

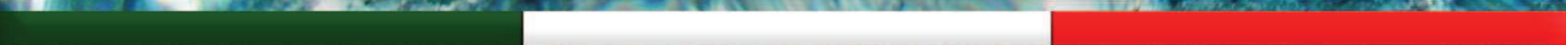


AQUAPRESS®

USE AND MAINTENANCE HANDBOOK



100% MADE IN ITALY





AQUAPRESS - USE AND MAINTENANCE HANDBOOK

GENERALITIES

These instructions apply to the Aquapress tanks with a capacity from 2 to 500 litres.

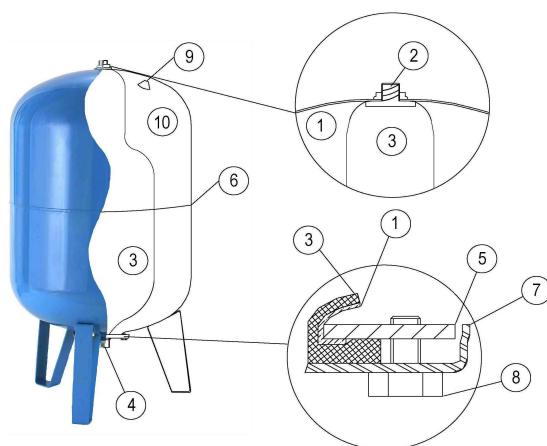
The package contains a tank with the relevant label and a use and maintenance handbook. The label lists the following technical characteristics of the tank: model, volume, preload pressure, maximum working pressure allowed, working temperature and period of production. The tanks are provided with standard EPDM membrane, on request BUTYL available. All tanks are made in line with the directive PED 97/23/EC.

I. AQUACOLD

Autoclave Tanks with interchangeable membrane for sanitary water circuits.

DESCRIPTION

The autoclave with interchangeable membrane is a metallic shell that can absorb and store the potential energy of a pressurized liquid and collected in a rubber bag called membrane. In case of request by the operating needs of the hydraulic plant, the energy stored by the liquid in pressure is transferred and transformed again into useful work. The previously preloaded air side (10) guarantees this transformation and acts among the membrane and the walls of the tank. The air chamber is isolated from the water chamber by the EPDM membrane (3), so eliminating the risks of water pollution through dust, vapour, fume, oil, bacteria and odours. Furthermore the insulation among the walls of the autoclave and liquid avoids the risk of dangerous corrosions.



LEGEND	
1	Half-shell
2	Tie rod
3	Membrane
4	Connection
5	Flange
6	Welding
7	Counter-flange
8	Screws
9	Preload valve
10	Preload air chamber

DIMENSIONING OF THE AUTOCLAVE TANK

For a correct working we recommend you to adjust the preload of the tank 0.2 bar less than the minimum pressure of calibration of the pump. The dimensioning is obtained by the following formula.

The necessary volume of the Tank V_v is calculated by the following formula:

$$V_v = Q_p K [(P_{MAX} + 1)(P_{MIN} + 1)] / [(P_{MAX} - P_{MIN})(P_{PRE} + 1)]$$

where

Q_p [litres/min] represents the *mean bearing capacity of the pump*

P_{MAX} [bar] represents the *maximum pressure of calibration of the pump*

P_{MIN} [bar] represents the *minimum pressure of calibration of the pump*

P_{PRE} [bar] represents the *preload pressure of the tank*

coefficient K, depending on the power of the pump (see chart)

Standard preload tanks: 1.5 bars for tanks from 2 to 200 lt; 2.5 bars for tanks from 300 to 500 lt.

Coefficients K depending on the power of the pump (1 HP = 0.9863 hp)	
hp	K
1 - 2	0,250
2,5 - 4	0,375
5 - 8	0,625
9 - 12	0,875

We recommended you to adopt the measure that closely matches the calculated theoretical value (rounding off).

2. AQUAHOT

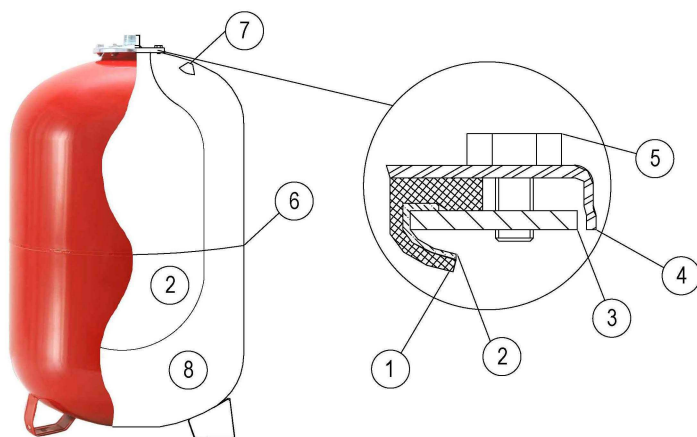
Expansion tank with interchangeable membrane (EPDM) for heating systems, water heaters and boilers.

DESCRIPTION

The main purpose of the expansion tank is to compensate for the increase of the water volume, due to the variation of the temperature in the civil and industrial heating systems.

Initially the volume of the expansion tank with interchangeable membrane is entirely occupied by the air, when the water of the plant warms up it determines an increase in volume, which will be absorbed by the expansion of the membrane (2) and by the resulting compression of the air volume.

At the decrease of the temperature and the consequent reduction of the water volume, the air side takes steps to bring the plant to its initial pressure.



LEGEND	
1	Half-shell
2	Membrane
3	Flange
4	Counter-flange
5	Screws
6	Welding
7	Preload valve
8	Preload air chamber

DIMENSIONING OF THE EXPANSION TANK

The installation of too small expansion tanks can cause failures in the working and damages to the plant.

The *Volume of Expansion* of the water (E) is calculated starting from the volume at the first temperature V_0 (generally among 10 and 20 litres every 1000 Kcal/h of the boiler power) and from the coefficients of expansion of the water at the first (e_0) and final (e) temperature, by the following formula [litres]:

$$E = V_0(e - e_0)$$

Therefore the *Volume of the Tank* (V_v) required in the heating plant is calculated by the following formula [litres]:

$$V_v = \frac{V_0(e - e_0)}{1 - P_i / P_F}$$

where

P_i [bar] represents the *absolute load pressure of the tank* (it has to overcome the static pressure where the expansion tank is installed of at least 0.15 bar; we recommend increases of 0.30 bar). It is therefore represented by

hydrostatic pressure + 0.30 bar + atmospheric pressure (1 bar)

In other words the preload pressure of the tank is increased by 1 bar.

P_F [bar] represents the maximum absolute working pressure referred to the tank. It is represented by

max plant working pressure + atmospheric pressure (1 bar)

In other words the calibration pressure of the safety valve is increased by 1 bar.

For the coefficients of expansion, you can typically gather:

$e = 0,0359$ per $t = 90^\circ\text{C}$ (maximum temperature)

$e_0 = 0,0009$ per $t = 15^\circ\text{C}$ (cold temperature)

Coefficients of water expansion and in comparison to $t=3,98^\circ\text{C}$	
t	e
0 °C	0,0001
5 °C	0,0000
10 °C	0,0003
15 °C	0,0009
20 °C	0,0018
25 °C	0,0030
30 °C	0,0043
35 °C	0,0058
40 °C	0,0078
45 °C	0,0098
50 °C	0,0121
55 °C	0,0145
60 °C	0,0170
65 °C	0,0198
70 °C	0,0227
75 °C	0,0258
80 °C	0,0290
85 °C	0,0324
90 °C	0,0359
95 °C	0,0396
100 °C	0,0434

Coefficients of the water expansion in comparison to $t = 3,98^\circ\text{C}$

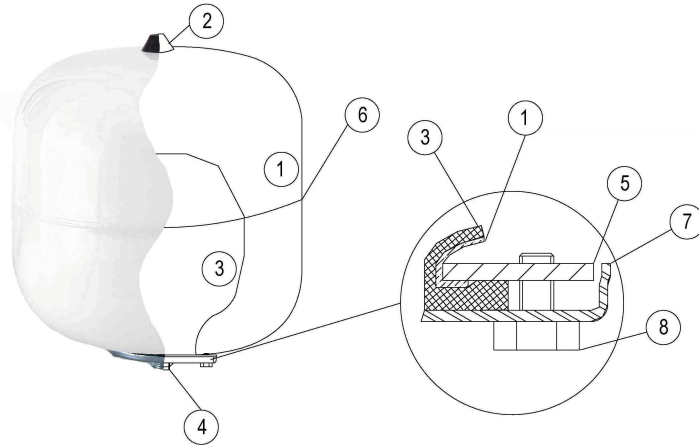
Standard preload tanks: 1.5 bars for tanks from 2 to 200 lt; 2.5 bars for tanks from 300 to 500 lt.

3. AQUAMULTI

Multifunctional tanks with interchangeable membrane at high temperature for solar systems, suitable also for their use in sanitary water circuits and heating systems.

DESCRIPTION

The multifunctional tanks can be used both in applications of the line AQUACOLD and in applications of the line AQUAHOT. The AQUAMULTI tanks are equipped with a special membrane that, thanks to the components of its compound, reaches a maximum acceptable temperature of 130° C making the products of this line fit at high temperature also for extended exposures and particularly suitable for solar plants.



LEGEND	
1	Half-shell
2	Preload valve
3	Membrane
4	Connection
5	Flange
6	Welding
7	Counter-flange
8	Screws

DIMENSIONING OF THE MULTIFUNCTIONAL TANK

The correct volume of the multifunctional tank which represents the useful space for the water following a high heating of the plant is calculated by the following formula:

$$V_v = \frac{V_0(e - e_0)}{1 - P_i / P_F}$$

where

P_i [bar] represents the *absolute load pressure of the tank* (it has to overcome the static pressure where the expansion tank is installed of at least 0.15 bar; we recommend increases of 0,30 bar). It is therefore represented by

hydrostatic pressure + 0,30 bar + atmospheric pressure (1 bar)

In other words the *preload pressure* of the tank is increased by 1 bar.

[bar] represents the maximum absolute working pressure referred to the tank. It is represented by

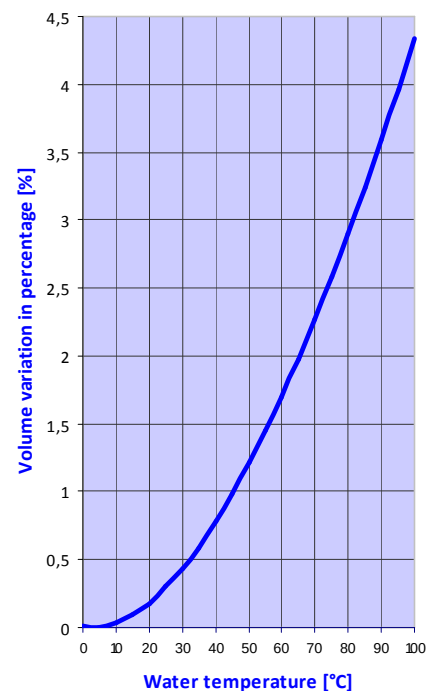
max plant working pressure + atmospheric pressure (1 bar)

In other words the *calibration pressure of the safety valve* is increased by 1 bar.

the coefficients of expansion, you can typically gather:

0,0359 per t = 90°C (maximum temperature)

0,0009 per t = 15°C (cold temperature)



Standard preload tanks: 1.5 bars for tanks from 2 to 200 lt; 2.5 bars for tanks from 300 to 500 lt.

4. Safety

The tank is given already pressurized at the preload pressure. We recommend the preload control at least once a year to avoid the slow and gradual pressure air download. The use of the products mentioned in this handbook should not be different from which they are bound to; the data do not bind the company Aquapress who reserves the right to modify them at any moment, with no notice. Note: a full expansion tank is heavy. The water in the expansion tank might be boiling hot. Proceed with the disposal of the expansion tank in accordance with the local current rules.

5. Assembly and maintenance

The assembly of the expansion tank must be carried out exclusively by a qualified installer. Please follow the local rules and directives. In order to use it we recommend to equip the plant with a fit safety valve calibrated at a pressure not superior to the maximum working pressure of the expansion tank or pressurization tank, or of the plant if this is of a lower pressure. Please take notice of the difference between the position of the safety valve and the expansion tank or pressurization tank.

If you carry out the maintenance of the tank in a plant, make sure you have removed the supply from the control board of the plant and you have exhausted it of the liquid contents. Check the preload pressure which must have a value of 0.2 bar lower than the minimum calibration of the control pressure switch and if necessary restore it. For reasons of the working of the plant, if the value of the preload pressure must be changed, bring the new value on the tag. The determination of a new value of preload and its variation must be done by competent and authorized experts under their own responsibility according to specific calculation rules to perform a correct dimensioning of the plant.

6. Disassembly

- a. Delete the pressure in the plant.
- b. Remove the protective cover and the valve cap.
- c. Press the inside valve to depressurize the expansion tank.
- d. Unscrew the expansion tank.

7. Warnings

When installing the device, verify its integrity. Never overcome the temperature and the maximum working pressure, foresee fit systems of prevention, exhaust and breather, fit drainage systems to limit damages consequent to losses of fluid. In the project phase no external stresses have been considered.

These must be taken into consideration at the moment of the installation. In this phase please follow the procedures suggested by the laws in force in the country of destination. The product has to be installed and checked periodically by authorised personnel only.

The manufacturer accepts no responsibility for any personal and material damages that the product may cause if installed and/or used inappropriately or in any other way different from as specified by the manufacturer.

8. Package

AQUACOLD AFC-AFCV

ITEM	BOX DIM.	PCS. X BOX	PCS. X PALLET
AFC2 BREAK	345x345x275	9	324
AFC2	490x340x200	6	360
AFC5	505x340x315	6	216
AFC8	620x420x335	6	144
AFC15	540x540x385	4	80
AFC20	540x540x435	4	64
AFC24	605x308x440	2	56
AFC24RIB	365x365x325	1	42
AFC24 S.S.	605x308x440	2	56
AFC33	380x380x430	1	30
AFCV50	790x373x380	1	18
AFCV60	710x425x433	1	12
AFCV80	795x460x470	1	12
AFCV100	910x460x470	1	12
AFCV150	980x505x515	1	8
AFCV200	1045x610x630	1	6
AFCV300	1240x660x675	1	4
AFCV500			1

AFC



AFCV



AQUACOLD AFC..SB

ITEM	BOX DIM.	PCS. X BOX	PCS. X PALLET
AFC20SBA	540x540x435	4	64
AFC24SBA	540x540x495	4	64
AFC24SB	605x308x440	2	42
AFC24SB S.S.	605x308x440	2	42
AFC33SB	415x365x390	1	30
AFC50SB	635x380x400	1	20
AFC60SB	595x425x455	1	16
AFC80SB	655x470x490	1	16
AFC100SB	775x470x490	1	16
AFC150SB	830x505x525	1	8
AFC200SB	940x615x645	1	6

AFC..SB



AQUAHOT ACR

ITEM	BOX DIM.	PCS x BOX	PCS. X PALLET
ACR2	490x340x200	6	360
ACR5	505x340x315	6	216
ACR8	620x420x335	6	144
ACR15	540x540x385	4	80
ACR20	540x540x435	4	64
ACR24	605x308x440	2	56
ACR33	380x380x430	1	30
ACRV33	380x380x430	1	30
ACRV50	635x380x400	1	20
ACRV60	595x425x455	1	16
ACRV80	655x470x490	1	16
ACRV100	775x470x490	1	16
ACRV150	830x505x525	1	8
ACRV200	940x615x645	1	6
ACRV300	1125x660x675	1	4
ACRV500			1

ACR**ACRV****AQUAMULTI AM-AMV**

ITEM	BOX DIM.	PCS x BOX	PCS. X PALLET
AM2	490x340x200	6	360
AM5	505x340x315	6	216
AM8	620x420x335	6	144
AM15	540x540x385	4	80
AM20	540x540x435	4	64
AM24	605x308x440	2	56
AM33	380x380x430	1	30
AMV50	790x373x380	1	18
AMV60	710x425x433	1	12
AMV80	795x460x470	1	12

AM**AMV**

Aquapress s.r.l. Loc. Cicogna
52028 Terranuova B.ni(Ar) ITALY
Tel. +39 0559703865 - Fax +39 055 9703812
e-mail: aquapress@aquapress.it
web-site: www.aquapress.it

