Hydro-pneumatic Membrane Tanks
Installation & Tank Sizing

ZU / ZH / GB Series

Applications

Heating (6 bars)

- Industrial Heating systems
- Solar energy Systems (Nitrile Membrane)
- Pressure boiler feeding Systems (SBR Membrane)

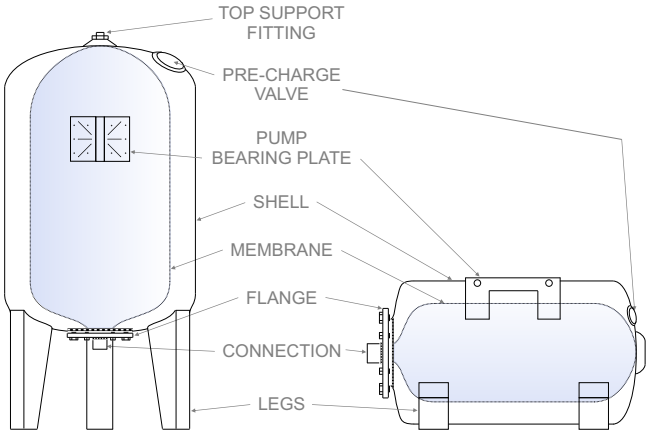
Water Tank (10 & 16 bars)

- Water boosting Systems
- Residential & Commercial Well Water
- Irrigation & Fire-fighting Systems
- Civil buildings & High pressure Applications
- Pure water Treating Systems
- Sea water Application
- Refining & Chemical Industries
- Industrial washing Systems / Car washing
- Reverse Osmosis / Filteration
- Pharmaceutical Industries
- Water hammer arresting

Concept

- The membrane water tank is an important element for a long lasting and regularly working potable water distribution system.
- The function of the tank is to increase the pressure with which adequate amount of water reaches the end-user.
- Problems are faced specially in flat areas and in periods when the water networks are bought to the limit, the pressure from local water systems could be insufficient for reaching the demand made by high or distant buildings.
- Installation of a pump is required at the main feed to guarantee water flow to the end user, even when the pressure falls below the minimum required for normal water usage.
- The water tank installation would compensate the difference between how much is supplied by the pump and the amount requested, Therefore limiting the number of pump start-ups during irregular demands. Hence h a v i n g crucial amounts of energy.
- These water tanks are suited for all types of water systems: Industrial, home and agricultural.
- The membranes are balloon-shaped and are directly attached to the flange (where ever applicable) avoiding any contact between the water and metal surfaces of the tank, hence no rust. Furthermore, the introduction of the membrane after tank painting preserves its elasticity, impermeability and non-toxicity.
- All these products together with the special engineered membrane is manufactured under the same roof, therefore supervising the heart of a trustworthy membrane tank.

Product Details



Construction

Shell material	Standard	Cold Pressed Carbon Steel
	Hostile condition	Stainless Steel & Galvanized
Pressure		10 & 16 kg/cm^{2}g (bars)
Membrane Type		Fixed & Replaceable
Membrane Material		Butyl & EPDM
Flange		Carbon steel, SS & Galvanized
End connections		Axial & Radial
Maximum Working Temperature		+70°C Vessel
		+99°C System

Publication Reference : **Flowmatics F204/2009 Rev.00**

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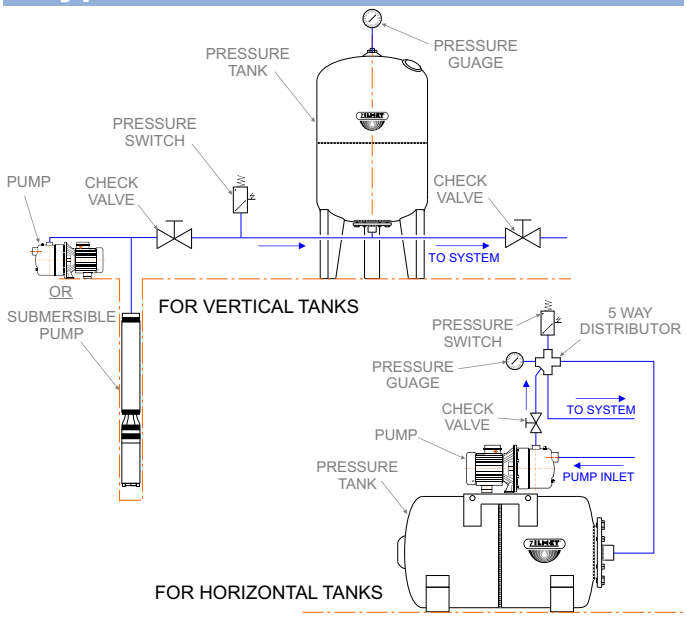
Advantages

- The membrane tank is suitable for all types of water even corrosive water
- Water comes into contact only with the membrane, therefore eliminating the possibility of corrosion / rust
- Ease in replacing membrane & low maintenance
- The membrane is made of butyl or EPDM rubber - is suitable for drinking water
- The draw down volume of the membrane tank is much greater than that of a normal tank
- Compact installation and lower investment
- Eliminates the requirement of an air feeder
- Quick and inexpensive assembly
- The membrane does not rub against the wall hence ensuring longer life
- Arresting water hammer caused due to sudden start / stop of pump, damaging pipe walls & increase of water velocity
- CE & ISO 9001-2000 certification

Typical Installations



Tank Sizing

Inputs ①

There are three factors to be considered when selecting the proper size tank for any water system

- The pump delivery rate or max flow of system
  A:[eg. 120 l/min] **B:[eg. 190 l/min]**
- The minimum running time of pump or pump power
  A:[eg. 0.8 min] **B:[eg. 4 kW]**
- The minimum and maximum system pressure
  [eg. 2 & 4 bar]

Calculations (Drawdown) ②

Two methods for calculating drawdown of the tank

- Multiply pump delivery rate by minimum running time of pump **A:[eg. 120 X 0.8 = 96 litres]**
- Find value of K from table by knowing your kW and multiply K with max flow of system **B:[eg. 190 X 0.5 = 95 litres]**

P (kW)	1	2	3	4	5	6	8	10
K	0.25	0.33	0.42	0.50	0.58	0.66	0.83	1.00

Calculations (Tank Size) ③

- Divide drawdown by the drawdown factor, find drawdown factor (from table below)

(factor is based on boyle's law)

MAXIMUM SYSTEM PRESSURE (CUT-OUT) **PSIG**/(kPa)/bar	MINIMUM SYSTEM PRESSURE (CUT-IN) **PSIG**/(kPa)/bar																		
	20 (138) 1.38	**25** (173) 1.72	**30** (207) 2.06	**35** (242) 2.41	**40** (276) 2.76	**45** (311) 3.10	**50** (345) 3.45	**55** (380) 3.80	**60** (414) 4.16	**65** (449) 4.48	**70** (483) 4.83	**75** (518) 5.17	**80** (552) 5.51	**85** (587) 5.86	**90** (621) 6.20	**95** (656) 6.55	**100** (690) 6.89	**105** (725) 7.24	**110** (759) 7.58
30/(207)/2.06	.21																		
35/(242)/2.41	.28	.19																	
40/(276)/2.76	.34	.26	.17																
45/(311)/3.10	.39	.32	.24	.16															
50/(345)/3.45	.44	.37	.30	.22	.15														
55/(380)/3.80	.47	.41	.34	.28	.21	.14													
60/(414)/4.16	.50	.44	**.38**	.32	.26	.19	.13												
65/(449)/4.48	.53	.48	.42	.36	.30	.24	.18	.12											
70/(483)/4.83	.56	.50	.45	.40	.34	.29	.23	.17	.11										
75/(518)/5.17		.53	.48	.43	.38	.32	.27	.22	.16	.11									
80/(552)/5.51			.50	.46	.41	.36	.31	.26	.21	.15	.10								
85/(587)/5.86				.48	.43	.39	.34	.29	.24	.20	.15	.10							
90/(621)/6.20					.46	.42	.37	.32	.28	.23	.19	.14	.09						
95/(656)/6.55						.44	.40	.35	.31	.27	.22	.18	.13	.09					
100/(690)/6.89							.42	.38	.34	.30	.26	.21	.17	.13	.09				
105/(725)/7.24								.41	.37	.33	.29	.25	.20	.16	.13	.08			
110/(759)/7.58									.39	.35	.31	.27	.24	.20	.16	.12	.08		
115/(794)/7.92										.38	.34	.30	.26	.23	.19	.15	.11	.08	
120/(828)/8.27											.36	.33	.29	.25	.22	.18	.15	.11	.07
125/(863)/8.62												.35	.32	.28	.25	.21	.18	.14	.11

Eg. Drawdown = 96 litres, cut-in pressure= 2 bar, cut-out pressure = 4 bar, hence drawdown factor from table = 0.38 (may vary depending on systems variables)

Exact Volume = (96) / (0.38) = 252 litres, Hence in this case a tank of 250 litres should be used

Publication Reference : **Flowmatics F204/2009 Rev.00**