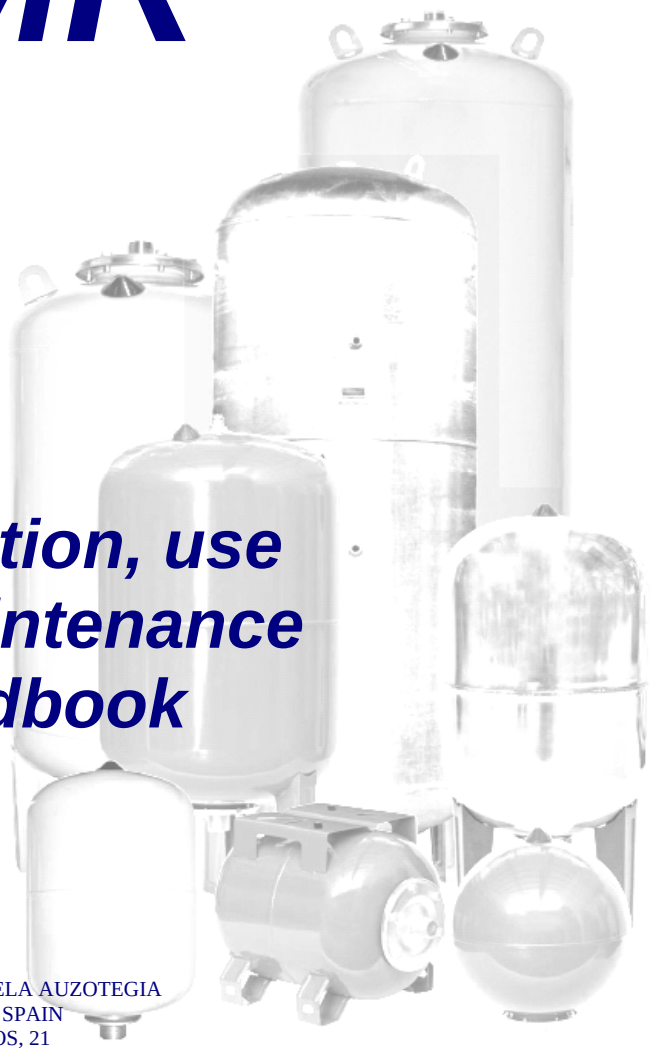
IBAIONDO

Replaceable bladder hydropneumatic tank

AMR



Installation, use and maintenance handbook

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1. DESCRIPTION

Welded steel tanks manufactured according to the European Directive 2014/68/UE. 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 (see models).

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

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

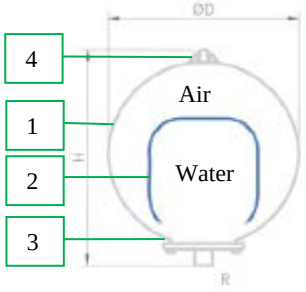
AMR hydropneumatic tanks are provided with a valve for the air-chamber pressure regulation.

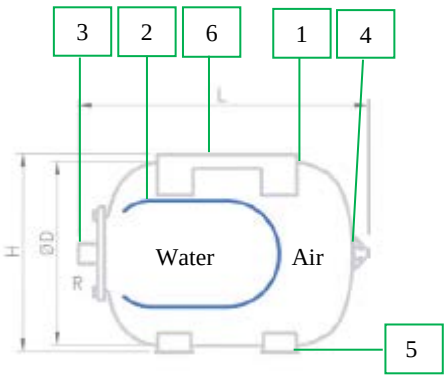
Final application of epoxy coat over phosphate surface. Red color RAL-3000.

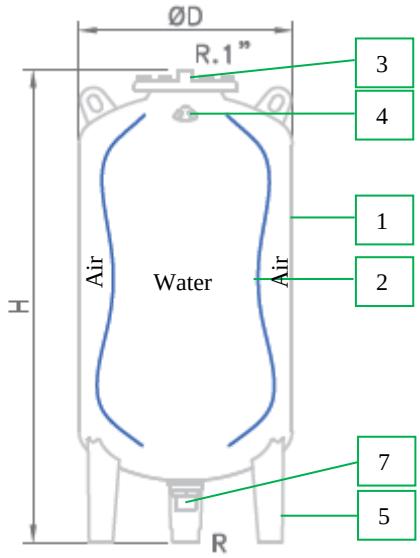
The resistance of the tanks are tested at a pressure 1,5 times higher than the maximum working pressure.

2. VESSEL COMPONENTS

1.- Steel tank
2.- Bladder
3.- Replaceable galvanized cap R G.M.
4.- Inflate valve
5.- Legs
6.- Pump support
7.- Flange R2" & R2½" G.M.







3. CHARACTERISTICS

- **Name:** AMR
- **Use:** Replaceable bladder hydropneumatic tank for booster sets
- **Volume:** 5 – 15.000 liters
- **Mode:** Vertical / Horizontal
- **Maximum service pressure:** 8 – 10 – 16 – 20 Bar
- **Test pressure:** 12 – 15 – 24 – 30 Bar
- **Precharge pressure:** 1,5 Bar
- **Gas:** Air
- **Temperature Min / Max**:-10ºC / +100ºC
- **Dimensions:** see below
- **Threaded bottom water connection:** See models
- **Upper threaded auxiliary connection:** See models
- **Membrane:** Replaceable bladder
- **Finish (painting):** External epoxy coating. Red RAL-3000
- **Inflate valve:** Included
- **Warranty:** 2 year
- Designed and manufactured according to European Directive 2014/68/EU

3.1. Vertical models

Models without legs 8-10 bar

Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Water connection
2	01005014	5 AMR	5	10	200	245	1"
2,5	01008021	8 AMR	8	10	200	350	1"
4	01015021	15 AMR	15	10	270	320	1"
4,5	01020021	20 AMR	20	10	270	425	1"
9	01035021	35 AMR	35	10	360	485	1"
10	01050021	50 AMR	50	10	360	620	1"
4,5	01025051	24 AMR-E	24	8	350	390	3/4"
4,5	01025061	24 AMR-E	24	8	350	390	1"


Models with legs 8-10 bar

Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Water connection
10	01035241	35 AMR-P	35	10	360	615	1"
12	01050241	50 AMR-P	50	10	360	750	1"
16	03080241	80 AMR-P	80	10	450	750	1"
18	03100031	100 AMR-P	100	10	450	850	1"
18	03100041	100 AMR-P-A	100	10	450	875	1 1/4"
25	03150801	150 AMR-B90 (M/F)	150	10	485	1060	1 1/4"
42	03200801	200 AMR-B90 (M/F)	200	10	550	1135	1 1/4"
55	03300801	300 AMR-B160 (M/F)	300	10	650	1180	1 1/4"
71	03500801	500 ARM-B160 (M/F)	500	10	750	1450	1 1/2"
78	03700501	700 AMR-B160 (M/F)	700	8	750	1750	1 1/2"


Vertical models 6 bar

Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Water connection
260	01100031	1000 AMR	1000	6	850	2225	2"
340	01140031	1400 AMR	1400	6	1000	2210	2"
545	01200031	2000 AMR	2000	6	1200	2255	2 1/2"
650	01300031	3000 AMR	3000	6	1200	3045	2 1/2"
830	01400031	4000 AMR	4000	6	1400	3110	2 1/2"
985	01500031	5000 AMR	5000	6	1500	3700	2 1/2"
1090	01600031	6000 AMR	6000	6	1500	4200	2 1/2"
1310	01800031	8000 AMR	8000	6	1500	5045	2 1/2"

Vertical models 10 bar

Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Water connection
294	03910031	1000 AMR	1000	10	850	2225	2"
387	03914031	1400 AMR	1400	10	1000	2210	2"
685	03920031	2000 AMR	2000	10	1200	2255	2 1/2"
840	03930031	3000 AMR	3000	10	1200	3045	2 1/2"
1105	03940031	4000 AMR	4000	10	1400	3110	2 1/2"
1430	03950031	5000 AMR	5000	10	1500	3700	2 1/2"
1595	03960031	6000 AMR	6000	10	1500	4200	2 1/2"
1940	03980031	8000 AMR	8000	10	1500	5045	2 1/2"

Vertical models 16 bar

Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Water connection
500	05910031	1000 AMR	1000	16	850	2225	2"
625	05914031	1400 AMR	1400	16	1000	2210	2"
910	05200031	2000 AMR	2000	16	1200	2255	2 1/2"
1160	05300031	3000 AMR	3000	16	1200	3045	2 1/2"
1535	05400031	4000 AMR	4000	16	1400	3110	2 1/2"
1980	05550031	5000 AMR	5000	16	1500	3700	2 1/2"
2225	05600031	6000 AMR	6000	16	1500	4200	2 1/2"
2735	05800031	8000 AMR	8000	16	1500	5045	2 1/2"

Optional: Flanged connection DN65 PN16 and manhole
For other capacities and horizontal models, please consult the factory.

Vertical models 16 - 20 bar

Poids (kg)	Code	Modèle	Capacité (Litres)	Pression Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Connexion d'eau
15	01050261	50 AMR-P	50	16	360	750	1"
39	05080031	80 AMR	80	16	485	690	1 1/2"
42	05100031	100 AMR	100	16	485	805	1 1/2"
55	05150031	150 AMR	150	16	485	1155	1 1/2"
62	05220031	220 AMR	200	16	485	1400	1 1/2"
79	05350031	350 AMR	350	16	485	1965	1 1/2"
165	05500031	500 AMR	500	16	600	2065	1 1/2"
233	05700031	700 AMR	700	16	700	2145	1 1/2"
341	05900311	900 AMR	900	16	800	2155	1 1/2"
500	05910031	1000 AMR	1000	16	850	2225	2"
625	05914031	1400 AMR	1400	16	1000	2210	2"
70	03150401	150 AMR	150	20	485	1155	1 1/2"
90	03220401	220 AMR	200	20	485	1400	1 1/2"
153	03350401	350 AMR	350	20	4785	1965	1 1/2"
234	03500401	500 AMR	500	20	600	2065	1 1/2"
328	03700401	700 AMR	700	2	700	2145	1 1/2"
605	03910401	1000 AMR	1000	20	850	2225	2"
666	03914401	1400 AMR	1400	20	1000	2210	2"

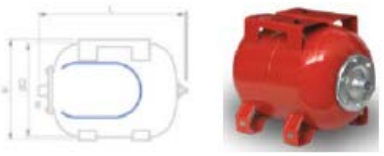
Models without legs 16 bar

Poids (kg)	Code	Modèle	Capacité (Litres)	Pression Max. (bar)	Dimensions Ø D (mm)	Dimensions H (mm)	R Connexion d'eau
4,5	01015251	15 AMR	15	16	270	330	1"
5,3	01020251	20 AMR	20	16	270	425	1"
6	01025251	25 AMR	25	16	320	440	1"
13	01050251	50 AMR	50	16	360	620	1"

3.2. Horizontal models

Horizontal models with support 10 bar

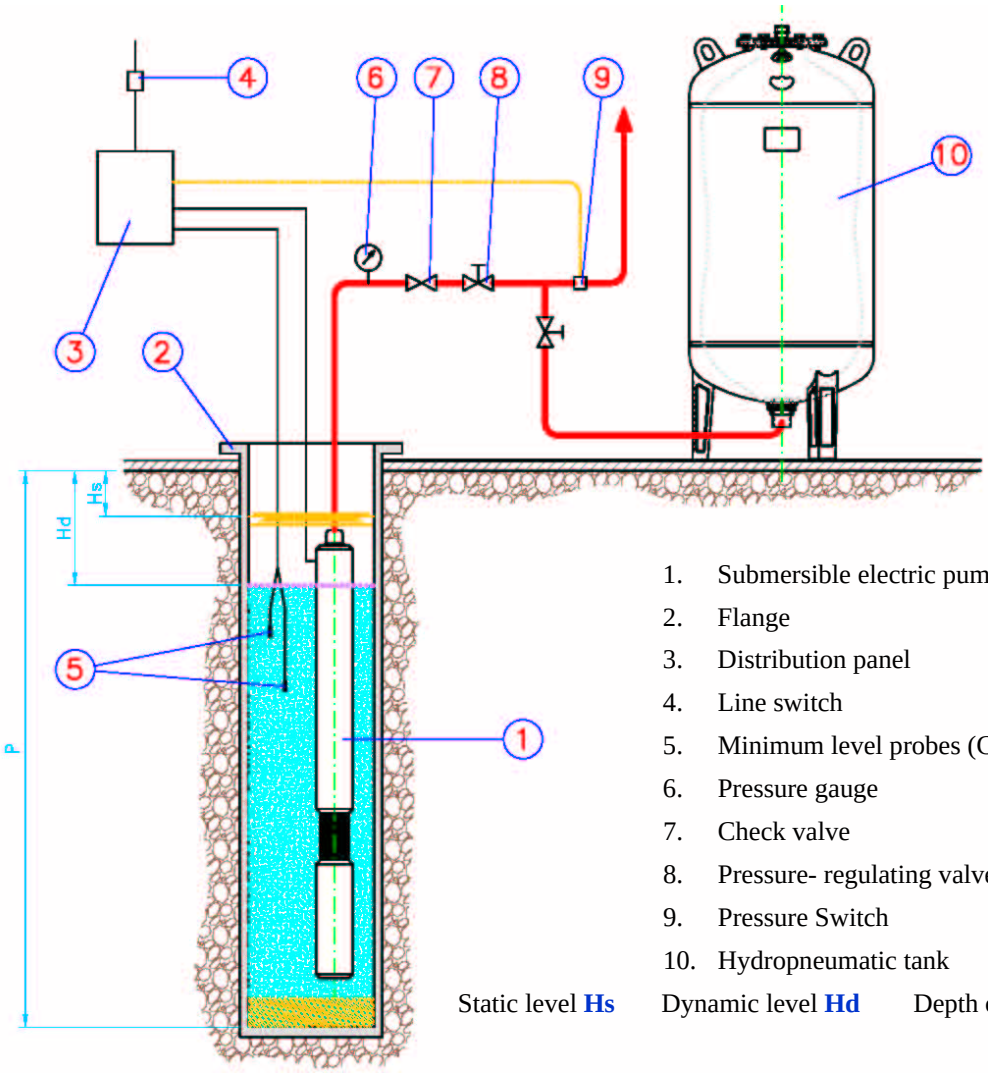
Weight (kg)	Code	Model	Capacity (Litres)	Pressure Max. (bar)	Dimensions Ø D (mm)	Dimensions L (mm)	Dimensions H (mm)	R Water connection
6	01020281	20 AMR-S	20	10	270	420	295	1"
12	01050281	50 AMR-S	50	10	360	620	390	1"
16	03080261	80 AMR-S	80	10	450	625	480	1"
18	03100211	100 AMR-S	100	10	450	750	480	1"



4. APPLICATION

AMR hydropneumatic tanks are intended for use in water catchments, facilities for drinking water supply, as well as fire groups, forming an essential part of the booster sets. In addition to maintaining a water reservoir pressure and ensure optimal water supply, allow longer life of the booster sets, significantly reducing the number of operations start-stop pump and a significant energy savings.

A typical installation of a hydropneumatic tank could be as follows:



1. Submersible electric pump
2. Flange
3. Distribution panel
4. Line switch
5. Minimum level probes (Catheter)
6. Pressure gauge
7. Check valve
8. Pressure- regulating valve
9. Pressure Switch
10. Hydropneumatic tank

Static level **Hs** Dynamic level **Hd** Depth of well **P**

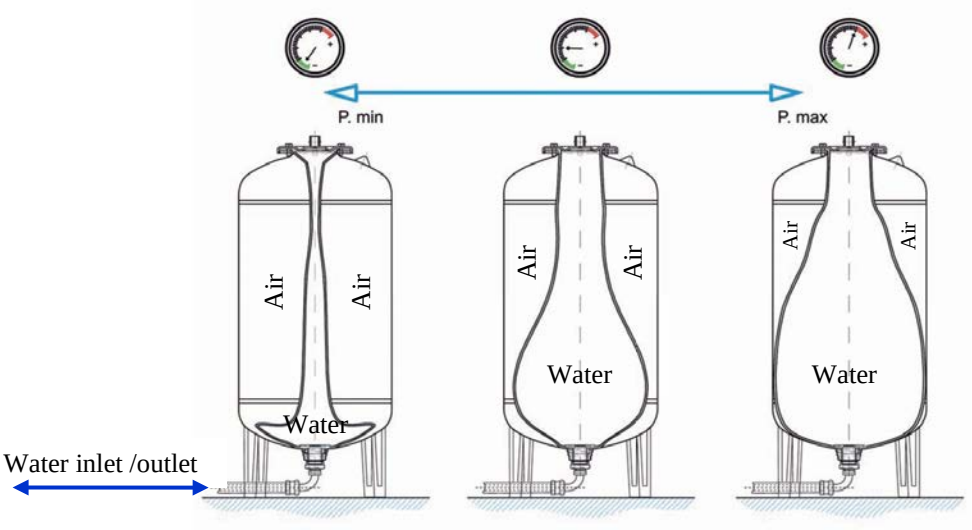
They are not suitable for use with hydrocarbon fluids and those belonging to Group 1 in accordance with European Directive 2014/68/EU.

The most important technical characteristics of AMR hydropneumatic tanks 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

Drinking water collected from the network, a reservoir, etc., is driven into the accumulator by the pump unit.

As the water enters the tank, it is stored inside of the bladder which separates hermetically the air chamber from the water chamber. The entry of water into the AMR hydropneumatic tank involves a reduction of the initial volume of the captive air in the vessel and therefore the pressure increase.



When the maximum required pressure is reached (pump stop pressure), the pressure switch cuts off the flow of water between the pump and AMR hydropneumatic tank. At this moment there will be a volume of water stored inside of the hydropneumatic tank at a pressure equal to the stopping pressure of the pump.

Depending on the needs and user requirements, the stored energy through the captive air will push the water contained into the bladder toward the points of consumption.

As a result of the demand and the various supplies from the vessel to the system, the bladder of the tank which contains the water gets empty and the air chamber pressure decreases consequently. As soon as the pressure falls below the pressure at which the pressure switch is calibrated (Pump star pressure), the pressure unit starts working, providing again the necessary water according to the current need and also recovering the normal operating conditions.

While the air chamber pressure is maintained, the cycle runs automatically, as many times as the maximum and minimum pressures are reached. It is therefore essential to implement and verification a periodic maintenance of the air preload pressure in the tank (See Section 7 & 8).

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 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.

Before installation, make sure that the hydropneumatic tank 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 hydropneumatic tank. 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 hydropneumatic tank. 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 hydropneumatic 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 hydropneumatic tank.

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

Do not place any valve whose closure may unintentionally cancel the operation of the hydropneumatic accumulator.

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

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

AMR hydropneumatic tanks are supplied from the factory with the inflation pressure specified on the label attached to the product (1.5 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 hydropneumatic tank is necessary to check and adjust the pressure. In the case in which the hydropneumatic tank is placed on the high side of the pump (Drive), the precharge pressure P_0 has to be adjusted as follow:

$$P_0 \text{ (Bar)} = \text{Pump start pressure} - 0{,}2 \text{ Bar}$$

In the case in which the hydropneumatic tank is placed on the low side of the pump, the precharge pressure P_0 has to be adjusted as follow:

$$P_0 \text{ (Bar)} = \text{Accumulator inlet pressure} - (0{,}5 \div 1) \text{ Bar} \geq 1 \text{ Bar}$$

If the initial P_0 *required precharge pressure is higher than 3 bar, before reloading air, it is necessary to,*

- *Introduce water through the inlet/outlet connection of the hydropneumatic tank to cover the bottom coupling or orifice.*
- *Isolate the hydropneumatic tank from the installation.*
- *Once this is done, charge or refill with air through the inflation valve up to calculated* P_0 *pressure.*

Once the precharge pressure P_0 has been adjusted in accordance with the instructions, it will be verified by means of a manometer the internal pressure of the accumulator remains stable at P_0. *It could happen*, due to internal pressure, that the screws of the accumulator flange or the nut of the lower coupling, need to be retightened, if it is observed that the pressure P_0 has fallen or varied.

Once P_0 has been verified and taking the appropriate precautions, the accumulator will be communicated with the installation. If the installation pressure is higher than the preload P_0, water will start to enter the tank with the consequent increase in the pressure until reaching maximum value at the sop pressure of the pump. *It could happen*, due to the increase in pressure, that it is necessary to retighten the screws of the accumulator flange or the nut of the lower coupling. Therefore, check that the tank is watertight and that there are no leaks.
The tank is ready to operate. 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 ***P0*** 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 desviation of the measured pressure respect the precharge pressure ***P0*** 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 disassemble hydropneumatic tank without having depressurized previously the installation and the vessel.

Before proceeding to removal hydropneumatic tank, make sure that all parts exposed to pressure are depressurized. Insulate the vessel from the 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 hydropneumatic tank. Finally, bleed through the inflation valve, reducing the air pressure to depressurize the hydropneumatic tank completely. Remove hydropneumatic tank and change.

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

AMR series vessels are replaceable bladder models. In case of bladder rupture, it can replace.

10. NOTES


TÜV NORD
CERTIFICATE
Management system as per
ISO 9001 : 2008
Industrias Ibaiondo S.A.
Pentzia Bidea, 3
48100 Mungia (Vizcaya)
Spain
Design, production and supply of
hydropneumatic tanks, replaceable &
hydropneumatic hammer shock
DAKKS
Lloyd's Register
EC Certificate of Conformity
In accordance with the requirements of the Pressure Equipment
Directive 97/23/EC
This is to certify that the Quality Management System of
Industrias Ibaiondo, S.A.
Pentzia Bidea, 3
48100 Mungia (Vizcaya)
Spain
has been assessed against the requirements of Annex III, Module D of the Pressure
Equipment Directive 97/23/EC, and conforms to the requirements for the product
shown below:
Manufacture of hydro-pneumatic tanks with replaceable bladder, replaceable &
fixed bladder, expansion tanks and hydro pneumatic hammer shock absorbers.
Approval is subject to the continued maintenance of the quality system in accordance
with the requirements of the above Directive and Regulations, and continuing to comply
with the EC Design and/or EC Type Examination Certificate(s) as listed on the attached
schedule.
Authorisation is hereby given to use the LRV Notified Body Identification Number in
accordance with the requirements of the specified Directive and Regulations in relation
to the products as identified above.
Certificate No: 0038/PED/MAD/0127
Original Approval: 22 March 2002
Current Certificate: 18 March 2014
Certificate Expiry: 21 March 2017
LRV Notified Body Number 0038
José Rivero on behalf of Lloyd's Register Verification