



Hydro-Pro Installation & Operations Guide



Installation & Maintenance Guide

Operation

The HYDRO-PRO range of Expansion Vessels is specifically designed for Unvented Potable Systems to deal with increased water volume resulting from heat expansion.

The purpose of these vessels is to accommodate the increased liquid volume which occurs during system heating in an Unvented Circuit. A pressurised membrane allows ingress/egress of the liquid only during periods of heating / cooling.

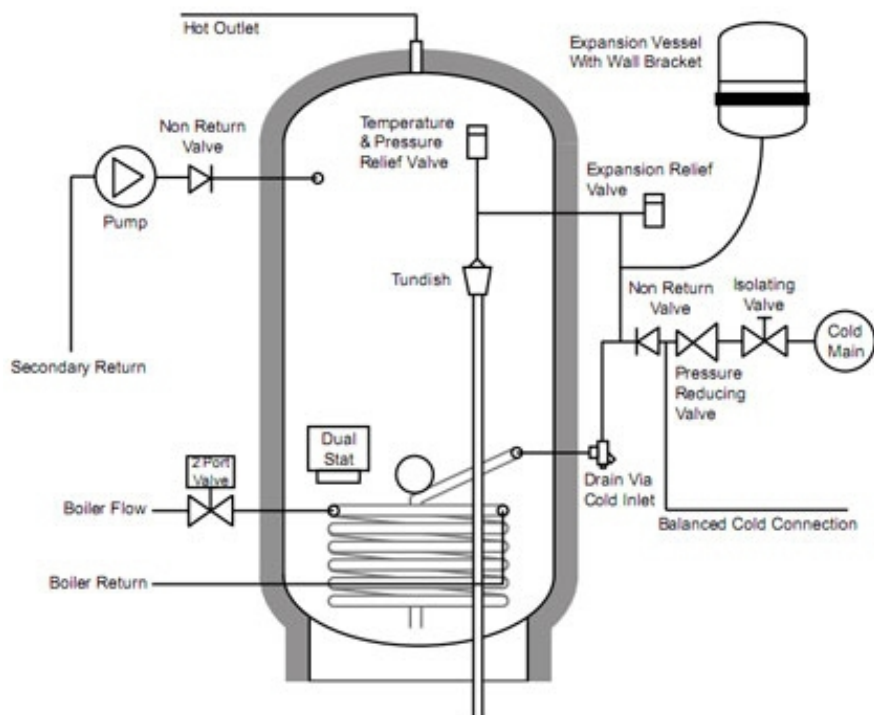
The correct size of vessel must be considered prior to installation and installed by appropriately trained engineers.

Installation Siting

The Expansion Vessel may be fitted to a very wide range of systems, different sources of heat are applied to Unvented Hot Water Systems, and as long as the temperature is controlled within normal limits, the HYDRO-PRO will be compatible in it's application.

Installations where the heat source is augmented by Solid Fuel, Solar Thermal or other heat sources with potentially uncontrolled input temperatures are not compatible with these vessels and an alternative model should be specified.

The physical siting of the vessel should always be in accordance with the Cylinder manufacturers instructions as a variety of acceptable siting options is available.





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Sizing

The appropriate sizing of an expansion vessel must be undertaken by qualified or appropriately trained engineers.

$$V = \frac{e \times C}{1 - P_i/P_f}$$

V = Expansion Vessel Size

e = Expansion Co-efficient corresponding to the difference between the cold water system temperature and the maximum working pressure.

In standard plants:-

$$e = 0.02244$$

C = Total Water Capacity of the system in Litres

P_i = Initial charge pressure (Absolute) - This should equal the value of the static system pressure minus 0.2 Bar.

P_f = Maximum operating pressure (Absolute) of the Safety Relief Valve, taking into account any differences in height between the vessel and the safety relief valve.

Temp	e Value
0	0.00013
10	0.00025
20	0.00174
30	0.00426
40	0.00782
50	0.01207
55	0.01450
60	0.01704
65	0.01980
70	0.02269
75	0.02580
80	0.02899
85	0.03240
90	0.03590
95	0.03960
100	0.04343

Example

C = 300 Litres

P_i = 3.3 Bar (4.5 Bar atmospheric)

P_f = 6 Bar (7 Bar Atmospheric)

$$V = \frac{0.02244 \times 300}{1 - (4.3 / 7)}$$

$$V = 18.7$$

Nearest vessel size with this capacity = 24 Litres

Maintenance

The vessel requires inspection at least once a year (or as and when a drop in performance is noted from the system). The vessel must be visibly inspected for pinholes in the metal body of the vessel and the air pressure must be checked against the required pre-charge. Some pressure loss is to be expected and should be rectified to within 20% accuracy but a significant drop in air pressure may signify that the vessel is nearing the end of its life span and may require membrane replacement. Some provision should be made within a wider piece of equipment for access and inspection.

The air pressure may only be inspected when the vessel is either detached completely from the system or when the system itself is de-pressurised to atmospheric pressure.



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50 ÷ 600 litres

Materials

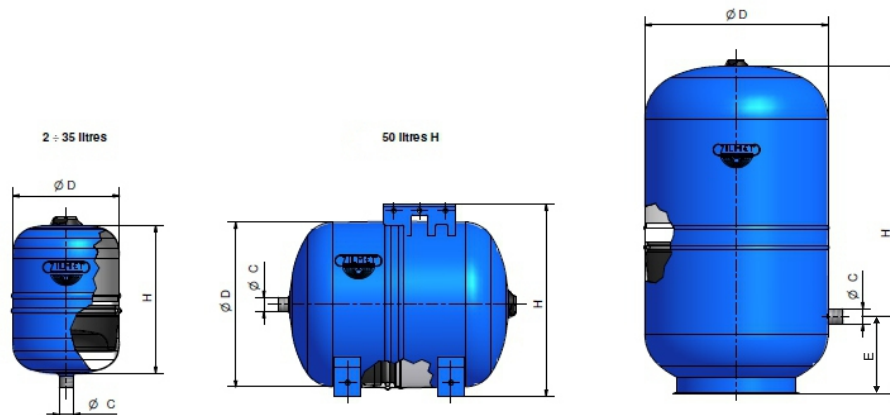
Shell: Carbon Steel

Membrane: Butyl

Max Pressure: 10 Bar

Colour: Blue/grey (2 Litres)

Max Temperature: 99 °C



Code	Capacity	Diameter	Height	Connection Height "E"	Pmax	Pre charge	Connection
	(Litres)	Ø(mm)	H(mm)		(Bar)	(Bar)	(BSP)
11A0000200	2 Vertical	142	196	-	10	3.5	1/2"G
11A0003500	35 Vertical	380	360	-	10	2	1"G
11A0003519	35 with Feet	380	360	135	10	2	3/4"G
11A0005000	50 Vertical	380	505	153	10	2	1"G
11A0005002	50 Horizontal	380	418	228	10	2	1"G
11A0008000	80 Vertical	450	608	150	10	2	1"G
11A0010500	105 Vertical	500	665	165	10	2	1 1/4"G
11A0015000	150 Vertical	500	897	216	10	2	1 1/4"G
11A0020000	200 Vertical	600	812	225	10	2	1 1/4"G
11A0025000	250 Vertical	630	957	245	10	2	1 1/4"G
11A0030000	300 Vertical	630	1105	245	10	2	1 1/4" G
11A0040000	400 Vertical	630	1450	245	10	2	1 1/4"G
11A0050000	500 Vertical	750	1340	290	10	2	1 1/4"G
11A0060000	600 Vertical	750	1460	290	10	2	1 1/4"G



Notes



HYDRO-PRO



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