



# HIDRACAR S.A.

## INSTRUCTIONS FOR THE USE, MAINTENANCE & DISMANTLING OF OUR PULSATION DAMPENERS

### USE

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For a correct function of a pulsation dampener, the apparatus should be pre-charged with gas (DRY NITROGEN) at a pressure of 80% of the minimum pressure of the circuit.

The maximum pressure in the circuit must **NEVER** be higher than the maximum working pressure of the apparatus, which is indicated on its attached adhesive label.

The temperature of the liquid in the circuit must never exceed the temperature limits indicated on the label.

All the materials of the body in contact with the process liquid and the separator element must be chemically compatible with the liquid of the circuit.

The thread of the connection port of the pulsation damper must be identical to the thread of the connection adapter to the pipe circuit.

**ATTENTION!** If a play exists between threads, made a control to see which is out of norm and tolerance. **NEVER** try to compensate the excess clearance between threads filling it with Teflon tape or similar.

The nominal size of a pulsation dampener indicates its internal gas volume in litres, but not the amount of liquid that it can store. This depends on the range of pressures at which the circuit must work.

### MAINTENANCE

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Our pulsation dampeners do not require practically any maintenance.

We only recommend verifying the pre-charge pressure every six months; monthly in the case of both PTFE bellows and membrane dampeners. To perform this task, you must use the **HIDRACAR** accessory for charging, purging and verifying the pressure (Ref. BV(\*\*\*)A1TM) (see also our *Instructions of use of the HIDRACAR charging & control gas kits for pulsation dampeners and hydro-pneumatic accumulators*).

In case the pulsation dampener is submitted to extreme working conditions, such as limit temperatures, highly corrosive liquid or environment, uninterrupted functioning 24 hours a day, etc. we recommend carrying out the pre-charge pressure control monthly.

## DISMANTLING:

Before proceeding to dismantle the pulsation dampener, you must make sure the dampener has been completely emptied of gas. For that purpose a **HIDRACAR** accessory for charging, purging and verifying the pressure (Ref. BV(\*\*\*)A1TM) should be used. This accessory has to be connected to the dampener gas charging valve (3).

### BLADDER TYPE:

(See drawings AV\_AI\_MP\_BP\_IN\_DOC and AV\_PL\_BP\_IN\_DOC)

Once the dampener is completely empty of gas, first unscrew the gas charging valve (3). Then you have to proceed to remove the upper lid (6) of the pulsation dampener. To do it, the retention screw(s) (if present) must be removed to allow pushing the lid down inside the body, with the help of a soft hammer, until its retaining ring (4) is cleared and can be removed from its recessed groove emplacement (see drawing).

When the retaining ring (4) has been taken out, the upper lid can be easily removed with the help of our *Tool for a quick extraction of the bladder from accumulators* (Ref. DRB.A/B) (see also the tool user's guide). On removing the lid, the bladder follows behind.

Replace the bladder, if necessary.

For re-assembling you have to proceed exactly in the reverse of the dismantling, using a high unctuousness lubricant compatible with the rubber bladder compound. Introduce the upper lid (6) with the bladder attached and push it down into the body of the dampener until the groove into which the retaining ring (4) must be lodged is cleared, then put the retaining ring (4) in place.

**IMPORTANT:** When introducing or removing the upper lid, you must make sure it slides in completely coaxial respect to the body of the dampener; otherwise it could get jammed.

Next, use our *Tool for a quick extraction of the bladder from accumulators* to return the lid to its right position (up until the retaining ring stops the lid, and screw the retention screw(s) (if any) with its (their) washer(s) to prevent the lid from getting back down inside the body. Screw back the gas charging valve.

#### ◆ Special case - Size U350 stainless steel dampener:

Once the dampener is completely empty of gas, proceed to remove the upper cap (6). For it, all the bolts (4.2) must be unscrewed from their nuts to release the retaining rings (4.1) that keep both the body and the upper cap together. Then remove the cap, the "O"- ring (7) and finally the circular frame (4.3) to which the bladder is attached.

Replace the bladder and / or the "O"- ring, if necessary.

For re-assembling you have to proceed exactly in the reverse of the dismantling, using a high unctuousness lubricant compatible with the rubber bladder compound. Put the circular frame (4.3) with the bladder back in place and then the "O"- ring (7) back in its groove. Then the upper cap, the retaining rings (4.1) and finally screw the bolts to their nuts (4.2) to hold both retaining rings together. The tightening torque to be applied is: 20 N x m.

#### ◆ Special case - Sizes U150 to U320 plastic dampeners:

Once the dampener is completely empty of gas, proceed to unscrew the upper cap. The bladder follows behind.

Replace the bladder, if necessary.

For re-assembling you have to proceed exactly in the reverse of the dismantling, using a high unctuousness lubricant compatible with the rubber bladder compound

Pre-charge again at the proper pressure with Nitrogen gas (N<sub>2</sub>) with the help of the gas charging kit. Keep the dampener always in a vertical position. Check that there are no gas leaks.

**MEMBRANE TYPE:**

(See drawing AM.AI.BP.IN.DOC)

Once the dampener is completely empty of gas, proceed to remove the upper shell (6). For it, all the bolts (4) must be unscrewed from their nuts (4.2); then the upper shell can be easily removed, allowing the silicone (1.2) and TFM (1) membranes with its insert button (2) to be checked.

Replace membranes (1) (1.2), if necessary.

For re-assembling you have to proceed exactly in the reverse of the dismantling, putting both membranes (1) (1.2) with the insert button (2) back in their place. Then, screw the bolts (4) to the nuts (4.2) with their washers (4.1).

The tightening torque to be applied depends on the size of the bolts:

<b>BOLT SIZE</b>	<b>M10</b>	<b>M12</b>	<b>M14</b>	<b>M16</b>	<b>M18</b>	<b>M20</b>
<b>TORQUE</b>	36 N x m	62 N x m	98 N x m	150 N x m	213 N x m	303 N x m

Pre-charge again at the proper pressure with Nitrogen gas (N<sub>2</sub>) with the help of the gas charging kit. Keep the dampener always in a vertical position. Check there are no gas leaks.

**PTFE BELLOWS TYPE:**

(See drawing AFT.AI.BP.IN.DOC.)

Once the dampener is completely empty of gas, proceed in the following order: Unscrew the bottom bolts (4.1), take out the retaining ring (4) and then pull out the nozzle piece (2) and the "O"- ring (6); next extract the bellows (1) by pulling it out.

Replace the bellows and the "O"- ring, if necessary.

For re-assembling the dampener you have to proceed in this order: First the bellows (1), then the nozzle piece (2), place the "O"- ring (6) back into its recessed groove; put the retaining ring (4) back in place and finally screw the bolts (4.1)

The tightening torque to be applied depends on the size of the dampener:

<b>DAMPENER SIZE</b>	<b>F002</b>	<b>F003 / F007 / F015</b>	<b>F030 / F040 / F060</b>	<b>F100 / F150</b>
<b>TORQUE</b>	5.1 N x m	8.8 N x m	44 N x m	21.5 N x m

Pre-charge again at the proper pressure with Nitrogen gas (N<sub>2</sub>) with the help of the gas charging kit. Keep the dampener always in a vertical position. Check there are no gas leaks.

**STAINLESS STEEL BELLOWS TYPE:**

In the event of malfunction of the pulsation dampener, please, proceed to send it back to us, cleared of any chemical, in order to get it repaired in our workshop.