

# HydroLine

## Bladder Expansion Vessels



For All Professional  
Water System Applications



# Compact design features that set new century standards

## BEV-SERIES



### VERTICAL AND HORIZONTAL REPLACEABLE-DIAPHRAGM TANKS PAINTED STEEL

Applications	Domestic, Industry Agriculture water supply system. Pressure boosting system.
Capacity	12-24-60-100-200-300-500-750-1000 L (Vertical) 100-200-300 L (Horizontal)
Colour	Blue
Flange	Painted steel
Tank Material	Painted steel
Diaphragm Mat.	Natural or butyl rubber
Diaphragm Type	Replaceable
Connection	ø 1" (12-24-60-100 L) ø 1½" (200-300-500 L), ø 2" (750-1000 L)

## NXV-SERIES



### VERTICAL AND HORIZONTAL - DIAPHRAGM TANKS STAINLESS STEEL

Applications	Domestic, Industry Agriculture water supply system. Pressure boosting system.
Capacity	12-24-60-100-200-300-500-750-1000 L (Vertical) 100-200-300 L (Horizontal)
Colour	Stainless Steel
Flange	AISI 304 stainless steel
Tank Material	AISI 304 stainless steel
Diaphragm Mat.	Natural or butyl rubber
Diaphragm Type	Replaceable
Connection	ø 1" (12-24-60-100 L) ø 1½" (200-300-500 L), ø 2" (750-1000 L)

## DESIGN FEATURES

- Vertical closed vessels
- Bladder vessel is suitable for all types of water, even corrosive water.
- Water only comes into contact with the bladder and so eliminates the possibility of corrosion.
- Complete range of capacities from 100 to 1,000 litres.
- Drawdown volume of the bladder vessel is much greater than that of a normal tank without a bladder.
- Replaceable one-piece natural rubber bladder.
- Two points fixed inside the vessel.
- Steel Shell coated with epoxy finish (Stainless Steel shell is option : Non-Tox series)
- Factory precharged a complete separation between air and water.
- No waterlogs.
- Pump and accessories can be fitted directly to the vessel.
- Economy and rapid assembly.

## Application

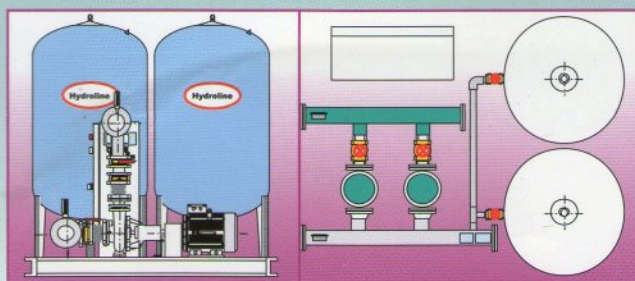
- Water booster system.
- Residential and commercial well water.
- Irrigation systems.
- Fire-fighting systems.
- HVAC expansion tanks.

## Advantages

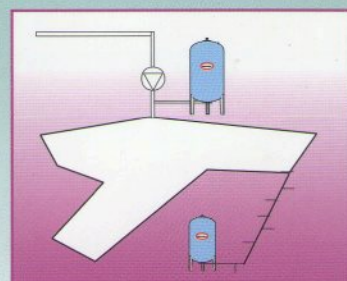
- Bladder made of natural rubber is suitable for food quality and drinking water.
- Easily interchangeable bladder with optimum service life.
- Easy and fast installation.
- Eliminates the requirement for an air feeder.
- Low maintenance requirement.

## Operating Limits

Temperature : 5 to 90 °C  
Working pressure : up to 10 bar  
Test Pressure : 15 bar



Hydroline Diaphragm tank are also used for high pressure booster applications, e.g. high rise buildings, irrigation system and community wells.



In the sprinkler system for a golf course, two Hydroline Diaphragm tank are used the larger BEV-500 protects and assures proper pump operation. While the smaller BEV-300 protects dead and lines from hammer and surge.



### Bladder Expansion Vessels Selection Table

PRESSURES IN BAR		BLADDER VESSEL CAPACITY IN LITRES												
Ps	Pp	8	12	24	50	60	100	200	300	500	750	1000	1500	2000
1.5	2.5	2.2	4.9	6.5	13.6	16.3	27.1	54	81	136	204	271	407	543
1.5	3	2.9	6.4	8.6	17.8	21.4	35.6	71	107	178	267	356	534	713
2	3	1.9	4.3	5.7	11.9	14.3	23.8	48	71	119	178	238	356	475
2	3.5	2.5	5.7	7.6	15.8	19.0	31.7	63	95	158	238	317	475	633
2.5	3.5	1.7	3.8	5.1	10.6	12.7	21.1	42	63	106	158	211	317	422
2.5	4	2.3	5.1	6.8	14.3	17.1	28.5	57	86	143	214	285	428	570
3	4	1.5	3.4	4.6	9.5	11.4	19.0	38	57	95	143	190	285	380
3	4.5	2.1	4.7	6.2	13.0	15.5	25.9	52	78	130	194	259	389	518
3	4	2.5	5.7	7.6	15.8	19.0	31.7	63	95	158	238	317	475	633
3.5	4.5	1.4	3.1	4.1	8.6	10.4	17.3	35	52	86	130	173	259	345
3.5	5	1.9	4.3	5.7	11.9	14.3	23.8	48	71	119	178	238	356	475
3.5	5.5	2.3	5.3	7.0	14.6	17.5	29.2	58	88	146	219	292	438	585
4	5	1.36	2.9	3.8	7.9	9.5	15.8	32	48	79	119	158	238	317
4	5.5	1.8	3.9	5.3	11.0	13.2	21.9	44	66	110	164	219	329	428
4	6	2.2	4.9	6.5	13.6	16.3	27.1	54	81	136	204	271	407	543
4.5	5.5	1.2	2.6	3.5	7.3	8.8	14.6	29	44	73	110	146	219	292
5	7	1.9	4.3	5.7	11.9	14.3	23.8	48	71	119	178	238	356	475
5	8	2.5	5.7	7.6	15.8	19.0	31.7	63	95	158	238	317	475	633
6	9	2.3	5.1	6.8	14.3	17.1	28.5	57	86	143	214	285	428	570
6	10	2.1	4.7	6.2	13.0	15.5	25.9	52	78	130	194	259	389	518

### Calculation

Determination of the vessel capacity based on the triggering (Ps), tripping pressure (Pp) and the effective water reserve.

Calculation of the effective water reserve using this general formula:

$$DV = \frac{16.5 \times Q}{n}$$

where:

Q : average outflow of the pump in l / min.

n : max. number of starts/hour (10 to 20)

Example :

Q = 10 m<sup>3</sup> / hour (165 l / min.).

n = 10 starts / hour.

Ps = 2 bar.

Pp = 3.5 bar.

DV = Effective water reserve

$$DV = 16.5 \times \frac{165}{10} = 272 \text{ litres}$$

In the opposite table, find the vessel capacity corresponding to the effective water reserve of 272 litres (or closest value), based on the Ps. and Pp. pressures.

Effective water reserve:  
-238 litres

Vessel capacity:  
-750 litres

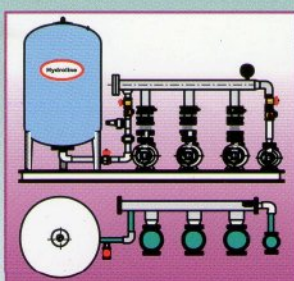
As you see, a large vessel gives you more drawdown which means that you would have more water available before the pump start. A large vessel also means the pump will cycle (turn on & off) long times and will run for longer periods of time which adds to pump life.

### Note :

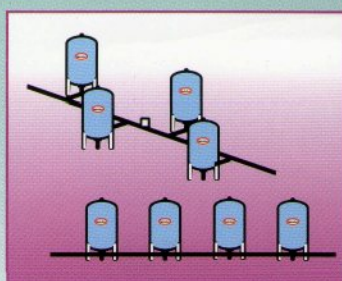
Ps = Start up pressure - (Pump start)

Pp = Shut off pressure - (Pump stop)

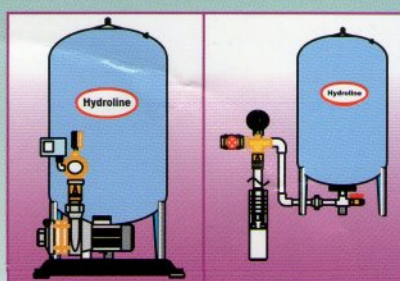
Do not forget to synchronise the tank preloading pressure which must be set below the pump start-up pressure (about 0.2 bar below).



In a municipal well system or pressure boosting station Hydroline Diaphragm tank are used to control sequential start of the main pumps. At the same time, it reduces surge and provides the jockey pump with guaranteed minimum run times during low peak demand periods.



Typical Multiple Hydroline Diaphragm tank.

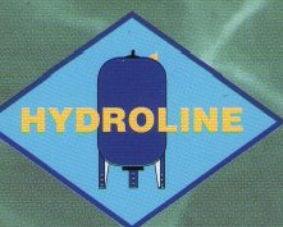
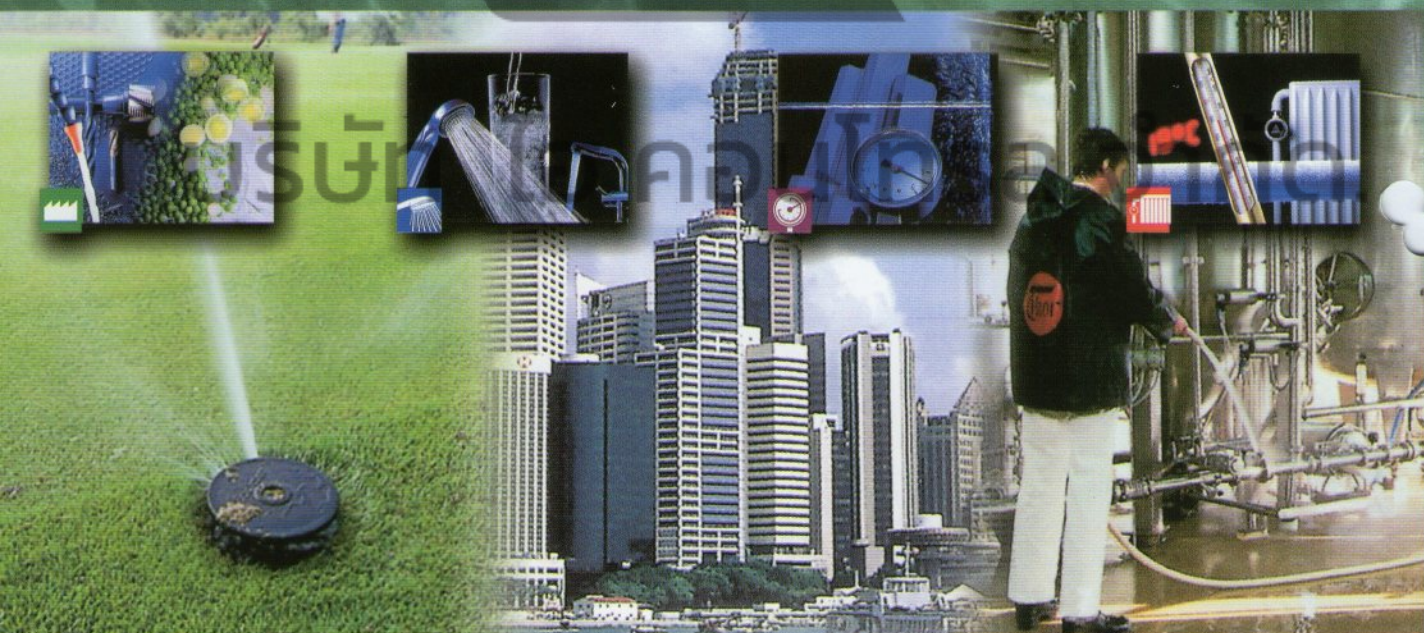


1. Pressure Switch and Pressure gauge
2. Gate Valve or Ball valve
3. Check valve
4. Union
5. Drain Valve



# HYDROLINE DIAPHRAGM TANK

Standard Model	Volume (litres)	Precharge Pressure(PSI)	Max. working Pressure(PSI)	Dimensions		Connection
				D(mm)	H(mm)	
BEV - 12	12	25	87	240	350	1"
BEV - 24	24	25	87	300	450	1"
BEV - 24 (แบบมีขาตั้ง)	24	25	87	300	570	1"
BEV - 60	60	35	100	380	850	1"
BEV - 100	100	35	150	450	965	1"
BEV - 200	200	35	150	550	1,275	1 1/2"
BEV - 300	300	35	150	630	1,440	1 1/2"
BEV - 500	500	35	150	780	1,590	1 1/2"
BEV - 750	750	35	150	780	2,040	2"
BEV - 1000	1000	35	150	940	2,040	2"
BEH - 100	100	35	150	570	825	1"
BEH - 200	200	35	150	670	1,055	1 1/2"
BEH - 300	300	35	150	750	1,250	1 1/2"



Distributor :