

GKD-DN80
Diaphragm Type Pulse Damper
Operation Manual and
Technical Data Sheet



I、 Overview

Pulsation buffer, also known as pulsation damper which is a common component for eliminating pulsation and is an accessory for diaphragm pumps, metering pumps, etc. Pulsation buffer can smooth out the pipeline pulsation and system water hammer caused by the volume of diaphragm pumps, plunger pumps, etc. It uses a corrosion-resistant diaphragm to isolate the gas from the liquid in the pipeline and smooth the pipeline pulsation by changing the volume of the gas chamber.

II、 Main Functions

1. Reduce the harm of water hammer to the system.
2. Reduce the peak value of flow rate fluctuation.
3. Protect pipelines, elbows and joints from pressure fluctuations.
4. Create a good working environment for diaphragm pumps and improve the working performance of pumps.
5. Allow the system to use smaller pipe diameters and reduce costs.
6. Used in conjunction with back pressure valves, etc., the pressure fluctuation of the pipeline can be close to zero.
7. Reduce the energy consumption of the system.

III、 Working principle

According to Boyle's law $P_1V_1 = P_2V_2$, by changing the volume of gas can smooth the pipeline pulsation. For the system with certain curves characteristics of flow rate, the air chamber volume goes smaller, and then pulsation damper can gain the extra flow of liquid at the peak. The air chamber volume goes larger and releases the stored liquid, then to achieve the smooth pulsation effect at the trough.

IV 、 Product Features

- To be filled with gas, the effect of smooth inflation pulsation is better than that of air chamber pulsation damper.
- The gas will not contact with the pipeline liquid, and the gas will not be lost due to dissolution into the liquid.
- The limit device is set to prevent excessive deformation of the diaphragm.

V 、 Installation

The pressure range of diaphragm pulsation damper's casing is 0.1-0.5mpa for plastic aterial and 1.2mpa for metal material. Overload pressure is forbidden to prevent leakage at the clamp connection. The highest service temperature is from 60℃, and the lowest service temperature is negative 10 ~45℃.

During installation to prevent shell rupture, collision should be avoided. Sufficient space shall be reserved around the pulsation damper to facilitate fixing the support and prefilling gas of the pulsation damper and future maintenance and adjustment. Shock absorbing materials shall be padded between the pulsation damper and the fixed support to absorb the vibration energy of the pulsation damper shell and prevent common vibration.

The damper is essentially used to reduce the pulse in the pipeline. There is an air inlet at the upper end of the equipment, insert the connector, insert the air pipe, and then charge the air. Air regulator shall to be installed at air inlet supply pipe. Adjusting the regulator appropriately after equipment running by keeping check the stability of the outlet pressure step by step (for example, once the air pressure has

been adjusted into 0.2MPa, please check the pulse at the outlet, if the pulse is still quite large, continue to increase the air pressure supply).

Pre charge nitrogen or argon for gas and the average pressure is 50%- 70% of the system. When it is installed at the pump outlet, it should pre charge 50% of the pressure. when it is installed at the pump inlet, it should pre charge 60% - 70% of the pressure. The pre charged gas shall be discharged to prolong the service life of the diaphragm if the pulsation damper will be laid aside for a long time. Pre charge oxidizing gas (such as oxygen and air) is not recommended, otherwise it will accelerate the oxidation speed of rubber and reduce the service life of diaphragm.

The pressure gauge parameter should swing slightly during the use. A large swing indicates too small pre charge gas pressure, while no swing parameter indicates too high pre charge gas pressure.

VI、MODEL SELECTION

The pulsation damper model selection shall according to the fluctuation of hydraulic pipeline. For positive displacement pump, it can be selected according to stroke flow. The larger the volume of the pulsation damper, the better the smooth pulsation effect.

If there is no definition of the allowable pulsation in the system, then please refer to the following table:

System Element or Purpose	Maximum Allowable Pulsation (%)
Sensor	± 0.5
Measurement / metering	± 1.0
Rotameter	± 2.5
Sealing Protection	± 5.0
Energy Conservation	± 7.5
Water Hammer Elimination	± 10

Considering that the gas pressure will change according to the change of temperature, for the system with liquid temperature exceeding 50 °C, please refer to the following formula:

$$V_{pa} = V_p T_i / (0.95 T_{op})$$

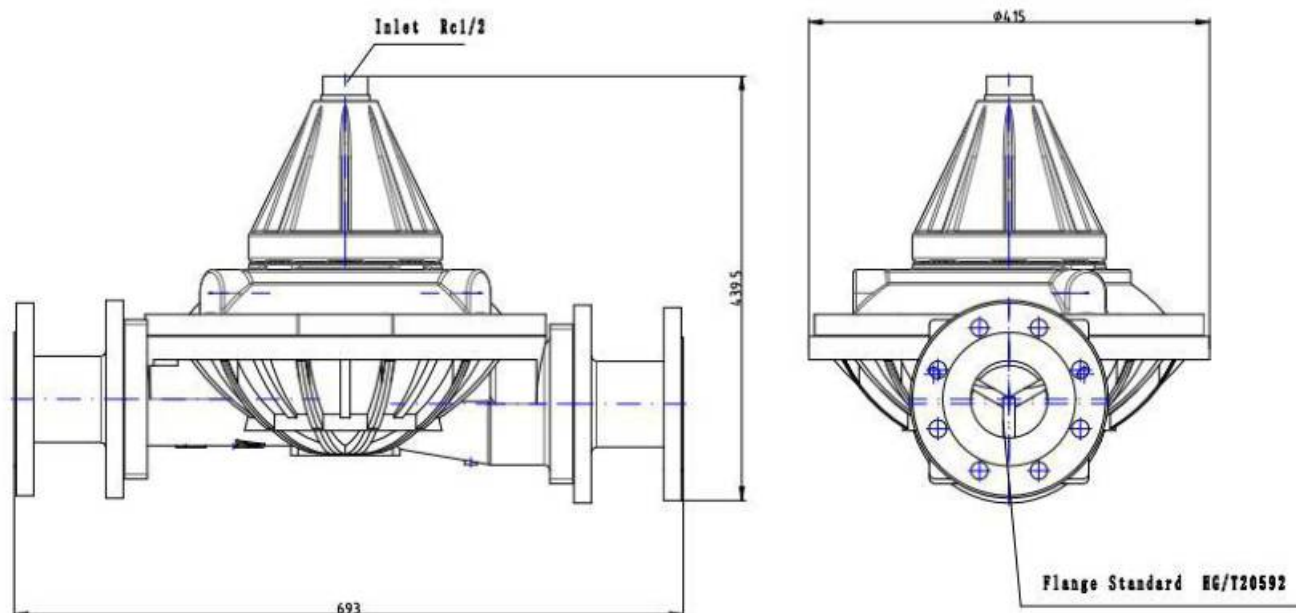
VPA corrected equivalent stroke flow

VP actual stroke flow

Ti precharge gas temperature (k)

Top maximum service temperature (k)

VII、 DIMENSION



*The damper inlet pressure adjustment range is 50%-70% of the outlet pressure.

*The pulsation damper is available in 304、 316、 316L、 1CR18NI9TI、

Ductile Iron、 Aluminum as options.

VIII、 PRESERVATION

- To clean the pulsation damper residue of the conveyed object.

- To evacuate oxidizing gas in the exhaust air chamber.
- To release the gas in the exhaust chamber to make the internal and external pressure the same.
- To dry pulsation damper.
- To seal the pulsation damper in plastic film.

The pulsation damper is hard to be kept for a long (preferably not more than two months) because of the aging of the diaphragm and other reasons. After the storage period, it is necessary to retest the sealing condition of the pulsation damper and check whether the diaphragm is damaged.

IX、 ATTENTION:

1. The effect of smooth pulsation will be better if it is installed close to the pump.
2. Vertical installation is better than horizontal installation.
3. The higher the pre charge gas pressure is not the best.
4. To avoid resonance with the system.
5. When used together with the back pressure valve, it shall be installed between the pump and the back pressure valve to absorb the peak flow between the pump and the back pressure valve, to reduce the wear rate of the back pressure valve.
6. Pulsation damper shall be used indoors to avoid direct sunlight and away from fire source and heat source. Protective shed or cover shall be added for outdoor use.
7. If the liquid is dangerous, the pulsation buffer shall be equipped with a protective cover to prevent the spilled liquids from damaging human body or polluting the environment after the shell is broken.

8. Check the pre charge gas pressure every day, check the plastic shell every month, check the diaphragm every 720 hours or 3 months, and decide whether to replace it according to the actual situation.

9. The pulsation buffer is not allowed to be heated or cooled during use.

10. Please stop the equipment before any maintenance of the pulsation damper.

Please release the pressure, close the valve connected to the pulsation damper and the system. Please confirm there is no pressure in the pulsation damper. During the maintenance, pay attention to the splashed liquid, to avoid human body harming.

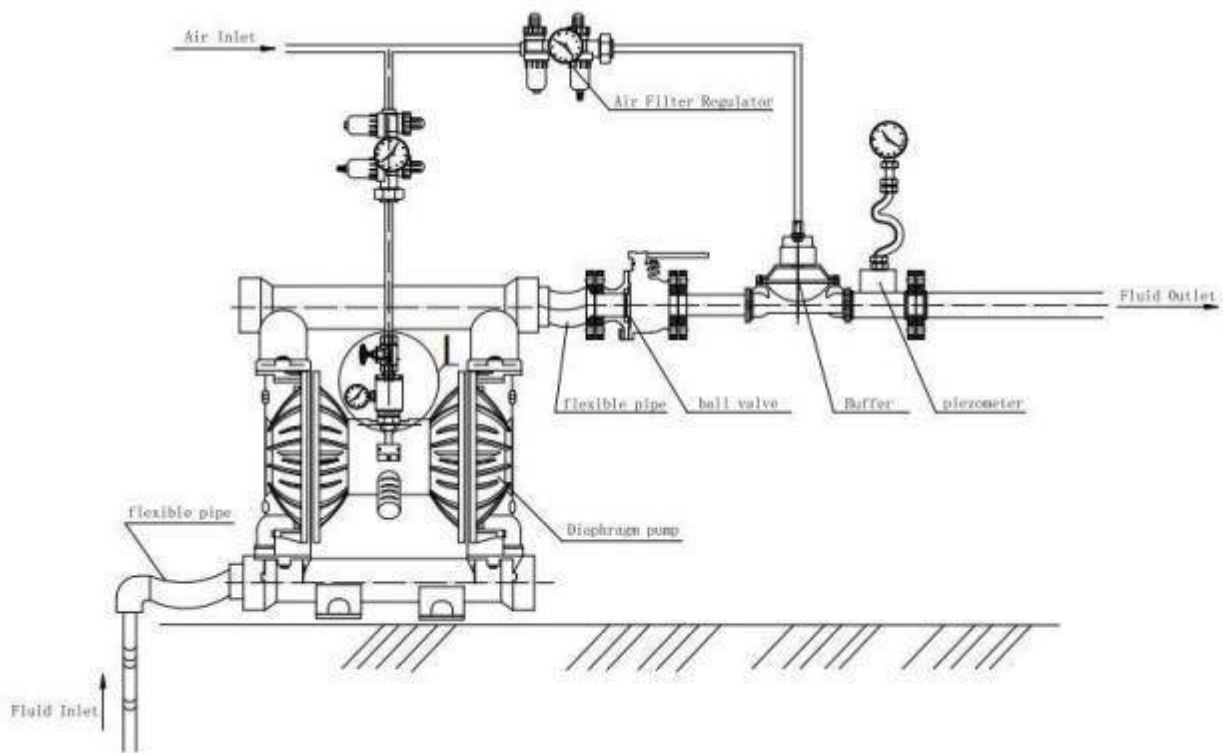
11. In case of diaphragm rupture during operation, the air supply shall be cut off right away.

12. If you have any further questions, please contact our company.

X.WARNING:

Please stop the equipment before any maintenance of the pulsation damper. Please release the pressure, close the valve connected to the pulsation damper and the system. Please confirm there is no pressure in the pulsation damper. During the maintenance, pay attention to the splashed liquid, to avoid human body harming.

XI.DRAWING:



Ability To Innovate And Develop New Product

GK expert for fluid
transfer.



Due to the continuous improvement of the product, GK will reserves the right to
modify the operation manual without notice.

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