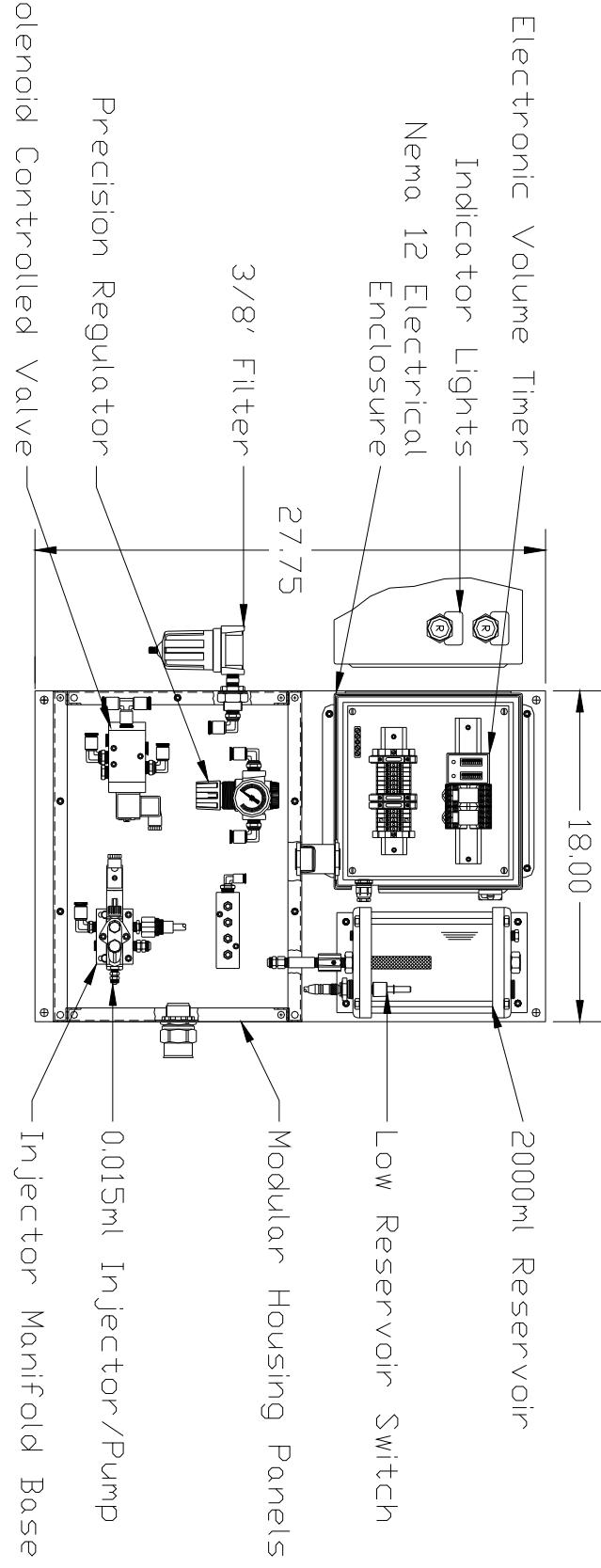


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## Technical Information



### Typical Spindle System Layout

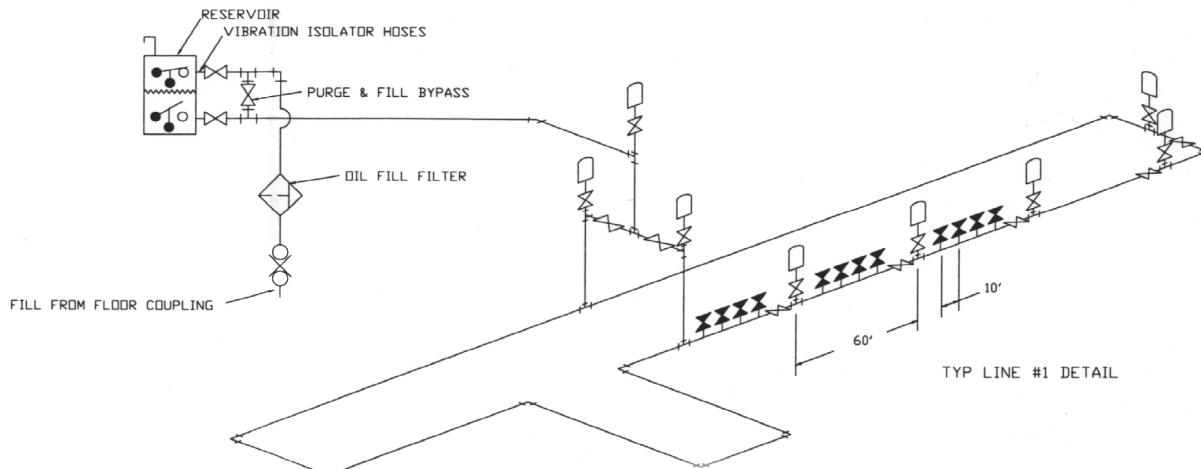


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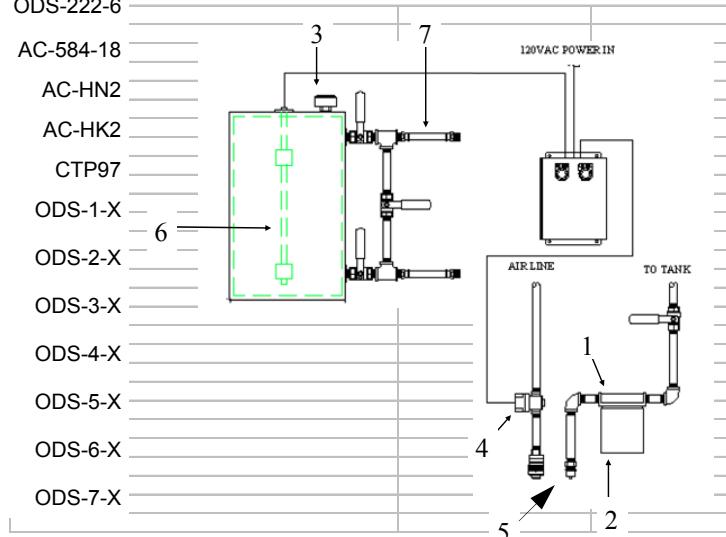
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# OIL DELIVERY SYSTEMS



Det.	DESCRIPTION	PART No.	SYSTEM FEATURES
30 Gallon	Reservoir with Standard Controls	ODS-C-S	Higher Volume Polyethylene Reservoir
30 Gallon	Reservoir with Auto Pump-Up Controls	ODS-C-P	• Reduction in Cost of Fill
30 Gallon	Polyethylene Reservoir Only	ODS-T-X	Electronic Controls
	Electronic Control Package Only	ODS-E-S	• Visual and / or Electronic Indication
	Electronic Control Package with Pump Up Controls	ODS-E-P	Gravity System
	Drum Pump Only	ODS-PUMP	• Simplicity by Design
	Air Hose to Pump	10705-68-P5-MO4R	System Capability - 1000 Lineal Feet Pipe
	Oil Hose from Pump	10707-128-M12R-DHS12	• Design by ACUMEN
	Portable Oil Fill Cart	AC-OFC97	
	Oil Header Vent	ODS-VENT	
	Poly Tubing, 3/8 OD Tube	ODS-222-6	
	Porous Bronze Filter Assembly - 3/8 Tube	AC-584-18	
	Central Fill Line Quick Disconnect Plug	AC-HN2	
	Central Fill Line Quick Disconnect Socket	AC-HK2	
	Capillary Tube Pliers	CTP97	
1	Complete Oil Filter Assembly	ODS-1-X	
2	Replacement Filter Element	ODS-2-X	
3	Replacement Breather For Reservoir	ODS-3-X	
4	Replacement Air Solenoid Valve	ODS-4-X	
5	Replacement Disconnect For Oil Fill	ODS-5-X	
6	Replacement HI-LO Switch Assembly	ODS-6-X	
7	Replacement Isolator Hose	ODS-7-X	



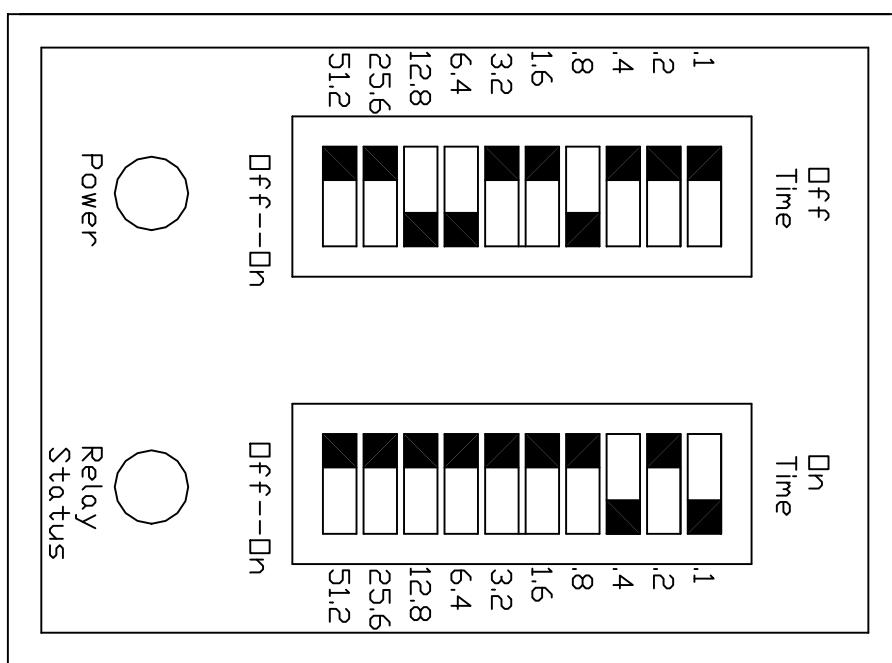
Your total system can be designed by Acumen Technologies, Inc. at no charge. Contact your technically trained, local Authorized Distributor for details.

## Technical Information

### Electronic Injector Volume Control Timer

Must be set at  
.5 Seconds

Optional Timing Range  
1 Second to 1023 Seconds  
In 1 Second Increments



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**Fluid Delivery Rate Chart For 0.015 ml Injector**

0.015 ml = 1/2 Drop    0.060 ml = 2 Drops    1 Gallon = 126,167 Drops  
0.030 ml = 1 Drop    1 Gallon = 3785 ml

Timer Setting	Fluid Delivery Rate In ml							
Seconds	Per Min	Per Hour	Per 8 Hour	Per 24 Hour	Per Week	Per Month	Per Year	
1	0.600	36.000	288.000	864.000	6,048.00	25,920.00	311,040.00	
2	0.360	21.600	172.800	518.400	3,628.80	15,552.00	186,624.00	
3	0.257	15.429	123.429	370.286	2,592.00	11,108.57	133,302.86	
4	0.200	12.000	96.000	288.000	2,016.00	8,640.00	103,680.00	
5	0.164	9.818	78.545	235.636	1,649.45	7,069.09	84,829.09	
6	0.138	8.308	66.462	199.385	1,395.69	5,981.54	71,778.46	
7	0.120	7.200	57.600	172.800	1,209.60	5,184.00	62,208.00	
8	0.106	6.353	50.824	152.471	1,067.29	4,574.12	54,889.41	
9	0.095	5.684	45.474	136.421	954.95	4,092.63	49,111.58	
10	0.086	5.143	41.143	123.429	864.00	3,702.86	44,434.29	
11	0.078	4.696	37.565	112.696	788.87	3,380.87	40,570.43	
12	0.072	4.320	34.560	103.680	725.76	3,110.40	37,324.80	
13	0.067	4.000	32.000	96.000	672.00	2,880.00	34,560.00	
14	0.062	3.724	29.793	89.379	625.66	2,681.38	32,176.55	
15	0.058	3.484	27.871	83.613	585.29	2,508.39	30,100.65	
16	0.055	3.273	26.182	78.545	549.82	2,356.36	28,276.36	
17	0.051	3.086	24.686	74.057	518.40	2,221.71	26,660.57	
18	0.049	2.919	23.351	70.054	490.38	2,101.62	25,219.46	
19	0.046	2.769	22.154	66.462	465.23	1,993.85	23,926.15	
20	0.044	2.634	21.073	63.220	442.54	1,896.59	22,759.02	
21	0.042	2.512	20.093	60.279	421.95	1,808.37	21,700.47	
22	0.040	2.400	19.200	57.600	403.20	1,728.00	20,736.00	
23	0.038	2.298	18.383	55.149	386.04	1,654.47	19,853.62	
24	0.037	2.204	17.633	52.898	370.29	1,586.94	19,043.27	
25	0.035	2.118	16.941	50.824	355.76	1,524.71	18,296.47	
26	0.034	2.038	16.302	48.906	342.34	1,467.17	17,606.04	
27	0.033	1.964	15.709	47.127	329.89	1,413.82	16,965.82	
28	0.032	1.895	15.158	45.474	318.32	1,364.21	16,370.53	
29	0.031	1.831	14.644	43.932	307.53	1,317.97	15,815.59	
30	0.030	1.770	14.164	42.492	297.44	1,274.75	15,297.05	
31	0.029	1.714	13.714	41.143	288.00	1,234.29	14,811.43	
32	0.028	1.662	13.292	39.877	279.14	1,196.31	14,355.69	
33	0.027	1.612	12.896	38.687	270.81	1,160.60	13,927.16	
34	0.026	1.565	12.522	37.565	262.96	1,126.96	13,523.48	
35	0.025	1.521	12.169	36.507	255.55	1,095.21	13,142.54	
36	0.025	1.479	11.836	35.507	248.55	1,065.21	12,782.47	
37	0.024	1.440	11.520	34.560	241.92	1,036.80	12,441.60	
38	0.023	1.403	11.221	33.662	235.64	1,009.87	12,118.44	
39	0.023	1.367	10.937	32.810	229.67	984.30	11,811.65	
40	0.022	1.333	10.667	32.000	224.00	960.00	11,520.00	
41	0.022	1.301	10.410	31.229	218.60	936.87	11,242.41	
42	0.021	1.271	10.165	30.494	213.46	914.82	10,977.88	
43	0.021	1.241	9.931	29.793	208.55	893.79	10,725.52	
44	0.020	1.213	9.708	29.124	203.87	873.71	10,484.49	
45	0.020	1.187	9.495	28.484	199.38	854.51	10,254.07	

**Fluid Delivery Rate Chart For 0.015 ml Injector**

0.015 ml = 1/2 Drop    0.060 ml = 2 Drops    1 Gallon = 126,167 Drops  
0.030 ml = 1 Drop    1 Gallon = 3785 ml

Timer Setting	Fluid Delivery Rate In ml						
Seconds	Per Min	Per Hour	Per 8 Hour	Per 24 Hour	Per Week	Per Month	Per Year
46	0.019	1.161	9.290	27.871	195.10	836.13	10,033.55
47	0.019	1.137	9.095	27.284	190.99	818.53	9,822.32
48	0.019	1.113	8.907	26.722	187.05	801.65	9,619.79
49	0.018	1.091	8.727	26.182	183.27	785.45	9,425.45
50	0.018	1.069	8.554	25.663	179.64	769.90	9,238.81
51	0.017	1.049	8.388	25.165	176.16	754.95	9,059.42
52	0.017	1.029	8.229	24.686	172.80	740.57	8,886.86
53	0.017	1.009	8.075	24.224	169.57	726.73	8,720.75
54	0.017	0.991	7.927	23.780	166.46	713.39	8,560.73
55	0.016	0.973	7.784	23.351	163.46	700.54	8,406.49
56	0.016	0.956	7.646	22.938	160.57	688.14	8,257.70
57	0.016	0.939	7.513	22.539	157.77	676.17	8,114.09
58	0.015	0.923	7.385	22.154	155.08	664.62	7,975.38
59	0.015	0.908	7.261	21.782	152.47	653.45	7,841.34
60	0.015	0.893	7.140	21.421	149.95	642.64	7,711.74
61	0.015	0.878	7.024	21.073	147.51	632.20	7,586.34
62	0.014	0.864	6.912	20.736	145.15	622.08	7,464.96
63	0.014	0.850	6.803	20.409	142.87	612.28	7,347.40
64	0.014	0.837	6.698	20.093	140.65	602.79	7,233.49
65	0.014	0.824	6.595	19.786	138.50	593.59	7,123.05
66	0.014	0.812	6.496	19.489	136.42	584.66	7,015.94
67	0.013	0.800	6.400	19.200	134.40	576.00	6,912.00
68	0.013	0.788	6.307	18.920	132.44	567.59	6,811.09
69	0.013	0.777	6.216	18.647	130.53	559.42	6,713.09
70	0.013	0.766	6.128	18.383	128.68	551.49	6,617.87
71	0.013	0.755	6.042	18.126	126.88	543.78	6,525.31
72	0.012	0.745	5.959	17.876	125.13	536.28	6,435.31
73	0.012	0.735	5.878	17.633	123.43	528.98	6,347.76
74	0.012	0.725	5.799	17.396	121.77	521.88	6,262.55
75	0.012	0.715	5.722	17.166	120.16	514.97	6,179.60
76	0.012	0.706	5.647	16.941	118.59	508.24	6,098.82
77	0.012	0.697	5.574	16.723	117.06	501.68	6,020.13
78	0.011	0.688	5.503	16.510	115.57	495.29	5,943.44
79	0.011	0.679	5.434	16.302	114.11	489.06	5,868.68
80	0.011	0.671	5.366	16.099	112.70	482.98	5,795.78
81	0.011	0.663	5.301	15.902	111.31	477.06	5,724.66
82	0.011	0.655	5.236	15.709	109.96	471.27	5,655.27
83	0.011	0.647	5.174	15.521	108.65	465.63	5,587.54
84	0.011	0.639	5.112	15.337	107.36	460.12	5,521.42
85	0.011	0.632	5.053	15.158	106.11	454.74	5,456.84
86	0.010	0.624	4.994	14.983	104.88	449.48	5,393.76
87	0.010	0.617	4.937	14.811	103.68	444.34	5,332.11
88	0.010	0.610	4.881	14.644	102.51	439.32	5,271.86
89	0.010	0.603	4.827	14.480	101.36	434.41	5,212.96
90	0.010	0.597	4.773	14.320	100.24	429.61	5,155.36

**Fluid Delivery Rate Chart For 0.015 ml Injector**

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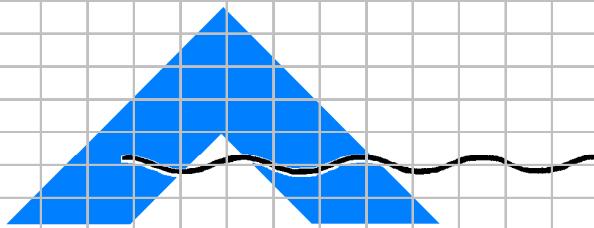
Timer Setting	Fluid Delivery Rate In ml						
Seconds	Per Min	Per Hour	Per 8 Hour	Per 24 Hour	Per Week	Per Month	Per Year
91	0.010	0.590	4.721	14.164	99.15	424.92	5,099.02
92	0.010	0.584	4.670	14.011	98.08	420.32	5,043.89
93	0.010	0.578	4.620	13.861	97.03	415.83	4,989.95
94	0.010	0.571	4.571	13.714	96.00	411.43	4,937.14
95	0.009	0.565	4.524	13.571	94.99	407.12	4,885.45
96	0.009	0.560	4.477	13.430	94.01	402.90	4,834.82
97	0.009	0.554	4.431	13.292	93.05	398.77	4,785.23
98	0.009	0.548	4.386	13.157	92.10	394.72	4,736.65
99	0.009	0.543	4.342	13.025	91.18	390.75	4,689.05
100	0.009	0.537	4.299	12.896	90.27	386.87	4,642.39
101	0.009	0.532	4.256	12.768	89.38	383.05	4,596.65
102	0.009	0.527	4.215	12.644	88.51	379.32	4,551.80
103	0.009	0.522	4.174	12.522	87.65	375.65	4,507.83
104	0.009	0.517	4.134	12.402	86.81	372.06	4,464.69
105	0.009	0.512	4.095	12.284	85.99	368.53	4,422.37
106	0.008	0.507	4.056	12.169	85.18	365.07	4,380.85
107	0.008	0.502	4.019	12.056	84.39	361.67	4,340.09
108	0.008	0.498	3.982	11.945	83.61	358.34	4,300.09
109	0.008	0.493	3.945	11.836	82.85	355.07	4,260.82
110	0.008	0.489	3.910	11.729	82.10	351.86	4,222.26
111	0.008	0.484	3.874	11.623	81.36	348.70	4,184.39
112	0.008	0.480	3.840	11.520	80.64	345.60	4,147.20
113	0.008	0.476	3.806	11.419	79.93	342.56	4,110.66
114	0.008	0.472	3.773	11.319	79.23	339.56	4,074.76
115	0.008	0.468	3.740	11.221	78.55	336.62	4,039.48
116	0.008	0.464	3.708	11.124	77.87	333.73	4,004.81
117	0.008	0.460	3.677	11.030	77.21	330.89	3,970.72
118	0.008	0.456	3.646	10.937	76.56	328.10	3,937.22
119	0.008	0.452	3.615	10.845	75.92	325.36	3,904.27
120	0.007	0.448	3.585	10.755	75.29	322.66	3,871.87
121	0.007	0.444	3.556	10.667	74.67	320.00	3,840.00
122	0.007	0.441	3.527	10.580	74.06	317.39	3,808.65
123	0.007	0.437	3.498	10.494	73.46	314.82	3,777.81
124	0.007	0.434	3.470	10.410	72.87	312.29	3,747.47
125	0.007	0.430	3.442	10.327	72.29	309.80	3,717.61
126	0.007	0.427	3.415	10.245	71.72	307.35	3,688.22
127	0.007	0.424	3.388	10.165	71.15	304.94	3,659.29
128	0.007	0.420	3.362	10.086	70.60	302.57	3,630.82
129	0.007	0.417	3.336	10.008	70.05	300.23	3,602.78
130	0.007	0.414	3.310	9.931	69.52	297.93	3,575.17
131	0.007	0.411	3.285	9.856	68.99	295.67	3,547.98
132	0.007	0.408	3.260	9.781	68.47	293.43	3,521.21
133	0.007	0.404	3.236	9.708	67.96	291.24	3,494.83
134	0.007	0.401	3.212	9.636	67.45	289.07	3,468.85
135	0.007	0.399	3.188	9.565	66.95	286.94	3,443.25

**Fluid Delivery Rate Chart For 0.015 ml Injector**

0.015 ml = 1/2 Drop    0.060 ml = 2 Drops    1 Gallon = 126,167 Drops  
0.030 ml = 1 Drop    1 Gallon = 3785 ml

Timer Setting	Fluid Delivery Rate In ml						
Seconds	Per Min	Per Hour	Per 8 Hour	Per 24 Hour	Per Week	Per Month	Per Year
136	0.007	0.396	3.165	9.495	66.46	284.84	3,418.02
137	0.007	0.393	3.142	9.425	65.98	282.76	3,393.16
138	0.006	0.390	3.119	9.357	65.50	280.72	3,368.66
139	0.006	0.387	3.097	9.290	65.03	278.71	3,344.52
140	0.006	0.384	3.075	9.224	64.57	276.73	3,320.71
141	0.006	0.382	3.053	9.159	64.11	274.77	3,297.24
142	0.006	0.379	3.032	9.095	63.66	272.84	3,274.11
143	0.006	0.376	3.010	9.031	63.22	270.94	3,251.29
144	0.006	0.374	2.990	8.969	62.78	269.07	3,228.79
145	0.006	0.371	2.969	8.907	62.35	267.22	3,206.60
146	0.006	0.369	2.949	8.846	61.92	265.39	3,184.71
147	0.006	0.366	2.929	8.786	61.51	263.59	3,163.12
148	0.006	0.364	2.909	8.727	61.09	261.82	3,141.82
149	0.006	0.361	2.890	8.669	60.68	260.07	3,120.80
150	0.006	0.359	2.870	8.611	60.28	258.34	3,100.07
151	0.006	0.356	2.851	8.554	59.88	256.63	3,079.60
152	0.006	0.354	2.833	8.498	59.49	254.95	3,059.41
153	0.006	0.352	2.814	8.443	59.10	253.29	3,039.48
154	0.006	0.350	2.796	8.388	58.72	251.65	3,019.81
155	0.006	0.347	2.778	8.334	58.34	250.03	3,000.39
156	0.006	0.345	2.760	8.281	57.97	248.43	2,981.21
157	0.006	0.343	2.743	8.229	57.60	246.86	2,962.29
158	0.006	0.341	2.726	8.177	57.24	245.30	2,943.60
159	0.006	0.339	2.708	8.125	56.88	243.76	2,925.14
160	0.006	0.336	2.692	8.075	56.52	242.24	2,906.92
161	0.006	0.334	2.675	8.025	56.17	240.74	2,888.92
162	0.006	0.332	2.658	7.975	55.83	239.26	2,871.14
163	0.006	0.330	2.642	7.927	55.49	237.80	2,853.58
164	0.005	0.328	2.626	7.878	55.15	236.35	2,836.23
165	0.005	0.326	2.610	7.831	54.82	234.92	2,819.09
166	0.005	0.324	2.595	7.784	54.49	233.51	2,802.16
167	0.005	0.322	2.579	7.737	54.16	232.12	2,785.43
168	0.005	0.320	2.564	7.691	53.84	230.74	2,768.90
169	0.005	0.319	2.549	7.646	53.52	229.38	2,752.57
170	0.005	0.317	2.534	7.601	53.21	228.04	2,736.42
171	0.005	0.315	2.519	7.557	52.90	226.71	2,720.47
172	0.005	0.313	2.504	7.513	52.59	225.39	2,704.70
173	0.005	0.311	2.490	7.470	52.29	224.09	2,689.11
174	0.005	0.309	2.476	7.427	51.99	222.81	2,673.70
175	0.005	0.308	2.462	7.385	51.69	221.54	2,658.46
176	0.005	0.306	2.448	7.343	51.40	220.28	2,643.40
177	0.005	0.304	2.434	7.301	51.11	219.04	2,628.51
178	0.005	0.303	2.420	7.261	50.82	217.82	2,613.78
179	0.005	0.301	2.407	7.220	50.54	216.60	2,599.22
180	0.005	0.299	2.393	7.180	50.26	215.40	2,584.82

# NOTES



ACUMEN TECHNOLOGIES, INC.



## ACUMEN TECHNOLOGIES, INC.

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