OPERATING INSTRUCTIONS

Pulsation Damping Valve (PDV) / Pulsation Damping Valve with Damping Disc (PDV-DS)
Translation DE → EN

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1. User Information

These operating instructions enable the safe and intended operation of the PDV and PDV-DS pulsation damping valves.

Safety rules:

- Read the instructions: Read and follow these instructions in full before carrying out any work on the valves.
- Qualification: Installation, adjustment and maintenance may only be carried out by trained specialist personnel.
- Availability: Keep these instructions readily available at the place of use throughout the product's service life.
- Transfer: Pass these instructions on if the product is resold or the system is transferred.

1.1 Limitation of Liability

The information reflects the state of the art and applicable standards at the time of preparation. The manufacturer accepts no liability for damage resulting from:

- Failure to observe these operating instructions
- Use other than as intended
- Use of unqualified personnel
- Unauthorised modifications or technical changes
- Use of unapproved spare or wear parts

1.2 Incoming Inspection & Warranty

- Inspection: Check the delivery immediately upon arrival for completeness and transport damage.
- Claims: Report transport damage immediately to the carrier and pulsmin. Returns are only accepted by prior arrangement and with a damage report.

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

1.3 Warnings

- DANGER: Immediate hazard – serious injury or death.
- WARNING: Potential hazard – serious injury or death.
- CAUTION: Potential hazard – minor injuries.
- NOTICE: Prevention of property damage or environmental harm.

2. Intended Use & Technical Data

Pulsmin pulsation dampers (PDV / PDV-DS) are designed to efficiently damp pulsating gaseous flows and rapid pressure fluctuations between the compressor and compressed-air dryer (preferably in rail vehicles).

2.1 Operating Limits

- Medium: Compressed air and neutral gases.

2.1 Operating Limits (continued)

- Purity: Maximum particle size 50 µm. If contamination is coarser, an upstream screen filter must be installed.
- Temperature: Medium and ambient temperature: −60 °C to +140 °C.
- Permissible pressure: Maximum 20 bar.

2.2 Design and Operating Principle

The PDV essentially consists of an inlet housing and an outlet housing, the valve piston with a self-centering valve seat, and the pressure spring. The PDV-DS is additionally fitted with a damping disc on the inlet side.

[Figure 1 – Valve design]

- Valve piston
- Pressure spring
- Damping disc (PDV-DS version only)
- Outlet housing
- Inlet housing

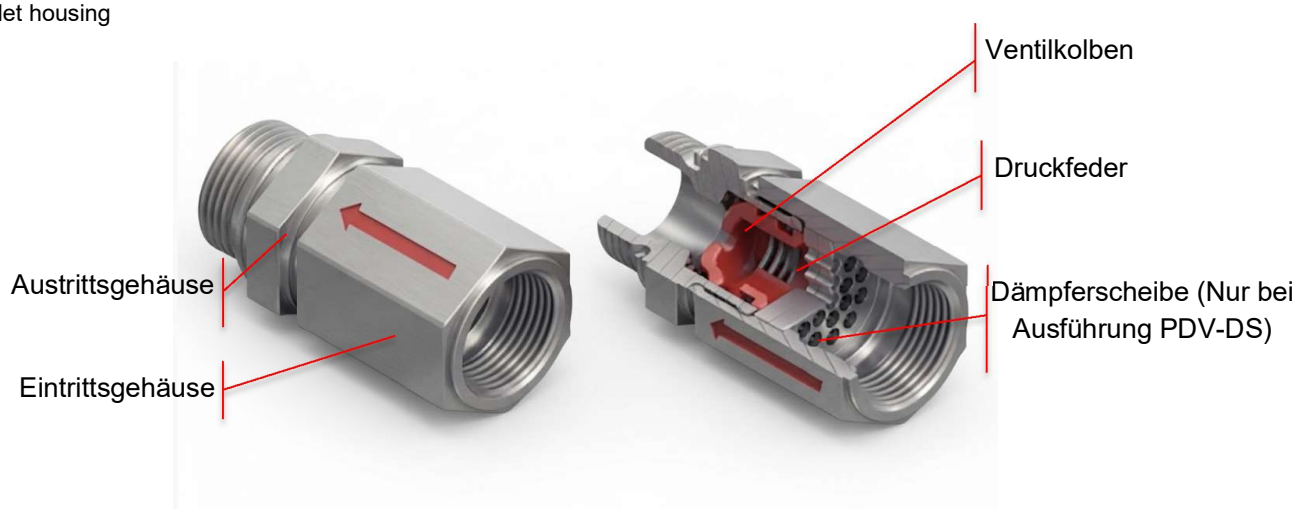


Figure 1: PDV / PDV-DS design

Operating principle

In the event of a sudden pressure drop on the outlet side, the valve piston closes. The compressed air that continues to be delivered passes through the valve via the bypass bore, maintaining a back pressure equal to the operating pressure. Once the pressure has equalised, the valve opens automatically again. In the PDV-DS, the additional damping disc dampens gas-displacement pulsation by reflection (destruction of standing waves) and dissipation (flow-mechanical friction).

2.3 Model Overview & Selection

Selection is based on compressor design and intake volume flow:

Compressor type	PDV (without DS)	PDV-DS (with damping disc)
Multi-vane and screw compressors (without pulsation)	Suitable (X)	—
Reciprocating compressors (strong discharge pulsation)	—	Suitable (X)

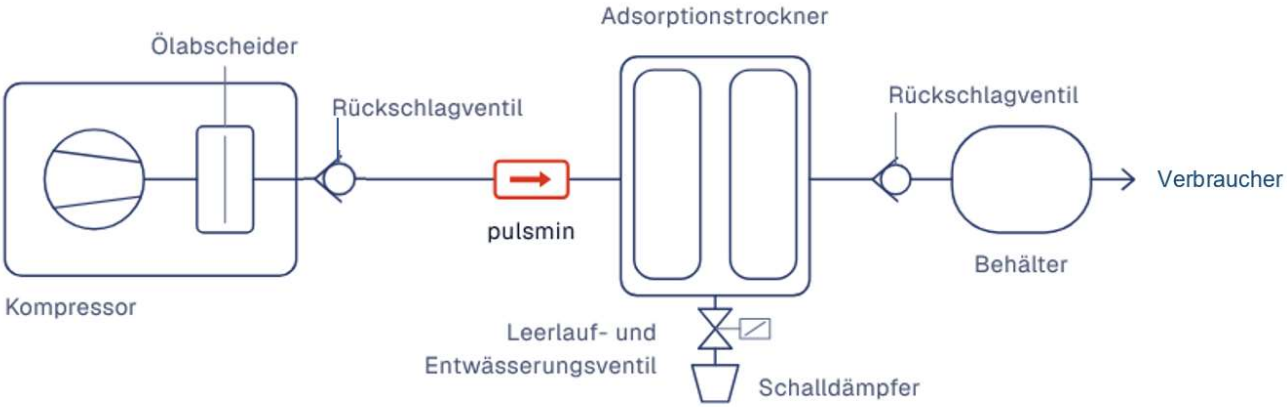
3. Installation and Commissioning

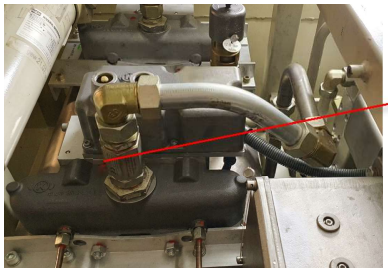
DANGER! Risk of fatal electric shock and injury from pressurisation!

All installation, maintenance and repair work may only be carried out on a system that has been electrically switched off, secured against being switched on again, and depressurised.

3.1 Installation Location and Positioning

The installation point is between the compressor compressed-air outlet and the dryer inlet (preferably directly at the dryer inlet). Before installation, clean the pipe thoroughly (welding beads and chips can cause malfunctions).





Install the PDV directly in the compressed-air inlet of the dryer

Figure 2: Installation in the system (compressor → valve → dryer)

3.2 Installation Orientation and Condensate Prevention

- Slope: The compressed-air line from the compressor to the valve must slope in the direction of flow.
- Water traps: Installation in water traps (low points where condensate accumulates) must always be avoided.
- Orientation: Horizontal to vertical installation is permitted. Observe the direction of flow!

3.3 Function Test

During initial installation, pressure measurement upstream of the valve in the direction of flow is recommended. In the event of sudden unloading, the valve closes; the pressure drop upstream of the valve must not exceed 1 to 3 bar (> 3 bar indicates that the bypass bore is too large). The valve opens automatically again when pressure equalises (pressure build-up).

4. Maintenance

Due to the high-quality stainless-steel components (1.4301) and fatigue-resistant pressure springs, the PDV and PDV-DS are maintenance-free by design.

5. Removal and Disposal

DANGER! Risk of fatal injury from residual pressure!

Before removal, switch off the system electrically, secure it against being switched on again, and depressurise it.

Disposal must comply with country-specific regulations and environmental requirements.

6. Troubleshooting

- Holding pressure too high / safety valve vents: Valve internals clogged by dirt → dismantle and clean the valve.
- Holding pressure too high (cause 2): Bypass bore too small → have the bypass cross-section / pressure spring adjusted.
- PDV does not close: Pressure fluctuation too weak (unloading is not sudden) → install a weaker pressure spring.
- PDV does not close (cause 2): Dryer unloading outlet contaminated → clean the outlet / silencer.

Note: Subject to change without notice.

EU DECLARATION OF INCORPORATION

in accordance with the EU Machinery Regulation (EU) 2023/1230 (Annex IV / Annex II, Part B)

The manufacturer hereby declares that the partly completed machinery identified below complies with the relevant essential health and safety requirements of the EU Machinery Regulation (EU) 2023/1230 and the other listed directives, insofar as this is possible within the scope of supply.

The specific technical documentation pursuant to Annex IV, Part B of this Regulation has been prepared. Upon a reasoned request, the manufacturer undertakes to transmit the specific documentation for the partly completed machinery to the national authorities via its documentation department.

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

Manufacturer / Address	Authorised representative established in the EU
pulsmin Seelhofstraße 24 D-79539 Lörrach	Hansjakob Lütte Seelhofstraße 24 D-79539 Lörrach
Authorised representative for technical documentation	Documentation responsibility
Hansjakob Lütte Seelhofstraße 24 D-79539 Lörrach	pulsmin | Technical Documentation Seelhofstraße 24, D-79539 Lörrach

Designation and identification of the partly completed machinery

Product designation	Pulsation Damping Valve Pulsation Damping Valve with Damping Disc
Short designation / type	PDV / PDV-DS
Nominal sizes / operating pressure	See the respective order confirmation and type plate

Relevant EU legislation & harmonised standards

The partly completed machinery complies with the provisions of the following EU legislation, as amended:

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

Applied harmonised standards and technical specifications (in particular):

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

Lörrach, 11.10.2026



Hansjakob Lütte
Managing Director