

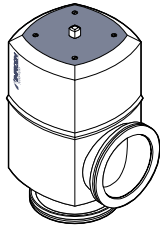
Intended Use

The Angle Valves are used as shut-off and venting devices in vacuum applications.

Angle Valve

pneumatically actuated
bellows sealed
with position indicator
with pilot valve

VAP063 ... 160-A/X

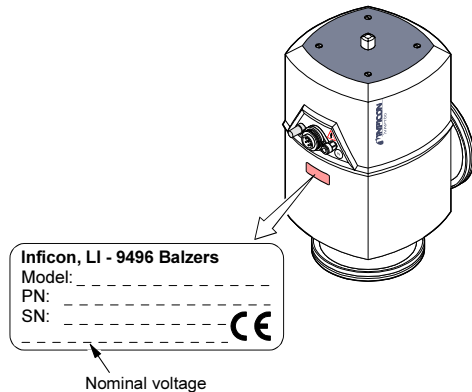


Instruction Sheet
incl. Manufacturer's Declaration

sima40e1-a (0204)

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.



Validity

This document applies to products with the following part numbers:

Aluminum housing:

DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K	Nominal voltage (pilot valve)
250-400	250-420	250-440	24 VDC (=)
250-401	250-421	250-441	24 VAC (-)
250-402	250-422	250-442	100 ... 115 VAC (-)
250-403	250-423	250-443	200 ... 240 VAC (-)

Stainless steel housing:

DN 63 ISO-K	DN 100 ISO-K	Nominal voltage (pilot valve)
250-410	250-430	24 VDC (=)
250-411	250-431	24 VAC (-)
250-412	250-432	100 ... 115 VAC (-)
250-413	250-433	200 ... 240 VAC (-)

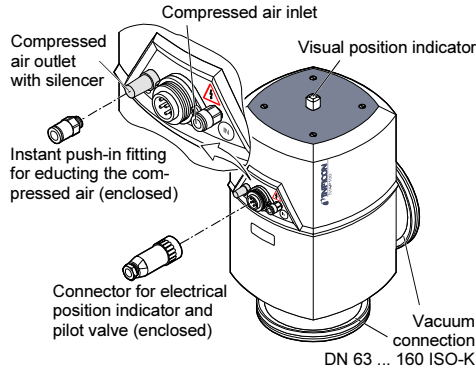
The part number (PN) can be taken from the product nameplate.

If not indicated otherwise in the legends, the illustrations in this document correspond to valves with the DN 100 ISO-K vacuum connection. They apply to valves with the DN 63 ISO-K and DN 160 ISO-K vacuum connection by analogy.

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

All dimensions in mm.

Description



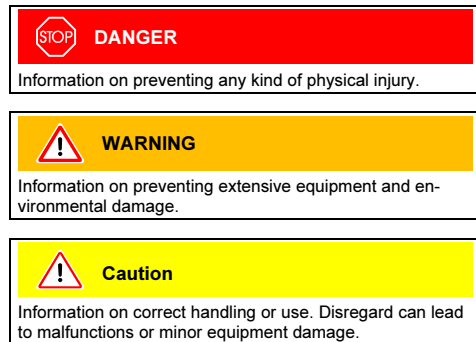
Functional Principle

When the pilot valve is activated, the pneumatic actuator opens the angle valve. The visual position indicator becomes visible, and the electrical position indicator "valve open" is activated.

When the pilot valve is de-energized, the pneumatic actuator is vented, and the angle valve is closed by the pressure spring. The visual position indicator is no longer visible, and the electrical position indicator "valve closed" is activated.

Safety

Symbols Used



General Safety Instructions

- Adhere to the applicable regulations and take the necessary precautions for the process media used. Consider possible reactions between the materials 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-users or third parties

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

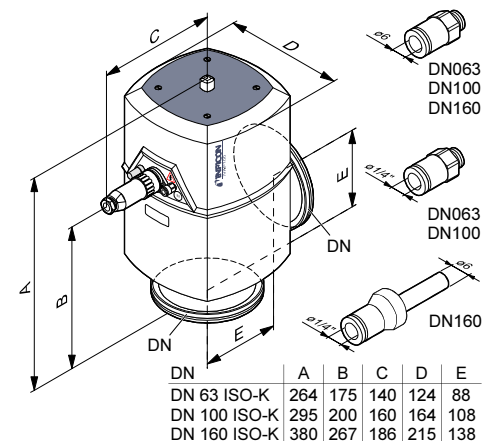
The end-user assumes the responsibility in conjunction with the process media used.

Technical Data

Pilot valve type of connection nominal voltage pickup/holding power DC solenoid coils AC solenoid coils duty cycle nominal diameter	soldered joints see product nameplate 1.6 / 1.6 W 3.1 / 2.2 VA 100% 4		
Position indicator type of connection rating	soldered joints 250 VAC / 30 VA / 0.125 A 50 VDC / 12.5 W / 0.25 A		
Connection flange	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Actuation	opening: pneumatic closing: by pressure spring		
Compressed air supply tube connection pressure range	ø6 mm, ø1/4" 4 ... 8 bar overpressure		
Piston displacement	75 cm ³	195 cm ³	570 cm ³
Stroke of the valve plate	20 mm	25 mm	35 mm
Conductance ¹⁾	140 l/s	330 l/s	800 l/s
Switching frequency ²⁾	60 / min	60 / min	40 / min
Opening time ²⁾	300 ms	400 ms	600 ms
Closing time ²⁾	300 ms	400 ms	650 ms
Cycle life ³⁾	1.5 million		
Tightness	1 × 10 ⁻⁸ mbar l/s (He)		
Pressure range	1 × 10 ⁻⁸ mbar ... 1.5 bar (absolute)		
Resistance to pressure	4 bar (absolute)		
Pressure difference Δp in closing direction in opening direction	1.5 bar 1.5 bar		
Opens to a pressure difference Δp ⁴⁾	1.5 bar		
Temperatures ambience bakeout aluminum housing st. steel housing actuator pilot valve	5 ... 60 °C 80 °C 150 °C 60 °C 60 °C		
Type of protection Protection class	IP 54 according to DIN 40 050 II		
Installation angle Flow direction	any any		
Materials aluminum housing st. steel housing bellows / valve plate pressure spring seals cover cylinder unit protective lids packing material	DIN 3.2373.62 DIN 1.4305 DIN 1.4541 / DIN 14301 DIN 1.1200 FPM styrol-butadiene DIN 3.2371.61 PE carton box, PE, PU		
Weight aluminum housing st. steel housing	4 kg 6.8 kg	6.7 kg 11.7 kg	11.4 kg -

- For air with molecular flow
- In a vacuum, pressure difference Δp = 0, and compressed air = 6 bar (overpressure)
- Cycles without expendable parts (seals) and under clean operating conditions
- Compressed air = 4 bar (overpressure)

Dimensions



Installation

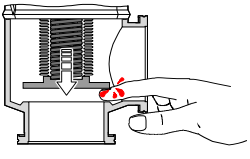
Vacuum Connection

Skilled personnel

The vacuum connection may only be established by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

DANGER

Caution: movement of the valve plate
When the valve is in operation, the valve plate can catch parts of the body and thus cause injuries.




Take appropriate measures (e.g. protective grid) to prevent access to the inside of the installed valve.

Caution

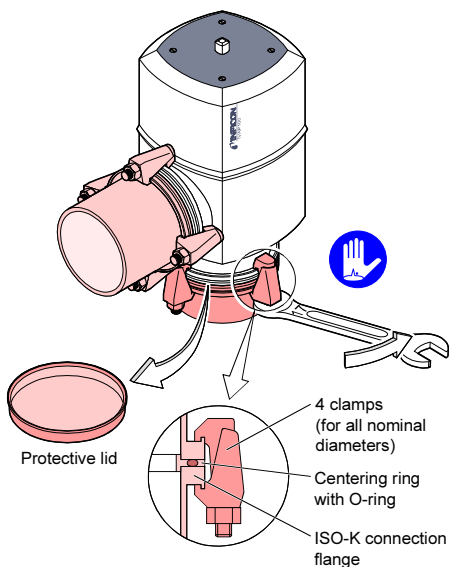
Caution: dirt sensitive area
Touching the product or parts thereof with bare hands increases the desorption rate.
Always wear clean, lint-free gloves and use clean tools when working in this area.

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 protective lids.

Remove the protective lids and install the valve to the vacuum system by means of the clamp flange fittings. Any installation angle and flow direction may be chosen.



Compressed Air Connection

Skilled personnel

The compressed air connection may only be established by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

Caution

Specifications for the compressed air:

- free of particles >50 µm
- 4 ... 8 bar overpressure
- dry, free of oil or containing oil (Keep using the same quality.)

If using compressed air which contains oil, dispose of it in accordance with the relevant regulations.

Caution

Specifications for the plastic tube:

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

Caution

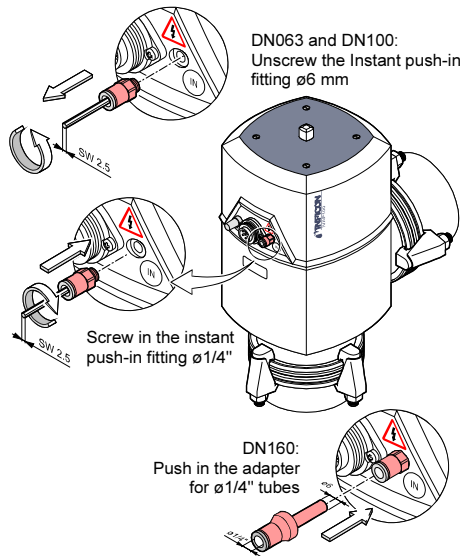
To ensure leak tightness,

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

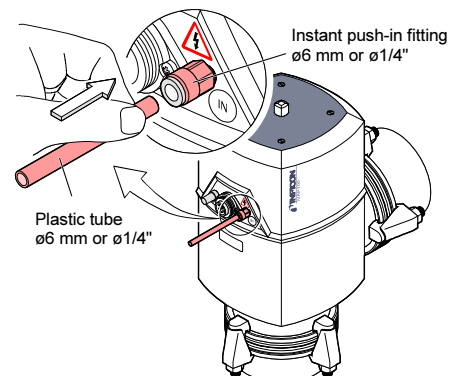
Compressed Air Inlet

The standard product is equipped with an instant push-in fitting for a plastic tube ø6 mm.

If you are using a ø1/4" plastic tube, exchange the instant push-in fitting for DN63 + DN100 and use the adapter for DN160.

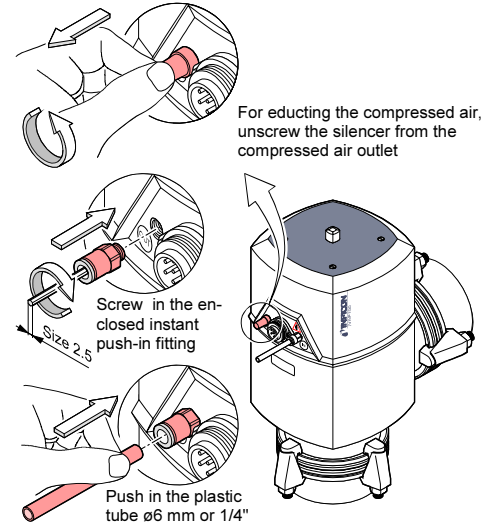


Push the tube into the instant push-in fitting until the mechanical stop is reached. Check that it is correctly mounted by slightly pulling.



Compressed air outlet

If necessary, unscrew the silencer and screw in the enclosed instant push-in fitting (ø6 mm or ø1/4") for educting the compressed air. Push the tube into the instant push-in fitting until the mechanical stop is reached. Check that it is correctly mounted by slightly pulling.



Electrical Connection

Skilled personnel

The electrical connection may only be established by a skilled electrician in the sense of VDE 0105. The VDE 0100 guideline has to be adhered to. The line cables shall be isolated from the line supply during all electrical work.

WARNING

Caution: mains voltage
The pilot valve can get destroyed if a wrong mains voltage is applied.
The local mains power rating must correspond with the nominal voltage of the pilot valve (see product nameplate). If they do not correspond, exchange the pilot valve (→ Further information).

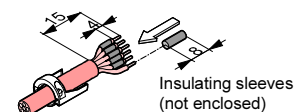
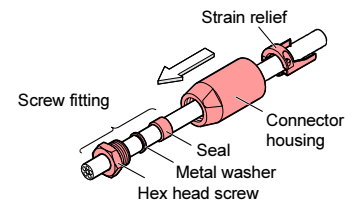
Caution

The cable must meet the following specifications:

- flexible
- conductor cross-section 0.75 mm²
- cable cross-section 10 mm
- 7-pole with protective conductor

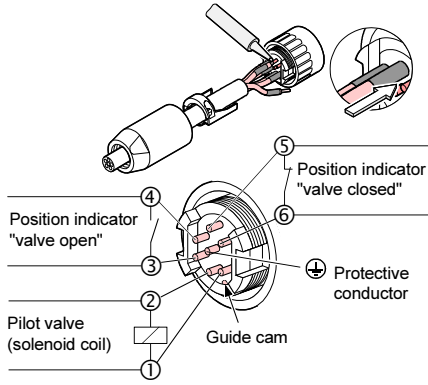
Preparing the connector:

- Slide the screw fitting, connector housing, and strain relief on the cable.
- Skin the cable and mount insulating sleeves if required.

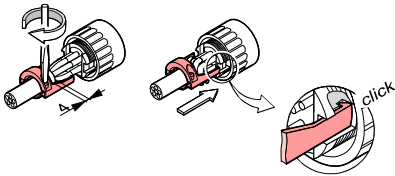


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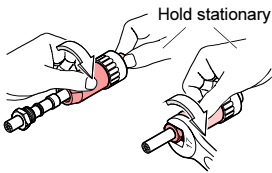
- 3 Solder the cable. Slide the insulating sleeves over the soldered connections. The polarity of the pilot valve (solenoid coil) need not be taken into consideration.



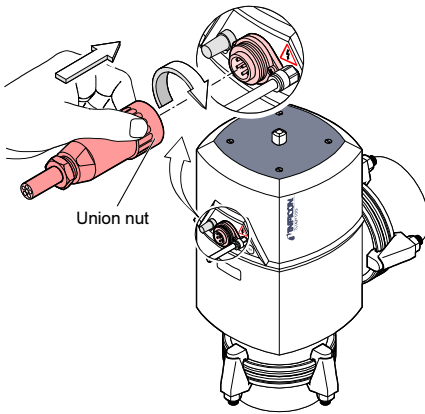
- 4 Tighten the strain relief and insert it (it will catch).



- 5 Reassemble the connector and tighten the screw fitting with an open-end wrench, size 17 mm.



- 6 Plug in the connector and secure it with the union nut.



Operation

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

Valve position

Valve position	Compressed air	Pilot valve	Position indicator
closed	admitted	deactivated	
	not admitted	activated	
	not admitted	deactivated	
open	admitted	activated	

Pressure range: 1×10^{-8} mbar ... 1.5 bar (absolute)

Pressure difference Δp in closing direction

Caution

Caution: pressure difference Δp

At $\Delta p > 1.5$ bar the valve may no longer be tight. Avoid pressure differences $\Delta p > 1.5$ bar.

Pressure difference Δp in opening direction

Caution

Caution: pressure difference Δp

At $\Delta p > 1.5$ bar the valve is opened. Avoid pressure differences $\Delta p > 1.5$ bar.

Opening against a pressure difference Δp

Caution

Caution: pressure difference Δp

At $\Delta p > 1.5$ bar the valve cannot open. Avoid pressure differences $\Delta p > 1.5$ bar.

Deinstallation

Electrical Connection

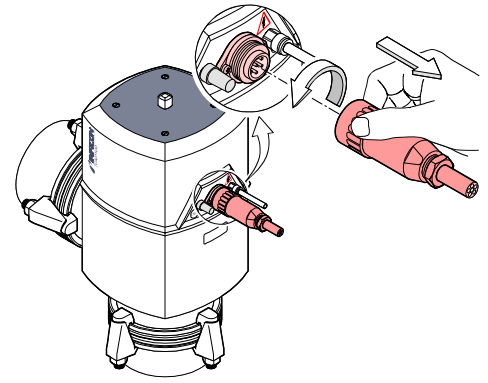
Skilled personnel

The electrical power must be disconnected by a skilled electrician.

Caution

The control system must be disconnected from the power source before any connection to the product is made or interrupted.

Unlock the connector and unplug it.



Compressed Air Connection

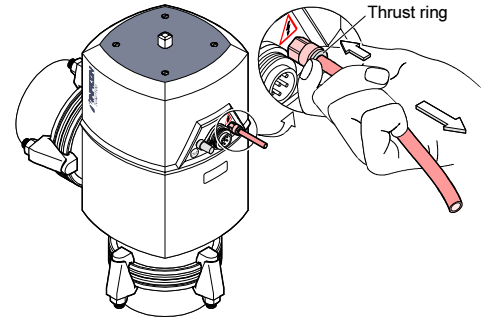
Skilled personnel

The compressed air may only be disconnected by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

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.

Pull out the tube while depressing the thrust ring.



Vacuum Connection

Skilled personnel

The vacuum connection may only be disassembled by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

DANGER

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

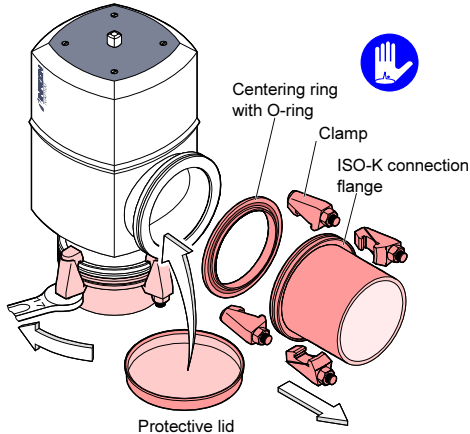
Caution

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 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 disassemble the clamping flange connection. Place the protective lids.



Further Information

Refer to the Operating manual with regard to maintenance, repair, and spare parts.

The Operating manual sina40e1 can

- be downloaded from our website or
- or ordered at Inficon.

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.

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.

- Description of product**
Type _____
Part number _____
Serial number _____
- Reason for return**

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

- Process related contamination of product**

toxic	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>
corrosive	no <input type="checkbox"/> 1)	yes <input type="checkbox"/>
biological hazard	no <input type="checkbox"/> 2)	yes <input type="checkbox"/> 2)
explosive	no <input type="checkbox"/> 2)	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"/>

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

2) Products thus contaminated will not be accepted without written evidence of decontamination!

The product is free of any substances which are damaging to health
- 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 Manufacturer	Chemical name (preferably with formula)

Precautions associated with substance	Action in case of human contact

- 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 _____

Company stamp _____

Date and legally binding signature _____

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 Council 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 accordance with the provisions of the EC Council Directive relating to machinery. We also declare that the equipment mentioned below complies with the provisions of the Council Directive relating to electrical equipment designed for use within certain voltage limits 73/23/EEC.

Angle Valve

pneumatically actuated bellows sealed with position indicator with pilot valve

VAP063 ... 160-A/X

Part numbers:

250-400	250-420	250-440
250-401	250-421	250-441
250-402	250-422	250-442
250-403	250-423	250-443
250-410	250-430	
250-411	250-431	
250-412	250-432	
250-413	250-433	

Standards

Harmonized and international/national standards and specifications:
DIN 28 404

Signatures

Inficon AG, Liechtenstein
12 April 2000

Hans-Christoph Gehlhar
Product management
Components and valves

12 April 2000

Hugo Frei
Product development
Components and valves



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