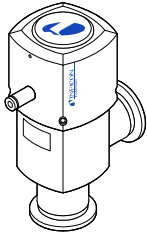


Angle Valve

pneumatically actuated
bellows sealed
without position indicator, without pilot valve

VAP016-A ... 040-A

VAP016-X ... 040-X



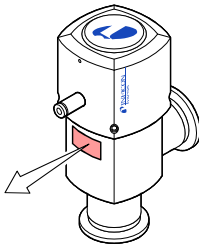
Instruction Sheet
Incl. Manufacturer's Declaration

sima84e1-b (0205)

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.

INFICON AG, LI-9496 Balzers
Model: -----
PN: -----
SN: -----



Validity

This document applies to products with the following part numbers:

VAP016-A ... 040-A (aluminum housing)

250-290 (DN 16 ISO-KF)
250-291 (DN 25 ISO-KF)
250-292 (DN 40 ISO-KF)

VAP016-X ... 040-X (stainless steel housing)

250-295 (DN 16 ISO-KF)
250-296 (DN 25 ISO-KF)
250-297 (DN 40 ISO-KF)

The part number (PN) can be taken from the product nameplate.

If not indicated otherwise in the legends, the illustrations in this document correspond to the valve with the nominal diameter DN 25 ISO-KF. They apply to valves with other nominal diameters by analogy.

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

Intended Use

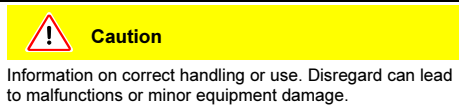
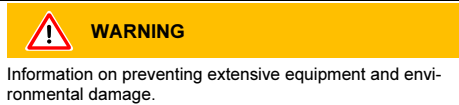
The Angle valves are used as shut-off or venting devices for vacuum applications.

Functional Principle

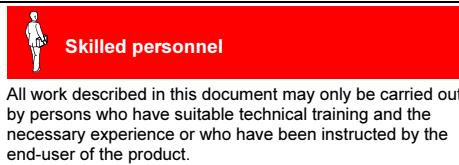
When compressed air is admitted to the Angle valve, it opens.

When the compressed air pressure drops, the Angle valve is closed by a pressure spring.

Symbols Used



Personnel Qualifications



General Safety Instructions

- Adhere to the applicable regulations and take the necessary precautions for the process media used. Consider possible reactions between the materials (see "Technical Data") 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.

Liability and Warranty

INFICON assumes no liability and the warranty becomes null and void if 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 and options not listed in the corresponding product documentation.

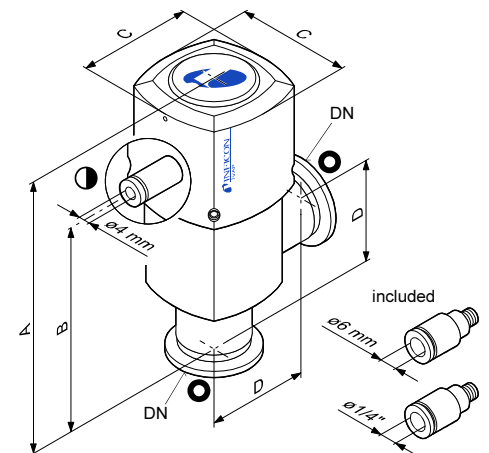
The end-user assumes the responsibility in conjunction with the process media used.

Technical Data

Connection flanges	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuation	opening: pneumatic closing: by pressure spring		
Compressed air supply tube connection	ø4 mm, ø6 mm or ø1/4"		
pressure range	3 ... 8 bar overpressure		
piston displacement	5.5 cm ³	12.1 cm ³	26.2 cm ³
Stroke of the valve plate	5 mm	10 mm	14 mm
Conductance ¹⁾	4.5 l/s	16 l/s	40 l/s
Switching frequency ²⁾	100 / min	100 / min	75 / min
Opening time ²⁾	100 ms	150 ms	250 ms
Closing time ²⁾	100 ms	150 ms	250 ms
Cycle life ³⁾	10 million		
Tightness	1×10 ⁻⁹ mbar l/s		
Pressure range (abs.)	1×10 ⁻⁸ mbar 2 bar		... 1.5 bar
Resistance to pressure (abs.)	4 bar		2.5 bar
Pressure difference Δp in closing direction	4 bar		2 bar
in opening direction	2 bar		1.5 bar
Opens to pressure difference Δp ⁴⁾	4 bar		2 bar
Temperatures operating	≤50 °C		
ambiance	0 ... 50 °C		
bakeout	80 °C		
aluminum housing	80 °C		
stainless steel housing	150 °C		
actuator	50 °C		
Mounting orientation	any		
Flow direction	any		
Materials housing	aluminum (3.2381)		
VAP016-A ... 040-A	stainless steel (1.4301)		
VAP016-X ... 040-X	stainless steel (1.4541)		
bellows	stainless steel (1.4301)		
valve plate	stainless steel (1.4301)		
seals	FPM75		
Weight			
VAP016-A ... 040-A	0.25 kg	0.55 kg	1.25 kg
VAP016-X ... 040-X	0.40 kg	0.80 kg	2.00 kg

- For air with molecular flow.
- With pressure difference Δp = 0, compressed air = 5 bar overpressure, pilot valve (3/2 way) with nominal diameter 2 mm and 1 m tube with OD4 mm.
- Cycles without expendable parts (seals) and under clean operating conditions.
- Compressed air = 5 bar overpressure.

Dimensions [mm]



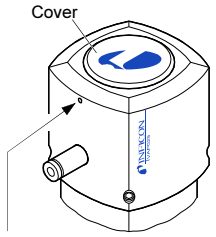
DN	A	B	C	D
DN 16 ISO-KF	104.2	77.5	42	40
DN 25 ISO-KF	135.3	101.3	56	50
DN 40 ISO-KF	161.5	119.5	80	65

- Compressed air in- and outlet
- Protective lid

Installation

STOP DANGER

Caution: overpressure
Obstructing the bore hole can cause injuries by catapulted parts (e.g. cover).
Make sure the bore hole is not obstructed.



Cover

Bore hole for air intake/exhaust according to stroke

Vacuum Connection

STOP 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 of clamps which are suited to overpressure.

STOP DANGER

Caution: overpressure in the vacuum system >2.5 bar
KF flange connections with elastomer seals (e.g. O-rings) cannot withstand such pressures. Process media can thus leak and possibly damage your health.
Use O-rings provided with an outer centering ring.

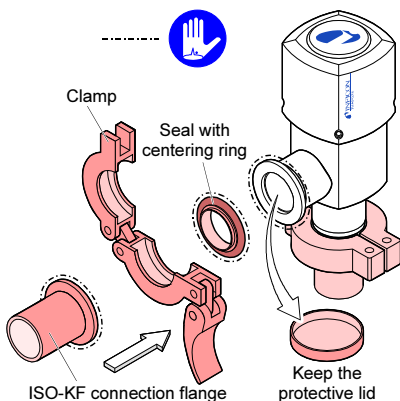
Caution

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.

Remove the protective lids and install the product.
Any mounting orientation and flow direction may be chosen.



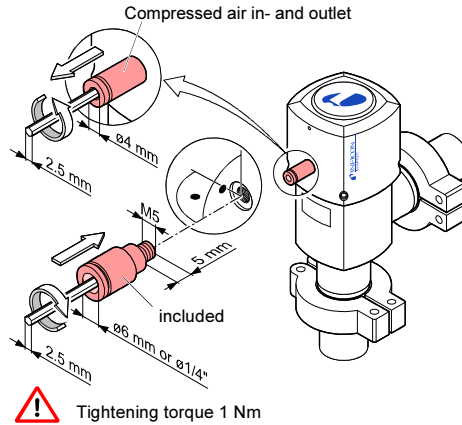
Compressed Air Connection

STOP 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.

The standard product is equipped with an instant push-in fitting for a plastic tube $\varnothing 4$ mm.
If you are using a $\varnothing 6$ mm or $\varnothing 1/4"$ plastic tube, exchange the instant push-in fitting.

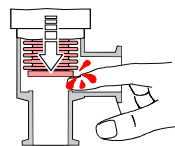
Exchanging the instant push-in fitting



Connecting the plastic tube

STOP DANGER

Caution: moving parts
When the product is connected to the supply media, parts can start moving. Moving parts can catch parts of the body and thus cause injuries.



The connection to the compressed air supply may only be established if:

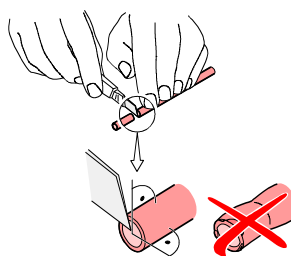
- the compressed air line is not pressurized
- the product is installed in a vacuum system or
- the moving parts are protected to avoid accidental contact.

! The plastic tube must meet the following specifications:

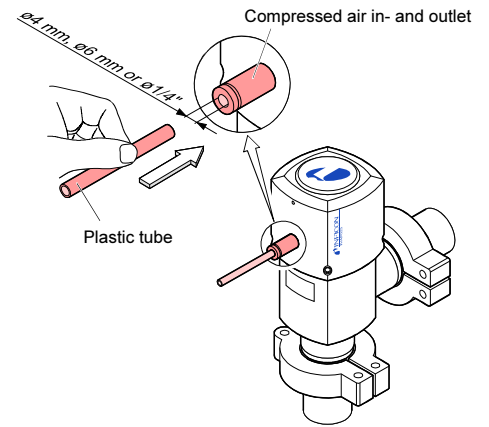
- bursting pressure ≥ 10 bar overpressure
- material: PA soft or PU

! To ensure leak tightness of the instant push-in fitting

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



Push the tube into the instant push-in fitting until the mechanical stop is reached. Check that it is correctly mounted by slightly pulling.



The compressed air must meet the following specifications:

- free of oil
- dry
- free of particles $> 5 \mu\text{m}$
- 3 ... 8 bar overpressure

Compressed air control system

The compressed air control system has to be supplied by the end-user.

To reach the opening and closing times indicated in the "Technical Data", a pilot valve with a nominal diameter of ≥ 1.2 mm is required.

If the nominal diameter of the pilot valve is > 1.2 mm, the opening and closing time are not affected because there is an orifice with a diameter of 1.2 mm in the Angle valve.

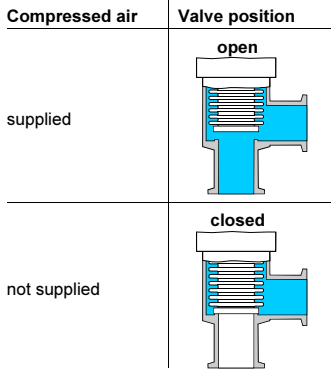


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Operation

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

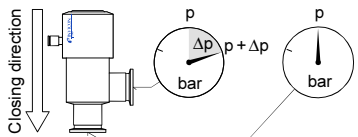
Valve position



Pressure difference Δp in closing direction

Caution

Caution: pressure difference



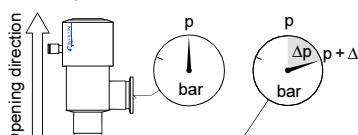
DN 16 ISO-KF and DN 25 ISO-KF
With $\Delta p > 4$ bar the valve may no longer be tight.
Avoid pressure differences $\Delta p > 4$ bar.

DN 40 ISO-KF
With $\Delta p > 2$ bar the valve may no longer be tight.
Avoid pressure differences $\Delta p > 2$ bar.

Pressure difference Δp in opening direction

Caution

Caution: pressure difference



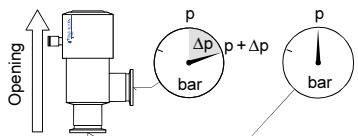
DN 16 ISO-KF and DN 25 ISO-KF
With $\Delta p > 2$ bar the valve opens.
Avoid pressure differences $\Delta p > 2$ bar.

DN 40 ISO-KF
With $\Delta p > 1.5$ bar the valve opens.
Avoid pressure differences $\Delta p > 1.5$ bar.

Opening against a pressure difference Δp

Caution

Caution: pressure difference



DN 16 ISO-KF and DN 25 ISO-KF
With $\Delta p > 4$ bar the valve cannot open.
Avoid pressure differences $\Delta p > 4$ bar.

DN 40 ISO-KF
With $\Delta p > 2$ bar the valve cannot open.
Avoid pressure differences $\Delta p > 2$ bar.

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

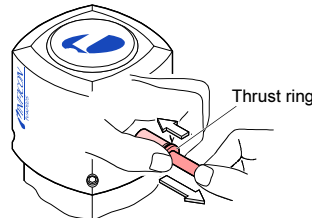
Caution: dirt sensitive area
Touching the product or parts thereof with one's bare hands increases the desorption rate.
Always wear clean, lint-free gloves and use clean tools when working in this area.

Preconditions

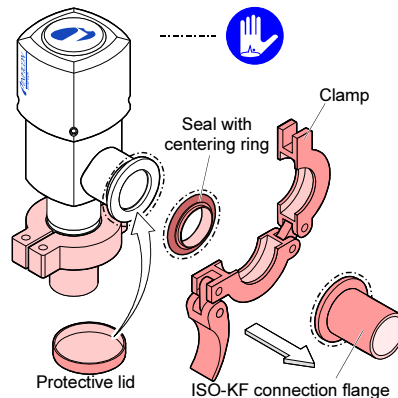
- Vacuum system vented
- Compressed air supply turned off
- Compressed air tube vented

Procedure

- 1 Pull out the tube while depressing the thrust ring.



- 2 Disassemble the small flange connections and place the protective lids.



Maintenance, Repair

See Operating Manual sina84e1-b, which can be downloaded from our website.

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 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.

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.

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 _____ Part number _____ Serial number _____	2 Reason for return _____ _____																								
↓																									
3 Operating fluid(s) used (Must be drained before shipping.) _____ _____																									
↓																									
4 Process related contamination of product <table style="width: 100%; border: none;"> <tr> <td style="width: 40%;">toxic</td> <td style="width: 10%;">no <input type="checkbox"/> 1)</td> <td style="width: 10%;">yes <input type="checkbox"/></td> <td style="width: 40%;"></td> </tr> <tr> <td>caustic</td> <td>no <input type="checkbox"/> 1)</td> <td>yes <input type="checkbox"/></td> <td></td> </tr> <tr> <td>biological hazard</td> <td>no <input type="checkbox"/></td> <td>yes <input type="checkbox"/> 2)</td> <td></td> </tr> <tr> <td>explosive</td> <td>no <input type="checkbox"/></td> <td>yes <input type="checkbox"/> 2)</td> <td></td> </tr> <tr> <td>radioactive</td> <td>no <input type="checkbox"/></td> <td>yes <input type="checkbox"/> 2)</td> <td></td> </tr> <tr> <td>other harmful substances</td> <td>no <input type="checkbox"/> 1)</td> <td>yes <input type="checkbox"/></td> <td></td> </tr> </table> <div style="text-align: right; margin-top: 10px;"> <p>2) Products thus contaminated will not be accepted without written evidence of decontamination!</p> </div>		toxic	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>		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"/>	
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other harmful substances	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>																							
↓																									
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: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 20%;">Trade/product name Manufacturer</th> <th style="width: 20%;">Chemical name (preferably with formula)</th> <th style="width: 20%;">Precautions associated with substance</th> <th style="width: 40%;">Action in case of human contact</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Trade/product name Manufacturer	Chemical name (preferably with formula)	Precautions associated with substance	Action in case of human contact																				
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↓																									
6 Legally binding declaration: We hereby declare that the information on this form is complete and accurate and that 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 _____ E-mail _____ Name _____ Date and legally binding signature _____ Company stamp _____																									

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

Manufacturer's Declaration

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

We, INFICON, 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 conformity with the provisions of the EC Directive relating to machinery.

Angle Valve

pneumatically actuated bellows sealed without position indicator, without pilot valve

VAP016-A ... 040-A
 VAP016-X ... 040-X

Part numbers

- 250-290
- 250-291
- 250-292
- 250-295
- 250-296
- 250-297

Standards

Harmonized and international/national standards and specifications:

- EN 292-1/-2 (Safety of machinery)
- EN 294 (Safety distances to prevent danger zones being reached by the upper limbs)
- DIN 28403 (ISO 2861 small flange connections)
- ISO 1609 (Vacuum technology, flange dimensions)
- ISO 2861-1 (Vacuum technology, quick-release couplings, clamped type)
- ISO 9803 (Vacuum technology, pipeline fittings, mounting dimensions)
- ISO 4414 (Pneumatic fluid power, general rules relating to systems)

Signatures

INFICON AG, Balzers

28 August 2001

Hans-Christoph Gehlhar
 Product Manager

28 August 2001

Dr. Georg Sele
 Technical Support Manager
 Quality Representative

This form can be downloaded from our website.

Copies: Original for addressee - 1 copy for accompanying documents - 1 copy for file of sender



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