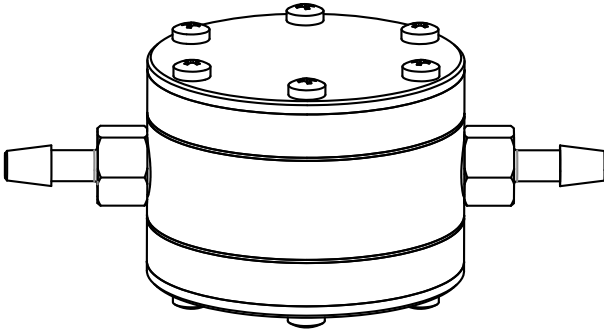




ZN60/ZN100 Pulse Damper Operating Manual



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Contents

| | |
|-------------------------------------|----|
| Safety Cautions | 1 |
| 1 Description | 2 |
| 2 Applications | 2 |
| 3 Functions and Features | 2 |
| 4 Components and Connectors | 3 |
| 5 Operating Instructions..... | 5 |
| 5.1 Damper Installation..... | 5 |
| 5.2 Buffer Film Replacement | 5 |
| 6 Regular Maintenance..... | 7 |
| 7 Malfunction and Maintenance | 7 |
| 7.1 Warranty | 7 |
| 7.2 Malfunction Solutions..... | 8 |
| 8 Pulse Dampener Connectors..... | 9 |
| 9 Chemical Compatibility | 10 |
| 10 Specifications | 12 |

Safety Cautions



Please carefully read the manual before operation.

The optimum performance of the pulse damper is achieved when used in conjunction with a peristaltic pump. Connecting other types of pumps may compromise the damper's performance, rendering it ineffective or causing damage.

Ensure that the distance between the pulse damper outlet and the pipeline outlet is not too short, as this may diminish the damper's effectiveness.

During use, air bubbles may temporarily appear in the pipeline when using the pulse damper. This condition typically resolves itself after a short period.

When transporting supercooled or overheated liquids, reduce the flow rate and allow the pulse damper sufficient preheating or precooling time to prevent leakage from threaded joints due to temperature differentials.

Use the pulse damper within the specified calibration parameters. We disclaim responsibility for any personal injury or material loss resulting from usage beyond these parameters.

Note



The chemical compatibility table provided is for assessing whether the pulse damper is suitable for specific liquid transmissions. The compatibility testing duration is 48 hours. Golander does not guarantee the application of these chemicals in other contexts.



Warning

Fluid properties may change due to fluctuations in temperature, pressure, concentration, and other conditions, potentially leading to damper failure and leakage. This can result in serious injury or loss. When handling chemicals, especially toxic substances, take appropriate precautions to prevent personal injury and material loss.

This product is not intended for use in clinical medicine.

1 Description

The Pulse Damper serves as a pressure vessel designed to mitigate liquid pressure pulsations or flow fluctuations within a pipeline. It effectively stabilizes fluid pressure and flow, dampens pipeline vibrations, and safeguards downstream instruments and equipment.

The ZN60 Pulse Damper is specifically engineered to complement the characteristics of peristaltic pumps. We do not possess pertinent data regarding its performance with other pump types or under different circumstances. For usage with alternative pumps or in different scenarios, we recommend consulting the damper's performance specifications.

Our company's Pulse Dampers boast a consistent material source and assured characteristics. Constructed from polytetrafluoroethylene(PTFE), the damper body ensures reliability. Customers have the flexibility to choose the appropriate damper type and joints based on the chemical requirements of their transmission liquids.

ZN60 internal volume 11 ml, maximum operating pressure of 0.18 Mpa at room temperature.

ZN100 internal volume 94 ml, maximum operating pressure of 0.25 Mpa at room temperature.

2 Applications

- Pulsating Frequency: 0 to 2000 Hz
- ZN60 Flow Rate: 0 to 1200 ml/min
- ZN100 Flow Rate: 500 to 8000 ml/min

3 Functions and Features

Featuring a simple structure, compact size, and user-friendly design. Suitable for a wide range of high-flow applications, effectively eliminating fluctuations during high-throughput liquid transmission.

The damper body incorporates spoiler wings, serving to convert fluid laminar flow at the input interface into turbulence, thereby dissipating some of the fluid's pulsation energy. Additionally, these wings divert fluid to the buffer membrane, which absorbs and suppresses fluid pulse energy.

Employing a dual-sided buffer film design enhances fluid pulse rectification efficiency, addressing the limitations of single-chip pulse dampers.

Equipped with a pressure ring and limit cover on the buffer film surface, offering protection against pipeline pressure and sharp objects to prevent fluid overflow. Additionally, these features provide explosion-proof capabilities, mitigating potential safety risks associated with fluid pulse dampers.

4 Components and Connectors

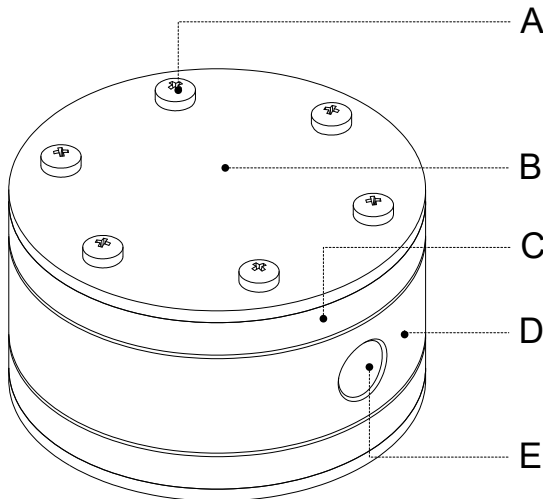


Figure 1. Components and Connectors

ZN60 applicable hose sizes: 14#, 19#, 16#, 25#, 17#, 15#24#.

ZN100 applicable hose sizes: 16#, 15#, 25#, 17#, 24#, 8#, 35#, 36#, 73#,

82#.

- A. Bolt: Used to install and secure the limit cover and pressure ring.
 - B. Limit Cover: It is transparent, allows observation of the internal liquid flow state of the damper, while also serving as a protective structure to isolate the internal and external environments of the damper.
 - C. Pressure Ring: Circular structure used to evenly press the buffer structure onto the damper body.
 - D. Body: The main structure of the damper, with the central space serving as a buffer chamber for liquid pulsations, and equipped with spoiler wings internally to suppress pulsations.
 - E. Connector Hole: Threaded hole with NPT threads, where the connector hole of ZN60 is 1/8 NPT and ZN100 is 3/8 NPT. Install corresponding size pipe connectors according to the actual hose used in the working conditions.
- The damper and connector are joined via threads, with the thread specification being 1/8 NPT.
 - Please refer to [Pulse Dampener Connectors](#) for connector and pipeline specifications.
 - Ensure that the direction of liquid flow through the damper aligns with the directional arrow indicated on the limit cover.
 - To prevent leakage at the connector between the damper and connector, tighten the joint securely during installation. Note that this product utilizes an end-face seal joint, where the joint's end face should be snug against the sealing ring at the bottom of the threaded hole. The tightening torque for the joint is 0.15 N·m (alternatively, it can be determined by observing the distance between the joint and the damper. During tightening, the connector should be close to the exterior of the damper body, with a distance of approximately 0.5mm).
 - Due to the high internal pressure when the damper is in operation, ensure proper sealing of the pipeline and connectors.

5 Operating Instructions

5.1 Damper Installation

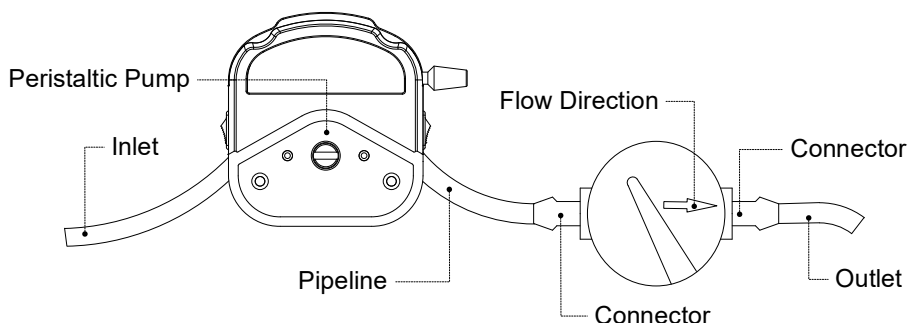


Figure 2. Damper Installation

- (1) Connect the NPT connectors to the damper.
- (2) Connect the pipeline with the connector to ensure that the distance between the fluid outlet and the damper should be greater than 20cm.

Note: The installation direction indicated on the damper should align with the direction of liquid flow.

- (3) Install the tube on the peristaltic pump.

5.2 Buffer Film Replacement

The damper product comes installed with a default 0.5mm buffer film. Additionally, the product package includes two pieces each of 0.1mm and 0.2mm buffer films, along with a buffer film gasket. If the inner diameter of the hose exceeds 4.8mm and the damping effect is not noticeable, resulting in splashing at speeds below 300rpm, users are advised to replace the buffer film with a thinner one. The specific replacement method is outlined below.

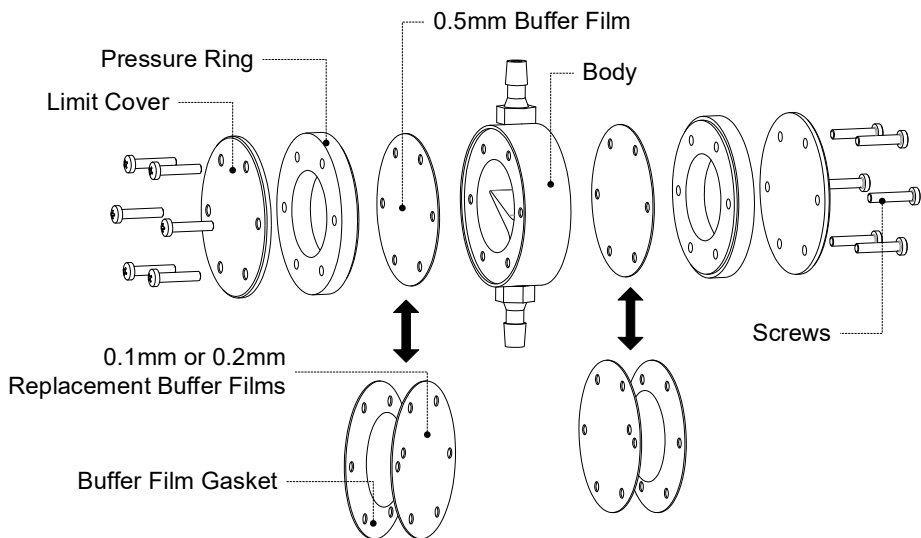


Figure 3. Disassemble Damper

- (1) Remove the fastening screws on both upper and lower sides of the ZN60 damper (as shown in [Figure 3](#)), disassemble the damper, and take out the 0.5mm buffer film.
- (2) Remove the 0.2mm or 0.1mm thin film from the packaging bag, peel off the protective film on both sides, and simultaneously take out two buffer film gaskets. Affix one side of the buffer film gasket to the pressure ring, then attach the thinner replacement buffer film to the other side of the buffer film gasket. Finally, tighten the screws on the top of the body.
- (3) When installing the single-side buffer film assembly, first ensure that the body is flush with the surface to secure the screws (as shown on the left side of [Figure 4](#)). Begin by screwing in the screws in this direction, but do not tighten them at this point. After screwing in the screws underneath the body, then tighten them (as shown on the right side of [Figure 4](#)). This means that screws opposite to the embedded nut should be tightened first during fastening to prevent the nut from slipping inside the body.

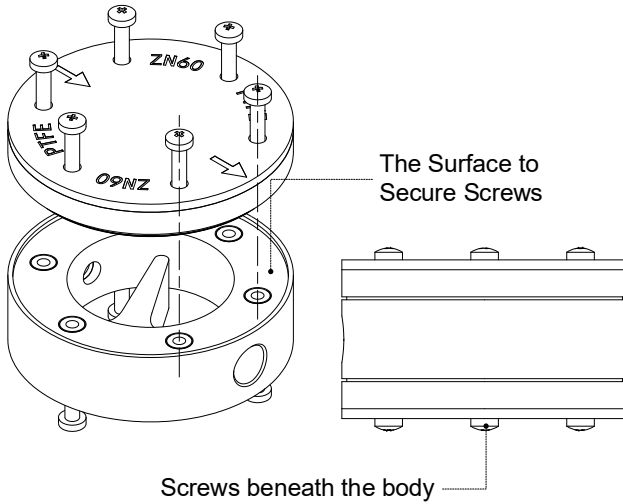


Figure 4. Disassemble Damper

(4) After installation, ensure that there are no wrinkles in the buffer film.

Note: The damper material is soft, do not remove the connector from the damper when it is unnecessary!

6 Regular Maintenance

In order to prevent the liquid from settling and crystallizing in the damper, please wash the damper in time after using.

7 Malfunction and Maintenance

7.1 Warranty

The product comes with one-year labor and parts warranty. The limited warranty does not cover any damage that is caused by improper usage and handling.

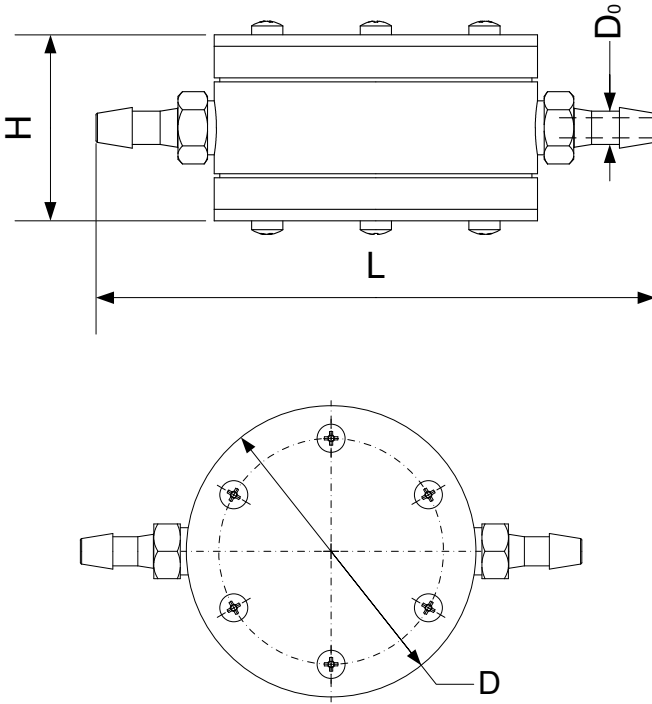
7.2 Malfunction Solutions

| Malfunction | Solution |
|--|--|
| 1. Pronounced pulsations at the outlet | <ol style="list-style-type: none"> 1. The liquid flow rate exceeds the upper limit. Replace the large inner diameter tube and reduce the speed of peristaltic pump. 2. The liquid flow rate is too low. Replace the small inner diameter tube and increase the speed of peristaltic pump 3. The outlet pipeline of damper is too short. Increase the length of outlet pipeline. 4. If the damper is inverted or tilted, the inner space of the damper will be filled with liquid. Empty the damper and keep it upright. 5. The liquid vapor condenses in the damper, which leads to the decrease of the pressure in the inner space of the damper, and keeps the temperature of the damper close to that of the liquid to avoid condensation. |
| 2. Liquid leakage between damper and connector | <ol style="list-style-type: none"> 1. The connector is tightened. Retighten the connector. 2. If the sealing ring at the connector fails to seal, replace the sealing ring. 3. The connectors are repeatedly installed, resulting in damage to the damper threads. Trim the damper threads. |
| 3. leakage from damper screws | <ol style="list-style-type: none"> 1. The screws on both sides of the damper are loose. Use tools to tighten the screws. <p>If the liquid pressure is too high and the damper fails, determine the transmission liquid characteristics and select the appropriate buffer film model or damper model.</p> |



If the problem can not be solved, please contact the manufacturer or distributor.

8 Pulse Dampener Connectors



ZN60 Damper

| Model | | NPT Connector | Applicable tube | Dimensions(mm) | | | |
|-------|---|---------------|-----------------|----------------|------|-----|-----|
| | | | | D | H | L | Do |
| ZN60 | A | 1/8-2.4 | 14#, 19# | 58 | 32.5 | 85 | 3.6 |
| | B | 1/8-3.2 | 16#, 19# | | | 91 | 4.8 |
| | C | 1/8-4.0 | 16#, 25# | | | 95 | 5.8 |
| | D | 1/8-4.8 | 15#, 25# | | | 99 | 7.1 |
| | E | 1/8-6.4 | 17#, 24# | | | 112 | 8.9 |

ZN100 Damper

| Model | | NPT Connector | Applicable tube | Dimensions(mm) | | | |
|-------|---|---------------|-----------------|----------------|----|-----|------|
| | | | | D | H | L | Do |
| ZN100 | A | 3/8-6 | 16#, 15#, 25# | 99 | 63 | 162 | 6.5 |
| | B | 3/8-8 | 17#, 24# | | | 162 | 8.5 |
| | C | 3/8-10 | 18#, 35# | | | 168 | 10.5 |
| | D | 3/8-12 | 36#, 73# | | | 172 | 12.5 |
| | E | 3/8-14 | 73#, 82# | | | 174 | 14.5 |
| | F | 3/8-16 | 82# | | | 174 | 16.5 |

Chemical Compatibility

| | | | | | |
|--------------------------|------------------------|---------------------------------|--------------------|-------------------------------|---------------------------------|
| Ammonia | Calcium hydroxide | Aluminum sulfate | Magnesium chloride | Barium hydroxide | Rosin |
| 10% Ammonia | Lye: sodium hydroxide* | 10% Aluminum potassium sulfate | Sodium chloride | Calcium hydroxide | Whisky and wine |
| White liquor (pulp mill) | Glue, P.V.A. | 100% Aluminum potassium sulfate | Nickel chloride | Calcium hydroxide (saturated) | Detergent |
| Propylene glycol | Propylene glycol | magnesium sulphate (Epsom salt) | Copper chloride* | 10% Calcium hydroxide | Potassium nitrate |
| Ozone | Buttermilk | Manganese sulfate* | Honey | Magnesium hydroxide | Silver nitrate |
| Propanol | Ammonium phosphate | Sodium sulphate | Alum* | Sodium hydroxide (20%)** | Epsom salts (magnesium sulfate) |
| Methanol | Diammonium phosphate** | Nickel sulfate | Gelatin | Sodium hydroxide (50%)* | Sodium sulfite |
| Isopropanol** | Triammonium phosphate | Sodium bisulfate | Citric acid | Sodium hydroxide (80%)* | Sodium bisulfite |

ZN60/ZN100 Pulse Damper

| | | | | | |
|-----------------------|---------------------|---|-------------------------|------------------------------------|-------------------|
| Isobutanol** | Trisodium phosphate | 5% Copper sulphate | Milk | Potassium cyanide solution | Calcium oxide |
| Vinegar | Sodium sulfosulfate | >5% Copper sulphate | Boric acid | Liquid sodium cyanide | Carbon monoxide** |
| Lead acetate | Barium sulfide | Zinc sulfate | Sodium borate(borax) | Copper cyanide | Glycolic acid |
| Acetic acid steam | Potassium sulfide | Barium chloride | Beer | Cyanic acid* | Ethylenediamine |
| 10% hydrogen peroxide | Sodium sulfide | Calcium chloride (30% aqueous solution) | Sodium metaphosphate | Latex | Glycol |
| Seawater* | Ammonium sulphate | Calcium chloride (saturated) | Glucose | Deionized water** | Acetaldehyde |
| Methanol | Barium sulfate | Potassium chloride | Glucose | Lactic acid | Acetylene |
| 10% Methanol | Potassium sulphate | Lithium chloride * | Grape Juice | Photographic developing solution * | Castor oil |
| Natural gas | Beet juice* | soybean oil | Peanut oil | Cottonseed oil | Flax seed oil |
| Coconut oil | Corn oil | Sugarcane juice | Potassium dichromate | Calcium bisulfite | Cupric acid* |
| Carbonic acid | Calcium carbonate | Sodium carbonate | Potassium bicarbonate * | Sodium bicarbonate | Sugar (liquid) |

Note: * - Test condition: 22 °C (-5.6 °F).

** - Test Condition: 48 °C (8.9 °F).

For other reagent compatibility, please contact us.

9 Specifications

ZN60 Pulse Damper

| | |
|----------------------------|---|
| Tube inner diameter | 1.6-3.2mm |
| Tube model | Silicone, pharmed, PVC, Viton, A-60-G/F (please refer to silicone hose for hose selection) |
| Working pressure | 0.15MPa |
| Maximum pressure | 0.18MPa |
| Material | PTFE, silicone |
| Seal up | Silicone |
| Damper connector | 1/8 NPT |
| Internal volume | 11 ml |
| Work conditions | 0-80°C(temperature drop≤5 °C /min) |
| Dimensions | 58*58*32.5mm |
| Damper weight | 132g |

ZN100 Pulse Damper

| | |
|----------------------------|---|
| Tube inner diameter | 3.1-13mm |
| Tube model | Silicone, pharmed, PVC, Viton, A-60-G/F (please refer to silicone hose for hose selection) |
| Working pressure | 0.2MPa |
| Maximum pressure | 0.25MPa |
| Material | PTFE, silicone |
| Seal up | Silicone |
| Damper connector | 3/8 NPT |
| Internal volume | 94 ml |
| Work conditions | 0-80°C(temperature drop≤5 °C /min) |
| Dimensions | 99*99*63mm |
| Damper weight | 625g |