OPERATING INSTRUCTIONS

Pulsation Dampening Disc (PDS) | Original Operating Instructions (EN)

Translation DE → EN

Document Responsible: pulsmin • H. Lütte • Seelhofstraße 24 • D-79539 Lörrach / Rev.00 / 10.10.26

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1. User Instructions

These instructions enable the safe and intended operation of the pulsation dampening disc.

Safety Rules:

- **Read Instructions:** Read and follow completely before performing any work on the pulsation dampening disc.
- **Qualification:** Installation, adjustment, and maintenance must only be performed by trained qualified personnel.
- **Availability:** Keep these instructions accessible at the deployment site throughout the product's entire service life.
- **Transfer:** Hand over these instructions to any subsequent owner or user.

For technical questions, the pulsmin customer service is gladly at your disposal (contact details in footer).

1.1 Limitation of Liability

The information and notes in these instructions take into account applicable standards, legal regulations, and the state of the art at the time of creation.

The manufacturer assumes no liability for personal injury or property damage resulting from:

- Non-observance of the instructions
- Improper use
- Employment of unqualified personnel
- Unauthorized modifications or technical changes
- Use of non-approved replacement or wear parts

For special designs, additional options, or technical modifications, the actual scope of delivery may deviate. The obligations agreed in the supply contract, our General Terms and Conditions (AGB), and the legal regulations valid at the time of contract conclusion apply.

1.2 Incoming Inspection & Warranty

- **Inspection:** Check the delivery immediately upon receipt for completeness (delivery note) and transport damage.
- **Complaints:** Report transport damages immediately to the freight forwarder and pulsmin.
- **Returns:** Only by prior arrangement. Include damage report as well as contact details and error description.

Return Address: pulsmin | Seelhofstraße 24 | D-79539 Lörrach

- **Warranty:** The sales contract and our General Terms and Conditions (AGB) apply (http://www.pulsmin.com/Agb).

1.3 Warning Notices in these Instructions

Warning notices indicate hazards and must be strictly observed to avoid personal injury and property damage.

- **DANGER:** Imminent hazard – Severe personal injury or death.
- **WARNING:** Possible hazard – Severe personal injury or death.

- **CAUTION:** Possible hazard – Minor to moderate personal injury.
- **NOTICE:** Prevention of material or environmental damage.

2. Intended Use & Technical Data

The pulsation dampening disc is used to dampen pulsating, gaseous flow rates in piping systems, particularly in systems with reciprocating compressors.

2.1 Operating Limits

- **Medium:** Compressed air and neutral gases.
- **Purity:** Particle size max. 50 µm. For coarser contamination, install an upstream sieve filter.
- **Pressure & Temperature:** Refer to the nameplate or data sheet for permissible maximum values.

2.2 Design and Mode of Operation

The pulsation dampening disc consists of a single-piece element (Fig. 1). Flow passes from the gas inlet side (straight holes) to the gas outlet side (countersunk holes).

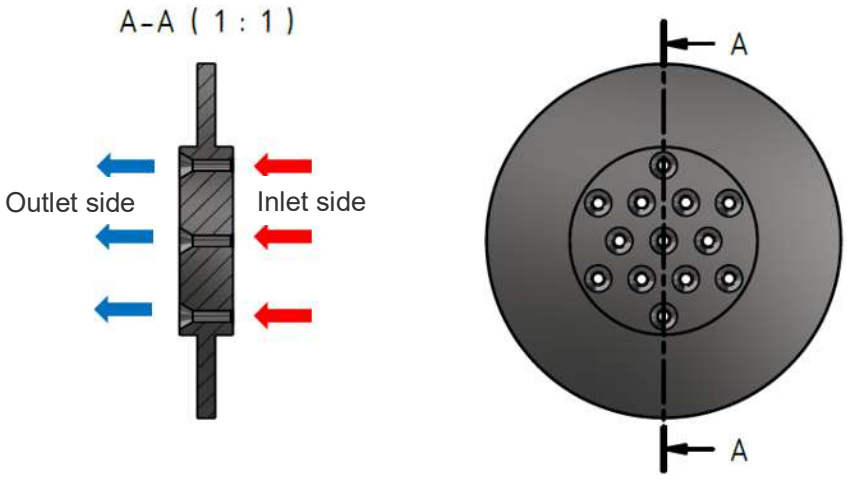


Figure 1: Cross-Section A-A & Front View PDS

Mode of Operation

The plate acts within the piping system through reflection and dissipation:

- **Reflection:** Prevents the propagation of pressure pulsations into the downstream system and destroys 'standing waves'.
- **Dissipation:** Increased fluid-mechanical friction in the bores additionally reduces pulsation energy.

2.3 Tailored Design

Since pulsation problems vary greatly depending on the system, operating state, and machine type, each pulsation dampening disc is custom-designed for your exact operating conditions.

In our design, we specifically consider:

- Pressure level and operating parameters
- Pulsation frequencies
- Piping geometry

This tailored concept ensures that dampening acts precisely in the relevant frequency range, unwanted side effects are avoided, and dynamic loads are reliably reduced.

3. Installation and Commissioning

> **DANGER! Danger to life from electric shock and pressurization!**
> All installation, maintenance, and repair work must only be performed on a system that is electrically de-energized and completely depressurized. The system must be secured against restarting (Lockout/Tagout).

3.1 Installation Location and Positioning

Installation Location: On the discharge side of the system. The pulsation dampening disc is designed for precise installation between two flanges without structural modifications (Fig. 2).

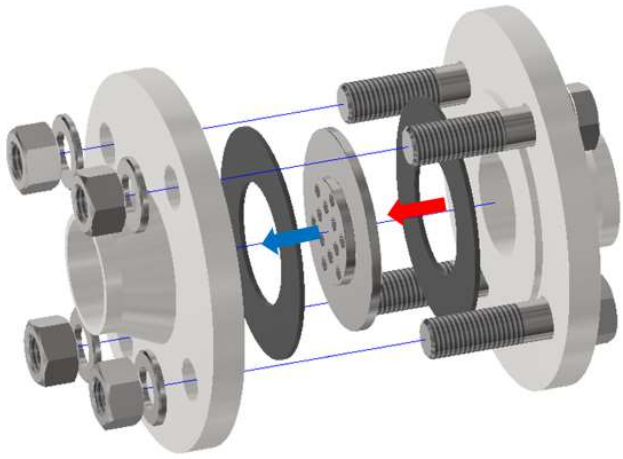


Figure 2: Flange Mounting Schema

- **Flow Direction:** Gas inlet side: Straight nozzle bores | Gas outlet side: Countersunk nozzle bores.
- **System Positioning:** To effectively reduce acoustic pressure peaks, the dampening plate must be placed close to the pipe end or directly before/after a large volume (e.g., dampener vessel).

> **IMPORTANT!**
> Avoid placement at a velocity node (1/4λ distance), as dampening effectiveness drops to zero here.

NOTICE: Prevention of Condensate Accumulation!
Installation in water pockets (low points with a risk of liquid accumulation) must generally be avoided to prevent malfunctions and corrosion.

3.2 Functional Testing

To ensure dampening performance, testing after installation is recommended:

- **Professional Measurement:** Measurement of pulsation before and after the pulsation dampening disc using a suitable pulsation meter (with appropriate sampling rate).
- **Simple Test (alternative):** Comparison of the pointer deflection using an unfilled precision pressure gauge (no glycerin-filled gauge). Measurement is taken once without and once with the installed pulsation dampening disc; the reduced pointer fluctuation serves as an evaluation criterion for the dampening effect.

4. Maintenance and Servicing

The pulsation dampening disc is maintenance-free by design.

However, as part of regular system or piping inspections, a visual check for contamination, damage, or deposits (especially in the area of the bores) is recommended.

5. Disassembly and Disposal

5.1 Disassembly

DANGER! Danger to life from electric shock and residual pressure!
Before starting disassembly, the system must be electrically disconnected, secured against restarting, and completely depressurized.

5.2 Disposal

The pulsation dampening disc must be disposed of or recycled in accordance with respective national regulations and environmental protection laws.

6. Troubleshooting

- **Fault: Safety valve upstream of the pulsation dampening disc triggers. | Cause 1:** Nozzle bores clogged with contamination -> Dismantle and clean.
- **Fault: Safety valve triggers. | Cause 2:** Nozzle bores incorrectly dimensioned (too small) -> Have reworked by manufacturer (pulsmin).

(Safety notice before disassembly: Depressurize and de-energize the system!)

Notice: Subject to change without notice.

EU Declaration of Incorporation

According to EU Machinery Regulation (EU) 2023/1230 (Annex IV / Annex II Part B)

Hereby, the manufacturer declares that the partly completed machinery described below complies with the relevant fundamental health and safety requirements of EU Machinery Regulation (EU) 2023/1230 as well as the other listed directives, to the extent possible within the scope of delivery.

The special technical documentation according to Annex IV Part B of this regulation has been prepared. The manufacturer undertakes to transmit the special documentation regarding the partly completed machinery to national authorities upon reasoned request via its documentation department.

The partly completed machinery must only be put into service once it has been established that the machinery into which this partly completed machinery is to be installed complies with the provisions of EU Machinery Regulation (EU) 2023/1230 (and where applicable, the EC/EU Declaration of Conformity according to Annex II has been issued).

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Document Responsibility: pulsmin | Technical Documentation | Seelhofstraße 24, D-79539 Lörrach

Designation and Identification of the Partly Completed Machinery

- **Product Designation:** Pulsation Dampening Disc
- **Short Designation / Type:** PDS
- **Nominal Diameters / Operating Pressure:** See respective order confirmation and nameplate

Relevant EU Directives & Harmonized Standards

The partly completed machinery complies with the provisions of the following EU regulations in their current valid versions:

- EU Machinery Regulation (EU) 2023/1230 (replaces former Directive 2006/42/EC)
- EU Pressure Equipment Directive 2014/68/EU

Applied harmonized standards and technical specifications (in particular):

- DIN EN ISO 20607: Safety of machinery – Instruction handbook – General principles for drafting
- DIN EN ISO 12100: Safety of machinery – General principles for design

Lörrach, October 13, 2026



Hansjakob Lütte
Managing Director