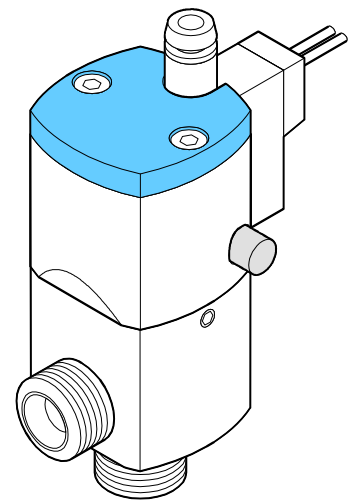


# Angle Valve

electropneumatically operated, bellows sealed

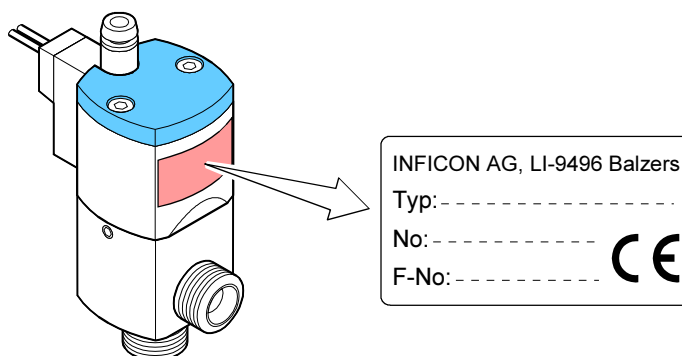
VAP005-X



CE

## Product Identification

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



This document applies to products with part number 250-050.  
The part number (No.) can be taken from the product nameplate.

We reserve the right to make technical changes without prior notice.

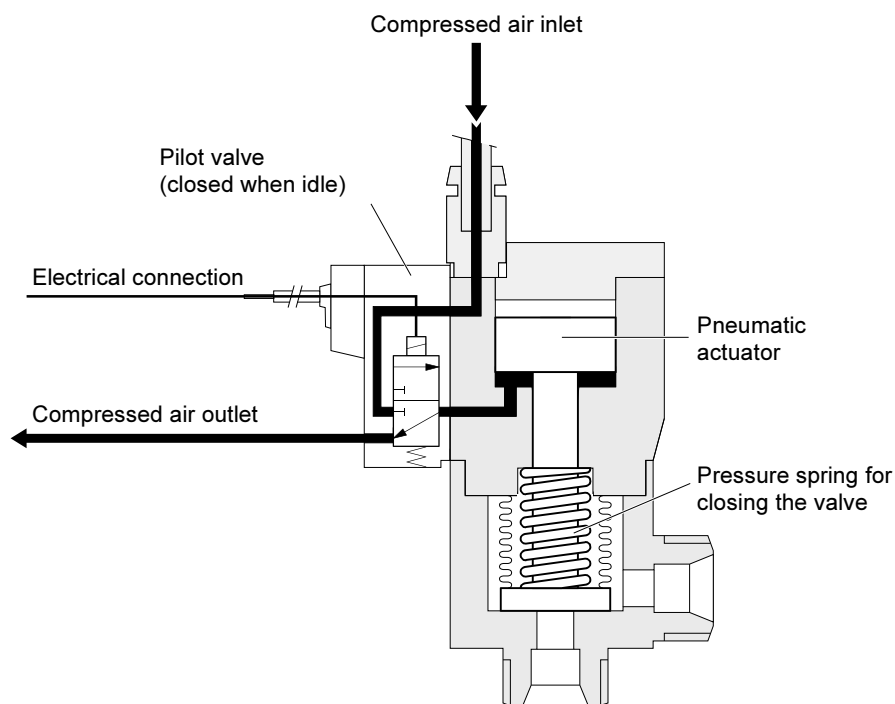
All dimensions in mm.

## Intended Use

The angle valve is universally used in vacuum systems.

## Functional Principle

The VAP005-X is opened electropneumatically and closed by the prestressed pressure spring.




It closes automatically in the event of a power and/or compressed air failure.

# Contents

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# 1 Safety


## 1.1 Symbols Used


DANGER

Information on preventing any kind of physical injury.


WARNING


Information on preventing extensive equipment and environmental damage.


Caution

Information on correct handling or use. Disregard can lead to malfunctions or minor equipment damage.


→  See page ...

## 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.  
Consider possible reactions between the materials (→  6) and the process media.
- 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

Inficon 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

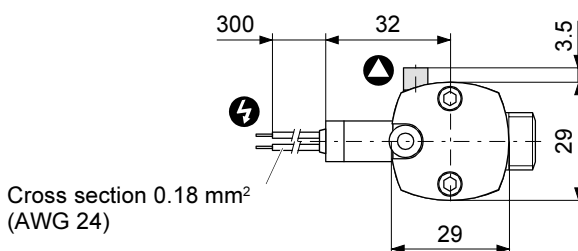
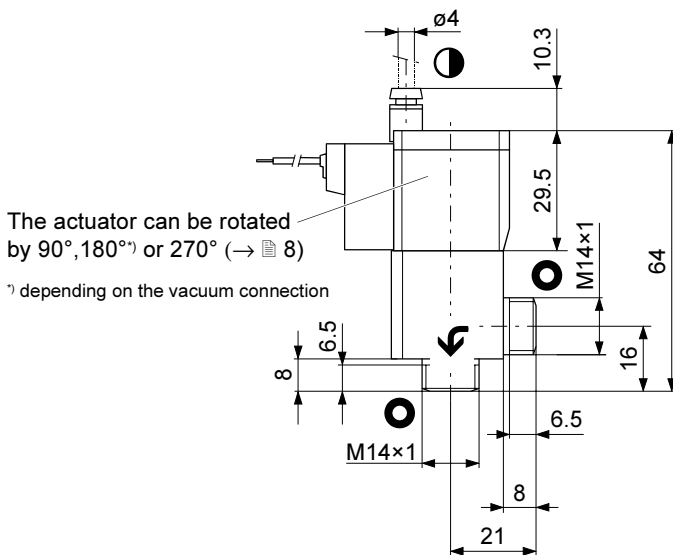
|                             |   |
|-----------------------------|---|
| Vacuum connection           | ø5 mm / M14×1   |
| Connection accessories      | <ul style="list-style-type: none"> <li>• flange fitting DN 10 ISO-KF</li> <li>• tube connection OD ¼"</li> <li>• tube connection OD 6 mm</li> </ul> |
| Nominal voltage             | 24 VDC ±10%   |
| Nominal power               | 1 W   |
| Duty cycle                  | 100% (i.e. continuous duty possible)  |
| Compressed air              |   |
| Connection                  | instant push-in fitting ø4 mm   |
| Pressure range              | 4 ... 8 bar overpressure  |
| Volume                      | 0.24 cm <sup>3</sup>  |
| Protection class            | IP 65 according to DIN 40 050   |
| Conductance for air         |   |
| Molecular flow              | 0.4 l/s   |
| Laminar flow                | 4 l/s   |
| Mounting orientation        | any   |
| Switching frequency max.    | 150 / min <sup>1)</sup>   |
| Cycles to first maintenance | ≈5,000,000 <sup>2)</sup>  |
| Tightness                   | 1×10 <sup>-9</sup> mbar l/s   |
| Pressure range              | 1×10 <sup>-8</sup> mbar ... 4 bar (absolute)  |
| Pressure difference Δp      |   |
| In closing direction        | 3 bar   |
| In opening direction        | 3 bar   |
| Opens against Δp            | 3 bar (compressed air: 4 bar overpressure)  |
| Closing time                | 35 ms   |
| Opening time                | 35 ms   |
|                             | } (Δp = 0, compressed air: 4 bar overpressure)  |
| Temperatures                |   |
| Ambiance                    | 5 °C <sup>3)</sup> ... 40 °C  |
| Bakeout                     | 150 °C (actuator 80 °C, pilot valve idle)   |
| Materials                   |   |
| Housing                     | stainless steel 1.4301  |
| Bellows                     | stainless steel 1.4301  |
| Actuator                    | anodized aluminium  |
| Seals                       | FPM   |
| Weight                      | 0.2 kg  |

<sup>1)</sup> With pressure difference Δp = 0.

<sup>2)</sup> Under clean operating conditions.

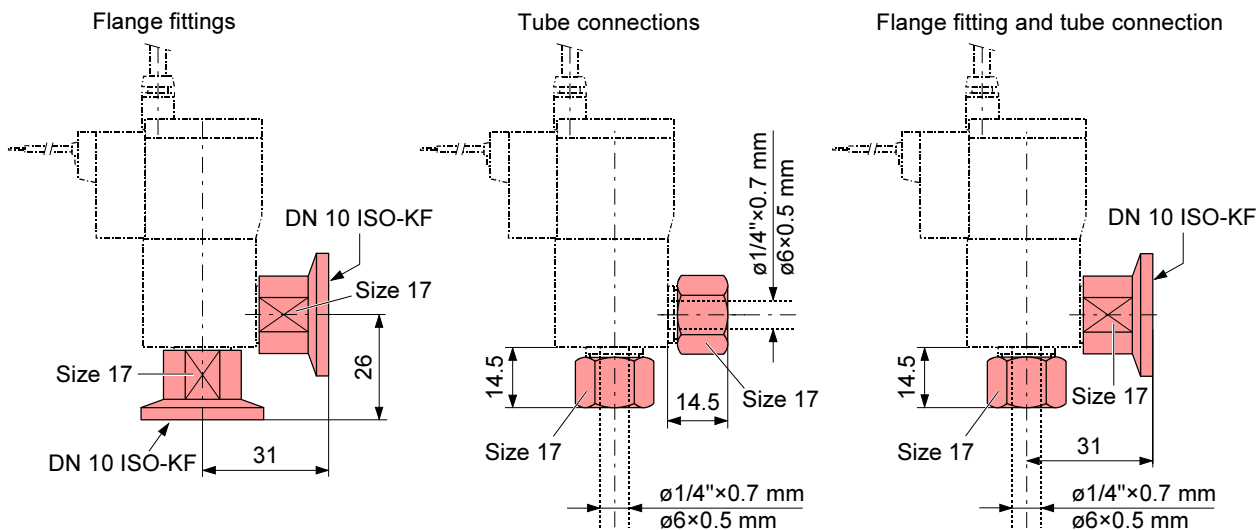
<sup>3)</sup> -15 °C, if the ambiance is free of condensable gases.

Dimensions [mm]



- Recommended flow direction
- Compressed air inlet
- Compressed air outlet with silencer
- Electrical connection
- Protective lid

Installation dimensions with connection accessories (Accessories → 21)



## 3 Installation

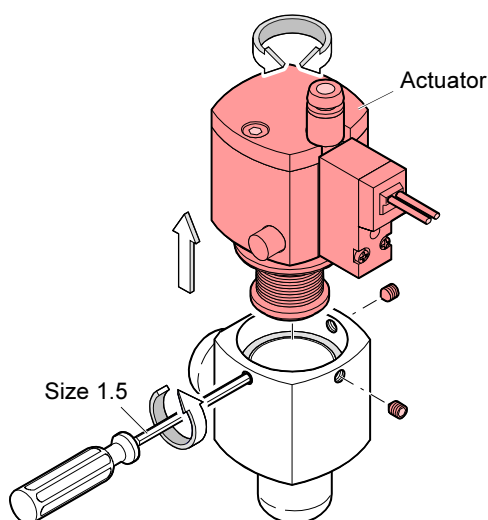
### 3.1 Orientation of the Actuator

Depending on the space requirements, the actuator can be rotated by 90°, 180° \*) or 270°.

\*) depending on the vacuum connection

Rotating the actuator

- 1 Remove the three hexagon socket set screws, lift the actuator and turn it into the desired position.



- 2 Put the actuator in place and secure it with the three hexagon socket set screws.

### 3.2 Vacuum Connection



#### 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

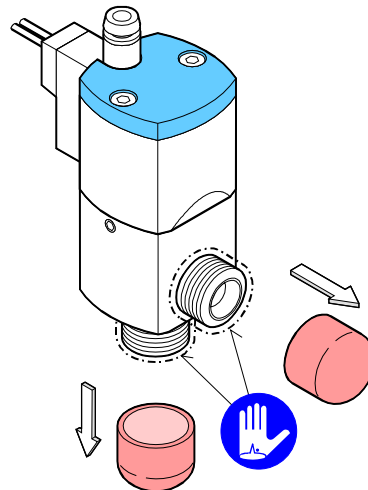


Caution: dirt sensitive area

Touching the product or parts thereof with one's bare hands increases the desorption rate.

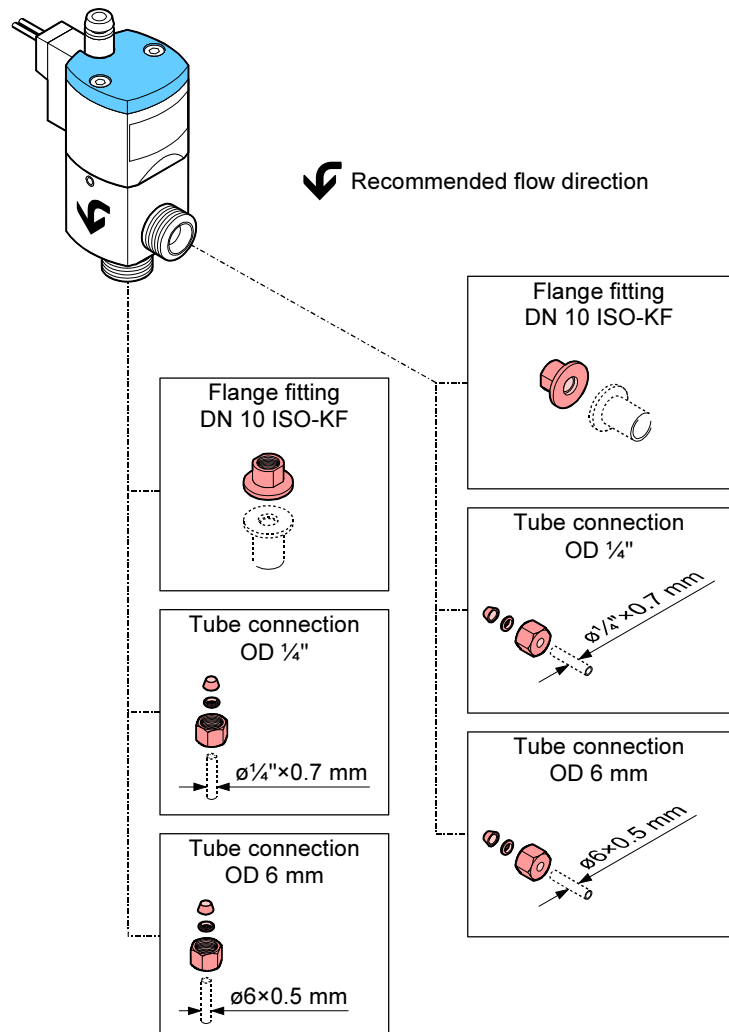
Always wear clean, lint-free gloves and use clean tools when working in this area.

- 1 Remove the protective lids.



Keep the protective lids.

- 2 Establish the vacuum connection by means of the accessories (→ 21).



Mount the accessories according to the instructions supplied with the accessories.

### 3.3 Compressed Air Connection

**DANGER**

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

**Caution**

**Specifications for the plastic tube:**

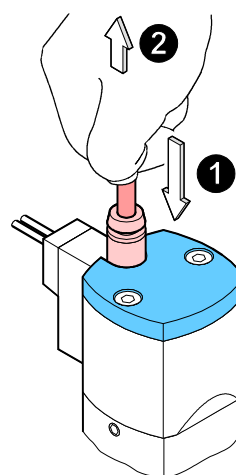
- ø4 mm
- bursting pressure  $\geq 10$  bar (overpressure)
- material: PA soft or PU

**Caution**

**To ensure leak tightness**

- cut the plastic tube square
- make sure the outside of the plastic tube is not damaged.

Insert the plastic tube into the instant push-in fitting until the mechanical stop is reached and verify correct mounting by slightly pulling.



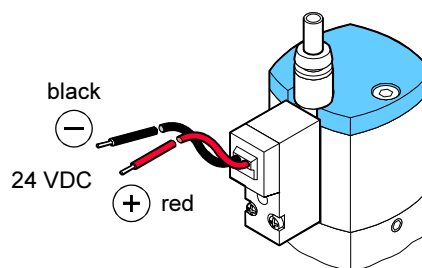
The compressed air must meet the following specifications:

- free of oil
- dry
- free of particles  $> 10 \mu\text{m}$
- 4 ... 8 bar overpressure

### 3.4 Electrical Connection



Before connecting or disconnecting the product, turn off the control system.

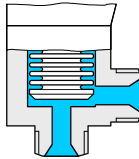
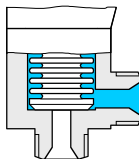


Be careful to correctly connect the poles.

## 4 Operation

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

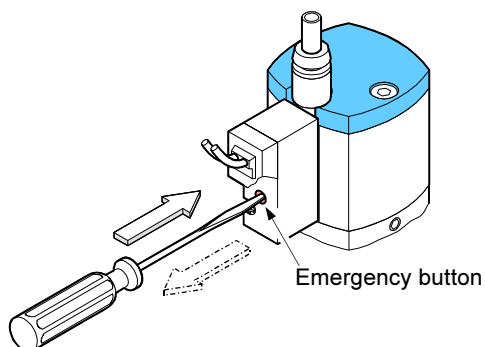
### Valve positions

| Nominal voltage | Compressed air | Valve  |
|-----------------|----------------|--|
| available       | available      | <p><b>open</b></p>    |
| available       | not available  | <p><b>closed</b></p>  |
| not available   | available      |  |
| not available   | not available  |  |



In the event of a power failure, the pilot valve can be manually actuated with the emergency button, if compressed air is available:

- Open the valve by pressing the emergency button
- Close the valve by releasing the emergency button.



Pressure difference  $\Delta p$   
in closing direction

**Caution**

Caution: pressure difference  
At  $\Delta p > 3$  bar the valve may be damaged.  
Avoid pressure differences  $\Delta p > 3$  bar.

Pressure difference  $\Delta p$   
in opening direction

**Caution**

Caution: pressure difference  
At  $\Delta p > 3$  bar the valve is opened.  
Avoid pressure differences  $\Delta p > 3$  bar.

Opening against a pressure  
difference  $\Delta p$

**Caution**

Caution: pressure difference  
At  $\Delta p > 3$  bar the valve may be damaged.  
Avoid pressure differences  $\Delta p > 3$  bar.

## 5 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.

### DANGER



**Caution: compressed air**  
Physical injury can result if a pressurized compressed air line is disconnected. Before doing any work, turn off the compressed air supply and relieve the compressed air lines.

### 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



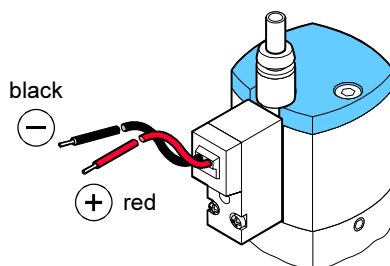
**Caution: dirt sensitive area**  
Touching the product or parts thereof with one's bare hands increases the desorption rate. Always wear clean, lint-free gloves and use clean tools when working in this area.

### Preconditions

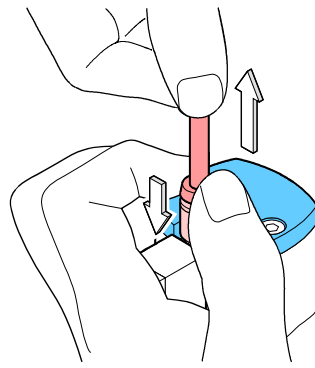
- Vacuum system vented
- Compressed air supply interrupted
- Compressed air line relieved
- Control system turned off.

### Procedure

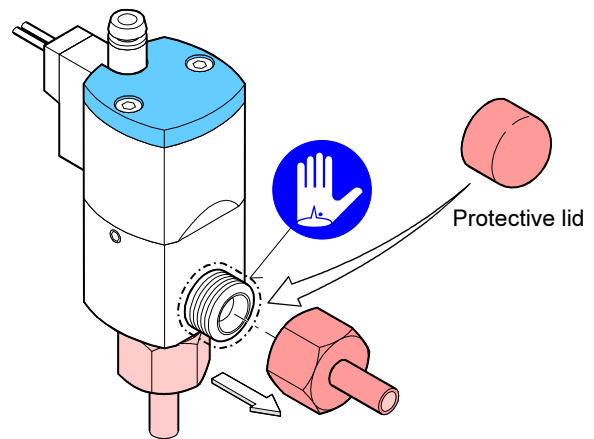
- 1** Disconnect the valve from the control system.



- 2** Press the ring towards the valve and pull the plastic tube.



- 3** Remove valve from vacuum system and place the protective lids.



## 6 Maintenance / Repair

Under clean operating conditions, the product requires no maintenance during the rated cycle life.

### 6.1 Cleaning the Valve / Replacing Parts

**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

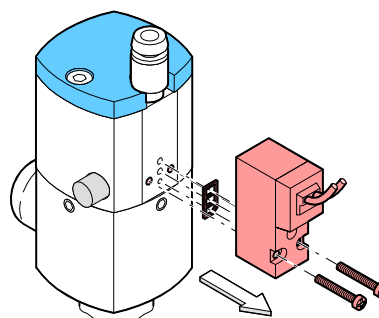
Dirt and damages impair the function of the vacuum component.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

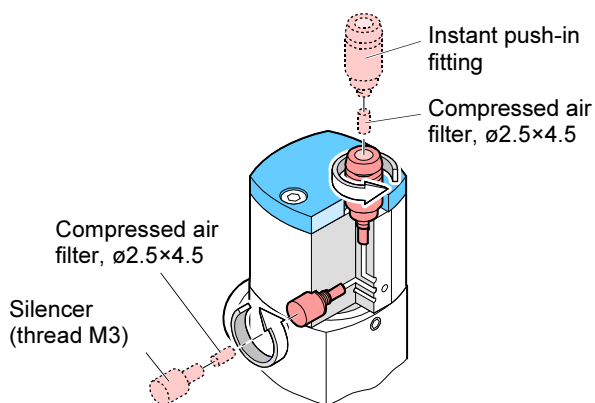
Preconditions

The valve has been deinstalled (→ [14](#)).

- 1 Deinstall the pilot valve.



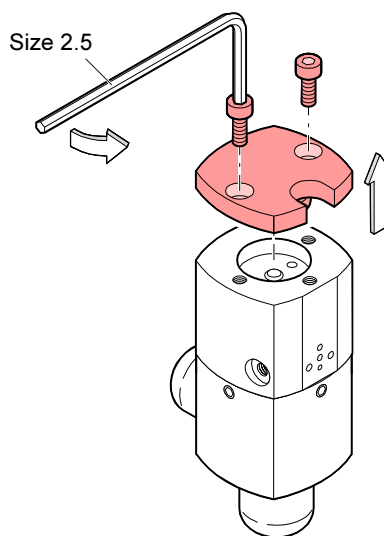
- 2
  - Unscrew the instant push-in fitting and remove the compressed air filter.
  - Unscrew the silencer and remove the compressed air filter.



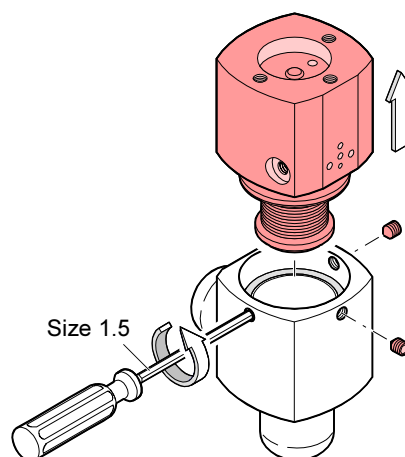
Further information → [22](#).

## Disassembling the valve

- 3** Remove the cover.



- 4** Remove the actuator.



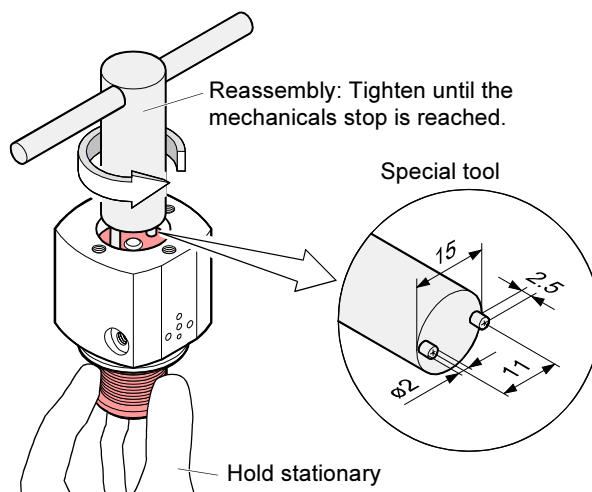
- 5** Remove the seal from the housing.



- 6** Loosen the piston by means of the special tool or pliers for Seeger circlip ring.



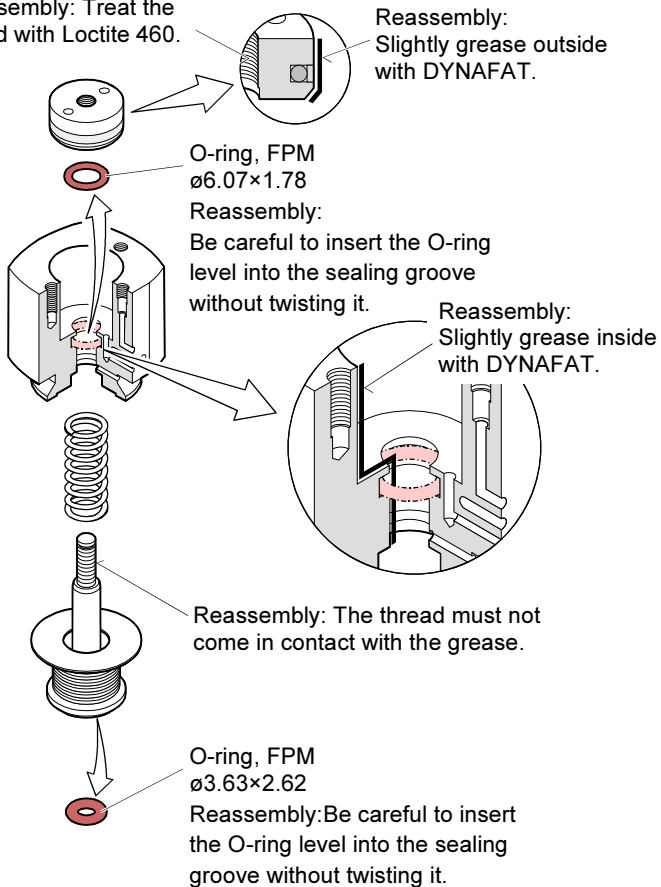
The screw connection is secured with Loctite 460 and thus difficult to loosen.



- 7** Disassemble the actuator.

Reassembly: Treat the thread with Loctite 460.

Reassembly: Slightly grease outside with DYNAFAT.



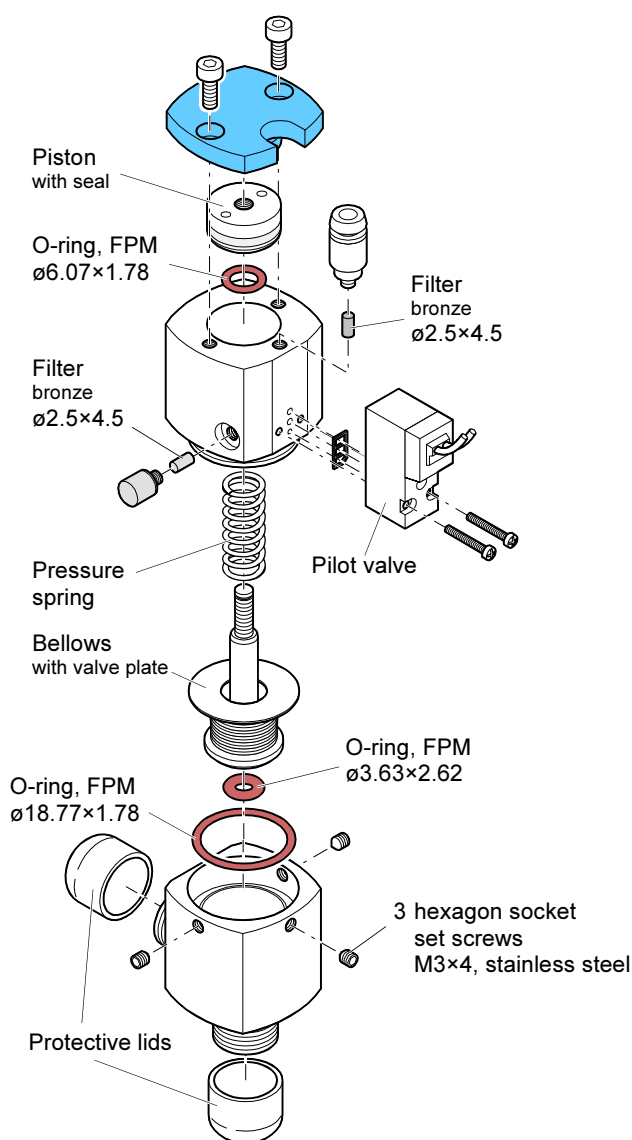
Cleaning the valve /  
Replacing parts

**8** Clean the valve and replace its parts as required.

**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).

- Carefully clean the parts with a grease solving, non-scouring cleaner.
- After cleaning, the parts should preferably be rinsed with alcohol and subsequently heated to  $\approx 50\text{ }^{\circ}\text{C}$  in an oven or with an industrial blower.
- Carefully clean the sealing surfaces with a lint-free cloth soaked with alcohol. Allow them to dry.
- Wipe the O-rings with a lint-free cloth slightly moistened with vacuum oil.



Further information → 22.

## Reassembling the valve

- 9** Proceed in reverse order to reassemble the valve.



### 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.

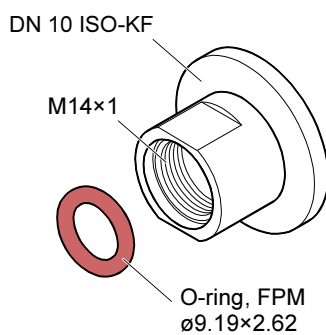
Always wear clean, lint-free gloves and use clean tools when working in this area.



After reassembly, a few switching cycles should be performed in order for the O-rings to perfectly adapt to the sealing surfaces. Take the necessary precautions for this procedure.

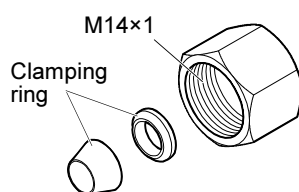
## 7 Accessories

### Flange fitting



|                                  | Ordering number |
|----------------------------------|-----------------|
| 1 flange fitting<br>DN 10 ISO-KF | 250-080         |

### Tube connection



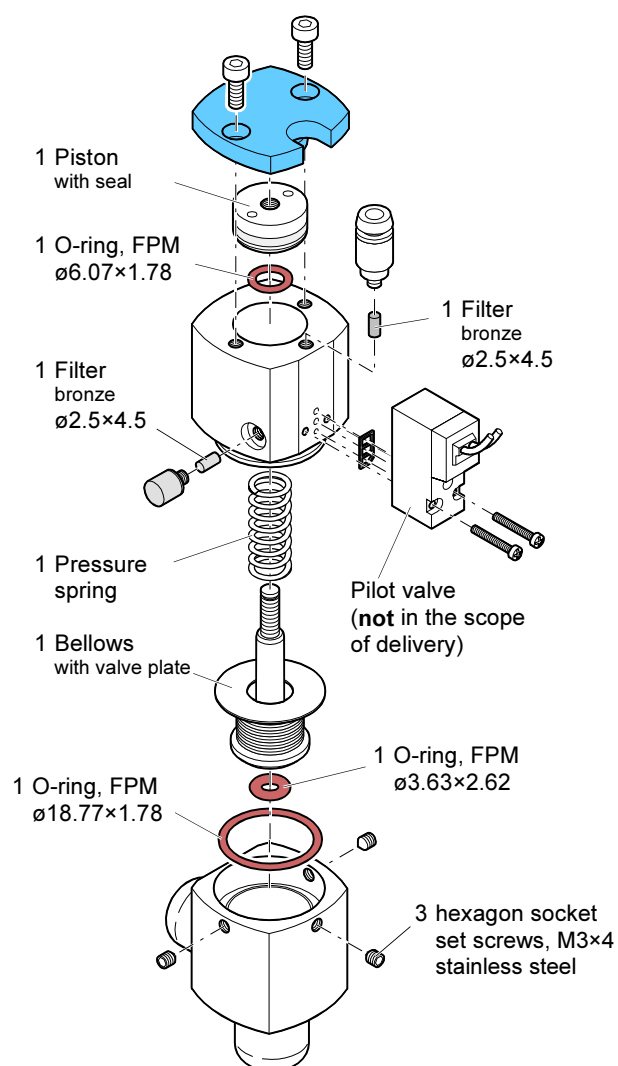
|                           | Ordering number |
|---------------------------|-----------------|
| 1 tube connection OD ¼"   | 250-085         |
| 1 tube connection OD 6 mm | 250-086         |

Further information → 9.

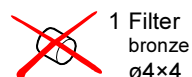
## 8 Spare Parts

Spare parts kit

Ordering number 215-368  
comprising:



Sealing agent DYNAFAT, 100 gr

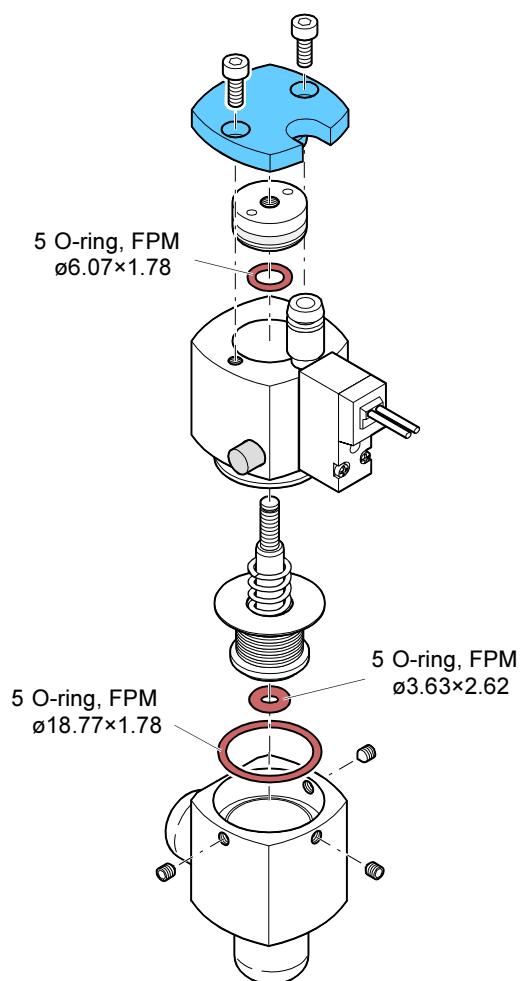


~~1 Filter bronze  $\varnothing 4 \times 4$~~

**Not required for this valve**

Seal kit

Ordering number 215-372  
comprising:



## 9 Returning the Product

**WARNING**

Caution: forwarding contaminated products

Contaminated products (e.g. radioactive, toxic, caustic or micro-biological hazard) can be detrimental to health and environment.

Products returned to Inficon 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 (→ 25).

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.

## 10 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

After disassembling the product, separate its components according to the following criteria:

#### Contaminated components

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.

#### Other components

Such components must be separated according to their materials and recycled.

# Declaration of Contamination

The service, repair, and/or 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 <input type="checkbox"/> 1) | yes <input type="checkbox"/>    | <br>2) Products thus contaminated will not be accepted without written evidence of decontamination! |
| caustic                  | no <input type="checkbox"/> 1) | yes <input type="checkbox"/>    |   |
| biological hazard        | no <input type="checkbox"/>    | yes <input type="checkbox"/> 2) |   |
| explosive                | no <input type="checkbox"/>    | yes <input type="checkbox"/> 2) |   |
| radioactive              | no <input type="checkbox"/>    | yes <input type="checkbox"/> 2) |   |
| other harmful substances | no <input type="checkbox"/> 1) | yes <input type="checkbox"/>    |   |

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

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

**5 Harmful substances, gases and/or by-products**

Please list all substances, gases, and by-products which the product may have come into contact with:

| Trade/product name | Chemical name (or symbol) | Precautions associated with substance | Action if human contact |
|--------------------|---------------------------|---------------------------------------|-------------------------|
|                    |                           |                                       |                         |
|                    |                           |                                       |                         |
|                    |                           |                                       |                         |
|                    |                           |                                       |                         |

**6 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

Notes

Notes

