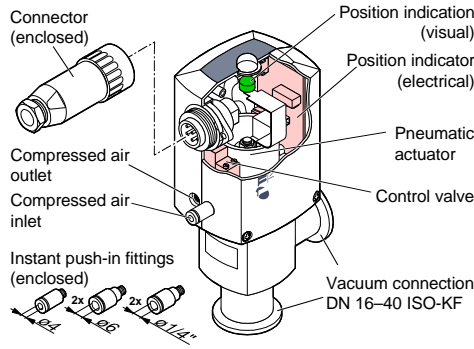


## Description



### Functional principle

When the pilot valve is activated, the angle valve is opened by the pneumatic actuator. The green position indicator becomes visible.

When the pilot valve is deactivated, the angle valve is closed by the pressure spring. The position indicator is no longer visible.

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

## Technical Data

Pilot valve connection	soldered joints		
nominal voltage	see product nameplate		
power	1 W		
duty cycle	100%		
nominal diameter	0.42		
Position indicator connection	soldered joints		
rating	250 VAC / 25 VA / 0.1 A 50 VDC / 12.5 W / 0.25 A		
Connection flange	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 ø¼"		
pressure range	3 ... 7 bar overpressure		
piston displacement	5.5 cm <sup>3</sup>	12.1 cm <sup>3</sup>	26.2 cm <sup>3</sup>
Stroke of the valve plate	5 mm	10 mm	14 mm
Conductance <sup>1)</sup>	4.5 l/s	16 l/s	40 l/s
Switching frequency <sup>2)</sup>	100 / min	100 / min	75 / min
Opening time <sup>2)</sup>	100 ms	110 ms	250 ms
Closing time <sup>2)</sup>	200 ms	290 ms	500 ms
Cycle life <sup>3)</sup>	10 million		
Tightness	1x10 <sup>-9</sup> mbar l/s		
Pressure range min.	1x10 <sup>-8</sup> mbar		
Pressure range max. (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 a pressure difference Δp <sup>4)</sup>	4 bar	2 bar	
Temperatures	0 °C ... 50 °C		
ambience			
bakeout			
housing			
aluminum	80 °C		
stainless steel	150 °C		
actuator / pilot valve	50 °C		
Type of protection	IP 50 according to DIN 40 050		
Protection class	II		
Installation angle	any		
Flow direction	any		
Materials			
housing			
aluminum	3.2572		
stainless steel	1.4301		
bellows / valve plate	1.4541 / 14301		
pressure spring			
DN 16+25 ISO-KF	1.4301		
DN 40 ISO-KF	1.1200		
seals	FPM		
shell / cylinder unit	PBTP		
protective lids	PE		
packing material	carton box, PE, PU		
Weight			
housing			
aluminum	0.3 kg	0.44 kg	0.9 kg
stainless steel	0.4 kg	0.75 kg	1.6 kg

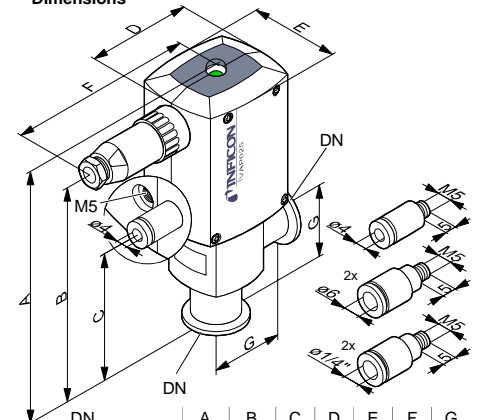
<sup>1)</sup> For air with molecular flow

<sup>2)</sup> With pressure difference Δp=0 and compressed air = 5 bar (overpressure)

<sup>3)</sup> Cycles without expendable parts (seals) and under clean operating conditions

<sup>4)</sup> Compressed air = 5 bar (overpressure)

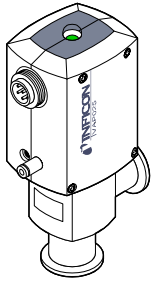
### Dimensions



DN	A	B	C	D	E	F	G
DN 16 ISO-KF	154	127	71	60	51	100	40
DN 25 ISO-KF	176	147.4	92.5	74	63	108	50
DN 40 ISO-KF	196.5	167.3	112	98	83	120	65

## Angle Valve

pneumatically actuated  
bellows sealed  
with position indicator and pilot valve  
VAP016-040-A/X

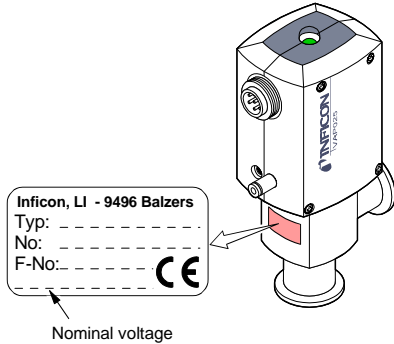


Instruction Sheet  
incl. Manufacturer's Declaration

sima45e1-a (0102)

## 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.



Nominal voltage

## Validity

This document applies to products with the following part numbers:

### Aluminum housing

DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	Nominal voltage (pilot valve)
250-200	250-220	250-240	24 VDC (=)
250-201	250-221	250-241	24 VAC (-)
250-202	250-222	250-242	100-115 VAC (-)
250-203	250-223	250-243	200-240 VAC (-)

### Stainless steel housing

DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	Nominal voltage (pilot valve)
250-210	250-230	250-250	24 VDC (=)
250-211	250-231	250-251	24 VAC (-)
250-212	250-232	250-252	100-115 VAC (-)
250-213	250-233	250-253	200-240 VAC (-)

The part number 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.

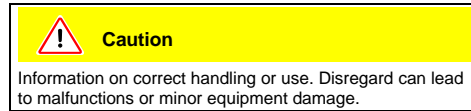
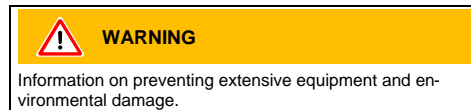
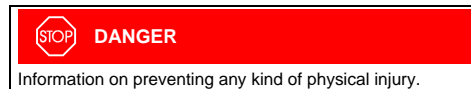
We reserve the right to make technical changes without prior notice.

## Intended Use

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

## Safety

### Symbols Used



⊞<sup>20</sup> Dimensions in mm

### 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-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.

# 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**

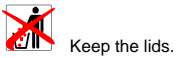
Caution: overpressure in the vacuum system >1 bar  
 Injury caused by released parts and harm caused by escaping process gases can result if clamps are opened while the vacuum system is pressurized.  
 Do not open any clamps while the vacuum system is pressurized. Use the type clamps which are suited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

**Caution**

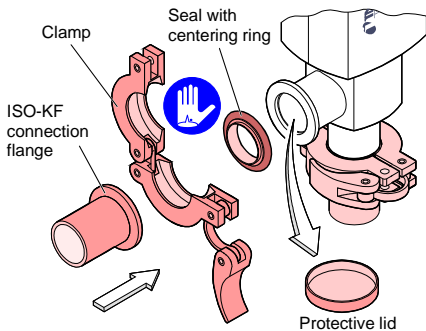
Caution: dirt sensitive area  
 Touching the product or parts thereof with one's bare hands increases the desorption rate. Always wear clean, lint-free gloves and use clean tools when working in this area.

**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.



Remove the protective lids and install the valve to the vacuum system by means of the small 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**

The compressed air must meet the following specifications:

- free of oil
- dry
- free of particles >5 µm
- 3 ... 7 bar (overpressure)

**Caution**

Specifications for the plastic tube:

- bursting pressure ≥10 bar overpressure (1 MPa)
- material: PA soft or PU.

**Caution**

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.

**Caution**

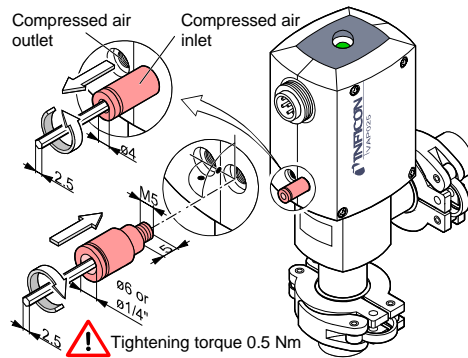
Caution: plastic thread

The plastic thread is damaged by tilting or overturning the instant push-in fitting.

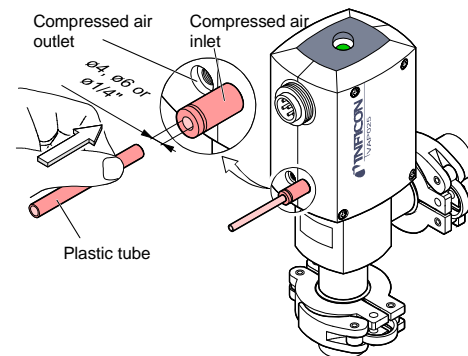
- use the enclosed instant push-in fitting (with extra-long thread) only.
- screw in the instant push-in fitting without tilting it and without exceeding the tightening torque of 0.5 Nm.

## Compressed Air Inlet

For connection of a ø6 mm or ø¼" plastic tube, exchange the instant push-in fitting.

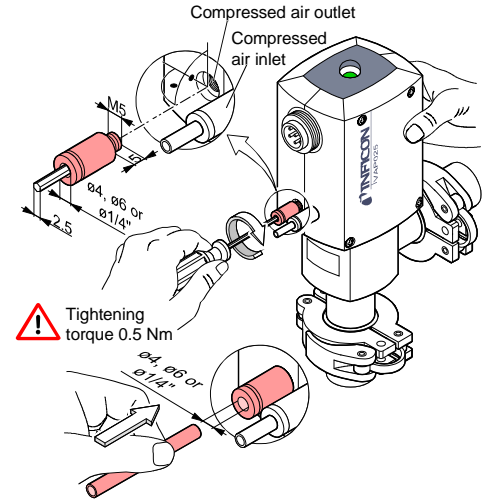


Push the tube into the instant push-in fitting until the mechanical stop is reached. Check that it is correctly mounted by slightly pulling.



## Compressed Air Outlet

Screw in the enclosed instant push-in fitting for exhausting the compressed air if necessary. Push the tube into the instant push-in fitting until the mechanical stop is reached. Check that it is correctly mounted by slightly pulling.



## Power 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.

**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).

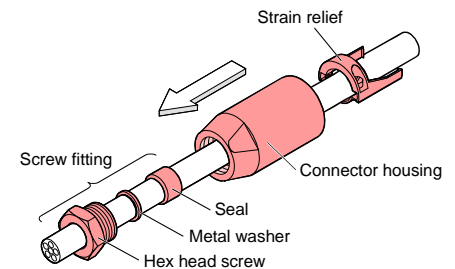
**Caution**

The cable must meet the following specifications:

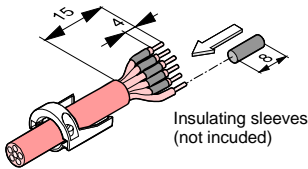
- flexible
- conductor cross-section ≤0.75 mm<sup>2</sup>
- cable cross-section ≤10 mm
- 6-pole without protective conductor or 7-pole with protective conductor.

## Preparing the connector

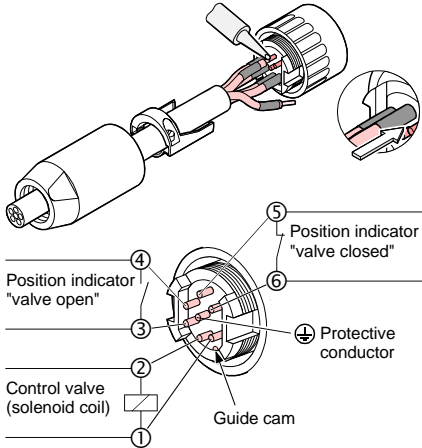
- Slide the screw fitting, connector housing, and strain relief on the cable.



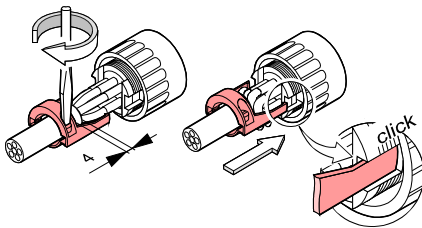
- 2 Skin the cable and mount the insulating sleeves if required.



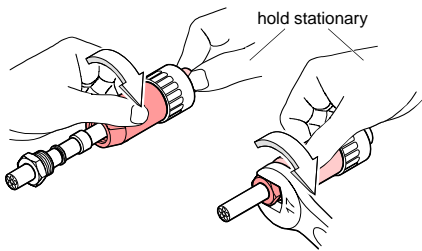
- 3 Solder the cable. Slide the insulating sleeve over the soldered connections. The polarity of the pilot valve (solenoid coil) need not be taken into consideration.



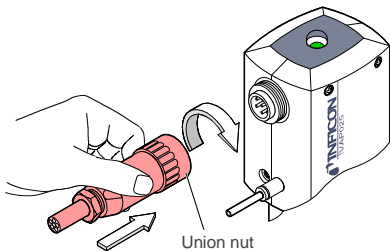
- 4 Tighten the strain relief and insert it (it will catch).



- 5 Reassemble the connector and tighten the screw fitting (width across 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	Compressed air	Pilot valve	Position indicator
closed	available	deactivated	
	not available	activated	
	not available	deactivated	
open	available	activated	

### Pressure range

DN 16+25 ISO-KF:  $1 \times 10^{-8}$  mbar ... 4 bar (absolute)  
 DN 40 ISO-KF:  $1 \times 10^{-9}$  mbar ... 2.5 bar (absolute)

### Pressure difference $\Delta p$ in closing direction

**Caution**

Caution: pressure difference  $\Delta p$

At  $\Delta p > 4$  bar (DN 16+25 ISO-KF) and  $\Delta p > 2$  bar (DN 40 ISO-KF) the valve may no longer be tight. Avoid bigger pressure differences.

### Pressure difference $\Delta p$ in opening direction

**Caution**

Caution: pressure difference  $\Delta p$

With  $\Delta p > 2$  bar (DN 16+25 ISO-KF) and  $\Delta p > 1.5$  bar (DN 40 ISO-KF) the valve is opened. Avoid bigger pressure differences.

### Opening against a pressure difference $\Delta p$

**Caution**

Caution: pressure difference  $\Delta p$

With  $\Delta p > 4$  bar (DN 16+25 ISO-KF) and  $\Delta p > 2$  bar (DN 40 ISO-KF) the valve cannot open. Avoid bigger pressure differences.

## Deinstallation

### Power Connection

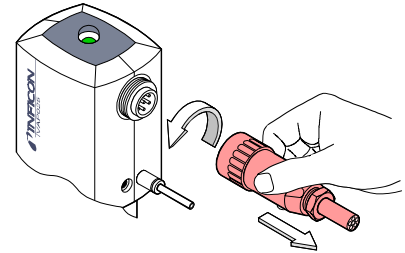
**Skilled personnel**

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.

Loosen the connector and unplug it.



### Compressed Air Connection

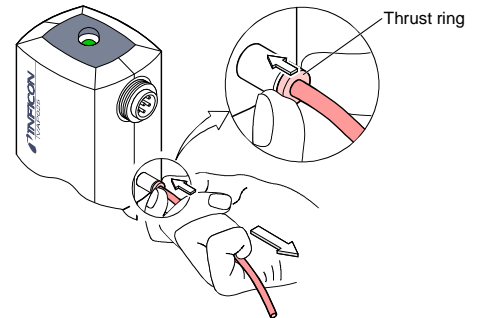
#### Skilled personnel

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 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.

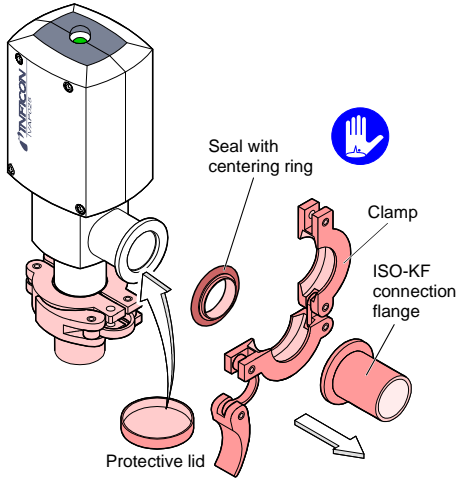
### Caution

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 disassemble the small flange connection. Place the protective lid.



### Further Information

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

The Operating manual sina45e1

- can be downloaded from our website 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 \_\_\_\_\_  
Article No. \_\_\_\_\_  
Serial No. \_\_\_\_\_
- Reason for return**  
\_\_\_\_\_
- Operating fluid(s) used**  
\_\_\_\_\_
- Process related contamination of product:**

toxic	no <input type="checkbox"/>	yes <input type="checkbox"/>
corrosive	no <input type="checkbox"/>	yes <input type="checkbox"/>
biological hazard	no <input type="checkbox"/>	yes <input type="checkbox"/> *)
explosive	no <input type="checkbox"/>	yes <input type="checkbox"/> *)
radioactive	no <input type="checkbox"/>	yes <input type="checkbox"/> *)
other harmful substances	no <input type="checkbox"/>	yes <input type="checkbox"/>

\*) 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 (or symbol)

Dangerous material class	Measures in case of spillage	First aid in case of contact
- 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 \_\_\_\_\_  
  
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 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 Directive relating to machinery.

We also declare that the equipment mentioned below complies with the provisions of the Directive relating to electrical equipment designed for use within certain voltage limits 73/23/EEC and the Directive relating to electromagnetic compatibility 89/336/EEC.

### Angle Valve

pneumatically actuated  
bellows sealed  
with position indicator and pilot valve  
VAP016-040-A/X

### Part numbers

250-200	250-220	250-240
250-201	250-221	250-241
250-202	250-222	250-242
250-203	250-223	250-243
250-210	250-230	250-250
250-211	250-231	250-251
250-212	250-232	250-252
250-213	250-233	250-253

### Standards

Harmonized and international/national standards and specifications:

- EN 292-2
- DIN EN 60 204-1
- ISO 9803
- ISO 1609
- ISO 4414
- DIN 28 403
- DIN 28 404
- DIN 2501-1
- DIN 24 558

### Signatures

Inficon AG, Liechtenstein

Balzers, 14 February 2001

Hans-Christoph Gehlhar  
Product management  
Components and valves

Balzers, 14 February 2001

Dr. Georg Sele  
Technical Support Manager  
Quality Representative



LI-9496 Balzers  
Liechtenstein  
Tel +423 / 388 3111  
Fax +423 / 388 3700  
reach.liechtenstein@Inficon.com  
www.Inficon.com