Vacuum Control

Catalog 2011

VACUUM GAUGES, VALVES, FITTINGS
AND FEEDTHROUGHS

INFICON

Table of Contents

VACUUM GAUGES

VACUUM FEEDTHROUGHS

VACUUM VALVES

VACUUM FITTINGS

ISO-KF Small Flange Components

ISO-K Clamp Flange Components

ISO-F Fixed Flange Components

UHV CF Components

Website

Vacuum Gauges

VACUUM GAUGES

VACUUM GAUGES (continued)

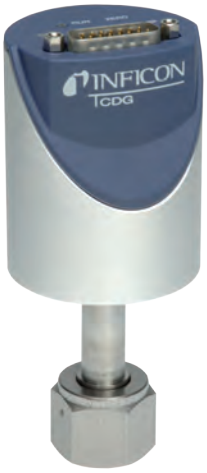
Vacuum Switch

Calibration Service

Website

SKY® Capacitance Diaphragm Gauge

CDG025D, CDG025D–S



The INFICON SKY CDG025D Capacitance Diaphragm Gauge line of highly accurate temperature compensated manometers is designed for stable performance in harsh manufacturing tool environments. Advanced digital electronics improve gauge performance and offer easy handling features such as one pushbutton zero function and setpoint adjustment. The corrosion resistant ultra pure ceramic sensor provides excellent zero stability with a long life expectancy of several million pressure cycles, including atmospheric bursts. A unique sensor shielding (patent pending) protects the gauge from process contamination. A robust mechanical design and digital electronics improve EMC compatibility, long term stability and temperature compensation. The CDG025D sets new standards for fast stability after power on and fast recovery from atmospheric pressure exposure.

Advantages

- Full scale ranges from 100 mTorr … 1000 Torr
- Fast stability after power on
- Fast recovery from atmospheric pressure
- Corrosion resistant ceramic sensor
- Excellent long term signal stability
- Temperature compensated
- Sensor protected from contamination
- One pushbutton zero function
- Wide range power supply
- 2 setpoints (optional)
- RS232 interface (optional)

Applications

- Semiconductor manufacturing equipment for Etch, CVD, PVD, ALD
- Data storage and display manufacturing equipment
- Industrial vacuum equipment
- General high accuracy pressure measurement

CDG025D, CDG025D–S (continued)

Ordering Information

CDG025D, temperature compensated

Full Scale Range			Flange type			
Torr	Pascal	mbar	1/2" tube	DN 16 ISO-KF	DN 16 CF-R	8 VCR®
1000	**133,322**	**1333**	**375-000**	**375-001**	**375-002**	**375-003**
100	**13,332**	**133**	**376-000**	**376-001**	**376-002**	**376-003**
10	**1,333**	**13.3**	**377-000**	**377-001**	**377-002**	**377-003**
1	**133**	**1.3**	**378-000**	**378-001**	**378-002**	**378-003**
0.1	**13.3**	**0.13**	**379-000**	**379-001**	**379-002**	**379-003**

CDG025D, with 2 setpoints and RS232 interface, temperature compensated

Full Scale Range			Flange type			
Torr	Pascal	mbar	1/2" tube	DN 16 ISO-KF	DN 16 CF-R	8 VCR®
1000	**133,322**	**1333**	**375-300**	**375-301**	**375-302**	**375-303**
–	110,000	1,100	375-500	375-501	375-502	375-503
200	26,664	267	382-300	382-301	382-302	382-303
100	**13,332**	**133**	**376-300**	**376-301**	**376-302**	**376-303**
–	10,000	100	376-500	376-501	376-502	376-503
20	2,666	26.7	383-300	383-301	383-302	383-303
10	**1,333**	**13.3**	**377-300**	**377-301**	**377-302**	**377-303**
–	1,000	10	377-500	377-501	377-502	377-503
1	**133**	**1.3**	**378-300**	**378-301**	**378-302**	**378-303**
–	100	1	378-500	378-501	378-502	378-503
0.25	33.3	0.33	385-300	385-301	385-302	385-303
0.1	**13.3**	**0.13**	**379-300**	**379-301**	**379-302**	**379-303**
–	10	0.1	379-500	379-501	379-502	379-503

bold = standard products

Other flange types and full scale ranges on request.

CDG025D, CDG025D–S (continued)

Specifications (Torr based standard products)

Measurement Range F.S. (Full Scale)	**Torr Pa mbar**	**1000 133,322 1333**	**100 13,332 133**	**10 1,333 13.3**	**1 133 1.3**	**0.1 13 0.13**
Accuracy [1]	% of reading	0.2	0.2	0.2	0.2	0.5
Temperature effect						
on zero	% F.S./°C	0.005	0.005	0.005	0.015	0.02
on span	% of reading/°C	0.01	0.01	0.01	0.01	0.03
Resolution	% F.S.	0.003	0.003	0.003	0.003	0.003
Pressure, max.	**kPa (absolute)**	**400**	**260**	**260**	**260**	**130**
Response time [2]	ms	30	30	30	30	130
Lowest reading	% F.S.			0.01		
Lowest suggested reading	% F.S.			0.05		
Lowest suggested control pressure	% F.S.			0.5		
Temperature						
Operation (ambient)	°C			+5 ... +50		
Bakeout at flange [3]	°C			≤110		
Storage	°C			–40 ... +65		
Supply voltage	VDC			14 ... 30		
Power consumption	W			≤1		
Output signal (analog)	VDC			0 ... +10		
Response time	ms			30		130
Degree of protection				IP 30		
Standards			EN 61000-6-2, EN 61000-6-3, EN 61010, UL 61010-1, CSA 22.2 No.61010-1, RoHS			
Electrical connection				D-sub, 15 pole, male		
Setpoint [4]				two setpoints (SP1, SP2)		
Relay contact	VDC / ADC			30 / ≤0.5		
Hysteresis	% F.S.			1		
Materials exposed to vacuum			Aluminum oxide ceramic (Al_2O_3), Vacon 70 [5], stainless steel (AISI 316L[6]), AgCuTi hard solder, sealing glass			

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
2) Increase 10 … 90% F.S.
3) Non operation
4) CDG025D-S only
5) 28% Ni, 23% Co, 49% Fe
6) 18% Cr, 10% Ni, 3% Mo, 69% Fe

CDG025D, CDG025D–S (continued)

Specifications (Torr based other ranges)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	– 110,000 1000	200 26,664 267	– 10,000 100	20 2,666 26.7	– 1,000 10	– 100 1	0.25 33.3 0.33	– 10 0.1
Accuracy [1]	% of reading	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.5
Temperature effect									
on zero	% F.S./°C	0.005	0.005	0.005	0.005	0.005	0.015	0.02	0.02
on span	% of reading/°C	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.03
Resolution	% F.S.	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Pressure, max.	kPa (absolute)	400	260	260	260	260	260	130	130
Response time [2]	ms	30	30	30	30	30	30	130	130

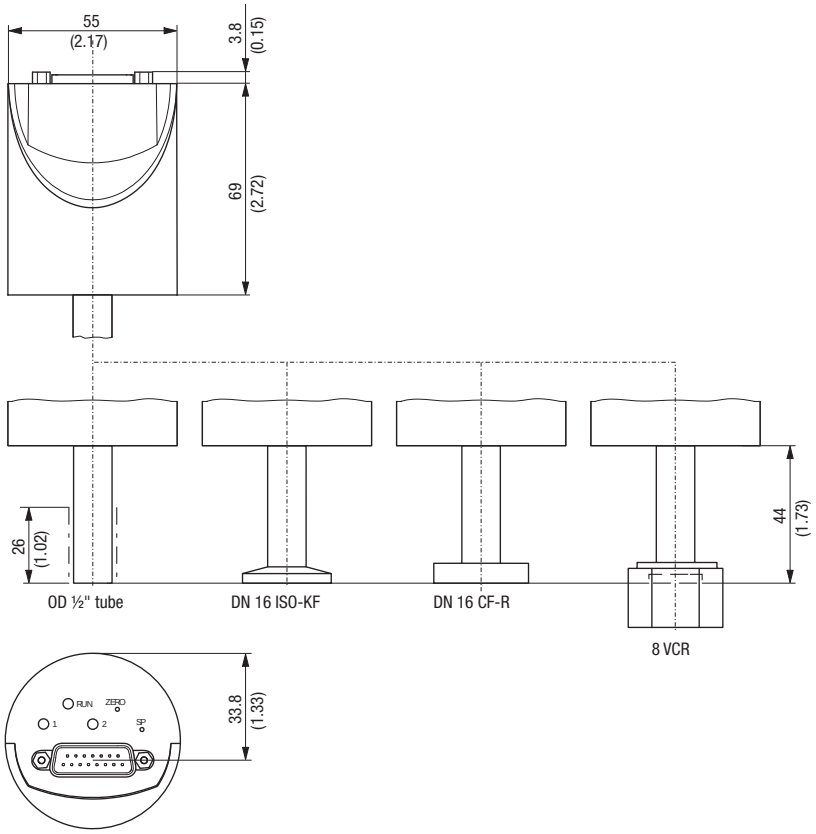
[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

[2] Increase 10 … 90% F.S.

For further specifications, see table above.

Dimensions, Internal Volume, Weight

mm (inch)



		1/2" tube	DN 16 ISO KF	DN 16 CF-R	8 VCR®
Internal volume	cm^3 ($inch^3$)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)
Weight	g	310	330	350	370

SKY® Capacitance Diaphragm Gauge

CDG025D–X3

The INFICON SKY CDG025D Capacitance Diaphragm Gauge line of highly accurate temperature compensated manometers is designed for stable performance in harsh manufacturing tool environments. Advanced digital electronics improve gauge performance and offer easy handling features such as one pushbutton zero function and setpoint adjustment. The corrosion resistant ultra pure ceramic sensor provides excellent zero stability with a long life expectancy of several million pressure cycles, including atmospheric bursts. A unique sensor shielding (patent pending) protects the gauge from process contamination. A robust mechanical design and digital electronics improve EMC compatibility, long term stability and temperature compensation. The CDG025D sets new standards for fast stability after power on and fast recovery from atmospheric pressure exposure..

Advantages

- Full scale ranges from 100 mTorr … 1000 Torr
- Fast stability after power on
- Fast recovery from atmospheric pressure
- Corrosion resistant ceramic sensor
- Excellent long term signal stability
- Temperature compensated
- Sensor double protected from contamination
- One pushbutton zero function
- Wide range power supply
- 2 setpoints
- RS232 interface
- Clean room compliant

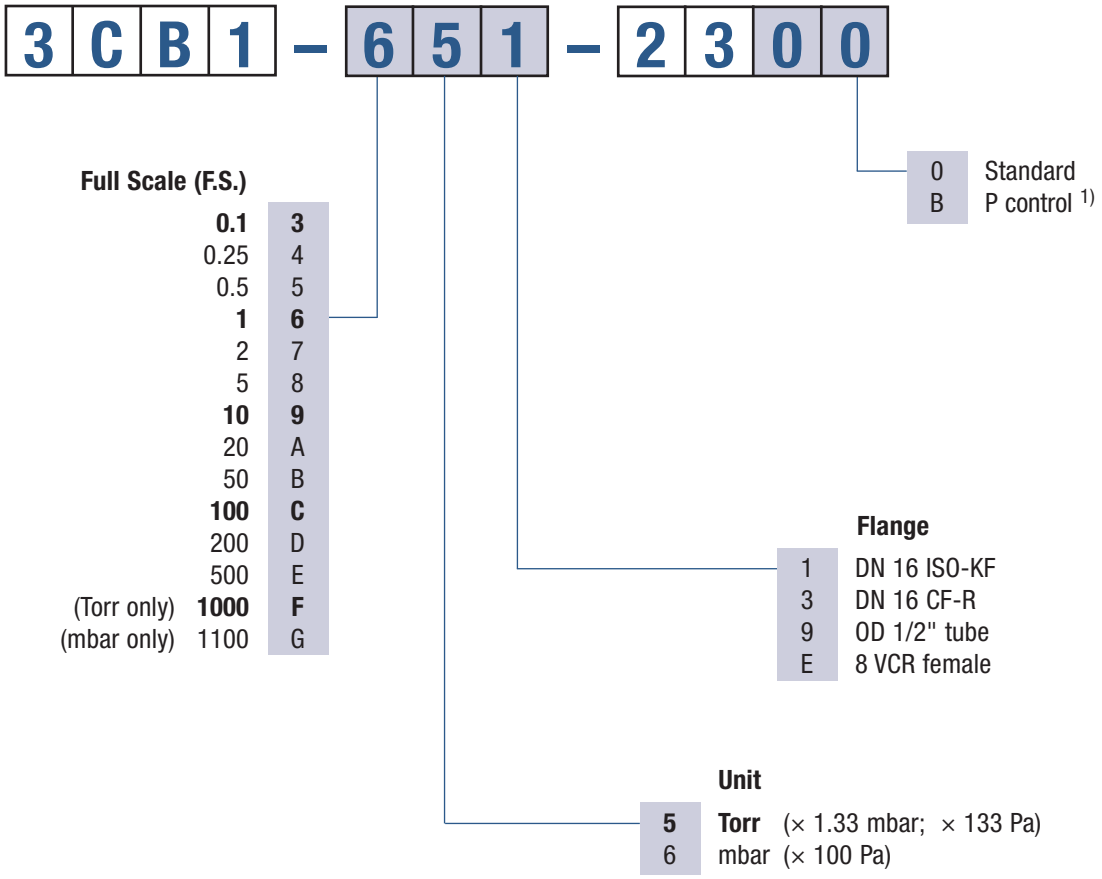
Applications

Accurate and fast pressure measurement for demanding applications:

- Semiconductor manufacturing equipment for Etch, CVD, PVD, ALD
- Data storage and display manufacturing equipment
- Industrial vacuum equipment
- General high accuracy pressure measurement

CDG025D–X3 (continued)

Ordering Information



1) Optimised signal filter setting for pressure control.

bold = standard products

Other flange types and full scale ranges (F.S.) on request.

CDG025D–X3 (continued)

Specifications (Torr based standard products)

Measurement Range F.S. (Full Scale)	**Torr Pa mbar**	**1000 133,322 1333**	**100 13,332 133**	**10 1,333 13.3**	**1 133 1.3**	**0.1 13 0.13**
Accuracy [1]	% of reading	0.2	0.2	0.2	0.2	0.5
Temperature effect						
on zero	% F.S./°C	0.005	0.005	0.005	0.015	0.02
on span	% of reading/°C	0.01	0.01	0.01	0.01	0.03
Resolution	% F.S.	0.003	0.003	0.003	0.003	0.003
Pressure, max.	**kPa (absolute)**	**400**	**260**	**260**	**260**	**130**
Response time [2]	ms	30	30	30	30	130 / 30
Lowest reading	% F.S.	0.01				
Lowest suggested reading	% F.S.	0.05				
Lowest suggested control pressure	% F.S.	0.5				
Temperature						
Operation (ambient)	°C	+5 ... +50				
Bakeout at flange [4]	°C	≤110				
Storage	°C	–40 ... +65				
Supply voltage	VDC	+14 ... +30				
Power consumption	W	≤1				
Output signal (analog)	VDC	0 ... +10				
Degree of protection		IP 30				
Standards		EN 61000-6-2, EN 61000-6-3, EN 61010, UL 61010-1, CSA 22.2 No.61010-1, RoHS				
Electrical connection		D-sub, 15 pole, male				
Setpoint		two setpoints (SP1, SP2)				
Relay contact	VDC / ADC	30 / ≤0.5				
Hysteresis	% F.S.	1				
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L[5])				

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
2) Increase 10 … 90% F.S.
3) For pressure control type only
4) Non operation
5) 18% Cr, 10% Ni, 3% Mo, 69% Fe

CDG025D–X3 (continued)

Specifications (Torr based other ranges)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	– 110,000 1100	200 26,664 267	– 10,000 100	20 2,666 26.7	– 1,000 10	– 100 1	0.25 33.3 0.33	– 10 0.1
Accuracy [1]	% of reading	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.5
Temperature effect									
on zero	% F.S./°C	0.005	0.005	0.005	0.005	0.005	0.015	0.02	0.02
on span	% of reading/°C	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.03
Pressure, max.	kPa (absolute)	236	260	260	260	260	260	130	130
Resolution	% F.S.	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Response time [2]	ms	30	30	30	30	30	30	130	130 / 30 [3]

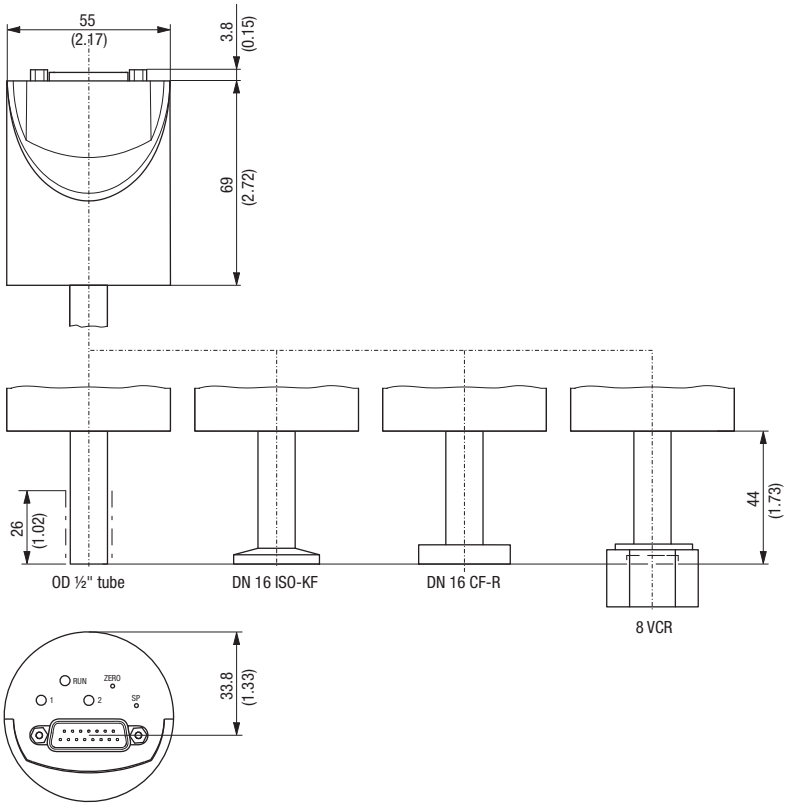
[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

[2] Increase 10 … 90% F.S. [3] For pressure control type only

Further specifications see table above.

Dimensions, Internal Volume, Weight

mm (inch)



		1/2" tube	DN 16 ISO KF	DN 16 CF-R	8 VCR®
Internal volume	cm^3 ($inch^3$)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)
Weight	g	310	330	350	370

SKY® Capacitance Diaphragm Gauge

CDG045D

INFICON SKY CDG045D manometers are your best choice for highly accurate total pressure measurement and control. CDG045D gauges are temperature controlled at 45°C for superior signal stability and repeatability. They are available for full scale ranges from 100 mTorr to 1000 Torr, with all common flange types and fieldbus interfaces and provide a linear 0 to 10 V, gas type independent, pressure signal. INFICON capacitance manometers use a corrosion proof ultra pure alumina ceramic diaphragm. The advantages of the ceramic sensor are better signal stability, faster recovery from atmosphere, short warm up time and an extraordinary lifetime. INFICON CDG are high quality, cost effective pressure sensors for demanding vacuum applications.

Advantages

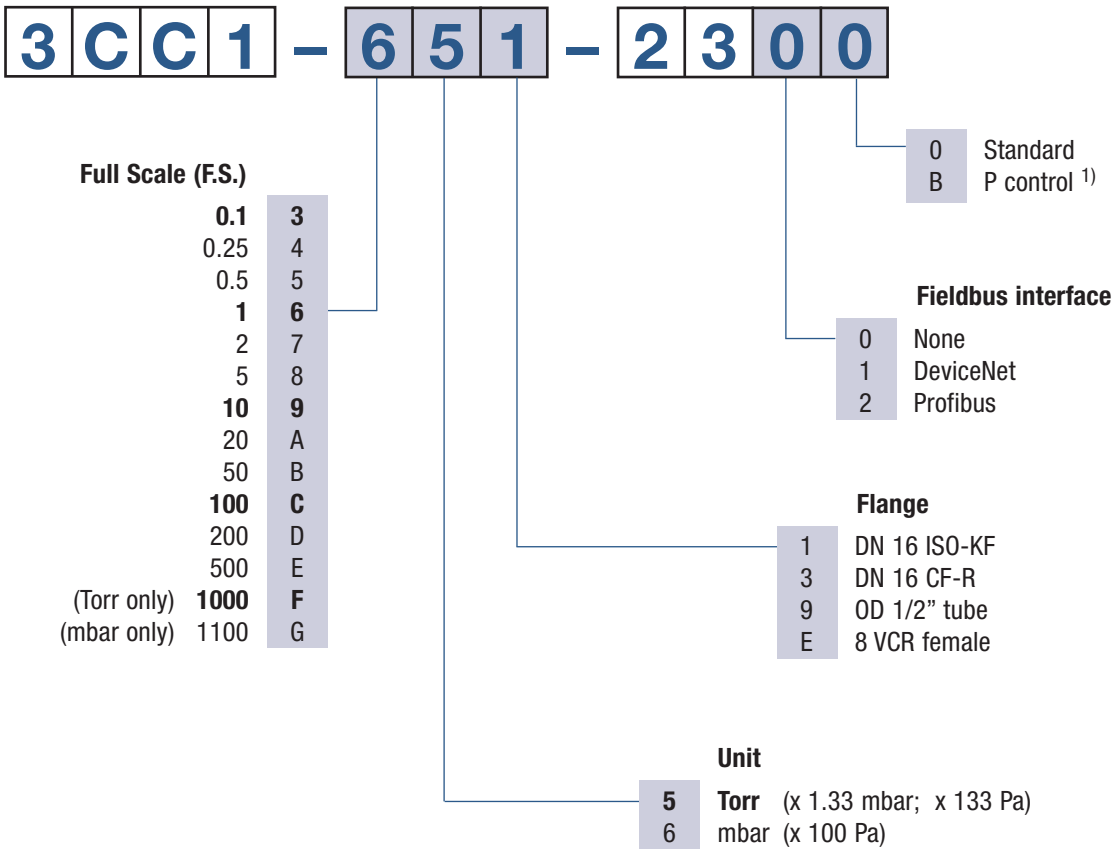
- Lower CoO (cost of ownership), 50% faster warm up, energy efficient low power consumption
- Easy integration, wide variety of full scales, flanges and interfaces, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service and maintenance
- Two year warranty, longer lifetime with advanced heating concept and gauge protection
- No long term recalibration due to excellent signal stability and repeatability, even in harsh plasma applications
- Compliance & standards: CE, EN, UL, SEMI, RoHS

Applications

- Etch, CVD, PVD and other semiconductor production processes
- Chemical and corrosive vacuum processes
- General thin film and vacuum processes
- Reference sensor for monitoring of test instruments according to international standards
- Transfer standard for traceability measurements

CDG045 (continued)

Ordering Information



1) Optimised siganl filter setting for pressure control

bold = standard products

Other flange types and full scale ranges (F.S.) on request.

Accessories

	Diagnostic
Communication adapter (2 m) for PC RS232 serial port	**303-333**

Software to run the diagnostic functions on Windows NT, XP can be downloaded from our website.

CDG045 (continued)

Specifications (Torr based standard products)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	1000 133,322 1333	100 13,332 133	10 1,333 13.3	1 133 1.3	0.1 13 0.13
Accuracy [1]	% of reading	0.15				
Temperature effect						
on zero	% F.S./°C	0.0025				0.005
on span	% of reading/°C	0.01				
Pressure, max.	kPa (absolute)	400	260			130
Resolution	% F.S.	0.003				
Lowest reading	% F.S.	0.01				
Lowest suggested reading	% F.S.	0.05				
Lowest suggested control pressure	% F.S.	0.5				
Temperature						
Operation (ambient)	°C	+10 ... +40				
Bakeout at flange	°C	≤110				
Storage	°C	–40 ... +65				
Supply voltage		+14 ... +30 VDC or ±15 V (±5%)				
Power consumption						
During Heat up	W	≤12				
At operating temperature	W	≤8				
Output signal (analog)	VDC	0 ... +10				
Response time [2]	ms	30				130 / 30 [3]
Degree of protection		IP 40				
Standards		EN 61000-6-3, EN 61010, UL 61010-1, CSA 22.2 No.61010-1, SEMI S-2				
Electrical connection		D-sub, 15 pole, male				
Setpoint		two setpoints (SP1, SP2)				
Relay contact	VDC / ADC	≤30 / ≤0.5				
Hysteresis	% F.S.	1				
Diagnostic port						
Protocol		RS232-C				
Read		pressure, status, ID,				
Set		set points, filter, zero adjust, factory reset, DC offset				
Materials exposed to vacuum		Aluminium oxide ceramic (Al_2O_3), stainless steel (AISI 316L[4])				

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation
2) Increase 10 … 90% F.S.
3) For pressure control type only
4) 18% Cr, 10% Ni, 3% Mo, 69% Fe

CDG045 (continued)

Specifications (Torr based other ranges)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	500 66,661 666.61	200 26,664 267	50 6,666.1 66.67	20 2,666 26.7	5 666.61 6.6661	2 266.66 2.67	0.5 66.66 0.67	0.25 33.3 0.33
Accuracy [1]	% of reading	0.15							
Temperature effect									
on zero	% F.S./°C	0.0025						0.005	
on span	% of reading/°C	0.01							
Pressure, max.	kPa (absolute)	400	260					130	
Response time [2]	ms	30							130

[1] Non-linearity, hysteresis, repeatability at 25 °C ambient operating temperature without temperature effects after 2 hours operation.
[2] Increase 10 … 90% F.S.

Further specifications see table above.

Specifications (mbar based products)

Measurement Range F.S. (Full Scale)	mbar Pa	1100 110,000	100 10,000	10 1,000	1 100	0.1 10
Accuracy [1]	% of reading	0.15				
Temperature effect						
on zero	% F.S./°C	0.0025				0.005
on span	% of reading/°C	0.01				
Pressure, max.	kPa (absolute)	400	260			130
Response time [2]	ms	30				130 / 30 [3]

[1] Non-linearity, hysteresis, repeatability at 25 °C ambient operating temperature without temperature effects after 2 hours operation.
[2] Increase 10 … 90% F.S.
[3] For pressure control type only

Further specifications see tables «SPECIFICATIONS (Torr based standard products)» and «SPECIFICATIONS (Torr based other products)».

Specifications (DeviceNet™)

		CDG045D DeviceNet™
Protocol		DeviceNet™, group 2 slave only
Data rate	kBaud	125, 250, 500 by switch or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		address 00 - 63 by switch or network programmable
Digital functions	read	pressure, status, ID
	set	set points, filter, zero adjust, factory reset, DC offset
Specification		DeviceNet™ "Vacuum Gauge Device Profile" (ODVA)
Device type		"VG" vacuum gauge
I / O slave messaging		polling only
Supply voltage for gauge at D-sub connector		+14 … +30 VDC or ±15 V / ≤12 W
Supply voltage for DeviceNet transceiver at microstyle connector		24 V nom / <2 W (11 … 25 V)
Connector for DeviceNet™		microstyle, 5 pin, male
Connector for CDG (analog output, supply voltage CDG, setpoints)		D-sub, 15 pin, male

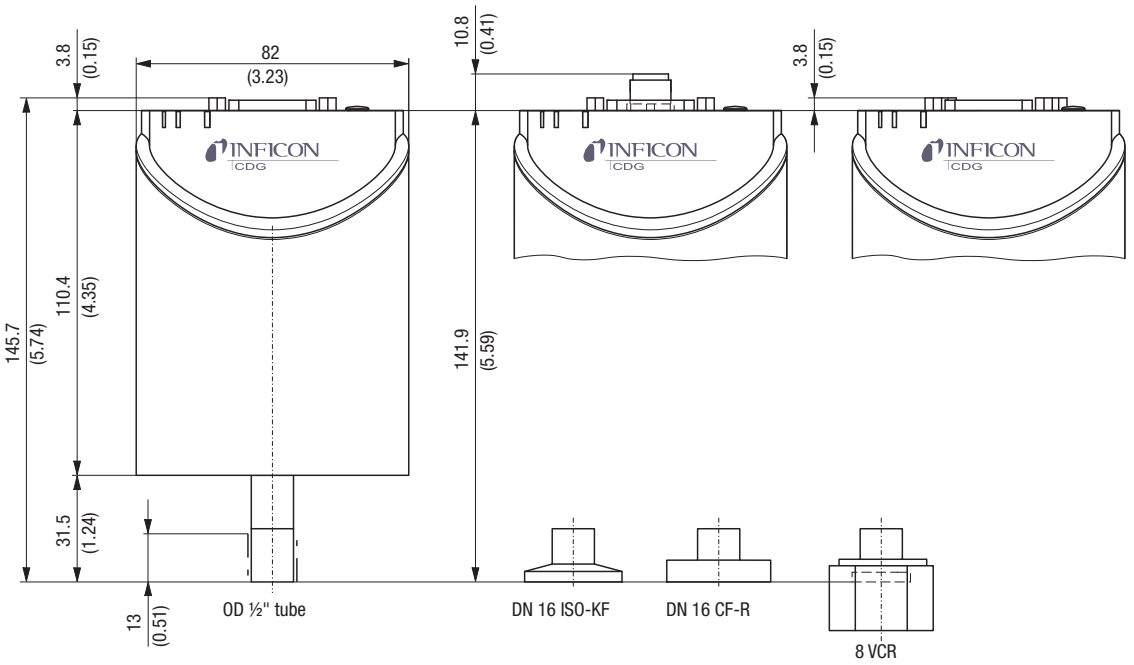
CDG045 (continued)

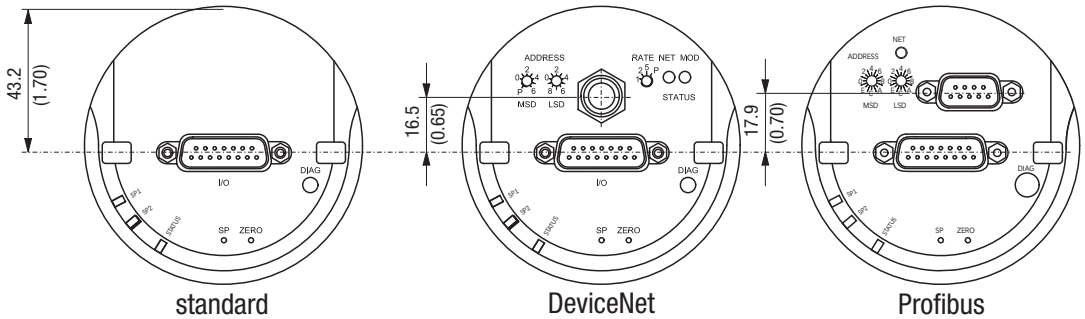
Specifications (Profibus DP)

		CDG045D Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		address 00 - 125 by switch or network programmable
Digital functions	read	pressure, status, ID
	set	set points, filter, zero adjust, factory reset, DC offset
Connector for Profibus DP		D-sub, 9 pin, female
Connector for CDG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

Dimensions

mm (inch)





		1/2" tube	DN 16 ISO KF	DN 16 CF-R	8 VCR®
Internal volume	cm³ (inch³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight	g	837	852	875	897

SKY® Capacitance Diaphragm Gauges

CDG100D

INFICON SKY CDG100D manometers are your best choice for accurate total pressure measurement and control. CDG100D gauges are temperature controlled at 100°C for superior performance in demanding semiconductor and plasma processes. They are available for full scale ranges from 100 mTorr to 1000 Torr, with all common flange types and fieldbus interfaces and provide a linear 0 to 10 V, gas type independent, pressure signal. INFICON capacitance manometers use an ultra pure alumina ceramic diaphragm which is corrosion proof. The advantages of the ceramic sensor are better signal stability, faster recovery from atmosphere, short warm up time and an extraordinary lifetime. INFICON CDG are high quality, cost effective pressure sensors for demanding semiconductor, plasma and vacuum applications.

Advantages

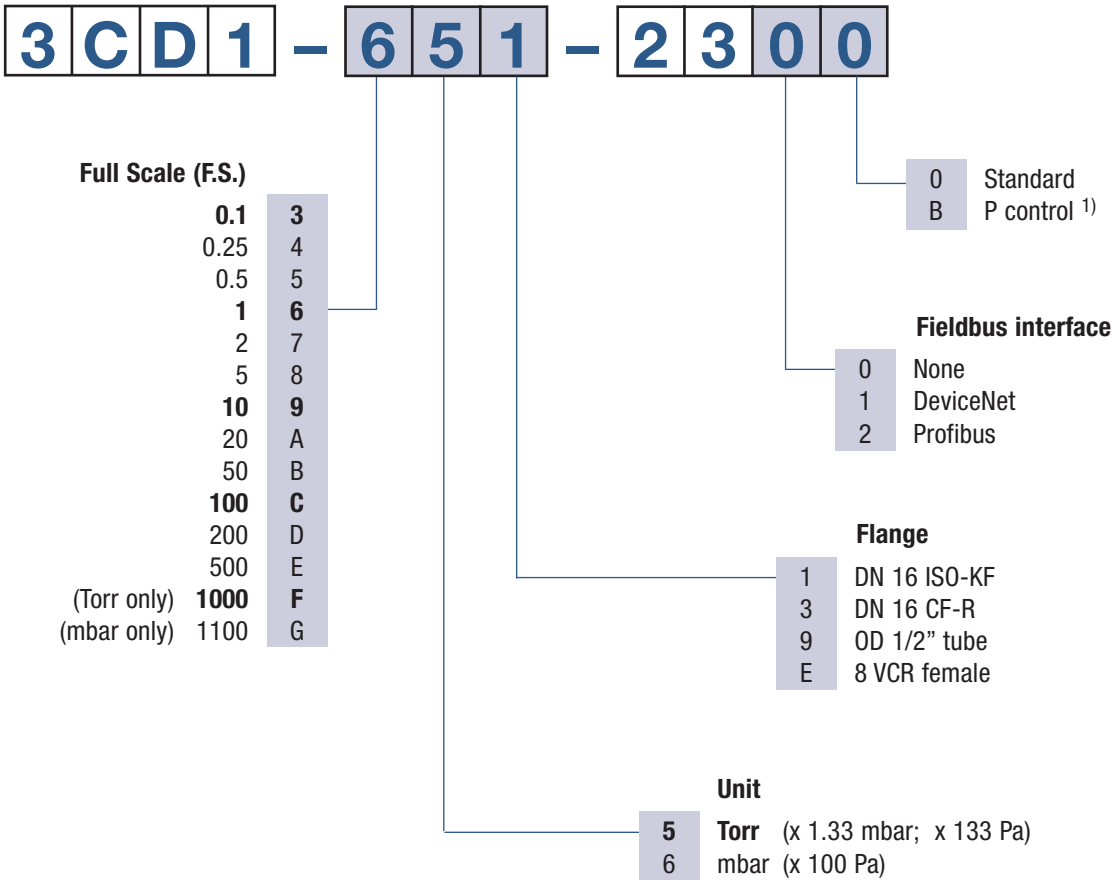
- Lower CoO (cost of ownership), 50% faster warm up, energy efficient low power consumption
- Easy integration, wide variety of full scales, flanges and interfaces, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service and maintenance
- Two year warranty, longer lifetime with advanced heating concept and gauge protection
- No long term recalibration due to excellent signal stability and repeatability, even in harsh plasma applications
- Compliance & standards: CE, EN, UL, SEMI, RoHS

Applications

- Etch, PVD, CVD and other semiconductor production processes
- Chemical and corrosive high temperature processes
- General thin film and vacuum processes requiring gauge protection

CDG100D (continued)

Ordering Information



1) Optimised siganl filter setting for pressure control

bold = standard products

Other flange types and full scale ranges (F.S.) on request.

Accessories

	Diagnostic
Communication adapter (2 m) for PC RS232 serial port	**303-333**

Software to run the diagnostic functions on Windows NT, XP can be downloaded from our website.

CDG100D (continued)

Specifications (Torr based standard products)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	1000 133,322 1333	100 13,332 133	10 1,333 13.3	1 133 1.3	0.1 13 0.13
Accuracy[1]	% of reading	0.2				0.4
Temperature effect						
on zero	% F.S./°C	0.0025				0.005
on span	% of reading/°C	0.02				
Pressure, max.	kPa (absolute)	400	260			130
Resolution	% F.S.	0.003				
Lowest reading	% F.S.	0.01				
Lowest suggested reading	% F.S.	0.05				
Lowest suggested control pressure	% F.S.	0.5				
Temperature						
Operation (ambient)	°C	+10 ... +50				
Bakeout at flange	°C	≤110				
Storage	°C	–40 ... +65				
Supply voltage		+14 ... +30 VDC or ±15 V (±5%)				
Power consumption						
During Heat up	W	≤15				
At operating temperature	W	≤10				
Output signal (analog)	VDC	0 ... +10				
Response time [2]	ms	30				130 / 30 [3]
Degree of protection		IP 40				
Standards		EN 61000-6-3, EN 61010, UL 61010-1, CSA 22.2 No.61010-1, SEMI S-2				
Electrical connection		D-sub, 15 pole, male				
Setpoint		two setpoints (SP1, SP2)				
Relay contact	VDC / ADC	≤30 / ≤0.5				
Hysteresis	% F.S.	1				
Diagnostic port						
Protocol		RS232-C				
Read		pressure, status, ID,				
Set		set points, filter, zero adjust, factory reset, DC offset				
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L[4])				

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
2) Increase 10 …
3) For pressure control type only
4) 18% Cr, 10% Ni, 3% Mo, 69% Fe

CDG100D (continued)

Specifications (Torr based other ranges)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	500 66,661 666.61	200 26,664 267	50 6,666.1 66.67	20 2,666 26.7	5 666.61 6.6661	2 266.66 2.67	0.5 66.66 0.67	0.25 33.3 0.33
Accuracy [1]	% of reading	0.2						0.4	
Temperature effect									
on zero	% F.S./°C	0.0025						0.005	
on span	% of reading/°C	0.02							
Pressure, max.	kPa (absolute)	400	260					130	
Response time [2]	ms	30							130

[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
[2] Increase 10 … 90% F.S.

Further specifications see table above.

Specifications (mbar based products)

Measurement Range F.S. (Full Scale)	mbar Pa	1100 110,000	100 10,000	10 1,000	1 100	0.1 10
Accuracy [1]	% of reading	0.2				0.4
Temperature effect						
on zero	% F.S./°C	0.0025				0.005
on span	% of reading/°C	0.02				
Pressure, max.	kPa (absolute)	400	260			130
Response time [2]	ms	30				130 / 30 [3]

[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
[2] Increase 10 … 90% F.S. [3] For pressure control type only

Further specifications see table «SPECIFICATIONS (Torr based standard products)».

CDG100D (continued)

Specifications (DeviceNet™)

		CDG100D DeviceNet™
Protocol		DeviceNet™, group 2 slave only
Data rate	kBaud	125, 250, 500 by switch or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		address 00 - 63 by switch or network programmable
Digital functions	read	pressure, status, ID
	set	set points, filter, zero adjust, factory reset, DC offset
Specification		DeviceNet™ "Vacuum Gauge Device Profile" (ODVA)
Device type		"VG" vacuum gauge
I / O slave messaging		polling only
Supply voltage for gauge at D-sub connector		+14 … +30 VDC or ±15 V / ≤12 W
Supply voltage for DeviceNet transceiver at microstyle connector		24 V nom / <2 W (11 … 25 V)
Connector for DeviceNet™		microstyle, 5 pin, male
Connector for CDG (analog output, supply voltage CDG, setpoints)		D-sub, 15 pin, male

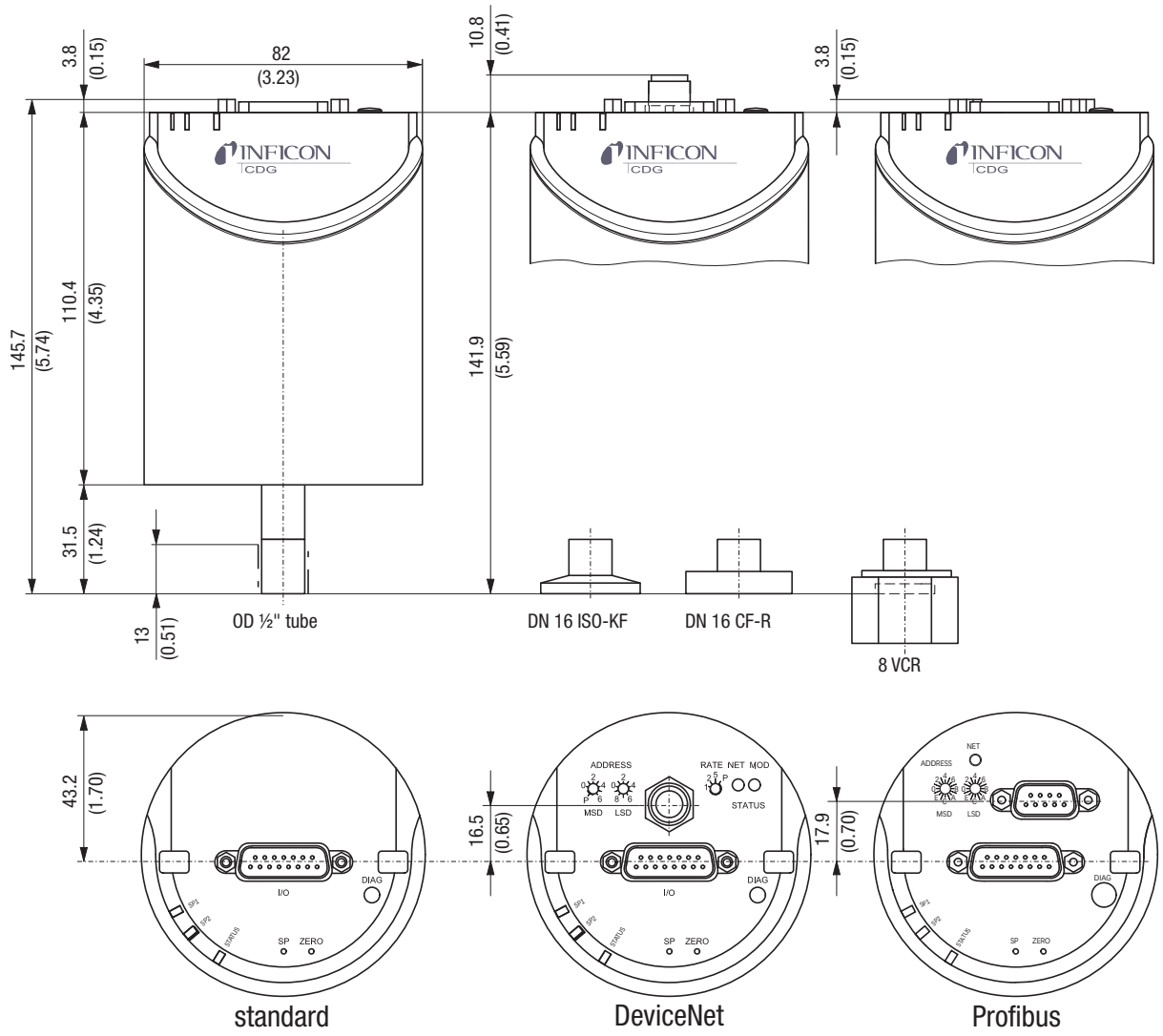
Specifications (Profibus DP)

		CDG100D Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		address 00 - 125 by switch or network programmable
Digital functions	read	pressure, status, ID
	set	set points, filter, zero adjust, factory reset, DC offset
Connector for Profibus DP		D-sub, 9 pin, female
Connector for CDG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

CDG100D (continued)

Dimensions

mm (inch)



		1/2" tube	DN 16 ISO KF	DN 16 CF-R	8 VCR®
Internal volume	cm³ (inch³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight	g	837	852	875	897

SKY® Capacitance Diaphragm Gauges

CDG160D, CDG200D

INFICON SKY CDG160D and CDG200D high temperature manometers are your best choice for accurate total pressure measurement and control. CDG160D and CDG200D gauges are temperature controlled at 160°C respectivly 200°C for superior performance in demanding semiconductor and plasma processes. They are available for full scale ranges from 1 Torr to 1000 Torr, with all common flange types and fieldbus interfaces and provide a linear 0 to 10V, gas type independent, pressure signal. INFICON capacitance manometers use an ultra pure alumina ceramic diaphragm which is corrosion proof. The advantages of the ceramic sensor are better signal stability, faster recovery from atmosphere, short warm up time and an extraordinary lifetime. INFICON CDG are high quality, cost effective pressure sensors for demanding semiconductor, plasma and vacuum applications.

New!
200°C sensor

Advantages

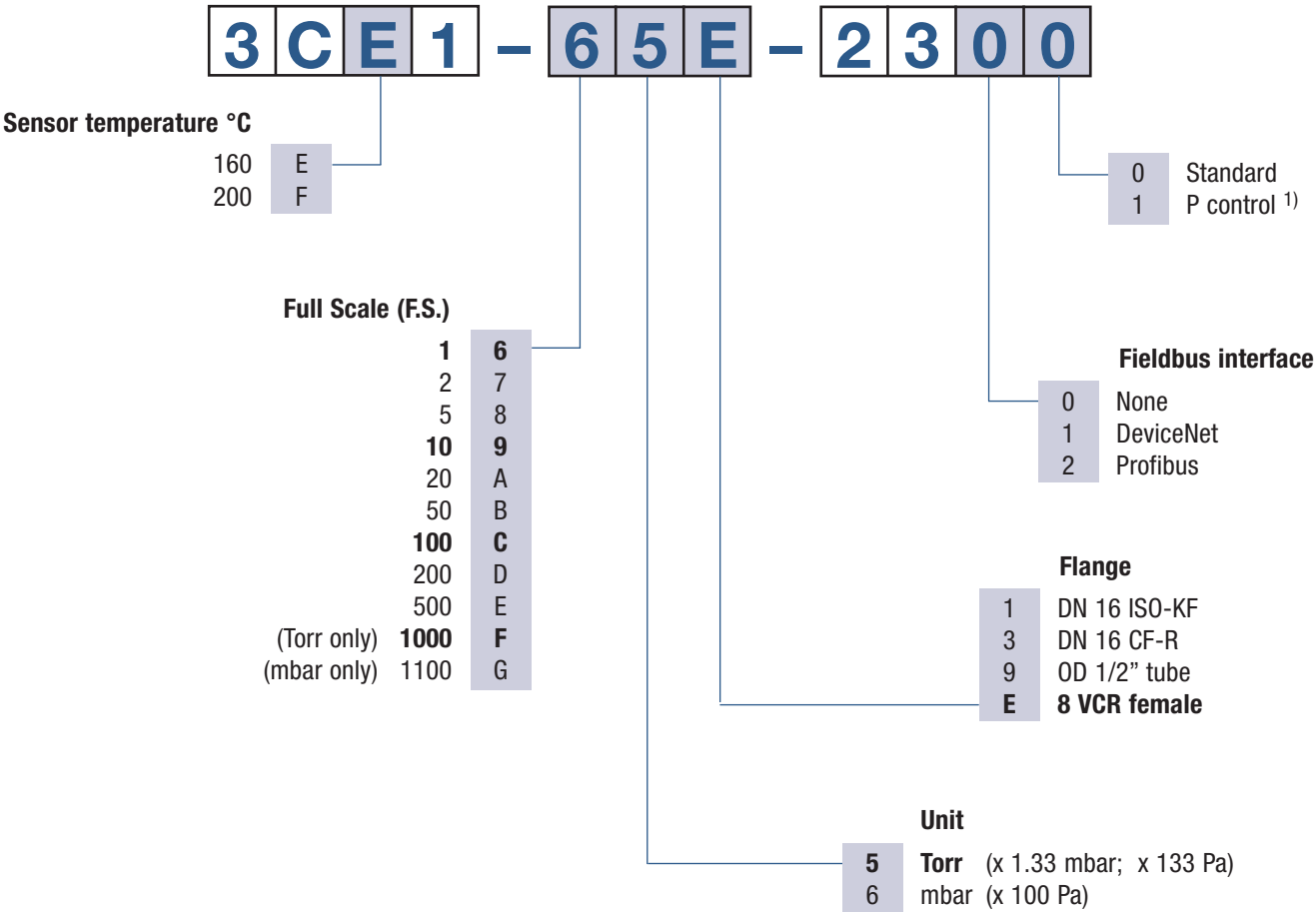
- Lower CoO (cost of ownership), 50% faster warm up, energy efficient low power consumption
- Easy integration, wide variety of full scales, flanges and interfaces, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service and maintenance
- Two year warranty, longer lifetime with HT heating concept and gauge protection
- No long term recalibration due to excellent signal stability and repeatability, even in harsh plasma applications
- Compliance & standards: CE, EN, UL, SEMI, RoHS

Applications

- Etch, PVD, CVD, LPCVD and other semiconductor production processes
- Chemical and corrosive high temperature processes
- General thin film and vacuum processes requiring gauge protection

CDG160D, CDG200D (continued)

Ordering Information



1) Optimised siganl filter setting for pressure control

bold = standard products

Other flange types and full scale ranges (F.S.) on request.

Accessories

	Diagnostic
Communication adapter (2 m) for PC RS232 serial port	**303-333**

Software to run the diagnostic functions on Windows NT, XP can be downloaded from our website.

CDG160D, CDG200D (continued)

Specifications (Torr based standard products)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	1000 133,322 1333	100 13,332 133	10 1,333 13.3	1 133 1.3
Accuracy[1]	% of reading	0.4			
Temperature effect					
on zero	% F.S./°C	0.005			
on span	% of reading/°C	0.02			
Pressure, max.	kPa (absolute)	400	260		
Resolution	% F.S.	0.003			
Lowest reading	% F.S.	0.01			
Lowest suggested reading	% F.S.	0.05			
Lowest suggested control pressure	% F.S.	0.5			
Temperature					
Operation (ambient)	°C	+10 ... +50			
Bakeout at flange	°C	≤200			
Storage	°C	–40 ... +65			
Supply voltage		+21 ... +30 VDC or ±15 V (±5%)			
Power consumption during heat up					
CDG160D	W	≤18			
CDG200D	W	≤25			
Power consumption at operating temperature					
CDG160D	W	≤12			
CDG200D	W	≤18			
Output signal (analog)	VDC	0 ... +10			
Response time [2]	ms	30			
Degree of protection		IP 40			
Standards		EN 61000-6-3, EN 61010, UL 61010-1, CSA 22.2 No.61010-1, SEMI S-2			
Electrical connection		D-sub, 15 pole, male			
Setpoint		two setpoints (SP1, SP2)			
Relay contact	VDC / ADC	≤30 / ≤0.5			
Hysteresis	% F.S.	1			
Diagnostic port					
Protocol		RS232-C			
Read		pressure, status, ID,			
Set		set points, filter, zero adjust, factory reset, DC offset			
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L[3])			

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.
2) Increase 10 … 90% F.S.
3) 18% Cr, 10% Ni, 3% Mo, 69% Fe

CDG160D, CDG200D (continued)

Specifications (Torr based other ranges)

Measurement Range F.S. (Full Scale)	Torr Pa mbar	500 66,661 666.61	200 26,664 267	50 6,666.1 66.67	20 2,666 26.7	5 666.61 6.6661	2 266.66 2.67
Accuracy [1]	% of reading	0.4					
Temperature effect							
on zero	% F.S./°C	0.005					
on span	% of reading/°C	0.02					
Pressure, max.	kPa (absolute)	400	260				
Resolution	% F.S.	0.003					

[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

Further specifications see table above.

Specifications (mbar based products)

Measurement Range F.S. (Full Scale)	mbar Pa	1100 110,000	100 10,000	10 1,000	1 100
Accuracy [1]	% of reading	0.4			
Temperature effect					
on zero	% F.S./°C	0.005			
on span	% of reading/°C	0.02			
Pressure, max.	kPa (absolute)	400	260		
Resolution	% F.S.	0.003			

[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

Further specifications see table «SPECIFICATIONS (Torr based standard products)».

Specifications (DeviceNet™)

		CDG160D, CDG200D DeviceNet™
Protocol		DeviceNet™, group 2 slave only
Data rate	kBaud	125, 250, 500 by switch or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		address 00 - 63 by switch or network programmable
Digital functions	read	pressure, status, ID
	set	set points, filter, zero adjust, factory reset, DC offset
Specification		DeviceNet™ "Vacuum Gauge Device Profile" (ODVA)
Device type		"VG" vacuum gauge
I / O slave messaging		polling only
Supply voltage for gauge at D-sub connector		+14 … +30 VDC or ±15 V / ≤12 W
Supply voltage for DeviceNet transceiver at microstyle connector		24 V nom / <2 W (11 … 25 V)
Connector for DeviceNet™		microstyle, 5 pin, male
Connector for CDG (analog output, supply voltage CDG, setpoints)		D-sub, 15 pin, male

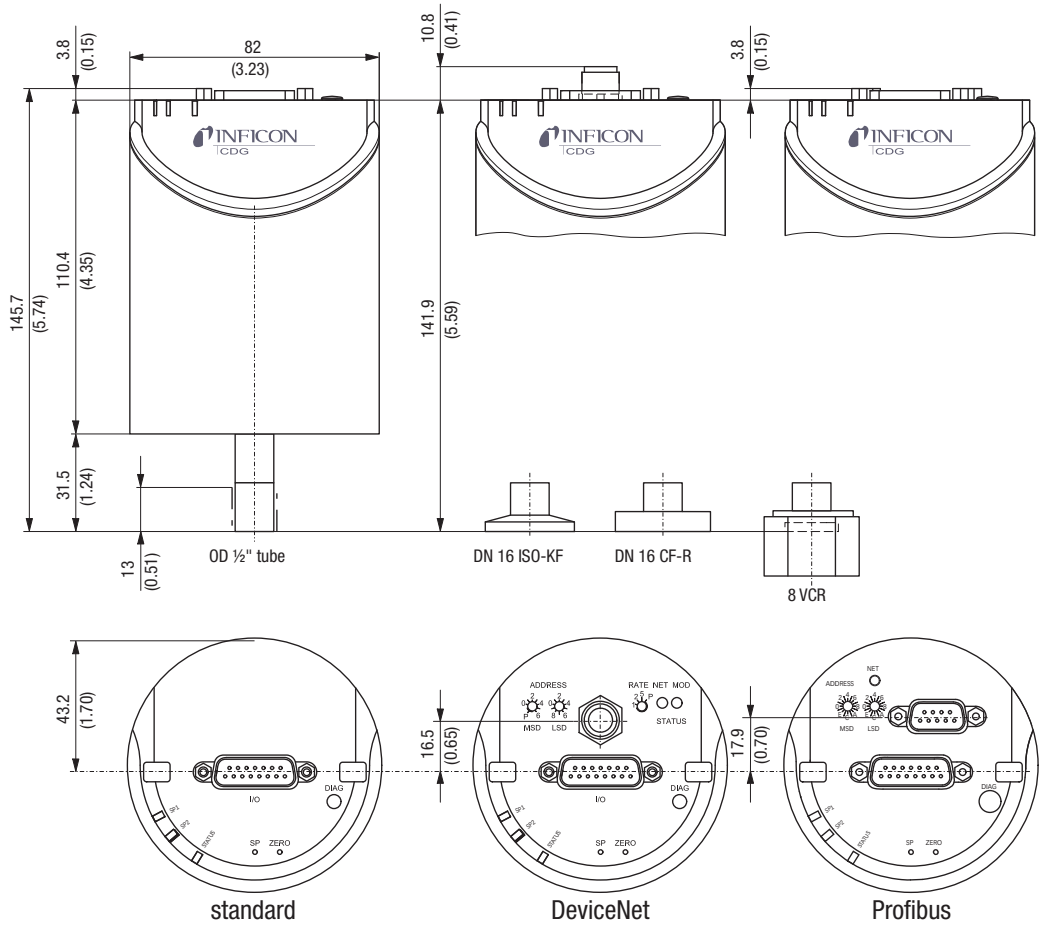
CDG160D, CDG200D (continued)

Specifications (Profibus DP)

		CDG160D, CDG200D Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		address 00 - 125 by switch or network programmable
Digital functions	read	pressure, status, ID
	set	set points, filter, zero adjust, factory reset, DC offset
Connector for Profibus DP		D-sub, 9 pin, female
Connector for CDG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

Dimensions, Internal Volume, Weight

mm (inch)



		1/2" tube	DN 16 ISO KF	DN 16 CF-R	8 VCR®
Internal volume	cm³ (inch³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight	g	837	852	875	897

SKY® Capacitance Diaphragm Gauges

AllCeramic™ CDG025–C

All vacuum exposed surfaces of the Sky AllCeramic CDG are constructed of ultra-pure aluminum oxide ceramic, replacing the stainless steel tubing of our traditional CDG. This product is preferred in applications where metal contamination must be avoided.

Advantages

- No metal contamination
- Marginal zero drift
- Virtually corrosion proof – long sensor life results in reduced downtime thus reducing cost of ownership
- Superior accuracy and repeatability over long period of operation
- Better long term and temperature stability
- Less sensitive to frequent pressure cycles to atmosphere, may eliminate isolation valve (depending on operation mode)
- Less susceptible to particles and process by-products due to protection shield (Suprashield)

Applications

- Etch, CVD and PVD processes
- Doping silicon using implantation or diffusion processes
- Oxidation
- Creation of gate oxide layer in the range of 100 Å
- Creation of barrier layers (Ti, TiN, Ta and TaN as a protection layer between Silicon and Aluminum or Copper)

Ordering Information

		Full scale (Pa[1])				
Type	**Flange**	**133322**	**13332.2**	**1333.22**	**133.322**	**ATM±13332.2 [2]**
CDG025-C	1/2" tube	**371-250**	**371-251**	**371-252**	**371-253**	**371-200**

[1] Other pressure units on request
[2] Pressure difference between atmospheric and gauge pressure

AllCeramic CDG025–C (continued)

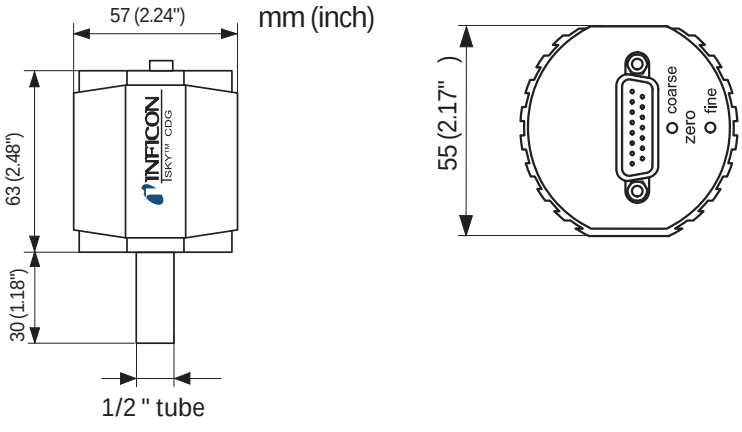
Specifications

Measurement Range F.S. (full scale)	Pa	133322	13332.2	1333.22	133.322	ATM±13332.2
Lowest suggested control pressure	Pa	6.66 x 10^{+2}	6.66 x 10^{+1}	6.66 x 10^{+0}	6.66 x 10^{-1}	–
Lowest suggested reading	Pa	6.66 x 10^{+1}	6.66 x 10^{+0}	6.66 x 10^{-1}	6.66 x 10^{-2}	–
Lowest reading	Pa	1.33 x 10^{+1}	1.33 x 10^{+0}	1.33 x 10^{-1}	1.33 x 10^{-2}	–
Accuracy[1]	% of reading	0.2	0.2	0.2	0.2	0.2
Temperature effect						
on zero	% F.S./°C	0.005	0.005	0.005	0.015	0.05
on span	% of reading/°C	0.01	0.01	0.01	0.01	0.04
Resolution	% F.S.	0.0015	0.0015	0.0015	0.0025	0.01
Temperature						
Operation (ambient)	°C	+5 ... +50	+5 ... +50	+5 ... +50	+5 ... +50	+5 ... +50
At flange	°C	≤110	≤110	≤110	≤110	≤110
Storage	°C	–40 ... +65	–40 ... +65	–40 ... +65	–40 ... +65	–40 ... +65
Pressure max. (absolute)	kPa	400	267	267	267	267
Power supply						
Voltage 1 or	VDC	±15 ±5%	±15 ±5%	±15 ±5%	±15 ±5%	±15 ±5%
Voltage 2	VDC	+18 ... +26.4	+18 ... +26.4	+18 ... +26.4	+18 ... +26.4	+18 ... +26.4
Power consumption[2]	W	≤1.6	≤1.6	≤1.6	≤1.6	≤1.6
Output signal (analog)						
Measuring range	V	0 ... +10	0 ... +10	0 ... +10	0 ... +10	+5±5
Voltage range	V	–11 ... +11	–11 ... +11	–11 ... +11	–11 ... +11	–11 ... +11
Relation voltage vs. pressure		linear	linear	linear	linear	linear
Response time	ms	30	30	30	100	30
Internal volume	cm^3 ($inch^3$)	4.5 (0.275)	4.5 (0.275)	4.5 (0.275)	4.5 (0.275)	4.5 (0.275)
Weight	g	250	250	250	250	250
Protective type		IP 30	IP 30	IP 30	IP 30	IP 30
Electrical connection		D-sub, 15 pole, male	D-sub, 15 pole, male	D-sub, 15 pole, male	D-sub, 15 pole, male	D-sub, 15 pole, male
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), sealing glass				

[1] Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

[2] Typical value at 25°C ambient temperature after reaching operating temperature.

Dimensions



SKY® Capacitance Diaphragm Gauges

AllCeramic™ CDG160A–C / CDG160A–CS

The INFICON SKY AllCeramic CDG160A-C is the only completely metal-free 160°C temperature controlled capacitance diaphragm gauge designed for demanding applications, such as oxidation, diffusion and LPCVD. All surfaces exposed to the vacuum such as tubing, plasma shield and contamination protection shield are composed of corrosion-resistant ultra pure aluminum oxide ceramic, eliminating potential metal contamination from the gauge.

The INFICON SKY AllCeramic CDG160A-C integrates the proven sensor technology of the INFICON CDG160A series of gauges for reliable and repeatable performance in LPCVD and other harsh semiconductor manufacturing applications.

Advantages

- Metal-free ultra pure ceramic design prevents metal contaminations
- Temperature controlled to 160°C prevents condensation of process products and by-products
- Compact design saves valuable space and simplifies tool integration
- High ambient temperature compatibility
- Enhanced particle protection chamber with an additional protection shield (Suprashield) reduces the probability of gauge contamination
- Unique ceramic sensor design provides repeatability and accurate measurements with excellent long-term stability
- Optional set point and status indication provides additional control and safety functions

Applications

- Oxidation, diffusion and LPCVD processes
- Other metal-free vacuum measurement requirements

Ordering Information

			Full scale (Pa[1])			
Type	**Set point**	**Flange**	**133322**	**13332.2**	**1333.22**	**133.322**
CDG160A-C	none	1/2" tube	**371-260**	**371-261**	**371-262**	**371-263**
CDG160A-CS	2	1/2" tube	**371-270**	**371-271**	**371-272**	**371-273**

[1] Other pressure units on request

CDG160A–C / CDG160A–CS (continued)

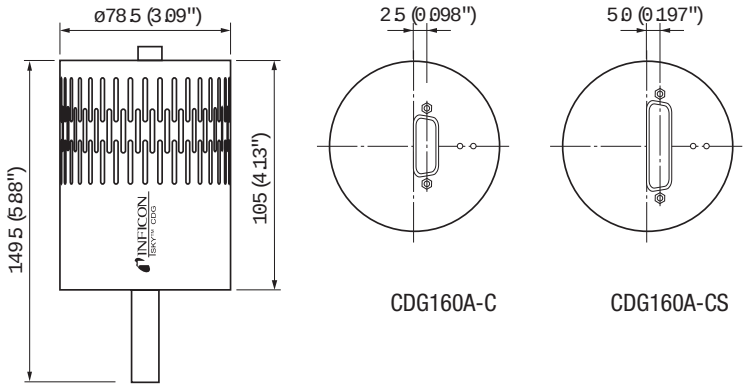
Specifications

Measurement Range F.S. (full scale)	Pa	133322	13332.2	1333.22	133.322
Lowest suggested control pressure	Pa	$6.66 \times 10^{+2}$	$6.66 \times 10^{+1}$	$6.66 \times 10^{+0}$	6.66×10^{-1}
Lowest suggested reading	Pa	$6.66 \times 10^{+1}$	$6.66 \times 10^{+0}$	6.66×10^{-1}	6.66×10^{-2}
Lowest reading	Pa	$1.33 \times 10^{+1}$	$1.33 \times 10^{+0}$	1.33×10^{-1}	1.33×10^{-2}
Accuracy[1)]	% of reading	0.5	0.5	0.5	0.5
Temperature effect					
on zero	% F.S./°C	0.005	0.005	0.005	0.005
on span	% of reading/°C	0.02	0.02	0.02	0.02
Resolution	% F.S.	0.005	0.005	0.005	0.005
Temperature					
Operation (ambient)	°C	+15 ... +55	+15 ... +55	+15 ... +55	+15 ... +55
Bakeout (at flange)	°C	≤160	≤160	≤160	≤160
Storage	°C	–40 ... +65	–40 ... +65	–40 ... +65	–40 ... +65
Pressure max. (absolute)	kPa	400	267	267	267
Power supply	VDC	±15 ±5%	±15 ±5%	±15 ±5%	±15 ±5%
Power consumption					
at operating temperature	W	≤15	≤15	≤15	≤15
during warm up					
CDG160A-C	W	≤24	≤24	≤24	≤24
CDG160A-CS	W	≤27	≤27	≤27	≤27
Output signal (analog)					
Measuring range	V	0 ... +10	0 ... +10	0 ... +10	0 ... +10
Voltage range	V	–11 ... +11	–11 ... +11	–11 ... +11	–11 ... +11
Relation voltage vs. pressure		linear	linear	linear	linear
Response time	ms	50	50	50	50
Protective type		IP 30	IP 30	IP 30	IP 30
Electrical connection					
CDG160A-C		D-sub, 15 pole, male	D-sub, 15 pole, male	D-sub, 15 pole, male	D-sub, 15 pole, male
CDG160A-CS		D-sub, 25 pole, male	D-sub, 25 pole, male	D-sub, 25 pole, male	D-sub, 25 pole, male
Internal volume	cm^3 ($inch^3$)	4.7 (0.286)	4.7 (0.286)	4.7 (0.286)	4.7 (0.286)
Weight					
CDG160A-C	g	460	460	460	460
CDG160A-CS	g	490	490	490	490
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), sealing glass			
CDG160A-CS					
Relay functions		two set points, five status indicators (two setpoints active, temperature sensor ok, temperature ready, overheat) and optical status indicator (power on)			
Relays type of contact		NO / NC change over	NO / NC change over	NO / NC change over	NO / NC change over
Switching voltage max.	VDC / VAC	110 / 125	110 / 125	110 / 125	110 / 125
Switching current	A	1	1	1	1

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after 2 hours operation.

CDG160A–C / CDG160A–CS (continued)

Dimensions



Ceramic tube 1/2"
CDG160A-C and CDG160A-CS

Bayard–Alpert Pirani Gauge

BPG400

The INFICON Bayard-Alpert Pirani Combination Gauge, BPG400, functions as two gauges in a single compact unit measuring from 5 x 10^{-10} mbar to atmosphere (3.8 x 10^{-10} Torr to atmosphere). Combining technologies reduces the complexity of installation, setup, and integration. Choose the BPG400 for affordable and repeatable process to base pressure measurements in one economic package.

ADVANTAGES

- Extremely wide measurement range from 5 x 10^{-10} mbar to atmosphere (3.8 x 10^{-10} Torr to atmosphere)
- Excellent repeatability in the process pressure range from 10^{-8} … 10^{-2} mbar of 5%
- The Pirani interlock protects the Bayard-Alpert system from premature filament burnout and excess contamination from high pressure operation
- Long-life yttrium oxide coated iridum filament
- Optional graphic display and Fieldbus interfaces available
- Automatic high vacuum Pirani adjustment reduces operator interventions

APPLICATIONS

- Pressure measurement in semiconductor process and transfer chambers
- Industrial coating
- General vacuum measurement and control in the low to ultra high vacuum range

Ordering Information

Type	BPG400 without LCD display	BPG400 with LCD display	BPG400-SP with Profibus DP	BPG400-SD with DeviceNet™	BPG400-SR with RS485
DN 25 ISO-KF	**353-500**	**353-501**	**353-505**	**353-507**	**353-509**
DN 40 CF-R	**353-502**	**353-503**	**353-506**	**353-508**	**353-513**
Replacement sensor 25 ISO-KF	**354-490**	**354-490**	**354-490**	**354-490**	**354-490**
Replacement sensor 40 CF-R	**354-491**	**354-491**	**354-491**	**354-491**	**354-491**

ACCESSORIES

Power supply 24 V DC / RS232C line	**353-511**
Bakeout extension, 100 mm (3.94 inch)	**353-510**
Baffle	**353-512**

BPG400 (continued)

Specifications

			BPG400 Standard **BPG400 Display**
Measurement range	(air, O_2, CO, N_2)	mbar (Torr)	5 x 10^{-10} … 1000 (3.8 x 10^{-10} … 750)
Accuracy	10^{-8} … 10^{-2} mbar	% of reading	±15
Repeatability	10^{-8} … 10^{-2} mbar	% of reading	5
Degas [1]	p < 7.2 x 10^{-6}	mbar	electron bombardment, max. 3 min
Pressure, max.		bar (absolute)	2
Temperature			
Operation (ambient)		°C	0 … +50
Storage		°C	-20 … +70
Bakeout			
At flange with extension		°C	150
At flange without extension		°C	80
Electronics removed		°C	150
Supply voltage		V / A DC	20 … 28 / 0.8
Output signal analog		V	0 … +10
Measurement range		V	0.774 … 10
Voltage vs. pressure		V / Decade	0.75
Error signal		V	0.3 / 0.5
Load impedance, min.		kΩ	10
Interface (digital) [2]			RS232C
Electrical connection			D-sub, 15 pin, male
Cable length, max.[3]		m (ft)	100 (330)
Materials exposed to vacuum			Yt_2O_3, Ir, Pt, Mo, Cu, W, NiFe, NiCr, stainless steel, glass
Internal volume KF / CF		cm^3 $(inch)^3$	24 (1.46) / 34 (2.1)
Weight KF / CF		g	285 / 550
Protection type			IP30

[1] Reduced accuracy during degas
[2] Simultaneous use of RS232C or VGC400 series controllers and Fieldbus is not allowed
[3] For RS232C operation <30 m

Specifications

		BPG400-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		2 switches (address 00 - 127) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa degas function, Pirani full scale adjust monitor gauge status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	60 / 0.5
Connector for Profibus DP		D-sub, 9 pin, female
Connector for BPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

BPG400 (continued)

Specifications

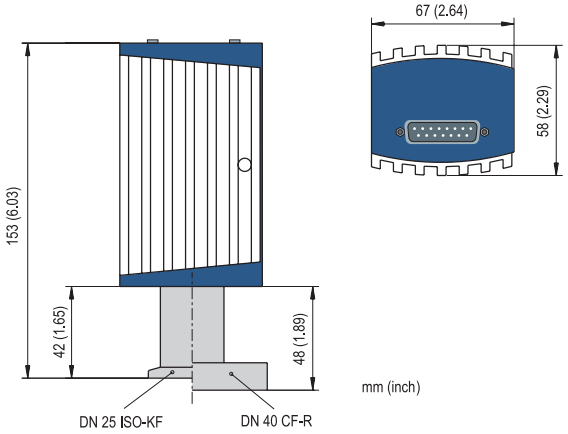
		BPG400-SD DeviceNet™
Protocol		DeviceNet™, group 2 slave only
Data rate switch	kBaud	125, 250, 500 or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		2 switches (address 00 - 63) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa degas function, Pirani full scale adjust monitor gauge status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Specification		DeviceNet™ "Vacuum Gauge Device Profile"
Device type		"CG" for combination gauge
I / O slave messaging		polling only
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	60 / 0.5
Supply voltage for DeviceNet™	V / A DC	11 … 25 / 0.5
Supply voltage for gauge	V / A DC	20 … 28 / 0.8
Connector for DeviceNet™		microstyle, 5 pin
Connector for BPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

Specifications

		BPG400-SR RS485
Baud rates	kBaud	0.3 / 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 28.8
Address		2 switches (address 00 - 127) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa degas function, Pirani full scale adjust monitor gauge status detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	60 / 0.5
Connector for RS485		D-sub, 9 pin, male
Connector for BPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

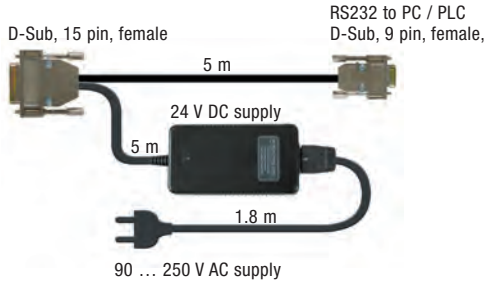
BPG400 (continued)

Dimensions



Accessories

Power supply 24 V DC / RS232C line



Bakeout extension:

Allows measurement at flange temperatures up to 150°C.
Fast and easy installation.

Baffle:

Prevents contamination of the sensor.
Easy installation into the vacuum connection - no tools required.

Bayard–Alpert Pirani Gauge

BPG402–S

The INFICON Bayard-Alpert Pirani Combination Gauge, BPG402-S, functions as two gauges in a single compact unit measuring from 5 x 10^{-10} mbar to atmosphere (3.8 x 10^{-10} Torr to atmosphere). Combining technologies reduces the complexity of installation, setup, and integration. Choose the BPG402-S with dual yttrium oxide coated iridium filaments for affordable and repeatable process to base pressure measurements in one economical package. Sensing elements with on-board calibration data guarantees high reproducibility when exchanging sensors.

Advantages

- Extremely wide measurement range from 5 x 10^{-10} mbar to atmosphere (3.8 x 10^{-10} Torr to atmosphere)
- Excellent repeatability in the process pressure range from 10^{-8} … 10^{-2} mbar of 5%
- Pirani interlock protects the filament from premature burnout
- Dual long-life yttrium oxide coated iridium filament
- Optional graphic display and Fieldbus interfaces available
- Automatic high vacuum Pirani adjustment reduces operator interventions
- Easy to exchange sensing element with on-board calibration data guarantees high reproducibility

Applications

- Pressure measurement in semiconductor process and transfer chambers
- Industrial coating
- General vacuum measurement and control in the low to ultra high vacuum range

Ordering Information

Type	BPG402-S without display	BPG402-S with display	BPG402-SL with long tube without display	BPG402-SP with Profibus DP	BPG402-SD with DeviceNet™
DN 25 ISO-KF	**353-570**	**353-572**	–	**353-574**	**353-576**
DN 40 CF-R	**353-571**	**353-573**	**353-578**	**353-575**	**353-577**
Replacement sensor 25 ISO-KF	**354-494**	**354-494**	–	**354-494**	**354-494**
Replacement sensor 40 CF-R	**354-495**	**354-495**	**354-496**	**354-495**	**354-495**

Accessories

Power supply 24 V DC / RS232C line	**353-511**
Baffle	**353-512**

BPG402-S (continued)

Specifications

			BPG402-S / -SL Standard BPG402-S Display
Measurement range	(air, O_2, CO, N_2)	mbar (Torr)	5 x 10^{-10} … 1000 (3.8 x 10^{-10} … 750)
Accuracy	10^{-8} … 10^{-2} mbar	% of reading	±15
Repeatability	10^{-8} … 10^{-2} mbar	% of reading	5
Degas [1]	p < 7.2 x 10^{-6}	mbar	electron bombardment, max. 3 min
Pressure, max.		bar (absolute)	2
Temperature			
Operation (ambient)		°C	0 … +50
Storage		°C	-20 … +70
Bakeout at flange without electronics			
BPG402-S		°C	80
BPG402-SL		°C	150
Supply voltage		V / A DC	20 … 28 / 0.8
Output signal analog		V	0 … +10
Measurement range		V	0.774 … 10
Voltage vs. pressure		V / Decade	0.75
Error signal		V	0.3 / 0.5
Load impedance, min.		kΩ	10
Set point relay			1
Range		mbar	1 x 10^{-9} … 100
Relay contact			n.o., potential free
Hysteresis		% of reading	10
Contact rating		V / A DC	≤30 / ≤0.5
Digital functions			degas
Interface (digital) [2]			RS232C
Emission control			automatic / manual via interface
Filament			dual Yt_2O_2 coated Ir
Filament status			LED / digital output
Electrical connection			D-sub, 15 pin, male
Cable length, max.[3]		m (ft)	100 (330)
Materials exposed to vacuum			Yt_2O_3, Ir, Pt, Mo, Cu, W, NiFe, NiCr, stainless steel, glass
Internal volume KF / CF		cm^3 $(inch)^3$	24 (1.46) / 34 (2.1)
Weight KF / CF		g	285 / 550
Protection type			IP30

1) Reduced accuracy during degas
2) Simultaneous use of RS232C or VGC400 series controllers and Fieldbus is not allowed
3) For RS232C operation <30 m

BPG402-S (continued)

Specifications

		BPG402-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		2 switches (address 00 - 127) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa emission control, degas function monitor gauge status, filament status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	≤30 / ≤0.5
Connector for Profibus DP		D-sub, 9 pin, female
Connector for BPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

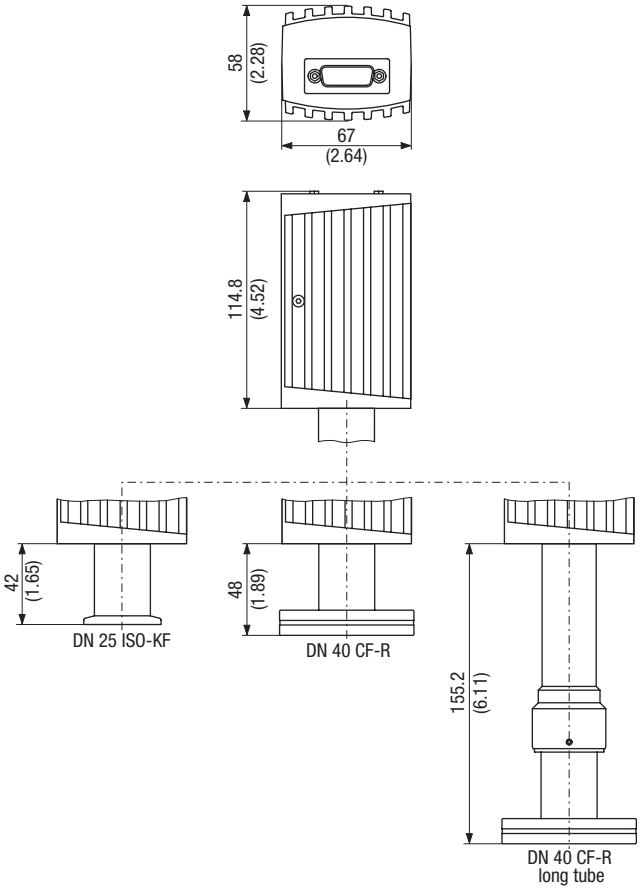
Specifications

		BPG402-SD DeviceNet™
Protocol		DeviceNet, group 2 slave only
Data rate switch	kBaud	125, 250, 500 or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		2 switches (address 00 - 63) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa emission control, degas function monitor gauge status, filament status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Specification		DeviceNet “Vacuum Gauge Device Profile”
Device type		“CG” for combination gauge
I / O slave messaging		polling only
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	≤30 / ≤0.5
Supply voltage for DeviceNet	V / A DC	11 … 25 / <0.2
Supply voltage for gauge	V / A DC	20 … 28 / 0.8
Connector for DeviceNet		microstyle, 5 pin
Connector for BPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

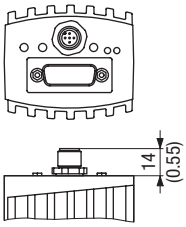
BPG402-S (continued)

Dimensions

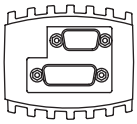
BPG402-S/-SL



BPG402-SD (DeviceNet)

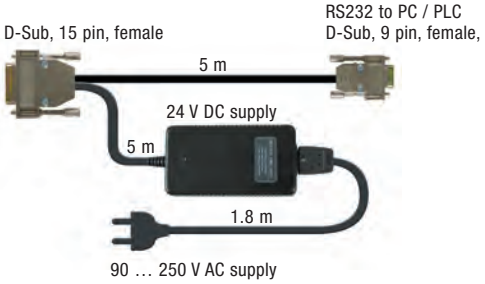


BPG402-SP (Profibus)



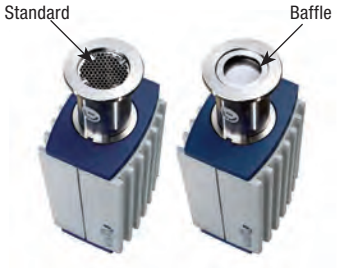
Accessories

Power supply 24 V DC / RS232C line



Baffle:

Prevents contamination of the sensor.
Easy installation into the vacuum connection - no tools required.



High Pressure Hot Ionization Pirani Gauge

HPG400

The INFICON High Pressure Hot Ionization Pirani Gauge, HPG400, combines High Pressure Hot Ionization and Pirani sensors in a single, compact, economical package to measure pressure from 2 x 10^{-6} mbar to atmosphere (1.5 x 10^{-6} Torr to atmosphere). The HPG400 provides highly repeatable and reproducible pressure measurement for accurate sputter process pressure control.

Advantages

- HPG400 saves cost and tool space and reduces the complexity of vacuum system installation and setup
- The high pressure hot ion gauge delivers accurate, reliable pressure measurements from 1 x 10^{-5} … 1 mbar for improved process control
- User selectable hot ion emission activation between 5 x 10^{-2} and 1 mbar
- Pirani interlock protects the hot filament from premature burnout
- Optional graphic display and Fieldbus interfaces available
- Automatic high vacuum Pirani adjustment reduces operator interventions

Applications

- Sputter applications in semiconductor manufacturing, electronics and media industry
- Industrial coating
- General vacuum measurement and control in the low to high vacuum range

Ordering Information

Type	HPG400 without LCD display	HPG400 with LCD display	HPG400-SP with Profibus DP[1)]	HPG400-SD with DeviceNet[1)]
DN 25 ISO-KF	**353-520**	**353-521**	**353-525**	**353-527**
DN 40 CF-F	**353-522**	**353-523**	**353-526**	**353-528**
Replacement sensor 25 ISO-KF	**354-487**	**354-487**	**354-487**	**354-487**
Replacement sensor 40 CF-F	**354-488**	**354-488**	**354-488**	**354-488**

[1)] not available with LCD display

Accessories

Power supply 24 V DC / RS232C line	**353-511**

HPG400 (continued)

Specifications

			HPG400 Standard HPG400 Display
Measurement range	(air, N_2)	mbar (Torr)	2×10^{-6} … 1000 (1.5×10^{-6} … 750)
Accuracy	10^{-5} … 1 mbar	% of reading	±15 [1]
Repeatability	10^{-5} … 10^{-1} mbar	% of reading	2
	10^{-1} … 100 mbar	% of reading	30
Hot ion emission on, selectable		mbar	1
		mbar	5×10^{-1}
		mbar	2×10^{-1}
		mbar	1×10^{-1}
		mbar	5×10^{-2}
Pressure, max.		bar (absolute)	5
Temperature			
Operation (ambient)		°C	0 … +50
Storage		°C	-20 … +70
Bakeout			
At flange		°C	80
Electronics removed		°C	150
Supply voltage		V / A DC	20 … 28 / 0.8
Output signal analog		V	0 … +10.2
Measurement range			
Hot cathode		V	1.5 … 7.5
Pirani		V	8.5 … 9.75
Voltage vs. pressure			
Hot cathode		V / Decade	1
Pirani		V / Decade	0.25
Error signal			
Hot cathode		V	0.3
Pirani		V	0.5
Load impedance , min.		kΩ	10
Interface (digital) [2]			RS232C
Electrical connection			D-sub, 15 pin, male
Cable length, max.[3]		m (ft)	100 (330)
Materials exposed to vacuum			Yt_2O_3, Ir, Pt, Mo, Cu, W, NiFe, NiCr, stainless steel, glass
Internal volume KF / CF		cm^3 $(inch)^3$	20 (1.2) / 30 (1.8)
Weight KF / CF		g	430 / 695
Protection type			IP30

1) Accuracy from 10^{-5} mbar to the selected hot ion emission on value
2) Simultaneous use of RS232C or VGC400 series controllers and Fieldbus is not allowed
3) For RS232C operation <30 m

HPG400 (continued)

Specifications

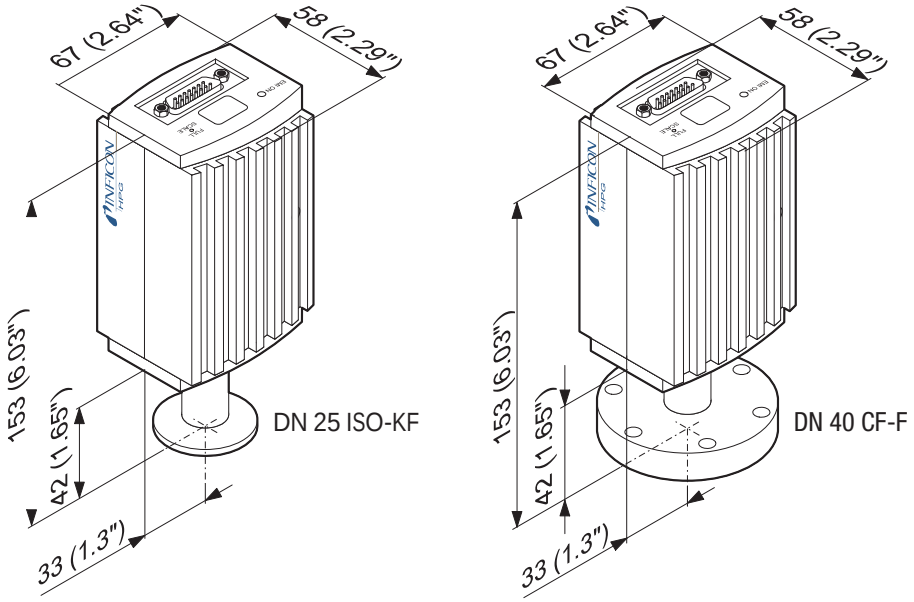
		HPG400-SD DeviceNet™
Protocol		DeviceNet, group 2 slave only
Data rate switch	kBaud	125, 250, 500 or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		2 switches (address 00 - 63) or network programmable
Network size		up to 64 nodes per segment
Digital functions		read pressure, select units: Torr, mbar, Pa Pirani full scale adjust monitor gauge status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Visual communication indicators		LED network status (green / red) LED module status (green / red)
Specification		DeviceNet “Vacuum Gauge Device Profile”
Device type		“CG” for combination gauge
I / O slave messaging		polling only
Setpoint relays		2
Range	mbar	2×10^{-6} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V DC / A	60 / 0.5
Supply voltage for DeviceNet	V DC / A	11 … 25 / 0.5
Supply voltage for gauge	V DC	20 … 28
Connector for DeviceNet		microstyle, 5 pin
Connector for HPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

Specifications

		HPG400-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		2 switches (address 00 - 127) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa Pirani full scale adjust monitor gauge status safe state allows definition of behavior in case of error detailed alarm and warning information
Analog functions		0 … 10 V analog output pressure indication two setpoint relays A + B
Setpoint relays		2
Range	mbar	1×10^{-6} … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V DC / A	60 / 0.5
Connector for Profibus DP		D-sub, 9 pin, female
Connector for HPG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

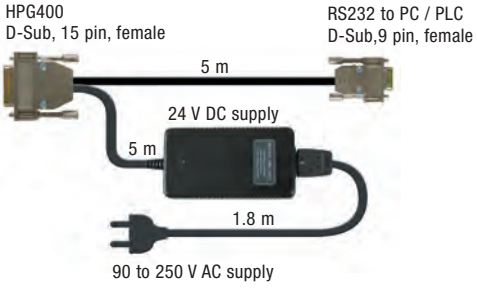
HPG400 (continued)

Dimensions



Accessories

Power supply 24 V DC / RS232C line



Bayard–Alpert Pirani Capacitance Diaphragm Gauge

TripleGauge® BCG450

The INFICON Bayard-Alpert Pirani Capacitance Diaphragm Gauge, BCG450, combines the advantages of three different technologies in a single, compact, economical package to measure process and base pressure from 5 x 10^{-10} to 1500 mbar (3.75 x 10^{-10} to 1125 Torr). The BCG450 is designed to take the place of three sensors (hot ion, convection enhanced Pirani and vacuum switch), thus reducing cost and valuable tool space.

2004 Award Winner

R&D 100

TripleGauge
Bayard-Alpert
Pirani Capacitance
Diaphragm Gauge

Advantages

- BCG450 saves cost and tool space and reduces the complexity of vacuum measurement installation and setup
- Gas-type-independent pressure measurement above 10 Torr provides more reliable loadlock control for any gas-mixture
- Pirani interlock protects the hot filament from premature burnout
- Automatic high vacuum and atmospheric Pirani adjustment reduces operator interventions
- Differential pressure measurement at atmosphere eliminates uncertainty related to atmospheric pressure changes
- Easy-to-exchange sensing element with on-board calibration data guarantees reproducibility
- Optional graphic display and Fieldbus interfaces available

Applications

- Pressure measurement in semiconductor process, transfer and loadlock chambers
- Industrial coating
- General vacuum measurement and control on systems in the low to ultra-high vacuum range

Ordering Information

Type	BCG450 without LCD display	BCG450 with LCD display	BCG450-SP with Profibus DP[2]	BCG450-SD with DeviceNet[2]	BCG450-SR with RS485[1][2]
DN 25 ISO-KF	**353-550**	**353-552**	**353-554**	**353-557**	**353-559**
DN 40 CF-R	**353-551**	**353-553**	**353-556**	**353-558**	**353-560**
Replacement sensor 25 ISO-KF	**354-492**	**354-492**	**354-492**	**354-492**	**354-492**
Replacement sensor 40 CF-R	**354-493**	**354-493**	**354-493**	**354-493**	**354-493**

[1] available on request
[2] not available with LCD display

Accessories

Power supply 24V DC / RS 232 C line	**353-511**
Baffle	**353-512**
Centering ring with baffle	**211-113**

TripleGauge® BCG450 (continued)

Specifications

			BCG450 Standard BCG450 Display
Measurement range		mbar (Torr)	5 x 10^{-10} to 1500 (3.75 x 10^{-10} to 1125)
Accuracy	10^{-8} to 10^{-2} mbar	% of reading	±15
	10^{-2} to 50 mbar	% of reading	±15
	50 to 950 mbar	% of reading	±5
	950 to 1050 mbar	% of reading	±2.5
Repeatability	10^{-8} … 10^{-2} mbar	% of reading	5
Hot ion emission on		mbar	2 x 10^{-2} (high)
(selectable high / low, via RS232 / Fieldbus)		mbar	8 x 10^{-3} (low)
Degas[1] p < 7.2 x 10^{-6}		mbar	Electron bombardment, max. 3 min
Pressure, max.		bar (absolute)	5
Temperature			
Operation (ambient)		°C	0 to +50
Storage		°C	-20 to +70
Bakeout			
At flange		°C	80
Electronics removed		°C	150
Supply		V / A DC	20 to 28 / 0.8
Output signal analog		V	0 to 10.3
Measurement range		V	0.774 to 10.3
Relation voltage / pressure		V / Decade	0.75
Error signal		V	0.3 / 0.5
Minimum load		kΩ	10
Interface (digital)[2]			RS232C
Connector			D-sub, 15 pin, male
Cable length, max.[3]		m (ft)	100 (330)
Materials exposed to vacuum			Yt_2O_3, Ir, Mo, Cu, W, NiFe, NiCr, Al_2O_3, SnAg, stainless steel, glass
Internal volume KF / CF		cm^3 $(inch)^3$	24 (1.46) / 34 (2.1)
Weight KF / CF		g	285 / 550
Protection type			IP30

[1] Reduced accuracy during degas
[2] Simultaneous use of RS232C or VGC400 series controllers and Fieldbus is not allowed
[3] For RS232C operation <30m

TripleGauge® BCG450 (continued)

Specifications

		BCG450-SD DeviceNet™
Protocol		DeviceNet, group 2 slave only
Data rate switch	kBaud	125, 250, 500 or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		2 switches (address 00 - 63) or network programmable
Network size		Up to 64 nodes per segment
Digital functions		Read pressure, select units: Torr, mbar, Pa Degas function Monitor gauge status Safe state allows definition of behavior in case of error Detailed alarm and warning information
Analog functions		0 to 10 V analog output pressure indication Two setpoint relays A + B
Visual communication indicators		LED network status (green / red) LED module status (green / red)
Specification		DeviceNet "Vacuum Gauge Device Profile"
Device type		"CG" for combination gauge
I / O peer to peer messaging		polling only
Configuration consistency value		no
Faulted node recovery		no
Baud rates	kBaud	125 / 250 / 500
Master / Scanner		no
I / O slave messaging		polling only
Setpoint relays		2
Range	mbar	1 x 10^{-9} to 1400
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	60 / 0.5
Connector		D-sub, 15 pin, male
Supply for DeviceNet	V / A DC	11 to 25 / 0.5
Supply for gauge	V DC	20 to 28
Connector for DeviceNet		Microstyle, 5 pin
Connector for BCG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

TripleGauge® BCG450 (continued)

Specifications

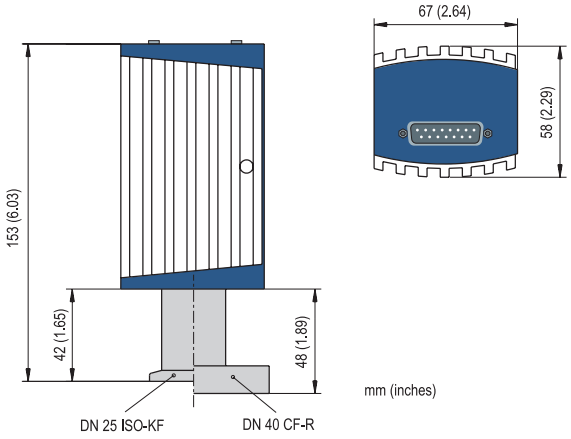
		BCG450-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		2 switches (address 00 - 127) or network programmable
Digital functions		Read pressure, select units: Torr, mbar, Pa
		Degas function
		Monitor gauge status
		Safe state allows definition of behavior in case of error
		Detailed alarm and warning information
Analog functions		0 to 10 V analog output pressure indication
		Two setpoint relays A + B
Setpoint relays		2
Range	mbar	1 x 10^{-9} to 1400
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	60 / 0.5
Connector		
for Profibus DP		D-sub, 9 pin, female
for BCG (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

Specifications

		BCG450-SR RS485
Baud rates	kBaud	0.3 / 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 28.8
Address		2 switches (address 00 - 127) or network programmable
Digital functions		Read pressure, select units: Torr, mbar, Pa
		Degas function, Pirani full scale adjust
		Monitor gauge status
		Detailed alarm and warning information
Analog functions		0 to 10 V analog output pressure indication
		Two adjustable setpoint relays A + B
Setpoint relays		2
Range	mbar	1 x 10^{-9} to 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A DC	60 / 0.5
Connector		
for RS485		D-sub, 9 pin, male
for gauge (analog output, supply voltage, setpoints)		D-sub, 15 pin, male

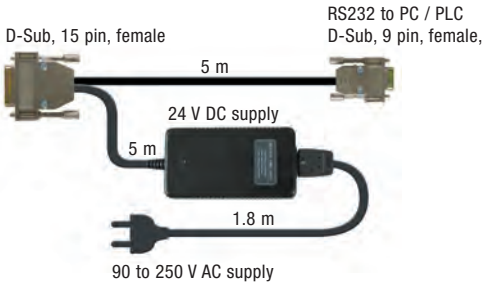
TripleGauge® BCG450 (continued)

Dimensions



Accessories

Power supply 24 V DC / RS 232 C line



Baffle

Prevents contamination of the sensor.
Easy installation into the vacuum connection - no tools required.

Pirani Standard Gauge

PSG100–S, PSG101–S

The INFICON Pirani Standard Gauges PSG100-S and PSG101-S are especially designed or easy integration into vacuum systems using Profibus DP or DeviceNet™ fieldbus protocols. The gauges are equipped with a setpoint and for corrosive applications, a platinum filament version is available.

Advantages

- Fieldbus interface (Profibus DB, DeviceNet™) for easy integration into vacuum systems using network communications
- For corrosive applications or high levels of water vapors the PSG101-S uses a platinum filament and a Al_2O_3 ceramic feedthrough
- Setpoint with adjustable threshold over a wide range
- Mounts in any orientation
- Logarithmic analog output signal
- Sensor cell is easily replaced

Applications

- Processes with corrosive gases (PSG101-S)
- Fore vacuum pressure monitoring
- Control of high vacuum ionization gauges
- Safety circuits in vacuum systems
- General vacuum measurement and control in the fine and rough vacuum range

Ordering Information

Type	PSG100-S DN 16 ISO-KF, Tungsten	PSG101-S DN 16 ISO-KF, Platinum
With setpoint	**350-020**	**350-030**
With DeviceNet™ (PSG100-SD, PSG101-SD)	**350-021**	**350-031**
With Profibus DP (PSG100-SP, PSG101-SP)	**350-022**	**350-032**
Replacement sensor (DN16 ISO KF)	**350-980**	**350-981**

PSG100–S, PSG101–S (continued)

Specifications

		PSG100-S Tungsten	PSG101-S Platinum
Measurement range (air, O_2, CO, N_2)	mbar	5×10^{-4} … 1000	
	Torr	3.8×10^{-4} … 750	
Filament material		tungsten	platinum
Mounting orientation		any	
Feldbus protocol		DeviceNet™ or Profibus DP	
Setpoint		1	
Range	mbar	1×10^{-3} … 500	
Relay contact		n.o. / potential free	
Hysteresis		≈30% of adjusted pressure	
Contact rating	VDC / A	60 / 0.5	
Relay status		LED, green	
Pressure, max. (absolute)	bar	3	10 [1]
Temperature			
Operation (ambient)	°C	+10 … +50	
Storage	°C	-20 … +70	
Bakeout at flange	°C	80	
Power supply			
Voltage	V DC	14.5 … 36	
Consumption, max.	W	<2	
Output signal analog	V	0 … 10.6	
Measurement range	V	0.66 … 10	
Relation voltage / pressure	V / Decade	1.333	
Connector		FCC 68, female, 8 pin (shielded)	
Cable length, max. (analog)	m (ft)	100 (330)	
Materials exposed to vacuum		tungsten, Al, nickel-plated steel, stainless steel, NiFe, glass, CrNi8020, epoxy cement	platinum, stainless steel, CrNi, Al_2O_3 ceramics, NiFe, Mo, Ni
Flange		DN 16 ISO-KF	
Internal volume DN 16 ISO-KF	cm^3 $(inch)^3$	11 (0.67)	
Weight, approx. DN 16 ISO-KF	g	290	
Protection type		IP40	

[1] Threaded connections only

Specifications

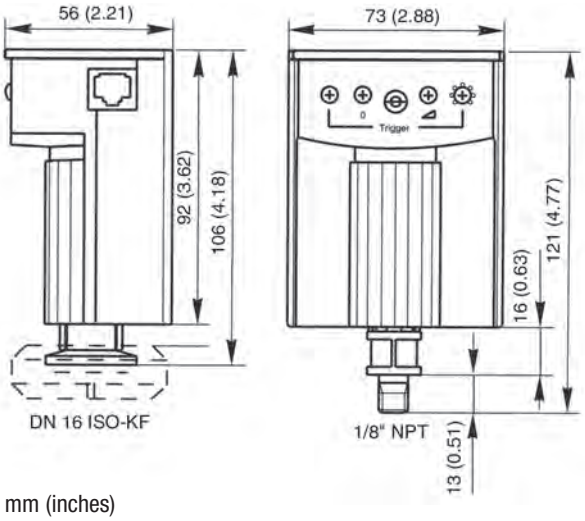
		PSG100-SP Profibus DP, PSG101-SP Profibus DP
Supported baud rates (for auto detection)	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500 / 1500
Expanded user parameter data	Bytes	5
Configuring		
Number of input and output data		2
Sync-Mode and Freeze-Mode		Yes
Connector		D sub, 9 pin

PSG100–S, PSG101–S (continued)

Specifications

		PSG100-SD DeviceNet™, PSG101-SD DeviceNet
Device type		generic
Explicit peer to peer messaging		no
I / O peer to peer messaging		no
Configuration consistency value		no
Faulted node recovery		no
Baud rates	kBaud	125 / 250 / 500
Master / Scanner		no
I / O slave messaging		
Bit Strobe		yes
Polling		yes
Cyclic		yes
Change of State (COS)		yes
Supply for DeviceNet	V DC	11 to 25
Connector for DeviceNet		Phoenix Combicon, 5 pin

Dimensions



mm (inches)

Pirani Standard Gauge

PSG500/–S, PSG502–S, PSG510–S, PSG512–S

The INFICON Pirani Standard Gauges, PSG500, PSG502-S, PSG510-S and PSG512-S, employ the most advanced digital Pirani technology available in the marketplace. The rugged stainless steel sensor cell and compact design qualify them for use on semiconductor systems and for standard applications, such as fore vacuum lines.

Advantages

- Easy push button ATM and HV adjustment
- Space saving rugged design
- Aluminum housing
- Mounts in any orientation
- Stainless steel measuring cell with metal-sealed feedthrough
- Logarithmic signal output for easy integration
- 10 bar absolute overpressure with threaded connections
- 250°C bakeable version
- Nickel filament option for corrosive applications
- Ceramic feedthrough for extremely corrosive applications (PSG510 & PSG512)
- Optional setpoints
- RoHS compliance

Applications

- Controlling high vacuum ionization gauges
- Fore vacuum pressure monitoring
- Safety circuits in vacuum systems
- General vacuum measurement and control in the fine and rough vacuum range

PSG500/–S, PSG502–S, PSG510–S, PSG512–S (continued)

Ordering Information

Type Setpoints Filament	PSG500 none tungsten	PSG500-S two setpoints tungsten	PSG502-S two setpoints nickel	PSG510-S two setpoints tungsten	PSG512-S two setpoints nickel
DN 16 ISO-KF	**350-060**	**350-080**	**350-140**	**350-200**	**350-300**
DN 16 CF-R	**350-062**	**350-082**	**350-142**		
1/8" NPT	**350-061**	**350-081**	**350-141**		
8 VCR®	**350-064**	**350-084**	**350-144**		
4 VCR®	**350-065**	**350-085**	**350-145**		
1/2" tube	**350-063**	**350-083**	**350-143**		
7/16-20 UNF	**350-066**	**350-086**	**350-146**		
DN 16 ISO-KF long tube	**350-067**	**350-087**	**350-147**		
DN 16 CF-R long tube	**350-068**	**350-088**	**350-148**		

Replacement sensor Filament	tungsten	nickel	tungsten	nickel
DN 16 ISO-KF	**350-920**	**350-900**	**350-930**	**350-940**
DN 16 CF-R	**350-922**	**350-902**		
1/8" NPT	**350-921**	**350-901**		
8 VCR®	**350-924**	**350-904**		
4 VCR®	**350-926**	**350-906**		
1/2" tube	**350-923**	**350-903**		
7/16-20 UNF	**350-925**	**350-905**		
DN 16 ISO-KF long tube	**350-927**	**350-907**		
DN 16 CF-R long tube	**350-928**	**350-908**		

PSG500/–S, PSG502–S, PSG510–S, PSG512–S (continued)

Specifications

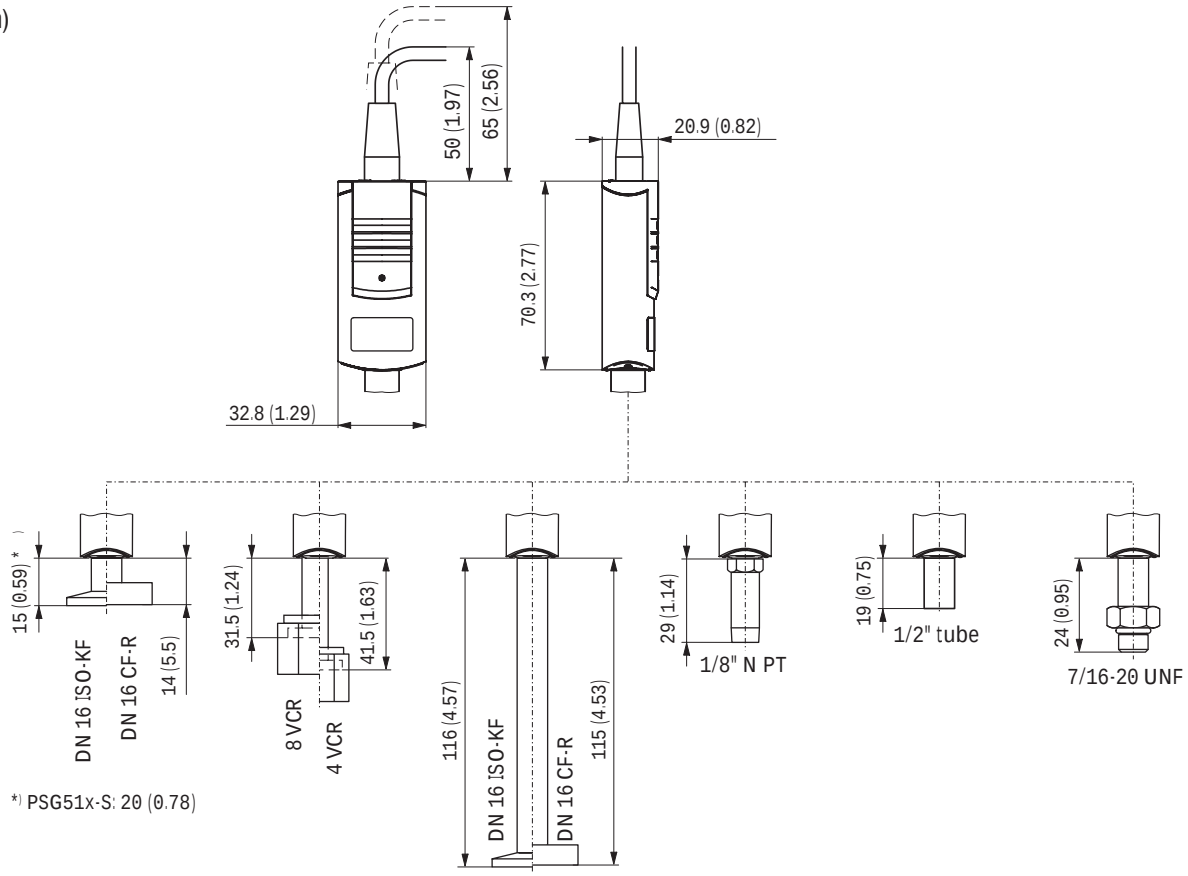
Type			PSG500	PSG500-S	PSG502-S	PSG510-S	PSG512-S
Filament			tungsten	tungsten	nickel	tungsten	nickel
Measuring principle			thermal conductance according to Pirani				
Measurement range (air, O_2, CO, N_2)		mbar	5×10^{-4} to 1000				
Accuracy (N_2)	1×10^{-3} … 100 mbar	% of reading	±15%				
	5×10^{-4} … 1×10^{-3} mbar	% of reading	±50%				
	100 … 1000 mbar	% of reading	±50%				
Resolution		% of reading	1%				
Repeatability (air)	1×10^{-3} … 100 mbar	% of reading	2%				
Output signal (measurement signal)							
Voltage range		V	0 … +10.3				
Measurement range		V	+1.9 … +10.0				
Voltage vs. pressure			logarithmic 1.286 V/decade				
Error signal		V	0 … +0.5 (filament rupture)				
Output impedance		Ω	2 x 4.7				
Mimimum loaded impedance		kΩ	10, short-circuit proof				
Response time		ms	80				
Gauge identification		kΩ	27.0, referenced to supply common				
Adjustment			one tactile switch for ATM and HV adjustment				
Setpoint			none	2			
Setting range		mbar		2×10^{-3} … 500			
Hysteresis		% of reading		10% above lower threshold			
Relay contact		V DC / A DC		30 / 0.5 floating			
Switching time		ms		<20			
Supply voltage							
At gauge		V DC	+14 … +30				
Ripple		V_{pp}	≤1				
Current consumption		mA	<500 (max. starting current)				
Power consumption		W	≤1				
Electrical connection			FCC 68 / RJ45 appliance connector, 8 poles, male				
Sensor cable			8 poles plus shielding				
Cable length		m	≤100 (8 x 0.14 mm²)				
Materials exposed to vacuum			glass, Ni, NiFe DIN 1.4301/1.4305/1.4435			Al_2O_3, Ni, DIN 1.3981/1.4305/1.4435	
Filament			W	W	Ni	W	Ni
Internal volume							
DN 16 ISO-KF, DN 16 CF-R, 7/16-20 UNF		cm^3	1.5				
DN 16 ISO-KF & DN 16 CF-R long tube		cm^3	10				
1/8" NPT, 4 VCR, 8 VCR, 1/2" tube		cm^3	2				
Admissible pressure		bar (absolute)	10, limited to inert gases				
Admissible temperature							
Operation		°C	+5 … +60				
Vacuum connection [1]		°C	80 / 250 [2]				
Storage		°C	-20 … +65				
Mounting orientation			any				
Degree of protection			IP40				
Weight							
DN 16 ISO-KF, 7/16-20 UNF		g	80				
DN 16 CF-R, 4 VCR		g	100				
1/8" NPT, 1/2" tube		g	70				
8 VCR, DN 16 ISO-KF long tube		g	130				
DN 16 CF-R long tube		g	140				

[1] In horizontal mounting orientation
[2] Long tube

PSG500/–S, PSG502–S, PSG510–S, PSG512–S (continued)

Dimensions

mm (inch)



Pirani Capacitance Diaphragm Gauge

PCG400, PCG410

The INFICON PCG Pirani Capacitance Diaphragm Gauge is the first vacuum gauge to combine the advantages of a ceramic capacitance diaphragm gauge and the cost effectiveness of a Pirani in one compact package. In the measurement range between 100 mbar (75 Torr) and atmosphere, where Pirani sensors lose sensitivity, the capacitance diaphragm technology supplies accurate, gas-type and flow independent measurement values up to 1500 mbar (1125 Torr). Available with up to two integrated relays, the PCG can eliminate the need for 1/2 atm or other expensive switches. To simplify tool integration, the Pirani and CDG signals are combined into a single log/linear analog output spanning the full range of the gauge.

Advantages

- Gas-type-independent above 100 mbar (75 Torr) **-** enables safe venting with any gas mixture
- Higher accuracy and reproducibility at atmosphere **-** for reliable detection of atmospheric pressure, no frequent readjustment at atmospheric pressure anymore
- Independence of mounting position **-** provides engineering freedom in tool design
- Faster atmosphere detection **-** eliminates waiting time and thus shortens process cycle time
- Compact design **-** saves valuable space on the tool
- One log/linear output signal over the entire range **-** for easy tool integration

Applications

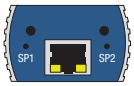
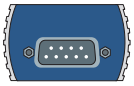
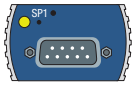
- Loadlock control
- Forevacuum pressure monitoring
- Safety circuits in vacuum systemss
- General measurement and control in the medium and rough vacuum range
- Control of high vacuum ionization gauges

Ordering Information

Type **Setpoint** **Connector**	**PCG400** **none** **FCC 68**	**PCG400-S** **with 2 setpoints** **FCC 68**	**PCG410** **none** **9 D-Sub**	**PCG410-S** **with 1 setpoint** **9 D-Sub**
DN 16 ISO-KF	**355-000**	**355-010**	**355-020**	**355-030**
1/8" NPT	**355-001**	**355-011**	**355-021**	**355-031**
DN 16 CF-F	**355-002**	**355-012**	**355-022**	**355-032**
8 VCR®, female	**355-004**	**355-014**	**355-024**	**355-034**
4 VCR®, female	**355-005**	**355-015**	**355-025**	**355-035**
4 VCR® 90°, female			**355-026**	

PCG400, PCG410 (continued)

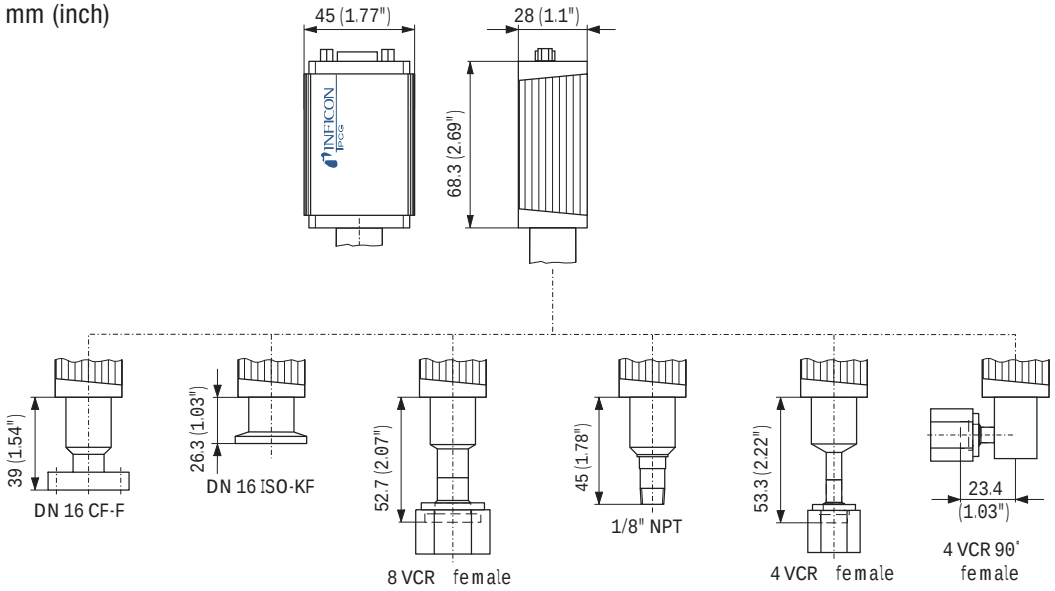
Specifications

		PCG400 FCC 68	PCG400-S FCC 68	PCG410 9 D-Sub	PCG410-S 9 D-Sub
					
		for INFICON VGC40x vacuum gauge controllers		for direct connection to PC / PLC	
Electrical connection		FCC 68, 8 pin		D-Sup, 9 pin, male	
Measurement range	mbar	5×10^{-4} to 1500			
	Torr	3.8×10^{-4} to 1125			
Accuracy (N_2)					
1 x 10^{-3} … 50 mbar	% of reading	±15%			
50 … 950 mbar	% of reading	±5%			
ATM (950 … 1050 mbar)	% of reading	±2.5%			
Repeatability (N_2)					
1 x 10^{-3} to 1100 mbar	% of reading	±2%			
Mounting orientation		any			
Setpoint		none	2	none	1
Range (N_2)	mbar		1.5 x 10^{-3} … 1400		1.5 x 10^{-3} … 1400
Relay contact			n.o. / potential free		n.o. / potential free
Hysteresis			10% of threshold		10% of threshold
Contact rating	V DC / A		30 / 1		30 / 1
Relay status			LED, green		LED, green
Pressure, max. (absolute)	bar	5			
Temperature					
Operation (ambient)	°C	+10 … +50			
Storage	°C	-20 … +65			
Bakeout at flange	°C	+80			
Filament	°C	<160			
Power supply					
Voltage	V DC	15 … 30 (Ripple ≤ 1 V_{pp})			
Consumption, max.	W	2.5			
Output signal analog	V	0 … +10.3		0 … +9.0	
Measurement range, logarithmic	V	+1.9 … +10.23		+2.2 … +8.68	
Relation voltage / pressure	V / Decade	1.286		1	
Response time	ms	10		10	
Connector		FCC 68, female, 8 pin (shielded)			
Cable length, max.	m (ft)	100 (330)			
Materials exposed to vacuum		Al_2O_3 (>99.5%), tungsten, stainless steel, Cu, glass, NiFe, Ni SnAg, AgPd			
Internal volume KF / CF	cm^3	6 / 8			
Weight KF / CF	g	90 / 120			
Protection type		IP 40			

PCG400, PCG410 (continued)

Dimensions

mm (inch)



Pirani Capacitance Diaphragm Gauge

PCG550, PCG552, PCG554

The INFICON Pirani Capacitance Diaphragm Gauge (PCG55x) combines the INFICON ceramic capacitance diaphragm sensor technology with the advantages of a Pirani unit in a single product.
In the measurement range between 10 mbar and atmosphere the capacitance diaphragm technology provides gas-type independent, highly accurate values for reliable pressure measurement. The PCG55x offers also a variety of features which allows the right product configuration for the demanded application..

Advantages

- Gas-type independent above 10 mbar – allows safe venting with any gas mixture
- High accuracy and reproducibility at atmosphere – for reliable atmospheric pressure detection
- Fast atmospheric detection – eliminates waiting time and shortens process cycle
- Versatile of mounting orientation – provides engineering freedom in tool design
- Available with Tungsten (PCG550) or Nickel (PCG552) filament or with a fully ceramic coated (PCG554) sensor unit for highly corrosive applications
- Easy to exchange plug & play sensor element with on-board calibration data – guarantees high reproducibility and low cost of ownership
- Eligible output signal for easy integration
- Optional atmospheric switch, display and digital interfaces
- Diagnostic port on all versions

Applications

- Load Lock control
- Fore vacuum pressure measurement
- Safety circuits in vacuum systems
- General vacuum measurement and control in the medium and rough vacuum range

PCG550, PCG552, PCG554 (continued)

Ordering Information

3	P	C	1	–	0	0	1	–	1	1	0	1

Filament

Tungsten	1
Nickel	2
Ceramic coated	3
Tungsten, galv. isolated [1]	6
Nickel, galv. isolated [1]	7
Ceramic coated, galv. isolated [1]	8

Unit [2]

mbar	0
Torr	1
Pa	2
micron	3

Flange

DN 16 ISO-KF	1
DN 16 ISO-KF long tube	2
DN 16 CF-F	4
DN 16 CF-R long tube	5
DN 25 ISO-KF	6
4 VCR female	D
8 VCR female	E
1/8" NPT	F
29×29 mm	K
4 VCR 90° female	M
7/16-20 UNF male	N

Measurement range

0	0.61 … 10.23 V [3]
1	1.2 … 8.68 V
2	0.375 … 5.659V
3	1.57 … 9.05 V

Digital interface

0	None [3]
1	DeviceNet™ [4]
2	Profibus DP

Electrical connection

0	FCC, 8-pin [3]
1	D-Sub, 9-pin
2	D-Sub, 15-pin HD
4	D-Sub, 15-pin HD, RS485 INF [5]

Display, switching functions

0	None
1	LCD display
2	2 setpoints (solid)
3	ATM & 2 setpoints (solid)
4	LCD display & 2 setpoints (solid)
5	ATM & LCD display & 2 setpoints (solid)
6	2 setpoints (mech.) [6]

1) Only with D-Sub 9-pin connector available

2) When selecting LCD choose desired pressure unit

3) Communication with an INFICON Vacuum Gauge Controller of the VGC40x series

4) Only with D-Sub 9-pin connector and galvanically isolated available

5) Only without additional digital interface available

6) Only with D-Sup 9-pin connector without LCD display available

PCG550, PCG552, PCG554 (continued)

Specifications

Type Filament			PCG550 Tungsten	PCG552 Nickel	PCG554 ceramic coated
Measurement range		mbar (Torr)	5×10^{-5} … 1500 (3.8×10^{-5} … 1125)		
Accuracy (N_2)	5×10^{-4} … 1×10^{-3} mbar	% of reading	±50		
	1×10^{-3} … 100 mbar	% of reading	±15		
	100 … 950 mbar	% of reading	±5		
	950 … 1050 mbar	% of reading	±2.5		
Repeatability (N_2)	1×10^{-3} … 1100 mbar	% of reading	±2		
Admissible pressure		bar (absolute)	≤5		
Burst pressure		bar (absolute)	10		
Admissible temperature					
Operation (ambient)		°C	+10 … +50		
Storage		°C	-20 … +65		
Bakeout at flange		°C	≤80		
Long tube		°C	≤250		
Supply voltage		V / A DC	+15 … +30		
Power consumption					
Without fieldbus		W	≤2.5		
DeviceNet™		W	≤3		
Profibus		W	≤3		
Output signal analog					
3PCx-0xx-xxx**0**		V	0 … +10.23		
-xxx**1**		V	0 … +8.68		
-xxx**2**		V	0 … +5.659		
-xxx**3**		V	0 … +9.05		
Measurement range					
3PCx-0xx-xxx**0**		V	+0.61 … +10.23		
-xxx**1**		V	+1.2 … +8.68		
-xxx**2**		V	+0.375 … +5.659		
-xxx**3**		V	+1.57 … +9.05		
Voltage vs. pressure					
3PCx-0xx-xxx**0**		V / Decade	1.286		
3PCx-0xx-xxx**2**		V / Decade	1		
Load impedance		kΩ	>10		
Setpoint relay			2		
Range (N_2)		mbar	5×10^{-5} … 1500		
Relay contact			n.o., potential free		
Hysteresis		% of threshold	10		
Contact rating					
Solid state relays		V / A DC	≤30 / ≤0.3		
Mechanical relays		V / A DC	≤30 / ≤1		
Switching time		ms	≤30		
Interface (digital)			RS232C		
Electrical connection					
3PCx-0xx-x**0**xx			FCC, 8-pin		
-x**1**xx			D-Sub, 9-pin, male		
-x**2**xx			D-Sub, 15-pin HD, male		
-x**4**xx			D-Sub, 15-pin HD, RS485 INFICON, male		
Cable length		m (ft)	≤100 (≤330)		
RS232C operation		m (ft)	≤30 (≤100)		

(continued)

PCG550, PCG552, PCG554 (continued)

Specifications (concluded)

Type Filament		PCG550 Tungsten	PCG552 Nickel	PCG554 ceramic coated
Materials exposed to vacuum		W, Ni, NiFe, ceramic, SnAg, stainless steel, glass	Ni, NiFe, ceramic, SnAg, stainless steel, glass	ceramic, stainless steel
Internal volume				
DN 16 ISO-KF	cm^3		4.7	
DN 16 ISO-KF long tube	cm^3		14.5	
DN 16 CF-F	cm^3		8	
DN 16 CF-R long tube	cm^3		14	
DN 25 ISO-KF, 4 VCR	cm^3		5.5	
8 VCR	cm^3		7	
1/8" NPT, 7/16-20 UNF	cm^3		5.2	
29×29 mm	cm^3		4.9	
4 VCR 90°	cm^3		7.9	
Weight				
Without fieldbus interface	g		115 … 130	
With fieldbus interface	g		230 … 250	
Degree of protection			IP 40	

Specifications DeviceNet™

Protocol		DeviceNet™, group 2 slave only
Data rate switch	kBaud	125, 250, 500 or network programmable
Cable length		
125 kbps	m (ft)	500 (1650)
250 kbps	m (ft)	250 (825)
500 kbps	m (ft)	100 (330)
MAC ID		2 switches (address 00 - 63) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa, micron, counts monitor gauge status, detailed alarm and warning information, safe state allows definition of behavior in case of error
Specification		DeviceNet™ "Vacuum Gauge Device Profile"
Device type		"CG" for combination gauge
I / O slave messaging		polling only
Supply voltage for DeviceNet™		
3PC**1**- / 3PC**2**- / 3PC**3**-0xx-xxxx	V / A DC	+15 … +30
Power consumption		
3PC**1**- / 3PC**2**- / 3PC**3**-0xx-xxxx	W	≤3
Connector for DeviceNet		Micro-Style, 5-pin, male

Specifications Profibus DP

Baud rates	kBaud MBaud	9.6 / 19.2 / 93.75 / 187.5 / 500 1.5 / 12
Address		2 switches (address 00 - 127) or network programmable
Digital functions		read pressure, select units: Torr, mbar, Pa, micron, counts monitor gauge status, detailed alarm and warning information, safe state allows definition of behavior in case of error
Connector for Profibus DP		D-Sub, 9-pin, female

PCG550, PCG552, PCG554 (continued)

Specifications RS485C

Baud rates	kBaud	9.6 / 19.2 / 38.4 /57.6
Address		2 switches (address 00 - 255)
Digital functions		read pressure, select units: Torr, mbar, Pa, micron, counts monitor gauge status, detailed alarm and warning information, safe state allows definition of behavior in case of error
Connector for RS485		D-Sub, 15-pin HD, male

Spare Parts

Type **Filament**		**PCG550** **Tungsten**	**PCG552** **Nickel**	**PCG554** **ceramic coated**
Replacement sensor	DN 16 ISO-KF	**357-925**	**357-936**	**357-947**
	DN 16 ISO-KF long tube	**357-926**	**357-937**	**357-948**
	DN 16 CF-F	**357-927**	**357-938**	**357-949**
	DN 16 CF-R long tube	**357-928**	**357-939**	**357-950**
	DN 25 ISO-KF	**357-929**	**357-940**	**357-951**
	4 VCR female	**357-932**	**357-943**	**357-954**
	8 VCR female	**357-931**	**357-942**	**357-953**
	1/8" NPT	**357-930**	**357-941**	**357-952**
	29×29 mm	**357-934**	**357-945**	**357-956**
	4 VCR 90° female	**357-935**	**357-946**	**357-957**
	7/16-20 UNF male	**357-933**	**357-944**	**357-955**

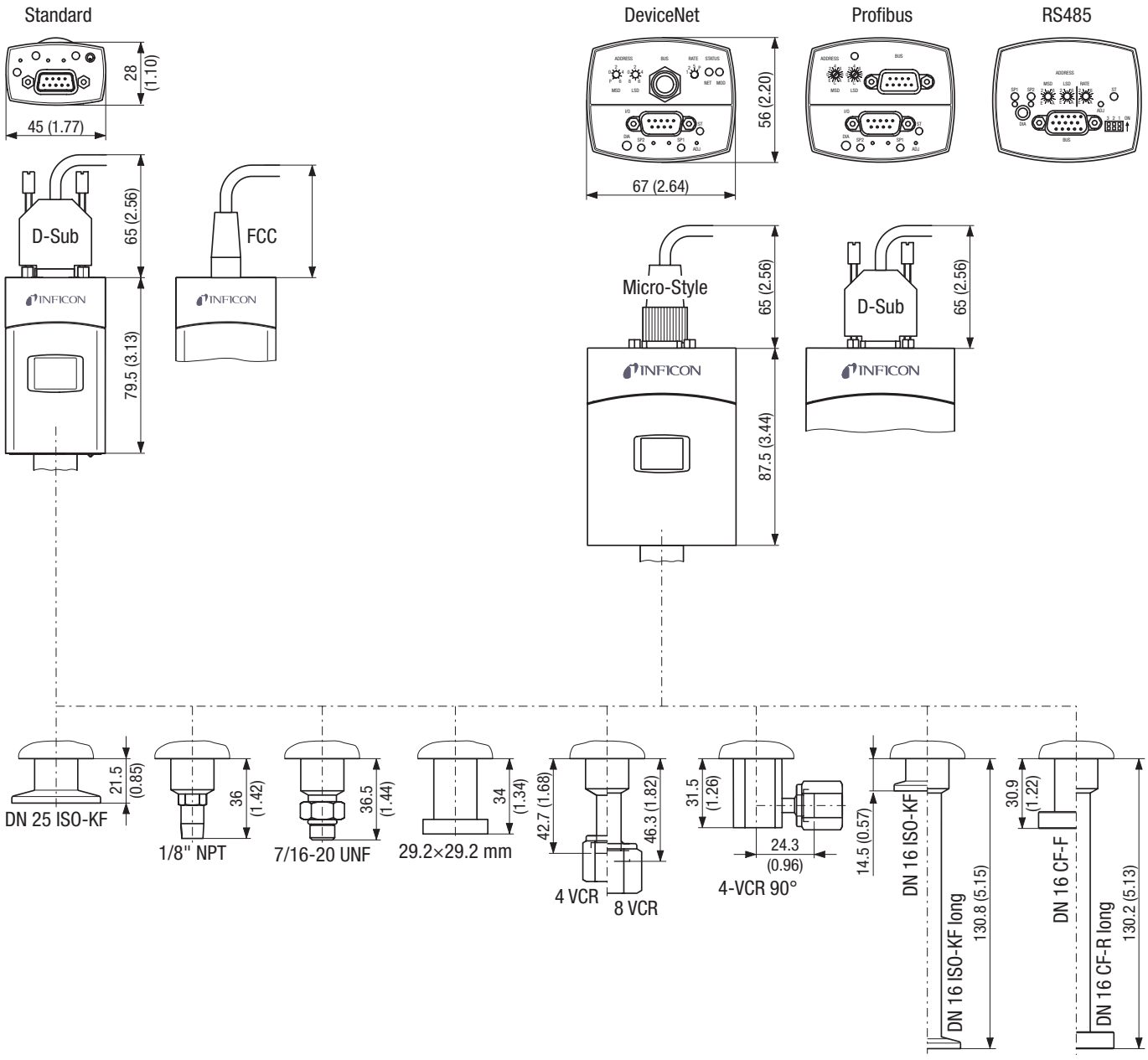
Accessories

Centering ring with filter (DN 16 ISO-KF)	**211-097**
Diagnostic [1]: Communication adapter (2 m) for PC RS232C serial port	**303-333**

[1] Software to run the diagnostic functions on Windows NT, XP can be downloaded from our website.

PCG550, PCG552, PCG554 (continued)

Dimensions, Internal Volume, Weight



Penning Gauge

PEG100

The INFICON Penning Gauge PEG100 provides reliable high vacuum measurements. The rugged Penning cold cathode sensor has no filament to burn out. Due to titanium cathode plates and the reduced high voltage after plasma ignition, the gauge can be operated also in sputtering applications. The fieldbus options, in addition to the logarithmic analog output signal, allow easy integration into vacuum systems using Profibus DP or DeviceNet protocols.

ADVANTAGES

- Wide measurement range from 5 x 10^{-9} to 1 x 10^{-2} mbar (7.5 x 10^{-10} to 7.5 x 10^{-3} Torr)
- All-metal cold cathode sensor (Penning) with ceramic feedthrough
- Innovative electrode geometry provides excellent ignition properties
- Decreased high voltage after plasma ignition and titanium cathode plates reduce risk of contamination, even during sputtering operations with argon
- The anode ring and the titanium cathode can be cleaned or replaced easily
- Minimal magnetic field intensity adjacent to gauge
- LED indicator for power on and plasma ignited
- Logarithmic analog output signal
- Fieldbus interface (Profibus DB, DeviceNet) for easy integration into vacuum systems using network communications

APPLICATIONS

- High vacuum pressure monitoring
- Evaporation and sputtering systems
- General vacuum measurement and control in the fine and high vacuum range

Ordering Information

Type	PEG100	PEG100-D with DeviceNet™	PEG100-P with Profibus DP™
DN 25 ISO-KF	**351-000**	**351-003**	**351-005**
DN 40 CF-R	**351-002**	**351-004**	**—**
Replacement cathode plates, titanium Set of 5 pieces	**351-490**	**351-490**	**351-490**

PEG100 (continued)

Specifications

		PEG100
Measurement range	mbar	1×10^{-9} to 1×10^{-2}
	Torr	7.5×10^{-10} to 7.5×10^{-3}
Accuracy 10^{-8} to 10^{-4} mbar	% of reading	±30
Pressure, max. absolute	bar	10
Temperature		
Operation (ambient)	°C	+10 to +50
Storage	°C	-20 to +75
Bakeout		
without electronics	°C	350
with electronics, at flange	°C	70
Supply		
Voltage	V DC	14.5 to 36
Consumption, max.	W	<2
Output signal analog	V	0 to 10.6
Measurement range	V	0.66 to 10
Relation voltage / pressure	V / Decade	1.333
Connector		FCC 68, female, 8 pin (shielded)
Cable length, max. (analog)	m (ft)	100 (330)
Materials exposed to vacuum		Stainless steel, CrNi, Al_2O_3, NiFe, Mo, Cu, Ni, Ti
Internal volume	cm^3 $(inch)^3$	21 (1.28)
Weight, approx.	g	500
Protection type		IP40

Specifications

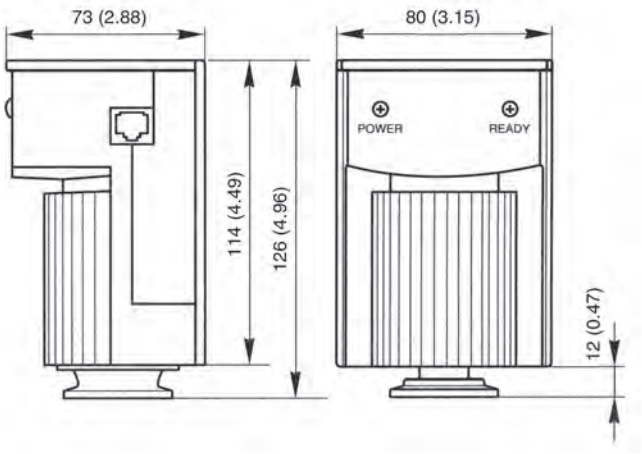
		PEG100-D DeviceNet™
Device type		generic
Explicit peer to peer messaging		no
I / O peer to peer messaging		no
Configuration consistency value		no
Faulted node recovery		no
Baud rates	kBaud	125 / 250 / 500
Master / Scanner		no
I / O slave messaging		
Bit Strobe		yes
Polling		yes
Cyclic		yes
Change of State (COS)		yes
Supply for DeviceNet	V DC	11 to 25
Connector for DeviceNet		Phoenix Combicon, 5 pin

Specifications

		PEG100-P Profibus DP™
Supported baud rates (auto detection)	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500 / 1500
Expanded user parameter data	Bytes	5
Configuring		
Number of input and output data		2
Sync-Mode and Freeze-Mode		Yes
Connector		D-sub, 9 pin

PEG100 (continued)

Dimensions



Inverted Magnetron Pirani Gauge

MPG400/401

The INFICON Inverted Magnetron Pirani Gauges, MPG400 and MPG401, measure from 5 x 10^{-9} mbar to atmosphere (3.8 x 10^{-9} Torr to atmosphere). Combining technologies into one single compact unit with one logarithmic analog out put signal significantly reduces the complexity of installation, setup and integration.

ADVANTAGES

- Combination gauge – Inverted Magnetron & Pirani
- Wide measurement range from 5 x 10^{-9} mbar to atmosphere
- No filament to burn out
- Excellent ignition properties
- Easy to clean
- FPM or metal-sealed feedthrough
- LED indicator for high voltage on
- Logarithmic analog output signal

APPLICATIONS

- High vacuum pressure monitoring
- Base pressure for evaporation and sputtering systems
- General vacuum measurement and control in the medium and high vacuum range

Ordering Information

Type	MPG400 FPM sealed	MPG401 metal-sealed
DN 25 ISO-KF	**351-010**	**351-020**
DN 40 ISO-KF	**351-011**	**351-021**
DN 40 CF-F	**351-012**	**351-022**

Accessories

Type	MPG400 FPM sealed	MPG401 metal-sealed
Magnetic shield	**351-023**	**351-023**

MPG400/401 – continued

Specifications

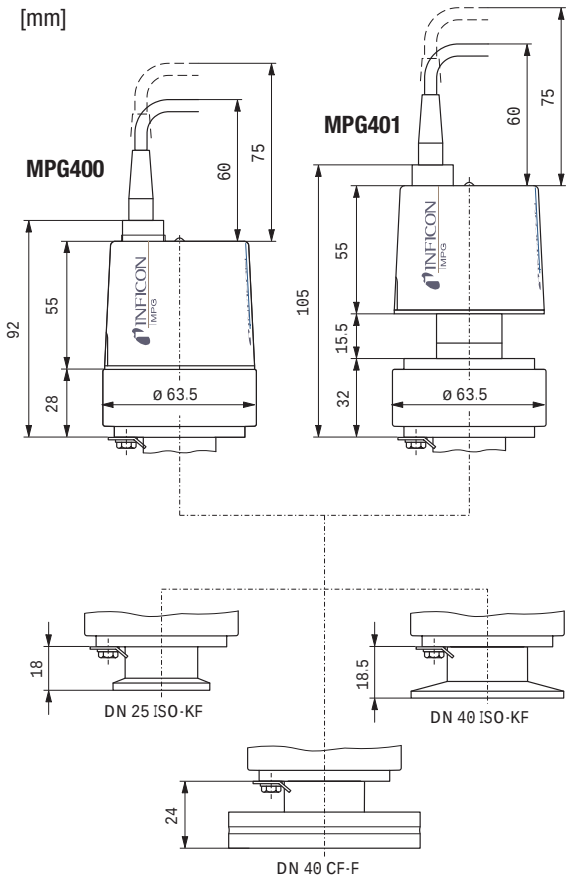
		MPG400 FPM sealed	MPG401 metal-sealed
Measurement range (air, N_2)	mbar (Torr)	5×10^{-9} … 1000 (3.8×10^{-9} … 760)	
Accuracy (N_2) 1 x 10^{-8} … 100 mbar	% of reading	≈±30%	
Repeatability 1 x 10^{-8} … 100 mbar	% of reading	≈±5%	
Mounting orientation		any	
Admissible pressure	bar (absolute)	≤10 (limited to inert gases)	
Admissible temperature			
Operation (ambient)	°C	+5 … +55	
Storage	°C	–40 … +65	
Bake-out [1]	°C	150	
Filament temperature (Pirani)	°C	120	
Supply voltage			
At gauge	V DC	+15 … +30	
At supply unit with max. cable length [2]	V DC	+16 … +30	
Ripple	V_{pp}	≤1	
Power consumption	W	≤2	
Fuse to be connected	AT	≤1	
Output signal (measurement signal)			
Voltage range	V	0 … +10.5	
Measurement range	V	+1.82 … +8.6	
Voltage vs. pressure		logarithmic, 0.6 V/decade	
Error signal	V	<0.5 (no supply)	
	V	>9.5 (Pirani sensor, filament rupture)	
Output impedance	Ω	2 x 10	
Minimum loaded impedance	kΩ	10, short-circuit proof	
Response time $p > 10^{-6}$ mbar	ms	<10	
$p = 10^{-8}$ mbar	ms	≈1000	
Identification gauge	kΩ	85, referenced to supply common	
Status			
Pirani-only mode		V	0 (low)
Combined Pirani / cold cathode mode	V	15 … 30 (high)	
LED	LED green	high voltage on	
Electrical connection		FCC 68 appliance connector, 8 poles, female	
Sensor cable		8 poles plus shielding	
Cable length	m	≤50 (8 x 0.14 mm^2)	
Operating voltage	kV	≤3.3	
Operating current	µA	≤500	
Materials exposed to vacuum		stainless steel, Al_2O_3, FPM75, Mo, Ni, Au, W	stainless steel, Al_2O_3, Ag, Cu, Sn Mo, Ni, Au, W
Internal volume	cm^3	≈20	
Weight			
DN 25 ISO-KF	g	≈700	≈730
DN 40 ISO-KF	g	≈720	≈750
DN 40 CF-F	g	≈980	≈1010
Protection category			IP 40
Standards		EN 61000-6-2, EN 61000-6-3, EN 61010-1	

[1] Without electronics and magnetic shielding.

[2] The minimum voltage of the supply unit must be increased proportionally to the length of the sensor cable.

MPG400/401 – continued

Dimensions



Spare Parts

Type	MPG400 FPM sealed	MPG401 metal-sealed
Maintenance kit includes: support/centering ring seals ignition aid	**351-999**	**351-997**
Repair kit includes: Pirani element anode anode extension [1] Cu seal [1] screw fitting [1] support/centering ring seals ignition aid	**351-998**	**351-996**
Ignition aid kit includes: ignition aid	**351-995**	**351-995**
Mounting tool for ignition aid	**351-994**	**351-994**

[1] MPG401 only

Vacuum Gauge Controllers

VGC401, VGC402, VGC403

VGC401

VGC402

VGC403

Your complete solution for process measurement and control.
Compatible with all INFICON active gauges, the VGC400 series of controllers can monitor the entire pressure range from 10^{-10} to 1500 mbar (10^{-10} to 1125 Torr) and the setpoint status.

Advantages

- Automatic identification of the connected INFICON gauges
- User selectable measurement unit (mbar, Torr, Pascal, micron)
- High resolution – 16 bit A/D converter
- Up to six adjustable setpoints with adjustable hysteresis may be assigned to any channel
- Compliance & standards: CE, ETL, RoHS
- Programmable 0 to 10 V chart recorder output with logarithmic / linear characteristics for each gauge or gauge combination (VGC402/403 only)
- Firmware upgrades available on-line are easily downloaded via the RS232 interface
- Versatile, compact bench-top model design can easily be mounted in a panel or 19" rack
- Wide range power supply 90 to 250V, 50 to 60Hz

Ordering Information

Type	**VGC401**	**VGC402**	**VGC403**
Vacuum Gauge Controller	**398-010**	**398-020**	**398-021**
Adapter for rack mount 2HE / 3HE	**398-499**	**–**	**–**

Accessories

Gauges	**PCG, PEG, PSG, MPG**	**BAG, BCG, BPG, HPG CDG**	**CDG** (unheated)
Signal read out / communication	analog	digital analog possible	analog
Connector	FCC / FCC	D-Sub / D-Sub	FCC / D-Sub
Cable to VGC401/402/403 in m (ft)			
3 (9.9)	**398-500**	**398-520**	**398-540**
5 (16.5)	**398-501**	**398-521**	**398-541**
10 (33.0)	**398-502**	**398-522**	**398-542**
15 (49.5)	**398-503**	**398-523**	**398-543**
20 (66.0)	**398-504**	**398-524**	**398-544**
30 (99.0)	**398-505**	**398-525**	**398-545**

other lengths on request

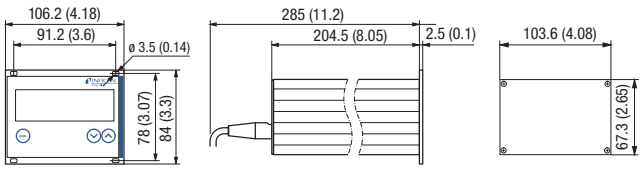
VGC401, VGC402, VGC403 (continued)

Specifications

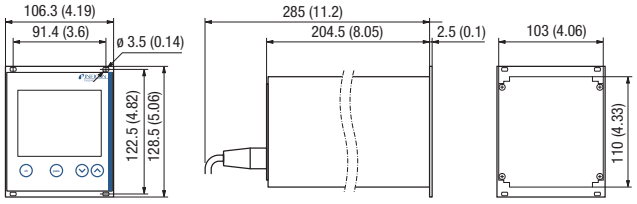
Type		VGC401	VGC402	VGC403
Measurement channels		1	2	3
Display		LED	LCD	LCD
Range	mbar (Torr)	2 x 10^{-10} … 1500 (1.5 x 10^{-10} … 1125)	5 x 10^{-10} … 1500 (3.75 x 10^{-10} … 1125)	5 x 10^{-10} … 1500 (3.75 x 10^{-10} … 1125)
Rate	1/s	10	10	10
A/D converter	bit	16	16	16
Connectable gauges with display range				
CDG (A/D)	Torr	1 x 10^{-3} x FS … 1 x FS		
PCG400	mbar (Torr)	5 x 10^{-4} … 1500 (3.75 x 10^{-4} … 1125)		
PSG	mbar (Torr)	5 x 10^{-4} … 1000 (3.75 x 10^{-4} … 750)		
MPG	mbar (Torr)	5 x 10^{-9} … 1000 (3.75 x 10^{-9} … 750)		
PEG	mbar (Torr)	1 x 10^{-9} … 1 x 10^{-2} (7.5 x 10^{-10} … 7.5 x 10^{-3})		
BCG	mbar (Torr)	5 x 10^{-10} … 1500 (3.75 x 10^{-10} … 1125)		
BPG	mbar (Torr)	5 x 10^{-10} … 1000 (3.75 x 10^{-10} … 750)		
HPG	mbar (Torr)	2 x 10^{-6} … 1000 (1.5 x 10^{-6} … 750)		
BAG	mbar (Torr)	2 x 10^{-10} … 1 x 10^{-1} (1.5 x 10^{-10} … 7.5 x 10^{-2})	–	–
Measurement unit (selectable)		mbar, Torr, Pascal, micron		
Setpoints				
Setpoint relays		1	4	6
Channel assignment		1	1 or 2	1/2 or 3
Adjustment range		Sensor dependent		
Hysteresis		adjustable		
Relay contact		potential free change over contact		
Contact rating	V AC / A	30 / 2	30 / 1	30 / 1
	V DC / A	60 / 1	60 / 0.5	60 / 0.5
Connector		D-Sub, 9 pin, male	D-Sub, 25 pin, female	D-Sub, 25 pin, female
Analog output				
Range		0 … 10.3 Volt, sensor analog output signal		
Programmable analog output		–	1	1
Connector		D-Sub, 9 pin, male	D-Sub, 9 pin, male	D-Sub, 9 pin, male
Interface (digital)		RS 232 C	RS 232 C	RS 232 C
Connector		D-Sub, 9 pin, female	D-Sub, 9 pin, female	D-Sub, 9 pin, female
Power				
Supply	V	90 … 250	90 … 250	90 … 250
Frequency	Hz	50 … 60	50 … 60	50 … 60
Consumption	W	≤ 30	≤ 45	≤ 65
Temperature				
Operation (ambient)	°C	5 … 50	5 … 50	5 … 50

Dimensions

VGC401



VGC402 / VGC403



mm (inch)

Pirani Gauge Display

PGD400

The INFICON Pirani Gauge Display PGD400 in combination with the INFICON Pirani Standard Gauge PSG500 is provides a cost effective pressure monitoring solution.

Advantages

- User selectable measurement unit (Pa, mbar or Torr)
- Compact bench top model design can be easily mounted in a panel or 19" rack
- 0 to 10 V output signal from the gauge is available for use in PLC or with a chart recorder
- One free adjustable set point
- Automatic gauge connection and filament detection
- CE / UL certified

Applications

- Fore vacuum pressure measurement
- Pressure measurement on evacuation/filling stations for RAC applications
- Pressure measurement in light bulb production lines
- General vacuum measurement and control in the medium and rough vacuum range

Ordering Information

Type	PGD400	PSG500
Pirani Gauge Display	**398-800**	
Pirani Standard Gauge [1]	–	**350-060**

[1] Other Pirani Standard Gauges on request

Accessories

Sensor cable [1]	1.3 m (4.27ft)	**398-498**
Seal with centering ring and filter	DN 16 ISO-KF	**211-090**
Adapter for rackmount 2HE / 3HE		**398-499**

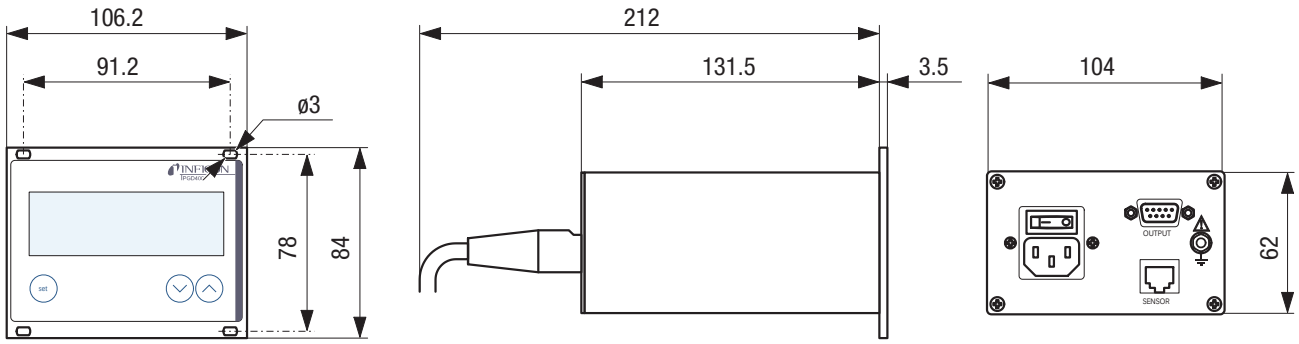
[1] Other lengths on request

PGD400 (continued)

Specifications

Measurement channels		1 (PSG5xx only)
Display		LED
Range	Pa	5×10^{-2} … 1×10^{5}
	mbar	5×10^{-4} … 1×10^{3}
Measurement rate	1/s	30
Measurement unit (selectable)		Pascal, mbar, Torr
Setpoint		
Setpoint relay		1
Adjustment range		1×10^{-3} … 500
Hysteresis		≥ 10% of measurement value
Relay contact		floating changeover contact
Contact rating	V AC / A	50 / 5
Connector		D-Sub, 9 pin, male
Analog output	V	0 … 10.3, sensor output signal
Power		
Supply	V AC	100 … 240
Frequency	Hz	50 … 60
Consumption	VA	≤ 30
Temperature		
Operation (ambiance)	°C	+5 … +50
Storage	°C	-20 … 60
Relative humidity		≤ 80% up to +31 °C decreasing to 50% at +40 °C
Degree of protection		IP20
Weight	kg	0.85

Dimensions



Vacuum Switch

VSA100A

The pressure switch VSA100A is used as a safety switch in vacuum systems. For example, to automatically interrupt the gas supply when venting vacuum systems with a purge gas at a pressure of 6 mbar below atmospheric pressure.

At a differential pressure of 6 mbar resp. return switching pressure of 3 mbar below atmospheric pressure, an elastic diaphragm actuates a changeover contact which in turn may be used to switch directly any ancillary equipment.

The electrical connections are protected by a plastic cover.

Advantages

- Reliable and budget-priced vacuum switch
- Long service life
- Rugged design
- Easy to integrate
- IP 44 protection
- Can be connected to a programmable control

Applications

- Control of load lock chambers
- Safety shutdown of vacuum systems

Ordering Information

Type	VSA100-A
DN 16 ISO-KF, complete with 3 m (9.9 ft) cable	**399-001**

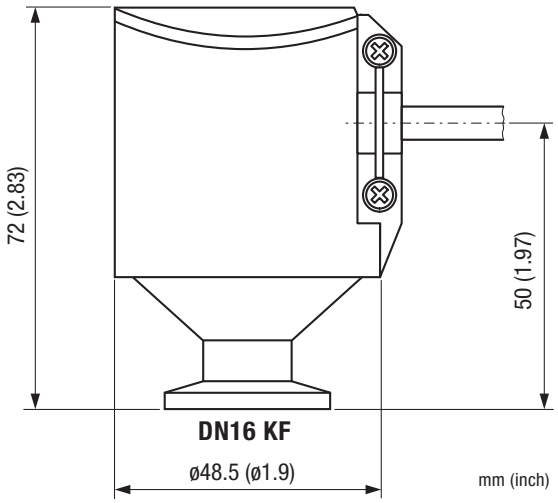
VSA100A – continued

Specifications

Switching pressure	mbar	6 ±2 (below atmosphere)
Back switching	mbar	3 ±2 (below atmosphere)
Operating pressure (absolute)	bar	<2
Helium permeation	mbar l/s	$<10^{-6}$
Leak rate	mbar l/s	$<5 \times 10^{-8}$
Temperature		
Operation	°C	0 ... +85
Storage	°C	-20 ... +85
Switching contacts (gold plated)		Change over contact
Voltage max.	VDC/VAC	24/24
Current max.	mA	30 (24 VDC) / 100 (24 VAC)
Load min.	mA	1
Electrical connector		Cable, bare wire
Cable length, standard	m (ft)	3 (9.9)
Vacuum connection		DN 16 ISO-KF
Protective type		IP 44
Mounting orientation		vertical (standing)
Internal volume	cm^3 ($inch^3$)	2 (0.122)
Materials exposed to vacuum		Stainless steel 1.4305, EPDM, PTFE (Teflon)
Weight	g	315

Technical Note: Due to the diaphragm material used (EPDM), the Vacuum Switch VSA100A is not suited for applications in which the process gas contains large quantities of helium. The leak rate of the diaphragm for helium is $>10^{-6}$ mbar l/s.

Dimensions



Vacuum Switch

VSA200, VSD200

INFICON Vacuum Switches are designed for accurate and reliable pressure detection. These robust electronic switches are used in all vacuum applications, including pressure interlock. The switches are available in two versions, absolute (references vacuum) or differential (references ambient).

Advantages

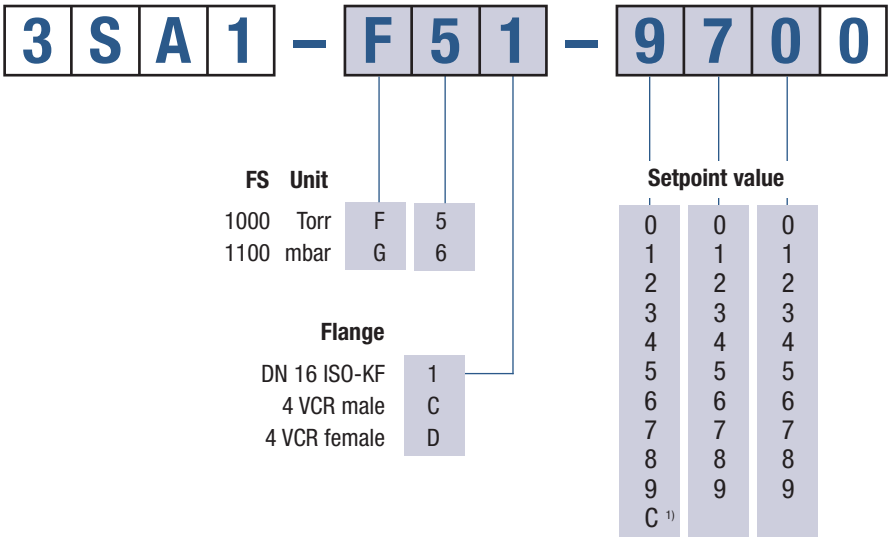
- Corrosion resistant all stainless steel design
- Relay output with potential free contacts
- Easy installation with setpoints factory preset or field-adjustable
- High-accuracy temperature compensated sensor
- Robust design, cleanroom compliant
- Pressure range 1×10^{-9} mbar … 2 bar
- CE, RoHS

Applications

- Atmospheric pressure detection for all vacuum applications
- Pressure interlock (power supplies, gas supplies, pumps, valves, actuators, etc.)
- Vacuum to high vacuum

VSA200, VSD200 – continued

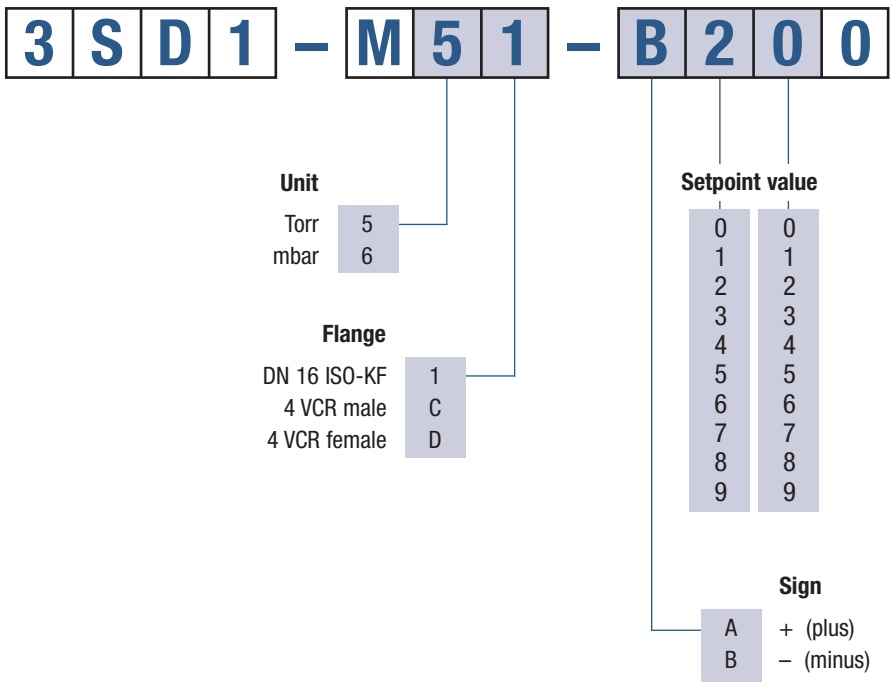
Ordering Information VSA200 absolute switch



1) C = 10

Example: Setpoint at 970 Torr absolute pressure, DN 16 ISO-KF: **3SA1-F51-9700**
Setpoint at 1080 mbar absolute pressure, 4 VCR male: **3SA1-G6C-C800**

Ordering Information VSD200 differential switch



Example: 20 Torr below ambient pressure, DN 16 ISO-KF: **3SD1-M51-B200**

VSA200, VSD200 – continued

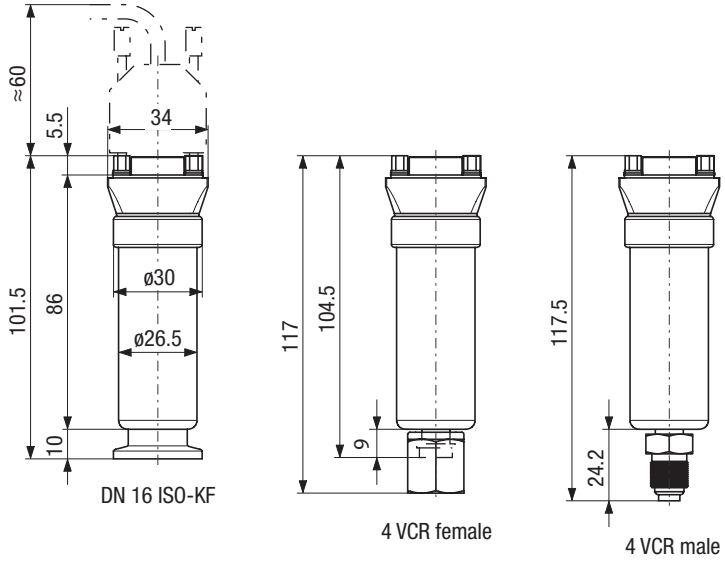
Specifications

		VSA200		VSD200	
Full Scale (F.S.)	mbar (absolute)	–	1100	–	–
	Torr (absolute)	1000	–	–	–
Differential range [1]	mbar	–	–	–	–100 … +50
	Torr	–	–	–100 … +50	–
Setpoint range	mbar		30 … 1060		–99 … +46
	Torr	20 … 970	–	–99 … +46	–
Admissible pressure	bar (absolute)	5		2	
Setpoint relay					
Relay output		n.o., n.c., potential free			
Contact rating	V / A DC	30 / 1			
	V / A AC	125 / 0.3			
Setpoint accuracy	% F.S.	0.5			
Temperature effect on zero and span	% F.S. / °C	≤±0.02			
Response time	ms	≤45			
Hysteresis	% F.S.	2			
Electrical connection		D-Sub, 9-pin			
Supply voltage	V DC	14 … 30			
Power consumption	W	<0.5			
Admissible temperature					
Operation (ambient)	°C	0 … 70			
Storage	°C	–40 … 80			
Materials exposed to vacuum		stainless steel			
Mounting orientation		any			
Internal volume					
DN 16 ISO-KF	cm^3 ($inch^3$)	2.81 (0.17)			
4 VCR	cm^3 ($inch^3$)	0.93 (0.057)			
Weight	g	140			
Degree of protection		IP 40			
Sensor protection		Short circuit protection and reverse polarity protection			

[1] References to ambient pressure.

VSA200, VSD200 – continued

Dimensions



ACCESSORIES

Communication adapter (2 m) for PC USB port [1]	**303-336**

[1] Software to read or write data on Windows can be downloaded from our website.

Vacuum Switch

VSC150A

The pressure switch VSA100A is used as a safety switch in vacuum systems. For example, to automatically interrupt the gas supply when venting vacuum systems with a purge gas at a pressure of 6 mbar below atmospheric pressure.

At a differential pressure of 6 mbar, and a return switching pressure of 3 mbar below atmospheric pressure, an elastic diaphragm actuates a changeover contact which in turn may be used to switch directly any ancillary equipment.

The electrical connections are protected by a plastic cover.

Advantages

- High switching accuracy (± 0.1 mbar)
- Stable long term operating characteristics
- Rugged, corrosion protected design
- Increased switching capability when using switching amplifier
- Switching contacts (normally closed) in the reference chamber and thus protected against process media
- Adapter available for differential pressure measurement

Applications

- Pressure switch or differential pressure switch to control valves, pumps, power supplies
- Load lock chambers
- Process chambers

Ordering Information

Type	VSC150
DN 16 ISO-KF	**399-005**

Accessories

SV Switching Amplifier	**399-008**
Pressure Switch Adjustment	**399-006**
Differential Pressure Adapter	**399-007**

VSC150A – continued

Specifications

		VSC150 Vacuum Switch
Switching range	mbar	0.5 … 2000
Response sensivity	mbar	0.1
Overload limit	mbar	3000
Switching hysteresis	mbar	0.5
Temperature		
Operation (ambient)	°C	5 … 90
Storage	°C	-20 … 70
Bakeout (max. 8 h)	°C	120
Coefficient of switch point	%/K of switching value	0.4
Vacuum connection		DN 16 ISO-KF
Electrical connection		Protected plug (DIN 43650)
Switch		n.c.
Switching voltage	V	24
Switching current	mA	10
Contact resistance	Ω	1
Protection category		IP 65
Materials in contact with the medium		
Sensing volume		Stainless steel 1.4301, 1.4401, 1.4310, 1.3541, FPM75
Reference volume		Stainless steel 1.4301, 1.4401, 1.3541, glass, gold
Sensing volume [1)]	cm^3	≈4
Reference volume	cm^3	≈20
Weight	kg	1.3

[1)] Including connection port.

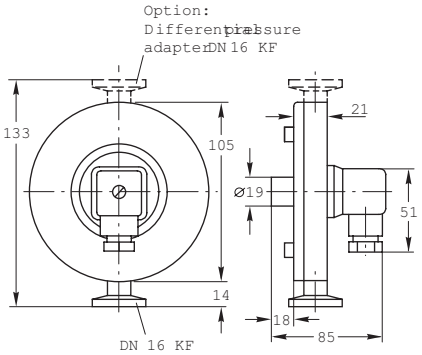
Specifications

		SV Switching Amplifier
Mains supply (selectable)	V	110 … 130, 220 … 240
Mains frequency	Hz	50 / 60
Power consumption	VA	3
Output relay		Change over contact
Switching voltage	V	250
Switching current	A	5
Switching capacity	VA	500
Response time	ms	30
Release time	ms	7
Control circuit	V / mA	24 / 10
Operation temperature	°C	5 … 50
Weight	kg	0.36

VSC150A – continued

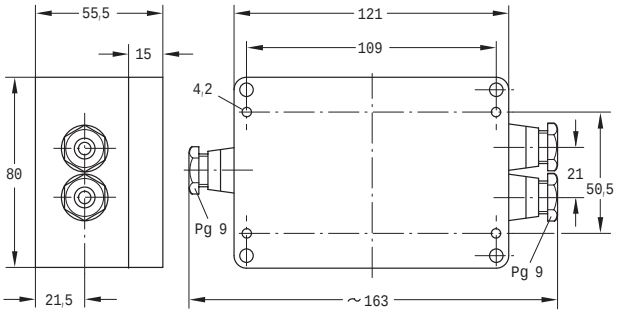
Dimensions

VSC150 Vacuum Switch



mm

SV Switching Amplifier



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Calibration Service

Vacuum Gauges

INFICON offers calibration services for vacuum gauges. A DKD calibration certificate or a factory calibration certificate can be issued. Calibration to other standards (e.g. NIST) is available upon request.

Advantages

- Known deviation to calibration standards
- Controlled quality over time

Applications

- Reference to standard is required
- Reference for customer in-house calibration service of vacuum gauges

DKD CALIBRATION

The German Calibration Service (DKD) ensures traceability of industrial measurements and testing to national calibration standards. It is run jointly by the Federal Institution for Physics and Technology (PTB), the Industry, the Federal Minister for Economics and the Western European Metrology Club (WEMC).

The transfer standards employed in the DKD calibration facility are checked regularly (recalibrated) by the PTB.

FACTORY CALIBRATION

Factory calibrations are run with standards which have not been calibrated directly at the PTB; instead the transfer standards of the DKD calibration service are used. Thus traceability to national standards is ensured in both cases.

OTHER CALIBRATIONS

NIST Calibration available upon request. Call for pricing and availability.

Ordering Information

Calibration Service	DKD Calibration	Factory Calibration
Calibration range		
to 10^{-3} mbar / Torr	**398-900**	**398-910**
to 10^{-5} mbar / Torr	**398-901**	**398-911**
to 10^{-7} mbar / Torr	**398-902**	**398-912**

Vacuum Feedthroughs

VACUUM FEEDTHROUGHS

Rotary Feedthroughs ISO–KF / ISO–K

FRH DN 16 – DN 63

Properties

- For transmitting high torque
- With FPM shaft seal and ball bearings

Selection Data

Vacuum connection		DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K
Feedthrough/seal		FPM	FPM	FPM	FPM
Shaft measure	mm	Ø5	Ø8	Ø12	Ø20

Ordering Information

Type	**FRH016-H**	**FRH025-H**	**FRH040-H**	**FRH063-H**
Part No.	**214-300**	**214-302**	**214-304**	**214-306** [2]

Specifications

Transferable torque	Nm	1.5	6	25	100
Rotational speed [1]	rpm	1500	1000	750	500
Idling torque under vacuum	Ncm	≤ 3	≤ 4	≤ 5	≤ 10
Starting torque under vacuum	Ncm	≤ 6	≤ 8	≤ 10	≤ 20
Shaft load vacuum sided					
Radial force	N	60	150	250	500
Axial force	N	30	50	60	100
Service life	Revolutions	20 000 000	20 000 000	20 000 000	10 000 000
Tightness, static	mbar l/s	1 x 10^{-9}	1 x 10^{-9}	1 x 10^{-9}	1 x 10^{-9}
Pressure (absolute)		1 x 10^{-9} mbar ... 1 bar			
Operating temperature	°C	50			
Bakeout temperature	°C	110			
Materials exposed to process media		stainless steel 420/1.4021 aluminum 6063/3.2315 elastomer FPM			
Weight	kg	0.1	0.2	0.6	2

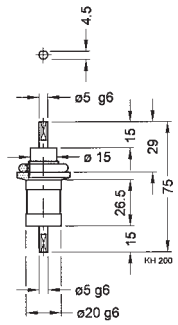
[1] When a reduced service life is acceptable, the rotation can be increased by up to a factor of two

[2] Centering ring / CR/aluminum Part No. 212-251 / FPM / stainless steel Part No. 212-281 not included in delivery

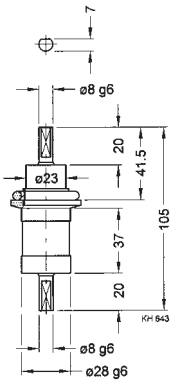
FRH DN 16 – DN 63 - continued

Dimensions

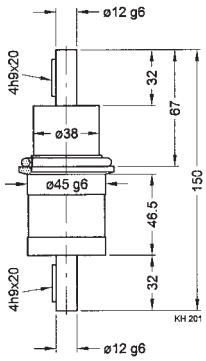
FRH016-H



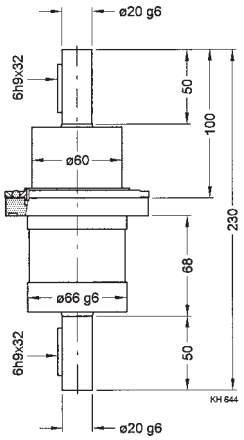
FRH025-H



FRH040-H



FRH063-H



Rotary Feedthroughs CF

FRU DN 16 – DN 40

Properties

- Bellow sealed
- All-metal version
- For very demanding vacuum requirements

Selection Data

Vacuum connection		DN 16 CF-F	DN 40 CF-F	DN 40 CF-F
Feedthrough / seal		bellow	bellow	bellow
Shaft connection	mm	4	8	12

Ordering Information

Type	**FRU016-H**	**FRU040-N**	**FRU040-L**
Part No.	**214-310**	**214-312**	**214-314**

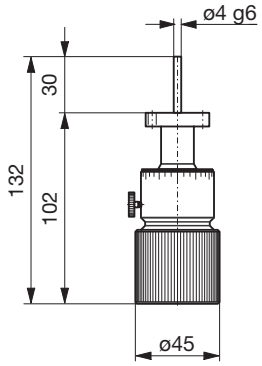
Specifications

Transferable torque				
Dynamic	Nm	0.4	4	10
Dynamic, at 300°C	Nm	0.2	2	2
Static	Nm	0.2	3	5
Rotational speed	rpm	200	1000	500
At max. torque	rpm		500	300
Shaft load vacuum sided				
Radial force	N	10	60	100
Axial force	N	5	20	30
Service life	Revolutions	1 000 000	2 000 000	1 000 000
Scale division	Degree	10	–	–
Tightness	mbar l/s		5×10^{-11}	
Pressure (absolute)			1×10^{-10} mbar ... 2 bar	
Operating temperature	°C		300	
Bakeout temperature	°C		300	
Materials exposed to process media		304L/1.4306 304/1.4301 –/2.4360	304L/1.4306 304/1.4301 –/2.4360	304L/1.4306 304/1.4301 303/1.4305
Weight	kg	0.3	1.5	3.0

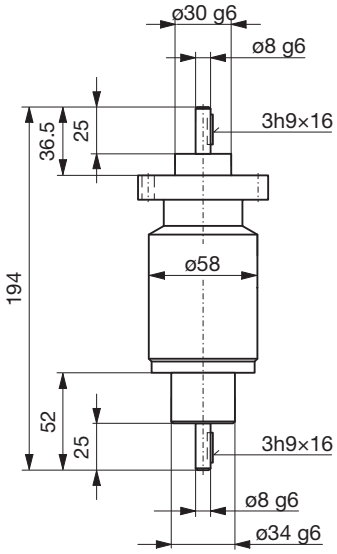
FRU DN 16 – DN 40 – continued

Dimensions

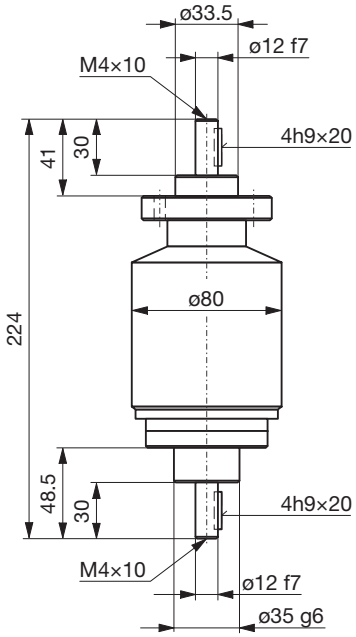
FRU016-H



FRU040-N



FRU040-L



Rotary/Linear Motion Feedthroughs ISO–KF

FCH DN 16 – DN 40

Properties

- Two FPM shaft seals
- Direct push/pull and rotary actuation
- With locking ring and optional anti-rotation device

Selection Data

Vacuum connection		DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Feedthrough/seal		FPM	FPM	FPM
Shaft connection		M 3 / Ø 5mm	M 4 / Ø 8mm	M 6 / Ø 12mm
Travel	mm	50	100	150

Ordering Information

Type		**FCH016-H**	**FCH025-H**	**FCH040-H**
Rotary/linear feedthrough	**Part No.**	**214-320**	**214-322**	**214-324**
Anti-rotation device	**Part No.**	**214-072**	**214-073**	**214-074**

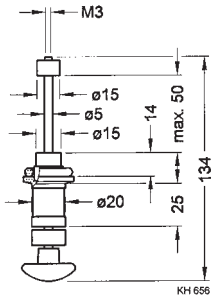
Specifications

Shaft load				
Radial force at max.travel	N	10	15	30
Torsion torque	Nm	2	8	20
Tightness, static	mbar l/s		1×10^{-9}	
Pressure (absolute)			1×10^{-8} mbar ... 1bar	
Operating temperature	°C		50	
Bakeout temperature	°C		110	
Materials exposed			stainless steel 304/1.4301	
to process media			aluminum 6063/3.2315	
Weight	kg	0.1	0.2	0.3

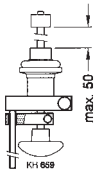
FCH DN 16 – DN 40 - continued

Dimensions

FCH016-H

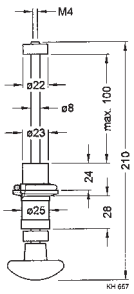


Feedthrough

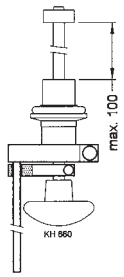


Anti-rotation device

FCH025-H

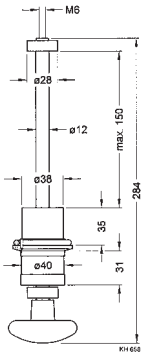


Feedthrough

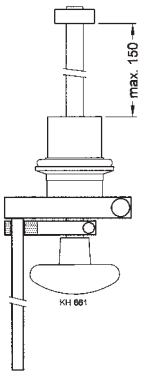


Anti-rotation device

FCH040-H



Feedthrough



Anti-rotation device

Linear Motion Feedthroughs CF

FPU DN 16 – DN 40

Properties

- With bellows for more demanding vacuum requirements
- Direct push and pull actuation
- High accuracy adjustment using micrometer screw

Selection Data

Vacuum connection		DN 16 CF-R	DN 40 CF-R	DN 16 CF-R	DN 40 CF-R
Feedthrough/seal		bellow	bellow	bellow	bellow
Shaft connection		M4x16 mm	M6x10 mm, Ø10 mm	M4x16 mm	M6x10mm, Ø10 mm
Actuator		manual	manual	micrometer screw	micrometer screw
Travel	mm	25	50	20	50

Ordering Information

Type	**FPU016-H**	**FPU040-H**	**FPU016-Z**	**FPU040-Z**
Part No.	**214-330**	**214-332**	**214-334**	**214-336**

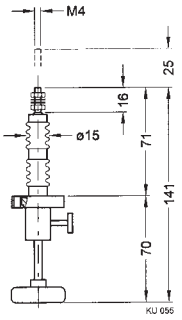
Specifications

Travel per revolution	mm			0.5	1
Scale division	mm	5	10	0.01	0.005
Shaft load					
Radial force at max.	N	20	100	20	100
Axial force vacuum	N	85	140	185	440
Axial force against atm	N	100	200	200	500
Torsion torque	Nm	0.2	0.5	0.2	0.5
Tightness	mbar l/s	5×10^{-11}			
Pressure (absolute)		1×10^{-10} mbar ... 2 bar			
Bakeout temperature					
Feedthrough	°C	300	300	300	300
Micrometer screw	°C			100	100
Materials exposed to process media		stainless steel 304L/1.4301 stainless steel 316Ti/1.4571			
Weight	kg	0.15	0.75	0.25	1

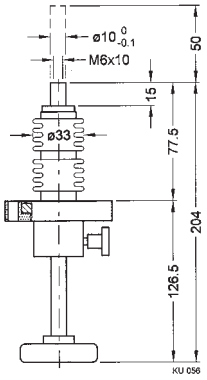
FPU DN 16 – DN 40 - continued

Dimensions

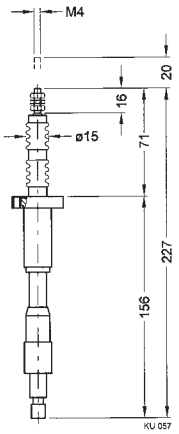
FPU016-H



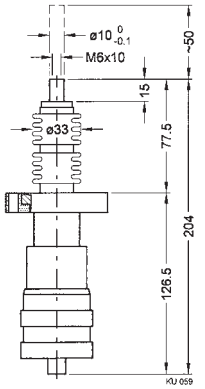
FPU040-H



FPU016-Z



FPU040-Z



Electrical Feedthroughs

DN 16 ISO–KF

Selection Data

Vacuum connection		DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Number of feedthroughs		4	9	9
Voltage per pole	V	50	50	50
Current per pole	A	1	2	2

Ordering Information

Feedthrough	**214-111**	**214-112**	**214-113**
Connector: vacuum side	**–**	**–**	**214-191**
Connector: atmospheric side	**214-171**	**214-172**	**214-172**

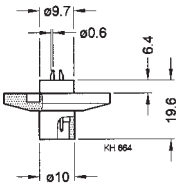
Specifications

Connection				
Vacuum side		solder connection	solder connection	connector
Atmospheric side		connector	connector	connector
Diameter of connecting wire	mm	0.6	1.2	1.2
Tightness	mbar l/s		1×10^{-9}	
Pressure (absolute)			1×10^{-8} mbar ... 2.5 bar	
Bakeout temperature (feedthrough and connector)	°C		130	
Housing			stainless steel 303/1.4305	
Insulator			PEEK / Araldite	
Seal			FPM	
Contacts (feedthrough and connector)			gold-plated bronze	

DN 16 ISO–KF - continued

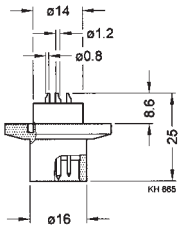
Dimensions

214-111



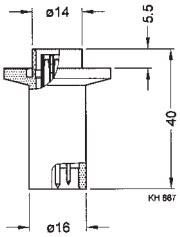
Feedthrough

214-112



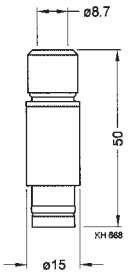
Feedthrough

214-113



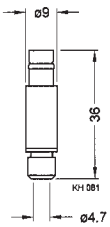
Feedthrough

214-191

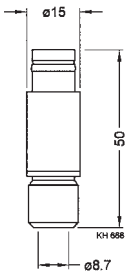


Connector:
vacuum side

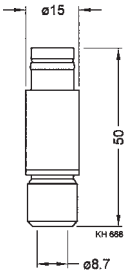
214-171



214-172



214-172



Connector:
air side

Electrical Feedthroughs

DN 40 ISO KF

Selection Data

Vacuum connection		DN 40 ISO - KF	DN 40 ISO - KF	DN 40 ISO - KF	DN 40 ISO - KF
Number of feedthroughs		7	7	4	1
Voltage per pole	V	380	380	800	6000
Current per pole	A	16	16	16	25

Ordering Information

Feedthrough	**214-121**	**214-122**	**214-123**	**214-131**
Connector: vacuum side	**–**	**214-193**	**214-194**	**–**
Connector: atmospheric	**214-174**	**214-174**	**214-175**	**214-180**

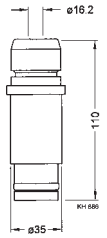
Specifications

Connection					
Vacuum side		solder connection	connector	connector	bolted connection
Atmospheric side		connector	connector	connector	connector
Diameter of connecting wire	mm	1.8	1.8	2.5	5
Test voltage	kV/HZ	–	–	–	15/50
Pressure (absolute)		1 x 10^{-8} mbar ... 2.5bar			
Bakeout temperature (feedthrough and connector)	°C	130			
Housing		stainless steel 303/1.4305			
Insulator		PTFE/Araldite			
Seal		FPM			
Contact (feedthrough and connector)		gold-plated bronze	gold-plated bronze	gold-plated bronze	nickel-plated brass

DN 40 ISO KF - continued

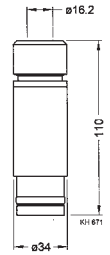
Dimensions

214-193



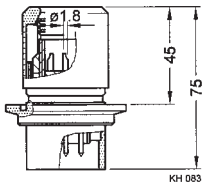
Connector:
vacuum side

214-194



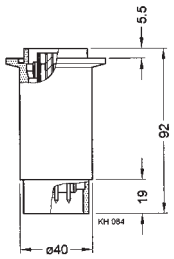
Connector:
vacuum side

214-121



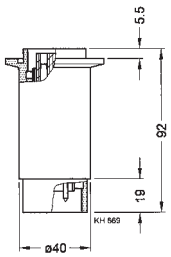
Feedthrough

214-122



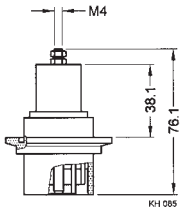
Feedthrough

214-123



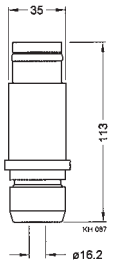
Feedthrough

214-131



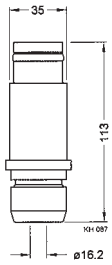
Feedthrough

214-174



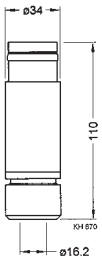
Connector:
air side

214-174



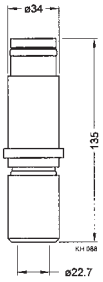
Connector:
air side

214-175



Connector:
air side

214-180



Connector:
air side

Electrical Feedthroughs

DN 16 CF

Selection Data

Vacuum connection		DN 16 CF-F
Number of feedthroughs		1
Voltage per pole	kV	0.3
Current per pole	A	120

Ordering Information

Feedthrough	**214-126**
Connection piece: vacuum side	**214-195**
Connector: atmospheric side	**214-176**

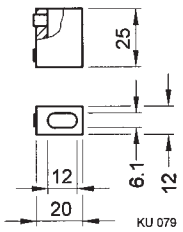
Specifications

Bakeout temperature	°C	400
Tightness	mbar l/s	5×10^{-11}
Pressure (absolute)		1×10^{-10} mbar ... 2 bar
Flange		stainless steel 304/1.4301
Conductor		OF-copper 2.0040
Insulator		aluminum oxide ceramic Al_2O_3
Weight		0.15
Connection piece: vacuum side		2
Current max.		100
Bakeout temperature	°C	400
Material		stainless steel 304/1.4301
Connector: atmospheric side	Pieces	2
Current max.	A	100
Insulated, for use up to	VAC/VDC	not insulated
Bakeout temperature	°C	150
Contact		silver-plated brass

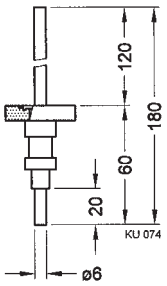
DN 16 CF - continued

Dimensions

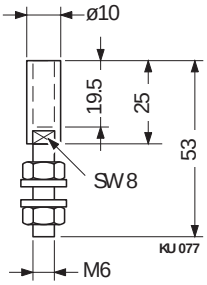
214-126



214-195



214-176



Electrical Feedthroughs

DN 40 CF

Selection Data

Vacuum connection		DN 40 CF-F	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Number of feedthroughs		1	1	2	4	9
Voltage per pole	kV	0.3	1	0.3	1	1
Current per pole	A	70	200/1000 [1]	70	8	8

1) With water-cooling

Ordering Information

Feedthrough	**214-136**	**214-127**	**214-128**	**214-116**	**214-117**
Connection piece: vacuum side	**214-195**	**214-196**	**214-195**	**214-192**	**214-198**
Connector: atmospheric side	**214-176**	**214-177**	**214-176**	**214-173**	**214-181**
Connector: atm. side, H_2O cooled	**–**	**214-178**	**–**	**–**	**–**

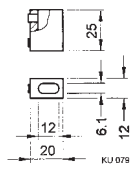
Specifications

Bakeout temperature	°C	400				
Tightness	mbar l/s	5×10^{-11}				
Pressure (absolute)		1×10^{-10} mbar ... 2 bar				
Flange		304/1.4301	304/1.4301	304/1.4301	304/1.4301	304/1.4301
Conductor		OFC 2.0040	OFC 2.0040	OFC 2.0040	304/1.4301	304/1.4301
Insulator		Al_2O_3	Al_2O_3	Al_2O_3	Al_2O_3	Al_2O_3
Weight		0.15	0.5	0.45	0.3	0.5
Connection piece: vacuum side		2	1	2	5	10
Current	A	20	1000[1]	100	12	12
Bakeout temperature	°C	400	400	400	400	400
Material		304/1.4301	2.0061	304/1.4301	304/1.4301	304/1.4301
Connector: atmospheric side	Pieces	2	1	2	5	10
Current max.	A	100	250	100	25	25
Insulated, for use up to	VAC/VDC	not insulated	30/60	30/60	30/60	30/60
Bakeout temperature	°C	150	150	50	50	50
Contact		silver-plated brass	silver-plated brass	silver-plated brass	gold-plated brass	gold-plated brass

DN 40 CF - continued

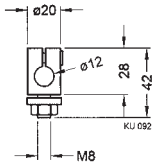
Dimensions

214-195



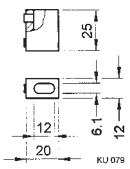
Connector vacuum side

214-196



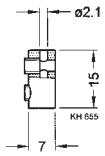
Connector vacuum side

214-195



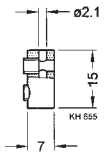
Connector vacuum side

214-192



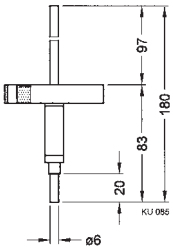
Connector vacuum side

214-198



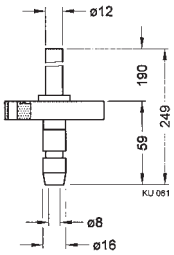
Connector vacuum side

214-136



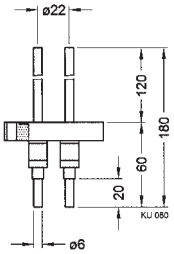
Feedthrough

214-127



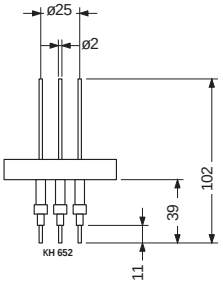
Feedthrough

214-128



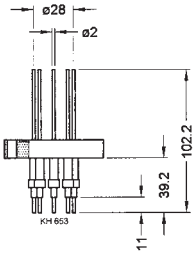
Feedthrough

214-116



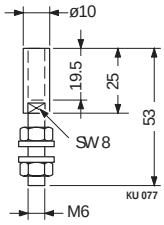
Feedthrough

214-117



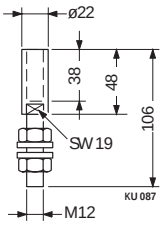
Feedthrough

214-176

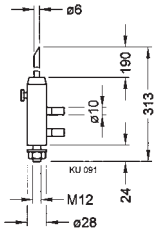


Connector air side

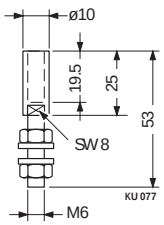
214-177



Connector air side

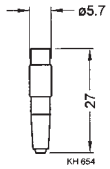


214-176



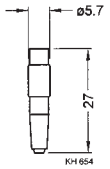
Connector air side

214-173



Connector air side
With soldered joint

214-181



Connector air side
With soldered joint

With water-proof [1]		
Current max.	A	1000
Not insulated, for use up to		24
Bakeout temperature	°C	120
Contact		silver-plated brass

High Current Feedthrough

DN 40 ISO KF

Properties

- Selection of three electrodes
- Slide into mounted feedthrough
- Current connection with water cooling

Selection Data

Vacuum connection		DN 40 ISO-KF
Number of feedthroughs		1
Voltage	V	100
Current	A	250/1500 [1]

[1] With water cooling

Ordering Information

Feedthrough with O-ring KF40	**214-141**
Current connection with water cooling [2]	**214-145**
Straight electrode	**214-142**
Angle electrode	**214-143**

[2] Not insulated

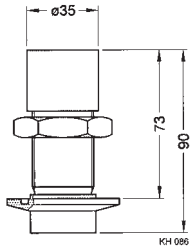
Specifications

Tightness	mbar l/s	1×10^{-9}
Pressure (absolute)		1×10^{-8} mbar ... 2.5 bar (max. 10 bar with external centering ring)
Bakeout temperature	°C	110
Housing		aluminum 6063/3.2315
Insulator		thermoplast and thermoset
Seal		FPM

DN 40 ISO KF - continued

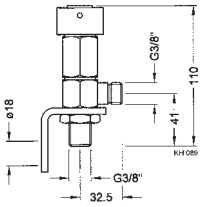
Dimensions

214-141



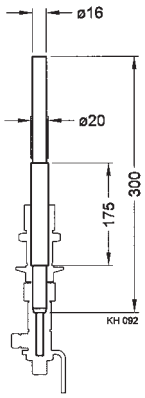
Feedthrough

214-145



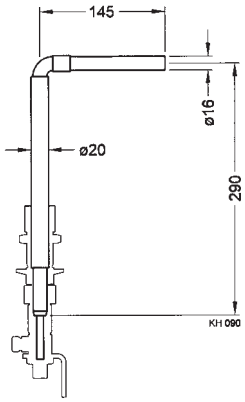
Current connection
with water cooling
copper/brass

214-142



Electrodes copper/brass

214-143



Electrodes copper/brass

Coaxial Feedthroughs ISO–KF / CF–F

BNC / MHV DN 16 – 40

Properties

- Based on MIL-C-39012A
- Voltage up to 5 kV DC
- With atmospheric connector

Selection Data

Vacuum connection	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 CF-F	DN 16 CF-F	DN 40 CF-F
Number of feedthroughs	1	1	1	1	3

Ordering Information

Type	**BNC**	**MHV**	**BNC**	**MHV**	**MHV**
Part No.	**214-151**	**214-152**	**214-155**	**214-156**	**214-157**

Specifications

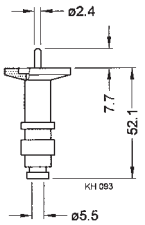
Voltage						
AC, 50 Hz	kV	0.35	3.5	0.35	3.5	3.5
DC	kV	0.5	5	0.5	5	5
Current	A	3	3	3	3	3
Frequency	MHz	150		150		
Impedance	Ω	50-60		50-60		
Insulation resistance at 20°C	Ω	10^{10}	10^{10}	10^{10}	10^{10}	10^{10}
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}	1×10^{-10}	1×10^{-10}	1×10^{-10}
Pressure (absolute) [1]		1×10^{-8} mbar to 2.5 bar	1×10^{-8} mbar to 2.5 bar	1×10^{-10} mbar to 10 bar	1×10^{-10} mbar to 10 bar	1×10^{-10} mbar to 10 bar
Housing, flange, conductor		stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
Feedthrough, seal		Al_2O_3	Al_2O_3	Al_2O_3	Al_2O_3	Al_2O_3
Bakeout temperature						
With connector	°C	50	50	50	50	50
Without connector	°C	200	200	400	400	400
Standart connection						
Atmospheric connector		UG 88/U	UG 932/U	UG 88/U	UG 932/U	UG 932/U
Cable		RG 58/U	RG 59/U	RB 58/U	RG 59/U	RG 59/U
Weight	kg	0.1	0.1	0.14	0.14	0.5

[1] Pressure at 400°C : 2 bar

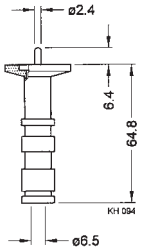
BNC / MHV DN 16 – 40 - continued

Dimensions

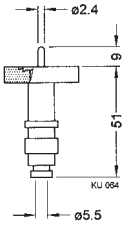
214-151



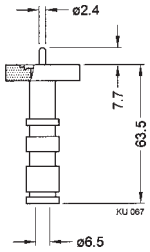
214-152



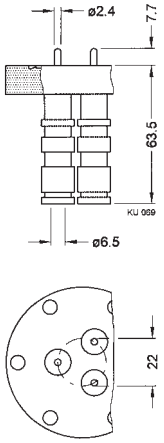
214-155



214-156



214-157



Vacuum Feedthroughs

METAL–CERAMIC CONNECTIONS

Properties

- High grade materials allow repeated bakings up to 400°C

Selection Data

Voltage [1]	3 kV	2 kV	5 kV	10 kV

Ordering Information

Part No.	**214-161**	**214-162**	**214-163**	**214-164**

Specifications

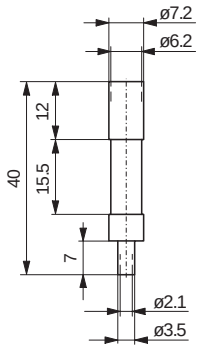
Insulator		Al_2O_3	Al_2O_3	Al_2O_3	Al_2O_3
Connection					
a		Fe-Ni	Fe-Ni	Fe-Ni	Fe-Ni
b		Fe-Ni	stainless steel 304/1.4301	stainless steel 304/1.4301	stainless steel 304/1.4301
Bakeout temperature	°C	400	400	400	400
Tightness	mbar l/s	5×10^{-11}	5×10^{-11}	5×10^{-11}	5×10^{-11}
Weight	g	5	12	25	90

[1] Based on VDE 0110 for air and surface-leakage in atmosphere on both sides.
Higher values up to factor two are admissible in pressures $<10^{-4}$ mbar.

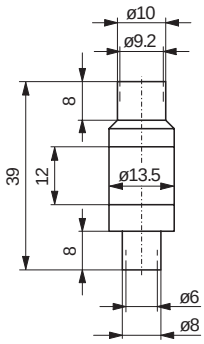
METAL–CERAMIC CONNECTIONS - continued

Dimensions

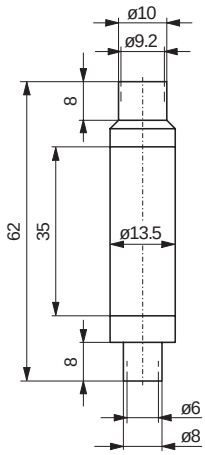
214-161



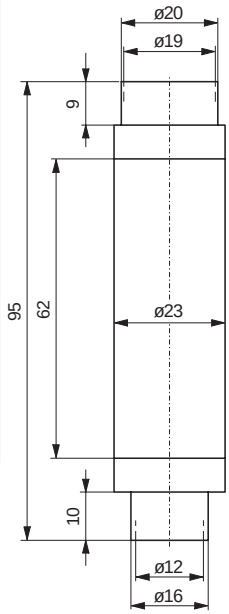
214-162



214-163



214-164



Liquid Feedthroughs ISO–KF / CF–F

DN 40

Properties

- For H_2O and LN_2
- Thermically insulated
- Specially suited for very hot and very cold applications

Selection Data

Vacuum connection		DN 40 ISO-KF	DN 40 CF-F
Feedthrough/seal		welded	welded
Tube dimensions	mm	Ø 8 x 1	Ø 8 x 1
Number of tubes		2	2

Ordering Information

Part No.		**214-101**	**214-102**

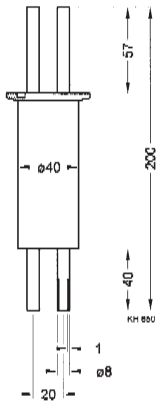
Specifications

Tightness	mbar l/s	1×10^{-9}	1×10^{-10}
Pressure		10^{-8} mbar ... 10 bar	10^{-9} mbar ... 10 bar
Temperature range	°C	-200 ... +150	-200 ... +400
Material		stainless steel 304/1.4301	stainless steel 304/1.4301
Weight	kg	0.3	0.4

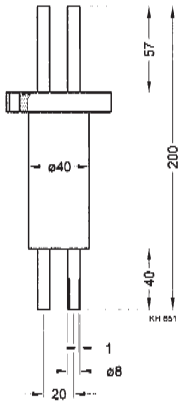
DN 40 – continued

Dimensions

214-101

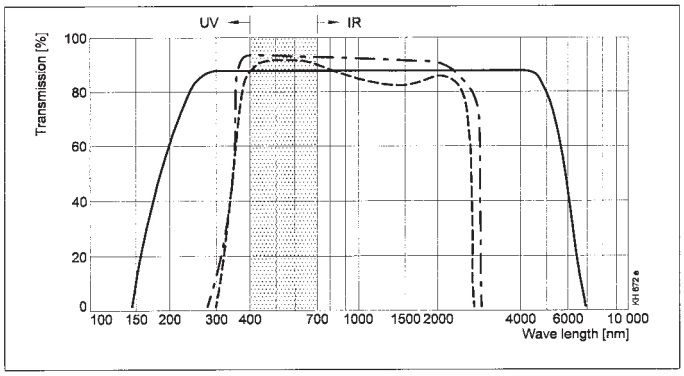


214-102



Viewports

DN 25 – DN 50 ISO–KF



Average transmittance curve

——— Sapphire

—·— Kodial

– – – Borosilicate

Properties

- Wide viewing angle

Selection Data

Vacuum connection		DN 25 ISO-KF	DN 40 ISO-KF	DN 50 ISO-KF
Window			borosilicate glass	
Seal			FPM	
Flange			aluminum 6082/3.2315	
Bakeout temperature	°C		150	

Ordering Information

Part No.	**214-003**	**214-004**	**214-005**

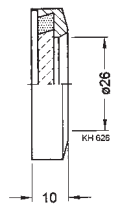
Specifications

Tightness	mbar l/s		1×10^{-9}	
Pressure (absolute)			1×10^{-8} mbar ... 4 bar	
Max. at 150°C	bar		3	
Window thickness	mm		3.8	
Weight	g	20	30	40

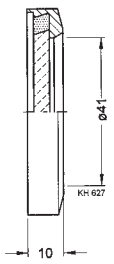
DN 25 – DN 50 ISO-KF - continued

Dimensions

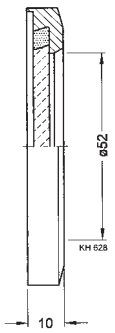
214-003



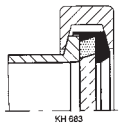
214-004

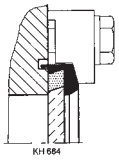


214-005



Mounting

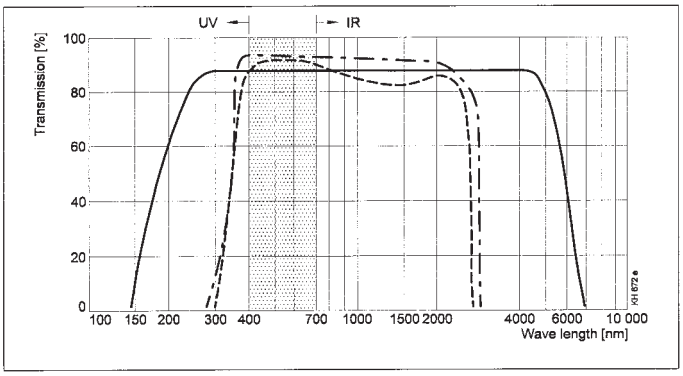




Claws, screws and clamping ring not included

Viewports

DN 63 – DN 160 ISO-K



Average transmittance curve

——— Sapphire

—·— Kodial

– – – Borosilicate

Properties

- Wide viewing angle

Selection Data

Vacuum connection		DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Window			borosilicate glass	
Seal			FPM	
Flange			aluminum 6082/3.2315	
Bakeout temperature	°C		150	

Ordering Information

Part No.	**214-006**	**214-007**	**214-008**

Specifications

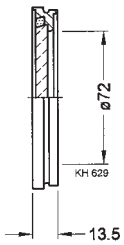
Tightness	mbar l/s		1×10^{-9}	
Pressure (absolute)			1×10^{-8} mbar ... 2 bar	
Max. at 150°C	bar		1	
Window thickness	mm	6	8	10
Weight	kg	0.2	0.3	0.4

[1] Claws not included

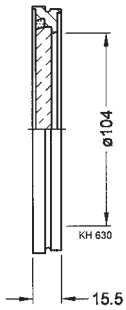
DN 63 – DN 160 ISO–K - continued

Dimensions

214-006



214-007



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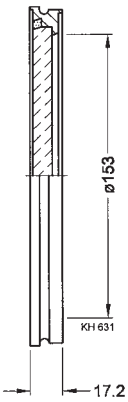
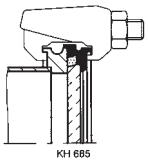
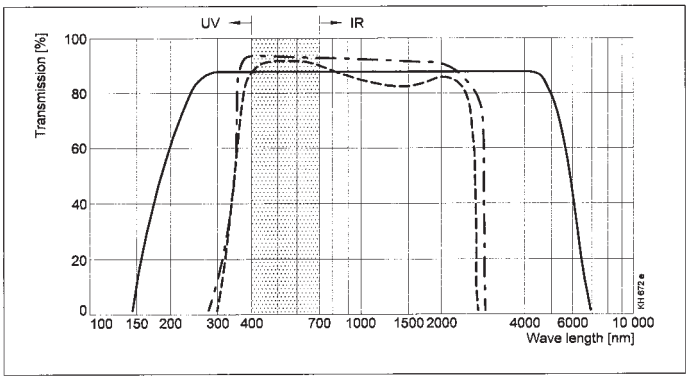


Mounting



Viewports

DN 16 – DN 160 CF



Average transmittance curve

——— Sapphire

—·— Kodial

– – – Borosilicate

Properties

- Protection window
- With Fe-Ni alloy as transition material

Selection Data

Vacuum connection		DN 16 CF-F	DN 40 CF-F	DN 40 CF-F	DN 63 CF-F	DN 100 CF-F	DN 160 CF-F
Window		kodial glass	kodial glass	sapphire glass	kodial glass	kodial glass	kodial glass
Seal		iron/nickel					
Flange		stainless steel 304/1.4301					
Bakeout temperature	°C	400					

Ordering Information

Viewport	**214-021**	**214-022**	**214-032**	**214-023**	**214-024**	**214-025**
Bolt set	**213-416**	**standard**	**standard**	**standard**	**standard**	**standard**

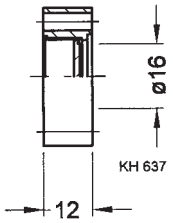
Specifications

Tightness	mbar l/s	5×10^{-11}					
Pressure (absolute)							
Min.	mbar	1×10^{-10}					
Max.	bar	2					
Max. at 400°C	bar	1					
Window thickness	mm	1.5	3	3	3.5	6	8
Weight	kg	0.04	0.24	0.35	0.85	1.4	2.8

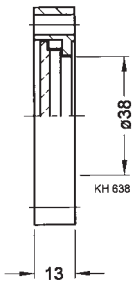
DN 16 – DN 160 CF - continued

Dimensions

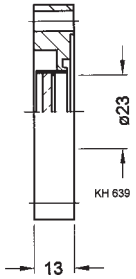
214-021



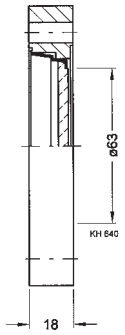
214-022



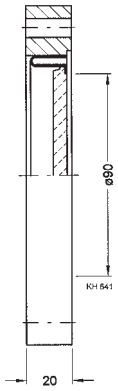
214-032



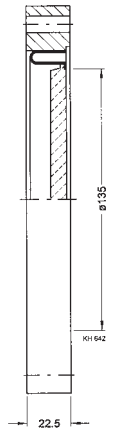
214-023



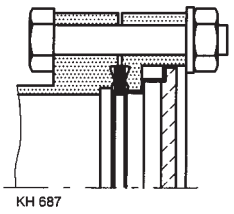
214-024



214-025

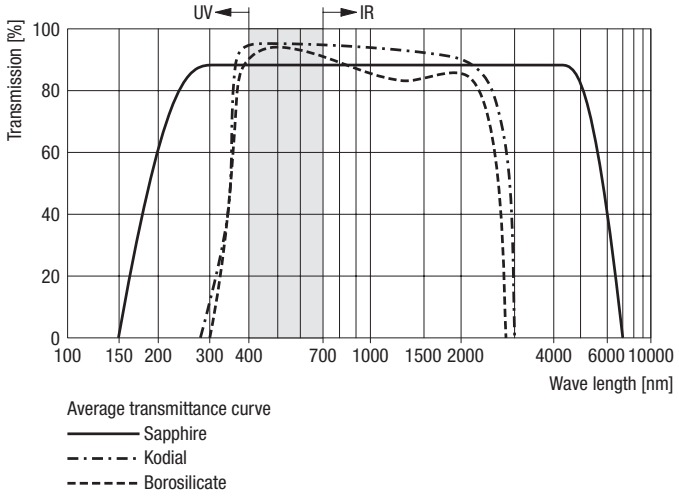


Mounting



Viewports

DN 63 – DN 160 ISO–F



Properties

- Wide viewing angle

Selection Data

Vacuum connection		DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F
Window			borosilicate glass	
Seal			FPM	
Flange			black anodized aluminum 6063/3.2315	
Centering ring			aluminum 6063/3.2315	
Snap ring			stainless steel 304/1.4301	
Bakeout temperature	°C		150	

Ordering Information

Viewport [1]	Part No.	**214-016**	**214-017**	**214-018**
Protective glass, 5 pcs.	Part No.	**214-046**	**214-047**	**214-048**

[1] Claws, bolts, nuts and washer included

Specifications

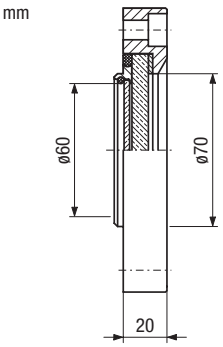
Tightness	mbar l/s		1×10^{-9}	
Pressure (absolute)			1×10^{-8} mbar ... 2 bar	
Max. at 150°C	bar		1	
Window thickness	mm	7.5	11	15
Protective glass thickness	mm	2.5	2.5	2.5
Weight	kg	0.8	1.4	3

DN 63 – DN 160 ISO–F - continued

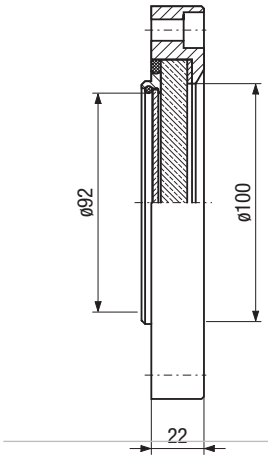
Dimensions

214-016

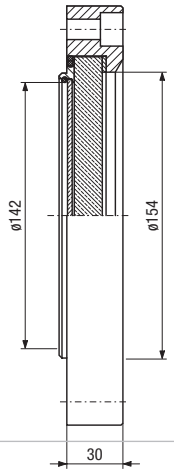
mm



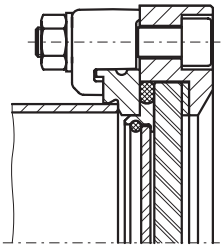
214-017



214-018



Mounting



Vacuum Feedthroughs

VACUUM BALL BEARINGS

Properties

- Specially suited for clean vacuum applications and extreme residual gas requirements
- With shields (non-rubbing seals)
- With dry lubrication
- Bearing clearance

Selection Data

Service life [1] (revolutions)		> 20 Mio.
Pressure (absolute)	mbar	1×10^{-12} ... 1×10^{-2}
Operating temperature [2]	°C	-200 ... +300
Material		stainless steel 440C/1.3543, 304/1.4301

Ordering Information

Type		**624**	**605**	**626**	**608**	**6000**	**6001**
Part No.		**214-211**	**214-212**	**214-213**	**214-214**	**214-215**	**214-216**

Specifications

Rotational speed at							
20°C	rpm	5000	4000	3000	2500	2000	1500
300°C	rpm	1500	1500	1000	800	500	300
Load capacity [3]							
Static C0	N	400	400	800	1000	1500	2000
Dynamic C	N	50	50	100	150	200	250
Axial load		<<C	<<C	<<C	<<C	<<C	<<C
Fit according to ISO		G6 / f6	G6 / f6	G6 / f6	G6 / f6	G6 / f6	G6 / f6
Weight	g	3	4	8	13	20	25

[1] At half load and > 1000/min

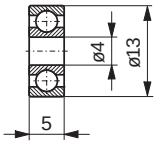
[2] At -200°C reduction of tenacity

[3] At 20°C; half value at 300°C

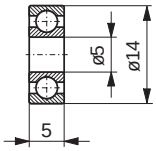
VACUUM BALL BEARINGS – continued

Dimensions

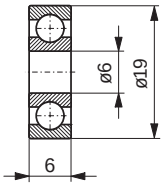
214-211



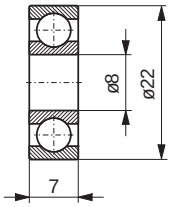
214-212



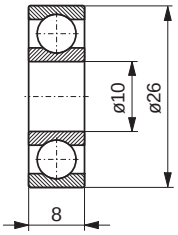
214-213



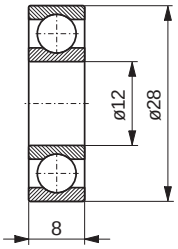
214-214



214-215



214-216



[mm]

Vacuum Feedthroughs

LUBRICANTS AND SEALING MATERIALS

High Temperature Lubricant

- Prevents seizing of stainless steel screw connections at atmosphere even at high temperatures
- Remains fully effective at least 10 bakeout cycles

Selection Data

Temperature resistance	1000°C
In packages of	28 g

Ordering Information

Type	**C 100**
Part No.	**214-231**

Sealing Material

- For sealing small leaks

Selection Data

Temperature resistance	°C	-40 - 200	350
Version		Paste	Spray
In packages of	g	200	170

Ordering Information

Type	**Rhodosil 340**	**Sprayseal**
Part No.	**214-233**	**214-234**

LUBRICANTS AND SEALING MATERIALS - continued

Vacuum Grease/Oil

- For sliding elastomer seals
- Low vapor pressure
- Good adhesiveness

Selection Data

Temperature resistance	°C	10 - 30	-40 - 200	-20 - 200	-60 - 300	-60 - 300
Vapor pressure at						
20°C	mbar	$<10^{-8}$	$<5 \times 10^{-7}$	$< 10^{-12}$	$< 10^{-12}$	$< 10^{-12}$
100°C	mbar		$<7 \times 10^{-6}$	$< 10^{-7}$	$< 10^{-7}$	$< 10^{-7}$
In packages of		25 g	50 g	10 g	30 g	10 ml
Material		mineral grease	silicon grease	fluorinated grease	fluorinated grease with MoS_2	fluorinated oil

Ordering Information

Type	**Apezon M**	**Dow Corning**	**FU 090**	**FM 090**	**OL 090**
Part No.	**214-236**	**214-237**	**214-238**	**214-239**	**214-240**

Characteristics

Lubricity	very good	good	good	good/very good	good
Resistance to					
Oxidation		very good	very good	very good	very good
Chemicals		good	very good	very good	very good
Thermal decomposition		very good	good	good	good

Vacuum Valves

VACUUM VALVES

VACUUM VALVES (continued)

Angle and Inline Valves (VAH, VAP, VAM, VIM)

DN 5

Manually Actuated

- Angle valve
- Spindle drive

Pneumatically Actuated

- Angle valves
- With and without pilot valve

Solenoid Actuated

- Angle and inline valves

Selection Data

Actuation		manual	pneumatic	el.-pneumatic	solenoid	solenoid	solenoid
Feedthrough		bellows	bellows	bellows	without	without	without
Vacuum connection	mm	Ø5 / M 14 x 1	Ø5 / M 14 x 1	Ø5 / M 14 x 1	Ø5 / M 14 x 1	Ø5 / M 14 x 1	Ø5 / M 14 x 1
Service life[1)]	cycles	–	5 Mio	5 Mio	2 Mio	2 Mio	2 Mio
Attributes		angle valve	angle valve w/o pilot valve	angle valve with pilot valve	angle valve	inline valve normally closed	inline valve normally open

[1)] Under clean operating conditions

Ordering Information

Type	VAH005-X	VAP005-X	VAP005-X	VAM005-X	VIM005-X	VIM005-Z
Valve / Part No.	**250-070**	**250-040**	**–**	**–**	**–**	**–**
Normally closed	**–**	**–**	**250-050**	**250-000**	**250-010**	**–**
Normally open	**–**	**–**	**250-060**	**–**	**–**	**250-020**

Spare Parts

Seal set	**215-373**	**215-372**	**215-372**	**215-371**	**215-371**	**215-371**
Spare parts set	**215-369**	**215-368**	**215-368**	**215-365**	**215-366**	**215-367**

Connection Elements

Type	Flange DN 10 ISO-KF	For pipe OD 1/4“	For pipe OD 6mm
Part No.	**250-080**	**250-085**	**250-086**

DN 5 – continued

Specifications

Type Actuation		VAH005-X manual	VAP005-X pneumatic	VAP005-X el.-pneumatic	VAM005-X solenoid	VIM005-X solenoid	VIM005-Z solenoid
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}
Conductance for air							
Molecular flow	l/s	0.4	0.4	0.4	0.3	0.2	0.2
Laminar flow	l/s	4	4	4	3	2	2
Pressure range (absolute)	mbar … bar	10^{-8} … 4	10^{-8} … 4	10^{-8} … 4	10^{-8} … 10	10^{-8} … 10	10^{-8} … 10
Pressure difference Δp							
In closing direction	bar	4	3	3	5	5	4
In opening direction	bar	4	3	3	1.5	1.5	2
Opens against Δp[1]	bar	4	3	3	1	1	4
Temperature							
Ambient	°C	5[2] … 70	5[2] … 80	5[2] … 40	5[2] … 40	5[2] … 40	5[2] … 40
Closing time	ms	–	35 / 35	35 / 35	7 / 30	7 / 30	30 / 10
Opening time	ms	–					
Switching frequency	1/min	–	150	150	300	300	300
Degree of protection		–	IP 65	IP 65	IP 65	IP 65	IP 65
Supply voltage/	V DC	–	–	24	24	24	24
Power consumption	W	–	–	1	10	10	10
Materials							
Housing		304/1.4301	304/1.4301	304/1.4301	304/1.4301	304/1.4301	304/1.4301
Actuator		Al & plastic	anodized Al	anodized Al	–	–	–
Bellows		304/1.4301	304/1.4301	304/1.4301	–	–	–
Valve plate		304/1.4301	304/1.4301	304/1.4301	–	–	–
Guiding tube		–	–	–	303/1.4105	303/1.4105	303/1.4105
Armature		–	–	–	303/1.4105	303/1.4105	303/1.4105
Seals		FPM	FPM	FPM	FPM	FPM	FPM
Weight	kg	0.15	0.20	0.20	0.26	0.28	0.30

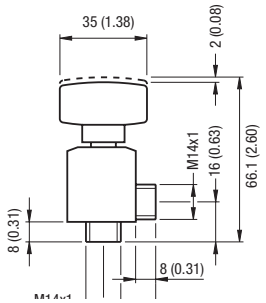
[1] Compressed air: overpressure 4 bar

[2] –15°C, if the ambiance is free of condensable gases

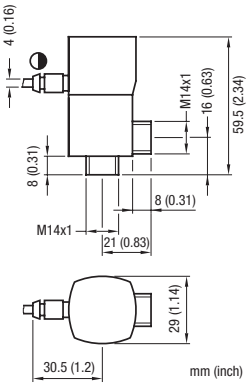
DN 5 – continued

Dimensions

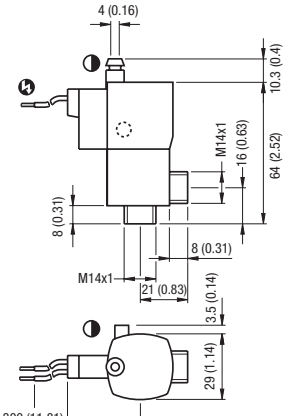
VAH005-X



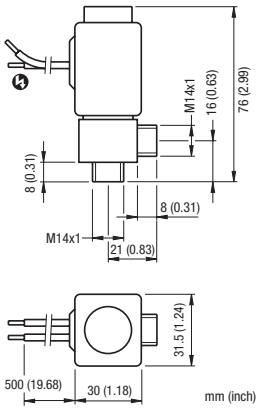
VAP005-X



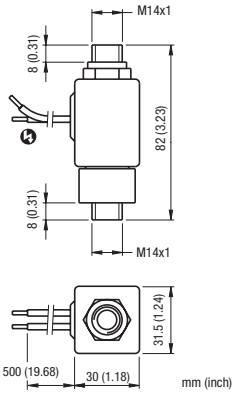
VAP005-X



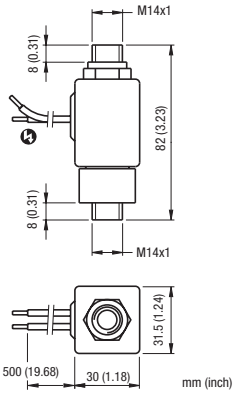
VAM005-X

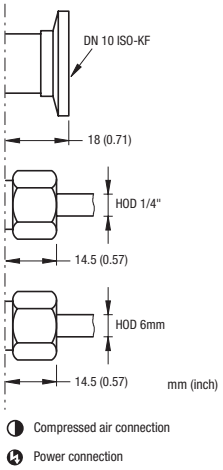


VIM005-X



VIM005-Z





Angle and Inline Valves (VAH, VIH) Manually Actuated

VAH016 ... 040-A/X

VIH016 ... 040-A/X

The INFICON ISO-KF valve line, VAH / VIH016 … 040-A/X performs as a gauge isolation, bypass, roughing or venting valve and is well suited for all general high vacuum and semiconductor processes. The improved industrial design results in a rugged, compact, easy to operate valve. The visual position indicator shows the open / close status of the valve for clear understanding of valve status. The extremely long service life and easy to maintain design results in a highly reliable valve with low cost of ownership. The new line is compatible with the current INFICON VAH / VIH016 … 040-A/X valve line.

Advantages

- Ergonomically designed knob for secure grip
- Fast open / close actuation with one 130° turn; or a soft continuously variable actuation for controlled venting / pumping of vacuum systems
- Low operating force required, even if the valve is opened against vacuum
- Drive locks into final open / close position
- Visual position indicator, standard
- 316L stainless steel bellows
- Easy maintenance, fast bellows and seal replacement
- High conductance for fast pump down or venting
- High differential pressure resistance
- FPM sealing standard, other sealing materials available upon request
- High purity aluminum or stainless steel housing

VAH016 ... 040–A/X

VIH016 ... 040–A/X – continued

Selection Data

Vacuum connection		DN 16 ISO-KF		DN 25 ISO-KF		DN 40 ISO-KF	
Aluminum housing	AISI/DIN	-/EN AW-6082		-/EN AW-6082		-/EN AW-6082	
Stainless steel housing	AISI/DIN		304/1.4301		304/1.4301		304/1.4301

Ordering Information

Angle Valve

Type	VAH016-A	VAH016-X	VAH025-A	VAH025-X	VAH040-A	VAH040-X
	253-200	253-245	253-300	253-345	253-400	253-445

Inline Valve

Type	VIH016-A	VIH016-X	VIH025-A	VIH025-X	VIH040-A	VIH040-X
	253-225	253-265	253-325	253-365	253-425	253-465

Specifications

Cycle life	Cycles	10000		10000		10000	
Conductance for molecular flow							
Angle valve	l/s	5		14		45	
Inline Valve	l/s	2.5		7		20	
Tightness	mbar l/s	1×10^{-9}		1×10^{-9}		1×10^{-9}	
Operating pressure min. / max.	mbar / bar	1×10^{-8} / 2		1×10^{-8} / 2		1×10^{-8} / 1.5	
Pressure, max. (absolute)	bar	4		4		4	
Pressure difference							
In closing direction	bar	4		4		2	
In opening direction	bar	2		2		1.5	
Ambiance temperature	°C	0 … +50		0 … +50		0 … +50	
Mounting orientation		any		any		any	
Seals		FPM		FPM		FPM	
Weight							
Angle valve	kg	0.31	0.34	0.42	0.49	0.85	0.96
Inline valve	kg		0.71		1.09		1.83

Spare Parts

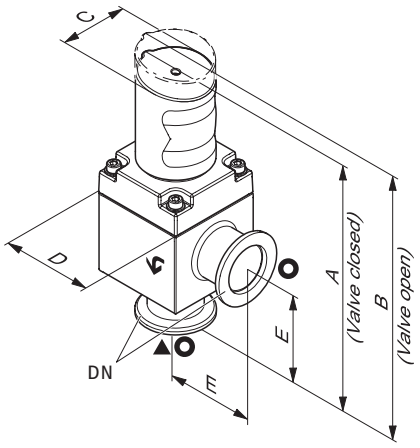
Vacuum connection	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Seal kit O-rings for one valve	299-001	299-006	299-011
Bellows cpl. Bellows & seal kit	299-002	299-007	299-012

VAH016 ... 040–A/X

VIH016 ... 040–A/X – continued

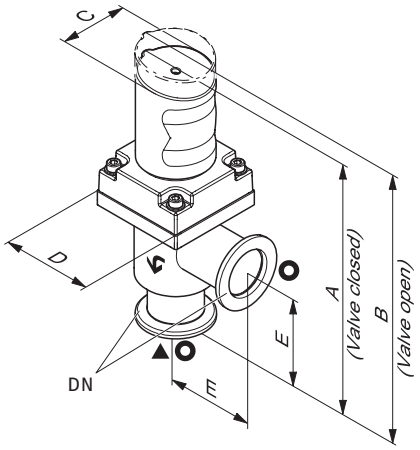
Dimensions Angle Valve

Aluminum housing



DN	A	B	C	D	E
DN 16 ISO-KF	141.3	149.5	39.6	45	40
DN 25 ISO-KF	145.3	155.7	39.6	54	50
DN 40 ISO-KF	186.2	201.4	50	69	65

Stainless steel housing



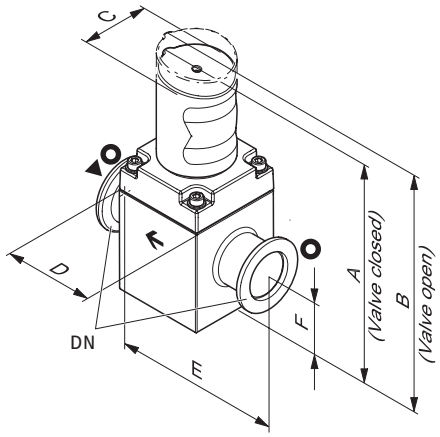
DN	A	B	C	D	E
DN 16 ISO-KF	143.9	152.1	39.6	45	40
DN 25 ISO-KF	148.7	159.1	39.6	54	50
DN 40 ISO-KF	189.2	204.4	50	69	65

- Protective lid
- Valve seat site
- Flow direction

VAH016 ... 040–A/X

VIH016 ... 040–A/X – continued

Dimensions Inline Valve



Protective lid

Valve seat site

Flow direction

Aluminum housing [mm]

DN	A	B	C	D	E	F
DN 16 ISO-KF	132.4	140.6	39.6	45	80	18.7
DN 25 ISO-KF	136	146.4	39.6	54	100	25
DN 40 ISO-KF	174.5	189.7	50	69	130	30

Stainless steel housing [mm]

DN	A	B	C	D	E	F
DN 16 ISO-KF	125.4	133.6	39.6	45	80	20
DN 25 ISO-KF	132	142.4	39.6	54	100	31.8
DN 40 ISO-KF	166.5	181.7	50	69	130	40.8

Diaphragm Valves Manually Actuated

VIH016 ... 040–AD

The INFICON ISO-KF diaphragm valve line, VIH016 … 040-AD performs as a gauge isolation, roughing or venting valve. The manual spindle drive allows easy gas dosing. The robust and rugged industrial design is well suited for gases and liquids and is resistant to contamination.

Advantages

- Spindle drive for controlled venting and easy dosing
- Low operating force required
- Visual position indicator
- FPM diaphragm sealing; other sealing materials on request
- Aluminum inline housing EN AW-6082
- Easy maintenance, fast diaphragm seal replacement
- Small footprint and easy system integration

Ordering Information Selection Data

Type	VIH016-AD	VIH025-AD	VIH040-AD
	253-481	253-482	253-483

Spare Parts

Diaphragm (1 piece)	299-031	299-032	299-033

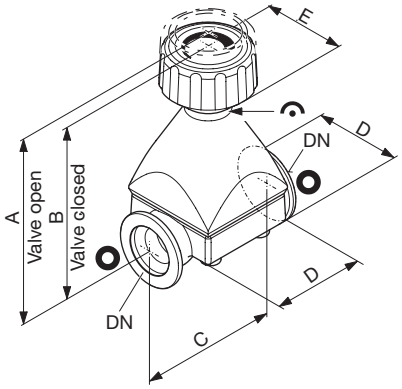
VIH016 ... 040–AD – continued

Specifications

		VIH016-AD	VIH025-AD	VIH040-AD
Vacuum connection		DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Cycle life	Cycles	>10000	>10000	>10000
Conductance for molecular flow	l/s	2	5	17
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}	1×10^{-9}
Operating pressure min. / max.	mbar / bar	1×10^{-7} / 5	1×10^{-7} / 5	1×10^{-7} / 5
Pressure, max. (absolute)	bar	5	5	5
Ambiance temperature	°C	0 … +50	0 … +50	0 … +50
Mounting orientation		any	any	any
Diaphragm		FPM	FPM	FPM
Weight	kg	0.16	0.5	1.2

Dimensions

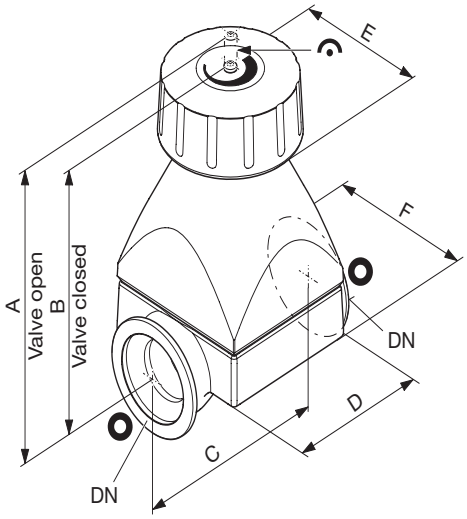
VIH016-AD, VIH025-AD



Protective lid

Visual position indicator

VIH040-AD



[mm]

DN	A	B	C	D	E	F
DN 16 ISO-KF	66	62	52	32.5	29.5	–
DN 25 ISO-KF	111	101	80	54	47	–
DN 40 ISO-KF	148.5	134.5	105	75	69.5	80

Angle and Inline Valves (VAP, VIP) Pneumatically Actuated

VAP016 ... 040-A/X

VIP016 ... 040-A/X

The INFICON ISO-KF valve line, VAP / VIP016 … 040-A/X performs as gauge isolation, bypass, roughing or venting valve and is well suited for all general high vacuum and semiconductor processes. The improved industrial design results in a rugged, compact, highly reliable valve with a low cost of ownership. The All-in-One concept means the valve is fast and easy to install and the pilot valve and electrical position indicator are integrated for convenient “plug and play” use. The proven All-in-One design and extremely long service lifetime makes this valve easy to maintain. The new line is fully compatible with the current INFICON VAP / VIP016 … 040-A/X valve line.

Advantages

- All-in-One design for fast and easy installation; one connector for pilot valve and electrical position indicator for easiest “plug and play”
- Direct pneumatic actuation or via integrated pilot valve
- Normally open and normally closed versions available
- Electrical and visual position indicator, standard
- 10 million cycle 316L stainless steel bellows
- Easy maintenance, fast bellows and seal replacement
- Fast opening and closing time
- High conductance for fast pump down or venting
- High differential pressure resistance
- FPM sealing standard, other sealing materials available upon request
- High purity aluminum or stainless steel housing

VAP016 ... 040–A/X

VIP016 ... 040–A/X – continued

Ordering Information
Selection Data

Vacuum connection		DN 16 ISO-KF		DN 25 ISO-KF		DN 40 ISO-KF	
Aluminum housing	AISI/DIN	-/EN AW-6060		-/EN AW-6060		-/EN AW-6060	
Stainless steel housing	AISI/DIN		304/1.4301		304/1.4301		304/1.4301

Ordering Information

Angle Valve

Type	VAP016-A	VAP016-X	VAP025-A	VAP025-X	VAP040-A	VAP040-X
Without pilot valve, with position indicator	**253-210**	**253-250**	**253-310**	**253-350**	**253-410**	**253-450**
With pilot valve, with position indicator						
24 V DC (n.c.)	**253-211**	**253-251**	**253-311**	**253-351**	**253-411**	**253-451**
24 V AC / 50 … 60 Hz (n.c.)	**253-212**	**253-252**	**253-312**	**253-352**	**253-412**	**253-452**
100 … 115 V AC / 50 … 60 Hz (n.c.)	**253-213**	**253-253**	**253-313**	**253-353**	**253-413**	**253-453**
200 … 230 V AC / 50 … 60 Hz (n.c.)	**253-214**	**253-254**	**253-314**	**253-354**	**253-414**	**253-454**
24 V DC **normally open**	**253-215**	**253-255**	**253-315**	**253-355**	**253-415**	**253-455**

Inline Valve

Type	VIP016-A	VIP016-X	VIP025-A	VIP025-X	VIP040-A	VIP040-X
Without pilot valve, with position indicator	**253-230**	**253-270**	**253-330**	**253-370**	**253-430**	**253-470**
With pilot valve, with position indicator						
24 V DC (n.c.)	**253-231**	**253-271**	**253-331**	**253-371**	**253-431**	**253-471**
24 V AC / 50 … 60 Hz (n.c.)	**253-232**	**253-272**	**253-332**	**253-372**	**253-432**	**253-472**
100 … 115 V AC / 50 … 60 Hz (n.c.)	**253-233**	**253-273**	**253-333**	**253-373**	**253-433**	**253-473**
200 … 230 V AC / 50 … 60 Hz (n.c.)	**253-234**	**253-274**	**253-334**	**253-374**	**253-434**	**253-474**
24 V DC **normally open**	**253-235**	**253-275**	**253-335**	**253-375**	**253-435**	**253-475**

VAP016 ... 040–A/X

VIP016 ... 040–A/X – continued

Specifications

Cycle life	Mio cycles	10		10		10		
Conductance for molecular flow								
Angle valve	l/s	5		14		45		
Inline Valve	l/s	2.5		7		20		
Tightness	mbar l/s	1×10^{-9}		1×10^{-9}		1×10^{-9}		
Operating pressure min. / max.	mbar / bar	1×10^{-8} / 2		1×10^{-8} / 2		1×10^{-8} / 2		
Pressure, max. (absolute)	bar	5		5		5		
Pressure difference								
In closing direction	bar	5		5		5		
In opening direction	bar	2		2		2		
Ambiance temperature	°C	0 … +50		0 … +50		0 … +50		
Switching frequency	1/min	100		100		75		
Opening time	ms	100		120		260		
Closing time	ms	100		160		540		
Electrical position indicator								
Rating	V AC/VA/A	250 / 25 / 0.1		250 / 25 / 0.1		250 / 25 / 0.1		
	V DC/W/A	50 / 12.5 / 0.25		50 / 12.5 / 0.25		50 / 12.5 / 0.25		
Compressed air, overpressure	bar	4 … 8		4 … 8		4 … 8		
Piston displacement	cm^3	4		11		35		
Mounting orientation		any		any		any		
Seals		FPM		FPM		FPM		
Weight								
Angle valve	kg	0.49	0.52	0.68	0.75	1.21	1.33	
Inline valve	kg	0.56	0.89	0.78	1.35	1.41	2.2	

Spare Parts

Vacuum connection	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Seal kit O-rings for one valve	**299-001**	**299-006**	**299-011**
Bellows cpl. Bellows & seal kit	**299-002**	**299-007**	**299-012**
Cover cpl. Receptacle, visual & electrical position indicator already assembled	**299-003**	**299-008**	**299-013**

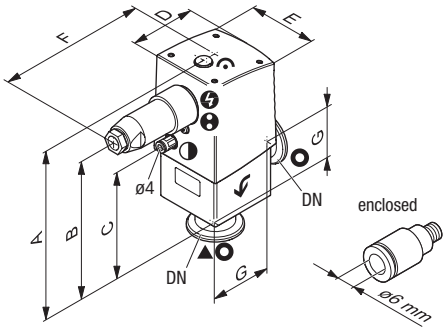
Accessories

Vacuum connection	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Cable connector right angled	**215-165**	**215-165**	**215-165**

VAP016 ... 040–A/X

VIP016 ... 040–A/X – continued

Dimensions Angle Valve

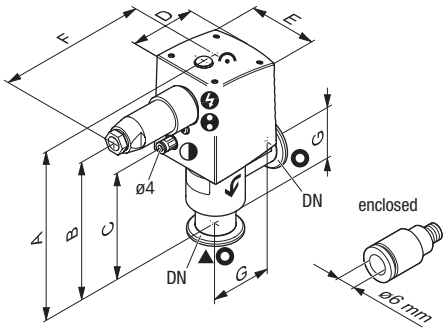


Aluminum housing [mm]

DN	A	B	C	D	E	F	G
DN 16 ISO-KF	142	112.9	75.1	55	51.4	93.2	40
DN 25 ISO-KF	146.9	117.8	79	64.3	60.1	97.8	50
DN 40 ISO-KF	188.8	159.7	114.9	81.3	75.7	105.3	65

- Compressed air connection
- Protective lid
- Electrical connection
- Flow direction
- Position indicator connection
- Valve seat site
- Visual position indicator

Dimensions Angle Valve



Stainless steel housing [mm]

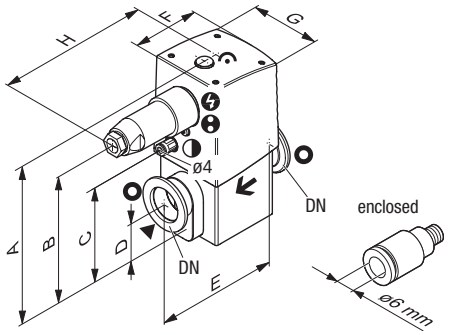
DN	A	B	C	D	E	F	G
DN 16 ISO-KF	144.5	115.4	77.6	55	51.4	93.2	40
DN 25 ISO-KF	150.3	121.2	82.5	64.3	60.1	97.8	50
DN 40 ISO-KF	191.8	162.7	117.9	81.3	75.7	105.3	65

- Compressed air connection
- Protective lid
- Electrical connection
- Flow direction
- Position indicator connection
- Valve seat site
- Visual position indicator

VAP016 ... 040-A/X

VIP016 ... 040-A/X – continued

Dimensions Inline Valve



Aluminum housing [mm]

DN	A	B	C	D	E	F	G	H
DN 16 ISO-KF	133.1	104	66.2	18.7	80	55	51.4	93.2
DN 25 ISO-KF	137.6	108.5	69.7	25	100	64.3	60	97.8
DN 40 ISO-KF	177.1	148	103.2	30	130	81.2	75.7	105.3

Stainless steel housing [mm]

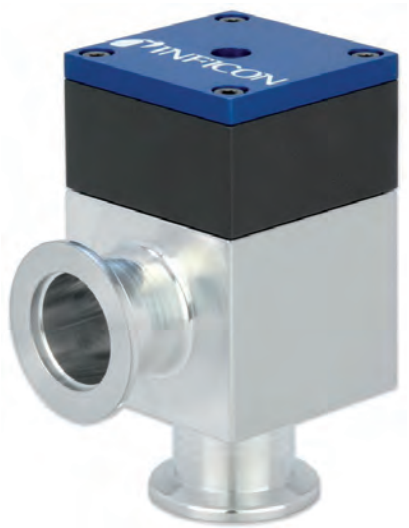
DN	A	B	C	D	E	F	G	H
DN 16 ISO-KF	126.1	97	59.2	20	80	55	51.4	93.2
DN 25 ISO-KF	133.6	104.5	65.7	31.8	100	64.3	60.1	97.8
DN 40 ISO-KF	169.1	140	95.2	40.8	130	81.3	75.7	105.3

- Compressed air connection
- Protective lid
- Electrical connection
- Flow direction
- Position indicator connection
- Valve seat site
- Visual position indicator

Angle and Inline Valves (VAP, VIP) Pneumatically Actuated

VAP016 ... 040–A/X

VIP016 ... 040–A/X



The new INFICON ISO-KF and CF-R valve line, VAP / VIP016 … 040-A/X performs as a gauge isolation, bypass, roughing or venting valve and is perfectly suited for all general high vacuum and semiconductor processes. The improved industrial design is very robust, compact and highly reliable with a low cost of ownership. This pneumatic actuated valve is designed for system manufacturers who need a compact and space saving valve unit. This valve comes with an outstanding long service life time and is very easy to maintain. It is equipped with the same approved high quality components like INFICON is using for its very successful All-in-One concept valve line.

Advantages

- Robust and very compact design
- Visual position indicator, standard
- 10 million cycle 316L stainless steel bellows
- Easy maintenance due to fast bellows and seal replacement
- Fast opening and closing time
- High conductance for fast pump down or venting
- High differential pressure resistance
- FPM sealing standard. Other sealing materials available upon request
- High purity aluminum or stainless steel housing
- CF-R flanges for stainless steel housings available

VAP016 ... 040–A/X

VIP016 ... 040–A/X – continued

Order Information Selection Data

Vacuum connection		DN 16		DN 25		DN 40	
Aluminum housing	AISI/DIN	-/EN AW-6060		-/EN AW-6060		-/EN AW-6060	
Stainless steel housing	AISI/DIN		304/1.4301		304/1.4301		304/1.4301

Ordering Information

Angle Valve ISO-KF

Type		VAP016-A	VAP016-X	VAP025-A	VAP025-X	VAP040-A	VAP040-X
Compressed air connection	Ø 4 mm	**253-220**	**253-260**	**253-320**	**253-360**	**253-420**	**253-460**
Compressed air connection	Ø ¼"	**253-222**	**253-262**	**253-322**	**253-362**	**253-422**	**253-462**

Angle Valve CF-R

Type		VAP016-A	VAP016-X	VAP025-A	VAP025-X	VAP040-A	VAP040-X
Compressed air connection	Ø ¼"	—	**253-261**	—	—	—	**253-461**

Inline Valve ISO-KF

Type		VIP016-A	VIP016-X	VIP025-A	VIP025-X	VIP040-A	VIP040-X
Compressed air connection		**253-240**	**253-280**	**253-340**	**253-380**	**253-440**	**253-480**

Specifications

Cycle life	Mio cycles	10		10		10	
Conductance for molecular flow							
Angle valve	l/s	5		14		45	
Inline Valve	l/s	2.5		7		20	
Tightness	mbar l/s	1×10^{-9}		1×10^{-9}		1×10^{-9}	
Operating pressure min. / max.	mbar / bar	1×10^{-8} / 2		1×10^{-8} / 2		1×10^{-8} / 2	
Pressure, max. (absolute)	bar	5		5		5	
Pressure difference							
In closing direction	bar	5		5		5	
In opening direction	bar	2		2		2	
Ambiance temperature	°C	0 … +50		0 … +50		0 … +50	
Bakeout temperature							
Housing	°C	120	150	120	150	120	150
Actuator	°C	120	120	120	120	120	120
Switching frequency	1/min	100		100		75	
Opening time	ms	100		120		260	
Closing time	ms	100		160		540	
Compressed air, overpressure	bar	4 … 8		4 … 8		4 … 8	
Piston displacement	cm^3	4		11		35	
Mounting orientation		any		any		any	
Seals		FPM		FPM		FPM	
Weight							
Angle valve ISO-KF	kg	0.38	0.42	0.57	0.66	1.17	1.28
Angle valve CF-R	kg	–	0.43	–	–	–	1.46
Inline valve ISO-KF	kg	0.45	0.83	0.67	1.27	1.38	2.48

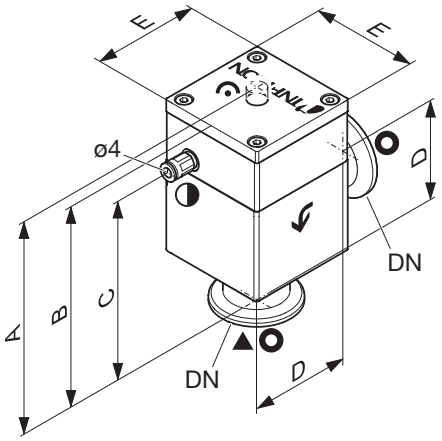
VAP016 ... 040-A/X

VIP016 ... 040-A/X - continued

Spare Parts

Vacuum connection	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Seal kit O-rings for one valve	299-001	299-006	299-011
Bellows cpl. Bellows & seal kit	299-002	299-007	299-012

Dimensions Angle Valve ISO-KF



Aluminum housing [mm]

DN	A	B	C	D	E
DN 16 ISO-KF	100.5	95.7	75.6	40	45
DN 25 ISO-KF	108.5	102.6	80.6	50	54
DN 40 ISO-KF	150.5	144.7	116.6	65	69

◑ Compressed air connection

▼ Valve seat site

O Protective lid

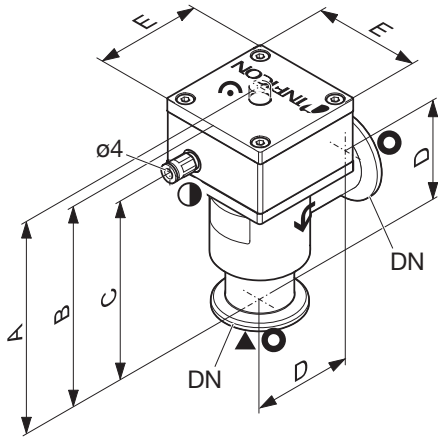
Visual position indicator

Flow direction

VAP016 ... 040-A/X

VIP016 ... 040-A/X - continued

Dimensions Angle Valve ISO-KF

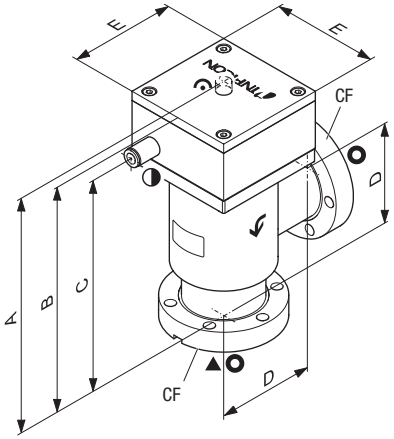


Stainless steel housing [mm]

DN	A	B	C	D	E
DN 16 ISO-KF	103	98.2	78.1	40	45
DN 25 ISO-KF	112	106	84	50	54
DN 40 ISO-KF	153.5	147.7	119.6	65	69

- Compressed air connection
- Protective lid
- Flow direction
- Valve seat site
- Visual position indicator

Dimensions Angle Valve CF-R



Stainless steel housing [mm]

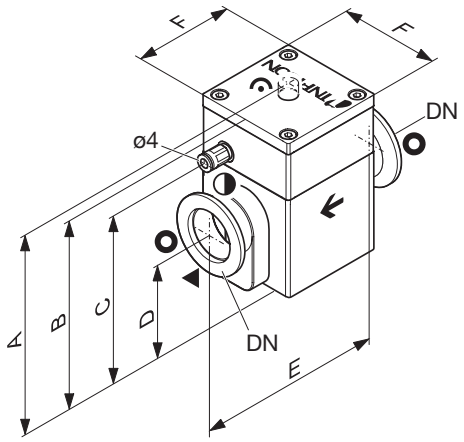
DN	A	B	C	D	E
DN 16 CF-R	101	96.3	76.2	38	45
DN 40 CF-R	151.6	145.8	117.7	63	69

- Compressed air connection
- Protective lid
- Flow direction
- Valve seat site
- Visual position indicator

VAP016 ... 040–A/X

VIP016 ... 040–A/X – continued

Dimensions Inline Valve ISO-KF



Aluminum housing [mm]

DN	A	B	C	D	E	F
DN 16 ISO-KF	91.8	86.8	66.7	18.7	80	45
DN 25 ISO-KF	98.5	93.3	71.3	25	100	54
DN 40 ISO-KF	138	133	104.9	30	130	69

Stainless steel housing [mm]

DN	A	B	C	D	E	F
DN 16 ISO-KF	84.5	79.8	59.7	20	80	45
DN 25 ISO-KF	95.5	89.3	67.3	31.8	100	54
DN 40 ISO-KF	131	125	96.9	40.8	130	69

◑ Compressed air connection
▼ Valve seat site
○ Protective lid
Visual position indicator
Flow direction

Solenoid Actuated Angle Valves

VAM016 ... 040-A/X

Advantages

- Bellows feedthrough, stainless steel 316L
- Compact design
- Electrical and visual (LED) position indication
- Selectable operating mode
  Remote control via PLC or PC
  Local operation
- Wide voltage range
- Easy maintenance, fast bellows and seal replacement
- Fast opening and closing time
- FPM sealing standard, other sealing materials available upon request
- Aluminum or stainless steel housing
- High conductance for fast pump down or venting

Selection Data

Vacuum connection		DN 16 ISO-KF		DN 25 ISO-KF		DN 40 ISO-KF	
Aluminum housing	AISI/DIN	-/EN AW-6060		-/EN AW-6060		-/EN AW-6060	
Stainless steel housing	AISI/DIN		304/1.4301		304/1.4301		304/1.4301

Ordering Information

Type	VAM016-A	VAM016-X	VAM025-A	VAM025-X	VAM040-A	VAM040-X
Part No.	**253-500**	**253-501**	**253-502**	**253-503**	**253-504**	**253-505**

Spare Parts

Seal kit O-rings for one valve	**299-001**	**299-006**	**299-011**
Bellows cpl. Bellows & seal kit	**299-002**	**299-007**	**299-012**
Electronics cpl.	**299-016**	**299-016**	**299-016**
Linear solenoid cpl.	**299-017**	**299-018**	**299-019**

VAM016 ... 040-A/X – continued

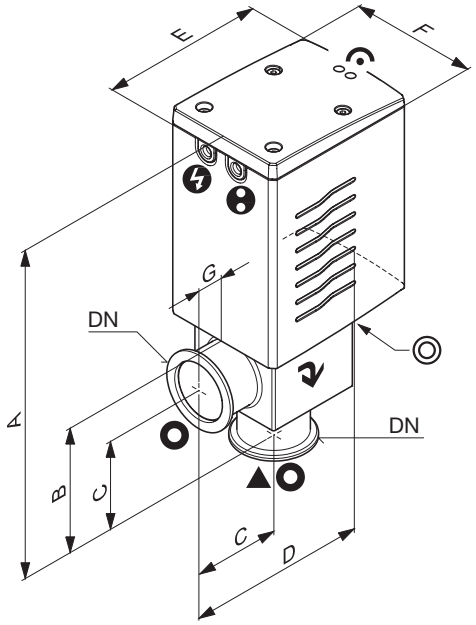
Specifications

Type		VAM016-A	VAM016-X	VAM025-A	VAM025-X	VAM040-A	VAM040-X
Cycle life	Mio cycles	2		2		2	
Conductance for molecular flow	l/s	4		13		35	
Tightness	mbar l/s	1×10^{-9}		1×10^{-9}		1×10^{-9}	
Operating pressure min. / max	mbar / bar	10^{-8} / 1.3		10^{-8} / 1.3		10^{-8} / 1.3	
Pressure max.	bar	3		3		1	
Pressure difference							
In closing direction	bar	1.3		1.3		1.3	
In opening direction	bar	1.3		1.3		1	
Opens to a pressure difference of	bar	1.3		1.3		1.3	
Ambient temperature	°C	0 … 50		0 … 50		0 … 50	
Bakeout temperature							
Housing	°C	120		120		120	
Actuator, idle	°C	50		50		50	
Supply voltage	V	90 … 264		90 … 264		90 … 264	
Frequency	Hz	47 … 63		47 … 63		47 … 63	
Pickup power	W	405		416		367	
Holding power	W	8.1		8.3		7.5	
Power consumption	W	400		400		400	
Closing time	ms	100		120		230	
Opening time	ms	220		220		650	
Dead time	ms	40		140		450	
Switching frequency							
At 40°C	1/min	30		30		30	
At 50°C	1/min	20		20		20	
Control voltage	V DC	15 … 30		15 … 30		15 … 30	
Power consumption	mA	1.5 … 5		1.5 … 5		1.5 … 5	
Position indicator							
Switching voltage	V DC	15 … 30		15 … 30		15 … 30	
Switching current	mA	100		100		100	
Materials							
Housing		EN-AW 6060	1.4301	EN-AW 6060	1.4301	EN-AW 6060	1.4301
Bellows		stainless steel		stainless steel		stainless steel	
Seals		FPM		FPM		FPM	
Degree of protection		IP 54		IP 54		IP 54	
Mounting orientation		any		any		any	
Weight	kg	1.1	1.2	1.9	2.0	4.3	4.4

VAM016 ... 040-A/X - continued

Dimensions

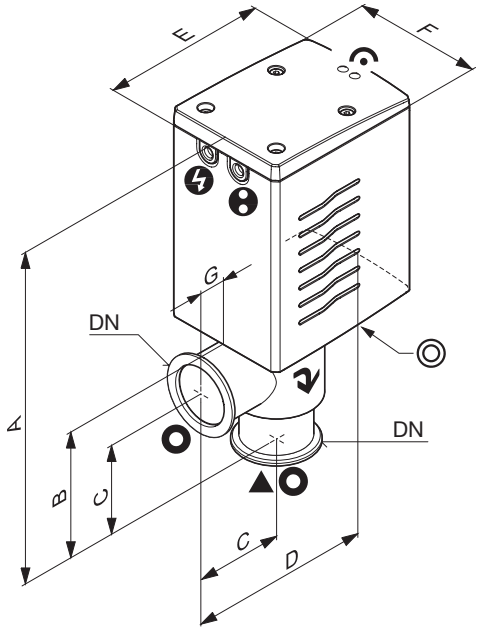
Aluminum housing [mm]



DN	A	B	C	D	E	F	G
DN 16 ISO-KF	170.9	51.4	40	96	86	59	10
DN 25 ISO-KF	193	64.9	50	112.7	97.3	70	15.4
DN 40 ISO-KF	246	92.9	65	139	119.5	90	19.5

- Leak detection opening
- Protective lid
- Electrical connection
- Flow direction
- Position indicator connection
- Valve seat site
- Visual position indicator

Stainless steel housing [mm]



DN	A	B	C	D	E	F	G
DN 16 ISO-KF	172.9	53.4	40	96	86	59	10
DN 25 ISO-KF	196.4	68.3	50	112.7	97.3	70	15.4
DN 40 ISO-KF	249	95.9	65	139	119.5	90	19.5

- Leak detection opening
- Protective lid
- Electrical connection
- Flow direction
- Position indicator connection
- Valve seat site
- Visual position indicator

Angle Valves (VAH, VAP)

DN 63

Manually Actuated

- Spindle drive with hand wheel
- Smooth opening
- Visual position indicaton

Pneumatically Actuated

- Visual indication for open and closed position
- Electrical position indicator for open and closed position
- For system manufacturers without pilot valve

Selection Data

Angle valve		DN 63 ISO-K	DN 63 ISO-K
Housing material	AISI/DIN	aluminum -/3.2373	stainless steel 304/1.4301

Ordering Information - Manually Actuated

Type		VAH063-A	VAH063-X
Angle valve	Part No.	**250-470**	**250-475**

Spare Parts

Seal set	**215-251**	**215-251**
Bellows set for manually actuated valves	**215-254**	**215-254**

Specifications - Manually Actuated

Service life	cycles	10'000	10'000
Conductance for molecular flow	l/s	140	140
Tightness	mbar l/s	1 x 10^{-9}	1 x 10^{-9}
Pressure absolute, min. / max.	mbar / bar	10^{-8} / 1,5	10^{-8} / 1,5
Pressure resistance	bar (abs.)	4	4
Differential pressure in closing / opening direction	bar	1.5 / 1.5	1.5 / 1.5
Opens to a pressure difference of	bar	1.5	1.5
Ambient temperature	°C	5 – 60	5 – 60
Mounting orientation		any	any
Seals		FPM	FPM
Weight	kg	3.6	6.5

DN 63 – continued

Selection Data

Angle valve		DN 63 ISO-K	DN 63 ISO-K
Housing material	AISI/DIN	aluminum —/3.2373	stainless steel 304/1.4301

Ordering Information - Pneumatically Actuated

Type		VAP063-A	VAP063-X
Angle valve w/o pilot valve, with position indicator		**250-404**	**250-414**
Valve with pilot valve, with position indicator			
24 V DC	Part No.	**250-400**	**250-410**
24 V AC	Part No.	**250-401**	**250-411**
100 – 115 V AC	Part No.	**250-402**	**250-412**
200 – 240 V AC	Part No.	**250-403**	**250-413**

Spare Parts

Seal set	**215-251**	**215-251**
Bellows set for pneumatically actuated valves	**215-253**	**215-253**

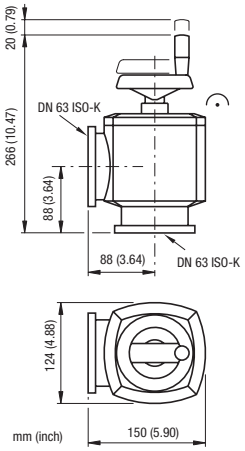
Specifications - Pneumatically Actuated

Service life	Mio cycles	1.5	1.5
Conductance for molecular flow	l/s	140	140
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}
Pressure, absolute, min. / max.	mbar / bar	10^{-8} / 1,5	10^{-8} / 1,5
Pressure resistance	bar (abs.)	4	4
Differential pressure in			
closing / opening direction	bar	1.5 / 1.5	1.5 / 1.5
Opens to a pressure difference of	bar	1.5	1.5
Ambient temperature	°C	5 – 60	5 – 60
Switching frequency	1/min	60	60
Closing time	ms	300	300
Opening time	ms	300	300
Electrical position indicator	VAC / A	250 / 0.125	250 / 0.125
load capacity	VDC / A	50 / 0.25	50 / 0.25
Compressed air, overpressure	bar	4 – 8	4 – 8
Air cylinder volume	cm^3	75	75
Mounting orientation		any	any
Seals		FPM	FPM
Weight	kg	4.0	6.8

DN 63 – continued

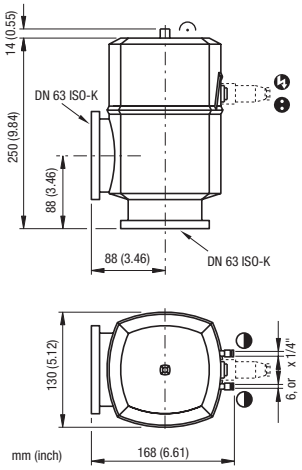
Dimensions - Manually Actuated

VAH063-A / VAH063-X



Dimensions - Pneumatically Actuated

VAP063-A / VAP063-X



Angle valve with and without pilot valve,
with position indicator

Angle Valves (VAH, VAP)

DN 100

Manually Actuated

- Bellows feedthrough
- Spindle drive with hand wheel
- Smooth opening
- Visual position indication

Pneumatically Actuated

- Bellows feedthrough
- Visual indication of the open and closed position
- Electrical position indicator for open and closed position
- For system manufacturers without pilot valve

Selection Data

Angle valve		DN 100 ISO-K	DN 100 ISO-K
Housing material	AISI(AA)/DIN	aluminum - / 3.2373	stainless steel 303 /1.4305

Ordering Information - Manually Actuated

Type	VAH100-A	VAH100-X
Part No.	250-480	250-485

Spare Parts

Seal set	**215-271**	**215-271**
Bellows set for manually actuated valves	**215-274**	**215-274**

Specifications - Manually Actuated

Service life	Cycles	10'000	10'000
Conductance for molecular flow	l/s	330	330
Tightness	mbar l/s	1 x 10^{-9}	1 x 10^{-9}
Pressure absolute, min. / max.	mbar / bar	10^{-8} / 1.5	10^{-8} / 1.5
Pressure resistance	bar (abs.)	4	4
Differential pressure in closing / opening direction	bar	1.5 / 1.5	1.5 / 1.5
Opens to a pressure difference of	bar	1.5	1.5
Ambient temperature	°C	5 – 60	5 – 60
Mounting orientation		any	any
Seals		FPM	FPM
Weight	kg	6.1	11.1

DN 100 – continued

Selection Data

Angle valve		DN 100 ISO-K	DN 100 ISO-K —
Housing material	AISI (AA) /DIN	aluminum - / 3.2373	stainless steel 303 / 1.4305

Ordering Information - Pneumatically Actuated

Type		VAP100-A	VAP100-X
Angle valve w/o pilot valve, with position indicator		**250-424**	**250-434**
Valve with pilot valve, with position indicator			
24 V DC	Part No.	**250-420**	**250-430**
24 V AC	Part No.	**250-421**	**250-431**
100 – 115 V AC	Part No.	**250-422**	**250-432**
200 – 240 V AC	Part No.	**250-423**	**250-433**

Spare Parts

Seal set	**215-271**	**215-271**
Bellows set for pneumatically actuated valves	**215-273**	**215-273**

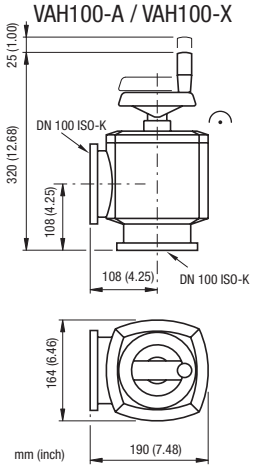
Specifications - Pneumatically Actuated

Service life	Mio cycles	1.5	1.5
Conductance for molecular flow	l/s	330	330
Tightness	mbar l/s	1 x 10^{-9}	1 x 10^{-9}
Pressure, absolute, min. / max.	mbar / bar	10^{-8} / 1.5	10^{-8} / 1.5
Resistance to pressure	bar (abs.)	4	4
Differential pressure			
In closing / opening direction	bar	1.5 / 1.5	1.5 / 1.5
Opens to a pressure difference of	bar	1.5	1.5
Ambient Temperature	°C	5 ... 60	5 ... 60
Switching frequency	1/min	60	60
Closing time	ms	400	400
Opening time	ms	400	400
Electrical position indicator,	V AC / A	250 / 0.125	250 / 0.125
Load capacity	V DC / A	50 / 0.25	50 / 0.25
Compressed air, overpressure	bar	4 – 8	4 – 8
Air cylinder volume	cm^3	195	195
Mounting orientation		any	any
Seals		FPM	FPM
Weight	kg	6.7	11.7

DN 100 – continued

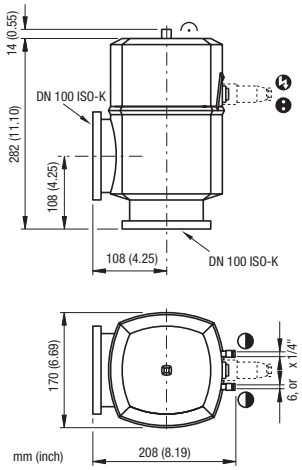
Dimensions - Manually Actuated

VAH100-A / VAH100-X



Dimensions - Pneumatically Actuated

VAP100-A / VAP100-X



Angle valve with and without pilot valve,
with position indicator

Angle Valves (VAP)

DN 160

Advantages

- Visual indication for open and closed position
- Electrical position indicator for open and closed position
- For system manufacturers without pilot valve

Selection Data

Angle valve		DN 160 ISO-K
Housing material	AA/DIN	aluminum -/3.2373

Ordering Information

Type		**VAP160-A**
Angle valve w/o pilot valve, with position indicator		**250-444**
Valve with pilot valve, with position indicator		
24 V DC	Part No.	**250-440**
24 V AC	Part No.	**250-441**
100 – 115 V AC	Part No.	**250-442**
200 – 240 V AC	Part No.	**250-443**

Spare Parts

Seal set	**215-291**
Bellows set for pneumatically actuated valves	**215-293**

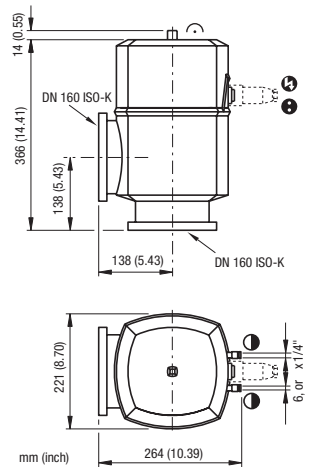
Specifications

Service life	Mio cycles	1.5
Conductance for molecular flow	l/s	800
Tightness	mbar l/s	1×10^{-9}
Pressure, absolute, min. / max.	mbar / bar	10^{-8} / 1,5
Pressure resistance	bar (abs.)	4
Differential pressure in		
closing / opening direction	bar	1.5 / 1.5
Opens to a pressure difference of	bar	1.5
Ambient Temperature	°C	5 – 60
Switching frequency	1/min	40
Closing time	ms	650
Opening time	ms	600
Electrical position indicator,	VAC / A	250 / 0.125
load capacity	VDC / A	50 / 0.25
Compressed air, overpressure	bar	4 – 8
Air cylinder volume	cm^3	570
Mounting orientation		any
Seals		FPM
Weight	kg	11.4

DN 160 – continued

Dimensions

VAP160-A



Butterfly Valves Manually actuated

VBH063 ... 160-X

Advantages

- Three sizes available: DN 63, 100, 160
- Robust and compact design with low installation height
- High conductance all stainless steel housings
- Lateral gauge/valve flange connections standard
- FPM sealings
- Extremely long service lifetime

Selection Data

Vacuum connection	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F

Ordering Information

Type	VBH063-X	VBH100-X	VBH160-X
	250-560	250-570	250-580

Specifications

Lateral vacuum connections		DN 10 ISO-KF DN 16 ISO-KF	2 x DN 10 ISO-KF DN 25 ISO-KF	2 x DN 10 ISO-KF DN 25 ISO-KF
Cycle life	Cycles	100,000	100,000	100,000
Conductance for molecular flow	l/s	350	1000	3400
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}	1×10^{-9}
Pressure in either direction				
Static min. / max.	mbar / bar	1×10^{-8} / 10	1×10^{-8} / 10	1×10^{-8} / 10
Dynamic min. / max	mbar / bar	1×10^{-8} / 4	1×10^{-8} / 4	1×10^{-8} / 4
Pressure difference Δp				
In either direction	bar	4	4	4
Bakeout teperature housing	°C	150	150	150
Housing, shaft, valve plate	AISI / DIN	304 / 1.4301	304 / 1.4301	304 / 1.4301
Seals		FPM	FPM	FPM
Weight	kg	3.1	5.2	9.3

VBH063 ... 160-X – continued

Spare Parts

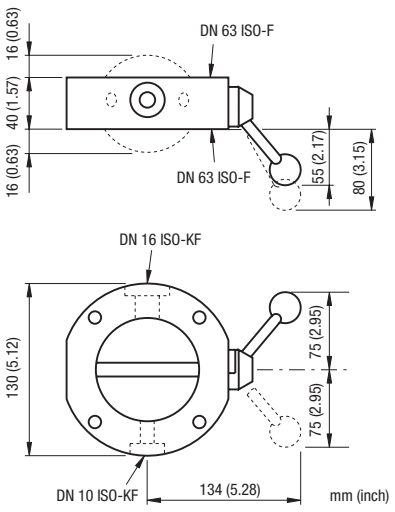
	VBH063	VBH100	VBH160
Seal kit			
X type	215-143	215-145	215-147

Accessories

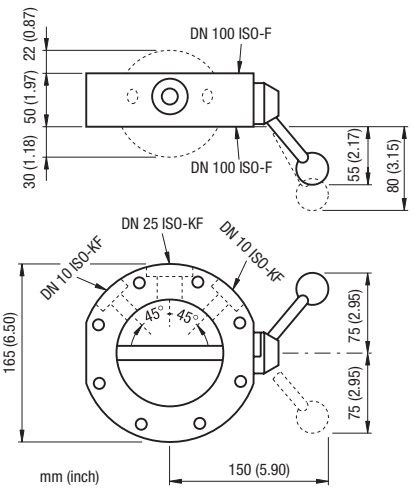
	VBH063	VBH100	VBH160
Connection elements			
X type	215-212	215-214	215-216

Dimensions

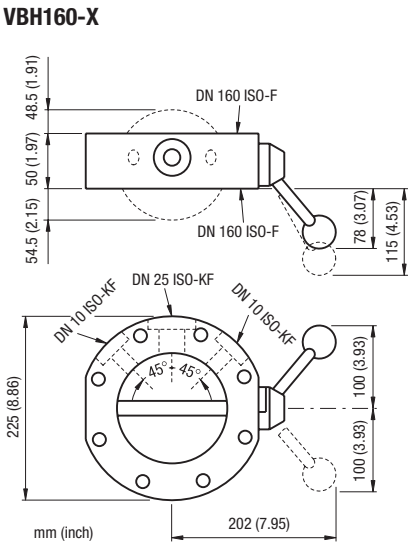
VBH063-X



VBH100-X



VBH160-X



Pneumatically Actuated Butterfly Valves (VBP)

VBP063 ... 250-X/Z

Advantages

- Four sizes available: DN 63, 100, 160, 250
- Robust and compact design with low installation height
- High conductance all stainless steel housings
- With or without lateral gauge/valve flange connections
- FPM sealings
- Extremely long service lifetime
- Direct pneumatic actuation or via pilot valve
- Electrical and visual position indicator

VBP063 ... 250–X/Z – continued

Selection Data

Vacuum connection	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 250 ISO-K
Lateral vacuum connections	DN 10 ISO-KF DN 16 ISO-KF	2 x DN 10 ISO-KF DN 25 ISO-KF	2 x DN 10 ISO-KF DN 25 ISO-KF	2 x DN 10 ISO-KF DN 25 ISO-KF DN 40 ISO-KF

Ordering Information

With lateral vacuum connections

Type	**VBP063-X**	**VBP100-X**	**VBP160-X**	**VBP250-X**
	253-100	**253-120**	**253-140**	**253-160**

Without lateral vacuum connections

Type	**VBP063-Z**	**VBP100-Z**	**VBP160-Z**	**VBP250-Z**
	253-110	**253-130**	**253-150**	**253-170**

Specifications

Cycle life	Cycles	1,000,000	1,500,000	1,500,000	1,000,000
Conductance for molecular flow					
X types	l/s	350	1000	3400	8200
Z types	l/s	400	1400	4000	8200
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}	1×10^{-9}	1×10^{-9}
Pressure in either direction					
Static min. / max.	mbar / bar	1×10^{-8} / 10	1×10^{-8} / 10	1×10^{-8} / 10	1×10^{-8} / 10
Dynamic min. / max	mbar / bar	1×10^{-8} / 4	1×10^{-8} / 4	1×10^{-8} / 4	1×10^{-8} / 4
Pressure difference Δp					
In either direction	bar	4	4	4	4
Bakeout temperature housing	°C	150	150	150	150
Housing, shaft, valve plate	AISI / DIN	304 / 1.4301	304 / 1.4301	304 / 1.4301	304 / 1.4301
Seals		FPM	FPM	FPM	FPM
Weight					
X types	kg	3.8	6.5	10	15.7
Z types	kg	3.5	5	8	16

VBP063 ... 250-X/Z - continued

Spare Parts

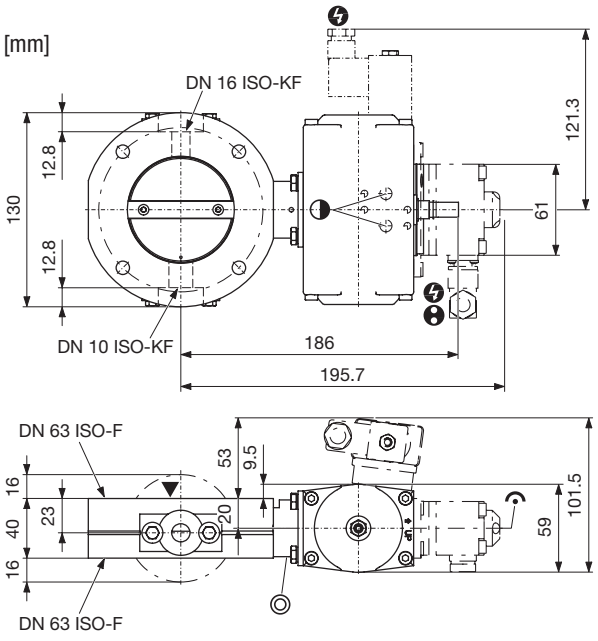
	VBP063	VBP100	VBP160	VBP250
Seal kit				
X type	215-143	215-145	215-147	215-149
Z type	215-144	215-146	215-148	215-149
Actuator	253-181	253-182	253-182	253-183

Accessories

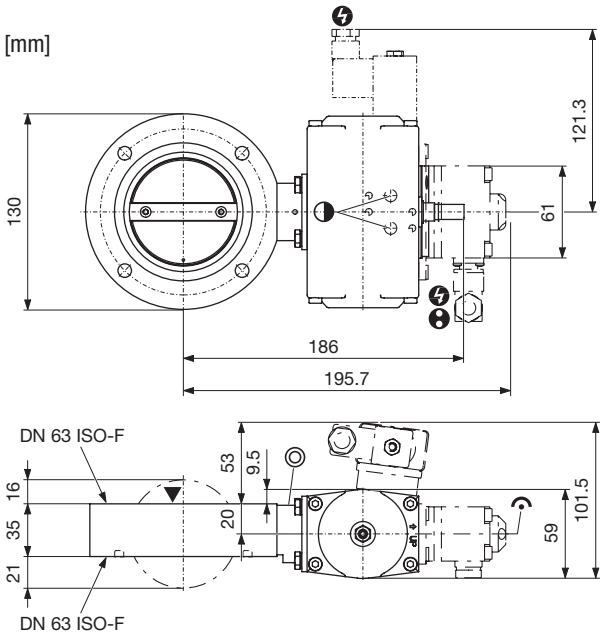
	VBP063	VBP100	VBP160	VBP250
Position indicator	253-180	253-180	253-180	253-180
Pilot valve				
230 V AC / 50 Hz	215-131	215-131	215-131	215-131
115 V AC / 60 Hz	215-132	215-132	215-132	215-132
24 V AC / 50 Hz	215-133	215-133	215-133	215-133
24 V DC / 50 Hz	215-134	215-134	215-134	215-134
Connection elements				
X type	215-212	215-214	215-216	212-225
Z type	215-213	215-215	215-217	212-225

Dimensions

VBP063-X



VBP063-Z

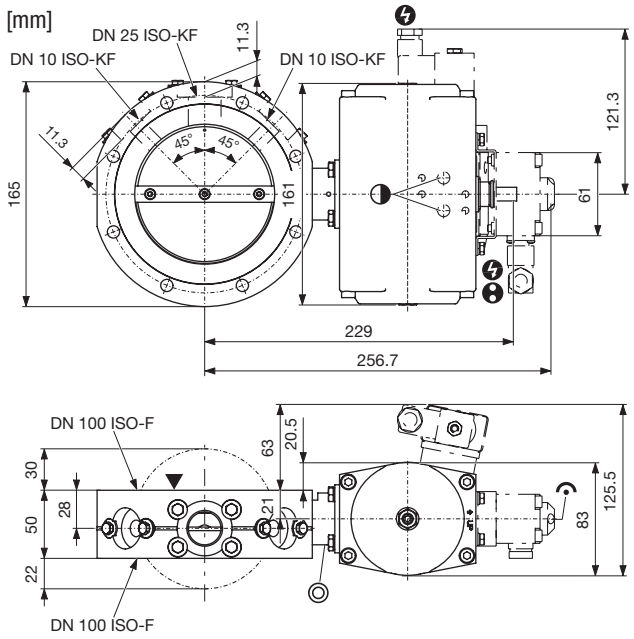


Compressed air connection
Position indicator connection
Visual position indicator
Electrical connection
Valve seat site
Leak detection opening

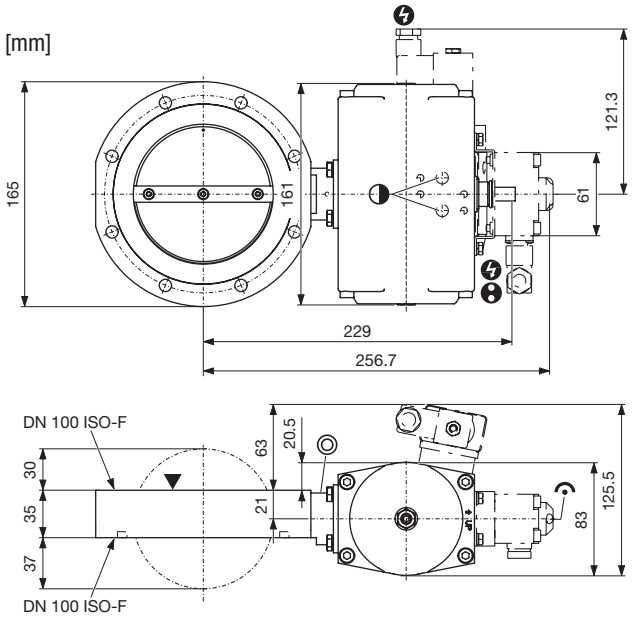
VBP063 ... 250–X/Z – continued

Dimensions

VBP100-X



VBP100-Z



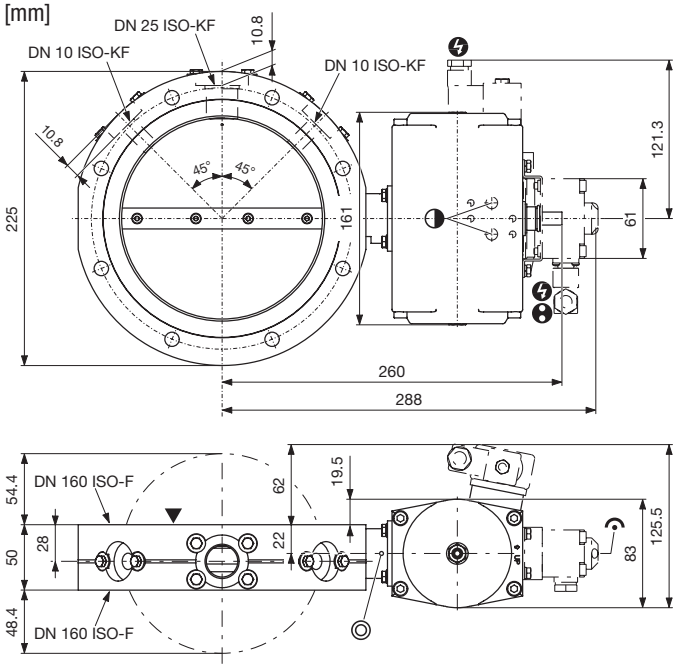
- Compressed air connection
- Position indicator connection
- Visual position indicator
- Electrical connection
- Valve seat site
- Leak detection opening

VBP063 ... 250-X/Z - continued

Dimensions

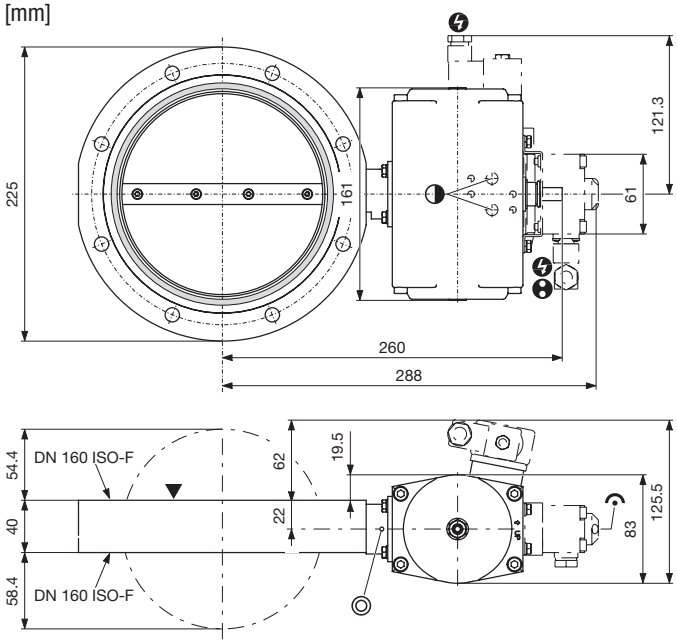
VBP160-X

[mm]



VBP160-Z

[mm]



Compressed air connection

Position indicator connection

Visual position indicator

Electrical connection

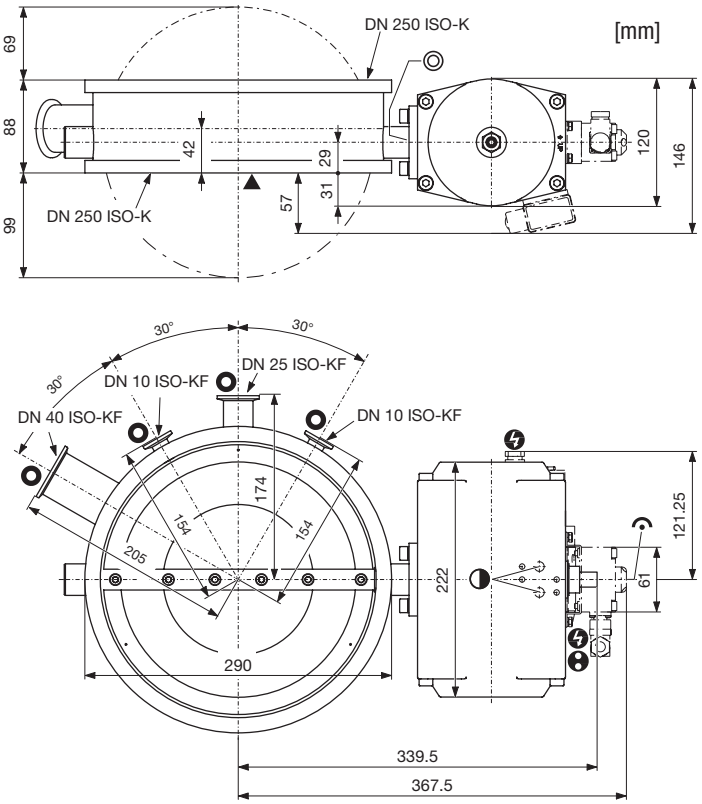
Valve seat site

Leak detection opening

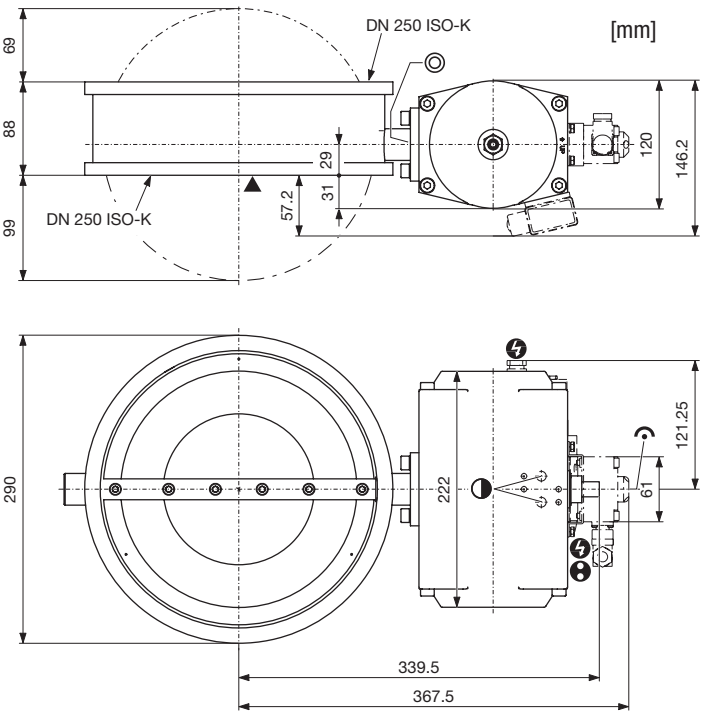
VBP063 ... 250-X/Z – continued

Dimensions

VBP250-X



VBP250-Z



- Compressed air connection
- Electrical connection
- Position indicator connection
- Valve seat site
- Visual position indicator
- Leak detection opening

Manually Actuated Coarse Gas Dosing Valve

VDH010–A

Advantages

- For admitting a reproducible flow of gas into a vacuum chamber

Selection Data

Vacuum connection		DN 10 ISO-KF
Gas flow, controllable		
Min.	mbar l/s	40
Max.	mbar l/s	1700

Ordering Information

Type	**VDH010-A**
Part No.	**250-520**

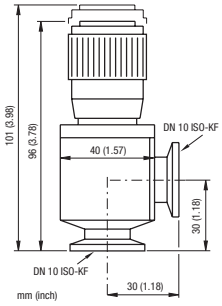
Specifications

Tightness	mbar l/s	1 x 10^{-8}
Pressure range	mbar to bar	1x 10^{-7} to 4
Bakeout temperature	°C	100
Housing		aluminum
Seals		FPM
Weight	kg	0.2

Spare Parts

Seal set	**215-207**

Dimensions



Manually Actuated Dosing and Shut-Off Valve

VDH016-X

Advantages

- Very wide control range
- Optimal control characteristics
- Digital display
- Excellent reproducibility
- Extremely small dead volume
- Integrated shut-off valve
- Closing without change of flow setting

Selection Data

Vacuum connection		DN 16 ISO-KF
Gas flow, controllable		
Min.	mbar/ls	5×10^{-6}
Max.	mbar/ls	1000

Ordering Information

Type	**VDH016-X**
Part No.	**250-500**

Specifications

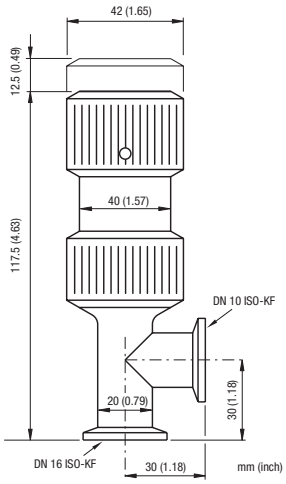
Tightness	mbar/ls	1×10^{-9}
Differential pressure	bar	2.5
Dead volume	cm^3	0.032
Operating temperature	°C	80
Bakeout temperature, flanges	°C	150
Housing, needle, filter		stainless steel
Dosing sleeve		Fluorplastomer
Seal		FPM
Weight	kg	0.4

Accessories

Filter, vacuum side		
590 mbar l/s	Part No.	**215-462**
1250 mbar l/s	Part No.	**215-463**

VDH016-X - continued

Dimensions



All-Metal Dosing Valves and System

VDH040-U / VDE040-U / VCE500

Advantages

- Minimal dead volume
- Controlled routing of the gas flow using capillaries
- Operating temperature 200°C
- Control of total pressure or gas flow
- Automatic control in conjunction with VDE40-U and VCE500

Selection Data

Actuator	manual	manual and thermo-mechanical in conjunction with VCE500

Ordering Information VDH040-U / VDE040-U

Type	VDH040-U	VDE040-U
Valve	**250-700**	**250-720**

Specifications

Connection flange			
Input		DN 16 CF-R	DN 16 CF-R
Output		DN 40 CF-F	DN 40 CF-F
Gas flow, controllable			
Min.	mbar/ls	1×10^{-10}	1×10^{-10}
Max.	mbar/ls	600	100 [1]
Tightness	mbar/ls	1×10^{-11}	1×10^{-11}
Pressure min./max. (absolute)	mbar	1×10^{-11}/30	1×10^{-10}/30
Conductance for molecular flow	l/s	0.7	0.7
Operating temperature	°C	200	200
Bakeout temperature	°C	350	350 [2]
Valve plate		sapphire	sapphire
Valve seat		copper	copper
Housing		stainless steel	stainless steel
Weight	kg	1.4	1.4

1) Can be regulated with the VCE500 Controller

2) Without cable

VDH040-U / VDE040-U / VCE500 – continued

Accessories

Type	VDH040-U	VDE040-U
Capillary complete, vacuum side, 1m	**215-708**	**215-708**
Heater, 200°C	**250-701**	**250-701**
Adapter DN 40/16 CF	**213-071**	**213-071**

Options

Tool kit	**215-707**	**215-707**

Spare Parts

Valve plate, sapphire	**215-715**	**215-715**
Valve seat		
Standard	**215-716**	**215-716**
Gold plated	**215-717**	**215-717**

Ordering Information VCE500

Controller for VDE040-U	**VCE500**
Part No.	**250-920**

Specifications

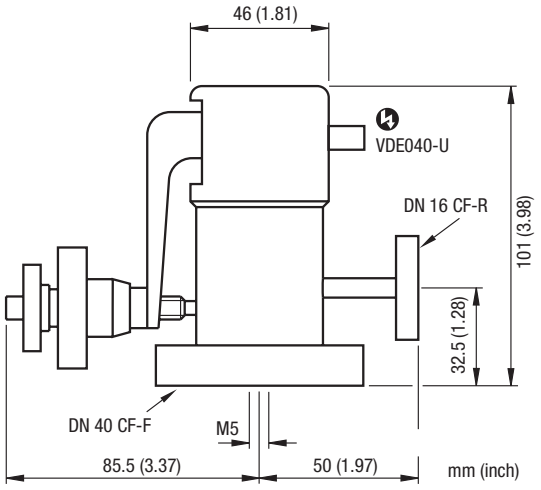
Power supply	V	115 / 230
Frequency	Hz	50 … 60
Power consumption	VA	20
Regulating characteristic		proportional-integral (PI)
Reset time	s	2 … 30
Proportional gain		2 … 1000
Internal nominal value		
Scale divisions		0 … 1000
External nominal value	VCD/100 kΩ	0 … +10
Protection class		IP 20

Cable

Standard, 80°C		
3 m	Part No.	**202-914**
12 m (max. cable length)	Part No.	**202-916**
Extension, 200°C		
2 m	Part No.	**202-924**

VDH040-U / VDE040-U / VCE500 - continued

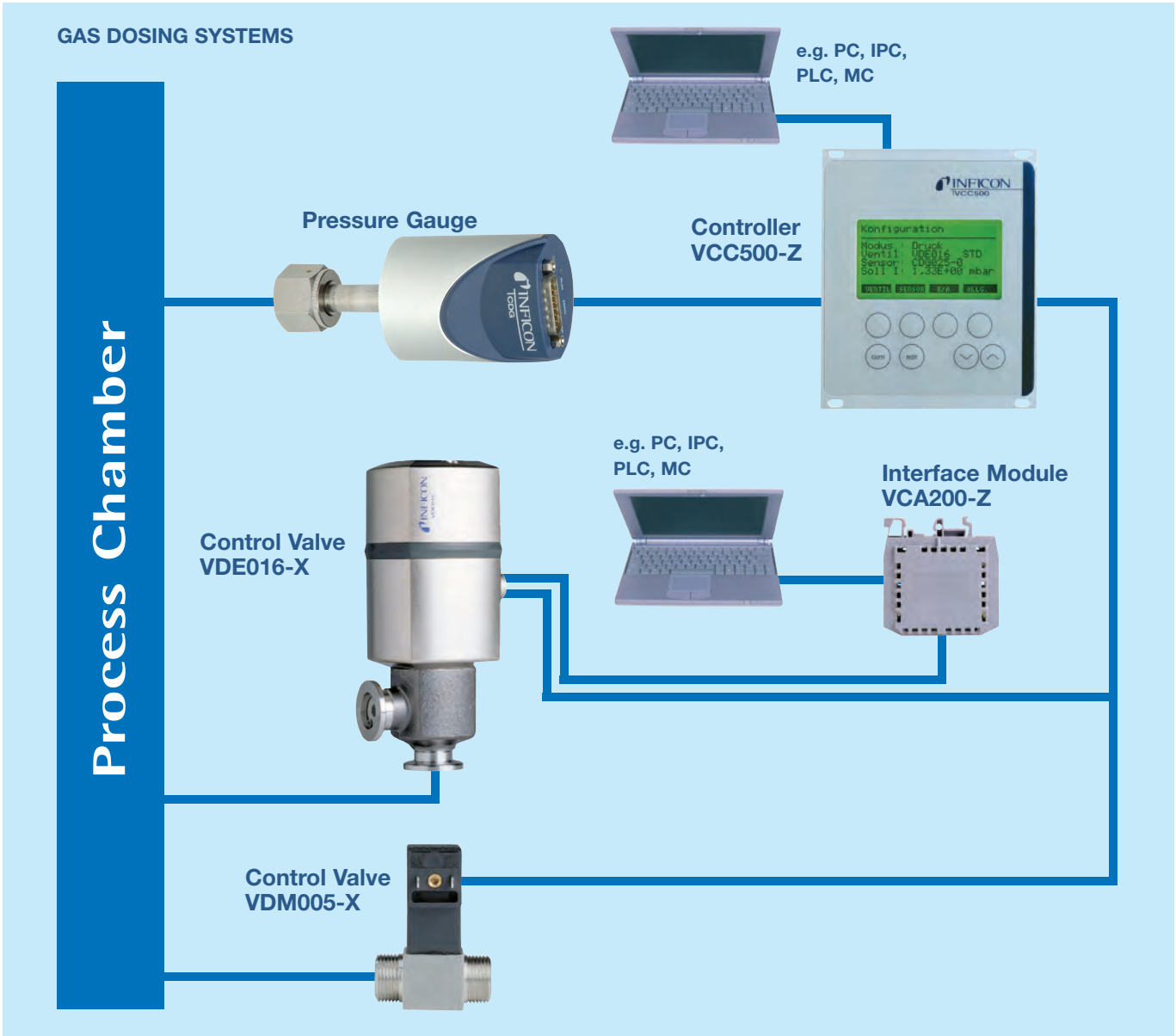
Dimensions



Gas Dosing Systems

User Advantages

- Higher yield
- Optimized cycle time
- Excellent reproducibility
- Easy system integration



Solenoid Control Valves

Control Valve VDM005A–X

User Advantages

- Fast response time
- Excellent control characteristics
- High reproducibility and repeatability
- Stainless steel housing
- Closes automatically in case of power failure
- Smooth solenoid drive
- Optional flange connection
- Very compact design

Selection Data

Vacuum connection	DN 5 mm / M 14 x 1
Control range	1 … 100 %FS 20 … 70 mA
Pressure range (outlet)	1 x 10^{-8} mbar
Pressure max. in closing diretion	2 bar
Response time	<30 ms

Ordering Information

Type	VDM005A-X
10 sccm	**250-508**
50 sccm	**250-509**
100 sccm	**250-510**
500 sccm	**250-511**
1000 sccm	**250-512**
5000 sccm	**250-513**

Cable VCC - VDM

3m	**216-160**
5m	**216-161**
10m	**216-162**
15m	**216-163**
20m	**216-164**
25m	**216-165**

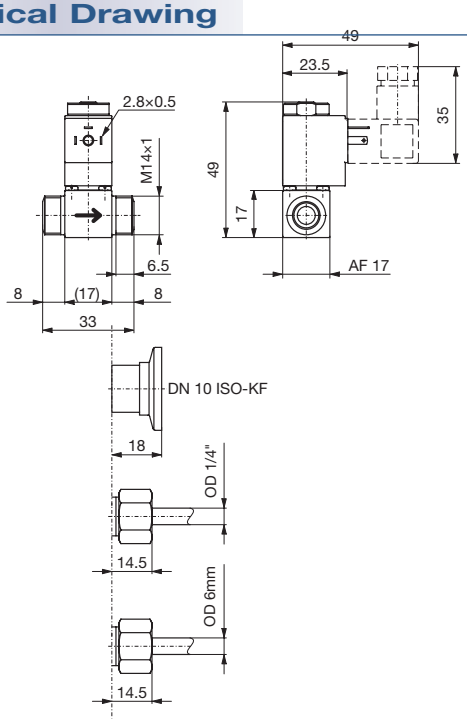
Accessories

DN 10 ISO-KF flange connection	**250-080**
Pipe OD 1/4" connection	**250-085**
Pipe OD 6 mm connection	**250-086**
Other connections	**on request**
Filter set (10 pcs.)	**215-519**

Technical Data

Tightness	1 x 10^{-9} mbar l/s
Actuator	solenoid
Controller	VCC500-Z
Ambient temperature	+5 ... +50 °C
Duty cycle	100 %
Protection type	IP51
Supply voltage	0 ... 24 V DC
Power consumption	2.5 W max.
Housing	stainless steel
Seals	FPM
Weight (without connection)	96 g

Technical Drawing



INFICON

Control Valve VDE016–X

User Advantages

- Broad control range
- Excellent reproducibility
- Status information and commands via digital interface
- Withstands corrosive gases - stainless steel / FPM
- Combined with the VCC500-Z controller, the valve closes automatically in case of a power failure

Selection Data

Vacuum connection	DN 16 ISO-KF
Gas flow, controllable	
Min.	5 x 10^{-6} mbar l/s
Max.	1250 mbar l/s
Pressure absolute	
Min.	1 x 10^{-8} mbar
Max.	2.5 bar
Closing / opening time	3 / 4 s

Technical Data

Tightness	1 x 10^{-9} mbar l/s
Actuator	Stepper motor
Control	
Digital	VCC500-Z, VCA200-Z
Analog	0 ... 10 V DC
Ambient temperature	5 ... 40 °C
Supply	24 V DC / 12 VA
Housing	stainless steel
Dosing sleeve	fluorplastomer
Seals	FPM
Weight[1)]	0.5 kg

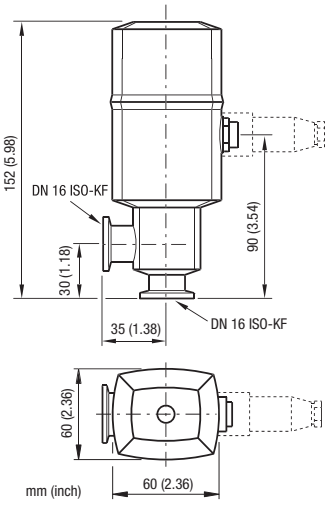
1) Connector included

Ordering Information[1)]

Type	**VDE016-X**
Part No.	**250-505**

1) Connector included

Technical Drawing



Cable VCC - VDE

3 m	Part No.	**216-150**
5 m	Part No.	**216-151**
10 m	Part No.	**216-152**
15 m	Part No.	**216-153**
20 m	Part No.	**216-154**
25 m	Part No.	**216-155**

Controller VCC500-Z

User Advantages

- Simple operation - user friendly LCD display and function keys
- Analog/digital inputs, outputs and interfaces
- 99 PI pre-programmed control adjustments for quick and easy operation
- Adjustable PID control algorithm
- Wide variety of pre-programmed pressure gauges

Selection Data

Analog input	0 ... 10 V DC nominal pressure, gas flow
Analog output	0 ... 10 V DC pressure, valve position

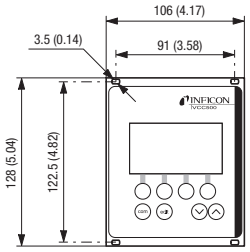
Ordering Information[1)]

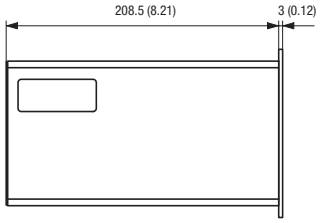
Type	**VCC500-Z**
Part No.	**250-900**

Technical Data

Operating modes	Pressure control Gas flow adjustment
8 available digital inputs	Flow adjustment, opening/closing the valve, switching between pressure and gas flow control
8 available digital outputs	Valve position indication, setpoint status reached, status messages - sensor, valve, pressure control upstream and downstream
Features	Switching on after power failure Output “nominal value reached”, adjustable tolerance
Units	mbar, Pa, Torr, mV
Languages	English, German
Interfaces	RS232C, RS485
Controller types	Auto = PI - selectable control speed steps 1-99 PID = PID - user definable parameters
Control accuracy	5 % FS sensors
Display accuracy	0.2 % FS sensor
Supply	
Voltage	90 ... 250 V AC
Consumption	50 VA
Weight	1.65 kg

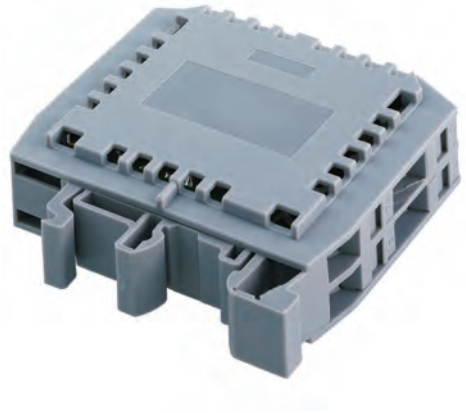
Technical Drawing





mm (inch)

Interface Module VCA200–Z



User Advantages

- Easy and economic system integration
- Connects an RS232C interface to the digital interface of the Control Valve VDE016-X
- Inquiry of status and valve position

Selection Data

Interface	RS232C
Supply	24 VDC / 0.5 A

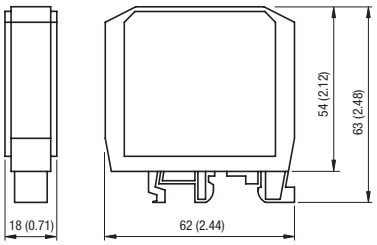
Ordering Information

Type	**VCA200-Z**
Part No.	**250-915**

Technical Data

Installation	DIN mounting rail (symmetric or asymmetric)
Connection	terminals
Ambient temperature	5 ... 50°C
Weight	40 g

Technical Drawing



Solenoid Control Valve

Control Valve VDM005A–X

The INFICON Solenoid Control Valve VDM005A-X offers a fast and reproducible upstream pressure control. A newly designed solenoid control mechanism allows smooth control and provides excellent repeatability and reproducibility. The VDM005A-X is the successor to the VDM005-X and can be used as a drop in replacement, as the electrical and vacuum connections are exactly the same.

User Advantages

- Fast response time
- Excellent control characteristics
- High reproducibility and repeatability
- Stainless steel housing
- Closes automatically in case of power failure
- Smooth solenoid drive
- Optional flange connection
- Very compact design

Applications

- Upstream pressure control for coating processes
- General gas inlet for rough and high vacuum systems

Ordering Information

Type	VDM005A-X
10 sccm	**250-508**
50 sccm	**250-509**
100 sccm	**250-510**
500 sccm	**250-511**
1000 sccm	**250-512**
5000 sccm	**250-513**

Accessories

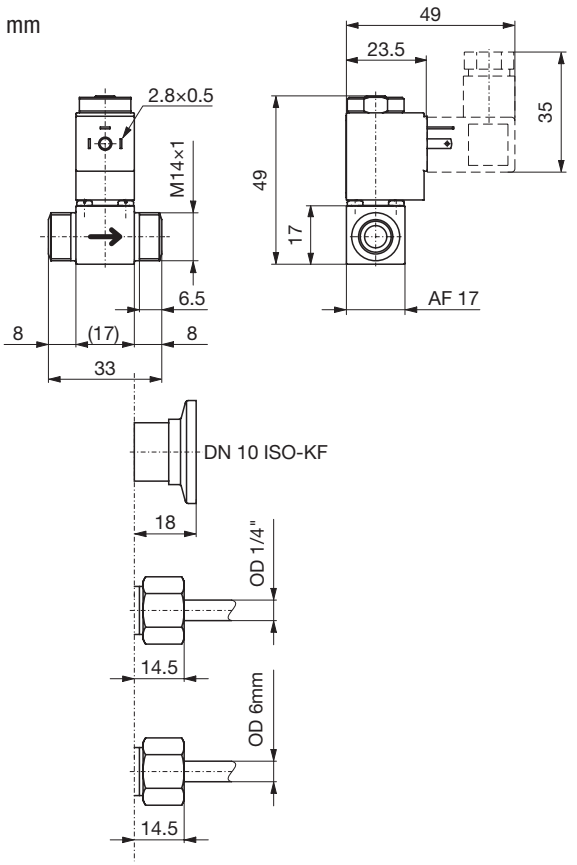
DN 10 ISO-KF flange connection	**250-080**
Pipe OD 1/4“ connection	**250-085**
Pipe OD 6 mm connection	**250-086**
Other connections	**on request**
Filter set (10 pcs.)	**215-519**

CONTROL VALVE VDM005A–X – continued

Specifications

		VDM005A-X
Actuator		solenoid
Control range	% FS	1 … 100
	mA	20 … 70
Tightness	mbar l/s	1.0×10^{-9}
Pressure range (outlet)	mbar	1.0×10^{-8} … 1000
Pressure, max. in closing direction	bar	2
Temperature		
Operation (ambient)	°C	+5 … +50
Bakeout (without supply voltage)	°C	+80
Supply voltage	V DC	0 … 24
Power consumption	W	2.5
Response time	ms	< 30
Weight (without connection)	g	96
Materials exposed to vacuum		FPM, stainless steel
Protection type		IP51

Dimensions



Manually Actuated Angle Valves with CF–Flanges (VAH)

DN 16–63

Standard

- For UHV and HV applications
- Bakeable at up to 180°C in open and closed position
- FPM sealed
- Maintenance-free

All-metal

- For UHV applications
- Bakeable at up to 300°C in open and closed position
- Copper sealed
- Maintenance-free

Selection Data

			STANDARD			ALL - METAL	
Vacuum connection		DN16 CF-R	DN40 CF-R	DN 63 CF-R	DN16 CF-R	DN40 CF-R	DN 63 CF-R
Tightness	mbar l/s	1 X 10^{-10}	1 X 10^{-10}	1 X 10^{-10}	5 X 10^{-11}	5 X 10^{-11}	5 X 10^{-11}
Bakeout temperature w/o hand wheel	°C	180	180	180	300	300	300

Ordering Information

Type		VAH016-Z	VAH040-Z	VAH063-Z	VAH016-U	VAH040-U	VAH063-U
Part No.		**250-731**	**250-736**	**250-741**	**250-730**	**250-735**	**250-740**

Specifications

Service life	cycles	50 000	50 000	50 000	1000	1000	1000
Conductance for molecular flow	l/s	3	38	100	3	38	100
Pressure (absolute) min. / max.	mbar/bar	1 x 10^{-9} / 4	1 x 10^{-9} / 4	1 x 10^{-9} / 4	1 x 10^{-10} / 4	1 x 10^{-10} / 4	1 x 10^{-10} / 4
Tightening torque	Nm	≤ 1	≤ 1.8	≤ 2.5	8-10	20-40	30-60
Heating and cooling rate	°C/min	—	—	—	4	4	2
Bellows, stainless steel AISI/DIN		321/1.4541	321/1.4541	321/1.4541	321/1.4541	321/1.4541	321/1.4541
Housing, stainless steel AISI/DIN		304/1.4301 welded	304/1.4301 welded	304/1.4301 welded	304/1.4301 welded	304/1.4301 welded	304/1.4301 welded
Valve plate, seal		FPM	FPM	FPM	copper	copper	copper
Valve plate, stainless steel AISI/DIN		304/1.4301	304/1.4301	304/1.4301	304/1.4301	304/1.4301	304/1.4301
Weight	kg	0.35	1.8	4.8	0.4	2.0	5.0

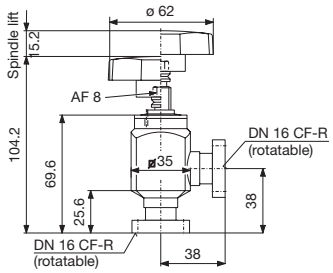
Spare Parts

FPM seal, 10 pieces	Part No.	**215-341**	**215-342**	**215-343**	**—**	**—**	**—**
Copper seal, 2 pieces	Part No.	**—**	**—**	**—**	**215-344**	**215-345**	**215-346**

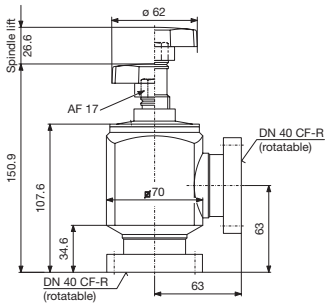
DN 16–63 – continued

Dimensions

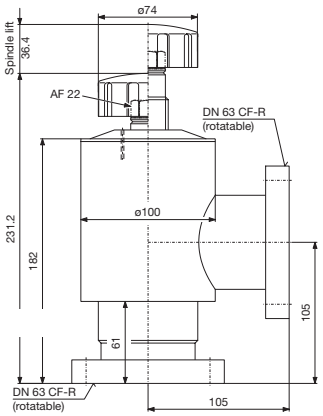
VAH016-Z



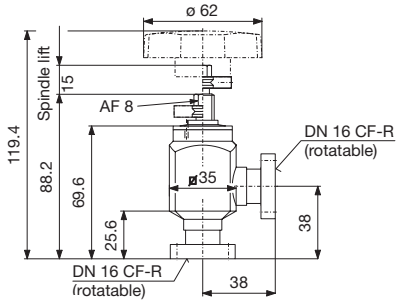
VAH040-Z



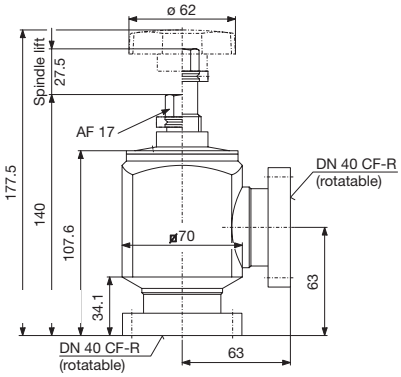
VAH063-Z



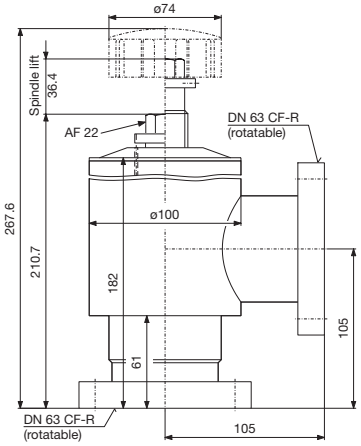
VAH016-U



VAH040-U



VAH063-U



Manually Actuated Venting Valve

VVH010–A/X

Advantages

- Simple opening and closing of the valve by loosening or tightening the screw cap

Selection Data

Vacuum connection		DN 10 ISO-KF	DN 10 ISO-KF
Housing	AISI / DIN	aluminum / 3.0615	stainless steel 303 / 1.4305

Ordering Information

Type	**VVH010-A**	**VVH010-X**
Part No.	**250-840**	**250-841**

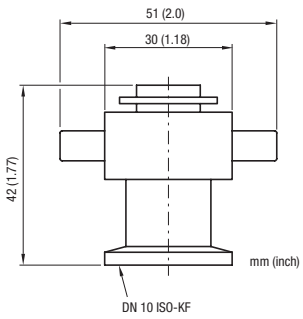
Specifications

Tightness	mbar l/s	1×10^{-9}	1×10^{-9}
Pressure (absolute)	mbar/bar	1×10^{-8} / 1	1×10^{-8} / 1
Valve plate		aluminum	stainless steel 304 / 1.4301
Screw cap		brass nickel-plated	brass nickel-plated
Seal		FPM	FPM
Weight	kg	0.1	0.15

Spare Parts

O-ring	**B 4070 207 PV**	**B 4070 207 PV**

Dimensions



Solenoid Actuated Venting Valve

VVM010-A

Advantages

- No vacuum feedthrough
- Long service life
- Mountable in any position

Selection Data

Vacuum connection	DN 10 ISO-KF

Ordering Information

Type		VVM010-A
230 V AC, 50/60 Hz	Part No.	**250-533**
115 V AC, 50/60 Hz	Part No.	**250-532**
24 V AC, 50/60 Hz	Part No.	**250-531**
24 V DC	Part No.	**250-530**

Specifications

Service life	cycles	1 500 000
Tightness	mbar l/s	1×10^{-9}
Conductance for molecular flow	l/s	1
Conductance at 1mbar	l/s	3.5
Pressure absolute min./max.	mbar/bar	1×10^{-8}
Duty cycle	%	100
Differential pressure in		
closing / opening direction	bar	10 / 1
opens to a pressure difference of	bar	2
Ambient temperature	°C	5 – 40
Pickup / holding power	VA	35 / 15
Pressure resistance	bar	10
Closing / opening time	ms	60 / 45
Switching frequency	1/min	50
Housing		aluminum
Seals		FPM
Weight	kg	0.46

VVM010–A – continued

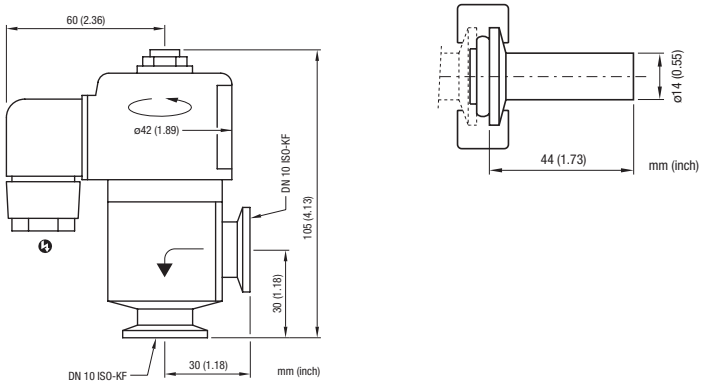
Options

Filter with port, centering ring and clamping ring	**215-152**

Spare Parts

Seal set	**215-208**
Filter	**B 4161 210 4F**

Dimensions



Power Failure Venting Valve

VIM010–A

Advantages

- For automatic venting of pumps, system or vacuum chambers in case of a power failure

Selection Data

Vacuum connection	DN 10 ISO-KF
Venting time for a 50 l vessel	270 s

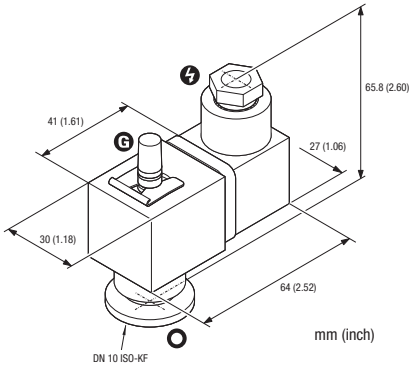
Ordering Information

Type	**VIM010-A**
200 - 230 V, 50/60 Hz	**250-851**
24 V DC	**250-850**
115 V, 50/60 Hz	**250-852**

Specifications

Part number		**250-850**	**250-851**	**250-852**
Tightness	mbar l/s		1 x 10^{-7}	
Ambient temperature	°C		0 – 50	
Switching frequency	1/min		60	
Service life	Mio cycles		3	
Opening time	ms		30	
Closing time	ms		30	
Housing			aluminum	
Seal			FPM	
Nominal power				
Pickup	W / VA	2.5 / –	– / 5	– / 5
Holding	W / VA	2.5 / –	– / 3.7	– / 3.7
Protection class			IP 65	
Weight	kg		0.1	

Dimensions



Vacuum Safety Valves

VSM DN 16 – DN 100

Advantages

- Fast-closing high vacuum isolation valve for separating the vacuum chamber from the backing pump
- Venting valve for roughing pumps
- Immediate closing action upon power failure
- Opening action only after the intake line has been evacuated

Selection Data

Vacuum connection	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K	DN 100 ISO-K

Ordering Information

Type	VSM016-A	VSM025-A	VSM040-A	VSM063-A	VSM100-A
200 - 230 V AC	**253-004**	**253-014**	**253-024**	**253-034**	**253-044**
100 - 115 V AC	**253-002**	**253-012**	**253-022**	**253-032**	**253-042**
24 V DC	**253-000**	**253-010**	**253-020**	**253-030**	**253-040**

Specifications

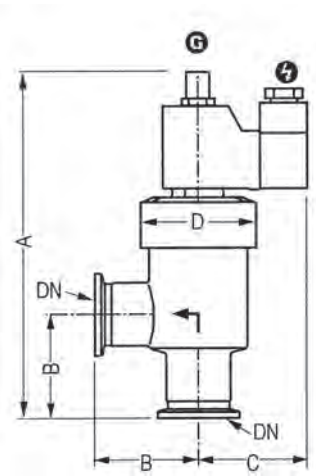
Nominal power	DC AC	2.5 W 5 / 3.7 VA (starting / holding)				
Type of protection		IP 65 according to DIN 40 050				
Conductance		3.8 l/s	11 l/s	30.5 l/s	126 l/s	300 l/s
Installation position		any				
Tightness	body valve plate	< $1x10^{-9}$ mbar l/s < $1x10^{-5}$ mbar l/s				
Pressure range		$1x10^{-8}$ mbar – 1 bar (abs.)				
Required pressure difference up for the safety valves to function properly						
	in closing direction in opening direction	> 150 mbar < 150 mbar				
Temperatures	ambiance	5°C – 50°C				
Solenoid coil	ambiance 20°C ambiance 20°C	< 55°C < 80°C				
Bakeout	housing actuator	< 60°C < 50°C				
Materials	housing, flange seals	aluminum FPM				
Weight		0.3 kg	0.5 kg	0.9 kg	2.4 kg	5.1 kg

VSM DN 16 – DN 100 – continued

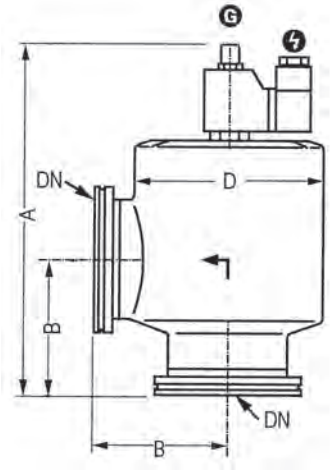
Spare Parts

Seal set	215-055	215-056	215-057	215-058	215-059

Dimensions



DN	A	B	C	D
DN 16 ISO-KF	139	40	49	44
DN 25 ISO-KF	162	50	49	56
DN 40 ISO-KF	178	65	49	82



DN	A	B	D
DN 63 ISO-K	220	88	124
DN 100 ISO-K	264	108	164

Pressure Relief Valve

VSA016–X

Advantages

- Protects vacuum systems from pressure >1.5bar
- Relief trigger point 1.2 to 1.5 bar absolute

Selection Data

Vacuum connection	DN 16 ISO-KF

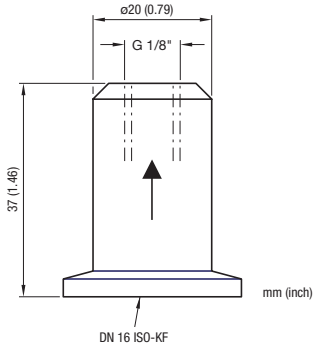
Ordering Information

Type	**VSA016-X**
Part No.	**250-555**

Specifications

Tightness	mbar l/s	1×10^{-9}
Pressure absolute min./max.	mbar / bar	1×10^{-8} / 1.2 (absolute)
Gas flow	l/min	0 – 6
Ambient temperature	°C	0 – 50
Bakeout temperature	°C	150
Housing		stainless steel
Seal		FPM
Weight	kg	0.1

Dimensions



Ball Valves with ISO–KF Flanges

DN 10–40

Advantages

- Rugged and cost effective
- Simple opening and closing by lever
- Unobstructed passage

Selection Data

Vacuum connection	DN 10 ISO-KF	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF

Ordering Information

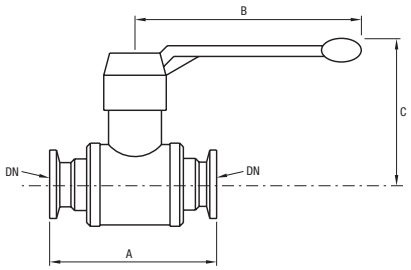
Part No.	**215-860**	**215-861**	**215-862**	**215-863**

Specifications

Tightness Conductance for molecular flow	mbar/ls l/s	1 x 10^{-5} 1.5	1 x 10^{-5} 3	1 x 10^{-5} 9	1 x 10^{-5} 30
Pressure absolute min./max.	mbar/bar	10^{-5} / 5 [1]	10^{-5} / 5 [1]	10^{-5} / 5 [1]	10^{-5} / 5 [1]
Bakeout temperature	°C	80	80	80	80
Housing Seals		brass nickel plated PTFE	brass nickel plated PTFE	brass nickel plated PTFE	brass nickel plated PTFE
Weight	kg	0.35	0.35	0.35	0.35

1) With outer centering ring

Dimensions



DN	A	B	C
DN 10 ISO-KF	75	83	47
DN 16 ISO-KF	100	95	51
DN 25 ISO-KF	130	110	64
DN 40 ISO-KF	160	160	85

Vacuum Fittings

High– & Ultra–High Vacuum Components

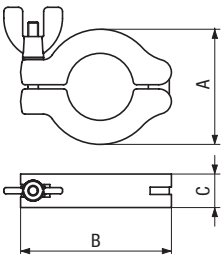
VACUUM FITTINGS

ISO-KF Small Flange Components

CONNECTION ELEMENTS

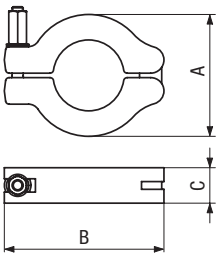
Clamping Ring Wing Nut

		DN ... ISO-KF	Part No.	A	B	C
Clamping ring half:	aluminum 380.0/3.2162	10 – 16	**211-001**	45	61	16
Bolt:	steel nickel plated	20 – 25	**211-002**	55	72	16
Nut:	zinc alloy nickel plated	32 – 40	**211-003**	70	90	18
		50	**211-004**	95	123	25



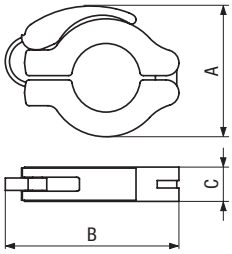
Clamping Ring Hex Nut

		DN ... ISO-KF	Part No.	A	B	C
Clamping ring half:	aluminum 380.0/3.2162	10 – 16	**211-611**	45	61	16
Bolt & nut:	steel nickel plated	20 – 25	**211-612**	55	72	16
		32 – 40	**211-613**	70	90	18
		50	**211-614**	95	123	25



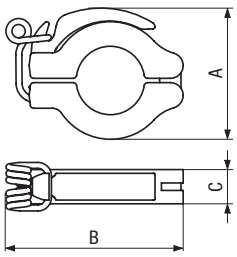
Rapid Fastening Clamp

		DN ... ISO-KF	Part No.	A	B	C
Spring:	steel	10 – 16	**211-005**	52	70	16
Clamping ring half:	aluminum 380.0/3.2162	20 – 25	**211-006**	61	81	16
Lever:	polyamide	32 – 40	**211-007**	75	98	18



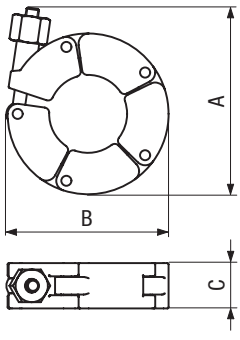
Rapid Fastening Clamp All Metal

		DN ... ISO-KF	Part No.	A	B	C
Spring:	stainless steel	10 – 16	**211-036**	52	71	16
Clamping ring half:	aluminum 380.0/3.2162	20 – 25	**211-037**	61	72	16
Lever:	aluminum –/3.2982	32 – 40	**211-038**	78	99	18



Chain Clamp

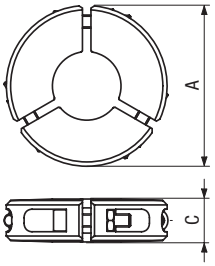
		DN ... ISO-KF	Part No.	A	B	C
Chain link:	aluminum 6081/3.2215	10 – 16	**211-021**	71	52.5	18
Screw & nut & bolts:	stainless steel	20 – 25	**211-022**	82	65	18
		32 – 40	**211-023**	98	79	18
		50	**211-024**	117	97.5	20



CONNECTION ELEMENTS - continued

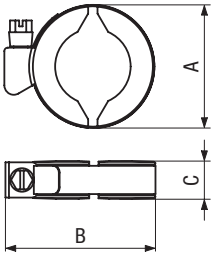
Clamping Element

		DN ... ISO-KF	Part No.	A	B	C
Clamping Element:	aluminum 380.0/3.2162	10 – 16	**211-008**	52		18
Bolt:	stainless steel	20 – 25	**211-009**	55	72	16
Nut:	steel zinc plated	32 – 40	**211-010**	70	90	18
		50	**211-011**	95	123	25



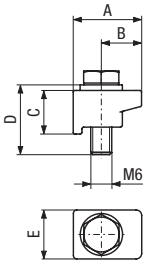
Hose Clip Clamping Ring

		DN ... ISO-KF	Part No.	A	B	C
Clamping ring half:	aluminum 380.0/3.2162	10 – 16	**211-016**	42	54	16
Band:	stainless steel 430/1.4016	20 – 25	**211-017**	52	64	16
Bolt & nut thread:	steel zinc plated	32 – 40	**211-018**	67	79	16



Claw Grip

		DN ... ISO-KF	Part No.	A	B	C	D	E	Set of
Claw:	aluminum 6081/3.2215	10 – 50	**211-015**	19.5	11.5	12.5	20	14	4 pcs.
Screw & washer:	stainless steel								

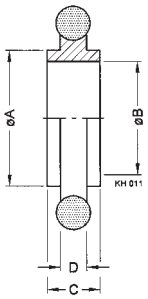


ISO-KF Small Flange Components

SEALS

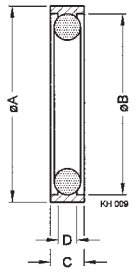
Centering Ring

	DN ... ISO-KF	Part No.	A	B	C	D
Ring: Aluminum 6082/–	10	**211-051**	12	10	8	3.9
Seal: Elastomer CR	16	**211-052**	17	16	8	3.9
	20	**211-053**	22	20	8	3.9
	25	**211-054**	26	25	8	3.9
	32	**211-055**	34	32	8	3.9
	40	**211-056**	41	40	8	3.9
	50	**211-057**	52	50	8	3.9
Ring: Aluminum 6082/–	10	**211-058**	12	10	8	3.9
Seal: Elastomer FPM	16	**211-059**	17	16	8	3.9
	20	**211-060**	22	20	8	3.9
	25	**211-061**	26	25	8	3.9
	32	**211-062**	34	32	8	3.9
	40	**211-063**	41	40	8	3.9
	50	**211-064**	52	50	8	3.9
Ring: Stainless steel 303/1.4305–	10	**211-065**	12	10	8	3.9
Seal: Elastomer FPM	16	**211-066**	17	16	8	3.9
	20	**211-067**	22	20	8	3.9
	25	**211-068**	26	25	8	3.9
	32	**211-069**	34	32	8	3.9
	40	**211-070**	41	40	8	3.9
	50	**211-071**	52	50	8	3.9



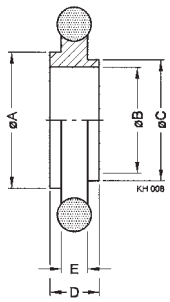
External Centering Ring

	DN ... ISO-KF	Part No.	A	B	C	D
Ring: Aluminum 6082/–	10-16	**211-081**	32	30.2	7	3.9
Seal: Elastomer CR	20-25	**211-082**	42	40.2	7	3.9
	32-40	**211-083**	57	55.2	7	3.9
	50	**211-084**	77	75.2	7	3.9
Ring: Aluminum 6082/–	10-16	**211-085**	32	30.2	7	3.9
Seal: Elastomer FPM	20-25	**211-086**	42	40.2	7	3.9
	32-40	**211-087**	57	55.2	7	3.9
	50	**211-088**	77	75.2	7	3.9



Reducing Centering Ring

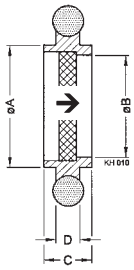
	DN ... ISO-KF	Part No.	A	B	C	D	E
Ring: Aluminum 6082/–	10 / 16	**211-072**	17	10	12	8	3.9
Seal: Elastomer CR	20 / 25	**211-073**	26	20	22	8	3.9
	32 / 40	**211-074**	41	32	34	8	3.9
Ring: Aluminum 6082/–	10 / 16	**211-075**	17	10	12	8	3.9
Seal: Elastomer FPM	20 / 25	**211-076**	26	20	22	8	3.9
	32 / 40	**211-077**	41	32	34	8	3.9
Ring: Stainless steel 303/1.4305	10 / 16	**211-078**	17	10	12	8	3.9
Seal: Elastomer FPM	20 / 25	**211-079**	26	20	22	8	3.9
	32 / 40	**211-080**	41	32	34	8	3.9



SEALS – continued

Centering Ring with Filter

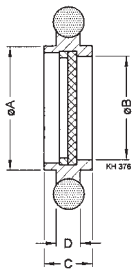
	DN ... ISO-KF	Part No.	A	B	C	D	E*
Ring: Stainless steel 303/1.4305	10	**211-089**	12	8	8	3.9	0.5m³/h
Seal: Elastomer FPM	16	**211-090**	17	14	8	3.9	1.2m³/h
Filter: Stainless steel 316L/1.4435	25	**211-092**	26	23	8	3.9	4.2m³/h
Pore size 0.02 mm	40	**211-094**	41	38	8	3.9	11.3m³/h
* Air at 0°C, 20 mbar differential pressure	50	**211-095**	52	48	8	3.9	18.1m³/h



→ Recommended gas flow direction

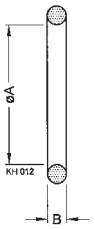
Centering Ring with Fine Filter

	DN ... ISO-KF	Part No.	A	B	C	D
Inner ring: Stainless steel 303/1.4305	10	**211-096**	12	9	8	3.9
Snab ring: Stainless steel 304/1.4301	16	**211-097**	17	13	8	3.9
Seal: Elastomer FPM	25	**211-098**	26	22	8	3.9
Filter: Stainless steel 316L/1.4435	40	**211-099**	41	35.5	8	3.9
Pore size 0.004 mm	50	**211-100**	52	45.7	8	3.9
Degree of separation at 0.001 mm up to 98%						



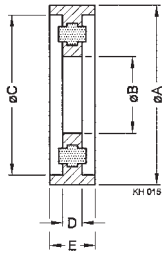
O-Ring

	DN ... ISO-KF	Part No.	A	B	Set of
Elastomer CR	10	**211-146**	15	5	10 pcs.
	16	**211-147**	18	5	10 pcs.
	20	**211-148**	25	5	10 pcs.
	25	**211-149**	28	5	10 pcs.
	32	**211-150**	40	5	10 pcs.
	40	**211-151**	42	5	10 pcs.
	50	**211-152**	55	5	10 pcs.
Elastomer FPM	10	**211-153**	15	5	10 pcs.
	16	**211-154**	18	5	10 pcs.
	20	**211-155**	25	5	10 pcs.
	25	**211-156**	28	5	10 pcs.
	32	**211-157**	40	5	10 pcs.
	40	**211-158**	42	5	10 pcs.
	50	**211-159**	55	5	10 pcs.



Indium Seal

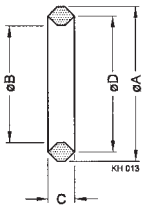
	DN ... ISO-KF	Part No.	A	B	C	D	E
Inner ring: Stainless steel 304/1.4301	10-16	**211-162**	32	18	30	3.9	7
Outer ring: Aluminum 5012/–	20-25	**211-163**	42	28	40	3.9	7
Seal: Indium	32-40	**211-164**	57	43	55	3.9	7
Working temperature: -196° to +60°C	50	**211-165**	77	63	75	3.9	7



SEALS - continued

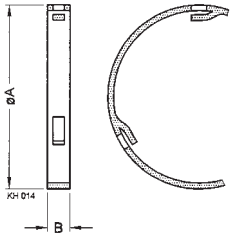
Aluminum Seal

	DN ... ISO-KF	Part No.	A	B	C	D	With Support Ring
Aluminum annealed 6082/3.2315	10-16	**211-167**	25.6	19.6	4.5	22.6	211-171
	20-25	**211-168**	35.6	29.6	4.5	32.6	211-168
	32-40	**211-169**	50.6	44.6	4.5	47.6	211-173
Set of 3 pieces	50	**211-170**	65.6	59.6	4.5	62.6	211-174



Support for Aluminum Seal

	DN ... ISO-KF	Part No.	A	B	For Aluminum Seal
Stainless steel 301/1.4310	10-16	**211-171**	32	7	211-167
	20-25	**211-172**	42	7	211-168
	32-40	**211-173**	57	7	211-169
Reusable	50	**211-174**	77	7	211-170

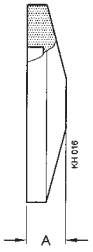


ISO–KF Small Flange Components

FLANGES

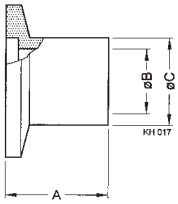
Blank Flange

	DN ... ISO-KF	Part No.	A
Aluminum 6082/–	10	**211-176**	5
	16	**211-177**	5
	25	**211-178**	5
	40	**211-179**	5
	50	**211-180**	6
Stainless steel 304/1.4301	10	**211-181**	5
	16	**211-182**	5
	25	**211-183**	5
	40	**211-184**	5
	50	**211-185**	6



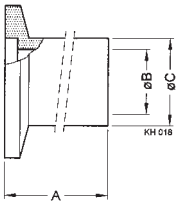
Flange with Tube, Short

	DN ... ISO-KF	Part No.	A	B	C
Steel –/1.0037	10	**211-201**	20	12	16
	16	**211-202**	20	16	20
	25	**211-203**	20	26	30
	40	**211-204**	20	41	45
	50	**211-205**	20	51	55
Stainless steel 304/1.4301	10	**211-211**	20	12	16
	16	**211-212**	20	16	20
	25	**211-213**	20	26	30
	40	**211-214**	20	41	45
	50	**211-215**	20	50	54



Flange with Tube, Long

	DN ... ISO-KF	Part No.	A	B	C
Steel –/1.0037	10	**211-206**	70	12	16
	16	**211-207**	70	16	20
	25	**211-208**	70	26	30
	40	**211-209**	70	41	45
	50	**211-210**	70	51	55
Stainless steel 304/1.4301	10	**211-216**	70	12	16
	16	**211-217**	70	16	20
	25	**211-218**	70	26	30
	40	**211-219**	70	41	45
	50	**211-220**	70	50	54

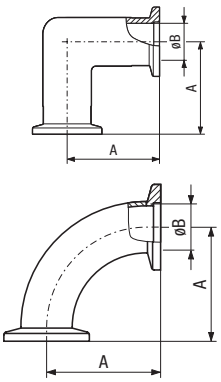


ISO-KF Small Flange Components

PIPE FITTINGS

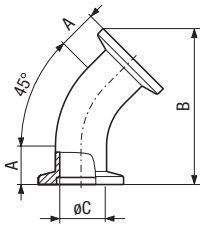
Elbow 90°

	DN ... ISO-KF	Part No.	A	B
Aluminum 6082/–	10	**211-251**	30	12
	16	**211-252**	40	16
	25	**211-253**	50	25
	40	**211-254**	65	39
Stainless steel 304/1.4301	10	**211-286**	30	9
	16	**211-287**	40	15
	25	**211-288**	50	25
	40	**211-289**	65	40.5
	50	**211-290**	70	49



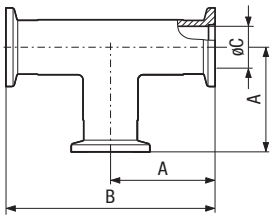
Elbow 45°

	DN ... ISO-KF	Part No.	A	B	C
Stainless steel 304/1.4301	16	**211-307**	26	55	15
	25	**211-308**	32	68.8	25
	40	**211-309**	40	87.7	37



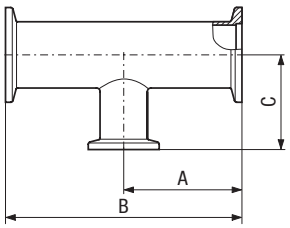
Tee

	DN ... ISO-KF	Part No.	A	B	C
Aluminum 6082/–	10	**211-261**	30	60	12
	16	**211-262**	40	80	16
	25	**211-263**	50	100	25
	40	**211-264**	65	130	39
Stainless steel 304/1.4301	10	**211-291**	30	60	12
	16	**211-292**	40	80	16
	25	**211-293**	50	100	25
	40	**211-294**	65	130	40.5
	50	**211-295**	70	140	53



Reducing Tee

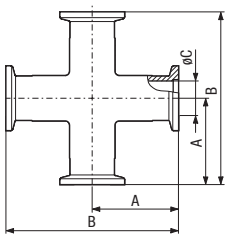
	DN ... ISO-KF	Part No.	A	B	C
Stainless steel 304/1.4301	25/16	**211-316**	50	100	40
	40/16	**211-317**	65	130	40
	40/25	**211-318**	65	130	50
	50/16	**211-319**	70	140	50
	50/25	**211-320**	70	140	65
	50/40	**211-321**	70	140	65



PIPE FITTINGS - continued

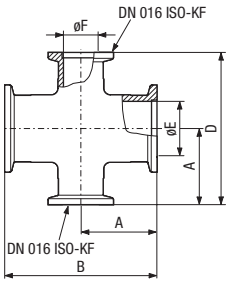
Cross

	DN ... ISO-KF	Part No.	A	B	C
Aluminum 6082/3.2315	10	**211-266**	30	60	12
	16	**211-267**	40	80	16
	25	**211-268**	50	100	25
	40	**211-269**	65	130	39
Stainless steel 304/1.4301	10	**211-296**	30	60	12
	16	**211-297**	40	80	16
	25	**211-298**	50	100	25
	40	**211-299**	65	130	40.5
	50	**211-300**	70	140	53



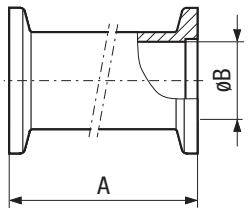
Reducing Cross

	DN ... ISO-KF	Part No.	A	B	C	D	E	F
Aluminum 6082/3.2315	25/16	**211-271**	35	70	35	70	25	16
	40/16	**211-272**	40	80	45	90	39	16
Stainless steel 304/1.4301	25/16	**211-301**	35	70	35	70	25	17
	40/16	**211-302**	40	80	45	90	40.5	16
	50/16	**211-303**	50	100	50	100	53	16



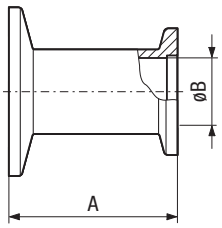
Intermediate Piece

	DN ... ISO-KF	Part No.	A	B
Aluminum 6082/–	16	**211-227**	80	16
	25	**211-228**	100	25
	40	**211-229**	130	40
Stainless steel 304/1.4301	16	**211-277**	80	16
	25	**211-278**	100	25
	40	**211-279**	130	40.5
	50	**211-280**	140	53



Reducer

	DN ... ISO-KF	Part No.	A	B
Aluminum 6082/–	25/16	**211-231**	40	16
	40/16	**211-232**	40	16
	40/25	**211-233**	40	25
	50/40	**211-234**	40	40
Stainless steel 303/1.4305	25/16	**211-281**	40	16
	40/16	**211-282**	40	16
	40/25	**211-283**	40	26
	50/16	**211-323**	40	16
	50/25	**211-324**	40	26
	50/40	**211-284**	40	40



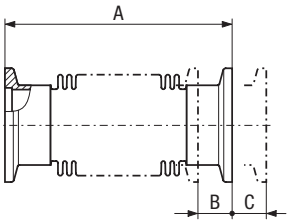
ISO-KF Small Flange Components

BELLOWS/HOSE WITH FLANGES

Bellows

DN ... ISO-KF	Part No.	A	B	C	D	E
10	**211-326**	70	3.5	3	23°	5
16	**211-327**	70	6.4	4.1	21°	4
25	**211-328**	80	8	5	17°	3.5
40	**211-329**	100	11	7	15°	7
50	**211-330**	100	10	6	15°	8

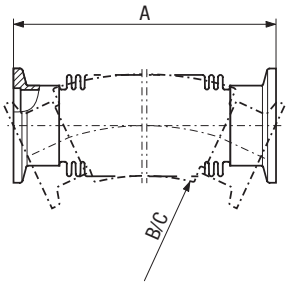
Flanges: stainless steel 304/1.4301
Bellow: stainless steel 316Ti/–
Max. internal pressure: 4bar
A = unstressed length
D = max. deviation from axis
E = lateral displacement



Metal Hose

DN ... ISO-KF	Part No.	A	B	C
10	**211-331**	250	70	32
10	**211-332**	500	70	32
10	**211-333**	750	70	32
10	**211-334**	1000	70	32
16	**211-335**	250	70	50
16	**211-336**	500	70	50
16	**211-337**	750	70	50
16	**211-338**	1000	70	50
16	**211-531**	1500	70	50
16	**211-532**	2000	70	50
25	**211-339**	250	100	60
25	**211-340**	500	100	60
25	**211-341**	750	100	60
25	**211-342**	1000	100	60
25	**211-533**	1500	100	103
25	**211-534**	2000	100	103
40	**211-343**	250	130	100
40	**211-344**	500	130	100
40	**211-345**	750	130	100
40	**211-346**	1000	130	100
40	**211-535**	1500	130	129
40	**211-536**	2000	130	129
50	**211-347**	250	200	130
50	**211-348**	500	200	130
50	**211-349**	750	200	130
50	**211-350**	1000	200	130

Max. internal pressure: 4 bar
B = radius for multiple bending
C = radius for single bend

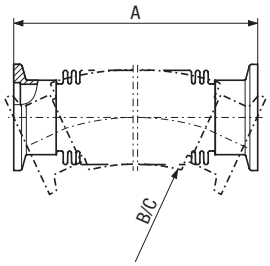


BELLOWS/HOSE WITH FLANGES – continued

Metal Hose, Flexible

Flanges: stainless steel 304/1.4301
Bellow: stainless steel 316Ti/–
Max. internal pressure: 2 bar
B = radius for multiple bending
C = radius for single bend

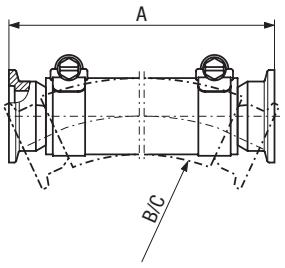
DN ... ISO-KF	Part No.	A	B	C
16	**211-515**	250	40	25
16	**211-516**	500	40	25
16	**211-517**	750	40	25
16	**211-518**	1000	40	25
25	**211-519**	250	55	36
25	**211-520**	500	55	36
25	**211-521**	750	55	36
25	**211-522**	1000	55	36
40	**211-523**	250	90	60
40	**211-524**	500	90	60
40	**211-525**	750	90	60
40	**211-526**	1000	90	60
50	**211-527**	250	100	65
50	**211-528**	500	100	65



PVC Hose

Hose: PVC with cast in steel spiral
Nipple: aluminum 6082/–
Hose clamp: stainless steel 430/–
B = radius for multiple bending
C = radius for single bend

DN ... ISO-KF	Part No.	A	B	C
16	**211-406**	500	130	65
16	**211-407**	1000	130	65
25	**211-408**	500	200	100
25	**211-409**	1000	200	100
25	**211-412**	2000	200	100
40	**211-410**	500	260	130
40	**211-411**	1000	260	130

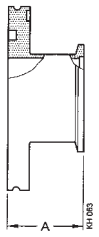


ISO–KF Small Flange Components

TRANSITION PIECES

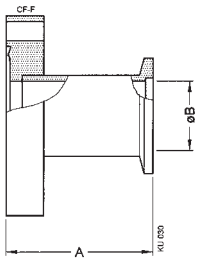
Adapter ISO-KF/ISO-K

	ISO-KF/ISO-K	Part No.	A
Aluminum 6082/–	40/63	**212-171**	40
	50/63	**212-172**	45
Stainless steel 303/1.4305	40/63	**212-173**	40
	50/63	**212-174**	45
	40/100	**212-175**	40



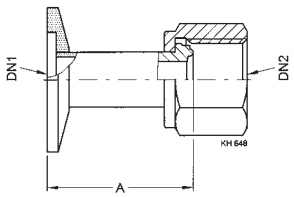
Adapter ISO-KF/CF-F

	ISO-KF/CF-F	Part No.	A	B
Stainless steel 304/1.4301	16/16	**213-251**	35	16
	25/16	**213-252**	35	16
	16/40	**213-254**	30	16
	25/40	**213-255**	30	26
	40/40	**213-256**	50	37
	40/63	**213-259**	35	41
	40/100	**213-262**	50	41



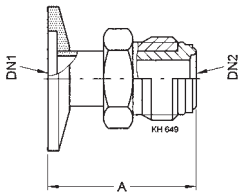
Adapter ISO-KF/VCR Female

	ISO-KF/VCR	Part No.	A
Flange: Stainless steel 304/1.4301	16/ 1/4”	**211-359**	35.8
Nut: Stainless steel 316L/1.4435	25/ 1/4”	**211-480**	35.8
	25/ 1/2”	**211-360**	40.6
Width across flats in inch	40/ 3/4”	**211-361**	53.3



Adapter ISO-KF/VCR Male

	ISO-KF/VCR	Part No.	A
Flange: Stainless steel 304/1.4301	16/ 1/4”	**211-362**	35.8
Nut: Stainless steel 316L/1.4435	25/ 1/4”	**211-481**	35.8
	25/ 1/2”	**211-363**	40.6
Width across flats in inch	40/ 3/4”	**211-364**	53.3

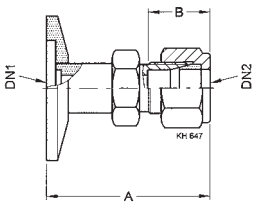


TRANSITION PIECES – continued

Adapter ISO-KF/Swagelok

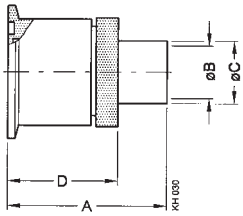
	ISO-KF/Swagelok	Part No.	A	B
Flange: Stainless steel 304/1.4301	16/6 mm	**211-356** [1]	37	15.3
Nut: Stainless steel 316L/1.4435	25/10 mm	**211-357** [1]	45	17.2
	40/16 mm	**211-358** [1]	53	24.4
	16/ 1/8”	**211-476** [2]	34.5	12.7
	25/ 1/4”	**211-477** [2]	37	15.3
	40/ 1/4”	**211-478** [2]	37	15.3
	40/ 1/2”	**211-479** [2]	47.5	22.8

[1] Width across flats metric (SI)
[2] Width across flats in inch



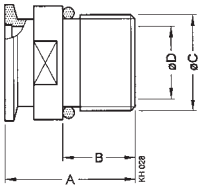
Glass Tube Connection

	DN ... ISO-KF	Part No.	A	B	C	D
Flange: Aluminum 6082/–	10	**211-351**	50	8	10	30
Sealing: Elastomer FPM	40	**211-353**	65	22	26	45
Tube: Glas Pyrex						



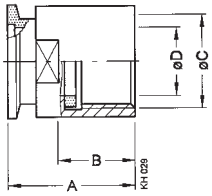
Screw-in Flange

	ISO-KF/DN	Part No.	A	B	C	D
Flange: Stainless steel 303/1.4305	10/ G 3/8”	**211-366**	35	15	G 3/8”	12
Sealing: Elastomer FPM	16/ G 1/2”	**211-367**	35	15	G 1/2”	16
	25/ G 1”	**211-368**	45	25	G1”	25
Width across flats metric (SI)	40/ G 1 1/2”	**211-369**	50	30	G 1 1/2”	41



Screw-on Flange

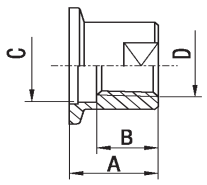
	ISO-KF/DN	Part No.	A	B	C	D
Flange: Stainless steel 303/1.4305	10/ G 3/8”	**211-376**	35	15	G 3/8”	10
Sealing: Elastomer FPM	16/ G 1/2”	**211-377**	35	15	G 1/2”	15
	25/ G 1”	**211-378**	45	25	G 1”	24
Width across flats metric (SI)	40/ G 1 1/2”	**211-379**	50	30	G 1 1/2”	38



TRANSITION PIECES – continued

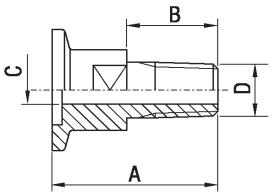
Adapter ISO-KF/NPT Female

	ISO-KF/NPT	Part No.	A	B	C	D
Stainless steel 303	16/ 1/8”	**211-566**	19	10	12	1/8-27 NPT
	16/ 1/4”	**211-567**	19	13	15	1/4-18 NPT
	25/ 1/8”	**211-569**	19	10	12	1/8-27 NPT
	25/ 1/4”	**211-570**	19	13	15	1/4-18 NPT
	25 / 1/2”	**211-571**	26	18	25	1/2-14 NPT
	25 / 1”	**211-572**	42	24	25	1-11 1/2 NPT
	40 / 1/4”	**211-574**	19	13	15	1/4-18 NPT
	40 / 1/2”	**211-575**	26	18	25	1/2-14 NPT
Width across flats in inch	40 / 1”	**211-576**	26	23	41	1-11 1/2 NPT



Adapter ISO-KF/NPT Male

	ISO-KF/NPT	Part No.	A	B	C	D
Stainless steel 303 / 1.4305	16/ 1/8”	**211-551**	40	17	5	1/8-27 NPT
	16/ 1/4”	**211-552**	40	22	7	1/4-18 NPT
	25/ 1/8”	**211-554**	40	17	5	1/8-27 NPT
	25/ 1/4”	**211-555**	40	22	7	1/4-18 NPT
	25 / 1/2”	**211-556**	50	30	14	1/2-14 NPT
	25 / 1”	**211-557**	60	32	25	1-11 1/2 NPT
	40 / 1/4”	**211-559**	40	21	7	1/4-18 NPT
	40 / 1/2”	**211-560**	50	30	14	1/2-14 NPT
	40 / 1”	**211-561**	60	33	25	1-11 1/2 NPT
	40 / 1 1/4”	**211-562**	50	31.5	32	1 1/4-11 1/2 NPT
	40 / 1 1/2”	**211-563**	50	28	32	1 1/2-11 1/2 NPT
Width across flats in inch	40 / 2”	**211-564**	50	27	40	2-11 1/2 NPT



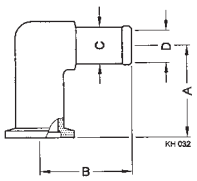
ISO–KF Small Flange Components

HOSE, HOSE CONNECTION

Hose Adapter 90°

	DN ... ISO-KF	Part No.	A	B	C	D
Aluminum 6082/–	16	**211-257**	40	40	16	13
	25	**211-258**	50	50	25	22
	40	**211-259**	65	65	40	37

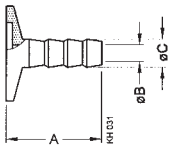
C = nominal connection for sleeve / hose



Hose Adapter for Rubber Hose

	DN ... ISO-KF	Part No.	A	B	C
Aluminum 6082/–	16	**211-387**	40	7	12
	25	**211-388**	40	7	12
	40	**211-389**	40	7	12
Stainless steel 303/1.4305	16	**211-392**	40	7	12
	25	**211-393**	40	7	12
	40	**211-394**	40	7	12

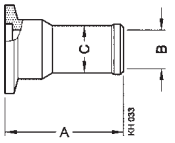
C = nominal connection for hose



Hose Connection

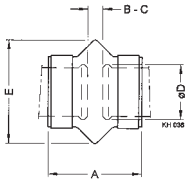
	DN ... ISO-KF	Part No.	A	B	C
Aluminum 6082/–	25	**211-401**	40	13	16
	16	**211-402**	40	13	16
	25	**211-403**	40	22	25
	40	**211-404**	40	37	40

C = nominal connection for sleeve / hose



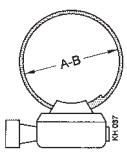
Sleeve with Hose Clamp

	DN ... ISO-KF	Part No.	A	B	C	D	E
Hose clamp: Stainless steel 430/–	16	**211-417**	58	7	14	16	44
Sleeve: Elastomer CR	25	**211-418**	60	9	16	25	50
Max. internal pressure: 1 bar	40	**211-419**	64	13	20	40	68



Hose Clamp

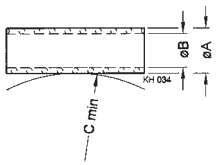
	DN ... ISO-KF	Part No.	A	B
Stainless steel 430/–	16	**211-461**	13	32
	25	**211-462**	19	44
	40	**211-463**	29	76



HOSE, HOSE CONNECTION - continued

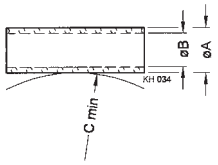
PVC Hose

	DN ... ISO-KF	Part No.	A	B	C
With cast in spiral	16	**211-442**	23	16	130
	25	**211-443**	33	25	200
For vacuum applications Indicate length in meters	40	**211-444**	53	40	260



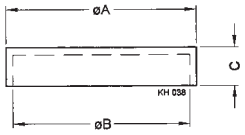
Rubber Hose

	DN ... ISO-KF	Part No.	A	B
For vacuum applications	10	**211-451**	17	7
Indicate length in meters Hardness: 55 ± 5 Shore A Temperature: -30 to +85 °C	16	**211-452**	25	10
	20	**211-453**	32	16



Protective Lid

	DN ... ISO-KF	Part No.	A	B	C
Polyethylene	10-16	**211-427**	32	29	7.5
	20-25	**211-428**	42	39	7.5
	32-40	**211-429**	57	54	7.5
	50	**211-430**	77	74	7.5

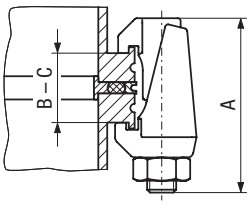


ISO-K Clamp Flange Components

CONNECTION ELEMENTS

Clamp

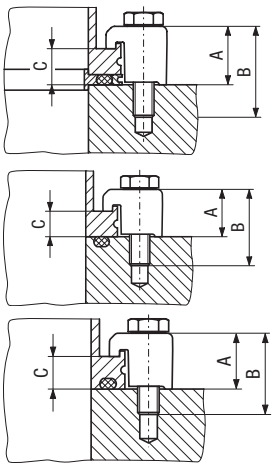
	DN ... ISO-K	Part No.	A	B	C	Set of
Steel zinc plated 1045/–	63-250	**212-225**	60	17	27	4 pcs.
	320-500	**212-226**	78	27	39	4 pcs.
	630	**212-227**	88	31	49	4 pcs.
Stainless steel 316/–	63-250	**212-228**	61	18	28	4 pcs.
	320-630	**212-240**	82	29	47	4 pcs.



Claw

	DN ... ISO-K	Part No.	A	B	C	Set of
Clamping flange / base plate	63-100	**212-231**	22.5	35	13.9	4 pcs.
	160-250	**212-232**	23	35	13.9	4 pcs.
	320-500	**212-233**	36.5	50	20.6	4 pcs.
	630	**212-234**	41.5	55	25.6	4 pcs.
Clamping flange/	63-100	**212-235**	18.6	30	10	4 pcs.
base plate with groove	160-250	**212-236**	19	35	10	4 pcs.
	320-500	**212-237**	31	45	15	4 pcs.
	630	**212-233**	36.5	50	20.6	4 pcs.
Clamping flange with	63-100	**212-247**	20.6	30	12	4 pcs.
groove / base plate	160-250	**212-248**	21.1	35	12	4 pcs.
	320-500	**212-249**	33.9	45	18	4 pcs.
	630	**212-233**	36.5	50	20.6	4 pcs.

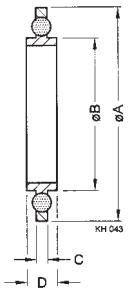
Steel zinc plated 1045/–



ISO-K Clamp Flange Components

SEALS

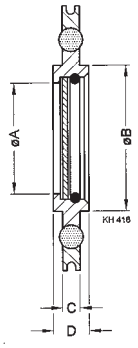
Centering Ring		DN ... ISO-K	Part No.	A	B	C	D
Inner & outer ring:	Aluminum 6082/–	63	**212-251**	96	70	3.9	8
Seal:	Elastomer CR	80	**212-091**	109	83	3.9	8
		100	**212-252**	128	102	3.9	8
		160	**212-253**	179	153	3.9	8
		200	**212-254**	239	213	3.9	8
		250	**212-255**	287	261	3.9	8
		320	**212-256**	358	318	5.6	14
		400	**212-257**	440	400	5.6	14
		500	**212-258**	541	501	5.6	14
		630	**212-259**	691	651	5.6	14
Inner & outer ring:	Aluminum 6082/–	63	**212-261**	96	70	3.9	8
Seal:	Elastomer FPM	80	**212-092**	109	83	3.9	8
		100	**212-262**	128	102	3.9	8
		160	**212-263**	179	153	3.9	8
		200	**212-264**	239	213	3.9	8
		250	**212-265**	287	261	3.9	8
		320	**212-266**	358	318	5.6	14
		400	**212-267**	440	400	5.6	14
		500	**212-268**	541	501	5.6	14
		630	**212-269**	691	651	5.6	14
		800	**212-270**	840	800	5.6	14
		1000	**212-271**	1040	1000	5.6	14
Inner ring:	Stainless steel 304/–	63	**212-281**	96	70	3.9	8
Outer ring:	Aluminum 6082/–	80	**212-093**	109	83	3.9	8
Seal:	Elastomer FPM	100	**212-282**	128	102	3.9	8
		160	**212-283**	179	153	3.9	8
		200	**212-284**	239	213	3.9	8
		250	**212-285**	287	261	3.9	8



SEALS – continued

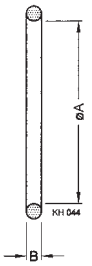
Centering Ring with Fine Filter

	DN ... ISO-K	Part No.	A	B	C	D
Inner ring: Stainless steel 304/–	63	**212-291**	62	69.8	3.9	8
Outer ring: Aluminum 6082/–	100	**212-292**	94	101.8	3.9	8
Seal: Elastomer FPM						
Snap ring: Stainless steel 304/–						
Filter grit: Stainless steel 304/–						
Filter: Stainless steel 316L/– Pore size 0.004 mm Degree of separation at 0.001 mm up to 98%						



O-Ring

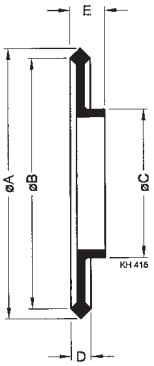
	DN ... ISO-K	Part No.	A	B	Set of
Elastomer CR	63	**212-386**	75.6	5.3	5 pcs.
	80	**212-387**	88.3	5.3	5 pcs.
	100	**212-388**	107.3	5.3	5 pcs.
	160	**212-389**	158.1	5.3	5 pcs.
	200	**212-390**	208.9	5.3	5 pcs.
	250	**212-391**	253.4	5.3	5 pcs.
	320	**212-356**	329.6	7	
	400	**212-357**	405.3	7	
	500	**212-358**	506.9	7	
	630	**212-359**	658.9	7	
Elastomer FPM	63	**212-392**	75.6	5.3	5 pcs.
	80	**212-393**	88.3	5.3	5 pcs.
	100	**212-394**	107.3	5.3	5 pcs.
	160	**212-395**	158.1	5.3	5 pcs.
	200	**212-396**	208.9	5.3	5 pcs.
	250	**212-397**	253.4	5.3	5 pcs.
Elastomer FPM	320	**212-366**	329.6	7	
	400	**212-367**	405.3	7	
	500	**212-368**	506.9	7	
	630	**212-369**	658.9	7	
	800	**212-370**	808	7	
	1000	**212-371**	1006	7	



SEALS - continued

Aluminum Seal

	DN ... ISO-K	Part No.	A	B	C	D	E
Aluminum annealed 6082/–	63	**212-301**	85.6	83	69.8	2.6	4.5
	100	**212-302**	116.6	114	101.8	2.6	4.5
	160	**212-303**	166.6	164	152.8	2.6	4.5
	250	**212-305**	276.6	274	260.8	2.6	4.5
Number of		Clamps	Claw Grips				
	DN 63 ISO -K	4					
	DN 100 ISO-K	6	8				
	DN 160 ISO-K	8	8				
	DN 250 ISO-K	12	12				

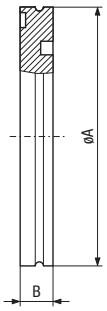


ISO–K Clamp Flange Components

FLANGES

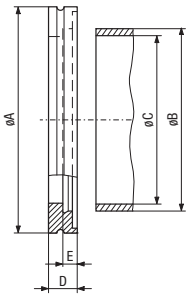
Blank Flange

	DN ... ISO-K	Part No.	A	B
Aluminum EN AW-6082 T6	63	**212-441**	95	12
	100	**214-442**	130	12
	160	**212-443**	180	12
	200	**212-444**	240	12
	250	**214-445**	290	12
	320	**212-446**	370	17
Steel nickel plated A570/–	63	**212-001**	95	12
	100	**212-002**	130	12
	160	**212-003**	180	12
	250	**212-005**	290	12
Stainless steel 304/–	63	**212-011**	95	12
	80	**212-076**	110	12
	100	**212-012**	130	12
	160	**212-013**	180	12
	200	**212-014**	240	12
	250	**212-015**	290	12
	320	**212-016**	370	17
	400	**212-017**	450	17
	500	**212-018**	550	17
	630	**212-019**	690	22



Welding Flange

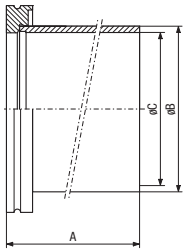
	DN ... ISO-K	Part No.	A	B	C	D	E
Steel –/1.0570	63	**212-021**	95	76.1	70.3	12	6
	100	**212-022**	130	108	102.2	12	6
Steel A570/–	160	**212-023**	180	159	153.2	12	6
	250	**212-025**	290	267	261	12	6
Stainless steel 304/–	63	**212-031**	95	76.1	71.5	12	6
	80	**212-078**	110	88.9	84.9	12	6
	100	**212-032**	130	108	102	12	6
	160	**212-033**	180	159	155	12	6
	200	**212-034**	240	219.1	213.9	12	6
	250	**212-035**	290	267	261	12	6
	320	**212-036**	370	324	318	17	8.5
Stainless steel 304/–	250	**212-385**	290	261	254	12	6
	250	**212-505**	290	273	261	12	5



FLANGES - continued

Flange with Tube

	DN ... ISO-K	Part No.	A	B	C
Flange: steel –/1.0570	63	**212-041**	100	76.1	70.3
Tube: steel –/1.0831	100	**212-042**	100	108	102.2
	160	**212-043**	100	159	153.2
	250	**212-045**	100	267	261
Stainless steel 304/–	63	**212-051**	100	76.1	71.5
	100	**212-052**	100	108	104
	160	**212-053**	100	159	155
	200	**212-054**	100	219.1	213.1
	250	**212-055**	100	267	261
	320	**212-056**	100	324	318
	400	**212-057**	100	406	400
	500	**212-058**	100	508	500
	630	**212-059**	100	660	650
Stainless steel 304/–	250	**212-506**	100	273	267

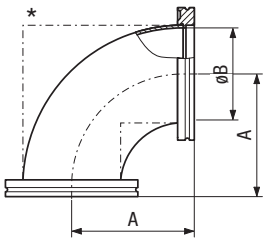


ISO-K Clamp Flange Components

PIPE FITTINGS

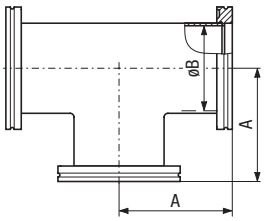
Elbow 90°

	DN ... ISO-K	Part No.	A	B
Stainless steel 304/–	63	**212-101**	88	66
	100	**212-102**	108	100
	160*	**212-103**	138	150
	200*	**212-104**	178	213
	250*	**212-105**	208	250
	320*	**212-106**	250	318



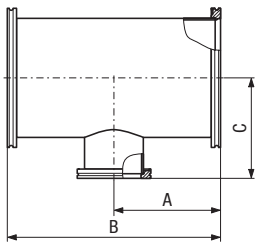
Tee

	DN ... ISO-K	Part No.	A	B
Stainless steel 304/–	63	**212-111**	88	66
	100	**212-112**	108	100
	160	**212-113**	138	150
	200	**212-114**	178	213
	250	**212-115**	208	250
	320	**212-116**	250	318



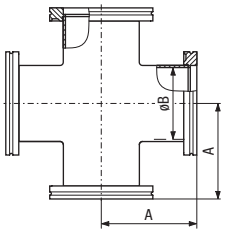
Reducing Tee

	DN ... ISO-K	Part No.	A	B	C
Stainless steel 304/–	160/63	**212-196**	138	276	130
	160/100	**212-197**	138	276	131
	250/200	**212-198**	190	380	208



Cross

	DN ... ISO-K	Part No.	A	B
Stainless steel 304/–	63	**212-121**	88	66
	100	**212-122**	108	100
	160	**212-123**	138	150
	200	**212-124**	178	213
	250	**212-125**	208	250

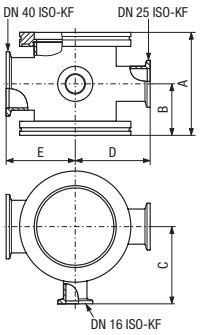


PIPE FITTINGS - continued

Reducing Cross

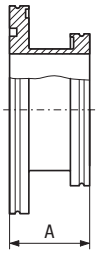
	DN ... ISO-K	Part No.	A	B	C	D	E
Stainless steel 304/–	63	**212-131**	88	44	66	64	59
	100	**212-132**	100	50	82	80	77
	160	**212-133**	100	50	107	107	105

1 x DN 16 ISO-KF, 1 x DN 25 ISO-KF, 1 x DN 40 ISO-KF



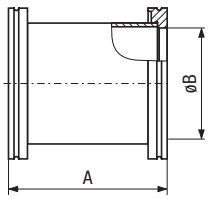
Reducer

	DN ... ISO-K	Part No.	A
Stainless steel 303/–	80/63	**212-084**	50
	100/63	**212-161**	50
	160/100	**212-163**	50
	200/160	**212-166**	50
	250/160	**212-169**	50
	250/200	**212-170**	50



Intermediate Piece

	DN ... ISO-K	Part No.	A	B
Stainless steel 304/–	63	**212-191**	100	70
	63	**212-192**	176	70



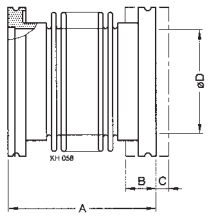
ISO-K Clamp Flange Components

BELLOWS / HOSE WITH FLANGES

Bellows

	DN ... ISO-K	Part No.	A	B	C	D	E
Flanges: Stainless steel 304/–	63	**212-201**	132	20	20	66	30°
Bellow: Stainless steel 316Ti/–	100	**212-202**	132	28	28	95	30°
	160	**212-203**	150	22	22	153	14°
	200	**212-204**	150	20	20	213	12°
E = max. deviation from axis	250	**212-205**	200	30	30	261	13°
Max. internal pressure 1.5 bar	320	**212-206**	250	50	50	313	12°

A = unstressed length

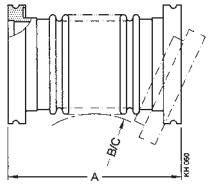


Metal Hose

	DN ... ISO-K	Part No.	A	B	C
Flanges: Stainless steel 304/–	63	**212-211**	250	250	160
Bellow: Stainless steel 316Ti/–	63	**212-212**	500	250	160
	63	**212-213**	750	250	160
	63	**212-214**	1000	250	160
	100	**212-215**	250	370	240
	100	**212-216**	500	370	240
	100	**212-217**	750	370	240
Max. internal pressure 1.5 bar	100	**212-218**	1000	370	240

B = radius for multiple bending

C = radius for single bending

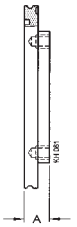


ISO-K Clamp Flange Components

TRANSITION PIECES

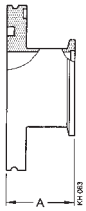
Adapter Flange

	ISO-K / ISO-F	Part No.	A
Stainless steel 304/–	160/63	**212-152**	22
	160/100	**212-153**	25
	200/100	**212-155**	20
	200/160	**212-156**	25
	250/160	**212-159**	22



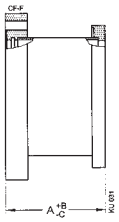
Adapter

	ISO-K / ISO-KF	Part No.	A
Aluminum 6082/–	63/40	**212-171**	40
	63/50	**212-172**	45
Stainless steel 303/–	63/25	**212-176**	50
	63/40	**212-173**	40
	63/50	**212-174**	45
	100/40	**212-175**	40



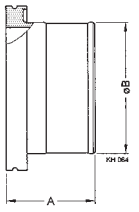
Adapter

	ISO-CF / ISO-K	Part No.	A	B	C
Stainless steel 304/–	63/63	**213-271**	90	1	1
	100/100	**213-272**	90	1	1
	160/160	**213-273**	90	1.5	1.5



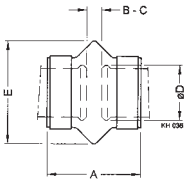
Adapter

	DN ... ISO-K	Part No.	A	B
Aluminum 6082/–	63	**212-181**	51	76
	100	**212-182**	56	107
	160	**212-183**	56	156



Sleeve with Hose Clamp

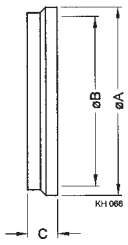
	DN ... ISO-KF	Part No.	A	B	C	D	E
Sleeve: Elastomer CR	63	**212-186**	70	14	24	75	120
Hose clamp: Stainless steel 430/–	100	**212-187**	72	8	26	106	150
Max. internal pressure: 1 bar	160	**212-188**	72	8	26	155	200



ISO-K Clamp Flange Components

PROTECTIVE LIDS

Protective Lids	DN ... ISO-K	Part No.	A	B	C
Polyethylene	63	**212-311**	102	95	18
	100	**212-312**	137	130	18
	160	**212-313**	187	180	18
	200	**212-314**	248	240	18.5
	250	**212-315**	297.5	290	18.5
	320	**212-316**	380	370	23.5
	400	**212-317**	461	450	23.5
	500	**212-318**	557	550	24
	630	**212-319**	697	690	29



ISO–F Fixed Flange Components

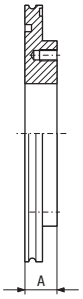
FLANGE COMPONENTS

Collar Flange with Retaining Ring

	DN ... ISO-F	Part No.	A	B	C
Flange:	63	**212-061**	12	95.5	130
DN 63 - 160: steel nickel plated –/1.0831	80	**212-081**	12	110.5	145
DN 200 - 630: steel nickel plated –/1.0037	100	**212-062**	12	130.5	165
	160	**212-063**	16	180.7	225
Retaining ring: steel nickel plated	200	**212-064**	16	240.7	285
	250	**212-065**	16	290.7	335
	320	**212-066**	20	370.8	425
	400	**212-067**	20	450.8	510
	500	**212-068**	20	550.8	610
	630	**212-069**	24	691	750

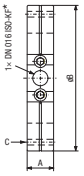
Adapter Flange with ISO-K / ISO-F

	DN ... ISO-F	Part No.	A
Stainless steel 304/1.4301	160/63	**212-152**	22
	160/100	**212-153**	25
	200/100	**212-155**	20
	200/160	**212-156**	25
	250/160	**212-159**	22



Measurement Flange

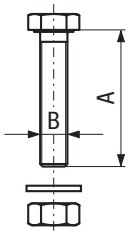
	DN ... ISO-F	Part No.	A	B	C
Aluminum 6082/3.2315	100	**212-142**	30	165	M 8
	160	**212-143**	30	225	M 10
Stainless steel 304/1.4301	63	**212-146**	30	130	M 8
	100	**212-147**	30	165	M 8
	160	**212-148**	30	225	M 10
	*Claw grip DN 16 ISO-KF included				



FLANGE COMPONENTS – continued

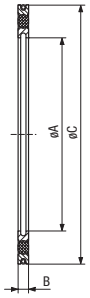
Set of Hexagon Bolts

	DN ... ISO-F	Part No.	A	B	Set of
Steel zinc plated	63-100	**212-241**	40	8	8 pcs.
	160-250	**212-242**	50	10	12 pcs.
	320-500	**212-243**	70	12	16 pcs.
	630	**212-244**	80	12	20 pcs.



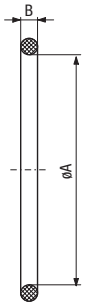
Sealing Disk

	DN ... ISO-F	Part No.	A	B	C
Disk: aluminum 6082/3.2315	63	**212-321**	73	3.9	98
O-ring: elastomer CR	100	**212-322**	107	3.9	132
	160	**212-323**	160	3.9	185
	250	**212-325**	270	3.9	295
	320	**212-326**	330	5.6	375
	400	**212-327**	415	5.6	460
	500	**212-328**	515	5.6	560
	630	**212-329**	656	5.6	701
	800	**212-330**	825	5.6	870
	1000	**212-331**	1025	5.6	1070



O-Ring

	DN ... ISO-F	Part No.	A	B	Set of
Elastomer CR	63	**212-345**	80	5	5 pcs.
	100	**212-346**	110	5	5 pcs.
	160	**212-347**	165	5	5 pcs.
	250	**212-349**	265	5	5 pcs.
	320	**212-338**	325	8	
	400	**212-339**	412	8	
	500	**212-340**	510	8	
	630	**212-341**	640	8	
	800	**212-342**	820	8	
	1000	**212-343**	1023	8	

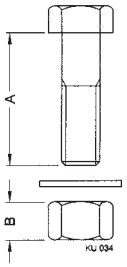


UHV CF Components

CONNECTION ELEMENTS

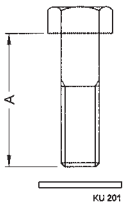
Hexagon Bolts with Nuts

		DN ... CF	Part No.	A	B	Set of	Required torque
Bolt:	Stainless steel 316/1.4401	16	**213-401**	20	3.2	25 x M4	3.5 Nm
Washer:	Stainless steel 304/1.4301	40	**213-402**	35	5	25 x M6	10 Nm
Nut:	Stainless steel 316/1.4401	63	**213-403**	45	6.5	25 x M8	20 Nm
		100	**213-404**	50	6.5	25 x M8	20 Nm
		160	**213-405**	55	6.5	25 x M8	20 Nm
		200-250	**213-406**	60	6.5	25 x M8	20 Nm
		300	**213-408**	70	8	34 x M10	30 Nm
		350	**213-409**	70	8	38 x M10	30 Nm



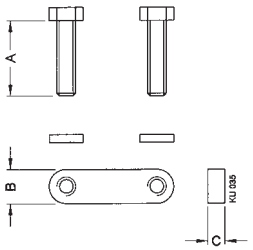
Hexagon Bolts without Nuts

		DN ... CF	Part No.	A	Set of	Required torque
Bolt:	Stainless steel 316/1.4401	16	**213-411**	16	25 x M4	4 Nm
Washer:	Stainless steel 304/1.4301	40	**213-412**	25	25 x M6	10 Nm
		63-160	**213-413**	35	25 x M8	20 Nm



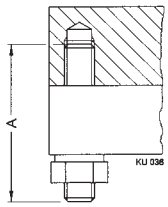
Hexagon Bolts with Duo Nuts

		DN...CF	Part No.	A	B	C	Duo nut	Required torque
Bolt:	Stainless steel 316/1.4401	16	**213-421**	20	7	4	6 x M4/3	4 Nm
Washer:	Stainless steel 304/1.4301	40	**213-422**	35	10	5	6 x M6/3	10 Nm
Duo nut:	Stainless steel 316/1.4401	63	**213-423**	45	12	8	8 x M8/3	20 Nm
		100	**213-424**	50	12	8	16 x M8/8	20 Nm
		160	**213-425**	55	12	8	20 x M8/10	20 Nm



Set of Stud Screws

		DN ... CF	Part No.	A	Set of	Required torque
Bolt:	Stainless steel 316/1.4401	16	**213-431**	20	6 x M4	4 Nm
Washer:	Stainless steel 304/1.4301	40	**213-432**	35	6 x M6	10 Nm
Nut:	Stainless steel 316/1.4401	63-100	**213-433**	45	16 x M8	20 Nm



Thread Lubricant

		Part No.	Temperature resistance
C100 Remains fully effective for at least 10 bakeout cycles	28g	**214-231**	1000°C

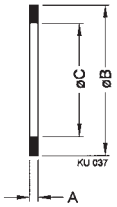
UHV CF Components

SEALS

Quality copper gaskets and silver plated copper gaskets are strictly designed for use in high-end UHV applications. These gaskets, made of OFHC copper, are inspected, cleaned and individually packed to ensure maximum quality.

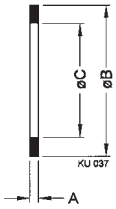
Copper Gasket

	DN ... CF	Part No.	A	B	C	Set of
High quality	16	**213-451**	2.1	21.3	16.2	10 pcs.
Copper OFHC –/2.0040	40	**213-452**	2.1	48.1	39	10 pcs.
Individually packed	63	**213-453**	2.1	82.4	63.6	10 pcs.
	100	**213-454**	2.1	120.5	101.8	10 pcs.
	160	**213-455**	2.1	171.3	152.6	10 pcs.
	200	**213-456**	2.1	222.1	203.4	10 pcs.
	250	**213-457**	2.1	272.9	254.2	5 pcs.
	300	**213-458**	2.1	326.2	307	1 pcs.
	350	**213-459**	2.1	376.5	357	1 pcs.



Copper Gasket Silver Plated

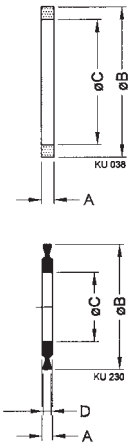
	DN ... CF	Part No.	A	B	C	Set of
High quality	16	**213-461**	2.1	21.3	16.2	10 pcs.
Individually packed	40	**213-462**	2.1	48.1	39	10 pcs.
Copper OFHC –/2.0040	63	**213-463**	2.1	82.4	63.6	10 pcs.
Double silver plated	100	**213-464**	2.1	120.5	101.8	10 pcs.
	160	**213-465**	2.1	171.3	152.6	5 pcs.
	200	**213-466**	2.1	222.1	203.4	5 pcs.
	250	**213-467**	2.1	272.9	254.2	5 pcs.



SEALS – continued

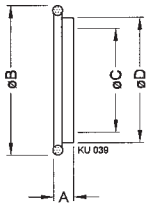
FPM Seal

	DN ... CF	Part No.	A	B	C	D	Set of
Elastomer FPM	16	**213-391**	2	21	16		5 pcs.
	40	**213-392**	2.5	48.2	42		5 pcs.
	63	**213-393**	3.2	82.7	69.7	2.5	2 pcs.
	100	**213-394**	3.2	119.8	107.8	2.5	2 pcs.
	160	**213-395**	3.2	171.1	156	2.5	2 pcs.
	200	**213-396**	3.2	222.5	206	2.5	2 pcs.



FPM Seal with Support Ring

		DN ... CF	Part No.	A	B	C	D	Set of
Seal:	Elastomer FPM	250	**213-397**	5	266.5	248.3	256.2	1 pcs.
Support ring:	Aluminum 6082/–							

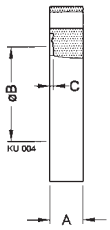


UHV CF Components

FLANGES

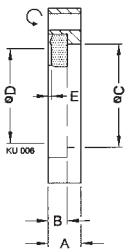
Blank Flange

	DN ... CF-F	Part No.	A	B	C
Stainless steel 304/1.4301	16	**213-001**	7.5	14	1.4
	40	**213-002**	13	38	1.4
	63	**213-003**	17.5	66	1.4
	100	**213-004**	20	104	1.4
	160	**213-005**	22	155	1.4
	200	**213-006**	24.5	205	1.4
	250	**213-007**	2405	256	1.4
Stainless steel 316L/1.4435	300	**213-008**	28.5	306	1.4
	350	**213-009**	28.5	356	1.4
Stainless steel 316LN/1.4429	16	**213-101**	7.5	14	1.4
	40	**213-102**	13	38	1.4
	63	**213-103**	17.5	66	1.4
	100	**213-104**	20	104	1.4
	160	**213-105**	22	155	1.4
	200	**213-106**	24.5	205	1.4
	250	**213-107**	24.5	256	1.4



Blank Flange, Rotatable

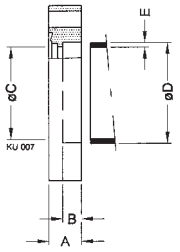
	DN ... CF-R	Part No.	A	B	C	D	E
Stainless steel 304/1.4301	16	**213-011**	7.5	5.8	18.6	14	1.4
	40	**213-012**	13	7.6	41	38	1.4
	63	**213-013**	17.5	12.6	71	66	1.4
	100	**213-014**	20	14.3	109	104	1.4
	160	**213-015**	22	15.8	160	155	1.4
	200	**213-016**	24.5	17.1	206	205	1.4
	250	**213-017**	24.5	18	257	256	1.4
Stainless steel 316LN/1.4429	16	**213-111**	7.5	5.8	18.6	14	1.4
	40	**213-112**	13	7.6	41	38	1.4
	63	**213-113**	17.5	12.6	71	66	1.4
	100	**213-114**	20	14.3	109	104	1.4
	160	**213-115**	22	15.8	160	155	1.4
	200	**213-116**	24.5	17.1	206	205	1.4
	250	**213-117**	24.5	18	257	256	1.4



FLANGES – continued

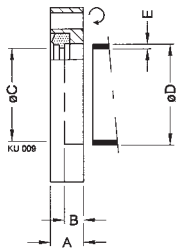
Welding Flange

	DN ... CF-F	Part No.	A	B	C	D	E
Stainless steel 304/1.4301	16	**213-021**	7.5	3.3	17.2	18	1
	40	**213-022**	13	7.5	39.5	40	1.5
	63	**213-023**	17.5	8	66	70	2
	100	**213-024**	20	9	104	108	2
	160	**213-025**	22	10	155	159	2
	200	**213-026**	24.5	12	205	205	2.5
	250	**213-027**	24.5	12	256	256	3
Stainless steel 316L/1.4435	300	**213-028**	28.5	15.8	306	306	3
	350	**213-029**	28.5	15.8	356	356	3
Stainless steel 316LN/1.4429	16	**213-121**	7.5	3.3	17.2	18	1
	40	**213-122**	13	7.5	39.5	40	1.5
	63	**213-123**	17.5	8	66	70	2
	100	**213-124**	20	9	104	108	2
	160	**213-125**	22	10	155	159	2
	200	**213-126**	24.5	12	205	205	2.5
	250	**213-127**	24.5	12	256	256	3



Welding Flange, Rotatable

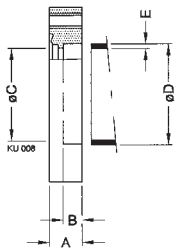
	DN ... CF-R	Part No.	A	B	C	D	E
Stainless steel 304/1.4301	16	**213-041**	7.5	3.3	17.2	18	1
	40	**213-042**	13	7.5	39.5	40	1.5
	63	**213-043**	17.5	8	66	70	2
	100	**213-044**	20	9	104	108	2
	160	**213-045**	22	10	155	159	2
	200	**213-046**	24.5	12	205	205	2.5
	250	**213-047**	24.5	12	256	256	3
Stainless steel 316LN/1.4429	16	**213-141**	7.5	3.3	17.2	18	1
	40	**213-142**	13	7.5	39.5	40	1.5
	63	**213-143**	17.5	8	66	70	2
	100	**213-144**	20	9	104	108	2
	160	**213-145**	22	10	155	159	2
	200	**213-146**	24.5	12	205	205	2.5
	250	**213-147**	24.5	12	256	256	3



FLANGES – continued

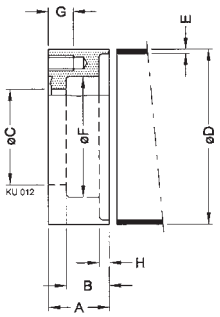
Welding Flange with Tapped Holes

	DN ... CF-F	Part No.	A	B	C	D	E	
Stainless steel 304/1.4301	16	**213-031**	7.5	3.3	17.2	18	1	6xM4
	40	**213-032**	13	7.5	39.5	40	1.5	6xM6
	63	**213-033**	17.5	8	66	70	2	8xM8
	100	**213-034**	20	9	104	108	2	16x M8



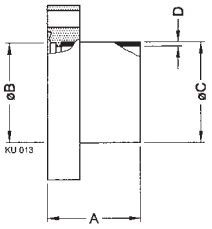
Welding Flange for Gauges

	DN ... CF-F	Part No.	A	B	C	D	E	F	G	F
Stainless steel 304/1.4301	40	**213-092**	24	17	38	69.5	1.75	48	10	4



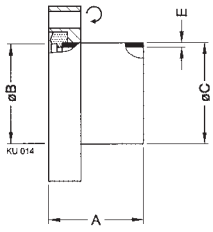
Flange with Tube

	DN ... CF-F	Part No.	A	B	C	D
Stainless steel 304/1.4301	16	**213-051**	38	17.2	18	1
	40	**213-052**	63	39.5	40	1.6
	63	**213-053**	105	66	70	2
	100	**213-054**	135	104	108	2
	160	**213-055**	167	155	159	2



Flange with Tube, Rotatable

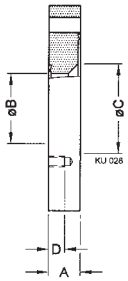
	DN ... CF-R	Part No.	A	B	C	D
Stainless steel 304/1.4301	16	**213-061**	38	17.2	18	1
	40	**213-062**	63	39.5	40	1.6
	63	**213-063**	105	66	70	2
	100	**213-064**	135	104	108	2
	160	**213-065**	167	155	159	2



FLANGES – continued

Reducing Flange CF-F/CF-F

	DN ... CF-F	Part No.	A	B	C	D	
Stainless steel 304/1.4301	40/16	**213-071**	13	16	22	5.5	6xM4
	63/40	**213-073**	17.5	39	50	9	6xM6
	100/40	**213-075**	20	39	55	9	6xM6
	100/63	**213-076**	20	66	85	11	8xM8
	160/40	**213-078**	22	39	60	9	6xM6
	160/100	**213-080**	22	104	120	11	16xM8
Stainless steel 316LN/1.4429	40/16	**213-171**	13	16	22	5.5	6xM4
	63/40	**213-173**	17.5	39	50	9	6xM6
	100/40	**213-175**	20	39	55	9	6xM6
	100/63	**213-176**	20	66	85	11	8xM8
	160/40	**213-178**	22	39	60	9	6xM6
	160/100	**213-180**	22	104	120	11	16xM8

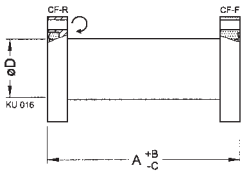


UHV CF Components

PIPE FITTINGS

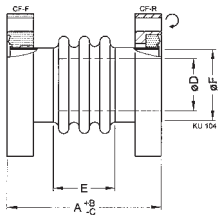
Intermediate Piece

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304/1.4301	16	**213-201**	76	0.5	0.5	16
	40	**213-202**	126	1	1	37
	63	**213-203**	210	1	1	104
	100	**213-204**	270	1	1	104
	160	**213-205**	334	1.5	1.5	155



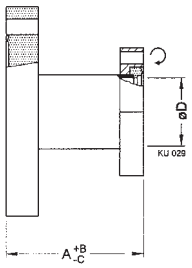
Intermediate Piece, Insulated

	DN ... CF	Part No.	A	B	C	D	E	F	G
Flanges: Stainless steel 304/1.4301	40	**213-212**	70	1	1	25	30	34.5	44
Insulator: Ceramic Al_2O_3	63	**213-213**	90	1	1	53	45	66	65
Transition insulator/flange: FeNi									
Bakeout temperature: 350 °C									
G = Surface leakage 20 kV at 10^{-4} mbar									



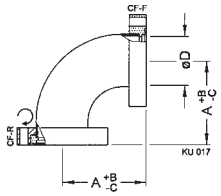
Reducer CF/CF

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304/1.4301	40/16	**213-221**	45	1	1	16
	63/40	**213-223**	75	1	1	37
	100/40	**213-225**	75	1	1	37
	100/63	**213-226**	95	1	1	66
	160/100	**213-230**	105	1.5	1.5	104



Elbow 90°

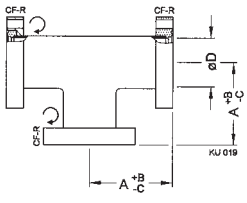
	DN ... CF	Part No.	A	B	C	D
Stainless steel 304/1.4301	16	**213-301**	38	0.5	0.5	15
	40	**213-302**	63	0.5	0.5	38
	63	**213-303**	105	1	1	66
	100	**213-304**	135	1	1	100
	160	**213-305**	167	1.5	1.5	150



PIPE FITTINGS - continued

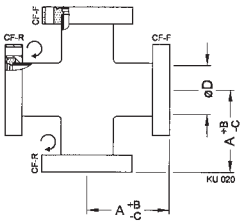
TEE

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304/1.4301	16	**213-311**	38	0.5	0.5	15
	40	**213-312**	63	0.5	0.5	38
	63	**213-313**	105	1	1	66
	100	**213-314**	135	1	1	100
	160	**213-315**	167	1.5	1.5	150



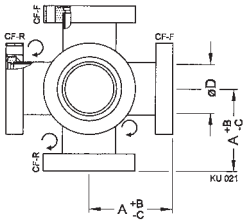
Cross

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304/1.4301	16	**213-321**	38	0.5	0.5	15
	40	**213-322**	63	0.5	0.5	38
	63	**213-323**	105	1	1	66
	100	**213-324**	135	1	1	100
	160	**213-325**	167	1.5	1.5	150



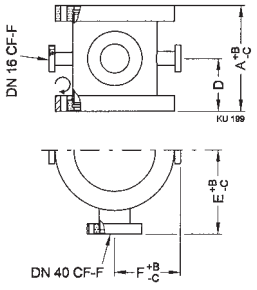
Double Cross Piece

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304/1.4301	40	**213-332**	63	0.5	0.5	38
3 rotatable flanges	63	**213-333**	105	1	1	66
3 fix flanges	100	**213-334**	135	1	1	100
	160	**213-335**	167	1.5	1.5	150



Reducing Cross

	DN ... CF	Part No.	A	B	C	D	E	F
Stainless steel 304/1.4301	100	**213-342**	135	1	1	67.5	106	84
2 x DN 16 CF-F								
2 x DN 40 CF-F								

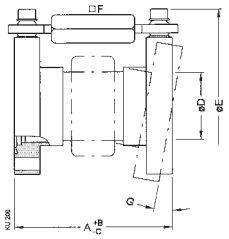


UHV CF Components

BELLOWS / HOSE WITH FLANGES, COMPENSATOR

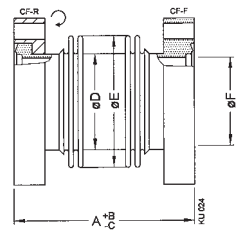
Compensator

	DN...CF-F	Part No.	A	B	C	D	E	F	G
Flanges: Stainless steel 304/1.4301	40	**213-346**	120	10	0	36.8	100	10	10°
Bellows: Stainless steel 316Ti/1.4571	63	**213-347**	130	20	0	62	154	13	12°
	100	**213-348**	127	30	0	93	192	13	12°
Max. internal pressure for DN 40: 4 bar									
Max. internal pressure for DN 63/100: 1.5 bar									



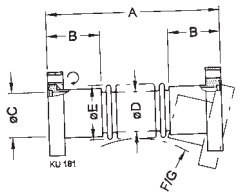
Bellows

	DN...CF	Part No.	A	B	C	D	E	F	G
Flanges: Stainless steel 304/1.4301	16	**213-351**	76	1.5	1.5	15	22	16	21°
Bellows: Stainless steel 316Ti/1.4571	40	**213-352**	126	2	2	40	55	36.8	7.5°
A = unstressed length	63	**213-353**	139	2	2	62	80	66	37°
Max. internal pressure DN 40: 4 bar	100	**213-354**	142	2	2	92	116	102	28°
Max. internal pressure DN 63 ... 160: 1.5 bar	160	**213-355**	250	3	3	154	187	153	16°



Flexible Metal Hose

	DN...CF	Part No.	A	B	C	D	E	F	G
Flanges: Stainless steel 304/1.4301	16	**213-361**	250	23	16	15	22.5	70	50
Bellows: Stainless steel 316Ti/1.4571	16	**213-362**	500	23	16	15	22.5	70	50
	16	**213-363**	750	23	16	15	22.5	70	50
	16	**213-364**	1000	23	16	15	22.5	70	50
F = radius for multiple bending	40	**213-365**	250	46	36.8	40.5	53	130	100
G = radius for single bending	40	**213-366**	500	46	36.8	40.5	53	130	100
Max. internal pressure: 5 bar	40	**213-368**	1000	46	36.8	40.5	53	130	100

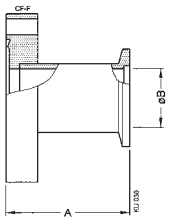


UHV CF Components

TRANSITION PIECES

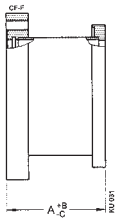
Adapter CF-F/ISO-KF

	DN...CF-F	Part No.	A	B
Stainless steel 304/1.4301	16/16	**213-251**	35	16
	16/25	**213-252**	35	16
	40/16	**213-254**	30	16
	40/25	**213-255**	30	26
	40/40	**213-256**	50	37
	63/40	**213-259**	35	41
	100/40	**213-262**	50	41



Adapter CF-F/ISO-K

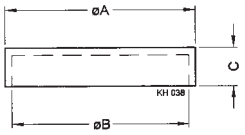
	DN ... CF-F	Part No.	A	B	C	D
Stainless steel 304/1.4301	63/63	**213-271**	90	1	1	66
	100/100	**213-272**	90	1	1	104
	160/160	**213-273**	90	1.5	1.5	153



UHV CF Components

PROTECTIVE LIDS

Protective Lids	DN ... CF	Part No.	A	B	C
Polyethylene	16	**213-441**	36	34	9.5
	40	**213-442**	71.5	69.5	17.5
	63	**213-443**	115.5	113.5	22
	100	**213-444**	154	152	24.5
	160	**213-445**	205	202.5	27
	200	**213-446**	263	254	36
	250	**213-447**	315	306	36



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