



***Expansion vessel
fix bladder
Hot sanitary water***

2 - 24 CMR

A collection of various expansion vessels of different sizes and shapes, rendered in a light gray, semi-transparent style, arranged in a cluster behind the text.

***Installation, use
and maintenance
handbook***

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1.- DESCRIPTION

Steel tanks manufactured according to the 2014/68/UE European Pressure Equipment Directive. They are made of two inlaid bottoms joined through welding cords in accordance with the authorized process and staff, suited to resist loosely the operating pressure they have been designed for.

The CMR from 2 liters up to 24 liters has a fixed synthetic rubber membrane incorporated which is waterproof, flexible of high elasticity and high temperature resistant. Its duration is virtually unlimited and it does not suffer the effects of the dilatation.

The design of the membrane and its dimension are calculated to fully occupy the inner surface of the tank avoiding thereby its breakage.

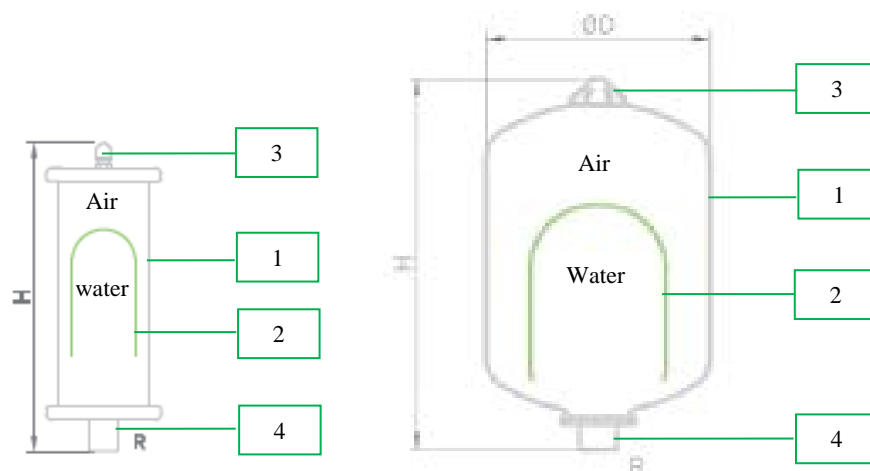
The expansion vessel is provided with a valve for the air-chamber pressure regulation and with threaded water connection (See models).

Final epoxy red printing coat application over phosphate surface.

The resistance of the tank are tested at a pressure 1,5 times above the maximum working pressure.

2.- VESSEL COMPONENTS

- 1.- Steel tank
- 2.- Bladder
- 3.- Inflate valve
- 4.- Threaded water connection



3.- CHARACTERISTICS

- ④ **Name:** CMR
- ④ **Use:** Expansion vessels for hot sanitary water
- ④ **Volume:** 2 - 24 liters
- ④ **Maximum service pressure:** 8 - 10 Bar
- ④ **Test pressure:** 12 - 15 Bar
- ④ **Precharge pressure:** 3 Bar
- ④ **Gas:** Air
- ④ **Temperature Min / Max:** -10°C / +100°C
- ④ **Dimensions:** see below
- ④ **Threaded water connection:** R $\frac{3}{4}$ " (plastic coating over the entire surface in contact with water)
- ④ **Membrane:** Fix bladder
- ④ **Finish (painting):** Epoxy coating
- ④ **Color:** White
- ④ **Inflate valve:** Included
- ④ **Warranty:** 2 year
- ④ Designed and manufactured according to Directive 2014/68/UE

Tubular models 8 Bar (non replaceable bladder)

Code	Model	Volume (Lts)	Weight (Kg)	A (mm)	L (mm)	H (mm)	Water connection
02002080	2 CMR-T	2	2	125	85	405	$\frac{3}{4}$ "
02003080	3 CMR-T	3	2,8	125	85	515	$\frac{3}{4}$ "
02004080	4 CMR-T	4	3,5	125	85	620	$\frac{3}{4}$ "



Models without feet 10 Bar (non replaceable bladder)

Code	Model	Volume (Lts)	Weight (Kg)	Ø D (mm)	H (mm)	Water connection
01002012	2 CMR	2	0,8	110	245	$\frac{3}{4}$ "
01005012	5 CMR	5	2	200	250	$\frac{3}{4}$ "
01008012	8 CMR	8	2,5	200	340	$\frac{3}{4}$ "
01011012	11 CMR	11	3,2	270	310	$\frac{3}{4}$ "
01018012	18 CMR	18	4	270	415	$\frac{3}{4}$ "
➤ 01025082	24 CMR	24	4,5	320	430	$\frac{3}{4}$ "



➤ **REMARK:** of 24 CMR maximum service pressure is 8 Bar and its connection stainless steel.

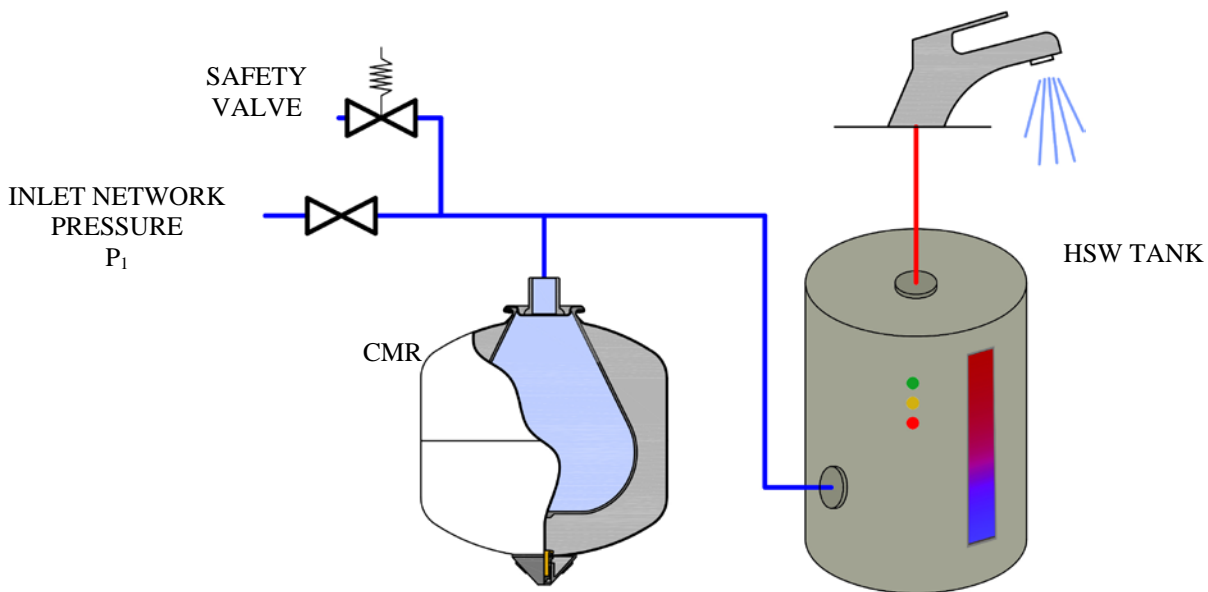
4.- APPLICATION

The CMR expansion vessels are intended to be used in hot sanitary water open circuit installations, allowing absorb expansion of the water caused by increased water temperature and preventing the circuit pressure exceeds the rated pressure of its components.

CMR vessels avoid to exceed the nominal pressure of their components, having the following advantages:

- **Reduce water hammer shock:** When the valves are suddenly closed, the water hammer shocks are caused inside the installation. It can cause sudden high pressures which produce noises inside of the pipes and an important mechanic fatigue of the installations components. These disadvantages are avoided installing CMR series expansion vessel.
- **Relieve the safety unit** (there are hardly water leakage drops). Saving consumption of water and energy.

A typical installation of the expansion vessel could be as follows,



They are not suitable for use in open circuits with potable water or hydrocarbon fluids and those belonging to Group 1 in accordance with Directive 2014/68/UE. The content of glycol in water should not exceed 50%. Vessels are not suitable for placement outdoors.

Possible damage caused by placement in other circuits is not responsibility of I. IBAIONDO.

The most important technical characteristics of CMR expansion vessels and other data relating to its manufacture are indicated on the label attached to the product. This label should never be deleted or modified. In addition, is provided an instruction handbook of the product.

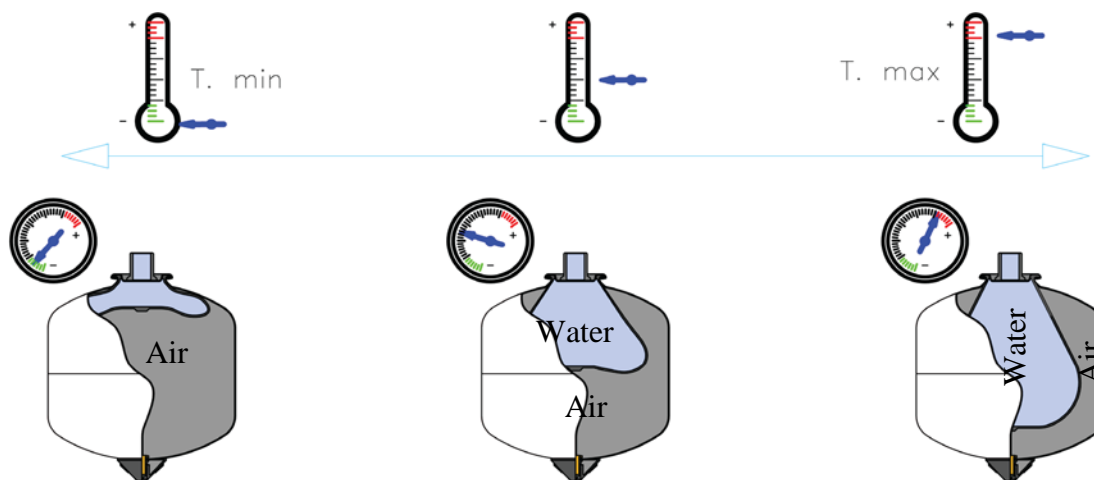


5.- FUNCTIONING

The expansion vessel allows compensating the increase of water volume caused by the variations of temperature, avoiding the circuit pressure to exceed the allowed limits.

When the temperature of the hot sanitary water contained in the circuit increases, the volume expansion of the heating fluid, pushes the membrane, enters into the vessel and the mass of air is compressed. When the water temperature decreases, the energy stored in the air chamber forces water to return to the circuit. This allows the system to maintain the pressure, ensuring energy savings and prevents circuit from overpressures provided the sizing and selection of the vessel is appropriate.

The existence of an expansion vessel implies notably reducing water refills, because no leakage drip occurs due to increased pressure and consequently the triggering of the safety valve.



6.- INSTALLATION

Check as soon as possible the equipment matches the order and that all components are free from damage, and the correct instructions are enclosed. It is especially important to inspect the pressure vessel for any deformities that could affect its strength. In the event of defects or damage contact the manufacturer.

The expansion vessel bears a designation plate containing all important and necessary data. Check that this matches the stipulated requirements and is appropriate for the system.

Before installation, make sure that the expansion vessel volume has been calculated by authorized staff. Ensure that technical staff has an appropriate profile and training at the facilities of this type of equipment. In any case it should be considered local regulations for the operation of the expansion vessel. Installation and operation must be carried out according to good practice by professional installers and qualified technicians.

They may be installed only vessels whose appearance does not provide damage to the body of the expansion vessel. It is prohibited drilling, welding on the vessel or in any item attached to it.

Make sure there is an adequate access around vessel to allow subsequent maintenance and servicing. The equipment must not be over-insulated in any way.

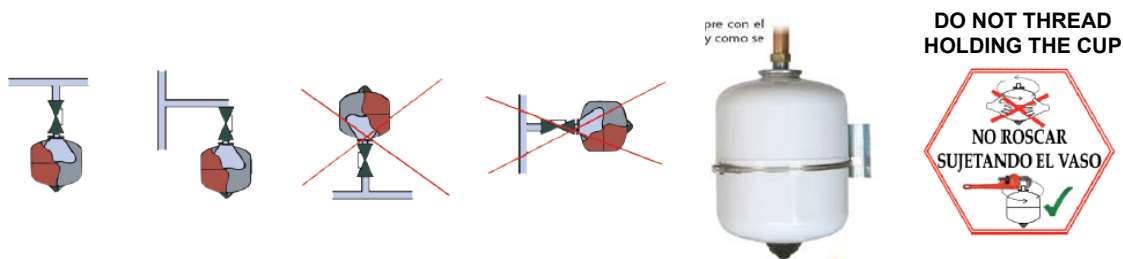
The facility in which the expansion tank is placed should provide for the installation a security system that limit the pressure and ensure that the pressure does not exceed the maximum working pressure of the expansion vessel. The safety valve shall be installed in the boiler, as close as possible to it and above its highest level. It will be calibrated according to the maximum system pressure and not exceed the maximum allowable pressure of expansion vessel.

It is recommended to connect expansion vessel in the return line, as close as possible to the boiler, preferably on the suction side of the recirculation pump. When the return temperature exceeds 70°C and / or below 0°C is recommended to place an intermediate VI vessel.

Avoid direct radiations over expansion vessel to protect the membrane of possible overheating.

Between the boiler and the expansion must not exist any valve that can isolate and unintentionally override the operation of the expansion vessel.

The expansion vessels without legs are installed directly to the pipe or preferably through a support designed for this purpose provided with sleeve water inlet at the top, to avoid creating air pockets. We recommend installing air separators to prevent air accumulation.



Make sure the hoses and couplings are tight and the working temperature or pressure for which is designed the expansion tank is never exceeded. Under no circumstances exceed the maximum pressure indicated on the label of the expansion vessel. The expansion tank could explode.

The pipes must be sized and installed in accordance with the specific requirements according to current national and local regulations.

The pre-commissioning, subsequent fundamental changes in the installation and periodic reviews should be initiated by the user in accordance with regulations in operational safety test.

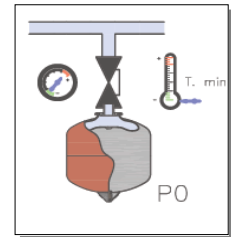
7.- OPERATION

The expansion vessels are supplied from the factory with the inflation pressure specified on the label attached to the product (3 Bar - Air). To ensure the proper functioning of the system, this value should be set to a pressure value P_0 , taking into account the characteristics of each installation, by filling air to the preload value P_0 or purging through the valve to reduce the initial air preload to the value P_0 .

Adjusting inflation pressure to P_0 : To ensure proper operation of the expansion vessel is necessary to check and adjust the pressure.

$$P_0 \text{ (Bar)} = P_1 - 0,3 \text{ Bar}$$

P_1 (Bar): Pressure Network input



It is recommended to keep steady supply network pressure installing a pressure reducer.

Under no circumstances exceed the maximum pressure indicated on the product label.

The inflation pressure P_0 should not initially exceed 3 Bar, if before we have not secured to fill the water inlet tank, since a higher pressure in the airlock without resistance from the water chamber could damage the membrane. We will place hydro-pneumatic tank in its final position, connected to the line. At the moment, fill the bottom of the tank (inlet) to be sure that the amount of water introduced is enough to cover the coupling, cap or lower hole. Then isolate the expansion vessel from the system. Once this is done, charge with air up to calculated P_0 pressure.

Once pressurized expansion vessel and taken appropriate precautions, we proceed to communicate the expansion vessel to the system. Once installed works automatically.

8.- MAINTENANCE

The maintenance must be performed only by the authorized staff. Never disassemble the vessel without having depressurized the unit and the inner pipe or air chamber to safe values previously.

At least once every six months, check that the value of the precharge pressure P_0 of the vessel is maintained within the values indicated in the previous section, taking care to do by the contrast of values at the same temperature, preventing unnecessary and prevent abnormal operation. For this purpose, it is necessary,

- Isolate the expansion vessel from the heating system.
- Drain water from expansion vessel.
- Once emptied of water, check pressure through the valve. If the deviation of the measured pressure respect the precharge pressure P_0 is greater than +/- 20%, adjusted to the original value P_0 , following the instructions given in section 7 of the instruction handbook.

At the time of depressurizing expansion vessel and emptying of water, ensure that the vessel has enough water to cover the coupling (inlet) so that the water holds a backpressure which protects the membrane from extrusion.

Make sure that the precharge pressure never exceed the design pressure of the equipment, coupling hoses and couplings are tight and the working temperature and pressure for which is designed the expansion vessel is never exceeded.

To prevent corrosion of the expansion vessel periodically purge the circuit. The possible entry of air must be minimized through periodic maintenance.

As spare parts may be used only the original components of manufacturer.

9.- DISASSEMBLY

Never disassemble the expansion vessel without having depressurized previously the installation and the vessel.

Before proceeding to removal expansion vessel, make sure that all parts exposed to pressure are depressurized. Insulate the vessel from the heating system. If the measured pressure through the inflation valve is more than 4 bar, firstly reduce the pressure through the purge valve (air chamber) up to 4 Bar. Then, drain water from expansion vessel. Finally, bleed through the air inflation valve, reducing the air pressure to depressurize the expansion vessel completely. Remove expansion vessel and change.

When replacing the expansion vessel will be disassembled having depressurized the installation and the water temperature below 35°C.

CMR series vessels from 2 up to 24 liter, both included, are fix bladder models. In case of bladder rupture must be replaced whole vessel.

