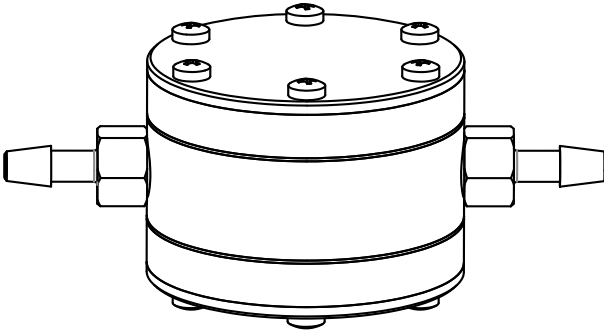




## ZN60 Pulse Damper Operation Manual



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## 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. With an internal volume of approximately 11ml, the pulse damper can withstand a maximum operating pressure of 0.18mpa at room temperature.

# 2 Applications

- Pulsating Frequency: 0 to 2000 Hz
- Flow Rate: 0 to 1200 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.

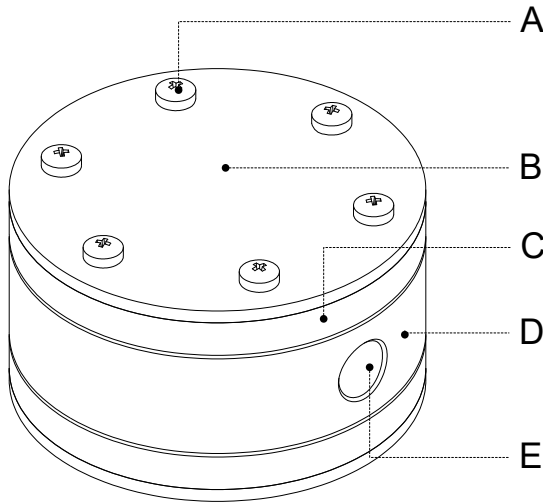
The damper body incorporates spoiler wings, serving to convert fluid laminar flow at the input interface into turbulence, thereby dissipating some of the fluid's pulsation energy. Additionally, these wings divert fluid

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*

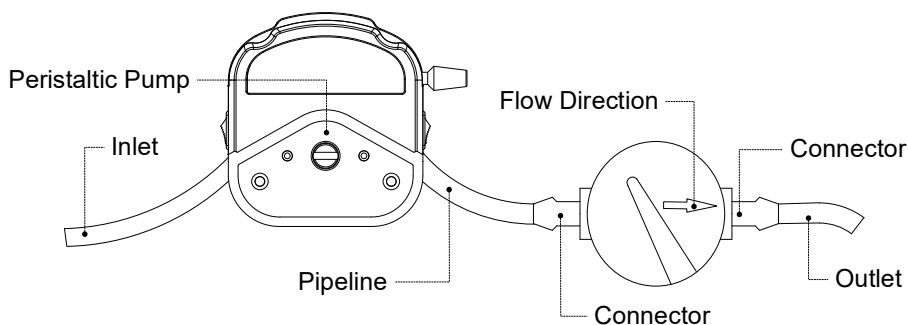
Applicable hose sizes: 14#, 19#, 16#, 25#, 17#, 15#24#.

- 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

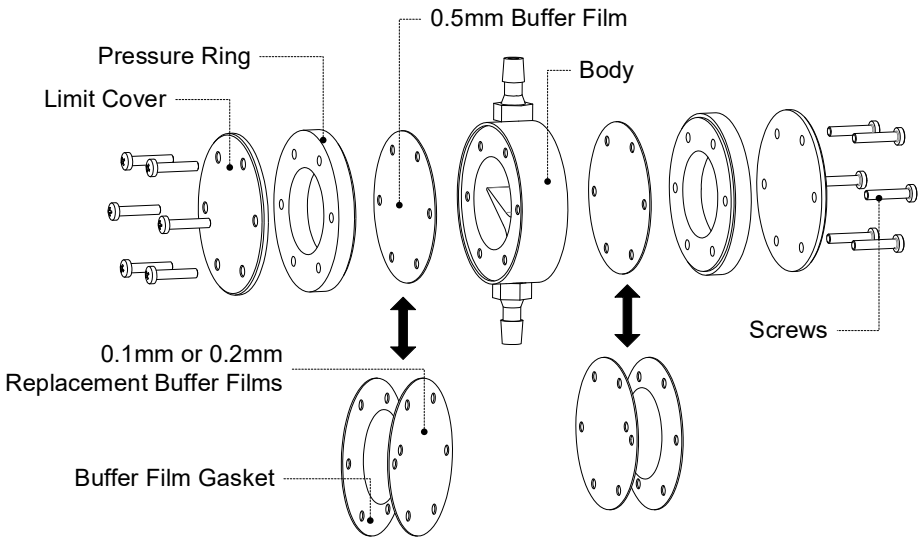


*Figure 2. Damper Installation*

- (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

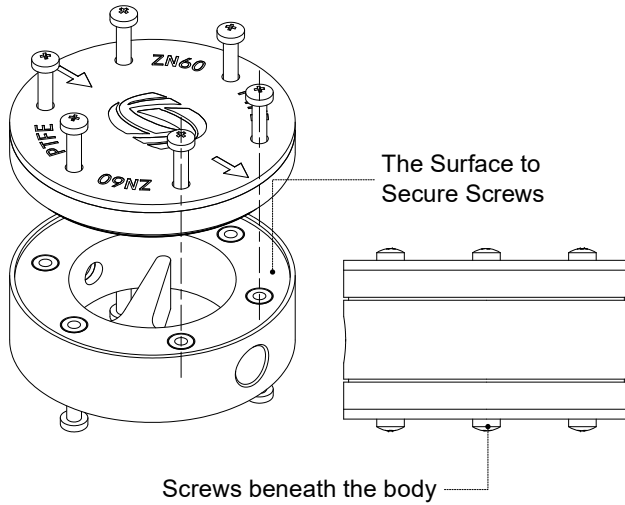
The damper product comes installed with a default 0.5mm buffer film. Additionally, the product package includes two pieces each of 0.1mm and 0.2mm buffer films, along with a buffer film gasket. If the inner diameter of the hose exceeds 4.8mm and the damping effect is not noticeable, resulting in splashing 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.

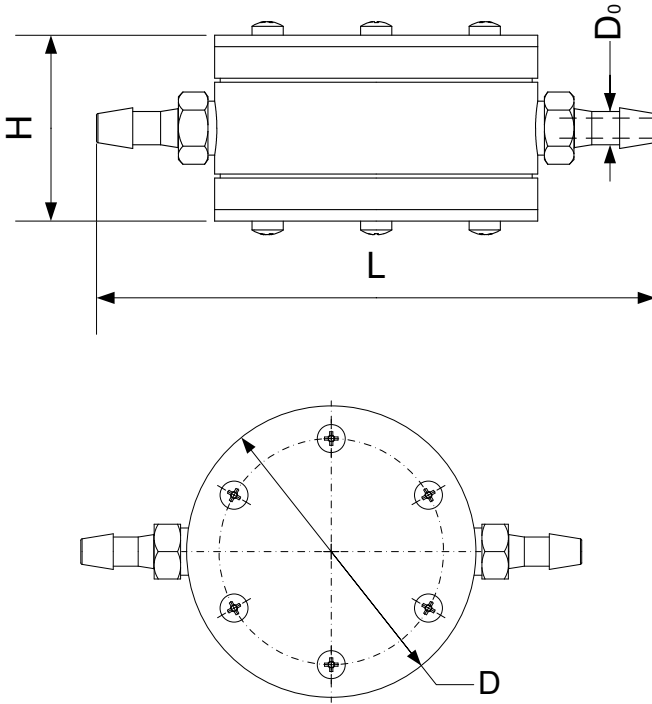
## 7.2 Malfunction Solutions

Malfunction	Solution
1. Pronounced pulsations at the outlet	<ol style="list-style-type: none"> <li>1. The liquid flow rate exceeds the upper limit. Replace the large inner diameter tube and reduce the speed of peristaltic pump.</li> <li>2. The liquid flow rate is too low. Replace the small inner diameter tube and increase the speed of peristaltic pump</li> <li>3. The outlet pipeline of damper is too short. Increase the length of outlet pipeline.</li> <li>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.</li> <li>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.</li> </ol>
2. Liquid leakage between damper and connector	<ol style="list-style-type: none"> <li>1. The connector is tightened. Retighten the connector.</li> <li>2. If the sealing ring at the connector fails to seal, replace the sealing ring.</li> <li>3. The connectors are repeatedly installed, resulting in damage to the damper threads. Trim the damper threads.</li> </ol>
3. leakage from damper screws	<ol style="list-style-type: none"> <li>1. The screws on both sides of the damper are loose. Use tools to tighten the screws.</li> </ol> <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

## 9 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
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

## ZN60 Pulse Damper

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.

## 10 Specifications

<b>Model number</b>	ZN60-PTFE
<b>Tube inner diameter</b>	1.6-3.2mm
<b>Tube model</b>	Silicone, pharmed, PVC, Viton, A-60-G/F (please refer to silicone hose for hose selection)
<b>Working pressure</b>	0.15MPa
<b>Maximum pressure</b>	0.18MPa
<b>Material</b>	PTFE, silicone
<b>Seal up</b>	Silicone
<b>Damper connector</b>	1/8 NPT
<b>Internal volume</b>	11ml
<b>Work conditions</b>	0-80°C(temperature drop≤5 °C /min)
<b>Dimensions</b>	58*58*32.5mm
<b>Damper weight</b>	132g