 <p>17 Rue PAUL BERT 89400 MIGENNES Tel : 03 86 82 30 04 Fax : 03 86 82 30 01 E-mail : reservoir@charlattereservoirs.fayat.com Site : www.charlatte.fr</p>	<b>TECHNICAL SPECIFICATION</b>	Quality Assurance
	<b>TITLE:</b>  <b>E.U.V.</b> <b>SURGE BLADDER VESSEL FOR RAW AND WASTE WATER</b>	REF <b>SPT 0176-04-GB</b>
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## **1- BLADDER VESSELS**

A bladder surge vessel has the same mission with regard to surge control as the traditional compressor vessel.

The objective of this pneumatic solution is to simplify the method of regulation, given the difficulty in effective level control with waste water.

As in the case of a vessel controlled by compressors, a pre-charge pressure is calculated to give the required elasticity to push the water into the system following a pump shut down or power cut.

The major difference being that the air is contained within a rubber bladder. Therefore, as there is no contact between the compressed air and the liquid there is no dissolution. There is thus no requirement for a permanent regulation system including compressors, etc...

Once the vessel has been commissioned and the correct precharge has been introduced, the vessel will operate automatically emptying when called upon and refilling with the return waves until naturally refinding its steady state balance.

Charlatte manufacture raw/waste water bladder vessels form 50 to 50000 liters.

## **2 - CONCEPTION OF A BLADDER VESSEL FOR RAW/WASTE WATER.**

This type of vessel is vertical. It is constituted of a steel vessel containing a rubber bladder with a protective coating resistant to aggressive waste water, and a flanged connection pipe equipped with anti-extrusion grill.

The vessels are treated internally with Epoxy paint as corrosion protection and externally to client specification.

# TECHNICAL SPECIFICATION

Quality Assurance

TITLE:

## E.U.V. SURGE BLADDER VESSEL FOR RAW AND WASTE WATER

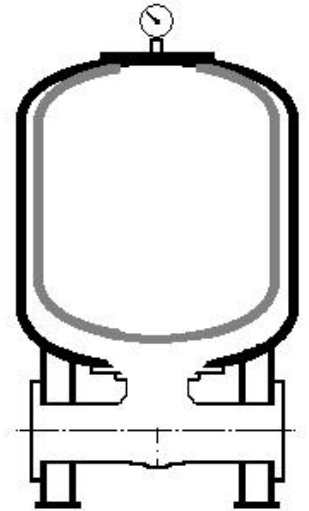
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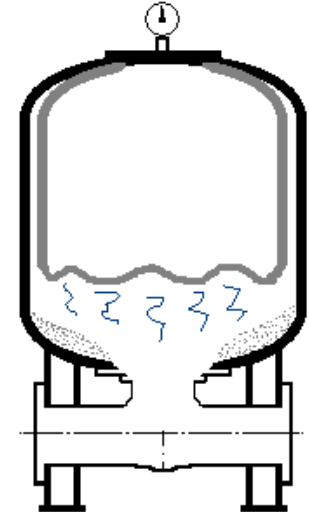
### 3 - OPERATION

The installation of such a surge vessel is very simple, but must be performed with care. If well done, future checking of the vessel will be very easy.

3.1 Initially the precharge pressure must be adjusted to the value resulting from the hydraulic analysis. At this stage the bladder occupies the full volume of the tank...



3.2 When the gate valve is opened the water will enter the vessel under static conditions, and begin to compress the gas (static pressure is always higher than precharge pressure)...



3.3 The water entering the vessel will further compress the precharged gas until a balance between the liquid and the compressed gas is reached.



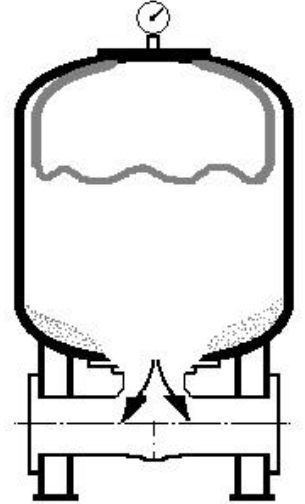
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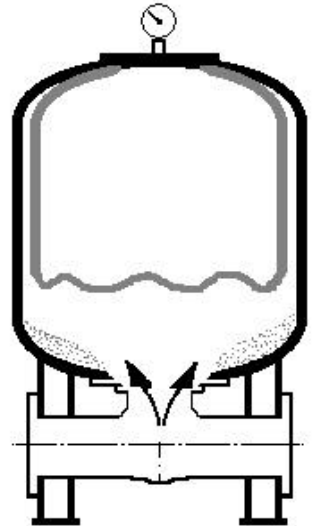
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3.4 Immediately after a pump stop the pressure in the line will start to decrease and the elastic energy in the vessel will discharge the water from the vessel into the line. This prevents dangerous low pressure along the pipe work.



3.5 As the pressure may become very low, the flow will reverse, this will then enter into the vessel. Several oscillations may occur before static state is reached.



3.6 When the pumping station will restart, the vessel will continue to fill until dynamic steady state is reached and it is then once again prepared for the next pump stop.

