FloMov

Airlift Pumps

FloNergia's FloMov family of pumps are designed specifically for Aquaculture, Aquaponic and Hydroponic applications. They offer a well-engineered, patented, dual-injector airlift pump solution that uses significantly less energy than conventional centrifugal pump/aerator systems.

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FloMov

Airlift Pumps

Creating energy efficient, rich water flow

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FloMov pumps are the perfect solution for providing water circulation and aeration in a single device for your application.

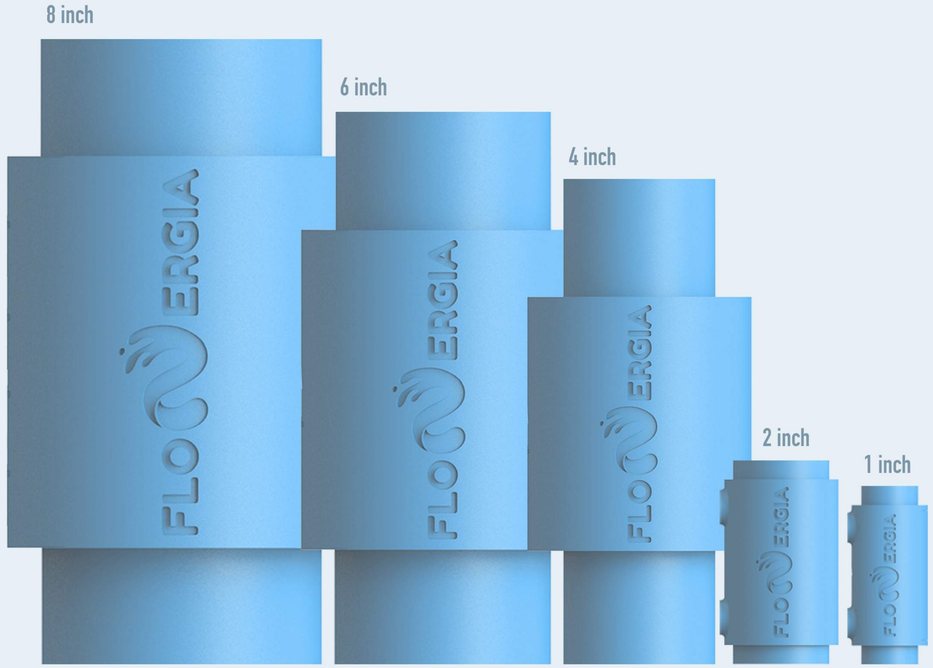
50-70%
ENERGY SAVINGS*

FloMov pumps are best integrated with regenerative blowers to maximize energy savings. Regenerative blowers provide the required air flow rates at the required pressure range with higher efficiency than alternatives such as compressed air.

1. Minimal maintenance requirements - no moving parts in the pump.
2. High ability to handle solid water mixtures.
3. Improved water aeration with the ability to operate using other injection gases if needed.
4. Reduced noise levels during maximum use.

Available Sizes

With a wide range of readily available sizes, our pumps serve the needs of producers large and small. FloNergia offers custom designed solutions for an even wider variety of applications and sizes.



* compared to systems using centrifugal pumps.

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Applications

Aquaculture

Hydroponics

Aquaponics

Wastewater

Technical Specifications

FloMov pump output varies with the submergence ratio. The **submergence ratio** is defined as the ratio between the static water head available above the pump to the total length of delivery pipe. The higher the submergence ratio, the higher the flow rate generated for a given air flow rate.

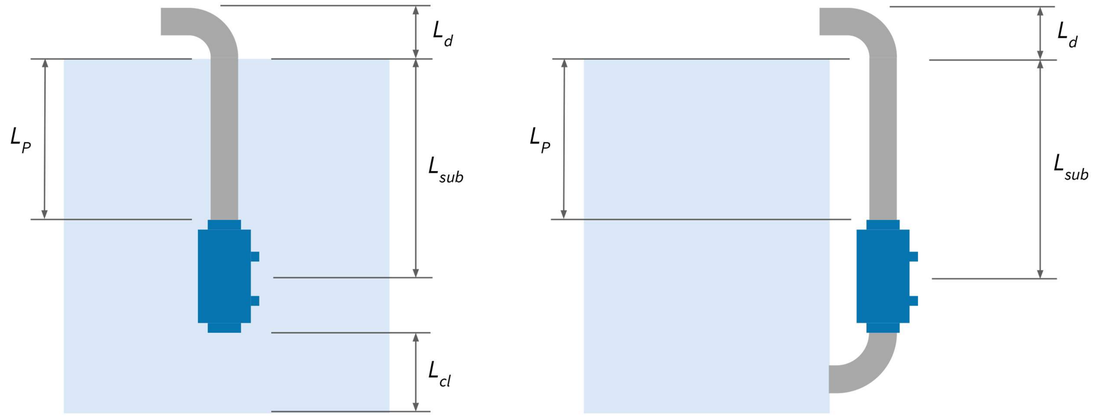
$$SR = \frac{L_{sub}}{L_{sub} + L_d}$$

FloMov pumps require a **minimum clearance** between the pump inlet side and the bottom of the body of water it is submerged in, if installed with no attachments to the pump inlet side, of at least one pump diameter.

$$L_{cl_{min}} = 1D$$

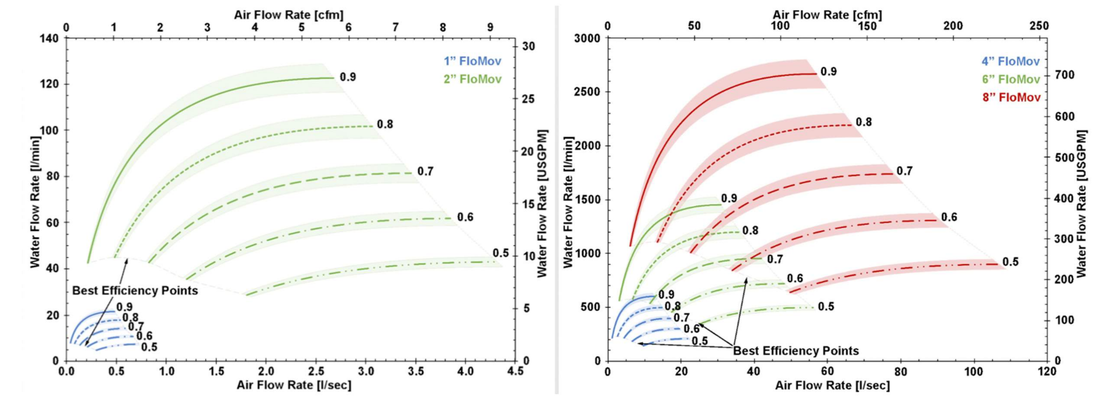
FloMov pumps require a **minimum straight pipe section** on the delivery side before any outlet elbow attachment of two pump diameters.

$$L_{p_{min}} = 2D$$



Performance Data

Performance data for FloMov pumps at different submergence ratios can be determined from the following table or figures. It is important to note that we do not recommend operating the pumps at submergence ratios below 0.5. We also do not recommend adding any fittings to the pump outlet side in addition to a straight pipe and an elbow.



FloMov pump performance curves for submergence ratios from 0.5 to 0.9. Shaded areas on the curves represent the expected variability in pump performance due to several factors including variations in installation, different inlet/outlet fittings, varying air inlet flaw distribution, and varying aeration needs.

Technical Specifications

Pump Size	Submergence Ratio	Best Efficiency: Water Flow Rate*		Best Efficiency: Required Air Flow Rate		Best Efficiency: Estimated Power Consumption+	Maximum Water Flow[2]: Water Flow Rate*		Maximum Water Flow[2]: Required Air Flow Rate		Maximum Water Flow[2]: Estimated Power Consumption+	Required Air Pressure	*Connection Type[3]*	
Inch (mm)		**LPM**	GPM	**LPS**	CFM	W	**LPM**	GPM	**LPS**	CFM	W		Water	Air
1 (25)	0.9	**8**	2.2	**0.05**	0.1	0.8	**22**	6	**0.5**	1	8	10% above static pressure at air injection depth	PVC Pipe Socket	1 /4" NPT threaded holes
	0.8	**7.5**	2	**0.1**	0.2	1.6	**18**	4.75	**0.55**	1.2	8.7			
	0.7	**7**	1.8	**0.15**	0.3	2.4	**15**	4	**0.6**	1.3	9.5			
	0.6	**6**	1.6	**0.2**	0.4	3.2	**11**	3	**0.65**	1.4	10.3			
	0.5	**5**	1.3	**0.3**	0.6	4.7	**7.5**	2	**0.7**	1.5	11			
2 (50)	0.9	**43**	11.5	**0.2**	0.4	3.2	**123**	32.5	**2.7**	5.7	42.5			
	0.8	**45**	12	**0.5**	1	8	**102**	27	**3**	6.5	47			
	0.7	**43**	11.5	**0.8**	1.7	12.5	**82**	22	**3.5**	7.5	55			
	0.6	**36**	9.5	**1.2**	2.5	19	**62**	16.5	**4**	8.5	63			
	0.5	**29**	8	**1.8**	3.8	28.5	**43**	11.5	**4.5**	9.5	71			
4 (101)	0.9	**216**	57	**1**	2	16	**600**	159	**13**	28	204		PVC SCH 40 Pipe Extension	1 " NPT threaded holes
	0.8	**235**	62	**3**	6	47	**500**	132	**15**	32	236			
	0.7	**215**	57	**4**	8	63	**400**	106	**17**	36	267			
	0.6	**185**	49	**7**	15	110	**300**	79	**20**	42	314			
	0.5	**145**	38	**10**	21	157	**210**	56	**22**	47	346			
6 (152)	0.9	**565**	149	**2**	6	47	**1450**	383	**30**	64	472			
	0.8	**576**	152	**7**	15	110	**1200**	317	**36**	76	566			
	0.7	**537**	142	**12**	25	189	**955**	252	**42**	89	660			
	0.6	**456**	120	**17**	36	267	**720**	190	**48**	102	755			
	0.5	**347**	92	**25**	53	393	**500**	132	**56**	118	880			
8 (203)	0.9	**1070**	283	**6**	13	95	**2685**	710	**56**	118	880			
	0.8	**1050**	277	**13**	28	204	**2190**	579	**66**	140	1037			
	0.7	**1008**	266	**23**	49	361	**1738**	459	**78**	165	1226			
	0.6	**843**	223	**34**	72	534	**1307**	345	**91**	193	1430			
	0.5	**640**	169	**50**	106	786	**900**	238	**107**	227	1682			

1 Best efficiency points represent the operating points for the given size and submergence ratio where the pump generates the reported water flow rate at the best operating efficiency.

2 Maximum water flow points represent the highest generated water flow rates for the given size and submergence ratio. Increasing air flow beyond these values will result in improved aeration but will not result in improved water flow rate.

3 Alternate connection types are available upon request.

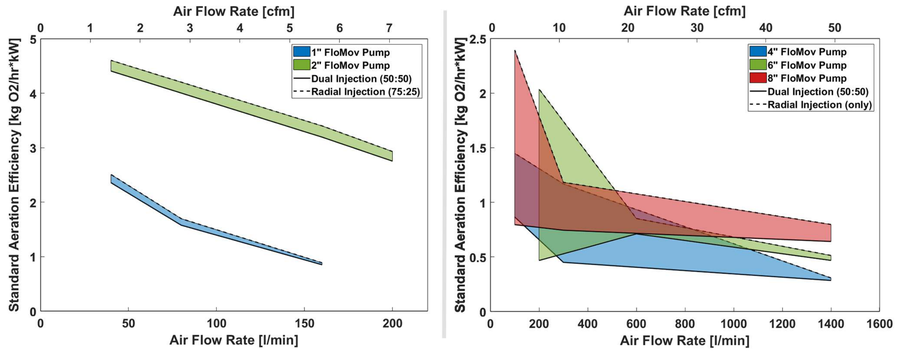
** It is expected that pump output will vary from the values indicated in the table due to several factors including variations in installation, different inlet/outlet fittings, varying air inlet flow distribution and varying aeration needs.*

+ Power consumption is estimated based on an air injection pressure of11 kPa (1.6 psi) which is equivalent to a submergence depth of1 m (3 ft), and a combined blower/motor efficiency of 70%. Actual power consumption will vary based on actual installation conditions.

Technical Specifications

Aeration Data

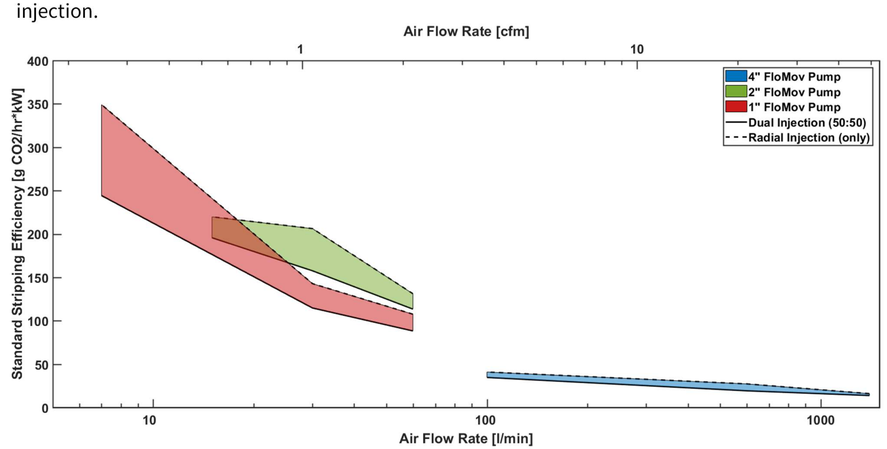
Aeration data for FloMov pumps of different sizes, given as standard aeration efficiency values, can be determined from the following figures. It is important to note that these figures were obtained at a submergence ratio of 0.9. The shaded areas represent the range of aeration efficiencies to be expected when air injection is changed from 50% radial / 50% axial to 100% radial injection.



FloMov pump aeration performance curves for a submergence ratio of 0.9. Shaded areas on the curves represent the expected variation of pump aeration performance as air injection is changed from 50% radial / 50% axial injection to 100% radial injection.

Carbon Dioxide Stripping

Carbon Dioxide stripping performance for FloMov pumps of different sizes, given as standard stripping efficiency values, can be determined from the following figure. It is important to note that this figure was obained at a submergence ratio of 0.9. The shaded areas represent the range of stripping efficiencies to be expected when air injection is changed from 50% radial / 50% axial to 100% radial injection.



FloMov pump carbon dioxide stripping performance curves for a submergence ratio of 0.9. Shaded areas on the curves represent the expected variation of pump carbon dioxide stripping performance as air injection is changed from 100% radial injection to 50% radial / 50% axial injection. Aeration and carbon dioxide stripping data is based on a controlled study in a labratory setting, values may differ due to varying external factors depending on the application.

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Return on Investment

The below table provides a comparative summary of the cost of owning and operating a FloMov system consisting of a FloMov pump matched with an appropriate blower vs a typical mechanical pump and aeration system providing similar flow and aeration performance. This analysis exclusively relies on energy savings and does not factor in maintenance or any additional costs. Moreover, it is specifically based on a test case for the Canadian market, without considering local market price differences or shipping charges.

System	Output		Operating Power Requirement	Comparative Assessment		
				Capital Investment	Energy Consumption	Annual Energy Savings*
	LPM	GPM	kW	%	%	MWh
FloMov 1 inch system[1]	38	10	0.035	59	19	1.31
Equivalent mechanical pump and aerator system[2]	42	11	0.185	100	100	0
FloMov 2 inch system[1]	125	33	0.19	125	70	0.70
Equivalent mechanical pump and aerator system[2]	125	33	0.27	100	100	0
FloMov 4 inch system[1]	617	163	0.3	101	38	4.38
Equivalent mechanical pump and aerator system[2]	606	160	0.8	100	100	0
FloMov 6 inch system[1]	1560	412	0.7	57	12	45.55
Equivalent mechanical pump and aerator system[2]	1438	380	5.9	100	100	0
FloMov 8 inch system[1]	2582	682	1.86	67	15	91.72
Equivalent mechanical pump and aerator system[2]	2582	662	12.33	100	100	0

**Energy Savings calculations are based on the difference in acquisition cost between the two systems divided by the annual energy savings.*

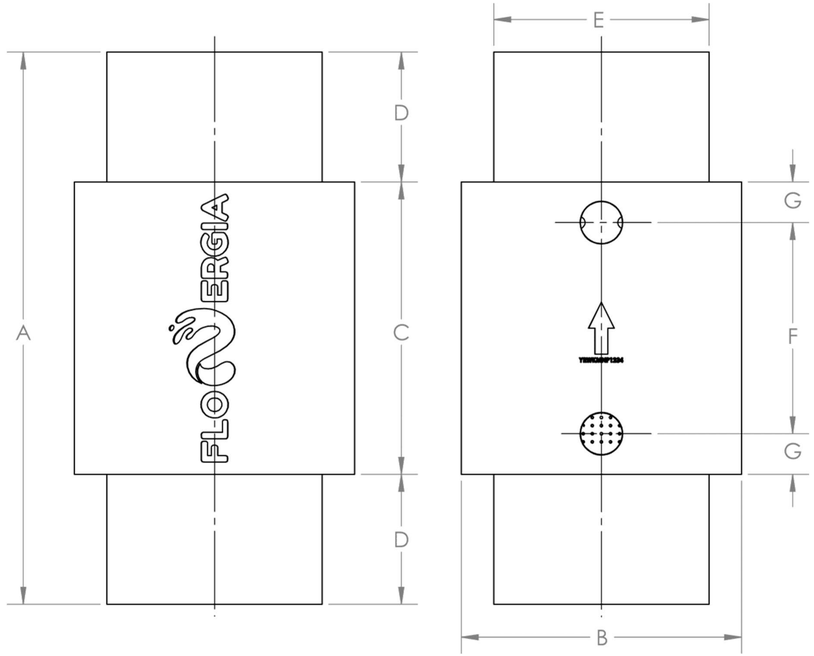
1 FloMov systems contain the equivalent size FloMov pump matched to an appropriately sized regenerative blower (diaphragm blower in case of the 1 inch system). Performance of the FloMov pumps in terms of water flow and aeration is based on a submergence ratio of 0.9.

2 The equivalent system constitutes a comparably sized mechanical pump capable of producing a similar water flow rate coupled with and aeration system that provides similar aeration performance to the FloMov pump.

Pump Dimensions

Pump Size	*A*	*B*	*C*	*D*	*E*	*F*	*G*
1	5.5	2.65	4.1	0.7	1.715	2.8	0.65
2	6.25	3.67	4.85	0.7	2.775	3.55	0.65
4	15	6.625	7	4	4.5	4.5	1.25
6	17	8.625	9	4	6.625	6.5	1.25
8	19	10.75	11	4	8.625	8.5	1.25

All measurements are in inches



Distributors

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