IBAIONDO

Fixed membrane hydro-pneumatic accumulators for hydrocarbons

HMF

Installation, use and maintenance handbook

PLENTZIA BIDEA, 3 BILLELA AUZOTEGIA
48100 MUNGIA- SPAIN
APDO CORREOS, 21
C.I.F. : A-48045199
Tlf.: +34 94 674 04 00
Fax: +34 94 674 09 62
E-mail: nacitec@ibaiondo.com

INDEX

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.

The fixed, completely impermeable membrane is made of flexible synthetic rubber, in one piece, keeping the oil and nitrogen permanently isolated, thus excluding any possibility of corrosion of the inner metal surface of the tank or dilution of the nitrogen in the oil.

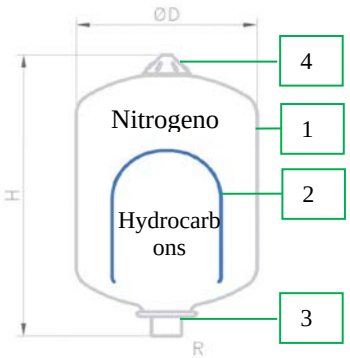
The tanks are fitted with a suitably protected valve for regulating the pressure in the nitrogen chamber..

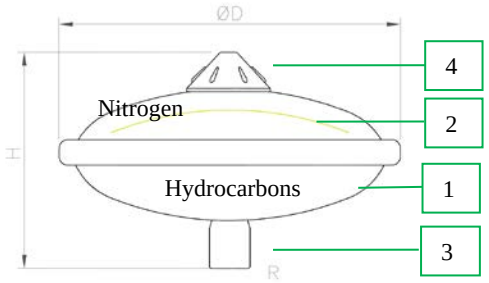
Final application, on phosphate-coated surface, of oven-dried epoxy paint, red colour.

Tightness and resistance of the tanks are tested at a pressure 1.5 times the maximum working pressure.

1. VESSEL COMPONENTS

1.- Steel vessel
2.- Membrane to contain hydrocarbon
3.- 3/4" G.M. zinc-plated steel threaded hydrocarbon connection.
4.- Inflation valve





2. MAIN CHARACTERITICS

- **Name:** HMF
- **Use:** Fixed bladder hydro-pneumatic tank for pressure boosting systems
- **Volume:** 1-25 litres
- **Maximum service pressure:** 3-8-10 Bar
- **Test pressure**: 4.5-12-15 Bar
- **Precharge pressure:** 1.5 Bar
- **Gas:** Nitrogen
- **Temperature Min / Max**: -10ºC / +100ºC
- **Dimensions:** see below
- **Threaded hydrocarbon connection:** R3/4" (Galvanized steel)
- **Membrane:** Fixed Membrane suitable for containing hydrocarbons
- **Finish (peinture) :** Paint coating
- **Colour:** Red RAL-3000
- **Inflate valve:** Included
- **Warranty: 2** años
- Designed and manufactured according to Pressure Equipment Directive 2014/68/EU

HMF (hydrocarbons)

Hydropneumatic tanks
Booster sets (Hydrocarbons)

- Non-replaceable bladder suitable for hydrocarbons
- External red epoxy powder coating
- Manufactured according to 2014/68/UE Directive

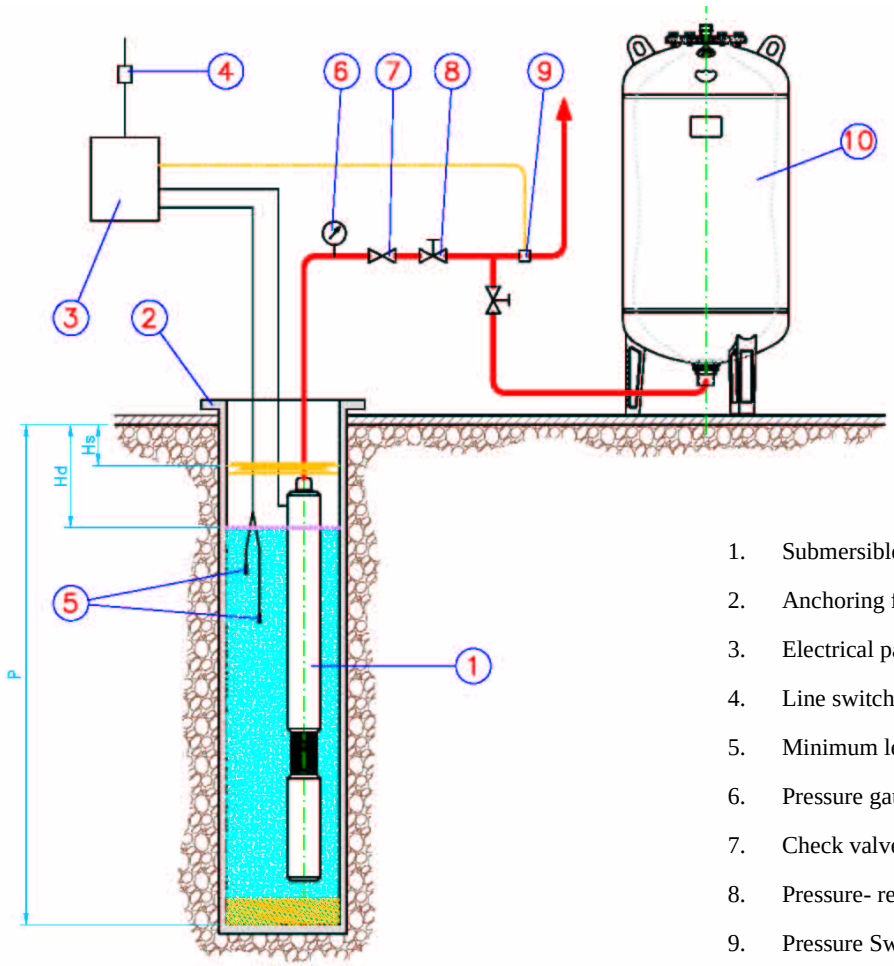
Models without feet 3 - 8 - 10 Bar

Code	Model	Volume (Lts)	Weight (Kg)	Pressure Máx. (Bar)	Ø D (mm)	H (mm)
06002621	1 HMF	1	1	3	226	82
06002631	2 HMF	2	1,5	3	230	130
06005631	5 HMF	5	2	10	200	250
06008631	8 HMF	8	2,5	10	200	340
06015631	15 HMF	15	3,2	10	270	320
06025631	25 HMF	25	4,2	8	320	430

3. APLICATION

HMF hydro-pneumatic accumulators are designed for use in hydrocarbon systems and hydrocarbon supply installations, forming an essential part of the pressure boosting system. In addition to maintaining a reserve of pressurized hydrocarbon and guaranteeing an optimum supply, they extend the life of the pressure boosting system, significantly reducing the number of pump start-stop operations, as well as providing significant energy savings.

A typical installation of a hydro-pneumatic tank could be as follows:



1. Submersible electro-pump
2. Anchoring flange
3. Electrical 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 HMF

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

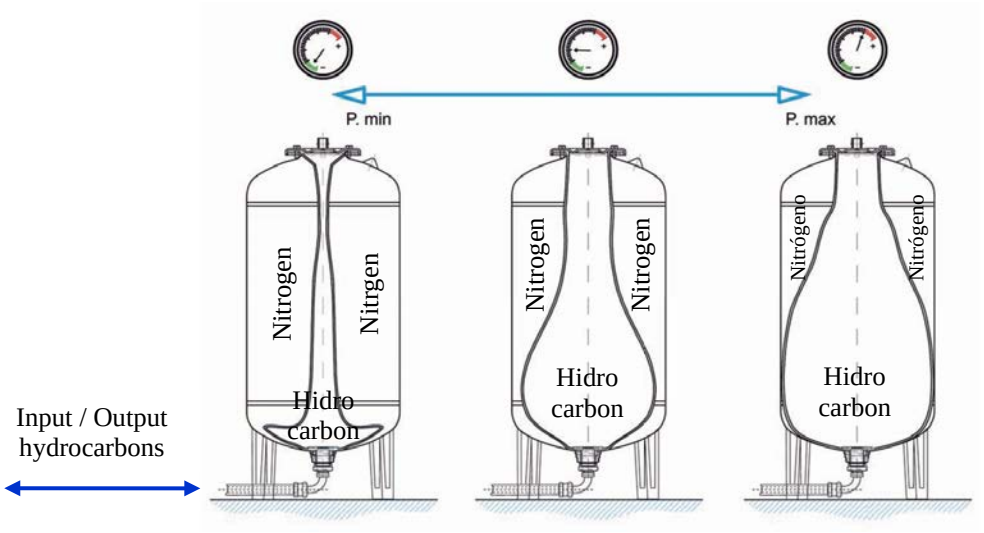
Suitable for use with hydrocarbons according to Directive 2014/68/EU.

The most important technical characteristics of HMF hydro-pneumatic accumulators and other data relating to their manufacture are indicated on the label attached to the product. This label must not be removed or altered 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..

4. OPERATION

The hydrocarbon is collected and pumped to the accumulator by the pumping unit.

As oil enters the tank, it is stored inside the bladder or membrane, which hermetically separates the nitrogen and oil chambers. As hydrocarbon enters the reservoir, the initial volume of captive nitrogen in the reservoir decreases and consequently the pressure increases.



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

Depending on the needs and demand of the users, the energy stored through the captive nitrogen inside the tank will propel the hydrocarbon contained inside the bladder to the consumption pointsAs a consequence of the demand and the various inputs from the accumulator to the system, the bladder of the tank containing the hydrocarbon 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 at that moment, supplying again the necessary hydrocarbon according to the needs of the moment and it will also refill the tank, recovering the 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. It is therefore essential to implement and perform a periodic check and maintenance of the tank nitrogen charging pressure (Sections 7 and 8).

5. 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.

2. COMMISSIONING

HMF hydropneumatic fixed membrane accumulators are supplied from the factory with the inflation pressure indicated on the label attached to the product (1.5 Bar - Nitrogen). To ensure correct operation of the system, this value must be set to a pressure value $\mathbf{P_0}$, taking into account the characteristics of each installation, either by filling with nitrogen up to the precharge value $\mathbf{P_0}$ or by venting through the filling valve if the initial nitrogen precharge needs to be reduced to the value $\mathbf{P_0}$.

In the case of hydropneumatic accumulators placed hydrocarbon downstream of the booster set (IMPULSION), the value of the pre-charge pressure $\boldsymbol{P_0}$ shall be as follows:

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

In the case of hydropneumatic accumulators placed hydrocarbon upstream of the booster set (ASPIRATION), the value of the pre-charge pressure $\boldsymbol{P_0}$ shall be as follows:

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

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

6. MAINTENANCE

The maintenance must be performed only by the authorized staff.

At least once a year, check that the value of the precharge pressure $\boldsymbol{P_0}$ 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,

- Close the valve connecting the tank to the system.
- Empty the hydropneumatic accumulator of hydrocarbon.
- After the oil has been drained, the pressure is checked through the accumulator valve. If the desviation of the measured pressure respect the precharge pressure $\boldsymbol{P_0}$ is greater than +/- 20%, adjusted to the original value P_0, following the instructions given in section 7 of the instruction handbook.

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

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

7. DISASSEMBLY

Never dismantle the hydropneumatic 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 hydrocarbon 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 hydropneumatic tank of hydrocarbon. Finally, bleed through the inflation valve, reducing the nitrogen pressure until the hydro-pneumatic accumulator is completely depressurised.

When replacing the hydro-pneumatic accumulator, under no circumstances should the tank be removed before the installation has been depressurised and the temperature of the hydrocarbon is below 35 ºC.

The HMF series vessels are fixed membrane models. If the membrane rupture, the accumulator must be replaced according to the instructions given.

10. NOTES


TÜV NORD
CERTIFICADO
Sistema de Gestión de acuerdo a la Norma
ISO 9001 : 2008
Industrias Ibaiondo S.A.
Plentzia Bidea, 3
48100 Mungia (Vizcaya)
España
Diseño, fabricación y comercialización de recipientes hidroneumáticos con membrana recambiable, y antiarietes hidroneumáticos
Lloyd's Register
Certificado de Conformidad CE
De acuerdo a los requisitos de la Directiva de Equipos a Presión
Directiva 97/23/EC
Industrias Ibaiondo, S.A.
Plentzia Bidea, 3
48100 Mungia (Vizcaya)
Spain
Fabricación de acumuladores hidroneumáticos con vejiga intercambiable, vasos de expansión con membrana y antiarietes hidroneumáticos
Certificado Nº:
Aprobación Original:
Certificado en Vigor:
Caducidad del Certificado:
Lloyd's Register Verification