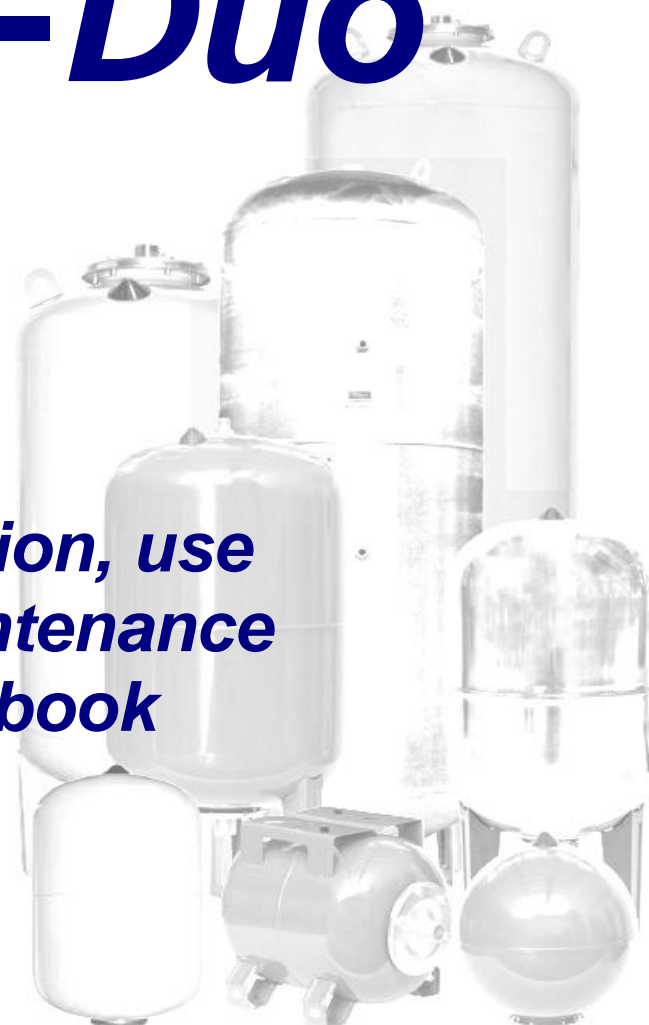




***Replaceable bladder  
hydropneumatic tank***

# ***AMR-Duo***

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



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## 1. DESCRIPTION

Welded steel tanks manufactured according to the European Directive 2014/68/UE for pressure equipments. They are made of two inlaid bottoms, joined together through welding cords following the proper procedure and according to the required authorized staff. They are loosely able to resist the working pressure for which they have been designed

Some holes have been provided in the bottoms for the assembly and fixation of the bladder through a screwed cover and a threaded sleeve according to DIN-259 (see models).

The fully waterproof replaceable bladder is made of synthetic flexible rubber as a single piece, keeping constantly isolated water from nitrogen, avoiding any possibility of corrosion of the inner metal surface of the tank or the dilution of nitrogen in the water.

The membrane complies satisfactorily with all legal requirements for food hygiene.

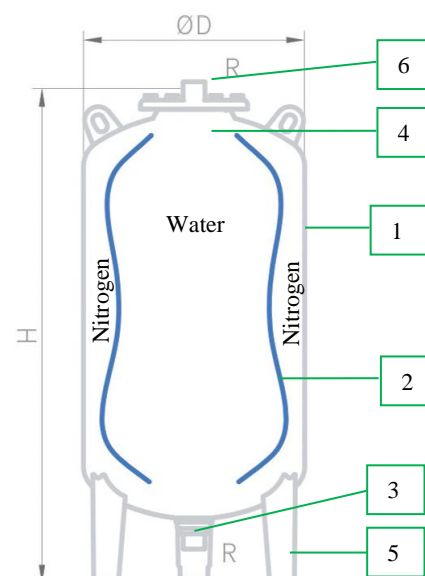
The tanks are fitted with a suitably protected inflation valve for regulating the pressure in the nitrogen chamber.

Final application of epoxy coat over phosphate surface. Blue color RAL-5012.

The resistance of the tanks are tested at a pressure 1,5 times higher than the maximum working pressure.

## 2. VESSEL COMPONENTS

- 1.- Steel tank
- 2.- Membrane to contain drinking water
- 3.- Stainless steel threaded coupling R1½" G.M.
- 4.- Inflate valve
- 5.- Legs
- 6.- Flange R1 ½" G.M.



### 3. MAIN CHARACTERISTICS

- ④ **Name:** AMR-*Duo*
- ④ **Use:** Replaceable bladder hydro-pneumatic tank for pressure boosting systems (suction).
- ④ **Volumee:** 150 - 1.000 litres
- ④ **Disposición:** Vertical
- ④ **Maximum service pressure:** 10 Bar
- ④ **Test pressure:** 15 Bar
- ④ **Precharge pressure:** 3 Bar
- ④ **Gas:** Nitrógeno
- ④ **Temperature Min / Max:** -10°C / +100°C
- ④ **Dimensions:** see below
- ④ **Threaded water connection:** R1½" G.M. (stainless steel)
- ④ Top cover and R1½" sleeve for fittings (stainless steel)
- ④ **Membrane:** Replaceable bladder suitable for drinking water
- ④ **Finishing (painting):** External epoxy coating, special for outdoors
- ④ **Colour:** Blue RAL-5012
- ④ **Inflate valve:** Included
- ④ **Warranty:** 5 years
- ④ Designed and manufactured according to Pressure Equipment Directive 2014/68/EU

#### Vertical models 10 bar

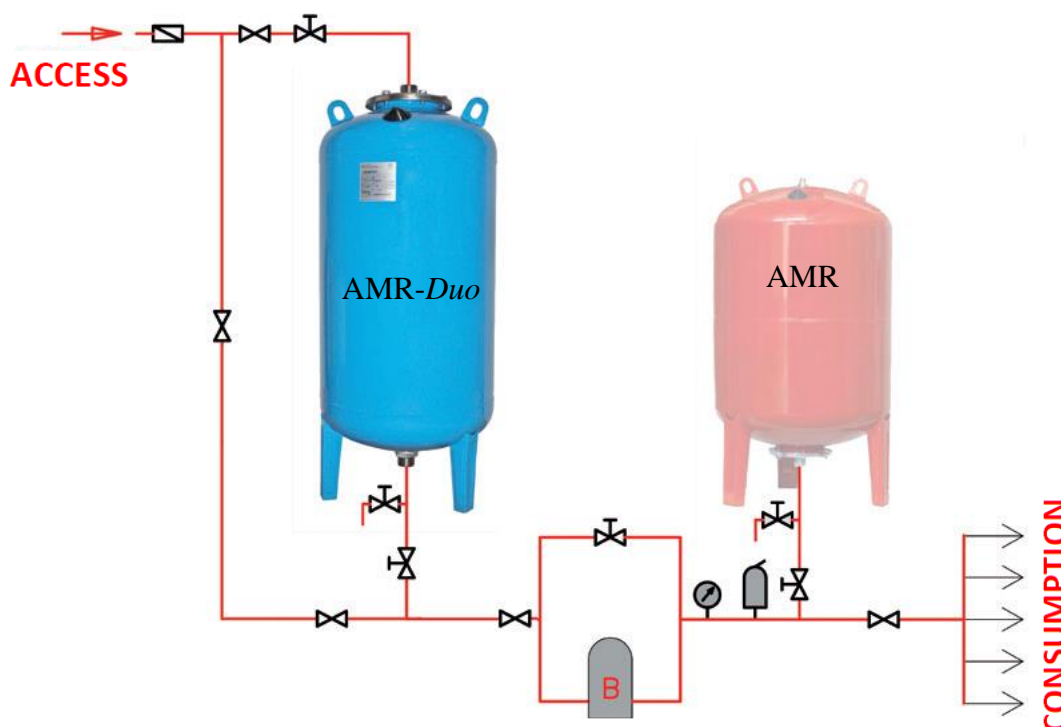
Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions		R Water connection
					Ø D (mm)	H (mm)	
38	08015010	150 AMR-DUO	150	10	485	1155	2 x 1 ½"
40	08022010	220 AMR-DUO	220	10	485	1400	2 x 1 ½"
60	08035010	350 AMR-DUO	350	10	485	1965	2 x 1 ½"
90	08050010	500 AMR-DUO	500	10	600	2065	2 x 1 ½"
158	08070010	700 AMR-DUO	700	10	700	2145	2 x 1 ½"
224	08090010	900 AMR-DUO	900	10	800	2155	2 x 1 ½"
274	08010010	1000 AMR-DUO	1000	10	800	2375	2 x 1 ½"



## 4. APPLICATION

Hydro-pneumatic accumulators AMR-Duo for use in the suction of booster sets in drinking water supply systems, as an essential part of the booster set. In addition to maintaining a reserve of pressurised water and guaranteeing an optimum water supply, they extend the life of the booster set, significantly reducing the number of pump start-stop manoeuvres, as well as saving energy.

A typical installation of an AMR-Duo hydropneumatic tank could be as follows:



Not suitable for use with hydrocarbons or fluids belonging to Group 1 according to Directive 2014/68/EU.

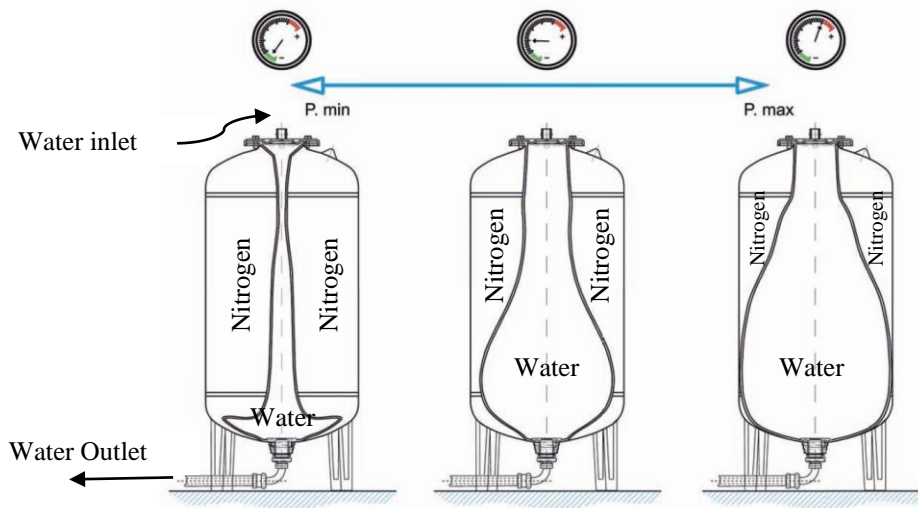
The most important technical characteristics of the AMR-Duo hydro-pneumatic accumulators and other data concerning their construction are indicated on the label attached to the product. This label must not be removed or modified under any circumstances. In addition, a document containing the instructions for use of the product and the EC declaration of conformity is supplied with each unit.



## 5. OPERATION

Drinking water is pumped to the hydropneumatic tank by the pumping unit.

As water enters into the tank, it is stored inside the bladder or membrane, which hermetically separates the nitrogen and water chambers. Water entering the tank implies a decrease in the initial volume of captive nitrogen in the tank and consequently an increase in pressure.



When the desired maximum pressure (pump stop pressure) is reached, the pressure switch cuts off the current and the water circulation between the pump and the tank is interrupted. At this point there will be a volume of water stored inside the tank at a pressure equal to the pump's shutdown pressure.

Depending on user needs and demand, the energy stored through the captive nitrogen inside the tank will propel the water contained inside the bladder to the points of consumption. Because of the demand and the different inputs from the accumulator to the system, the bladder of the tank containing the water is emptied and as a consequence, the nitrogen pressure decreases. As soon as the pressure drops below the pressure at which the pressure switch is set (pump start pressure), the booster set will start up again, supplying the necessary water according to the needs of the moment and also refilling the tank to restore normal working conditions.

As long as the nitrogen pressure in the chamber is maintained, the cycle runs automatically, as many times as the maximum and minimum pressures are reached. Therefore, it is essential to implement and perform a regular check and maintenance of the nitrogen filling pressure of the container (sections 7 and 8).

## 6. INSTALLATION

*Control on arrival:* 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 hydropneumatic tank 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 information on the sticker affixed to the hydro-pneumatic tank corresponds to the purchase specification and that it is suitable for the installation. Before installation, make sure that the volume of the hydro-pneumatic accumulator has been calculated by authorized personnel. Ensure that the technical staff has an appropriate profile and training in the installation of this type of equipment. In any case, the local regulations in force for the operation of hydro-pneumatic accumulators must be considered. Installation and operation must be carried out according to good practice by professional installers and authorized technical personnel.

They may be installed only vessels whose appearance does not provide damage to the body of hydropneumatic tank.

They shall be installed in an enclosure that has the necessary access dimensions to facilitate inspection of the hydro-pneumatic tank, with the filling valve, the connection sleeve to the system and the label being accessible.

The installation in which the hydro-pneumatic tank is placed must provide for the installation of a safety system to limit the pressure and ensure that the pressure does not exceed the upper design limit of the hydro-pneumatic tank

It is prohibited drilling, welding on the vessel or in any item attached to it.

Do not install any valves whose closure could unintentionally disable the operation of the hydro-pneumatic tank.

Avoid direct radiation on the hydro-pneumatic accumulator in order to protect the diaphragm from overheating.

Ensure that the hoses and couplings are watertight and that the operating temperature and pressure for which the hydro-pneumatic tank is designed is never exceeded. Under no circumstances should the maximum operating pressure indicated on the label of the hydro-pneumatic tank be exceeded. The hydro-pneumatic tank could explode.

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.

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

## 7. COMMISSIONING

The AMR-Duo replaceable membrane hydro-pneumatic tanks are delivered ex works with the inflation pressure indicated on the label attached to the product (3 Bar - Nitrogen). To ensure correct operation of the system, this value must be set to a pressure value  $P_0$ , taking into account the characteristics of each installation, either by filling with nitrogen up to the precharge value  $P_0$  or by venting through the filling valve if the initial nitrogen precharge needs to be reduced to the value  $P_0$ .

In the case of hydro-pneumatic tanks placed upstream of the booster set (SUCTION), the value of the pre-charge pressure  $P_0$  shall be as follows

$$P_0 \text{ (Bar)} = \text{Water supply pressure in tank} - (0,5 \div 1) \text{ Bar} \geq 1 \text{ Bar}$$

If the obtained precharge pressure value is higher than 3 bar, prior to the nitrogen refilling operation, it shall be necessary to introduce water through the water inlet/outlet connection of the hydro-pneumatic accumulator until the coupling, cap or lower inlet orifice is covered. From this moment on, isolate the hydro-pneumatic tank from the pipe by closing the tap or valve provided for this purpose. At this point, the accumulator will be recharged with nitrogen through the accumulator inflation valve until the Precharge  $P_0$  value is reached.

Once the pressure has been set in accordance with the above instructions and the appropriate precautions have been taken, the accumulator is connected to the system under load. Its operation is automatic.

## 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 a year, 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 hydropneumatic tank from the installation.
- Drain water from hydropneumatic tank.
- 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 hydropneumatic tank 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 bladder 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 hydropneumatic tank is never exceeded.

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

Periodic tests should be conducted according to the provisions of Pressure Equipment Regulations



## 9. DISASSEMBLY

Never dismantle the hydro-pneumatic accumulator without first depressurising the system and the nitrogen chamber to safe values. Before disassembling the accumulator, make sure that all parts exposed to pressure are depressurised by isolating the hydro-pneumatic accumulator from the water circuit.

If the pressure measured through the inflation valve is higher than 4 bar, first reduce the pressure by venting through the valve (nitrogen chamber) to 4 bar. Drain the hydro-pneumatic accumulator of water. Finally, bleed through the inflation valve, reducing the nitrogen pressure until the hydro-pneumatic accumulator is completely depressurised.

When replacing the hydropneumatic tank will be disassembled having depressurized the installation and the water temperature below 35°.

The hydro-pneumatic accumulators of the AMR-Duo series are models with a replaceable bladder. In case of bladder rupture, the bladder can be replaced without having to replace the entire accumulator. In this case, please ask for replacement instructions.

## 10. NOTES

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