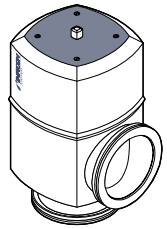
Angle valve

pneumatically actuated
bellows sealed
with electrical position indicator
without pilot valve

VAP063 ... 160-A/X

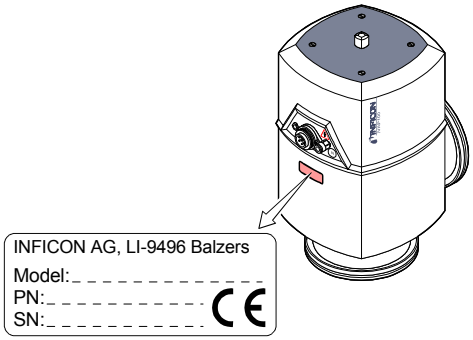


Instruction sheet
incl. Manufacturer's Declaration

sima41e1-a (0306)

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:

250-404	(DN 63 ISO-K)
250-424	(DN 100 ISO-K)
250-444	(DN 160 ISO-K)
250-544	(DN 160 ISO-K, bellows with protection tube)

Stainless steel housing:

250-414	(DN 63 ISO-K)
250-434	(DN 100 ISO-K)

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 vacuum connection DN 100 ISO-K. They apply to valves with other vacuum connections by analogy.

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

If not indicated otherwise, the dimensions are given in mm.

Intended Use

The angle valves are used as shut-off and venting devices in vacuum applications.

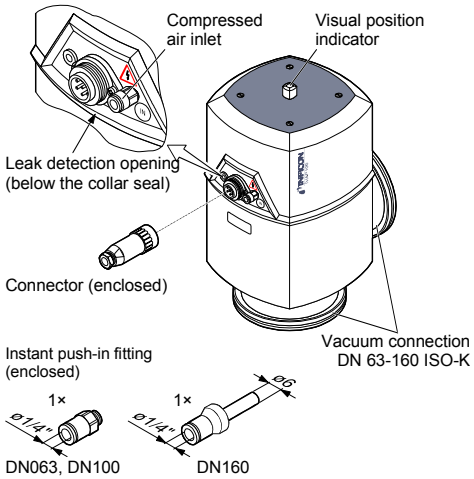
Functional Principle

The angle valve opens pneumatically. In the open position, the green position indicator is visible.

The angle valve is closed by the prestressed pressure spring. In the closed position, the position indicator is not visible.

The final positions can be polled by the electrical position indicator.

Description



Safety

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.

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

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, ø¼" 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] Opening time [2] Closing time [2]	60 / min 300 ms 700 ms	60 / min 450 ms 700 ms	40 / min 500 ms 700 ms
Cycle life [3] 250-4xx 250-544	1.5 million 0.7 million		
Tightness	1×10^{-9} mbar l/s (He)		
Pressure range	1×10^{-8} mbar … 1.5 bar (abs.)		
Resistance to pressure	4 bar (abs.)		
Pressure difference Δp in closing direction in opening direction Opens to a pressure difference Δp [4]	 1.5 bar 1.5 bar 1.5 bar		
Temperatures ambiance bakeout aluminium housing steel housing actuator	 5 °C … 60 °C 80 °C 150 °C 60 °C		
Type of protection Protection class	IP 54 according to DIN 40 050 II		
Mounting orientation [5]	any		
Materials housing 250-404, 250-424 250-444, 250-544 250-414, 250-434 bellows / valve plate pressure spring seals cover cylinder unit protective lids packing material	 3.2373.62 1.4305 1.4541 / 1.4301 1.1200 FPM styrol / butadiene 3.2371.61 PE carton box, PE, PU		
Weight 250-404, 250-424, 250-444 250-544 250-414, 250-434	 4 kg 6.8 kg	 6.7 kg 11.7 kg	 11.4 kg 11.9 kg –

[1] For air with molecular flow

[2] With pressure difference Δp=0 and compressed air = 5 bar (overpressure)

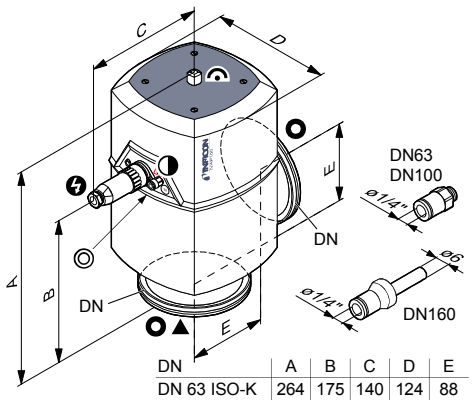
[3] Cycles under clean operating conditions and recommended mounting orientation

[4] Compressed air = 4 bar (overpressure)

[5] The recommended mounting orientation is with the valve seat in direction to the vacuum chamber

Position indicator connection rating	soldered joints 250 VAC / 30 VA / 0.125 A 50 VDC / 12.5 W / 0.25 A		

Dimensions [mm]



DN	A	B	C	D	E
DN 63 ISO-K	264	175	140	124	88
DN 100 ISO-K	295	200	160	164	108
DN 160 ISO-K	380	267	186	215	138

- Protective lid
- Compressed air inlet
- Electrical connection for the position indicator
- Visual position indicator
- Valve seat site
- Leak detection opening (below the collar seal)

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.

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.

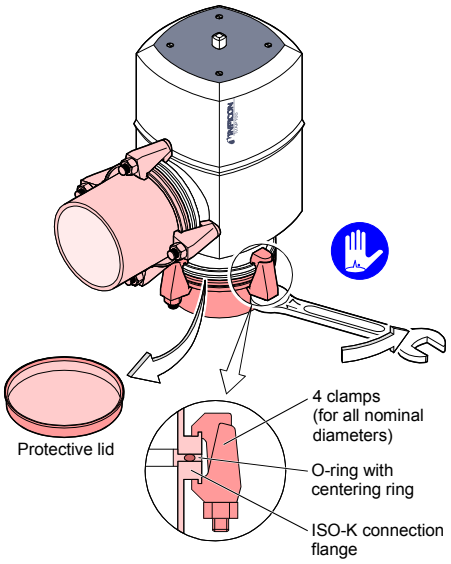
Caution

Caution: dirt sensitive area

Dirt 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 by means of the clamping flange fittings.



Keep the protective lids.

Compressed Air Connection

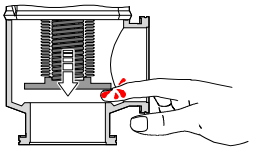
Skilled personnel

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.

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 cause injuries.



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

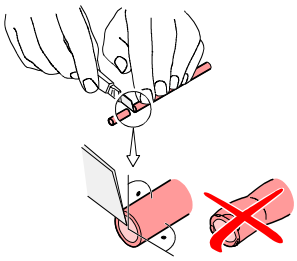
- the compressed air line is not pressurized
- the product is installed in a vacuum system or
- the moving parts are protected to avoid accidental contact.

The plastic tube must meet the following specifications:

- OD 6 mm
- 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.

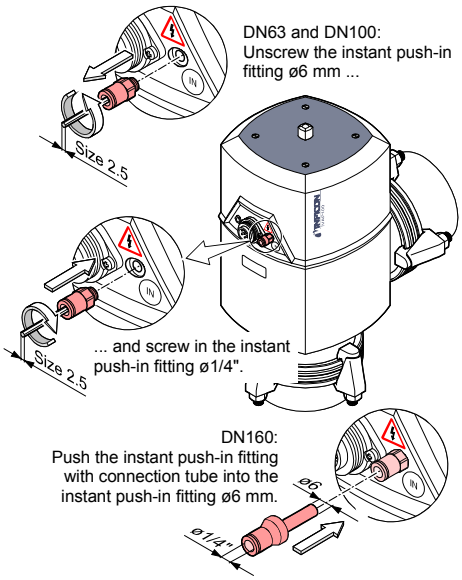


The compressed air must meet the following specifications:

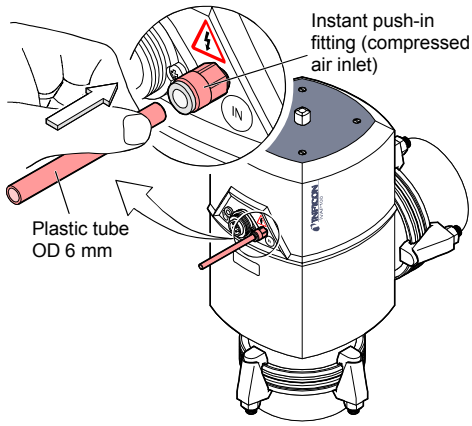
- free of oil
- dry
- free of particles >5 µm
- 4 … 8 bar overpressure

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

If you are using a ø¼" plastic tube, exchange by the valves with connection flange DN063 and DN100 the instant push-in fitting and mount by the valve with connection flange DN160 the instant push-in fitting with connection tube.



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

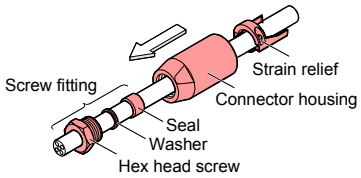
The electrical connection, in accordance with the VDE 0100 guidelines, may be made only by a licensed electrician, qualified as per VDE 0105. The line cables shall be isolated from the line supply during all electrical work.

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

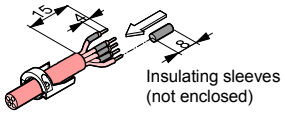
The cable must meet the following specifications:

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

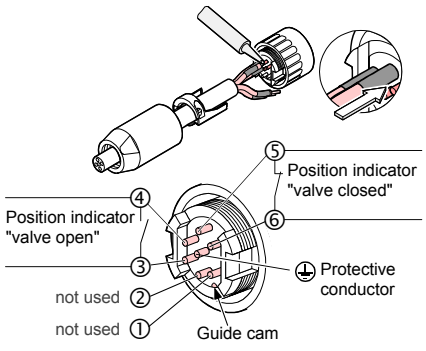
❶ Slide the screw fitting, connector housing, and strain relief on the cable.



❷ Skin the cable and mount insulating sleeves if required.



❸ Solder the cable. Slide the insulating sleeves over the soldered connections.



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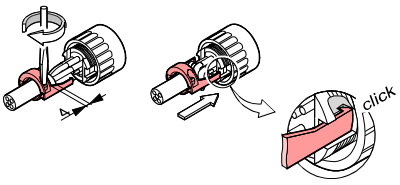
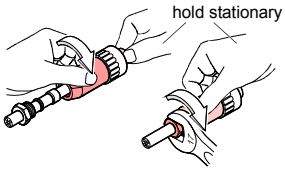
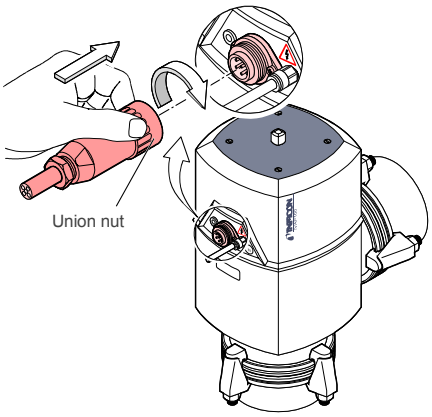
❹ Tighten the strain relief and insert it (it will catch).



❺ Reassemble the connector and tighten the screw fitting (width across 17 mm).



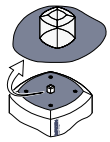
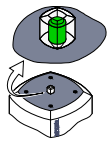
❻ Plug in the connector and secure it with the union nut.

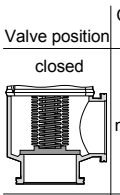


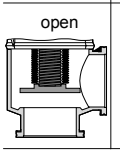
Operation

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

Valve position

Valve position	Compressed air	Position indicator
closed	not available	
open	available	

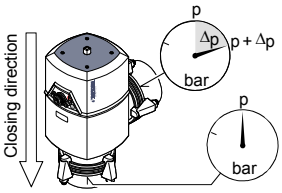




Pressure difference Δp in closing direction

Caution

Caution: pressure difference Δp

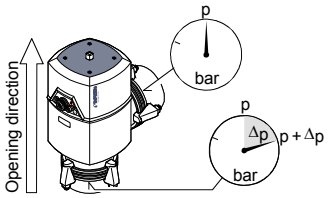


At Δp >1.5 bar the valve may no longer be tight.
Avoid pressure differences Δp >1.5 bar.

Pressure difference Δp in opening direction

Caution

Caution: pressure difference Δp

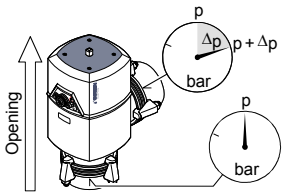


At Δp >1.5 bar the valve is opened.
Avoid pressure differences Δp >1.5 bar.

Opening against a pressure difference Δp

Caution

Caution: pressure difference Δp



At Δp >1.5 bar the valve cannot open.
Avoid pressure differences Δp >1.5 bar.

Deinstallation

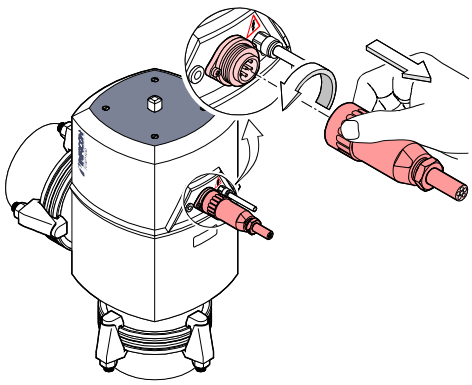
Precondition

- Vacuum system vented
- Compressed air supply turned off
- Compressed air lines relieved

Electrical Connection

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

Loosen the connector and unplug it.



Compressed Air Connection

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.

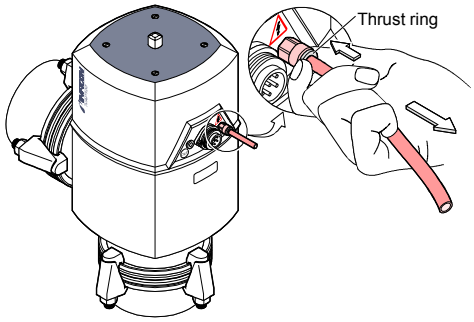
DANGER

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

The product may only be disconnected from the compressed air supply if

- the product is installed in a vacuum system or
- the moving parts are protected to avoid accidental contact.

Pull out the tube while depressing the thrust ring.



Vacuum Connection

DANGER

Caution: contaminated parts
Contaminated parts can be detrimental to health.
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.

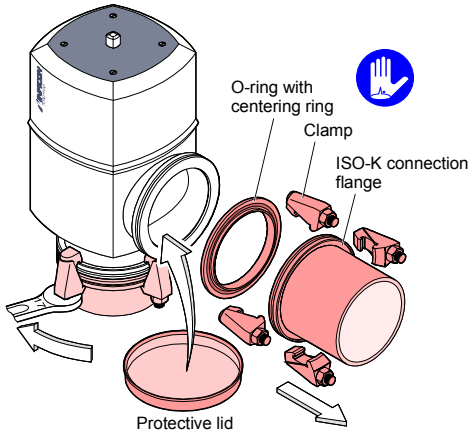
Caution

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
Dirt increases the desorption rate.
Always wear clean, lint-free gloves and use clean tools when working in this area.

Disassemble the clamping flange connections and place the protective lids.



Maintenance, Repair

→ 🕮 Operating Manual sina41e1. The manual can be downloaded from our website (www.inficon.com).

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.

1 Description of product

Type _____

Part number _____

Serial number _____

2 Reason for return

_____

_____

_____

3 Operating fluid(s) used

(Must be drained before shipping.)

_____

_____

4 Used in copper process

no ❑ yes ❑ → Seal product in plastic bag and mark it with a corresponding label.

5 Process related contamination of product:

toxic	no ❑ 1)	yes ❑
corrosive	no ❑ 1)	yes ❑
biological hazard	no ❑	yes ❑ 2)
explosive	no ❑	yes ❑ 2)
radioactive	no ❑	yes ❑ 2)
other harmful substances	no ❑ 1)	yes ❑

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. yes ❑

6 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 (or symbol)

Precautions associated with substance	Action if human contact

7 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 _____

Email _____

Name _____

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 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 electrical position indicator
without pilot valve

VAP063 ... 160-A/X

Part numbers:

250-404
250-424
250-444
250-544

250-414
250-434

Standards

Harmonized and international/national standards and specifications:

DIN 28 404

Signatures

INFICON AG, Liechtenstein

5 June 2003

Remo Klaiber
Product Marketing Management

5 June 2003

Dr. Georg Sele
Technical Support Manager
Quality Representative

INFICON
LI–9496 Balzers
Liechtenstein
Tel +423 / 388 3111
Fax +423 / 388 3700
reach.liechtenstein@inficon.com
www.inficon.com