



***Expansion vessel  
replaceable bladder Hot  
sanitary water***

# ***CMR 35-1000***

***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 models from 35 to 1000 litres have a replaceable, waterproof, flexible, highly elastic and temperature resistant synthetic rubber membrane inside. Its duration is practically unlimited, as it does not suffer the effects of expansion, in accordance with the physical and mechanical characteristics according to EN-13831.

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).

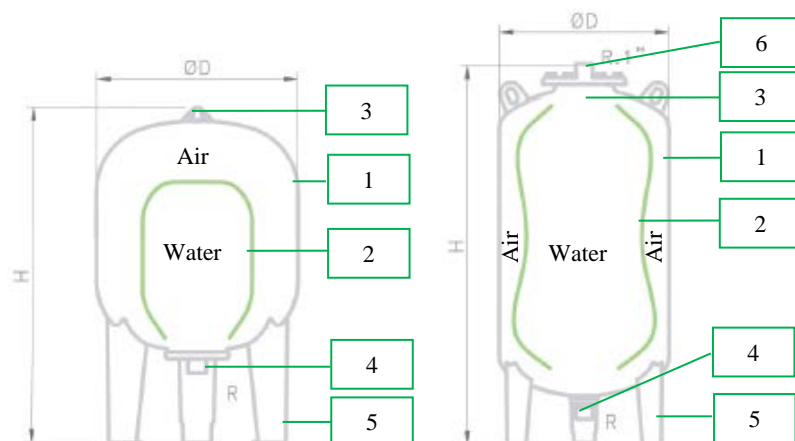
Disponen de conexión de agua roscada R1" y R1½" G.M según modelo.

Final epoxy red printing coat application over phosphate surface.

Tanks are tested for tightness and strength at a pressure 1.5 times the maximum working pressure.

## 2.- VESSEL COMPONENTS

- 1.- Steel tank
- 2.-Bladder/Membrane
- 3.- Inflate valve
- 4.- water connection sleeve
- 5.-Legs
- 6.- Top cover accessories

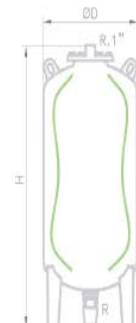


### 3.- CHARACTERISTICS

- ④ **Name:** CMR
- ④ **Use:** Expansion vessels for hot sanitary water
- ④ **Volume:** 35 - 1000 litros
- ④ **Maximum service pressure:** 10 Bar
- ④ **Test pressure::** 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:** Stainless steel R1" & R1 1/2" G.M.
- ④ **Membrane:** replaceable membrane
- ④ **Finish (painting):** Epoxy coating **Color:** Blanco
- ④ **Inflate valve:** Included
- ④ **Warranty:** 2 years
- ④ Designed and manufactured according to Directive 2014/68/UE

#### Models with feet 10 Bar (replaceable bladder)

Code	Model	Volume (Lts)	Weight (Kg)	Ø D (mm)	H (mm)	Water connection
01035249	35 CMR-P	35	10	360	615	1"
01050249	50 CMR-P	50	12	360	750	1"
03080239	80 CMR-P	80	16	450	750	1"
03100039	100 CMR-P	100	18	450	850	1"
03150039	150 CMR	150	38	485	1155	1 1/2"
03220039	220 CMR	200	49	485	1400	1 1/2"
03350039	350 CMR	300	60	485	1965	1 1/2"
03500039	500 CMR	500	90	600	2065	1 1/2"
03700039	700 CMR	700	158	700	2145	1 1/2"
03911039	1000 CMR	1000	274	800	2375	1 1/2"



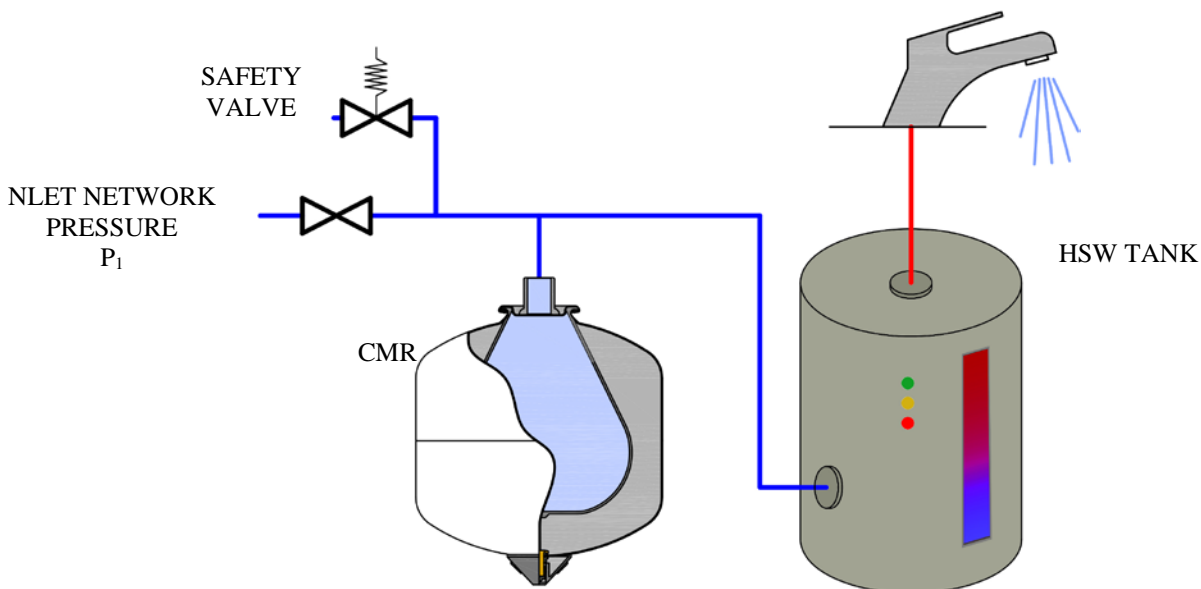
#### 4.- APPLICATION

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 installation's 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.

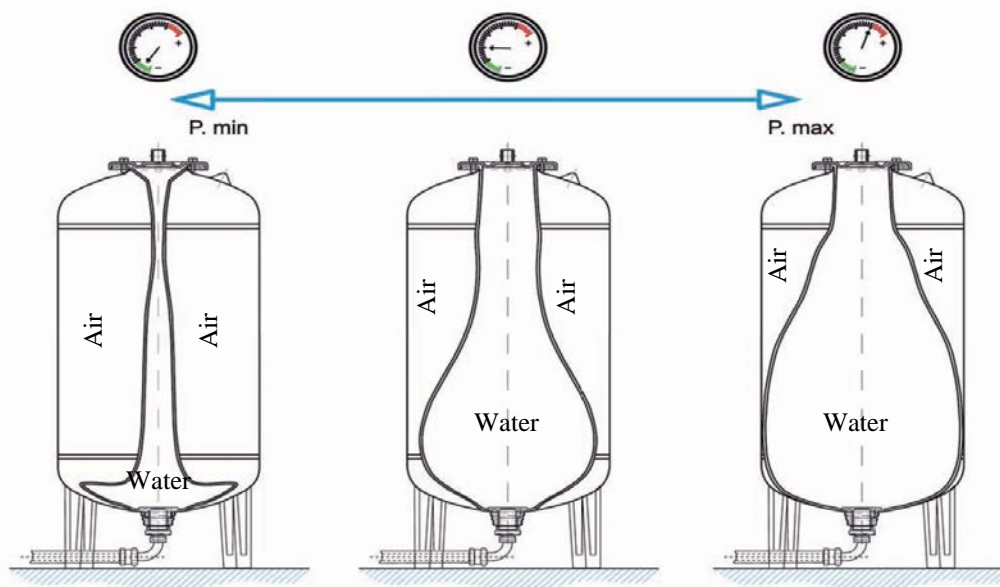


## 5.- OPERATION

Its principle of operation is based on the compression of the air chamber inside the expansion vessel when there is a volumetric change in the domestic hot water due to temperature variation.

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. On the other hand, 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.

Membrane expansion vessels without mass transfer have a fixed air charge.



## 6.- INSTALLATION

*Arrival control:* Check immediately that the equipment corresponds to the order and that all components are in perfect condition and that the correct operating 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.

Check that the data on the sticker affixed to the expansion vessel matches the purchase specification and is suitable for the installation. Before installation, make sure that the volume of the expansion vessel has been calculated by authorized personnel. Asegúrese que el personal técnico posee un perfil apropiado y formación en las instalaciones de este tipo de equipamientos. 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.

They shall be installed in a weather-protected enclosure having the necessary dimensions of access to facilitate inspection of the expansion vessel from all parts, with the air filling valve, the connecting sleeve to the installation and the label being accessible.

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..

Expansion vessels must be placed in the cold water inlet pipe, between the safety valve and the storage tank or domestic hot water producer.

Do not install any valves whose closure could unintentionally isolate and disable the operation of the expansion vessel.

Vessels with volumes between 35 and 900 litres are installed vertically on the floor and have the connection sleeve at the bottom.

It is recommended to install air vents and/or air separators to avoid air accumulation.

Ensure that hoses and couplings are leak tight and that the working temperature and pressure for which the expansion vessel is designed is never exceeded. Under no circumstances exceed the maximum operating pressure indicated on the expansion vessel label. The expansion vessel could explode.

The pipelines must be dimensioned and installed in accordance with the specific requirements according to local and national regulations.

*Pre-commissioning testing*, subsequent fundamental modifications to the installation and periodic inspections must be initiated by the user in accordance with the applicable operational safety regulations.

## 7.- COMMISSIONING

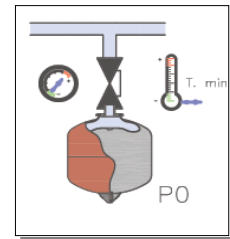
The expansion vessels are supplied from the factory with the inflation pressure specified on the label attached to the product (3 Bar - Air). To ensure the proper functioning of the system, this value should be set to a pressure value  $P_0$ , taking into account the characteristics of each installation, 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 correct operation of the expansion vessel, it is necessary to check and adjust the inflation pressure, both at the time of installation and during periodic maintenance.

When adjusting the inflation pressure, the following guidelines should be followed:

$$P_0 \text{ (Bar): Minimum vessel inflation pressure} = P_1 - 0,3 \text{ Bar}$$

$P_1$  (Bar): Pressure Network input.



It is recommended to keep the mains supply pressure constant by 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 hydropneumatic 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.

Check that the equipment is working with the correct air pressure  $P_0$ . Ensure that the pre-charge pressure never exceeds the design pressure of the equipment, that the coupling hoses and couplings are leak-tight and that the operating temperature and the pressure for which the expansion vessel is designed are never exceeded.

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

*Periodic inspections* must be carried out in accordance with the Pressure Equipment Regulations (REP).

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..

The vessels of the CMR series with volumes from 35 to 1000 litres inclusive are replaceable bladder models. If the bladder breaks, it can be replaced. In this case, please ask for replacement instructions.

## 10.- NOTES

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