Dosing Valve
EVN 116
Product Identification

In all communications with Pfeiffer Vacuum, please specify the information on the product nameplate. For convenient reference copy that information into the space provided below.

Typ: - - - - - - - - - -
No: - - - - - - - - - -
F-No: - - - - - - - - -

Validity

This document applies to products with part number PFI32031.
The part number can be taken from the product nameplate.

Intended Use

The manually actuated EVN 116 Dosing valve is used for both, gas dosing and shutting off a defined gas flow without changing the gas flow setting.
The EVN 116 must not be used in connection with liquid gases.

Functional Principle

Rotating the dosing knob translates into a linear movement and places the dosing needle reproducibly in the desired position.
Rotating the Open/close ring positions the valve plate.
These movements are independent of each other.
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For cross-references within this document, the symbol (→ ☐ XY) is used, for cross-references to other documents, the symbol (→ ☐ [Z]).
1 Safety

1.1 Symbols Used

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>!</td>
<td>DANGER</td>
</tr>
<tr>
<td>!</td>
<td>WARNING</td>
</tr>
<tr>
<td>!</td>
<td>Caution</td>
</tr>
</tbody>
</table>

Dimensions in mm

1.2 Personnel Qualifications

- Skilled personnel

All work described in this document may only be carried out by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.
1.3 General Safety Instructions

- Adhere to the applicable regulations and take the necessary precautions for the process media used.
- Adhere to the applicable regulations and take the necessary precautions for all work you are going to do and consider the safety instructions in this document.
- Before beginning to work, find out whether any vacuum components are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Communicate the safety instructions to all other users.

1.4 Liability and Warranty

Pfeiffer Vacuum assumes no liability and the warranty becomes null and void if the end-user or third parties

- disregard the information in this document
- use the product in a non-conforming manner
- make any kind of interventions (modifications, alterations etc.) on the product
- use the product with accessories not listed in the corresponding product documentation.

The end-user assumes the responsibility in conjunction with the process media used.
2 Technical Data

<table>
<thead>
<tr>
<th>Connection flanges</th>
<th>DN 16 ISO-KF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting orientation</td>
<td>any</td>
</tr>
<tr>
<td>Dosing range</td>
<td>$5 \times 10^{-6} \ldots 1000$ mbar l/s</td>
</tr>
<tr>
<td>Tightness</td>
<td>$1 \times 10^{-9}$ mbar l/s</td>
</tr>
<tr>
<td>Pressure difference</td>
<td>$\leq 2.5$ bar</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>$80 , ^\circ$C</td>
</tr>
<tr>
<td>Bakeout temperature</td>
<td>$\leq 150 , ^\circ$C *)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$5 \ldots 40 , ^\circ$C</td>
</tr>
<tr>
<td>Dead volume</td>
<td>$0.032 , \text{cm}^3$</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Housing, needle, filter</td>
<td>stainless steel</td>
</tr>
<tr>
<td>Dosing sleeve</td>
<td>fluor plastomer</td>
</tr>
<tr>
<td>Seal</td>
<td>FPM75</td>
</tr>
<tr>
<td>Weight</td>
<td>$400 , \text{g}$</td>
</tr>
<tr>
<td>*) at the flange connections</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions

Gas flow with standard filter 1700 mbar l/s
Gas flow without standard filter 3100 mbar l/s
Inlet filter (standard)

Filter vacuum side

Accessories → G32 18

Gas flow 590 mbar l/s

Accessories

Filter

Gas flow 1250 mbar l/s
3 Installation

DANGER
Caution: overpressure in the vacuum system >1 bar
Injury caused by released parts and harm caused by escaping process gases can result if clamps are opened while the vacuum system is pressurized.
Do not open any clamps while the vacuum system is pressurized. Use the type clamps which are suited to overpressure.

Caution
Caution: dirt sensitive area
Touching the product or parts thereof with one's bare hands increases the desorption rate.
Always wear clean, lint-free gloves and use clean tools when working in this area.

Caution
Caution: vacuum component
Dirt and damages impair the function of the vacuum component.
When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

Keep the lids.
Remove the lid and connect the valve to the vacuum system using the small flange connections.
4 Operation

The product is ready for operation as soon as it has been installed.

**DANGER**

Caution: hot surface
Touching the hot surface (>55 °C) can cause burns.
Wear protective gloves.

\[ \leq 80 \, ^\circ C \]

\[ 55 \, ^\circ C \]

\[ \leq 80 \, ^\circ C \]
Dead volume

Due to the gas dosing and valve seat seals, there is a dead volume of 0.032 cm³.

If the pressure in the dead volume is higher than in the vacuum system, the pressure between the dead volume and the vacuum system is compensated. During the compensation phase, one could come to the false conclusion that the valve is not tight.

Leak flow rate for pressure compensation =

\[ 10^{-6} \text{ mbar l/s} \times \text{pressure difference} \]
5 Gas Flow

5.1 Gas Flow Curve

Using the gas flow curve, the digital indication on the dosing knob and the gas flow can be related to each other.
The gas flow rates in the diagram are mean values.

![Gas Flow Curve Diagram]

Example:
Digital position indication: 200
⇒ Gas flow = $2 \times 10^{-1}$ mbar l/s

5.2 Conversion Table

<table>
<thead>
<tr>
<th>Gas flow</th>
<th>mbar l/s</th>
<th>Torr l/s</th>
<th>sccm</th>
<th>atm cm³/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>mbar l/s</td>
<td>1</td>
<td>0.75</td>
<td>59.2</td>
<td>0.987</td>
</tr>
<tr>
<td>Torr l/s</td>
<td>1.33</td>
<td>1</td>
<td>78.9</td>
<td>1.32</td>
</tr>
<tr>
<td>sccm</td>
<td>$1.69 \times 10^{-2}$</td>
<td>$1.27 \times 10^{-2}$</td>
<td>1</td>
<td>$1.67 \times 10^{-2}$</td>
</tr>
<tr>
<td>atm cm³/s</td>
<td>1.01</td>
<td>0.76</td>
<td>59.8</td>
<td>1</td>
</tr>
</tbody>
</table>
6 Deinstallation

**DANGER**

Caution: contaminated parts
Contaminated parts can be detrimental to health and environment.
Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

**Caution**

Caution: vacuum component
Dirt and damages impair the function of the vacuum component.
When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

**Caution**

Caution: dirt sensitive area
Touching the product or parts thereof with one's bare hands increases the desorption rate.
Always wear clean, lint-free gloves and use clean tools when working in this area.

Vent the vacuum system and let it cool down to <55 °C.
Remove the small flange fittings and put the protective lids in place.
7 Maintenance

Cleaning the filter(s)

1. Remove the valve from the vacuum system according to section “Deinstallation”.

2. Remove the lid(s).

3. Remove the filter(s).
4 Clean the filter(s) with alcohol.

![DANGER]

Caution: cleaning agents
Cleaning agents can be detrimental to health and environment.
Adhere to the relevant regulations and take the necessary precautions when handling and disposing of cleaning agents. Consider possible reactions with the product materials (→ 6).

5 Dry the filter(s) with compressed air.

![DANGER]

Caution: compressed air
Unprofessionally handling compressed air can cause physical injuries.
Adhere to the relevant regulations and take the necessary precautions when handling compressed air.

∆ The compressed air must meet the following specifications:
- free of oil
- dry
- free of particles >25 µm

5 Reinstall the filter and connect the Dosing valve to the vacuum system according to section "Installation".
8 Repair

We recommend returning the product to your local Pfeiffer Vacuum service center for repair. Pfeiffer Vacuum assumes no liability and the warranty becomes null and void if any repair work is carried out by the end-user or third parties.
9 Accessories

If the dosing needle can be contaminated by the process, installing a filter at the vacuum port of the valve is strongly recommended.

Filter vacuum side (gas flows 590 mbar l/s)

Filter vacuum side (gas flow 1250 mbar l/s)
10 Storage

Caution: vacuum component
Inappropriate storage leads to an increase of the desorption rate and/or may result in mechanical damage of the product.
Cover the vacuum ports of the product with protective lids or grease free aluminum foil. Do not exceed the admissible storage temperature range (→ § 6).

11 Returning the Product

WARNING
Caution: forwarding contaminated products
Contaminated products (e.g. radioactive, toxic, caustic or microbiological hazard) can be detrimental to health and environment.
Products returned to Pfeiffer Vacuum should preferably be free of harmful substances.
Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a duly completed declaration of contamination (→ § 21).

Products that are not clearly declared as "free of harmful substances" are decontaminated at the expense of the customer.
Products not accompanied by a duly completed declaration of contamination are returned to the sender at his own expense.
12 Disposal

**DANGER**

Caution: contaminated parts
Contaminated parts can be detrimental to health and environment.
Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

**WARNING**

Caution: substances detrimental to the environment
Products or parts thereof (mechanical and electric components, operating fluids etc.) can be detrimental to the environment.
Dispose of such substances in accordance with the relevant local regulations.

Separating the components

<table>
<thead>
<tr>
<th>Contaminated components</th>
<th>Other components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated components (radioactive, toxic, caustic, or biological hazard etc.) must be decontaminated in accordance with the relevant national regulations, separated according to their materials, and disposed of.</td>
<td>Such components must be separated according to their materials and recycled.</td>
</tr>
</tbody>
</table>
Declaration of Contamination

The service, repair, and disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay. This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

1. Description of product
   - Type
   - Article Number
   - Serial Number

2. Reason for return

3. Operating fluid(s) used (Must be drained before shipping)

4. Process related contamination of product:
   - toxic: no, yes
   - caustic: no, yes
   - biological hazard: no, yes
   - explosive: no, yes
   - radioactive: no, yes
   - other harmful substances: no, yes

   1) or not containing any amount of hazardous residues that exceed the permissible exposure limits

5. The product is free of any substances which are damaging to health

6. Harmful substances, gases and/or by-products
   - Trade/product name
   - Chemical name (or symbol)
   - Precautions associated with substance
   - Action if human contact

7. Legally binding declaration:
   - I/we hereby declare that the information on this form is complete and accurate and that I/we will assume any further costs that may arise. The contaminated product will be dispatched in accordance with the applicable regulations.
   - Organization/company
   - Address
   - Post code, place
   - Phone
   - Fax
   - Email
   - Name
   - Date and legally binding signature
   - Company stamp

This form can be downloaded from our website.

Copies: Original for addressee - 1 copy for accompanying documents - 1 copy for file of sender
Manufacturer's Declaration

as defined by the Directive relating to machinery 98/37/EC, Appendix IIb.

We, Pfeiffer Vacuum, hereby declare that putting the incomplete equipment mentioned below into operation is not permitted until evidence is given that the system into which that incomplete equipment shall be installed is in accordance with the provisions of the EC Directive relating to machinery.

Product
Dosing Valve
EVN 116

Part number
PFI32031

Standards
Harmonized and international/national standards and specifications:
- EN 292-1/-2 (Safety of machinery)
- DIN 28403 (ISO 2861 small flange connections)

Signature
Pfeiffer Vacuum GmbH, Asslar
29 November 2000

Wolfgang Dondorf
Managing director