Vacuum Control Catalog 2018–2020

Vacuum Gauges, Fittings and Feedthroughs

Gauge Selection Overview

Capacitance Diaphragm Gauge

CDG: gas type independent, high accuracy corrosion resistant

Sensor Temperature [°C]	Accuracy [%]	Characteristics	Setpoints	Full scales [Torr] ... 10m	100m	1	...Full scales [Torr] 10	100	1000	Product	Type	Page
Ambient	0.5 / 1	Compact Gauge	w/o				0.01 - 10	0.1 - 100	1 - 1000	CDG020D	Porter™	A1
Ambient	0.2	Standard Gauge	w/o		0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG025D	SKY™	A5
			2							CDG025D-S		
		Process Gauge	2		0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG025D-X3	SKY™	A9
		Current Loop 4-20mA	w/o		0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG025D-X3	SKY™	A13
Ambient	0.2	EtherCAT	2			0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG025D2	Edge™	A17
45	0.15	Process Gauge	2		0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG045D	SKY™	A21
		Compact Gauge, EtherCAT				0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG045D2	Edge™	A27
		Fast Process Gauge		0.01 - 10m	0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG045Dhs	Stripe™	A31
45	0.025	Reference Gauge	w/o		0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDGsci	Cube™	A35
100	0.2	Process Gauge	2		0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG100D	SKY™	A39
		Compact Gauge, EtherCAT				0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG100D2	Edge™	A45
		Fast Process Gauge			0.1 - 100m	0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG100Dhs	Stripe™	A49
160	0.4	Process Gauge	2			0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG160D	SKY™	A53
200	0.4	Process Gauge	2			0.0005 - 1	0.01 - 10	0.1 - 100	1 - 1000	CDG200D	SKY™	A53
Ambient	0.4	OEM Integration	2				0.01 - 10	0.1 - 100	1 - 1000	CDS500D	Spot™	on request

Please select part number, flange, connector, filter, field bus, etc in ordering information on website or datasheet.

Active Gauge Selection Overview

Measurement principles:
Hot Ion · Cold Cathode · Pirani · Capacitance Diaphragm

Pressure Range [mbar]

XHV | Ultra High Vacuum | High Vacuum | Medium Vacuum | Low Vacuum | ATM
10^{-12} | 10^{-7} | 10^{-3} | 1 | 1000

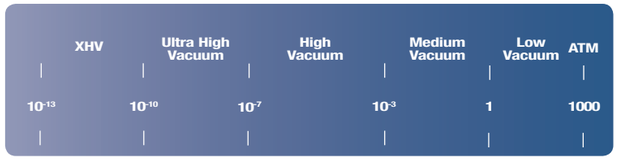
Applications	Corrosion resistant version	Setpoints	Display	Controller: VGC50x	Controller: PGD500	Interfaces: RS232	Interfaces: RS485	Interfaces: DeviceNet	Interfaces: Profibus	Interfaces: EtherCat	Principle	Product	Page
• Fore vacuum pressure monitoring • Safety circuits in vacuum systems • General vacuum measurement and control from atmosphere to the medium vacuum range	✔	2		✔	✔						Pirani	PSG500	A95
	✔	2	✔	✔	✔	✔	✔	✔	✔	✔	Pirani	PSG55x	A99
• Load lock control • Fore vacuum pressure monitoring • Safety circuits in vacuum systems • General vacuum measurement and control ifrom atmosphere to the medium vacuum range	✔	2	✔	✔	✔	✔	✔	✔	✔	✔	Pirani Capacitance	PCG55x	A105
• General vacuum measurement and control in the medium to the low vacuum range • Fore vacuum pressure monitoring		1	✔								Convection Enhanced Pirani	PGE300	A91
		2	✔			✔	✔				Convection Enhanced Pirani	PGE500	A87
• Pressure measurement in semiconductor process and transfer chambers • Industrial coating • General vacuum measurement and control from atmosphere to the ultra high vacuum range		2	✔			✔	✔				Bayard-Alpert Hotlon	BAG302	A63
											Bayard-Alpert Hotlon	BAG402	A66
		2	✔	✔		✔		✔	✔	✔	Bayard-Alpert Pirani	BPG40x	A69/A73
• Pressure measurement in Semiconductor process, transfer and loadlock chambers • Industrial coating • General vacuum measurement and control from atmosphere to the ultra high vacuum range		2	✔	✔		✔		✔	✔	✔	Bayard-Alpert Hotlon Pirani Capacitance	BCG450	A82
• Sputter applications in Semiconductor manufacturing, electronics and media industry • Industrial coating • General vacuum measurement and control in medium to the high vacuum range		2	✔	✔		✔		✔	✔	✔	Hot Ion Pirani	HPG400	A78
• Base pressure monitoring and control, from atmosphere to high vacuum in evaporation and sputter coating applications • General vacuum measurement - industrial furnaces, architectural glass, semiconductor, refrigeration and air conditioning • Analytical and R&D applications - mass spectrometry, electron microscopes, medial, ophthalmic, optical and high energy physics	✔			✔		✔	✔		✔	✔[1]	Inverted Magnetron / Cold Cathode	MAG5xx	A114
	✔			✔	✔	✔	✔		✔	✔[1]	Inverted Magnetron Pirani / Cold Cathode	MPG5xx	
• General vacuum measurement and control in medium and high vacuum range • High vacuum pressure monitoring • Base pressure for evaporation and sputtering systems				✔	✔						Inverted Magnetron Pirani / Cold Cathode	MPG40x	A119
• General vacuum measurement and control in the high vacuum range • High vacuum pressure monitoring • Evaporation and sputtering systems				✔				✔	✔		Penning / Cold Cathode	PEG100	A111

[1] available July 2018

Passive Gauge Selection Overview

Measurement principles:
- Hot Ion
- Cold Cathode
- Pirani
- Capacitance Diaphragm

Pressure Range [mbar]



Applications

- Fore vacuum pressure monitoring
- General vacuum measurement and control from low to the high vacuum range

- Reliable and proven gauge head design
- Drop in for most nude hot ion gauge heads
- Available with single/dual yttria coated iridium and dual tungsten filament cathode assemblies

Corrosion resistant version	Setpoints	Display	Controller		Interfaces					Principle	Product	Page
			VGC031	VGC083	RS232	RS485	DeviceNet	Profibus	EtherCat			
			✔							Pirani	PGE050	A136
			✔	✔						Bayard-Alpert Hot Ion	BAG050	A141
			✔	✔						Bayard-Alpert Hot Ion	BAG051 BAG052 BAG053	

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Bayard-Alpert Gauge

Bayard-Alpert Pirani Gauge

High Pressure Hot Ionization Pirani Gauge

Bayard-Alpert Pirani Capacitance Diaphragm Gauge

Pirani Standard Gauge

Vacuum Gauges (continued)

Capacitance Diaphragm Gauge

Porter CDG020D

The INFICON Porter CDG020D Capacitance Diaphragm Gauge is a high quality, cost effective, gas type independent absolute pressure sensor. The Porter is designed for stable long time performance in industrial environments. The ceramic sensor provides excellent span stability over many years of maintenance free operation paired with outstanding zero stability. The corrosion resistant single material sensor architecture guaranties excellent temperature compensation. Fully digital electronics and small footprint defines flexibility in any integration. The Porter vacuum gauge is humble, reliable, always available and never overpaid.

Advantages

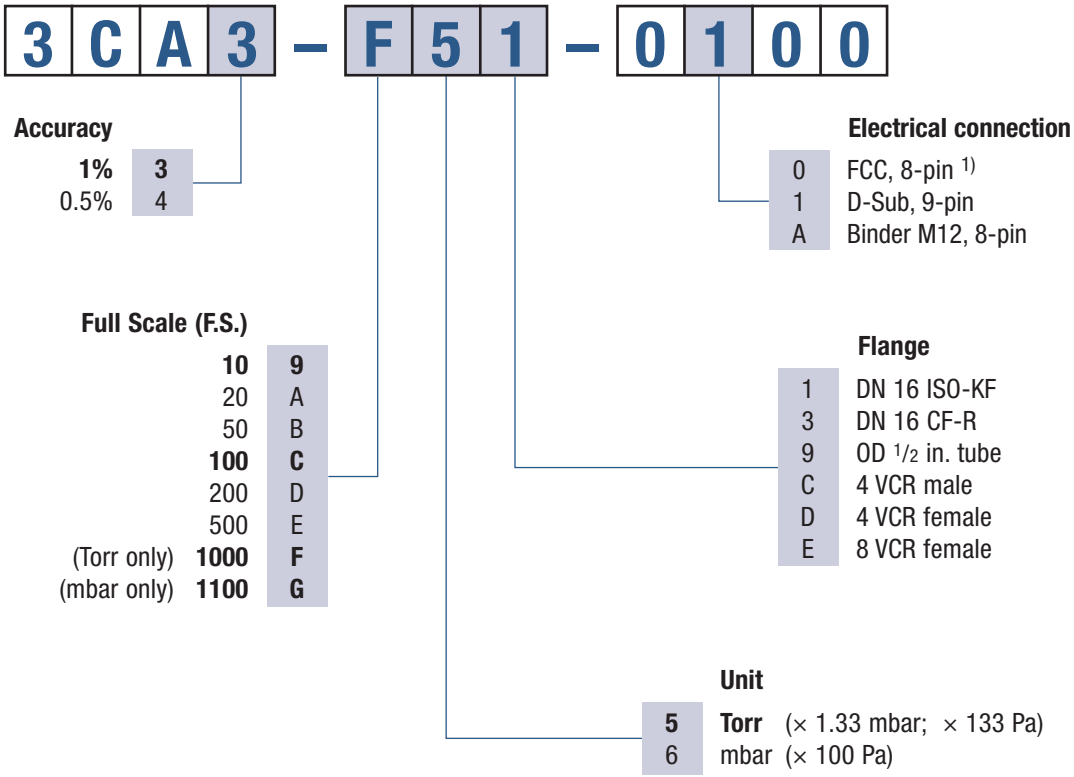
- Excellent span stability—gas type independent
- Corrosion resistant alumina sensor
- Compact, smallest size in it's class
- Easy integration, any mounting orientation
- Digital signal processing
- Maintenance free

Applications

- Vacuum coating
- Vacuum monitoring
- Sterilization
- Food and packaging
- Vacuum oven, puller
- Analytical
- Chemical vacuum processes

Porter CDG020D (continued)

Ordering Information



1) for use with INFICON controllers

bold = standard products

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

Porter CDG020D (continued)

Specifications

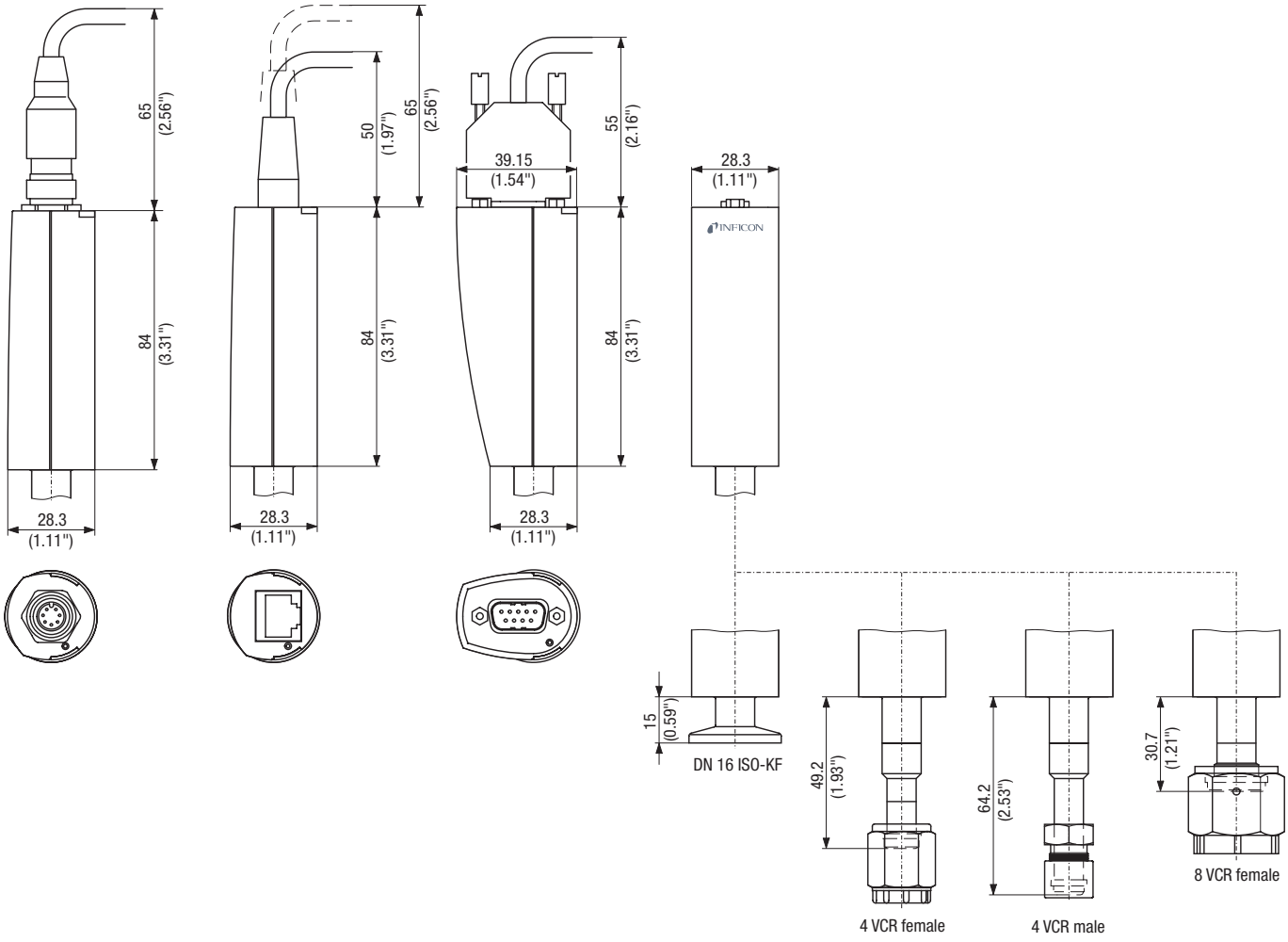
Measurement Range / **F.S. (Full Scale)**	**Torr** / **Pa** / **mbar**	**1000** / **133,322** / **1333**	**100** / **13,332** / **133**	**10** / **1,333** / **13.3**	*500* / *66,661* / *667*	*200* / *26,664* / *267*	*50* / *6,666* / *66.7*	*20* / *2,666* / *27*	**110,000** / **1100**	**10,000** / **100**	**1000** / **10**
Accuracy [1]											
3CA**3**-xxx-xxx	% of reading					1					
3CA**4**-	% of reading					0.5					
Temperature effect											
On zero	% F.S. / °C					0.02					
On span	% of reading / °C					0.02					
Resolution	% F.S.					0.05					
Long time stability	% F.S. / year					<0.5					
Lowest reading	% F.S.					0.05					
Temperature compensated range	°C					+10 … +50					
Admissible temperature											
Operation (ambient)	°C					0 ... +70					
Bakeout at flange [2]	°C					≤110					
Storage	°C					–20 ... +85					
Ambient humidity limits	% RH					<80%, non-condensing					
Supply voltage	V (dc)					+13 ... +30					
Power consumption	W					≤0.3					
Output signal (analog)	V (dc)					0 ... +10					
Max. output voltage	V (dc)					+10.24					
Response time [3]	ms					100					
Degree of protection						IP 40					
Standards											
CE conformity						EMC (EN 61000-6-2, EN 61000-6-3), EN 61010-1 and RoHS					
ETL certification						UL 61010-1, CAN/CSA C22.2 No. 61010-1					
SEMI compliance						SEMI S2					
Electrical connection											
3CAx-xxx-0**0**00						FCC, 8-pin					
-0**1**00						D-Sub, 9-pin, male					
-0**A**00						Binder M12, 8-pin, male					
Materials exposed to vacuum						Aluminum oxide ceramic (Al_2O_3), stainless steel 1.4404 (AISI 316L),					
Tightness	mbar l/s					$<1x10^{-9}$					
Mounting orientation						Any					
Internal volume											
DN 16 ISO-KF	cm^3 ($in.^3$)					3.7 (0.226)					
4 VCR male	cm^3 ($in.^3$)					6.1 (0.372)					
4 VCR female	cm^3 ($in.^3$)					5.6 (0.342)					
8 VCR female	cm^3 ($in.^3$)					5.1 (0.311)					
Weight											
DN 16 ISO-KF	g					~110					
4 VCR male	g					~123					
4 VCR female	g					~133					
8 VCR female	g					~159					
Maintenance						none					

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

Porter CDG020D (continued)

Dimensions

mm (in.)



Capacitance Diaphragm Gauge

Sky CDG025D, CDG025D-S 0.1 ...1000 Torr/mbar

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 push button 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 push button zero function
- Wide range power supply
- Two 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

Sky CDG025D, CDG025D–S 0.1 ...1000 Torr/mbar (continued)

Ordering Information

CDG025D, temperature compensated

Full Scale Range			Flange type			
Torr	Pascal	mbar	1/2 in. 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 in. 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.

Sky CDG025D, CDG025D–S 0.1 ...1000 Torr/mbar (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	–20 ... +65				
Supply voltage	V (dc)	14 ... 30				
Power consumption	W	≤1				
Output signal (analog)	V (dc)	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 [4]		Two setpoints (SP1, SP2)				
Relay contact	V (dc) / A (dc)	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 two 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

Sky CDG025D, CDG025D–S 0.1 ...1000 Torr/mbar (continued)

Specifications (Torr based other ranges)

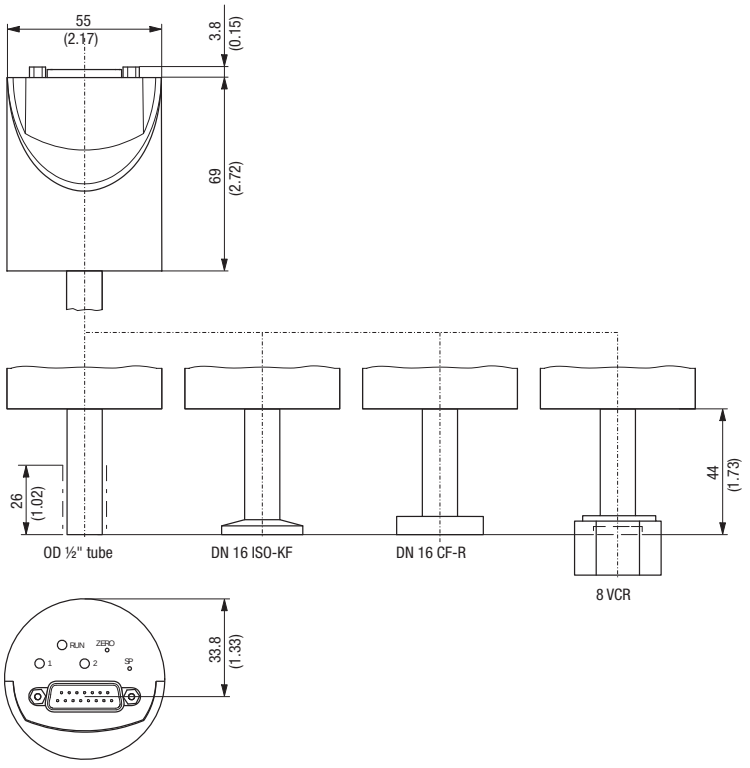
Measurement Range **F.S. (Full Scale)**	**Torr** **Pa** **mbar**	**–** **110,000** **1000**	**200** **26,664** **267**	**–** **10,000** **100**	**20** **2,666** **26.7**	**–** **1,000** **10**	**–** **100** **1**	**0.25** **33.3** **0.33**	**–** **10** **0.1**
Accuracy [1]	% of reading	0.2	0.2	0.2	0.2	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 two hours operation.
2) Increase 10 … 90% F.S.

For further specifications, see table above.

Dimensions, Internal Volume, Weight

mm (in.)

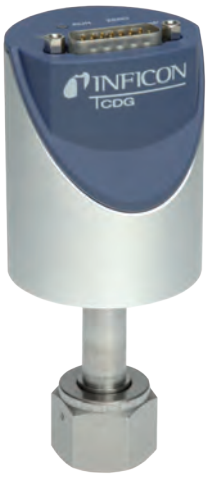


		½ in. tube	**DN 16 ISO KF**	**DN 16 CF-R**	**8 VCR**
Internal volume	cm^3 ($in.^3$)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)
Weight	g	310	330	350	370

Capacitance Diaphragm Gauge

Sky CDG025D–X3 0.1 ...1000 Torr/mbar

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 push button 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 push button zero function
- Wide range power supply
- Two setpoints
- RS232 interface
- Clean room compliant

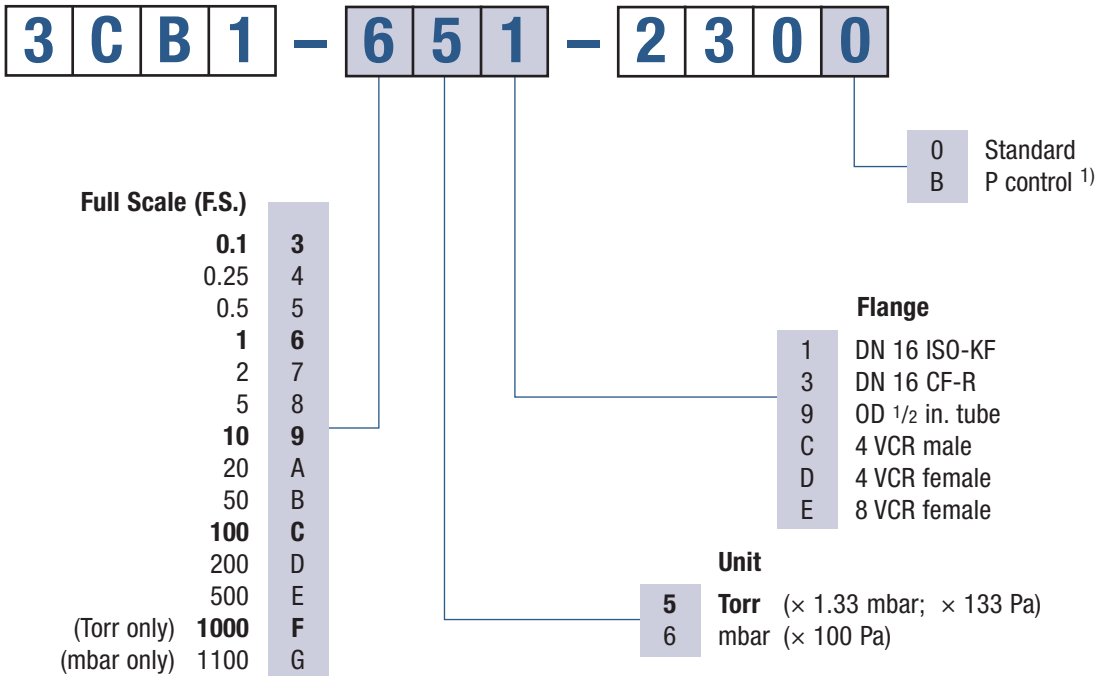
Applications

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

Sky CDG025D–X3 0.1 ...1000 Torr/mbar (continued)

Ordering Information



1) Optimized signal filter setting for pressure control.

bold = standard products

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

Sky CDG025D–X3 0.1 ...1000 Torr/mbar (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 [3]
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	–20 ... +65				
Supply voltage	V (dc)	+14 ... +30				
Power consumption	W	≤1				
Output signal (analog)	V (dc)	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-pin, male				
Setpoint		Two setpoints (SP1, SP2)				
Relay contact	V (dc) / A (dc)	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 two 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

Sky CDG025D–X3 0.1 ...1000 Torr/mbar (continued)

Specifications (Torr based other ranges)

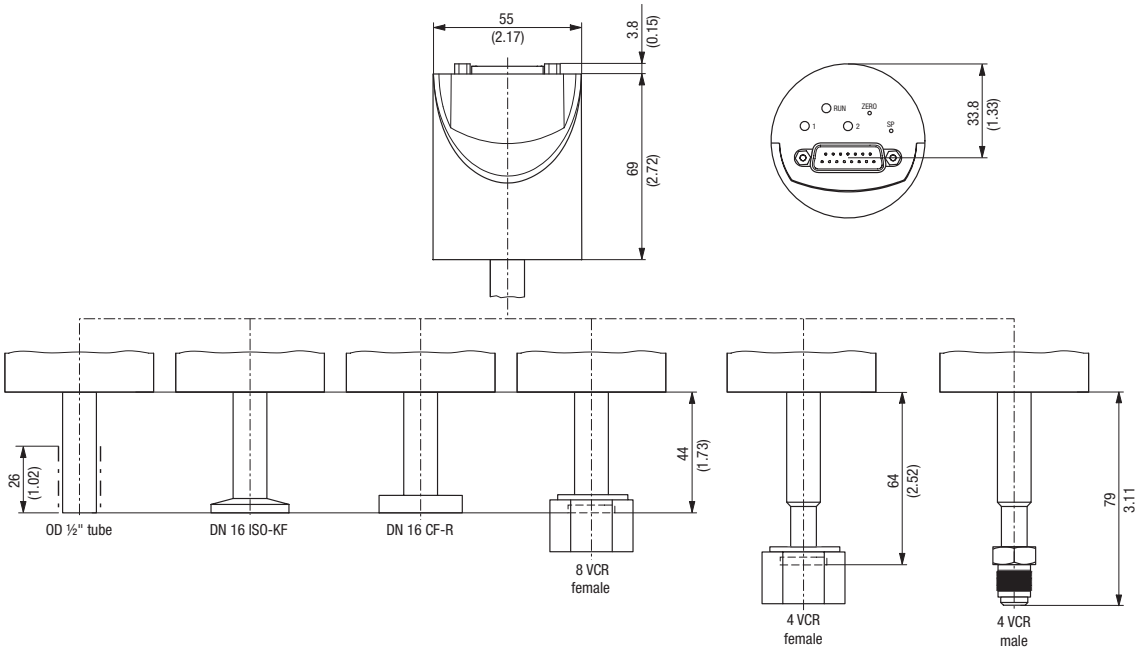
Measurement Range F.S. (Full Scale)	Torr Pa mbar	– 110,000 1100	200 26,664 267	– 10,000 100	20 2,666 26.7	– 1,000 10	– 100 1	0.25 33.3 0.33	– 10 0.1
Accuracy [1]	% of reading	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.5
Temperature effect									
on zero	% F.S. / °C	0.005	0.005	0.005	0.005	0.005	0.015	0.02	0.02
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 two hours operation.
2) Increase 10 … 90% F.S.
3) For pressure control type only

Further specifications see table above.

Dimensions, Internal Volume, Weight

mm (in.)



		½ in. tube	DN 16 ISO KF	DN 16 CF-R	8 VCR
Internal volume	cm³ (in.³)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)	3.6 (0.22)
Weight	g	310	330	350	370

Capacitance Diaphragm Gauge

Sky CDG025D–X3 4–20mA current loop 0.1 ...1000 Torr/mbar

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 push button 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

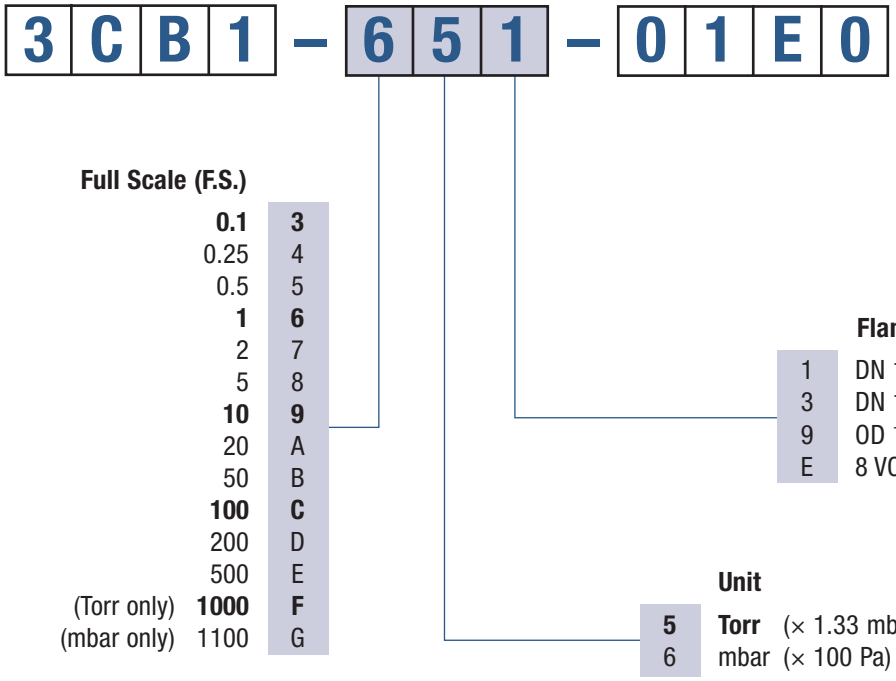
- Full scale ranges from 100 mTorr … 1000 Torr
- Fast stability after power on
- Fast recovery from atmospheric pressure
- Corrosion resistant ceramic sensor
- Excellent long term signal stability
- Temperature compensated
- Sensor double protected from contamination
- One pushbutton zero function
- Interface with 2-wire current loop
- Long cable distance (<300m)
- Low energy gauge
- Remote zero included
- Clean room compliant
- Status LED

Applications

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

Sky CDG025D–X3 4–20mA current loop (continued)

Ordering Information



bold = standard products

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

Sky CDG025D–X3 4–20mA current loop (continued)

Specifications (Torr based standard products)

Measurement Range	**Torr**	**1000**	**500...10**	**1**	**0.25**	**0.1**
F.S. (Full Scale)	**Pa**	**133.332**	**66.661...1.333**	**133**	**33.3**	**13**
	mbar	**1100**	**66.7...13.3**	**1.3**	**0.33**	**0.13**
Accuracy [1]	% of reading	0.2	0.2	0.2	0.25	0.5
Temperature effect						
on zero	% F.S. / °C	0.005	0.005	0.015	0.02	0.02
on span	% of reading / °C	0.01	0.01	0.01	0.03	0.03
Resolution	% F.S.	0.003	0.003	0.003	0.003	0.003
Pressure, max.	kPa (absolute)	300	200	200	200	130
Response time [2]	ms	≤100	≤100	≤100	≤100	≤100
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 ... +60				
Bakeout at flange [3]	°C	≤110				
Storage	°C	–20 ... +65				
Supply voltage	V (dc)	+21 ... +27				
Output signal (analog)		2-wire, current loop				
Relationship current-preasure		linear				
Signal range	mA	3.8 ... 20.2				
Measureing range (zero ... FS)	mA	4.0 ... 20.0				
Loaded impedance RL						
Ω		typical 500Ω±1% 24±3 V (dc) [4]				
absolute		309 ... 657Ω at 24 V (dc) [4]				
remote zero input		digital input, floating contact				
High level (pulse > 1s)		+21 ... +27 V (dc) / ≤8 mA				
Low level		≤2				
remote zero function						
High level (pulse > 1s)		auto zero adjust				
Low level		measurement operation				
Degree of protection		IP 30				
Standards						
CE conformity		EN 61000-6-3, EN 61010, 61326-1 & RoHS				
ETL certification		UL 61010-1, CSA 22.2 No.61010-1				
Electrical connection		D-Sub, 9-pin, male				
Sensor cable						
Without remote zero		two-wire cable plus shielding, twisted				
With remote zero		four-wire cable plus shielding, twisted				
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L[5])				
Internal volume						
I. volume 1/2" tube	cm^3 ($in.^3$)	3.6 (0.22)				
I. volume DN 16 ISO-KF	cm^3 ($in.^3$)	3.6 (0.22)				
I. volume DN 16 CF-R	cm^3 ($in.^3$)	3.6 (0.22)				
I. volume 8 VCR®	cm^3 ($in.^3$)	3.6 (0.22)				

Sky CDG025D–X3 4–20mA current loop (continued)

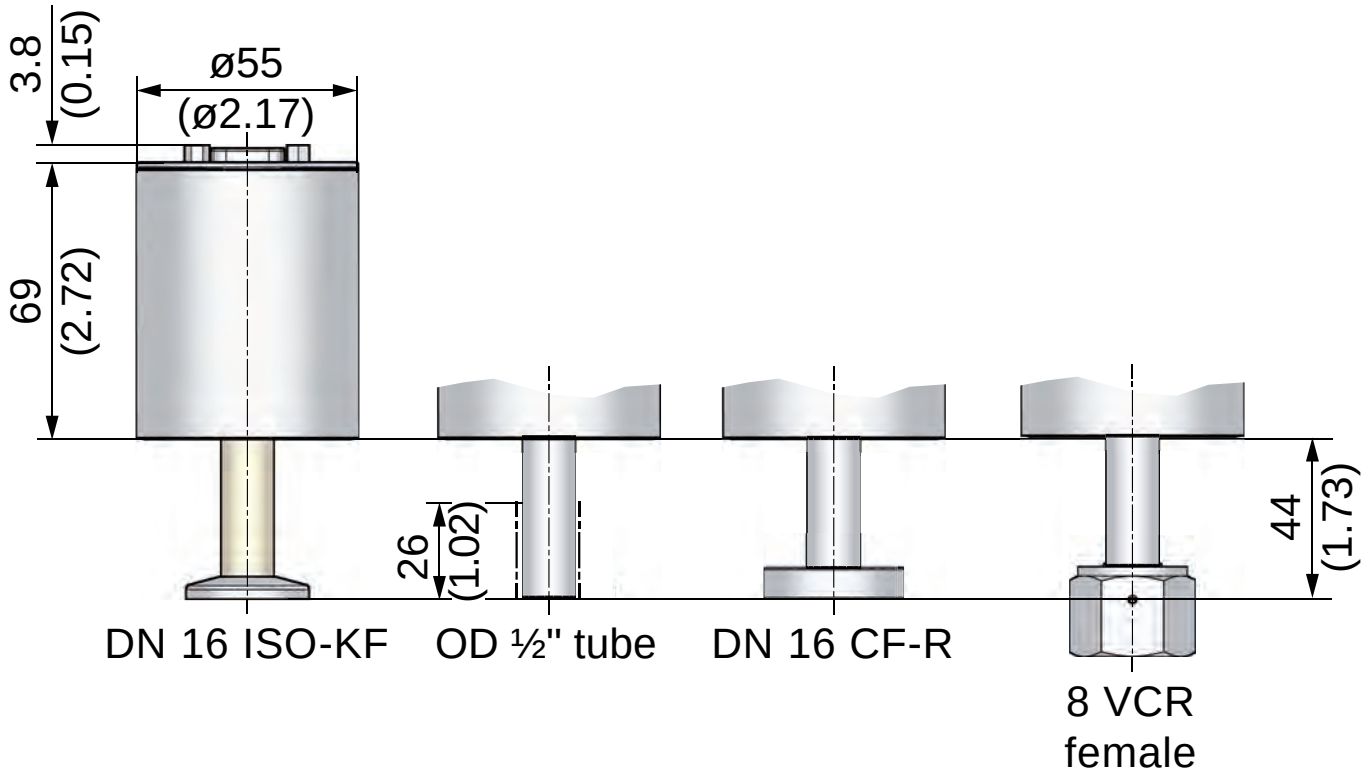
Specifications (Torr based standard products)

Measurement Range	Torr	1000	500...10	1	0.25	0.1
F.S. (Full Scale)	Pa	133.332	66.661...1.333	133	33.3	13
	mbar	1100	66.7...13.3	1.3	0.33	0.13
Weight						
1/2 in. tube	g			310		
DN 16 ISO-KF	g			330		
DN 16 CF-R	g			350		
8 VCR®	g			370		

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after two hours operation.
2) Increase 10 … 90% F.S.
3) Non operation
4) Supply voltage at the gauge
5) 18% Cr, 10% Ni, 3% Mo, 69% Fe

Dimensions

mm (in.)



Capacitance Diaphragm Gauge

Edge CDG025D2 with EtherCAT 0.1... 1000Torr/mbar

INFICON temperature compensated Edge CDG025D2 with EtherCAT Capacitance Diaphragm Gauge is a highly accurate vacuum measurement instrument designed for harsh manufacturing environments.

The proven temperature compensated, corrosion resistant, ultra-pure ceramic sensor provides superior span stability over many years paired with state-of-the-art zero stability. Edge comes with the INFICON patented unique sensor shield which protects the gauge from undesired process by-products. Advanced electronics offer a wide range of configurable signal conditioning for all applications with EtherCAT fieldbus interface..

Advantages

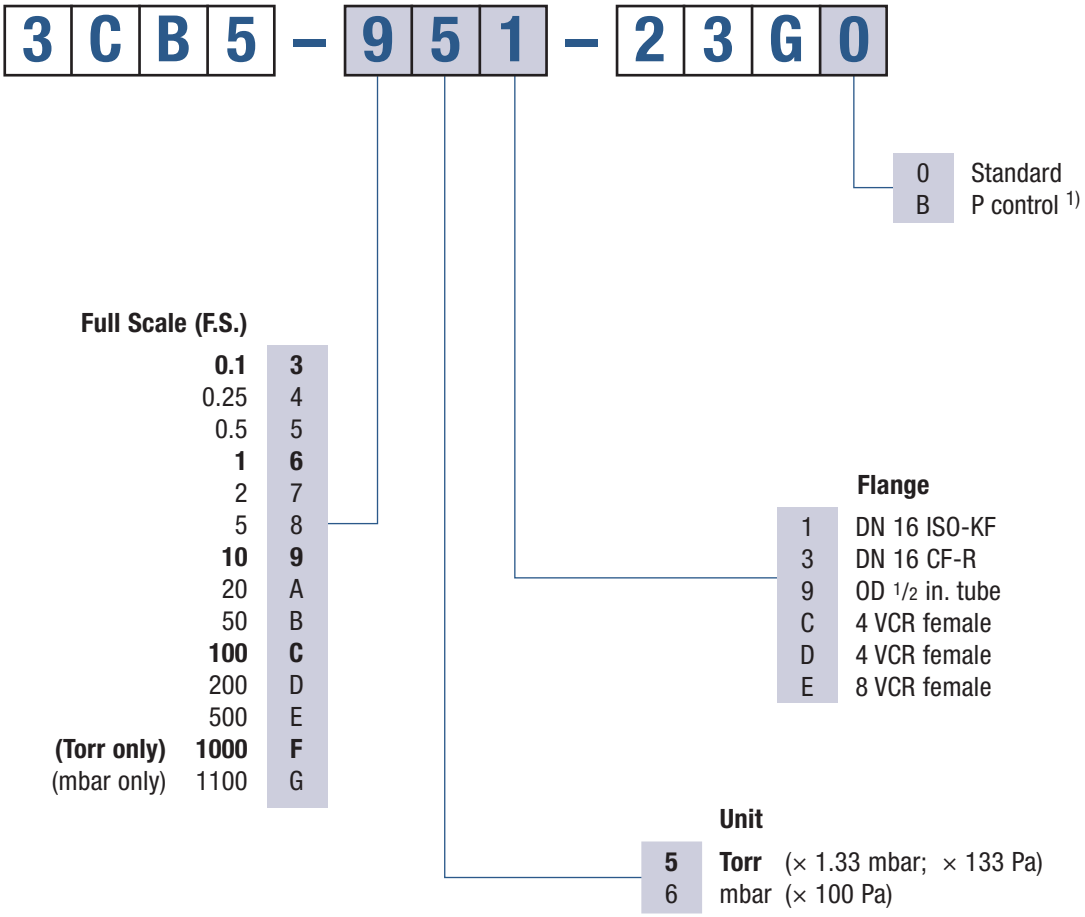
- Easy integration, EtherCAT, wide variety of full scales and flanges, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service and maintenance
- Corrosion resistant ceramic sensor
- Excellent long term signal stability
- Temperature compensated
- Sensor protected from contamination
- Compliance & standards: CE, EN, UL, SEMI, RoHS

Applications

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

Edge CDG025D2 with EtherCAT 0.1 ... 1000Torr/mbar (continued)

Ordering Information



1) Optimised signal filter setting for pressure control

bold = standard products

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

Edge CDG025D2 with EtherCAT 0.1 ... 1000Torr/mbar (continued)

Specifications (Torr based standard products)

Measurement Range	**Torr**	**1000**	**500 ... 10**	**1**	**0.25**	**0.1**
F.S. (Full Scale)	**Pa**	**133.322**	**66.661 ...1.333**	**133**	**33.3**	**13**
	mbar	**1100**	**133 ...13.3**	**1.3**	**0.33**	**0.13**
Accuracy [1]	% of reading	0.2	0.2	0.2	0.25	0.5
Temperature effect						
on zero	% F.S. / °C	0.005	0.005	0.015	0.02	0.02
on span	% of reading / °C	0.01	0.01	0.01	0.03	0.03
Pressure, max.	kPa (absolute)	400	260	260	130	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						
Sensor	°C	25				
Operation (ambient)	°C	+5 ... +50				
Bakeout at flange	°C	≤110				
Storage	°C	–20 ... +65				
Supply voltage	V (dc)	+14 ... +30 VDC or ± 15 V (±5%)				
Power consumption						
At operating temperature	W	≤1				
Output signal (analog)	V (dc)	0 ... +10				
Response time [2]	ms	30			130	130/30 [3]
Degree of protection		IP 40				
Standards						
CE conformity		EN 61000-6-2/-6-3, EN 61010 & RoHS				
ETL certification		UL 61010-1, CSA 22.2 No.61010-1				
SEMI compliance		SEMI S2				
Electrical connection		D-sub, 15 pole, male				
Setpoint						
Number of setpoints		2 (SP1, SP2)				
Relay contact	V (dc)	≤30				
	A (dc)	≤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])				
Internal volume						
1/2" tube	cm^3 ($in.^3$)	4.2 (0.26)				
DN 16 ISO-KF	cm^3 ($in.^3$)	4.2 (0.26)				
DN 16 CF-R	cm^3 ($in.^3$)	4.2 (0.26)				
8 VCR®	cm^3 ($in.^3$)	4.2 (0.26)				
Weight						
1/2" tube	g	837				
DN 16 ISO-KF	g	852				
DN 16 CF-R	g	875				
8 VCR®	g	897				

Edge CDG025D2 with EtherCAT 0.1 ... 1000Torr/mbar (continued)

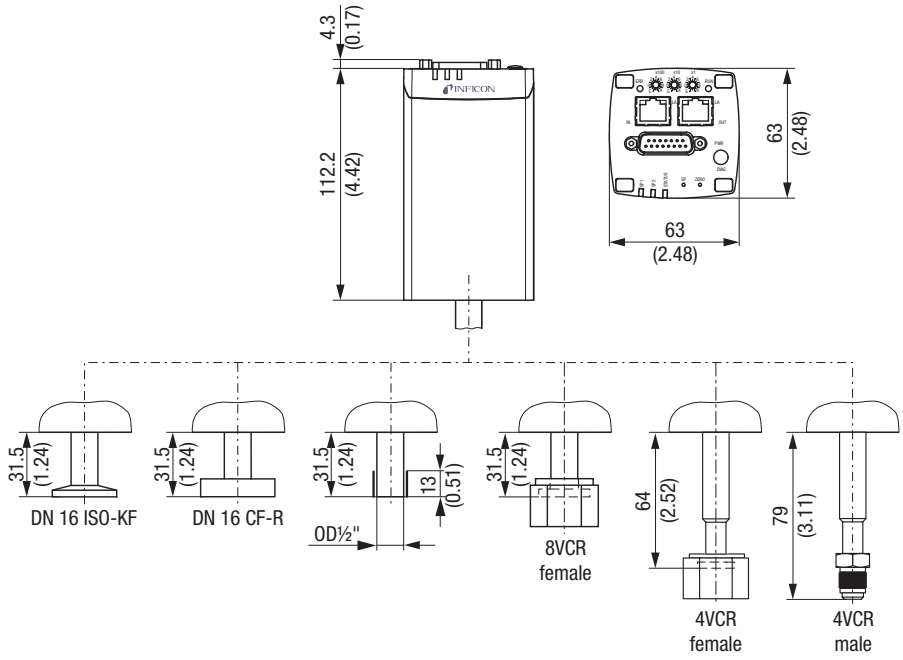
Specifications (Torr based standard products)

Measurement Range	Torr	1000	500 ... 10	1	0.25	0.1
F.S. (Full Scale)	Pa	133.322	66.661 ...1.333	133	33.3	13
	mbar	1100	133 ...13.3	1.3	0.33	0.13
EtherCAT						
Protocol EtherCAT			protocol specialized for EtherCAT			
Communication standards			ETG.5003 Part 1 “Semiconductor Device Profile” ETG.5003 Part 2080 “Specific Device Profile: Vacuum Pressure Gauge			
Node address			Explicit Device Identification			
Physical layer			100BASE-Tx (IEEE802.3)			
Digital functions	read		pressure, status, ID			
	set		set points, filter, zero adjust, reset, DC offset			
Mailbox (CoE)			SDO requests, responses and information			
Process data			Fixed PDO mapping and configurable PDO mapping			
EtherCAT connector			RJ45, 8-pin (socket), IN and OUT			
Cable			shielded Ethernet CAT5e or higher			
EtherCAT						
Data rate	Kbps		100000			
Cable length	m (ft.)		≤100 (330)			

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

Dimensions

mm (in.)



Capacitance Diaphragm Gauge

Sky CDG045D 0.05 ...1000 Torr/mbar

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 50 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 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 and 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

Sky CDG045D 0.05 ...1000 Torr/mbar (continued)

Ordering Information

3	C	C	1	–	6	5	1	–	2	3	0	0

Full Scale (F.S.)

	0.05	2
	0.1	**3**
	0.25	4
	0.5	5
	1	**6**
	2	7
	5	8
	10	**9**
	20	A
	50	B
	100	**C**
	200	D
	500	E
(Torr only)	**1000**	**F**
(mbar only)	1100	G

Unit

5	**Torr** (x 1.33 mbar; x 133 Pa)
6	mbar (x 100 Pa)

Flange

1	DN 16 ISO-KF
3	DN 16 CF-R
9	OD 1/2 in. tube
E	8 VCR female

Fieldbus interface

0	None
1	DeviceNet™
2	Profibus DP™
G	EtherCAT

0	Standard
B	P control [1]

[1] Optimized signal 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.

Sky CDG045D 0.05 ...1000 Torr/mbar (continued)

Specifications (Torr based standard products)

Type		1000 Torr, 1100 mbar	500 ... 1 Torr / mbar	0.5 ... 0.05Torr / mbar
Accuracy (1)	% of reading	0.15	0.15	0.15
Temperature effect on zero	percent FS/°C	0.0025	0.0025	0.005
Temperature effect on span	% of reading / °C	0.01	0.01	0.01
Pressure, max.	kPa (absolute)	400	260	130
Resolution	percent FS	0.003	0.003	0.003
Lowest reading	percent FS	0.01	0.01	0.01
Lowest suggested reading	percent FS	0.05	0.05	0.05
Lowest suggested control pressure	percent FS	0.5	0.5	0.5
Temperature				
Operation (ambient)	°C	+10 … +40	+10 … +40	+10 … +40
Bakeout at flange	°C	≤110	≤110	≤110
Storage	°C	–20 … +65	–20 … +65	–20 … +65
Supply voltage		+14 … +30 V (dc) or ±15 V (±5%)	+14 … +30 V (dc) or ±15 V (±5%)	+14 … +30 V (dc) or ±15 V (±5%)
Power consumption				
During Heat up	W	≤12	≤12	≤12
At operating temperature	W	≤8	≤8	≤8
Output signal (analog)	V (dc)	0 … +10	0 … +10	0 … +10
Response time (2)	ms	30	30	130/30 [3]
Degree of protection		IP 40	IP 40	IP 40
Standards				
CE conformity		EN 61000-6-2/-6-3, EN 61010 & RoHS	EN 61000-6-2/-6-3, EN 61010 & RoHS	EN 61000-6-2/-6-3, EN 61010 & RoHS
ETL certification		UL 61010-1, CSA 22.2 No.61010-1	UL 61010-1, CSA 22.2 No.61010-1	UL 61010-1, CSA 22.2 No.61010-1
SEMI compliance		SEMI S2	SEMI S2	SEMI S2
Electrical connection		D-sub, 15 pole, male	D-sub, 15 pole, male	D-sub, 15 pole, male
Setpoint				
Number of setpoints		2 (SP1,SP2)	2 (SP1,SP2)	2 (SP1,SP2)
Setpoint				
Relay contact	V (dc)	≤30	≤30	≤30
Relay contact	A (dc)	≤0.5	≤0.5	≤0.5
Setpoint				
Hysteresis	percent FS	1	1	1
Diagnostic port				
Protocol		RS232-C	RS232-C	RS232-C
Read		pressure, status, ID	pressure, status, ID	pressure, status, ID
Set		set points, filter, zero adjust, factory reset, DC offset	set points, filter, zero adjust, factory reset, DC offset	set points, filter, zero adjust, factory reset, DC offset
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316l [4])	Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316l [4])	Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316l [4])

Sky CDG045D 0.05 ...1000 Torr/mbar (continued)

Specifications (Torr based standard products)

Type		1000 Torr, 1100 mbar	500 ... 1 Torr / mbar	0.5 ... 0.05Torr / mbar
Internal volume				
I. volume 1/2 in. tube	cm³ (in.³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
I. volume DN 16 ISO KF	cm³ (in.³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
I. volume DN 16 CF-R	cm³ (in.³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
I. volume 8 VCR	cm³ (in.³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight				
Weight 1/2 in. tube	g	837	837	837
Weight DN 16 ISO KF	g	852	852	852
Weight DN 16 CF-R	g	875	875	875
Weight 8 VCR	g	897	897	897

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

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 two 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 two hours operation.
2) Increase 10 … 90% F.S.
3) For pressure control type only
4) 18% Cr, 10% Ni, 3% Mo, 69% Fe

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

Sky CDG045D 0.05 ...1000 Torr/mbar (continued)

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 V (dc) 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)

		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

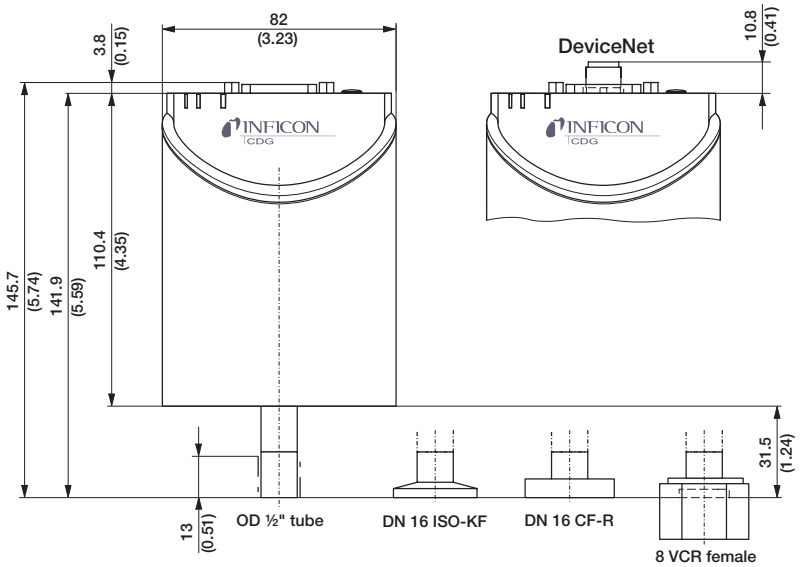
Specifications (EtherCAT)

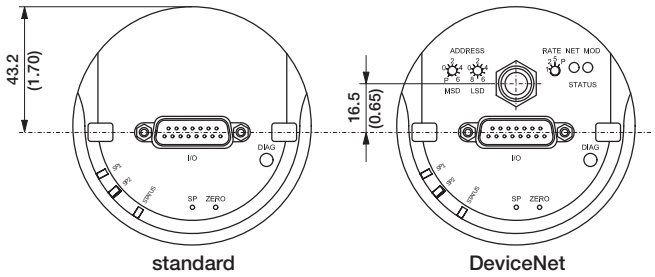
	CDG045D EtherCAT
Protocol	protocol specialized for EtherCAT
Communication Standards	ETG.5003 Part 1 “Semiconductor Device Profile” ETG.5003 Part 2080 “Semiconductor Device Profile” Specific Device Profile: Vacuum Gauge
Node address	Explicit Device Identification
Physical layer	100BASE-Tx-(IEEE 802.3)
Digital functions read	Pressure, status, ID
Digital functions set	Set points, filter, zero adjust, reset, DC offset
Mailbox (CoE)	SDO requests, responses and information
Process data	Fixed PDO mapping and configurable PDO mapping
EtherCAT connector	RJ45, 8-pin (socket), IN and OUT
Cable	Shielded Ethernet CAT5e or higher
Cable length m (ft.)	<100 (330)

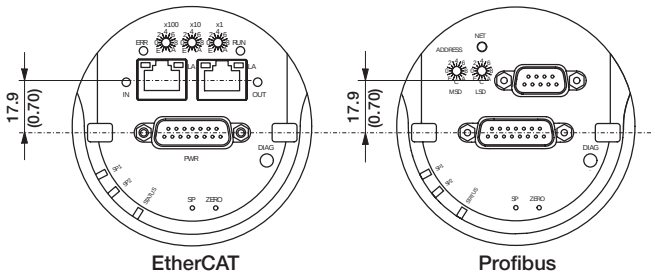
Sky CDG045D 0.05 ...1000 Torr/mbar (continued)

Dimensions

mm (in.)







		½ in. tube	DN 16 ISO KF	DN 16 CF-R	8 VCR
Internal volume	cm^3 ($in.^3$)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight	g	837	852	875	897

Capacitance Diaphragm Gauge

Edge CDG045D2 1... 1000Torr/mbar

INFICON Edge Capacitance Diaphragm Gauge is a highly accurate vacuum mesurement instrument designed for harsh manufacturing environments. The proven temperature controlled, corrosion resistant, ultra-pure ceramic sensor provides superior span stability over many years paired with state-of-the-art zero stability. Edge comes with the INFICON patented unique sensor shield, which protects the gauge from undesired process by-products. Advanced electronics offer a wide range of configurable signal conditioning for all applications and optional EtherCAT® fieldbus interface. The innovative heating concept enables a cool to the touch surface and saves valuable tool space. INFICON Edge is the smallest vacuum measurement instrument of its kind.

Advantages

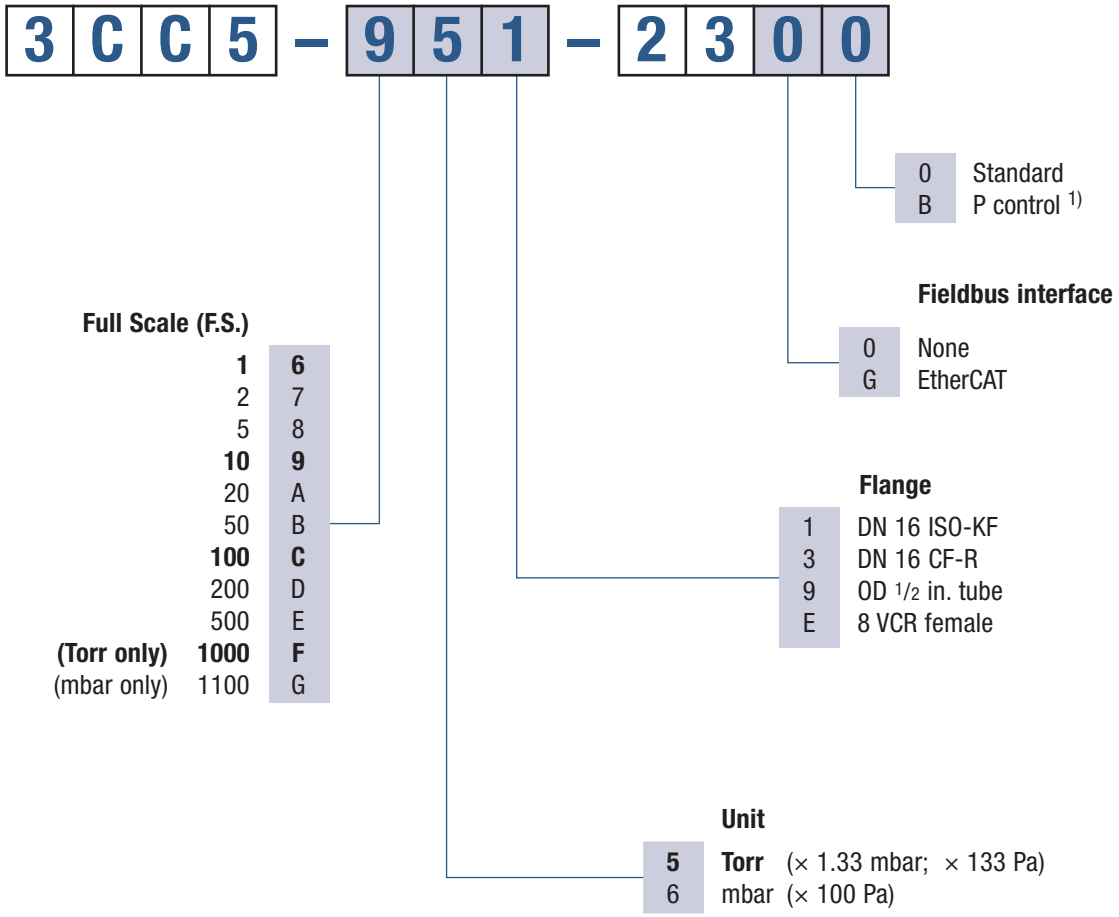
- Compact, saves valuable tool space
- Easy integration, EtherCAT, wide variety of full scales and flanges, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service and maintenance
- Two year warranty, longer life time with advanced heating concept and gauge protection.
- No long term recalibration due to excellent signal stability and repeatability, even in harsh plasma applications
- Compliance and standards: CE, EN, UL, SEMI, RoHS

Applications

- CVD, Etch, PVD and other semiconductor production processes

Edge CDG045D2 1... 1000Torr/mbar (continued)

Ordering Information



1) Optimized signal filter setting for pressure control

bold = standard products

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

Edge CDG045D2 1... 1000Torr/mbar (continued)

Specifications

Type		1000 Torr, 1100 mbar	500 ... 1 Torr / mbar
Accuracy [1]	% of reading	0.15	
Temperature effect			
On zero	% F.S. / °C	0.0025	
On span	% of reading / °C	0.01	
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 ... +40	
Bakeout at flange	°C	≤110	
Storage	°C	–20 ... +65	
Supply voltage		+14 ... +30 V (dc) or ±15 V (±5%)	
Power consumption			
During Heat up	W	≤12	
At operating temperature	W	≤8	
Output signal (analog)	V (dc)	0 ... +10	
Response time [2]	ms	30	
Degree of protection		IP 40	
Standards			
CE conformity		EMC (EN 61000-6-2, EN 61000-6-3), EN 61010-1 and RoHS	
ETL certification		UL 61010-1, CSA 22.2 No. 61010-1	
SEMI compliance		SEMI S2	
Electrical connection		D-sub, 15 pole, male	
Setpoint			
Number of setpoints		2 (SP1, SP2)	
Relay contact	V (dc) / A (dc)	≤30 / ≤0.5	
Hysteresis	% F.S.	1	
Diagnostic port			
Protocol		RS232-C	
Read		Pressure, status, ID	
Set		Setpoints, filter, zero adjust, factory reset, DC offset	
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L [4])	
Internal volume			
1/2 in. tube	cm^3 ($in.^3$)	4.2 (0.26)	
DN 16 ISO-KF	cm^3 ($in.^3$)	4.2 (0.26)	
DN 16 CF-R	cm^3 ($in.^3$)	4.2 (0.26)	
8 VCR® female	cm^3 ($in.^3$)	4.2 (0.26)	
Weight			
1/2 in. tube	g	~837	
DN 16 ISO-KF	g	~852	
DN 16 CF-R	g	~875	
8 VCR female	g	~897	

Edge CDG045D2 1... 1000Torr/mbar (continued)

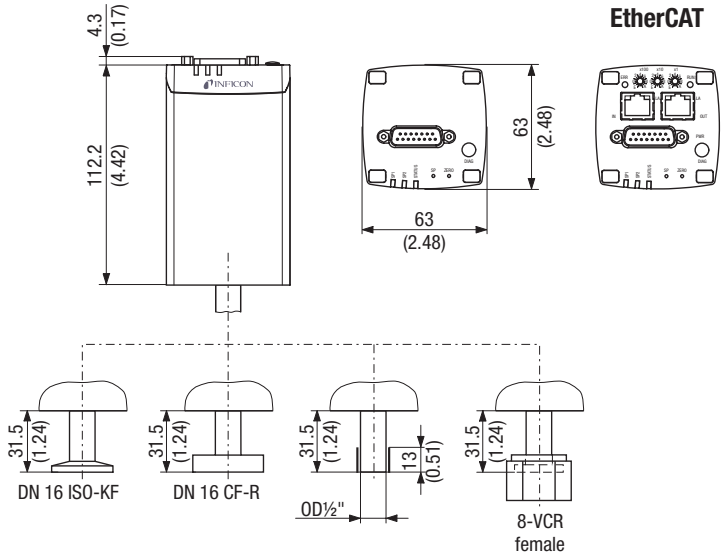
Specifications

Type		1000 Torr, 1100 mbar	500 ... 1 Torr / mbar
EtherCAT			
Protocol EtherCAT		Protocol specialized for EtherCAT	
Communication standards		ETG.5003 Part 1, “Semiconductor Device Profile”	
		ETG.5003 Part 2080, “Specific Device Profile: Vacuum Pressure Gauge”	
Node address		Explicit Device Identification	
Physical layer		100BASE-Tx (IEEE 802.3)	
Digital functions read		Pressure, status, ID	
Digital functions set		Set points, filter, zero adjust, reset, DC offset	
Mailbox (CoE)		SDO requests, responses and information	
Process data		Fixed PDO mapping and configurable PDO mapping	
EtherCAT connector		RJ45, 8-pin (socket), IN and OUT	
Cable		Shielded Ethernet CAT5e or higher	
EtherCAT			
Data rate	kbps	100000	
EtherCAT			
Cable length	m (ft.)	≤100 (330)	

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

Dimensions

mm (in.)



Capacitance Diaphragm Gauge

Stripe CDG045Dhs 0.01 ... 1000Torr/mbar

INFICON Stripe high-speed Capacitance Diaphragm Gauges are the fastest, highly accurate vacuum measurement instruments available. With a less than 2 ms response time combined with the EtherCAT fieldbus interface it opens up a total new field of applications. The proven temperature controlled, corrosion resistant, ultra-pure ceramic sensor provides superior span stability over many years paired with state-of-the-art zero stability. Stripe comes with the INFICON patented unique sensor shield which protects the gauge from undesired process by-products. INFICON Stripe using an innovative heating concept, which provides a cool to the touch surface, and its unique speed capabilities, enabling an unprecedented productivity increase, making it the most advanced vacuum instrument of its kind.

Stripe CDG045Dhs is a proud winner of the prestigious 2014 R&D 100 Award!

Advantages

- High productivity — faster than 2 ms response time (FS > 50 mTorr)
- Flexible integration — EtherCAT fieldbus
- Long lifetime — proven ceramic sensor
- Forget recalibration — 90ppm / year full scale stability

Applications

- Atomic layer deposition
- High speed process control
- PVD, CVD, Etch
- General high temperature vacuum applications

Stripe CDG045Dhs 0.01... 1000Torr/mbar (continued)

Ordering Information

3	C	C	9	–	6	5	1	–	2	3	G	0

Full Scale (F.S.)

	0.1 [1]	S
	0.02 [1]	1
	0.05 [1]	2
	0.1	**3**
	0.25	4
	0.5	5
	1	**6**
	2	7
	5	8
	10	**9**
	20	A
	50	B
	100	**C**
	200	D
	500	E
(Torr only)	**1000**	**F**
(mbar only)	1100	G

Unit

5	**Torr** (× 1.33 mbar; × 133 Pa)
6	mbar (× 100 Pa)

Flange

1	DN 16 ISO-KF
3	DN 16 CF-R
9	OD 1/2 in. tube
E	8 VCR female

[1] Mounting orientation: vertical

bold = standard products

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

Stripe CDG045Dhs 0.01... 1000Torr/mbar (continued)

Specifications

Type		1000Torr / 1100mbar ... 0.5Torr / mbar	0.02 ... 0.01 Torr / mbar
Accuracy [1]	% of reading	0.15	-
Precision	% of reading	-	0.2
Temperature effect			
On zero			
1000 ...1 Torr/mbar	% F.S. / °C	0.0025	-
0.5 ...0.05 Torr/mbar	% F.S. / °C	0.0005	-
0.02 ...0.01 Torr	% F.S. / °C	-	0.01
On span	% of reading / °C	0.01	
Pressure, max.			
P max 100Torr/mbar	kPa (absolute)	400	
P max 500...1Torr/mbar	kPa (absolute)	260	
P max 0.5...0.01Torr/mbar	kPa (absolute)	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	–20 ... +85	
Supply voltage		+14 ... +30 V (dc) or ±15 V (±5%)	
Power consumption			
During Heat up	W	≤14	
At operating temperature	W	≤9	
Output signal (analog)	V (dc)	0 ... +10	
Response time [2]	ms	2	
Degree of protection		IP 30	
Standards			
CE conformity		EN 61000-6-2, EN 61000-6-3, EN 61010 and RoHS	
ETL certification		UL 61010-1, CSA 22.2 No. 61010-1	
SEMI compliance		SEMI S2	
Electrical connection		D-sub, 15 pole, male	
Setpoint			
Number of setpoints		2 (SP1, SP2)	
Relay contact	V (dc) / A (dc)	≤30 / ≤0.5	
Hysteresis	% F.S.	1	
Diagnostic port			
Protocol		USB	
Read		Pressure, status, ID	
Set		Setpoints, filter, zero adjust, factory reset, DC offset	
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L)	
Internal volume			
1/2 in. tube	cm^3 ($in.^3$)	4.2 (0.26)	
DN 16 ISO-KF	cm^3 ($in.^3$)	4.2 (0.26)	
DN 16 CF-R	cm^3 ($in.^3$)	4.2 (0.26)	
8 VCR female	cm^3 ($in.^3$)	4.2 (0.26)	

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

[2] Increase 10 ... 90 % FS

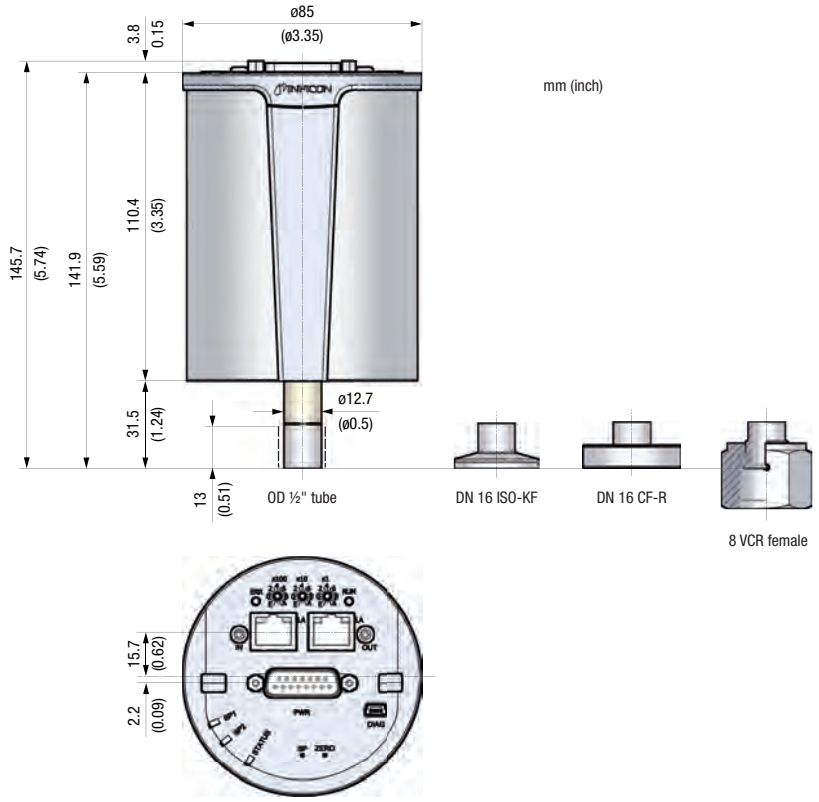
Stripe CDG045Dhs 0.01... 1000Torr/mbar (continued)

Specifications

Type		1000Torr / 1100mbar ... 0.5Torr / mba	0.02 ... 0.01 Torr / mbar
Weight			
1/2 in. tube	g	837	
DN 16 ISO-KF	g	852	
DN 16 CF-R	g	875	
8 VCR female	g	897	
EtherCAT			
Protocol EtherCAT		Protocol specialized for EtherCAT	
Communication standards		ETG.5003 Part 1, “Semiconductor Device Profile”	
		ETG.5003 Part 2080, “Specific Device Profile: Vacuum Pressure Gauge”	
Node address		Explicit Device Identification	
Physical layer		100BASE-Tx (IEEE 802.3)	
Digital functions read		Pressure, status, ID	
Digital functions set		Set points, filter, zero adjust, reset, DC offset	
Mailbox (CoE)		SDO requests, responses and information	
Process data		Fixed PDO mapping and configurable PDO mapping	
EtherCAT connector		RJ45, 8-pin (socket), IN and OUT	
Cable		Shielded Ethernet CAT5e or higher	
EtherCAT			
Cable length	m (ft.)	≤100 (330)	

Dimensions

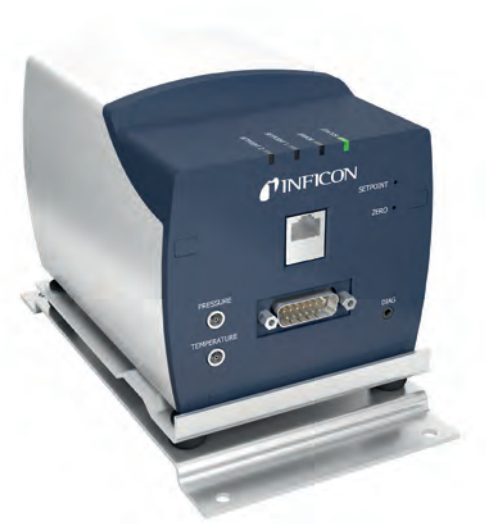
mm (in.)



Capacitance Diaphragm Gauge

Cube CDGsci

The high end INFICON Cube Capacitance Diaphragm Instrument is the most accurate (≤0.025 % Rd accuracy; ≤50 ppm F.S. Repeatability) and most stable vacuum gauge available (<5 ppm F.S./°C temperature stability; <70 ppm F.S./year long term stability). Cube is designed as a pure reference device to standardize vacuum measurement systems and is the only choice for vacuum research applications. The proven INFICON temperature controlled, corrosion resistant ultrapure ceramic sensor is at the heart of Cube's outstanding performance. Cube sets new standards in modern communication and user flexibility with a 20 Bit analog output and RS232-C, TCP/IP and HTML digital output connected through a wireless or wired Ethernet interface. Each device comes with a quality assurance certificate, hand-signed by Cube's leading product researchers. Delivery in a reusable hard shell suit case for storage or shipment to calibration laboratories underlines its professionality.



Advantages

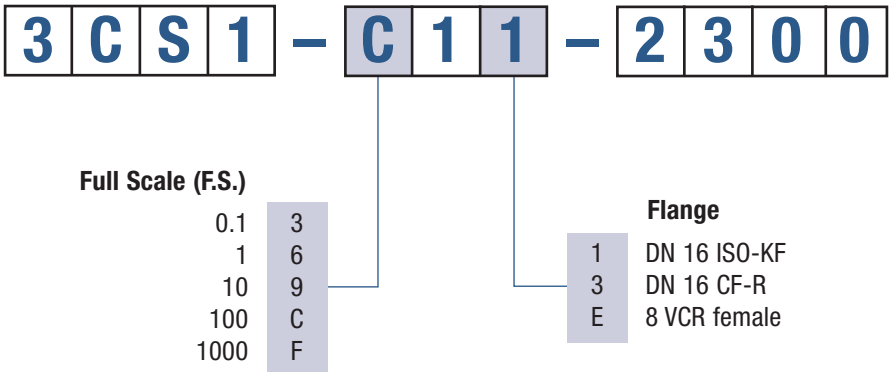
- True high precision pressure measurement — ceramic technology
- Full stable ouput — proven by PTB
- Flexible communication — various modern interfaces
- All functions integrated — no controller required
- Direct mounting to chamber — optimized center of gravity
- Transportation without isolation valve possible

Applications

- Transfer standard
- Main reference gauge
- Research
- In-house standard

Cube CDGsci (continued)

Ordering Information



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

Cube CDGsci (continued)

Specifications

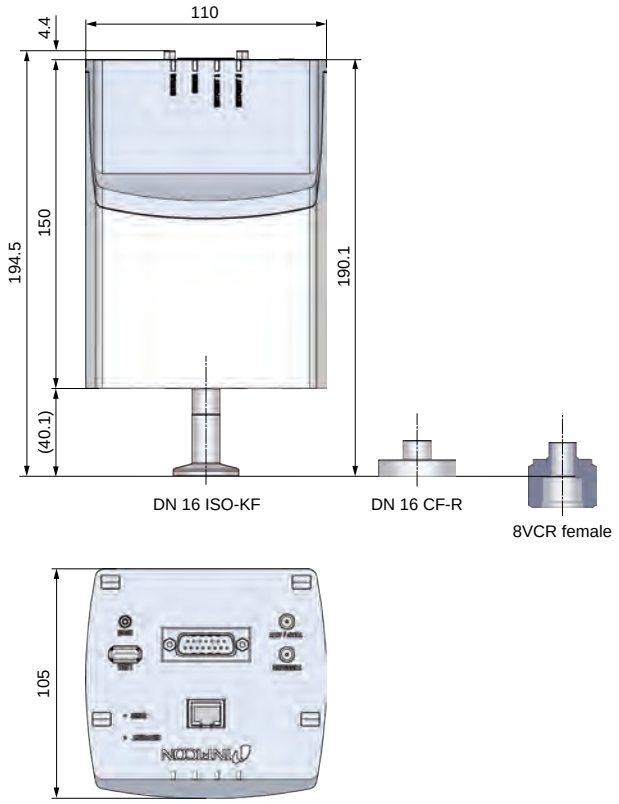
Type		1000 Torr	100 … 1 Torr	100 mTorr
Accuracy [1]	% of reading	0.025	0.025	0.05
Temperature effect				
On zero	% F.S. / °C	0.0005	0.0005	0.005
On span	% of reading / °C	0.001	0.001	0.01
Pressure, max.	bar (absolute)	3	2.5	1.5
Lowest reading	% F.S.		0.01	
Lowest suggested reading	% F.S.		0.05	
Temperature				
Operation (ambient)	°C		+10 … +40	
Storage	°C		–10 … +50	
Supply voltage			+14 ... +30 V (dc) or ±15 V (±5%)	
Power consumption				
During Heat up	W	≤15	≤15	≤12
At operating temperature	W	≤10	≤10	≤8
Output signal (analog)	V (dc)		0 ... +10	
Response time [2]	ms		100	
Degree of protection			IP 40	
Standards				
CE conformity			EN 61000-6-2, EN 61000-6-3, EN 61010-1 and RoHS	
ETL certification			UL 61010-1, CSA 22.2 No. 61010-1	
SEMI compliance			SEMI S2	
Electrical connection			D-sub, 15 pole, male; 2 x LEMO Coax; Ethernet FCC	
Setpoint				
Number of setpoints			2 (SP1, SP2)	
Relay contact	V (dc) / A (dc)		≤30 / ≤0.5	
Hysteresis	% F.S.		1	
Diagnostic port				
Protocol		Web pages, REST services, RS232-ASCII	Web pages, REST services, RS232-ASCII	RS232-C
Read			Pressure, status, ID	
Set			Setpoints, filter, zero adjust, factory reset, DC offset	
Materials exposed to vacuum			Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L [4])	
Internal volume				
DN 16 ISO-KF	cm^3 ($in.^3$)		4.2 (0.26)	
DN 16 CF-R	cm^3 ($in.^3$)		4.2 (0.26)	
8 VCR female	cm^3 ($in.^3$)		4.2 (0.26)	
Weight				
DN 16 ISO-KF	g		~1670	
DN 16 CF-R	g		~1670	
8 VCR female	g		~1670	

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

Cube CDGsci (continued)

Dimensions

mm (in.)



Capacitance Diaphragm Gauges

Sky CDG100D 0.1 ... 1000Torr/mbar

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

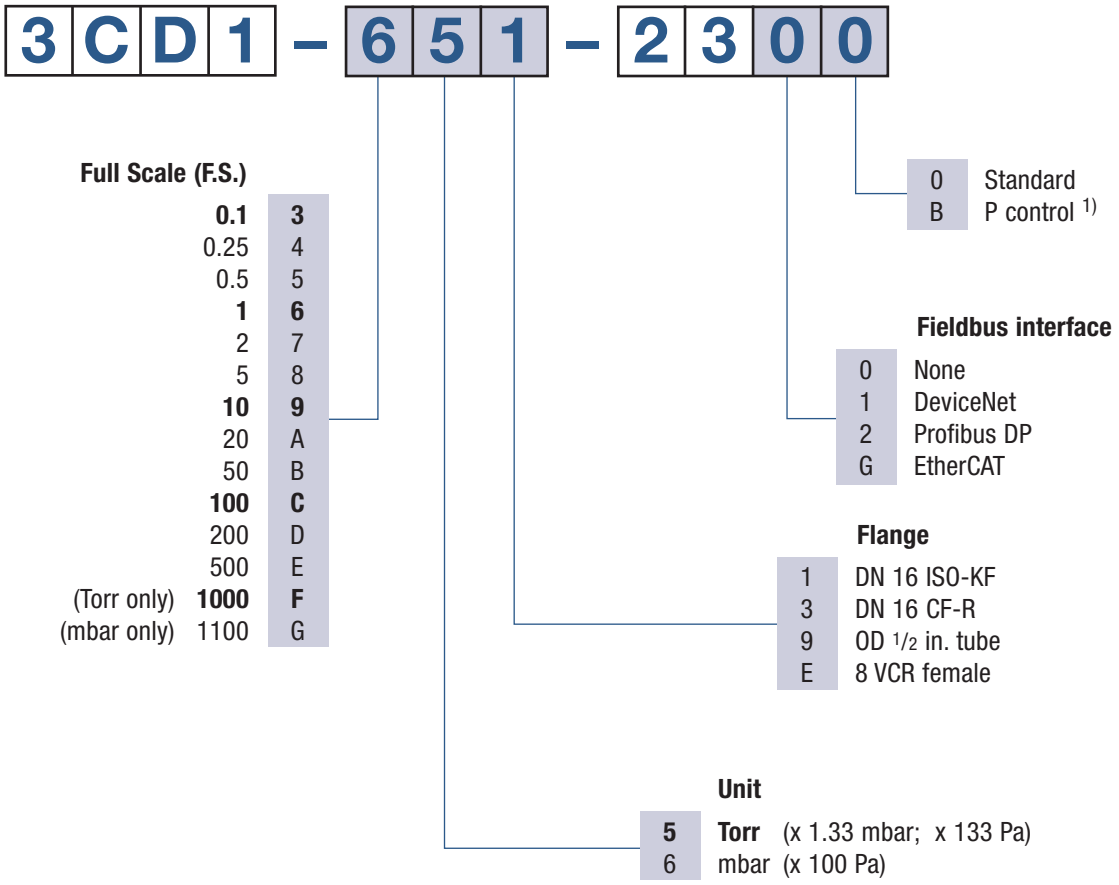
- Lower cost of ownership, 50% faster warm up, energy efficient low power consumption
- Easy integration, wide variety of full scales, flanges and interfaces, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service 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 and 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

Sky CDG100D (continued)

Ordering Information



1) Optimized signal 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.

Sky 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) [5]	°C			+10 ... +50		
Bakeout at flange	°C			≤110		
Storage	°C			–20 ... +65		
Supply voltage				+14 ... +30 V (dc) or ±15 V (±5%)		
Power consumption						
During Heat up	W			≤15		
At operating temperature	W			≤10		
Output signal (analog)	V (dc)			0 ... +10		
Response time [2]	ms			30		130 / 30 [3]
Degree of protection				IP 40		
Standards				EN 61000-6-2, 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	V (dc) / A (dc)			≤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 two hours operation.
2) Increase 10 ... 90% F.S.
3) For pressure control type only
4) 18% Cr, 10% Ni, 3% Mo, 69% Fe
5) Ambient temperatures >40°C may increase surface temperature above SEMI S2 compliance levels — mark “caution hot!”

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

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

Sky 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 V (dc) 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

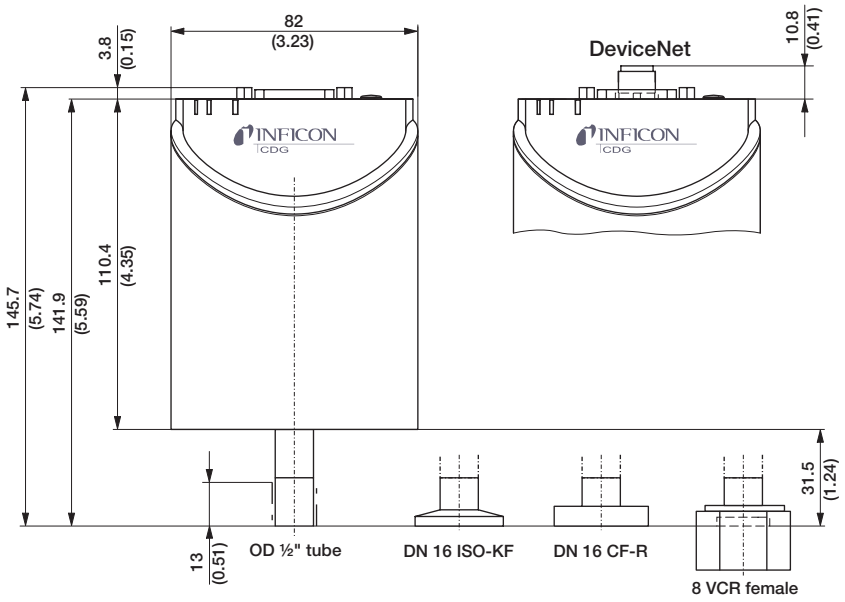
Specifications (EtherCAT)

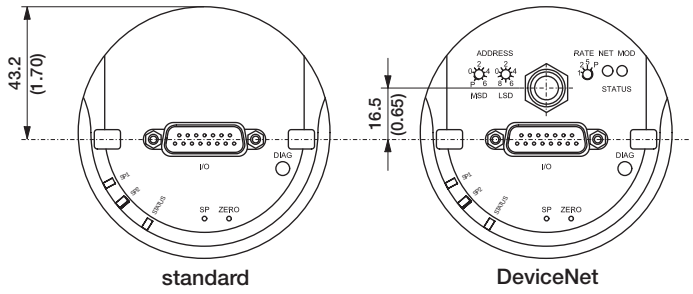
	CDG100D EtherCAT
Protocol	protocol specialized for EtherCAT
Communication Standards	ETG.5003 Part 1 “Semiconductor Device Profile”
	ETG.5003 Part 2080 “Semiconductor Device Profile”
	Specific Device Profile: Vacuum Gauge
Node address	Explicit Device Identification
Physical layer	100BASE-Tx-(IEEE 802.3)
Digital functions read	Pressure, status, ID
Digital functions set	Set points, filter, zero adjust, reset, DC offset
Mailbox (CoE)	SDO requests, responses and information
Process data	Fixed PDO mapping and configurable PDO mapping
EtherCAT connector	RJ45, 8-pin (socket), IN and OUT
Cable	Shielded Ethernet CAT5e or higher
Cable length m (ft.)	<100 (330)

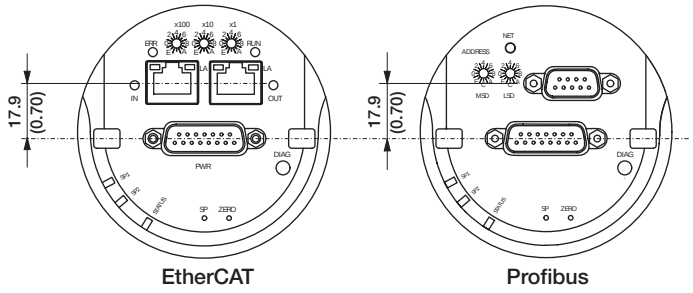
Sky CDG100D (continued)

Dimensions

mm (in.)







		½ in. tube	DN 16 ISO KF	DN 16 CF-R	8 VCR
Internal volume	cm^3 ($in.^3$)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight	g	837	852	875	897

Capacitance Diaphragm Gauge

Edge CDG100D2 1... 1000Torr/mbar

INFICON Edge Capacitance Diaphragm Gauge is a highly accurate vacuum mesurement instrument designed for harsh manufacturing environments. The proven temperature controlled, corrosion resistant, ultra-pure ceramic sensor provides superior span stability over many years paired with state-of-the-art zero stability. Edge comes with the INFICON patented unique sensor shield which protects the gauge from undesired process by-products. Advanced electronics offer a wide range of configurable signal conditioning for all applications and optional EtherCAT fieldbus interface. The innovative heating concept enables a cool to the touch surface and saves valuable tool space. INFICON Edge is the smallest vacuum measurement instrument of its kind.

Advantages

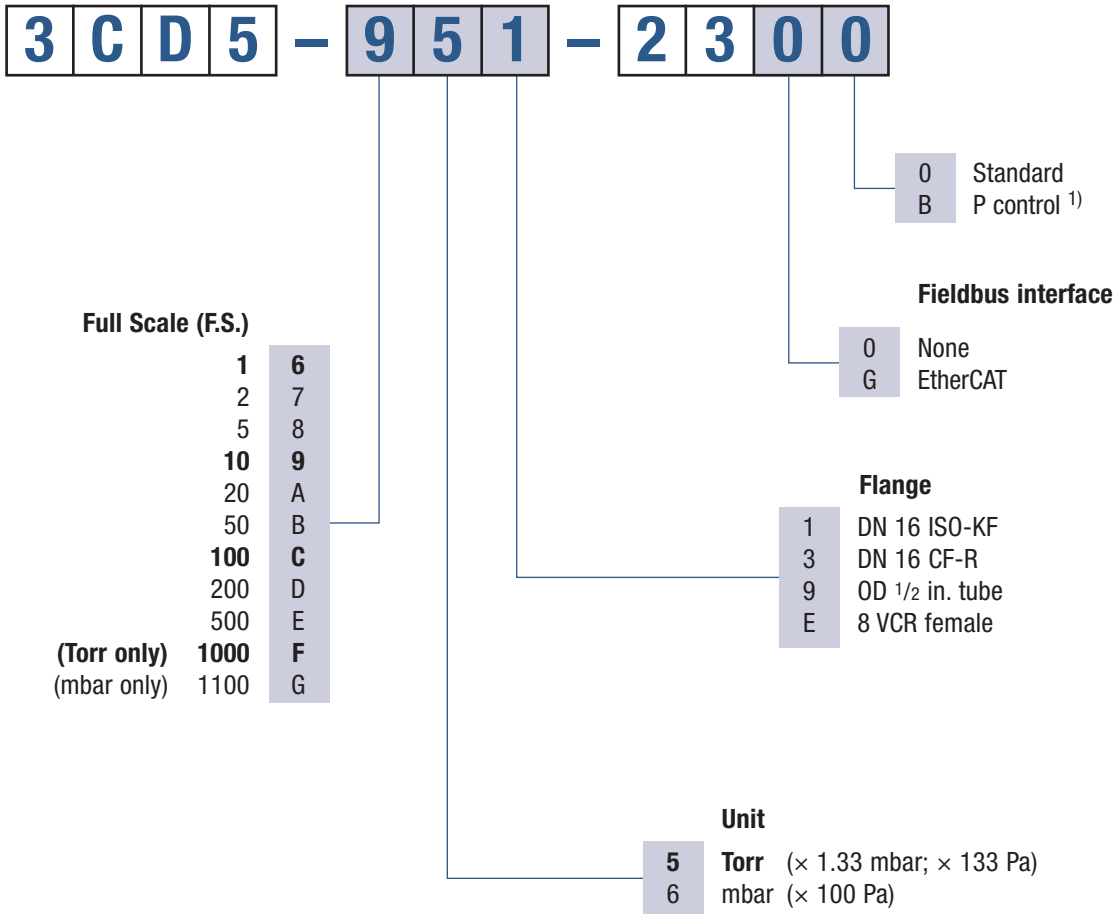
- Compact, saves valuable tool space
- Easy integration, EtherCAT, wide variety of full scales and flanges, standard with two set points
- Easy one push button or remote signal zero command, zero offset adjustable
- Diagnostic port for quick service and maintenance
- Two year warranty, longer life time with advanced heating concept and gauge protection.
- No long term recalibration due to excellent signal stability and repeatability, even in harsh plasma applications
- Compliance and standards: CE, EN, UL, SEMI, RoHS

Applications

- CVD, Etch, PVD and other semiconductor production processes

Edge CDG100D2 1... 1000Torr/mbar (continued)

Ordering Information



1) Optimized signal filter setting for pressure control

bold = standard products

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

Edge CDG100D2 1... 1000Torr/mbar (continued)

Specifications

Type		1000 … 500 Torr / mbar	200 … 1 Torr / mbar
Accuracy [1]	% of reading	0.15	
Temperature effect			
On zero	% F.S. / °C	0.0025	
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) [5]	°C	+10 … +50 [5]	+10 … +50
Bakeout at flange	°C	≤110	
Storage	°C	–20 ... +65	-20 … +65
Supply voltage		+14 ... +30 V (dc) or ±15 V (±5%)	
Power consumption			
During Heat up	W	≤20	
At operating temperature	W	≤14	
Output signal (analog)	V (dc)	0 ... +10	
Response time [2]	ms	30	
Degree of protection		IP 40	
Standards			
CE conformity		EN 61000-6-2, EN 61000-6-3, EN 61010-1 and RoHS	
ETL certification		UL 61010-1, CSA 22.2 No. 61010-1	
SEMI compliance		SEMI S2 [5]	SEMI S2
Electrical connection		D-sub, 15 pole, male	
Setpoint			
Number of setpoints		2 (SP1, SP2)	
Relay contact	V (dc) / A (dc)	≤30 / ≤0.5	
Hysteresis	% F.S.	1	
Diagnostic port			
Protocol		RS232-C	
Read		Pressure, status, ID	
Set		Setpoints, filter, zero adjust, factory reset, DC offset	
Materials exposed to vacuum		Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L [4])	
Internal volume			
1/2 in. tube	cm^3 ($in.^3$)	4.2 (0.26)	
DN 16 ISO-KF	cm^3 ($in.^3$)	4.2 (0.26)	
DN 16 CF-R	cm^3 ($in.^3$)	4.2 (0.26)	
8 VCR female	cm^3 ($in.^3$)	4.2 (0.26)	
Weight			
1/2 in. tube	g	~837	
DN 16 ISO-KF	g	~852	
DN 16 CF-R	g	~875	
8 VCR female	g	~897	

Edge CDG100D2 1... 1000Torr/mbar (continued)

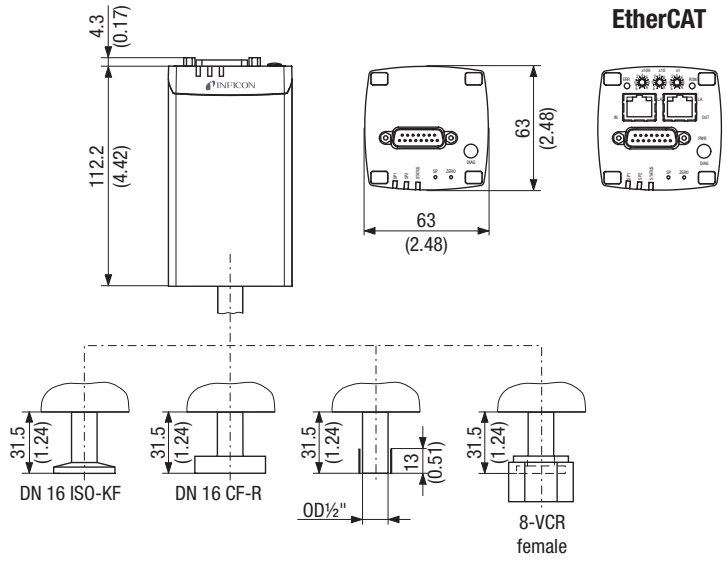
Specifications

Type		1000 ... 500 Torr/mbar	200 ... 1 Torr / mbar
EtherCAT			
Protocol EtherCAT		Protocol specialized for EtherCAT	
Communication standards		ETG.5003 Part 1, “Semiconductor Device Profile”	
		ETG.5003 Part 2080, “Specific Device Profile: Vacuum Pressure Gauge”	
Node address		Explicit Device Identification	
Physical layer		100BASE-Tx (IEEE 802.3)	
Digital functions read		Pressure, status, ID	
Digital functions set		Set points, filter, zero adjust, reset, DC offset	
Mailbox (CoE)		SDO requests, responses and information	
Process data		Fixed PDO mapping and configurable PDO mapping	
EtherCAT connector		RJ45, 8-pin (socket), IN and OUT	
Cable		Shielded Ethernet CAT5e or higher	
Connector for CDG (analog output, supply voltage, setpoints)		D-sub. 15 pin, male	
EtherCAT			
Data rate	kbps	100000	
EtherCAT			
Cable length	m (ft.)	≤100 (330)	

1) Non-linearity, hysteresis, repeatability at 25°C ambient operating temperature without temperature effects after two hours operation.
2) Increase 10 … 90% F.S.
3) For presssure control type only
4) 18% Cr, 10% Ni, 3% Mo, 69% Fe
5) Ambient temperatures >40°C may increase surface temperature above SEMI S2 compliance levels — mark “caution hot!”

Dimensions

mm (in.)



Capacitance Diaphragm Gauge

Stripe CDG100Dhs 0.1 ... 1000Torr/mbar

INFICON Stripe high-speed Capacitance Diaphragm Gauges are the fastest, highly accurate vacuum measurement instruments available. With a less than 2 ms response time combined with the EtherCAT fieldbus interface it opens up a total new field of applications. The proven temperature controlled, corrosion resistant, ultra-pure ceramic sensor provides superior span stability over many years paired with state-of-the-art zero stability. Stripe comes with the INFICON patented unique sensor shield which protects the gauge from undesired process by-products. INFICON Stripe using an innovative heating concept, which provides a cool to the touch surface, and its unique speed capabilities,enabling an unprecedented productivity increase, making it the most advanced vacuum instrument of its kind.

Advantages

- High productivity — faster than 2 ms response time
- Flexible integration — EtherCAT fieldbus
- Long lifetime — proven ceramic sensor
- Forget recalibration — 90ppm / year full scale stability

Applications

- Atomic layer deposition
- High speed process control
- PVD, CVD, Etch
- General high temperature vacuum applications

Stripe CDG100Dhs 0.1... 1000Torr/mbar (continued)

Ordering Information

Full Scale (F.S.)

	0.1	**3**
	0.25	4
	0.5	5
	1	**6**
	2	7
	5	8
	10	**9**
	20	A
	50	B
	100	**C**
	200	D
	500	E
(Torr only)	**1000**	**F**
(mbar only)	1100	G

Flange

1	DN 16 ISO-KF
3	DN 16 CF-R
9	OD 1/2 in. tube
E	8 VCR female

Unit

5	**Torr** (× 1.33 mbar; × 133 Pa)
6	mbar (× 100 Pa)

bold = standard products

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

Stripe CDG100Dhs 0.1... 1000Torr/mbar (continued)

Specifications

Type		1000 … 500 Torr / mbar	200 … 1 Torr / mbar	0.5 … 0.1 Torr / mbar
Accuracy	% of reading	0.2	0.2	0.4
Temperature effect				
On zero	% F.S. / °C	0.0025	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		–20 … +85	
Supply voltage			+14 ... +30 V (dc) or ±15 V (±5%)	
Power consumption				
During Heat up	W		≤16	
At operating temperature	W		≤11	
Output signal (analog)	V (dc)		0 ... +10	
Response time	ms		2	
Degree of protection			IP 30	
Standards				
CE conformity			EN 61000-6-2, EN 61000-6-3, EN 61010-1 and RoHS	
ETL certification			UL 61010-1, CSA 22.2 No. 61010-1	
SEMI compliance			SEMI S2	
Electrical connection			D-sub, 15 pole, male	
Setpoint				
Number of setpoints			2 (SP1, SP2)	
Relay contact	V (dc) / A (dc)		≤30 / ≤0.5	
Hysteresis	% F.S.		1	
Diagnostic port				
Protocol			USB	
Read			Pressure, status, ID	
Set			Setpoints, filter, zero adjust, factory reset, DC offset	
Materials exposed to vacuum			Aluminum oxide ceramic (Al_2O_3), stainless steel (AISI 316L)	
Internal volume				
1/2 in. tube	cm^3 ($in.^3$)		4.2 (0.26)	
DN 16 ISO-KF	cm^3 ($in.^3$)		4.2 (0.26)	
DN 16 CF-R	cm^3 ($in.^3$)		4.2 (0.26)	
8 VCR female	cm^3 ($in.^3$)		4.2 (0.26)	
Weight				
1/2 in. tube	g		~837	
DN 16 ISO-KF	g		~852	
DN 16 CF-R	g		~875	
8 VCR female	g		~897	

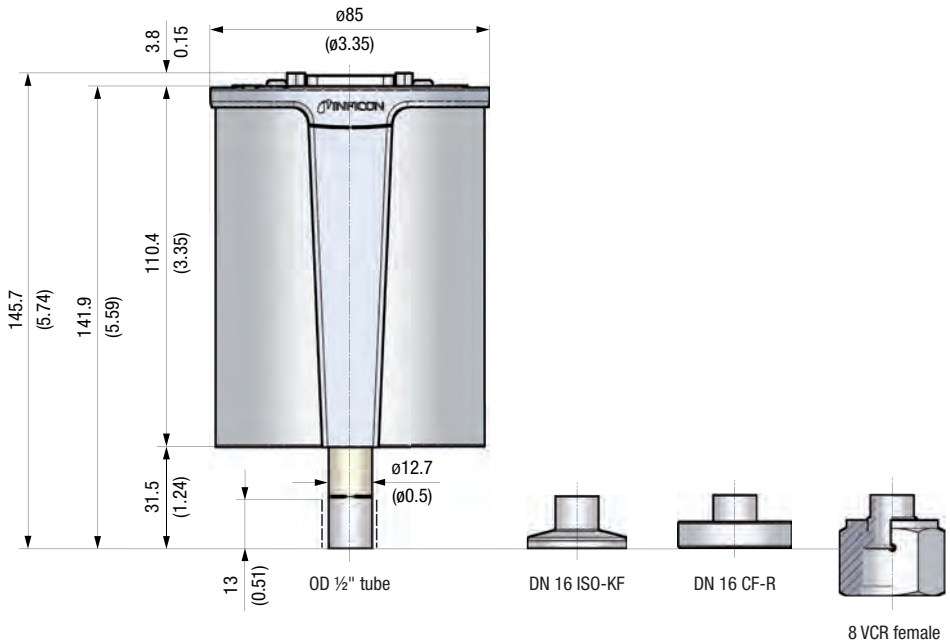
Stripe CDG100Dhs 0.1... 1000Torr/mbar (continued)

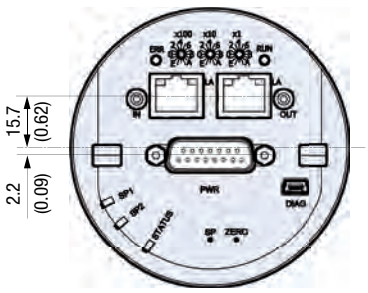
Specifications

Type		1000 … 500 Torr / mbar	200 … 1 Torr / mbar	0.5 … 0.1 Torr / mbar
EtherCAT				
Protocol EtherCAT		Protocol specialized for EtherCAT		
Communication standards		ETG.5003 Part 1, “Semiconductor Device Profile” ETG.5003 Part 2080, “Specific Device Profile: Vacuum Pressure Gauge”		
Node address		Explicit Device Identification		
Physical layer		100BASE-Tx (IEEE 802.3)		
Digital functions read		Pressure, status, ID		
Digital functions set		Set points, filter, zero adjust, reset, DC offset		
Mailbox (CoE)		SDO requests, responses and information		
Process data		Fixed PDO mapping and configurable PDO mapping		
EtherCAT connector		RJ45, 8-pin (socket), IN and OUT		
Cable		Shielded Ethernet CAT5e or higher		
EtherCAT				
Cable length	m (ft.)	≤100 (330)		

Dimensions

mm (in.)





Capacitance Diaphragm Gauges

Sky CDG160D, CDG200D 1 ... 1000 Torr/mbar

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 respectively 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 CDGs are high quality, cost effective pressure sensors for demanding semiconductor, plasma and vacuum applications.

Advantages

- Lower 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 and standards: CE, EN, UL, SEMI, RoHS

Applications

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

Sky CDG160D, CDG200D 1 ... 1000 Torr/mbar (continued)

Ordering Information

3	C	E	1	–	6	5	E	–	2	3	0	0

Sensor temperature °C

160	E
200	F

Full Scale (F.S.)

	1	**6**
	2	7
	5	8
	10	**9**
	20	A
	50	B
	100	**C**
	200	D
	500	E
(Torr only)	**1000**	**F**
(mbar only)	1100	G

Unit

5	**Torr** (x 1.33 mbar; x 133 Pa)
6	mbar (x 100 Pa)

Flange

1	DN 16 ISO-KF
3	DN 16 CF-R
9	OD 1/2 in. tube
E	**8 VCR female**

Fieldbus interface

0	None
1	DeviceNet
2	Profibus DP
G	EtherCAT

0	Standard
B	P control [1]

[1] Optimized signal 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.

Sky CDG160D, CDG200D 1 ... 1000 Torr/mbar (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) [4]	°C	+10 ... +50			
Bakeout at flange	°C	≤200			
Storage	°C	–20 ... +65			
Supply voltage		+21 ... +30 V (dc) 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)	V (dc)	0 ... +10			
Response time [2]	ms	30			
Degree of protection		IP 40			
Standards		EN 61000-6-2, EN 61000-6-3, EN 61010, UL 61010-1, CSA 22.2 No.61010-1, SEMI S-2			
Electrical connection		D-Sub, 15-pin, male			
Setpoint		Two setpoints (SP1, SP2)			
Relay contact	V (dc) / A (dc)	≤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 two hours operation.
2) Increase 10 … 90% F.S.
3) 18% Cr, 10% Ni, 3% Mo, 69% Fe
4) Ambient temperatures >40°C may increase surface temperature above SEMI S2 compliance levels — mark “caution hot!”

Sky CDG160D, CDG200D 1 ... 1000 Torr/mbar (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 two 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 two 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 V (dc) 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

Sky CDG160D, CDG200D 1 ... 1000 Torr/mbar (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

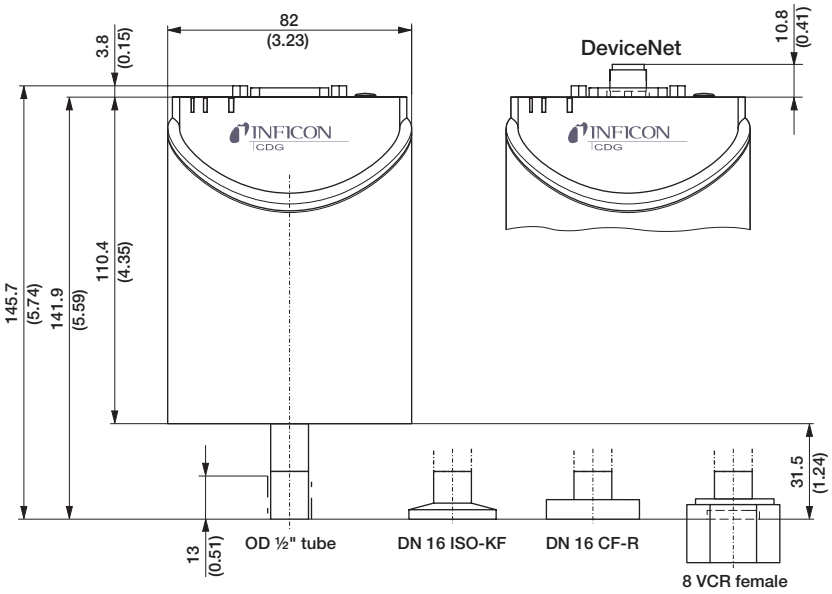
Specifications (EtherCAT)

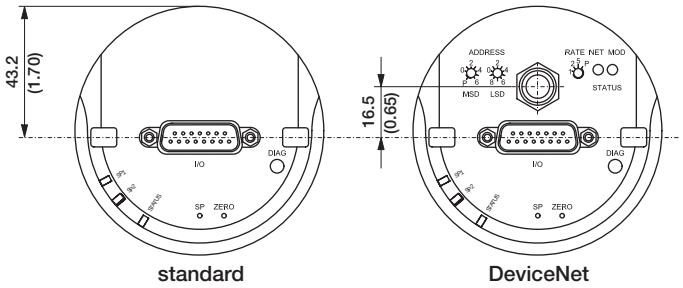
	CDG160D, CDG200D EtherCAT
Protocol	protocol specialized for EtherCAT
Communication Standards	ETG.5003 Part 1 “Semiconductor Device Profile” ETG.5003 Part 2080 “Semiconductor Device Profile” Specific Device Profile: Vacuum Gauge
Node address	Explicit Device Identification
Physical layer	100BASE-Tx-(IEEE 802.3)
Digital functions read	Pressure, status, ID
Digital functions set	Set points, filter, zero adjust, reset, DC offset
Mailbox (CoE)	SDO requests, responses and information
Process data	Fixed PDO mapping and configurable PDO mapping
EtherCAT connector	RJ45, 8-pin (socket), IN and OUT
Cable	Shielded Ethernet CAT5e or higher
Cable length m (ft.)	<100 (330)

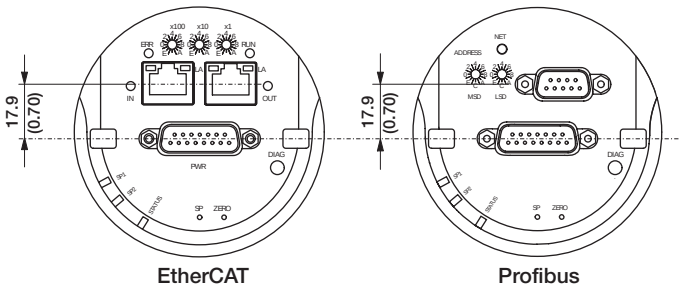
Sky CDG160D, CDG200D 1 ... 1000 Torr/mbar (continued)

Dimensions, Internal Volume, Weight

mm (in.)







		½ in. tube	DN 16 ISO KF	DN 16 CF-R	8 VCR
Internal volume	cm³ (in.³)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)	4.2 (0.26)
Weight	g	837	852	875	897

Pressure Display for CDG

VGD500

The INFICON Vacuum Gauge Display VGD500 connects to our CDG product line to provide a 4 Digit Display. It's a small unit which displays the pressure of the gauge. The pressure reading is selectable in pressure unit Torr, mTorr, mbar and Pa.

Advantages

- 4 Digit display for easy read out
- Large 10mm active LED display - readable from distance and wide range gauge of angle
- In-line plug design
- 15pin D-Sub, no extra power connection
- Compact small size
- Compatible with all Fullscale; 100 mTorr
- Pressure Units selectable (Torr, mTorr, mbar and Pa)
- CE certified

Ordering Information

Type	VGD500
VGD500 Vacuum Gauge Display	**399-653**

VGD500 (continued)

Specifications

Type		VGD500
Display		4 digits
Connection		
Gauge Side		D-Sub, 15-pin, female
Measurement cable side		D-Sub, 15-pin, male
Signal		digital input RS232
Pressure unit (adjustable)		Torr (default), mTorr, mbar, Pa
Supply		
Power consumption	W	≤1
Voltage		+14 … +30V (dc) or +/- 15V (ac)
Degree of protection		IP 40
Temperature		
Operation	°C	+5 … +50
Storage	°C	-20 … +85
Use		indoors only
Connectable gauges in the measurement range (F.S.) 0.1 mbar/Torr to 1000 mbar/Torr		CDG025D / -S, CDG025D-X3, CDG045D … CDG200D, CDG045D2 … CDG100D2
Weight	g	58
Dimensions	mm	50x63x34

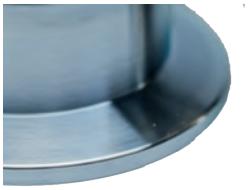
Application specific CDG solutions

INFICONs innovative ceramic capacitance diaphragm technology offers new and unique solutions. The flexible platform allows direct drop in replacements for legacy products. Please contact our sales for more information.

AllCeramic, the metal free process CDG

Only ceramic surfaces (aluminum oxide) are wetted to process media. This option is available to all CDG products (SKY, Edge, Stripe).

- Higher corrosion resistance
- Lower metal contamination
- Lower particle contamination
- Longer lifetime, less maintance



Remote CDG, custom engineered

Standard heated CDG products are not matching your design requirments? Remote heated CDG could be the perfect solution.

- Sensor integrated in hot environment
- Sensor integrated in limited space

UHP Porter

You need a UHP compatible CDG? INFICONs xParts coating lifts the product performance to UHP level matched with clean room double packaging.

- Lower particle contamination
- Chemical resistant
- Lower metal contamination

Application specific CDG solutions (continued)

Drop in retrofit solutions

You need to replace a legacy gauge of any brand? No problem, INFICON offers attractive drop in solutions for most legacy products matching other vendors pinout and functionality. Some examples are:

- Dual output
- Trip point versions with pinout and trip point voltage levels

Pin	Leagacy Gauge	INFICON Standard Gauge	INFICON drop in replacement
1	Trip point A V-level	SP1 common	SP1 voltage level
2	Pressure signal output	Signal output	Signal output
3	Trip point A N.C.	Status	SP1 normaly closed contact N.C.
4	Trip point A N.O.	SP1 no	SP1 normally open contact N.O.
5	Power return	Supply common	Supply common
6	-15VDC	Supply (-15V)	Supply (-15V)
7	+15VDC	Supply (+14...+30V)	Supply (+14...+30 or +15V)
8	Trip point A Com	SP2 no	SP1 common
9	Trip point B N.O.	SP2 common	SP2 normally open contat N.O.
10	Trip point B N.C.	Gauge identification	SP2 normally closed
11	Trip point B Com	Supply	SP2 common
12	Pressure signal return	Signal common	SP2 Voltage level
13	Trip point B V-Level	RS232 TxD	SP2 Voltage level
14	No connection	RS232 RXD	Not used
15	Chassis ground	Chassis ground	Housing (Chassis ground)

You didn't find the CDG solving your application?

INFICONs ceramic capacitance diaphragm technology paired with digital signal processing and experienced engineering will offer leading, innovative solutions. Please contact INFICON and describe your measurement requirements.

Bayard–Alpert Hot Ion Gauge

BAG302

The INFICON single Bayard-Alpert Hot Ion Gauge BAG302 covers a wide measurement range from 1.3 x 10^{-9} mbar to 6.7 x 10^{-2} mbar (1 x 10^{-9} Torr to 5 x 10^{-2} Torr). The compact All in one Hot Ion gauge BAG302 offers an easy to exchange dual filament sensor, a built in OLED display, set-point relay and a long-linear analog output as well as an integrated RS485 digital interface for increased integration flexibility.
These features combined with the rugged design makes the BAG302 an affordable and repeatable process to base pressure measurement instrument of its own and provides a high value/low cost of ownership choice.
The BAG302 is considered as OEM gauge and therefore not supported by VGC50x controller series.

Advantages

- Wide measurement range from 1.3 x 10^{-9} mbar to 6.7 x 10^{-2} mbar (1 x 10^{-9} Torr to 5 x 10^{-2} Torr)
- Two long-life yttrium oxide coated iridium filaments
- Tungsten filaments on special order
- All-in-One active gauge with built-in display, set-point, analog output and standard integrated RS485 digital interface
- Bright digital OLED display with keypad for simple setup, operation and programming
- User programmable set point relay
- User programmable display unitss in mbar, Torr or Pa
- RoHS compliance
- User selectable Auto-ranging of emission current
- Mechanical strength and ruggedness
- Choice of various flange options
- Easy to exchange sensing element
- Compliance & standards: CE, RoHS
- Direct drop in replaces Granville-Phillips® 354 Micro-Ion® Module - identical control functions including software commands (RS485)

Applications

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

BAG302 (continued)

Ordering Information

Type	BAG302	Replacement Sensor
(Yt_2O_3 coated iridium filaments)	OLED, SP, analog output, RS485	
DN 16 ISO-KF	**352-050**	**352-060**
DN 25 ISO-KF	**352-051**	**352-061**
DN 40 ISO-KF	**352-052**	**352-062**
DN 16 CF-R	**352-053**	**352-063**
DN 16 CF-R	**352-054**	**352-064**
3/4" tube	**352-055**	**352-065**
8 VCR female	**352-056**	**352-066**

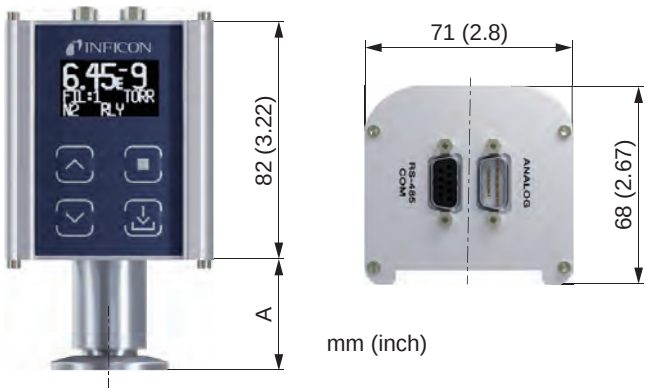
Specifications

Type			BAG302
Measurement range		mbar	1.3×10^{-9} … 6.7×10^{-2}
		Torr	1×10^{-9} … 5×10^{-2}
		Pa	1.3×10^{-7} … 6.7
Accuracy (N_2)[1]			
1.3×10^{-8} … 6.7×10^{-2} mbar		% of reading	±15
1×10^{-8} … 5×10^{-2} Torr		% of reading	±15
Repeatability [1]		% of reading	±5
Degas [2]	$p < 6.7 \times 10^{-5}$	mbar	electron bombardment, 2 min (default)
	$p < 5.00 \times 10^{-5}$	Torr	(programmable between 2 … 10 min)
Temperature			
Operation (ambient)		°C	0 … +40
Storage		°C	-40 … +70
Bakeout at flange (sensor only, electronics removed)		°C	200
Supply voltage		V (dc)	+20 … +28 [3]
Output signal analog		V	0 … +9 (log linear)
Voltage vs. pressure		V / Decade	1
Set point relay			1 (single-pole double-throw relay (SPDT)) 1 A at 30 V (dc) resistive, or V (ac) non-inductive
Digital functions			degas, filament on/off and emission control
Interface (digital)			RS485
Emission control			Manual
Filament			Two Yt_2O_3 coated Ir
Filament status			display / digital output
Electrical connection			D-Sub, 9-pin, male for analog D-Sub, 9-pin, female for RS485
Materials exposed to vacuum			Yt_2O_3, Ir, W, Ta, stainless steel, glass, Ni
Mounting orientation			any
Internal volume		cm^3 ($inch^3$)	16.4 (1.0)
Weight KF / CF		g (lb)	270 (0.6)

1) typically
2) Reduced accuracy during degas
2) 30 W protected against power reversal and transient over-voltages

BAG302 (continued)

Dimensions



mm (inch)

Dimension A	mm	(in)
DN 16 ISO-KF	37	(1.45)
DN 25 ISO-KF	37	(1.45)
DN 40 ISO-KF	37	(1.45)
DN 16 CF-R	47	(1.85)
DN 40 CF-R	33	(1.7)
8 VCR female	65	(2.58)
3/4" tube	55	(2.16)

Accessories

Power supply for BAG302[1)] **352-075**

Input power:	V (ac)	100 … 240
Output power:	V (dc)	+24 @ 2.5 A (60 W)
Cable length:	m (ft)	2 (6)

1) The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide

Bayard–Alpert Gauge

BAG402

The INFICON single Bayard-Alpert Hot Ion Gauge BAG402 covers a wide measurement range from 5 x 10^{-10} mbar to 2.7 x 10^{-2} mbar (3.75 x 10^{-10} Torr to 2 x 10^{-2} Torr). Choose the INFICON BAG402 for affordable and repeatable process to base pressure measurements in a compact active gauge package. The unique, supported dual filaments offer superior accuracy, longterm stability and longevity.
The BAG402 is considered as OEM gauge and therefore is not supported by VGC50x controller series.

Advantages

- Measurement range from 5 x 10^{-10} mbar to 2.7 x 10^{-2} mbar (3.75 x 10^{-10} Torr to 2 x 10^{-2} Torr)
- Excellent repeatability in the process pressure range from 10^{-8} … 10^{-2} mbar of ±5%
- Overpressure detection protects the filament from premature burnout
- Two long-life yttrium oxide coated iridium filaments
- Emission current selection reduces control complexity
- Easy to exchange sensing element with on-board calibration data guarantees high reproducibility
- RoHS compliance

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	**BAG402**
Setpoint	**none**
Connector	**D-Sub, 9-pin**
Interface	**analog**
DN 25 ISO-KF	**353-600**
DN 40 CF-R	**353-601**
Replacement sensor DN 25 ISO-KF	**354-484**
Replacement sensor DN 40 CF-R	**354-485**

BAG402 (continued)

Accessories

Baffle	**353-512**
Centering ring with baffle DN 25 ISO-KF	**211-113**

Specifications

Type			**BAG402**
			D-Sub, 9-pin
Measurement range	(air, O_2, CO, N_2)	mbar (Torr)	5×10^{-10} … 2.7×10^{-2} (3.75×10^{-10} … 2×10^{-2})
Accuracy	10-8 … 10^{-2} mbar	% of reading	±15
Repeatability	10-8 … 10^{-2} mbar	% of reading	5
Degas [1]	$p < 7.2 \times 10^{-6}$	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		°C	80
Supply voltage		V / A (dc)	+20 … +28 / ≤0.8
Output signal analog		V	0 … +10.5
Measurement range		V	0.57 ... 8.31
Voltage vs. pressure		V / Decade	1
Error signal		V	>10
Load impedance, min.		kΩ	10
Digital functions			Degas and emission control
Interface (digital)			Diagnostic port
Emission control			Manual
Filament			Two Yt_2O_3 coated Ir
Filament status			LED / digital output
Electrical connection			D-Sub, 9-pin, male
Cable length, max.		m (ft)	100 (330)
Materials exposed to vacuum			Yt_2O_3, Ir, Pt, Mo, W, NiFe, NiCr, stainless steel, glass
Internal volume KF / CF		cm^3 ($inch^3$)	24 (1.46) / 34 (2.1)
Weight KF / CF		g	450 / 710
Degree of protection			IP30

[1] Reduced accuracy during degas

BAG402 (continued)

Accessories

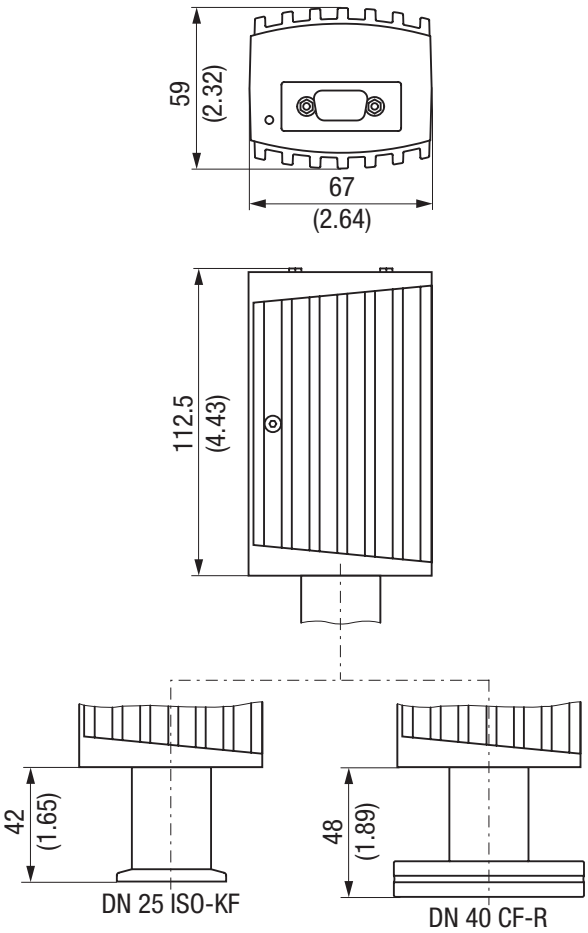
Baffle:

Prevents contamination of the sensor.
Fast and easy installation.

Dimensions

mm (in.)

BAG402
(D-Sub, 9-pin)



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
- RoHS compliance

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	BPG400 with LCD	BPG400-SP with Profibus DP	BPG400-SD with DeviceNet
DN 25 ISO-KF	**353-500**	**353-501**	**353-505**	**353-507**
DN 40 CF-R	**353-502**	**353-503**	**353-506**	**353-508**
Replacement sensor 25 ISO-KF	**354-490**	**354-490**	**354-490**	**354-490**
Replacement sensor 40 CF-R	**354-491**	**354-491**	**354-491**	**354-491**

Accessories

Power supply 24 V (dc) / RS232C line	**353-511**
Bakeout extension, 100 mm (3.94 in.)	**353-510**
Baffle	**353-512**
Centering ring with baffle DN 25 ISO-KF	**211-113**

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 ($in.^3$)	24 (1.46) / 34 (2.1)
Weight KF / CF		g	285 / 550
Degree of protection			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 (Profibus DP)

		BPG400-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		Two 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)

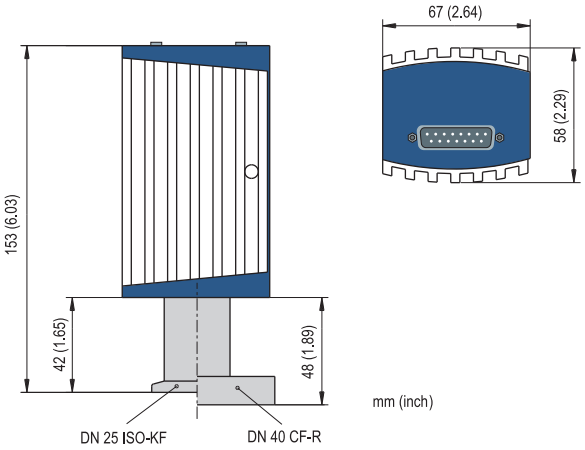
Specifications (DeviceNet)

		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		Two 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	1×10^{-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

BPG400 (continued)

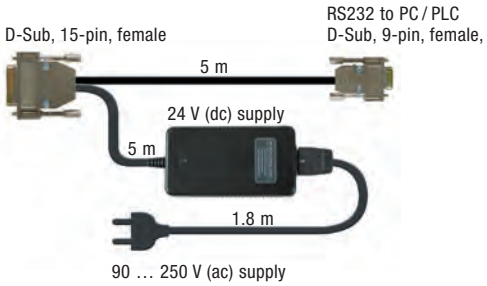
Dimensions

mm (in.)



Accessories

Power supply 24 V (dc) / RS232C line



Bakeout extension:

Allows measurement at flange temperatures up to 150°C.
Easy installation into the vacuum connection - no tools required.

Baffle:

Prevents contamination of the sensor.
Fast and easy installation.

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 two 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
- Two long-life yttrium oxide coated iridium filaments
- Optional graphic display and Fieldbus interfaces available, e.g. EtherCAT
- Automatic high vacuum Pirani adjustment reduces operator interventions
- Easy to exchange sensing element with on-board calibration data guarantees high reproducibility
- RoHS compliance

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	BPG402-SE with EtherCAT
DN 25 ISO-KF	**353-570**	**353-572**	–	**353-574**	**353-576**	**353-590**
DN 40 CF-R	**353-571**	**353-573**	**353-578**	**353-575**	**353-577**	**353-591**
Replacement sensor 25 ISO-KF	**354-494**	**354-494**	–	**354-494**	**354-494**	**354-494**
Replacement sensor 40 CF-R	**354-495**	**354-495**	**354-496**	**354-495**	**354-495**	**354-495**

BPG402-S (continued)

Accessories

Power supply 24 V (dc) / RS232C line	**353-511**
Baffle	**353-512**
Centering ring with baffle DN 25 ISO-KF	**211-113**

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	0.1 / 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			Two 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 ($in.^3$)	24 (1.46) / 34 (2.1)
Weight KF / CF		g	450 / 710
Degree of protection			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 (Profibus DP)

		BPG402-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		Two 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 (EtherCAT)

		BPG402-SE EtherCAT
Protocol		EtherCAT
Communication Standards		ETG.5003 Part 1 [1)] ETG.5003 Part 2080 [2)] Specific Device Profile: Vacuum Gauge
Node address		Explicit Device Identification
Physical layer		100BASE-Tx-(IEEE 802.3)
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
Setpoint relays		2
Range	mbar	1×10-9 … 100
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A (dc)	≤30 / ≤0.5
EtherCAT connector		2 × RJ45, 8-pin (socket), input and output
Cable		special Ethernet Patch Cable or Crossover Cable, shielded (CAT5e quality or higher)
Cable length	m (ft)	≤100 (330)
Process data		fixed PDO mapping and configurable PDO mapping
Mailbox (CoE)		SDO requests, responses and information

1) Semiconductor Device Profile
2) Specific Device Profile: Vacuum Pressure Gauge

BPG402-S (continued)

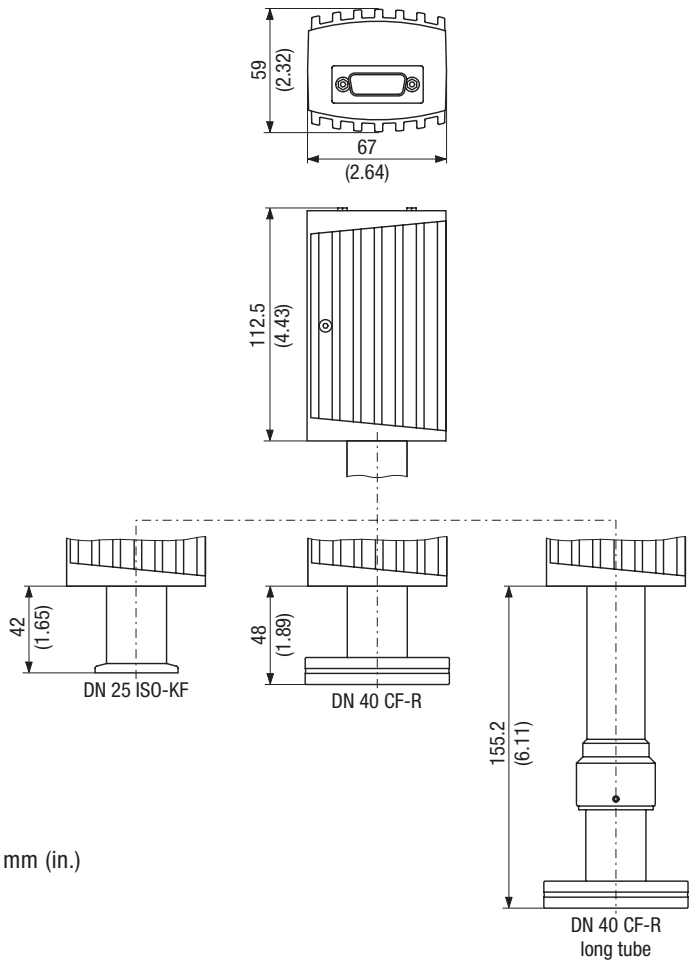
Specifications (DeviceNet)

		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		Two 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	1×10^{-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 / ≤0.5
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

BPG402-S (continued)

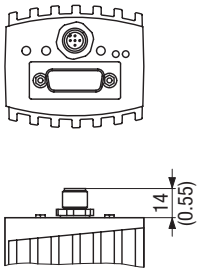
Dimensions

BPG402-S/-SL

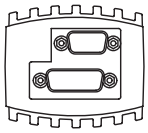


mm (in.)

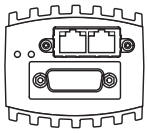
BPG402-SD (DeviceNet)



BPG402-SP (Profibus)

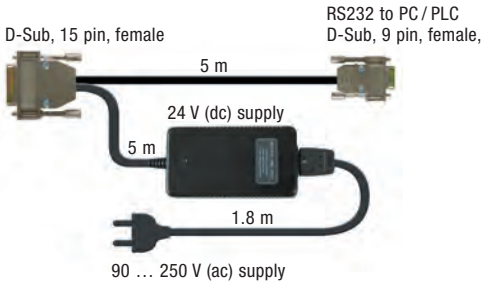


BPG402-SE (EtherCAT)



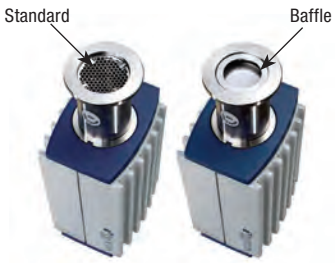
Accessories

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
- RoHS compliance

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	HPG400 with LCD	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-R	**354-488**	**354-488**	**354-488**	**354-488**

1) Not available with LCD

Accessories

Power supply 24 V (dc) / RS232C line	**353-511**
Centering ring with baffle DN 25 ISO-KF	**211-113**

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)	2
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 ($in.^3$)	20 (1.2) / 30 (1.8)
Weight KF / CF		g	430 / 695
Degree of protection			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 (DeviceNet)

		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		Two 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	$2x10^{-6}$ … 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) / A	20 … 28
Connector for DeviceNet		Microstyle, 5-pin
Connector for HPG (analog output, supply voltage, setpoints)		D-Sub, 15-pin, male

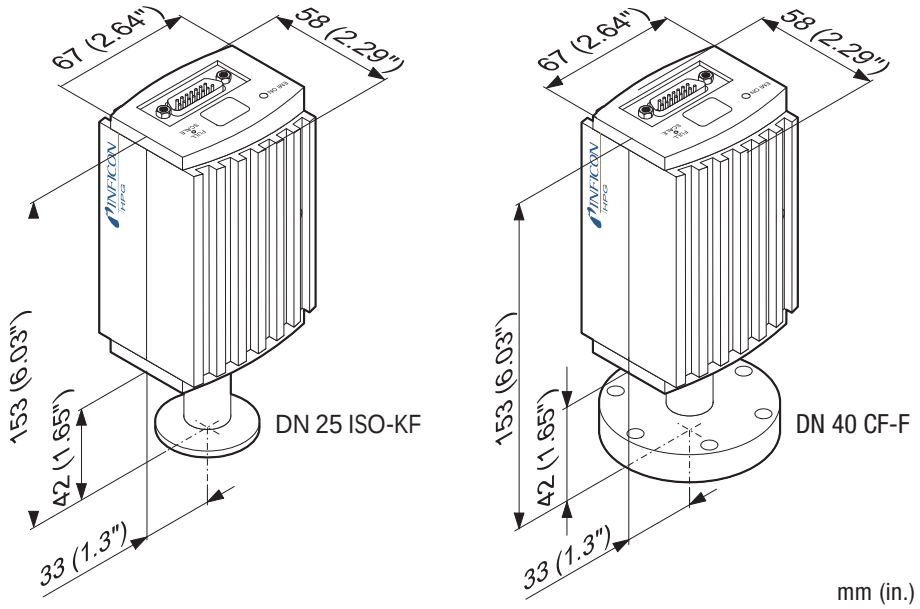
Specifications (Profibus DP)

		HPG400-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		Two 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	$1x10^{-6}$ … 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)

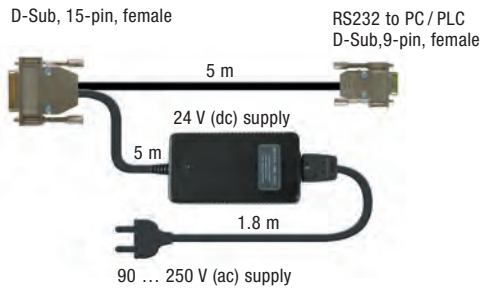
Dimensions

mm (in.)



Accessories

Power supply 24 V (dc) / RS232C line



Pirani Gauge Enhanced

PGE500

The INFICON Pirani Gauge Enhanced (PGE) is equipped with the latest digital convection enhanced Pirani technology available on the market. Due to the physical properties of convection this type of Pirani offers higher accuracy in the measurement range between 100 to 1000 mbar. The rugged gauge and sensor design in combination with many factory build in features, such as the bright, sharp and clear OLED display with integrated keypad, RS485/RS232 digital interface and 4 selectable analog output signals make the PGE500 a high value/ low cost of ownership choice. All these features qualify this gauge for many applications where an economical vacuum measurement from low to high vacuum range is required.

Advantages

- Convection Enhanced Pirani Technology for wide measurement range and higher accuracy near atmosphere
- All-in-One active gauge with built-in display, 2 set points, 4 analog output signalsl, and 2 digital interfaces
- Bright digital OLED display with keypad for simple setup, calibration and operation
- 4 optional analog output signals (3 user selectable, 1 default)
- Factory pre-set analog output signal or selectable via keypad
- Factory pre-set display units or selectable via keypad
- User programmable set point relays (factory pre-set on request for volume orders)
- Gold plated tungsten filament
- Mechanical strength, highly robust and less susceptible to mechanical shock and vibration
- Choice of flange options
- Compliance & standards: CE, RoHS
- Direct drop in replaces most Granville-Phillips® Mini-Convectron® modules (GP275)

Applications

- Fore vacuum pressure measurement
- General vacuum measurement and control from low to the high vacuum range

PGE500 (continued)

Ordering Information

3 P E 5 – 0 0 1 – B 7 F 0

Unit

mbar	0
Torr	1
Pa	2

Flange

DN 16 ISO-KF	1
DN 16 CF-R	3
DN 25 ISO-KF	6
DN 40 ISO-KF	7
DN 40 CF-R	8
4 VCR female	D
8 VCR female	E
1/8" NPT	F

Output Signal Analog

0	1.15 … 10.215 V [1]
2	0.375 … 5.659 V [2]
5	1 … 8 V [3]
-	0 … 10 V [4]

1) log-linear, $p=10^{0.778(U-c)}$
2) non-linear S-curve, compatible to most Granville-Phillips® Mini-Convectron® modules (GP275)
3) log-linear, $p=10^{(V-5)}$
4) linear, available on all devices by default on pin 9

PGE500 (continued)

Specifications

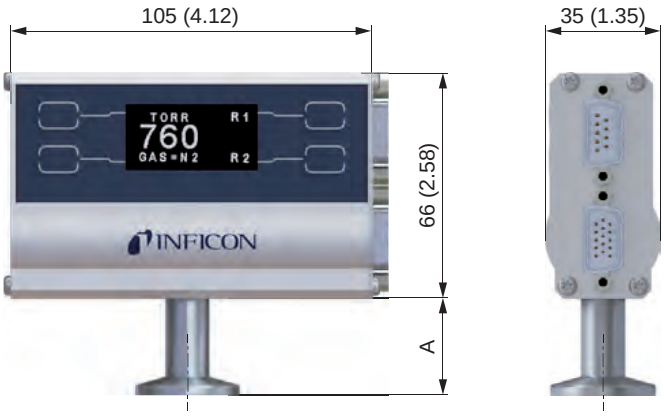
Type		PGE500
Filament		Tungsten gold-plated
Measurement range	mbar	1.3×10^{-4} … 1333
	Torr	1×10^{-4} … 1000
	Pa	1.3×10^{-2} … 133000
Accuracy (N_2)[1]		
1.3×10^{-4} … 1.3×10^{-3} mbar		0.1×10^{-3} mbar resolution
1.3×10^{-3} … 530 mbar	% of reading	±10
530 … 1333 mbar	% of reading	±2.5
1×10^{-4} … 1×10^{-3} Torr		0.1 mTorr resolution
1×10^{-3} … 400 Torr	% of reading	±10
400 … 1000 Torr	% of reading	±2.5
Repeatability (N_2)[1]	% of reading	±2
Admissible Temperature		
Operation	°C	0 ... +40
Storage	°C	-40 ...+70
Bakeout (electronics removed)	°C	≤150
Supply voltage	V (dc)	+12 ... +28) [2]
Output signal (analog)		
3PE5-0xx-B7F0	V (dc)	1.15 ... 10.215 (log-linear)
3PE5-0xx-B7F2	V (dc)	0.375 ... 5.659 (non-linear S-curve)
3PE5-0xx-B7F5	V (dc)	1 ... 8 (log-linear)
3PE5-0xx-B7F-[3]	V (dc)	1 ... 10 (linear)
Voltage vs. pressure		
3PE5-0xx-B7F0	V / Decade	1.286
3PE5-0xx-B7F5	V / Decade	1
Setpoint relay		2 (single-pole double-throw relays (SPDT)) 1 A at 30 V (dc) resistive, or V (ac) non-inductive
Electrical connection		D-Sub, 9-pin, male and D-Sub, 15-pin HD, male (with RS485)
Mounting orientation		horizontal recommended [4]
Materials exposed to vacuum		gold-plated tungsten, 304 & 316 stainless steel, glass, nickel, Teflon®
Internal volume	cm^3 ($in.^3$)	26 (1.589)
Internal surface area	cm^2 ($in.^2$)	59.7 (9.25)
Weight	g (oz)	340 (12)

1) typically
2) 2 W protected agianst power reversal and transient over-voltages
3) available on all devices by default on pin 9
4) orientation has no effect on measurements below 1.3 mbar (1 Torr)

PGE500 (continued)

Dimensions

mm (in.)



Dimension A	mm	(in)
DN 16 ISO-KF	29.5	(1.16)
DN 25 ISO-KF	29.5	(1.16)
DN 40 ISO-KF	29.5	(1.16)
DN 16 CF-R	34	(1.34)
DN 40 CF-R	34	(1.34)
4 VCR female	43.7	(1.72)
8 VCR female	40.9	(1.61)
1/8” NPT	21.8	(0.86)

Accessories

Power supply for PGE300 & PGE500[1)]	**352-525**

Input power:	V (ac)	100 … 240
Output power:	V (dc)	+24 @ 2.5 A (60 W)
Cable length:	m (ft)	2 (6)

1) The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide

Pirani Gauge Enhanced

PGE300

The INFICON Pirani Gauge Enhanced 300 (PGE300) like it's bigger brother PGE500 is equipped with the latest digital convection enhanced Pirani technology available on the market. Equipped with the same sensor components as the PGE500, the PGE300 yields the same higher accuracy readings in the measurement range between 100 to 1000 mbar.
The PGE300 offers only the critical built-in features that the majority of customers in the vacuum industry are looking for, minimizing costs and maximizing efficiency. This rugged gauge and sensor design, in combination with the factory build in clear readable LED display, 3 selectanle analog output signals and a set point relay makes the PGE300 a high value/low cost of ownership choice not only for OEM customers, but all customers.
These features qualify this gauge for many applications where an economical vacuum measurement from low to high vacuum range is required. With its wider measuring range and higher accuracy, especially at lower pressures in combination with the economically priced built in features the PGE300 also is the first choice when replacing thermocouple gauges in your vacuum system.

Advantages

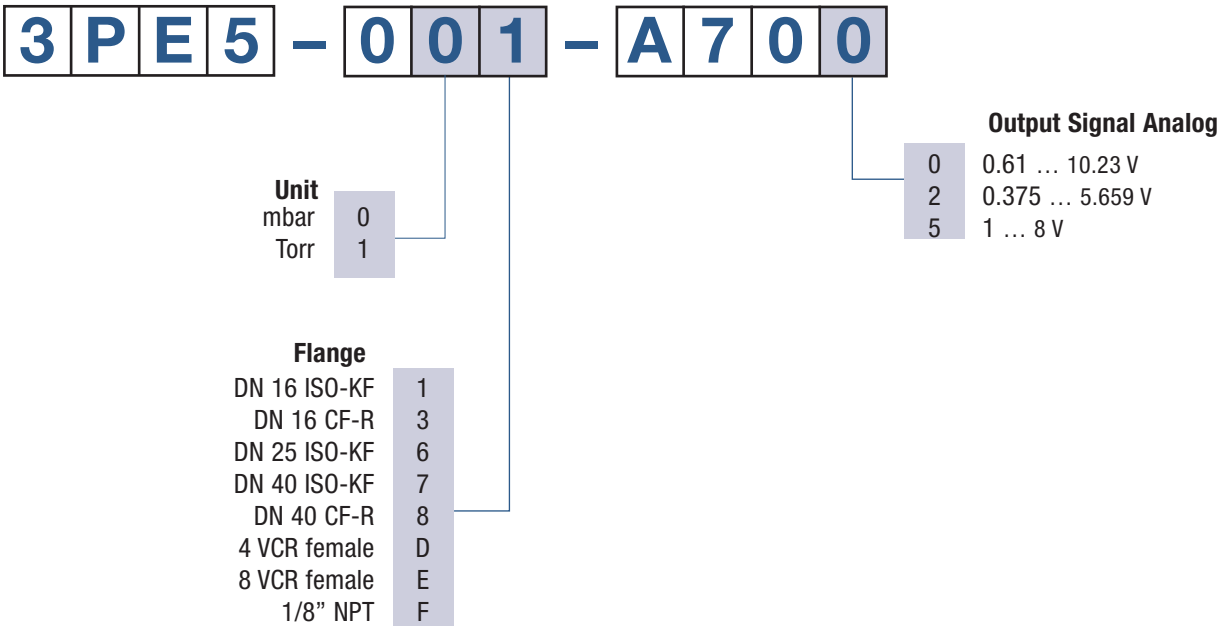
- Convection Enhanced Pirani Technology for wide measurement range and higher accuracy near atmosphere
- All-in-One active gauge with built-in display, 1 set point and 3 selectable analog output signalsl
- Bright digital LED display features a user friendly for calibration and operation
- 3 optional analog output signals (user selectable)
- Factory pre-set analog output signal or selectable via user interface
- User programmable set point relays
- Gold plated tungsten filament
- Mechanical strength, highly robust and less susceptible to mechanical shock and vibration
- Choice of flange options
- Compliance & standards: CE, RoHS
- Direct drop in replaces most Granville-Phillips® Mini-Convectron® modules (GP275) and ideal device for upgrading your installed thermocouple gauges

Applications

- Fore vacuum pressure measurement
- General vacuum measurement and control from low to the high vacuum range

PGE300 (continued)

Ordering Information



PGE300 (continued)

Specifications

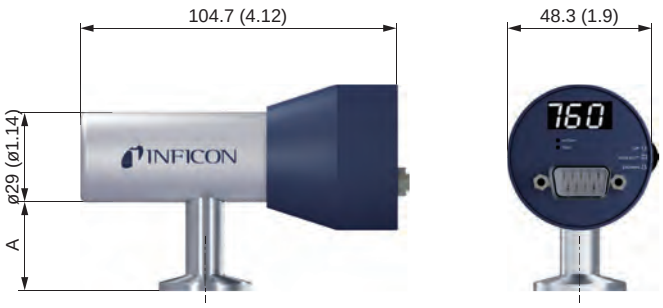
Type		PGE300
Filament		Tungsten gold-plated
Measurement range	mbar	1.3×10^{-4} … 1333
	Torr	1×10^{-4} … 1000
	Pa	1.3×10^{-2} … 1333000
Accuracy (N_2)[1]		
1.3×10^{-4} … 1.3×10^{-3} mbar		0.1×10^{-3} mbar resolution
1.3×10^{-3} … 530 mbar	% of reading	±10
530 … 1333 mbar	% of reading	±2.5
1×10^{-4} … 1×10^{-3} Torr		0.1 mTorr resolution
1×10^{-3} … 400 Torr	% of reading	±10
400 … 1000 Torr	% of reading	±2.5
Repeatability (N_2)[1]	% of reading	±2
Admissible Temperature		
Operation	°C	0 ... +40
Storage	°C	-40 ...+70
Bakeout	°C	≤70
Supply voltage	V (dc)	+12 ... +28) [2]
Output signal (analog)		
3PE5-0xx-A700	V (dc)	0.61 ... 10.23 (log-linear)
3PE5-0xx-A702	V (dc)	0.375 ... 5.659
3PE5-0xx-A705	V (dc)	1 ... 8 (log-linear)
Voltage vs. pressure		
3PE5-0xx-A700	V / Decade	1.286
3PE5-0xx / -A705	V / Decade	1
Setpoint relay		1 (single-pole double-throw relay (SPDT)) 1 A at 30 V (dc) resistive, or V (ac) non-inductive
Electrical connection		D-Sub, 9-pin, male
Mounting orientation		horizontal recommended [3]
Materials exposed to vacuum		gold-plated tungsten, 304 & 316 stainless steel, glass, nickel, Teflon®
Internal volume	cm^3 ($in.^3$)	26 (1.589)
Internal surface area	cm^2 ($in.^2$)	59.7 (9.25)
Weight	g (oz)	136 (4.8)

1) typically
2) 2 W protected agianst power reversal and transient over-voltages
3) orientation has no effect on measurements below 1.3 mbar (1 Torr)

PGE300 (continued)

Dimensions

mm (in.)



Dimension A	mm	(in)
DN 16 ISO-KF	33	(1.3)
DN 25 ISO-KF	33	(1.3)
DN 40 ISO-KF	33	(1.3)
DN 16 CF-R	27.4	(1.08)
DN 40 CF-R	37.3	(1.47)
4 VCR female	47.2	(1.86)
8 VCR female	44.5	(1.75)
1/8” NPT male	25.4	(1)

Accessories

Power supply for PGE300 & PGE500[1)] **352-525**

Input power:	V (ac)	100 … 240
Output power:	V (dc)	+24 @ 2.5 A (60 W)
Cable length:	m (ft)	2 (6)

1) The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide

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.

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 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, e.g. EtherCAT
- RoHS compliance

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	BCG450 with LCD	BCG450-SP with Profibus DP [1]	BCG450-SD with DeviceNet [1]	BCG450-SE with EtherCAT [1]
DN 25 ISO-KF	**353-550**	**353-552**	**353-554**	**353-557**	**353-592**
DN 40 CF-R	**353-551**	**353-553**	**353-556**	**353-558**	**353-593**
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] Not available with LCD display

Accessories

Power supply 24 V (dc) / RS 232 C line	**353-511**
Baffle	**353-512**
Centering ring with baffle DN 25 ISO-KF	**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}… 50 mbar	% of reading	±15
	50 … 950 mbar	% of reading	±5
	950 … 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 … +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 … 10.3
Measurement range		V	0.774 … 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 ($in.^3$)	24 (1.46) / 34 (2.1)
Weight KF / CF		g	285 / 550
Degree of protection			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 (Profibus DP)

		BCG450-SP Profibus DP
Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		Two 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 … 10 V analog output pressure indication
		two setpoint relays A + B
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 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
Connector for BCG (analog output, supply voltage, setpoints)		D-Sub, 15-pin, male

Specifications (EtherCAT)

		BCG450-SE EtherCAT
Protocol		EtherCAT
Communication standard		ETG.5003 Part 1 [1]
		ETG.5003 Part 2080 [2]
Node address		Explicit Device Identification
Physical layer		100BASE-Tx (IEEE 802.3)
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
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 1400
Relay contact		n.o., potential free
Hysteresis	% of reading	10
Contact rating	V / A (dc)	60 / 0.5
EtherCAT connector		2 x RJ45, 8-pin (socket), input and output
Cable		special Ethernet Patch Cable or Crossover Cable, shielded
		(CAT5e quality or higher)
Cable length	m (ft)	≤100 (330)
Process data		fixed PDO mapping and configurable PDO mapping
Mailbox (CoE)		SDO requests, responses and information

[1] Semiconductor Device Profile
[2] Specific Device Profile: Vacuum Pressure Gauge

TripleGauge BCG450 (continued)

Specifications (DeviceNet)

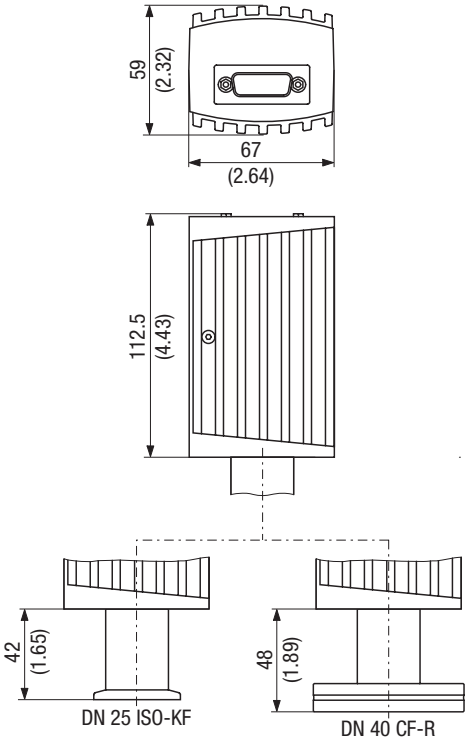
		BCG450-SD DeviceNet
Protocol		DeviceNet, group 2 slave only
Data rate switch	kBaud	125, 250, 500 or network programmable
Cable length		
125 kbps	m (ft.)	500 (1650)
250 kbps	m (ft.)	250 (825)
500 kbps	m (ft.)	100 (330)
MAC ID		Two switches (address 00 – 63) or network programmable
Network size		Up to 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 … 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 / 0 slave messaging		polling only
Setpoint relays		2
Range	mbar	1 x 10^{-9} … 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 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 BCG (analog output, supply voltage, setpoints)		D-sub, 15-pin, male

TripleGauge BCG450 (continued)

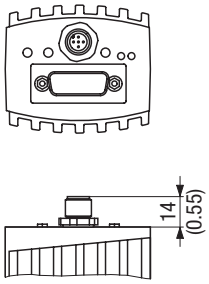
Dimensions

mm (in.)

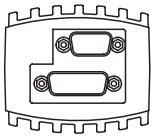
BCG450



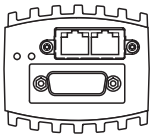
BCG450-SD (DeviceNet)



BCG450-SP (Profibus)

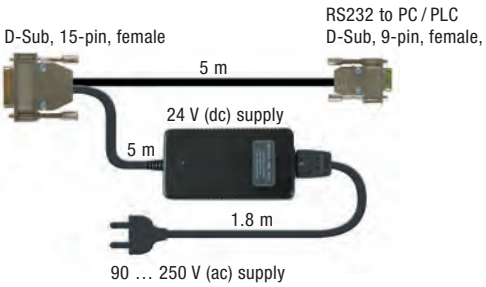


BCG450-SE (EtherCAT)



Accessories

Power supply 24 V (dc) / RS 232 C line



Baffle

Prevents contamination of the sensor.
Fast and easy installation.

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
- All stainless steel measuring cell
- 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 and 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	PSG500	PSG500-S	PSG502-S	PSG510-S	PSG512-S
Setpoints	None	Two setpoints	Two setpoints	Two setpoints	Two setpoints
Filament	Tungsten	Tungsten	Nickel	Tungsten	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 in. 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 in. 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 in. NPT	**350-921**	**350-901**		
8 VCR	**350-924**	**350-904**		
4 VCR	**350-926**	**350-906**		
1/2 in. 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

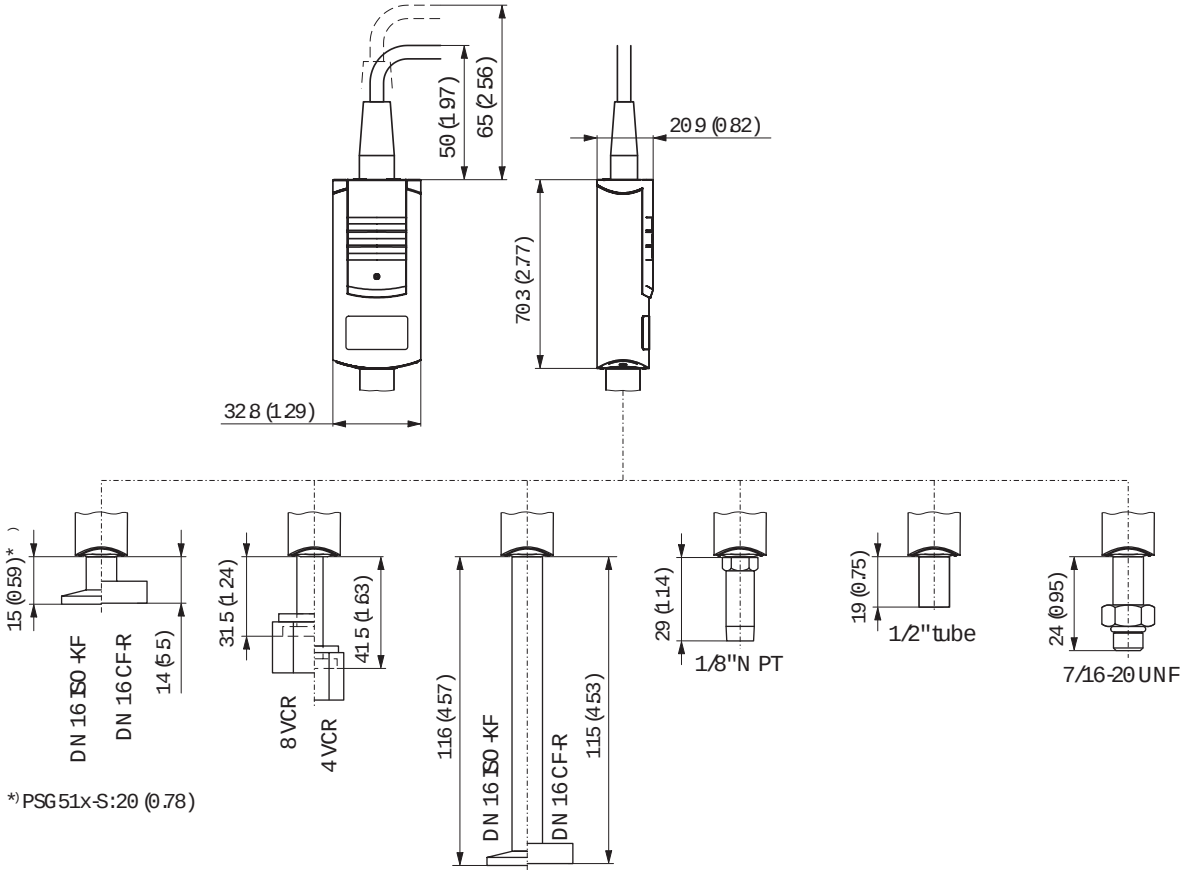
Type			PSG500	PSG500-S	PSG502-S	PSG510-S	PSG512-S
Filament			Tungsten	Tungsten	Nickel	Tungsten	Nickel
Measuring principle			thermal conductance according to Pirani				
Measurement range (air, O_2, CO, N_2)		mbar	5×10^{-4} to 1000				
Accuracy (N_2)	1×10^{-3} … 100 mbar	% of reading	±15%				
	5×10^{-4} … 1×10^{-3} mbar	% of reading	±50%				
	100 … 1000 mbar	% of reading	±50%				
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				
Minimum 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 ($in.^3$)	1.5 (0.092)				
DN 16 ISO-KF and DN 16 CF-R long tube		cm^3 ($in.^3$)	10 (0.61)				
1/8 in. NPT, 4 VCR, 8 VCR, 1/2 in. tube		cm^3 ($in.^3$)	2 (0.122)				
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 in. NPT, 1/2 in. 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 (in.)



Pirani Standard Gauge

PSG550, PSG552, PSG554

The INFICON Pirani Standard Gauge (PSG55x) employs like his brothers PCG55x and PSG50x the most advanced digital Pirani technology available. The rugged sensor design combined with the compact size and the variety of features qualifies as the right product for measurement from low to the high vacuum range.

Advantages

- Available with Tungsten (PSG550) or nickel (PSG552) filament or with a fully ceramic coated (PSG554) sensor unit for highly corrosive applications
- Optional display, setpoints and digital interfaces, e.g. EtherCAT
- Easy to exchange plug and play sensor element with on-board calibration data—guarantees high reproducibility and low cost of ownership
- Selectable output signal and various plug versions for easy integration
- Mounts in any orientation—provides engineering freedom in tool design
- Diagnostic port on all versions
- Compliance and standards: CE, EN, UL, CSA, RoHS

Applications

- Fore vacuum pressure measurement
- Safety circuits in vacuum systems
- General vacuum measurement and control from low to the high vacuum range

PSG550, PSG552, PSG554 (continued)

Ordering Information

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 in. NPT	F
Surface mount 29 mm / 1.15 in.	K
4 VCR 90° female	M
7/16-20 UNF male	N

Display, switching functions

0	None
1	LCD
2	2 setpoints (solid state)
4	LCD and 2 setpoints (solid state)
6	2 setpoints (mechanical) [6]

Electrical connection

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

Digital interface

0	None [3]
1	DeviceNet [4] [7]
2	Profibus DP [1] [7]
8	EtherCAT [1] [7]
-	RS485 [8]

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

1) Only with D-Sub 9-pin connector available
2) When selecting LCD (liquid crystal display) choose desired pressure unit
3) Choose these settings when using an INFICON VGC40x or PGD400 controller or when choosing “4” under electrical connections
4) Only with D-Sub 9-pin connector and galvanically isolated available
5) Only without additional digital interface available
6) Only with D-Sub 9-pin connector without LCD available
7) Fieldbus options only available together with switching functions (select number “2” or “4” from table “Display, switching functions”)
8) Just selectable via number “4” from table “Electrical connection”

PSG550, PSG552, PSG554 (continued)

Specifications (continued)

Type			PSG550	PSG552	PSG554
Filament			Tungsten	Nickel	Ceramic coated
Measurement range		mbar (Torr)	5×10^{-5} … 1000 (3.8×10^{-5} … 750)		
Accuracy (N_2)	5×10^{-4} … 1×10^{-3} mbar	% of reading	±50		
	1×10^{-3} … 100 mbar	% of reading	±15		
	100 … 1000 mbar	% of reading	±50		
Repeatability (N_2)	1×10^{-3} … 100 mbar	% of reading	±2		
Admissible pressure		bar (absolute)	≤5		
Pressure, max.		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 DP		W	≤3		
Output signal analog					
3PIx-0xx-xxx0		V	0 … +10		
-xxx1		V	0 … +8.5		
-xxx2		V	0 … +5.529		
-xxx3		V	0 … +8.875		
Measuring range					
3PIx-0xx-xxx0		V	+0.61 … +10		
-xxx1		V	+1.2 … +8.5		
-xxx2		V	+0.375 … +5.529		
-xxx3		V	+1.57 … +8.875		
Voltage vs. pressure					
3PIx-0xx-xxx0		V / Decade	1.286		
3PIx-0xx-xxx1 / -xxx2 / -xxx3		V / Decade	1		
Load impedance		kΩ	>10		
Setpoint relay			2		
Range (N_2)		mbar	5×10^{-5} … 1000		
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					
3PIx-0xx-x0xx			FCC, 8-pin		
-x1xx			D-Sub, 9-pin, male		
-x2xx			D-Sub, 15-pin HD, male		
-x4xx			D-Sub, 15-pin HD, with RS485, male		
Cable length		m (ft.)	≤100 (≤330)		
RS232C operation		m (ft.)	≤30 (≤100)		
Materials exposed to vacuum			W, Ni, NiFe, glass, SnAg, stainless steel	Ni, NiFe, glass, SnAg, stainless steel	Al_2O_3, stainless steel

(continued)

PSG550, PSG552, PSG554 (continued)

Specifications (continued)

Type Filament		PSG550 Tungsten	PSG552 Nickel	PSG554 Ceramic coated
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 in. NPT, 7/16-20 UNF	cm^3		5.2	
Surface mount 29 mm (1.15 in.)	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	
Standards		EN 61000-6-2/-6-3, EN 61010, UL 61010-1, CSA 22.2 No. 61010-1		

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		Two 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		
3PI**6**- / 3PI**7**- / 3PI**8**-0xx-xxxx	V / A (dc)	+15 … +30
Power consumption		
3PI**6**- / 3PI**7**- / 3PI**8**-0xx-xxxx	W	≤3
Connector for DeviceNet		Micro-Style, 5-pin, male

Specifications (Profibus DP)

Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		Two 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

PSG550, PSG552, PSG554 (continued)

Specifications (EtherCAT)

		PSG55x EtherCAT
Protocol		EtherCAT
Communication standard		ETG.5003 Part 1 [1)] ETG.5003 Part 2080 [2)]
Node address		Explicit Device Identification
Physical layer		100BASE-Tx (IEEE 802.3)
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
EtherCAT connector		2 x RJ45, 8-pin (socket), input and output
Cable		Special Ethernet Patch Cable or Crossover Cable, shielded (CAT5e quality or higher)
Cable length	m (ft)	≤100 (330)
Process data		Fixed PDO mapping and configurable PDO mapping
Mailbox (CoE)		SDO requests, responses and information

1) Semiconductor Device Profile
2) Specific Device Profile: Vacuum Pressure Gauge

Specifications (RS485C)

Baud rates	kBaud	9.6 / 19.2 / 38.4 /57.6
Address		Two 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		PSG550 Tungsten	PSG552 Nickel	PSG554 Ceramic coated
Replacement sensor	DN 16 ISO-KF	**355-925**	**355-936**	**355-947**
	DN 16 ISO-KF long tube	**355-926**	**355-937**	**355-948**
	DN 16 CF-F	**355-927**	**355-938**	**355-949**
	DN 16 CF-R long tube	**355-928**	**355-939**	**355-950**
	DN 25 ISO-KF	**355-929**	**355-940**	**355-951**
	4 VCR female	**355-932**	**355-943**	**355-954**
	8 VCR female	**355-931**	**355-942**	**355-953**
	1/8 in. NPT	**355-930**	**355-941**	**355-952**
	Surface mount 29 mm (1.15 in.)	**355-934**	**355-945**	**355-956**
	4 VCR 90° female	**355-935**	**355-946**	**355-957**
	7/16-20 UNF male	**355-933**	**355-944**	**355-955**

PSG550, PSG552, PSG554 (continued)

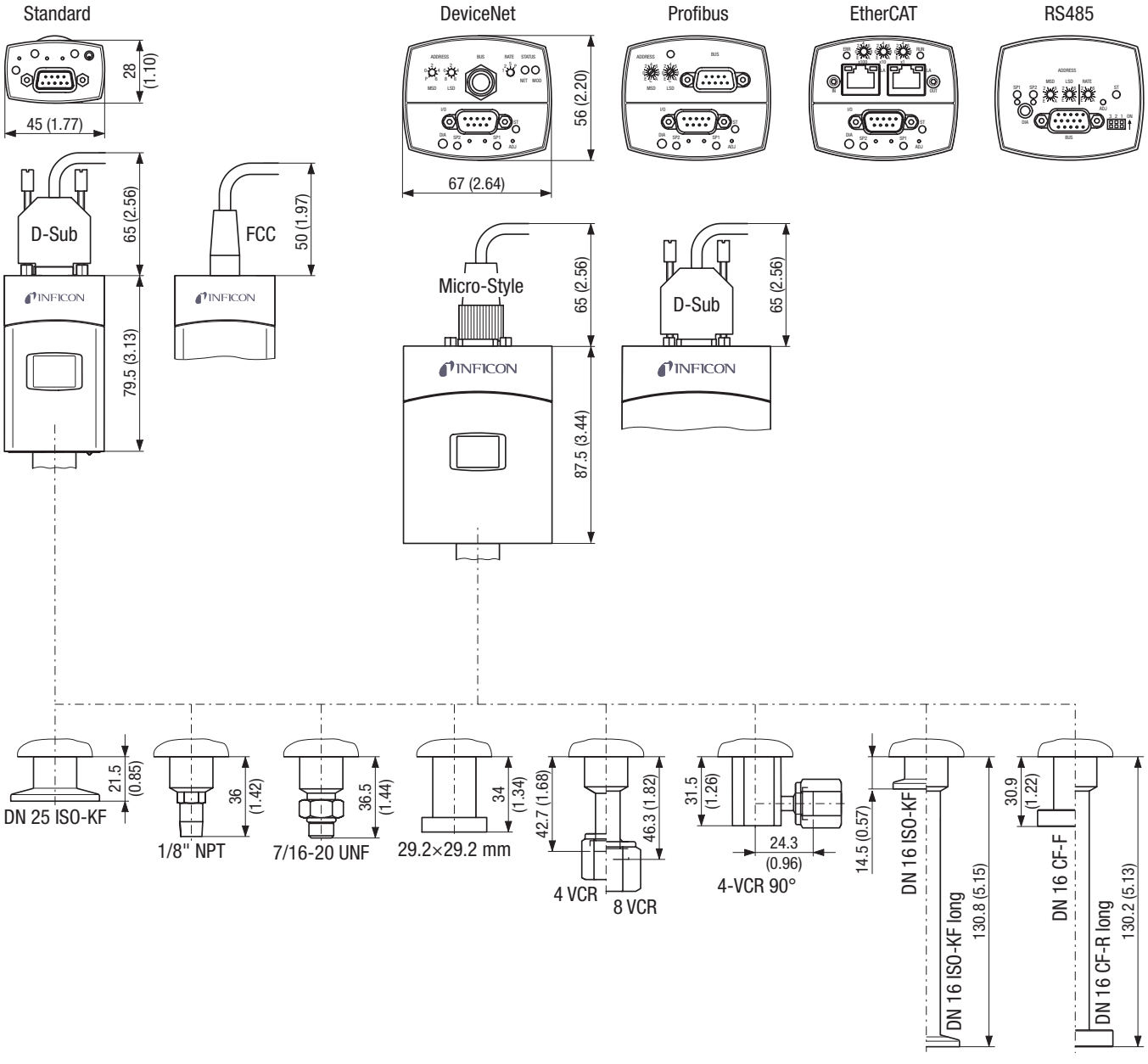
Accessories

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.

Dimensions

mm (in.)



Pirani Capacitance Diaphragm Gauge

PCG550, PCG552, PCG554

The INFICON Pirani Capacitance Diaphragm Gauge (PCG55x) combines the INFICON Pirani technology with the advantages of a ceramic capacitance diaphragm sensor 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 and play sensor element with on-board calibration data—guarantees high reproducibility and low cost of ownership
- Selectable output signal for easy integration
- Optional atmospheric switch, display and digital interfaces e.g. EtherCAT
- Diagnostic port on all versions
- Compliance and standards: CE, EN, UL, CSA, RoHS

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 in. NPT	F
Surface mount 29 mm (1.15 in.)	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] [7]
2	Profibus DP [1] [7]
8	EtherCAT [1] [7]
–	RS485 [8]

Electrical connection

0	FCC, 8-pin [3]
1	D-Sub, 9-pin
2	D-Sub, 15-pin HD
4	D-Sub, 15-pin HD with RS485 [5] [7]

Display, switching functions

0	None
1	LCD display
2	2 setpoints (solid state)
3	ATM and 2 setpoints (solid state)
4	LCD display and 2 setpoints (solid state)
5	ATM and LCD display and 2 setpoints (solid state)
6	2 setpoints (mechanical) [6]
7	ATM and 2 setpoints (mechanical) [6]

[1] Only with D-Sub 9-pin connector available

[2] When selecting LCD (liquid crystal display) choose desired pressure unit

[3] Choose these settings when using the INFICON VGC40x/PGD controllers or if selecting “4” under electrical connections

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

[5] Only without additional digital interface available

[6] Only with D-Sub 9-pin connector without LCD display available

[7] Fieldbus options only available together with switching functions (select number “2”, “3”, “4”, or “5” from table “Display, switching functions”)

[8] Just selectable via number “4” from table “Electrical connection.

PCG550, PCG552, PCG554 (continued)

Specifications

Type Filament			PCG550 Tungsten	PCG552 Nickel	PCG554 Ceramic coated
Measurement range		mbar (Torr)	5 x 10^{-5} … 1500 (3.8 x 10^{-5} … 1125)		
Accuracy	5 x 10^{-4} … 1 x 10^{-3} mbar (N_2)	% of reading	±50		
	1 x 10^{-3} … 100 mbar (N_2)	% of reading	±15		
	100 … 950 mbar	% of reading	±5		
	950 … 1050 mbar	% of reading	±2.5		
Repeatability	1 x 10^{-3} … 1100 mbar (N_2)	% of reading	±2		
Admissible pressure		bar (absolute)	≤5		
Pressure, max.		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 DP		W	≤3		
Output signal analog					
3PCx-0xx-xxx0		V	0 … +10.23		
-xxx1		V	0 … +8.68		
-xxx2		V	0 … +5.659		
-xxx3		V	0 … +9.05		
Measuring range					
3PCx-0xx-xxx0		V	+0.61 … +10.23		
-xxx1		V	+1.2 … +8.68		
-xxx2		V	+0.375 … +5.659		
-xxx3		V	+1.57 … +9.05		
Voltage vs. pressure					
3PCx-0xx-xxx0		V / Decade	1.286		
3PCx-0xx-xxx1 / -xxx2 / -xxx3		V / Decade	1		
Load impedance		kΩ	>10		
Setpoint relay			2		
Range (N_2)		mbar	5 x 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-x0xx			FCC, 8-pin		
-x1xx			D-Sub, 9-pin, male		
-x2xx			D-Sub, 15-pin HD, male		
-x4xx			D-Sub, 15-pin HD with RS485, 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, Al_2O_3, SnAg, stainless steel, glass	Ni, NiFe, Al_2O_3, SnAg, stainless steel, glass	Al_2O_3, 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 in. NPT, 7/16-20 UNF	cm^3		5.2	
Surface mount 29 mm (1.15 in.)	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	
Standards			EN 61000-6-2/-6-3, EN 61010, UL 61010-1, CSA 22.2 No. 61010-1	

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		Two 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**6**- / 3PC**7**- / 3PC**8**-0xx-xxxx	V / A (dc)	+15 … +30
Power consumption		
3PC**6**- / 3PC**7**- / 3PC**8**-0xx-xxxx	W	≤3
Connector for DeviceNet		Micro-Style, 5-pin, male

Specifications (Profibus DP)

Baud rates	kBaud	9.6 / 19.2 / 93.75 / 187.5 / 500
	MBaud	1.5 / 12
Address		Two 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 (EtherCAT)

		PCG55x EtherCAT
Protocol		EtherCAT
Communication standard		ETG.5003 Part 1 [1)] ETG.5003 Part 2080 [2)]
Node address		Explicit Device Identification
Physical layer		100BASE-Tx (IEEE 802.3)
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
EtherCAT connector		2 × RJ45, 8-pin (socket), input and output
Cable		special Ethernet Patch Cable or Crossover Cable, shielded (CAT5e quality or higher)
Cable length	m (ft)	≤100 (330)
Process data		fixed PDO mapping and configurable PDO mapping
Mailbox (CoE)		SDO requests, responses and information

1) Semiconductor Device Profile
2) Specific Device Profile: Vacuum Pressure Gauge

Specifications (RS485C)

Baud rates	kBaud	9.6 / 19.2 / 38.4 / 57.6
Address		Two 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 in. NPT	**357-930**	**357-941**	**357-952**
	Surface mount 29 mm (1.15 in.)	**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

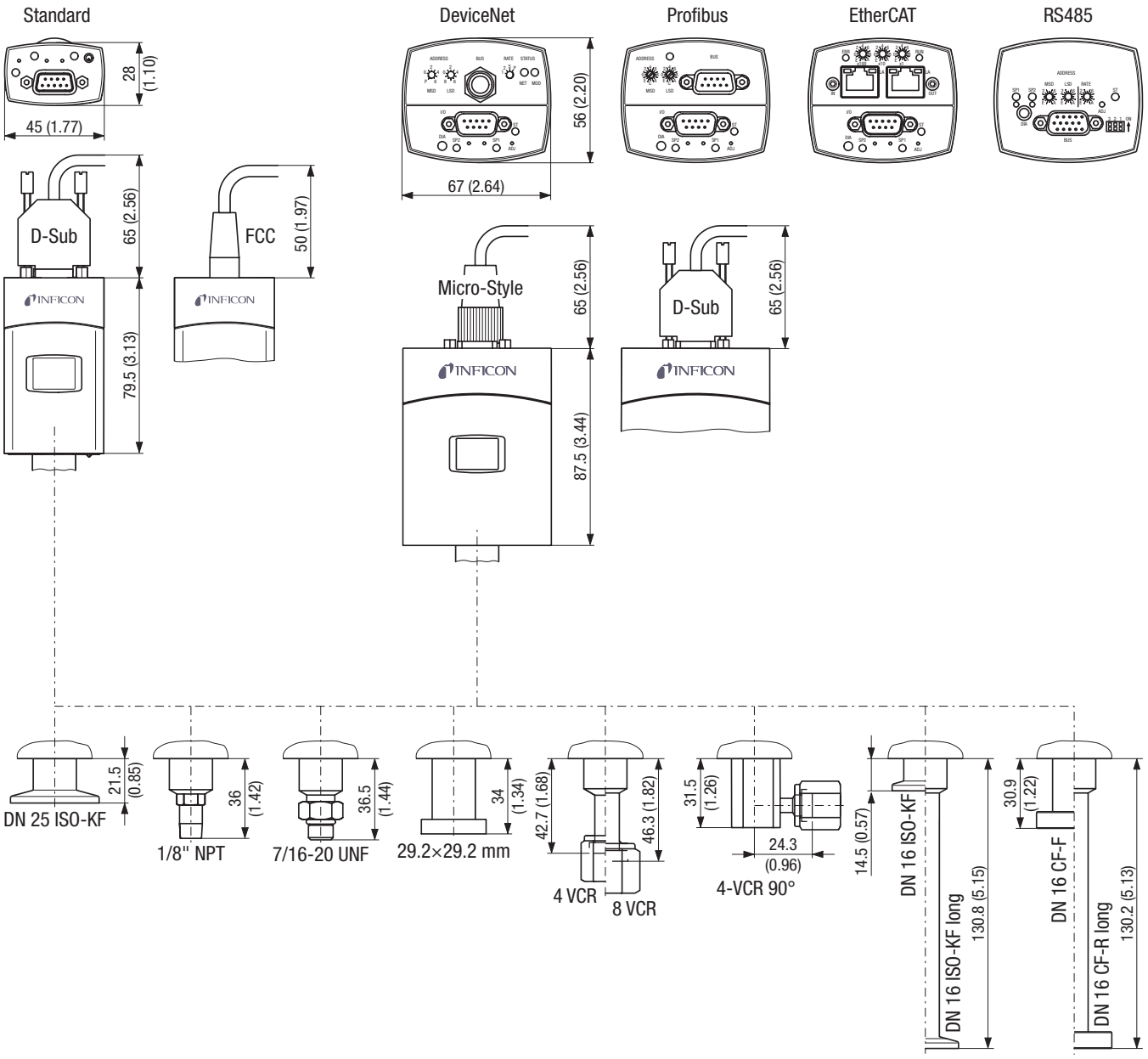
Centering ring with filter (DN 16 ISO-KF)	**211-097**
Diagnostic:[1)] Communication adapter (2 m) for PC RS232C serial port	**303-333**

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

mm (in.)



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 1 x 10^{-9} mbar to 1 x 10^{-2} mbar (7.5 x 10^{-10} Torr 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-F	**351-002**	**351-004**	—
Replacement cathode plates, titanium Set of five 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 ($in.^3$)	21 (1.28)
Weight, approx.	g	500
Protection type		IP40

Specifications (DeviceNet)

		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 (Profibus DP)

		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

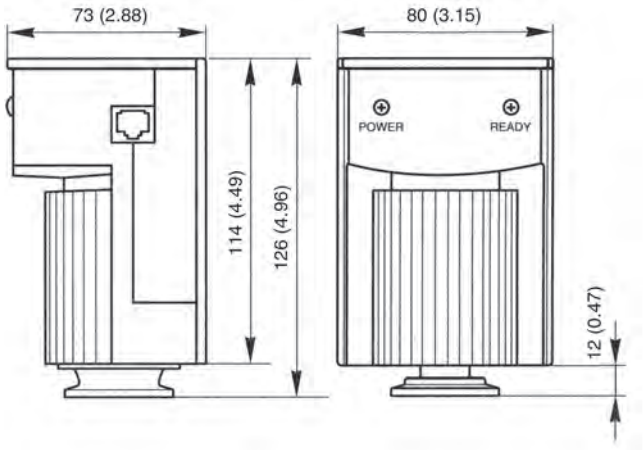
PEG100 (continued)

Spareparts

Type	PEG100
Spare Cathode Plate, set of 5 pcs	351-490

Dimensions

mm (in.)



Inverted Magnetron
Inverted Magnetron Pirani Gauge

Gemini MAG/MPG500, MAG/MPG504

The INFICON Gemini sensor MAG500 is just a purely cold cathode gauge while his twin MPG500 combines two sensor systems (cold cathode and Pirani) in the same housing. The MPG500 measures from atmosphere to 1 x 10^{-9} mbar. The patented ultra-low magnetic stray field design in both gauges gives opportunities in existing and new applications. A unique interchangeable dual chamber sensor unit reduces maintanance cycles and time. This is making Gemini the most robust and economical vacuum sensor of its kind.

Gemini Cold Cathode and combination sensor's comes with fully integrated digital electronics, providing ultimate flexibility for system integration.
Both cold cathode and Pirani combination sensor option provide seamless transition, reliability, poractivity and flexibility across wide ranging applications.

Advantages

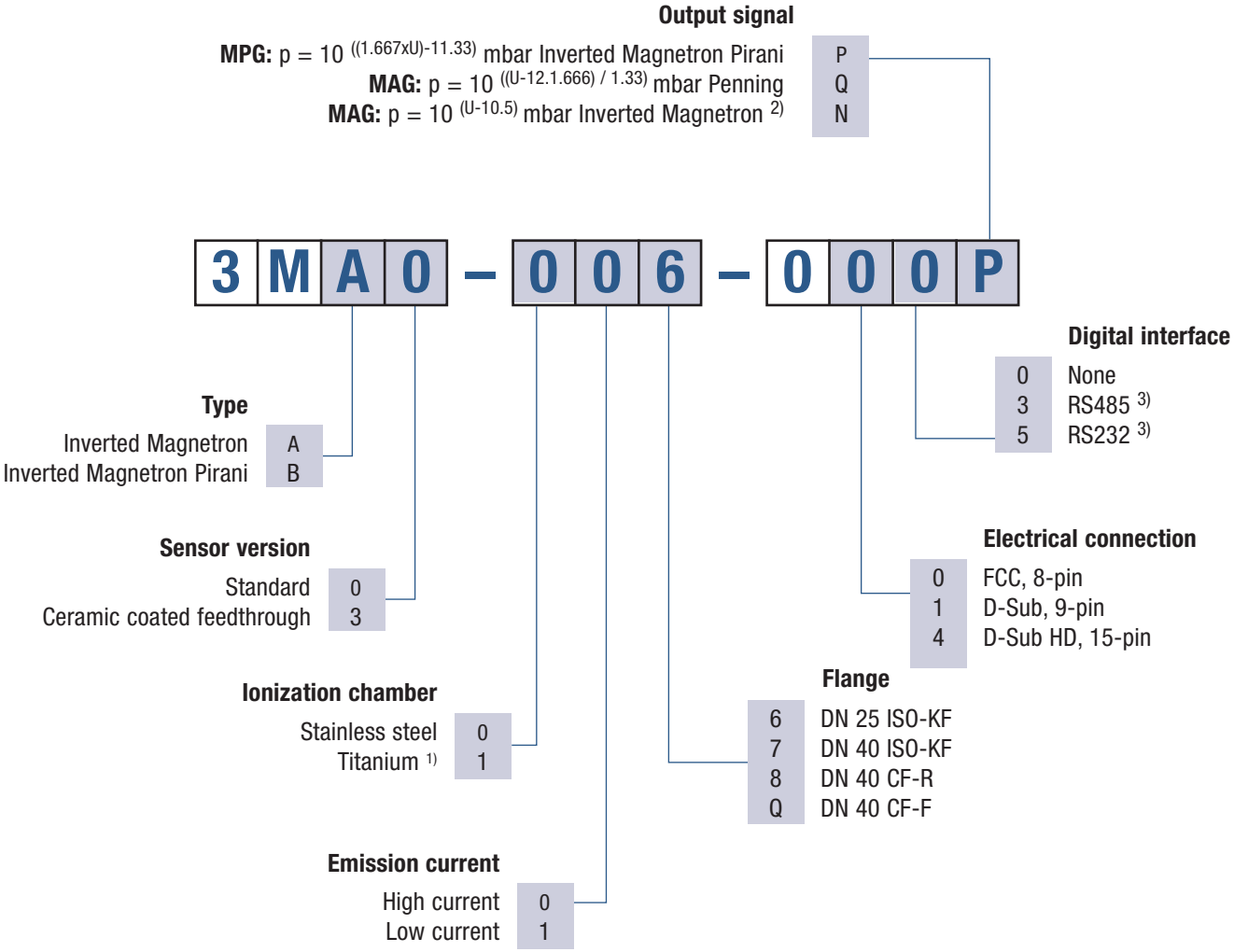
- Long lifetime in harsh environments
- Reliable fast ignition
- Low magnetic stray field
- Selectable measuring current
- Fast maintenance - replaceable insert
- Corrosion proof feedthrough
- Digital interface RS 232/485

Applications

- Base pressure monitoring and control, from atmosphere to high vacuum in evaporation and sputter coating applications.
- General vacuum measurement – industrial furnaces, architectural glass, semiconductor, production labratory's..
- Analytical and R&D applications – mass spectrometry, electron microscopes, ophthalmic, optical, medical and high energy physics.

Gemini MAG/MPG500, MAG/MPG504 (continued)

Ordering Information



1) For low current version only.

2) Not suited for operation with an INFICON vacuum gauge controller VGC40x or VGC50x.

3) Digital interfaces only available with D-Sub HD, 15-pin connection (select number “4” from table “Electrical connection”) to select 3 & 5 from "Digital interfaces"

Gemini MAG/MPG500, MAG/MPG504 (continued)

Specifications

Type		MAG50x	MPG50x
Measurement system		Cold Cathode ionization measurement system (according to the inverted magnetron principle)	Pirani and Cold Cathode ionization measurement system (according to the inverted magnetron principle)
Measurement range (air, N2)			
mbar		1×10^{-9} … 1×10^{-2}	1×10^{-9} … 1000
Torr		7.6×10^{-10} … 7.6×10^{-3}	7.6×10^{-10} … 760
Accuracy (N2)			
1×10^{-8} … 1×10^{-2} mbar	% of reading	30	–
1×10^{-8} … 100 mbar	% of reading	–	30
100 … 1000 mbar	% of reading	–	50
Repeatability (N2)			
1×10^{-8} … 1×10^{-2} mbar	% of reading	5	–
1×10^{-8} … 100 mbar	% of reading	–	5
Mounting orientation		any	
Admissible pressure	bar (absolute)	10 (limited to inert gases <55°C)	
Admissible temperature			
Operation (ambient)	°C	+5 … +55	
Bakeout at flange [1]	°C	≤150	
Storage	°C	–40 … +70	
Filament temperature	°C	–	120
Relative humidity for 30 days a year			
1×10^{-7} 1×10^{-2} mbar	% RH	≤95 (non-condensing)	
1×10^{-8} 1×10^{-2} mbar	% RH	≤70 (non-condensing)	
Supply voltage			
At gauge [2]	V (dc)	+14.5 … +30	
Ripple	V_{pp}	≤1	
Power consumption	W	≤2	
Fuse to be connected	AT	≤1	
Voltage range (analog output)	V	0 … +10.5	
Measurement range			
3MAx-0xx-0x0N	V	+1.5 … +8.5	–
3MBx-0xx-0x0Q	V	+0.667 … +10	–
3MAx-0xx-0x0P	V	–	+1.398 … +8.598
Voltage vs. pressure			
3MAx-0xx-0x0N	V/decade	1 (logarithmic)	–
3MBx-0xx-0x0Q	V/decade	1.33 (logarithmic)	–
3MAx-0xx-0x0P	V/decade	–	0.6 (logarithmic)
Error signal			
3MAx-0xx-0x0N	V	<+0.5	–
3MBx-0xx-0x0Q	V	≤+0.3	–
3MAx-0xx-0x0P	V	–	+9.5 … +10.5
Output impedance	Ω	2 x 4.7 (short circuit-proof)	
Load impedance	kΩ	≥10 (short circuit-proof)	
Step response time			
$p > 10^{-6}$ mbar	ms	<100	
$p = 10^{-8}$ mbar	s	≈1	

Gemini MAG/MPG500, MAG/MPG504 (continued)

Specifications

Type		MAG50x	MPG50x
Gauge identification			
3MAx-0xx-0x0N	kΩ	–	–
3MBx-0xx-0x0Q	kΩ	100	–
3MAx-0xx-0x0P	kΩ	–	85
Status signal	V	+14.5 … +30 (cold cathode ignited)	
Status (pin 6)			
Cold cathode ignited	V	+15 … +30	–
Pirani-only mode	V	–	0 (low)
Combined Pirani / Cold Cathode	V	–	+15 … +30 (high)
Electrical connection			
3Mxx-0xx-000x		FCC68, 8-pin, female	
3Mxx-0xx-010x		D-Sub, 9-pin, male	
3Mxx-0xx-040x		D-Sub, 15-pin HD, male	
Sensor cable			
3Mxx-0xx-000x		8-pin, shielded	
3Mxx-0xx-010x		9-pin, shielded	
3Mxx-0xx-040x		15-pin, shielded	
Cable length (FCC only)	m	≤50 (0.14 mm^2/conductor)	
High voltage (in the measuring chamber)			
Ignition voltage	kV	≤4.5	
Operating voltage	kV	≤3.3	
Current (in the measuring chamber)			
High current	µA	≤500	
Low current	µA	≤100	
Materials exposed to vacuum			
3Mx0-0xx-0x0x		Ni alloys, Mo, Al_2O_3, glass, stainless steels	W, Ni alloy, Mo, Al_2O_3, glass, stainless steels
3Mx3-0xx-0x0x		Mo, Al_2O_3, stainless steels	W, Mo, Al_2O_3, stainless steels
Internal volume			
DN 25 ISO-KF	cm^3	≈19.9	
DN 40 ISO-KF	cm^3	≈20.9	
DN 40 CF-F	cm^3	≈25.2	
DN 40 CF-R	cm^3	≈25.6	
Weight			
DN 25 ISO-KF	g	<280	
DN 40 ISO-KF	g	<320	
DN 40 CF-F & CF-R	g	<570	
Degree of protection		IP40	-
Standards			
CE conformity		EMC (EN 61000-6-2, EN61000-6-3), EN 61010-1 & RoHS	

1) Without electronics
2) The minimum voltage of the supply unit must be increased proportionally to the length of the sensor cable

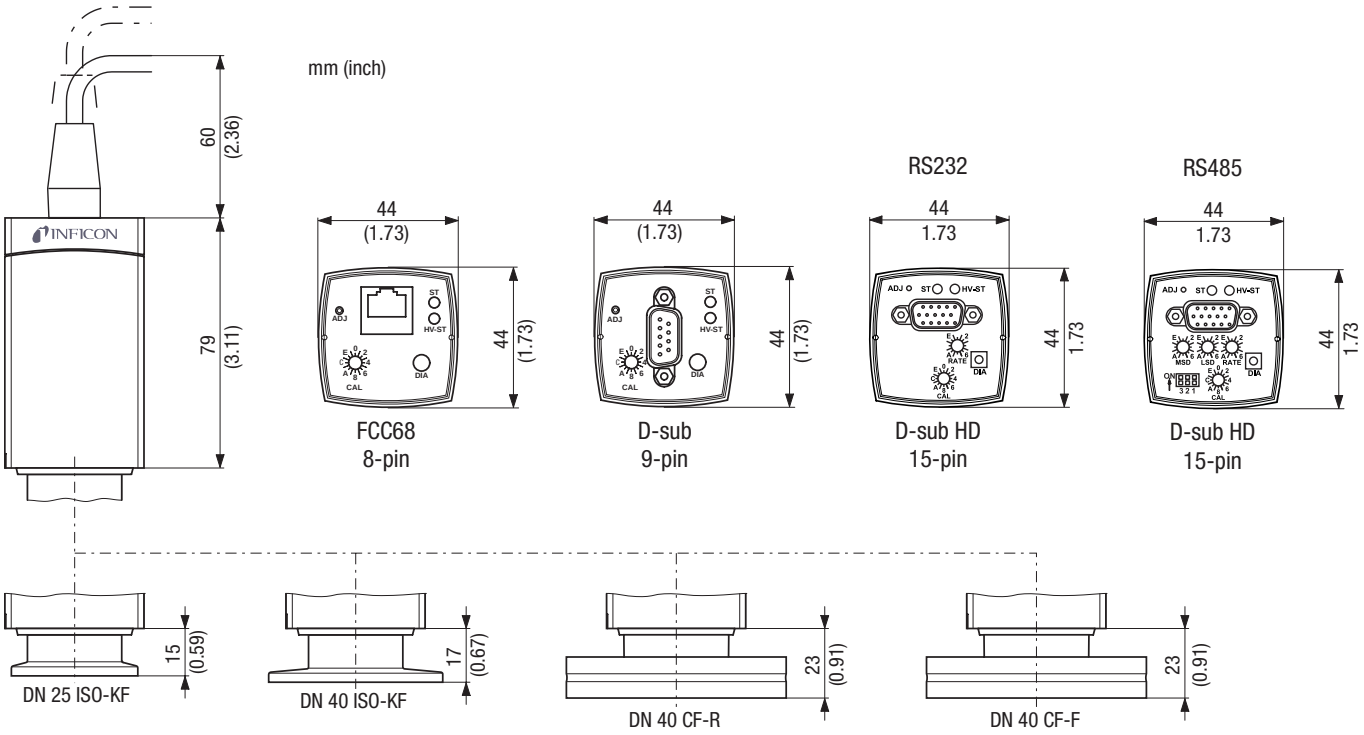
Gemini MAG/MPG500, MAG/MPG504 (continued)

Specifications

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, saft state alllows definition of behaviour in case of error
Connector for RS485		D-Sub, 15-pin HD, male

Dimensions

mm (in.)



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 and 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

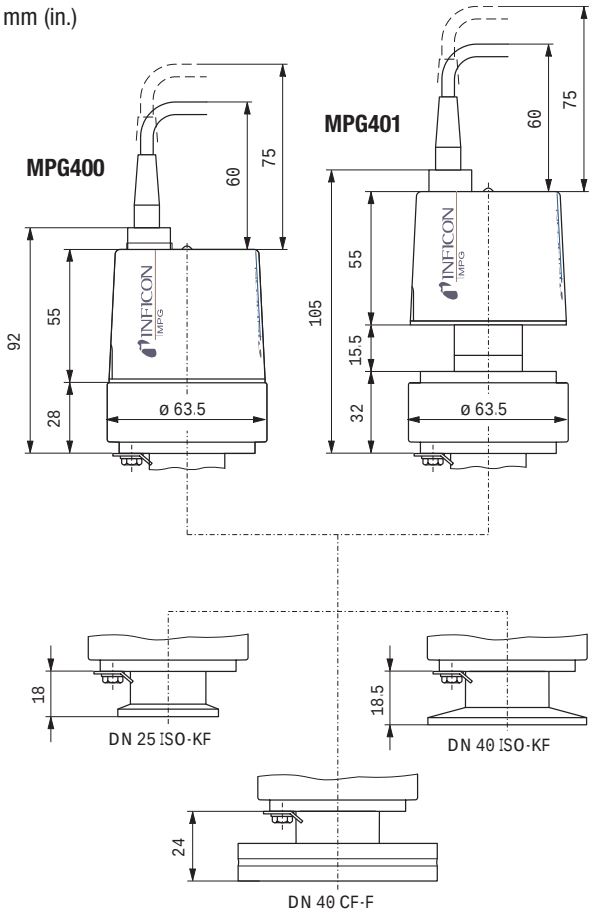
			MPG400 FPM sealed	MPG401 Metal-sealed
Measurement range (air, N_2)		mbar (Torr)	5×10^{-9} … 1000 (3.8×10^{-9} … 760)	
Accuracy (N_2)	1 x 10^{-8} … 100 mbar	% of reading	≈±30%	
Repeatability	1 x 10^{-8} … 100 mbar	% of reading	≈±5%	
Mounting orientation			any	
Admissible pressure		bar (absolute)	≤10 (limited 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

mm (in.)



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 Controller

VGC50x

Sustainable solution for process measurement, control and data log

Compatible to the wide range of INFICON acive gauges, the new VGC50x series of active gauge controllers are able to monitor and data log the entire pressure range from 10^{-10} to 1500 mbar (10^{-10} to 1125 Torr) and the set point status.

Advantages

- Simple operation with dot matrix menu guided display for parameter, sensor or general settings
- Very bright and clear Display for long distance Instrument read-out
- Bar graph display with setpoints's or pressure vs. time display
- Data log and parameter log function with USB port (rear side) and USB stick (front side)
- Ethernet interface
- Firmware upgrade available online or with USB stick
- Two free definable setpoints per channel with adjustable hysteresis
- High Resolution - 16 bit A/D converter
- Automatic identification of the INFICON active gauges
- Programmable 0 to 10 V Chart Recorder Output with logarithmic/linear characteristics for single gauge or gauge combination (only VGC502 and VGC503)

Ordering Information

Type	VGC501	VGC502	VGC503
Vacuum Gauge Controller	**398-481**	**398-482**	**398-483**
Adapter rack mount 2HE / 3HE	**398-499**	-	-
Adapter USB to RS232	**398-487**	**398-487**	**398-487**

VGC50x (continued)

Accessories

Gauges	PCG, PEG, PSG, MAG, MPG, Porter	BCG, BPG, HPG, CDG-D	CDG (unheated)
Signal read out and communication	analog only	digital RS232 / analog	analog only
Cable connectors	FCC / FCC	D-Sub[1] / D-Sub[1]	FCC / D-Sub[1]
Cable to VGC50x in m (ft)			
3 (9.0)	**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

[1] D-Sub 15-pin

Specifications

Type		VGC501	VGC502	VGC503
Measurement channels		1	2	3
Display		LCD, LED backlight		
Rate	1/s	10		
Connectable gauges with display range				
CDG (A/D)	Torr	1×10^{-3} x F.S … 1 x F.S		
PCG	Torr	3.75×10^{-4} … 1125		
PSG	Torr	3.75×10^{-4} … 750		
MPG	Torr	3.75×10^{-9} … 750		
PEG	Torr	7.5×10^{-10} … 7.5×10^{-3}		
MAG	Torr	7.5×10^{-10} … 7.5×10^{-3}		
BCG	Torr	3.75×10^{-10} … 1125		
BPG	Torr	3.75×10^{-10} … 750		
HPG	Torr	1.5×10^{-6} … 750		
Connectable gauges with display range				
PCG	mbar	5×10^{-4} … 1500		
PSG	mbar	5×10^{-4} … 1000		
MPG	mbar	1×10^{-9} … 1000		
PEG	mbar	1×10^{-9} … 1×10^{-2}		
MAG	mbar	1×10^{-9} … 1×10^{-2}		
BCG	mbar	5×10^{-10} … 1500		
BPG	mbar	5×10^{-10} … 1000		
HPG	mbar	2×10^{-6} … 1000		
Measurement unit (selectable)		mbar, Torr, Pa, hPa, Micron, V		
Setpoints				
Setpoint relays		2	4	6
Channel assignment		1	1 or 2	1, 2 or 3

VGC50x (continued)

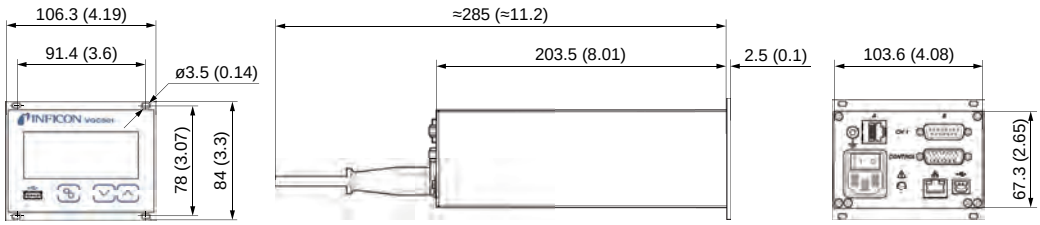
Specifications

Type		VGC501	VGC502	VGC503
Setpoints				
Adjustment range			sensor dependent	
Hysteresis			adjustable	
Relay contact			floating changeover contact	
Connector		D-Sub, 15-pin, male	D-Sub, 25-pin, male	D-Sub, 25-pin, male
Contact rating	V (ac) · A		30 / 1	
	V (dc) · A		60 / 0.5	
Analog output				
Range	V		0 … 10.3, sensor analog output signal	
Analog output		1	2	3
programmable analog output		-	1	1
Connector		D-Sub, 15-pin, male	D-Sub, 9-pin, male	D-Sub, 9-pin, male
Interface				
Connector		USB slave, master and Ethernet, USB Typ A (stick), USB Type B, FCC68/RJ45		
Power				
Supply	V (ac)		100 … 240	
Frequency	Hz		50 … 60	
Consumption	W	≤45	≤65	≤90
Operating temperature (ambiance)	°C		+5 … +50	

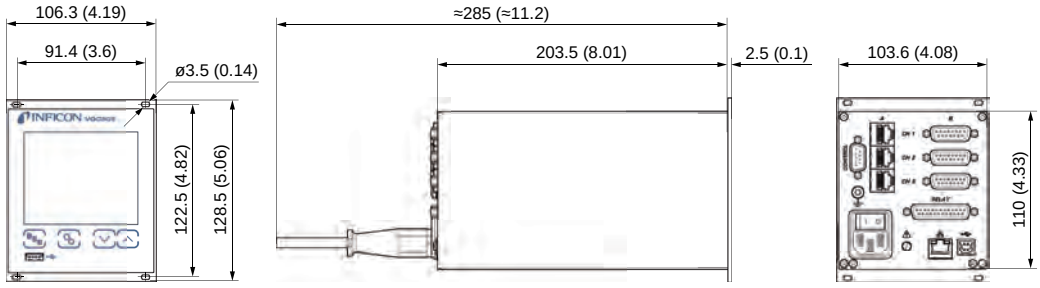
Dimensions

mm (in.)

VGC501



VGC502
VGC503



Pirani Gauge Display

PGD500

The INFICON Pirani Gauge Display PGD500 in combination with the INFICON Pirani Standard Gauge PSG5xx provides a cost effective pressure monitoring solution.

Although it is called Pirani Gauge Display the PGD500 also supports our PCG55x and MPG series vacuum gauges.

Advantages

- User selectable measurement unit (Pa, mbar or Torr)
- Compact bench top model design can be easily mounted in a panel or 19 in. 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
- User selectable aguge PSG, PCG and MPG

Applications

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

Ordering Information

Type	PGD500
Pirani Gauge Display	**398-802**

Accessories

Sensor cable [1]	1.3 m (4.27 ft.)	**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

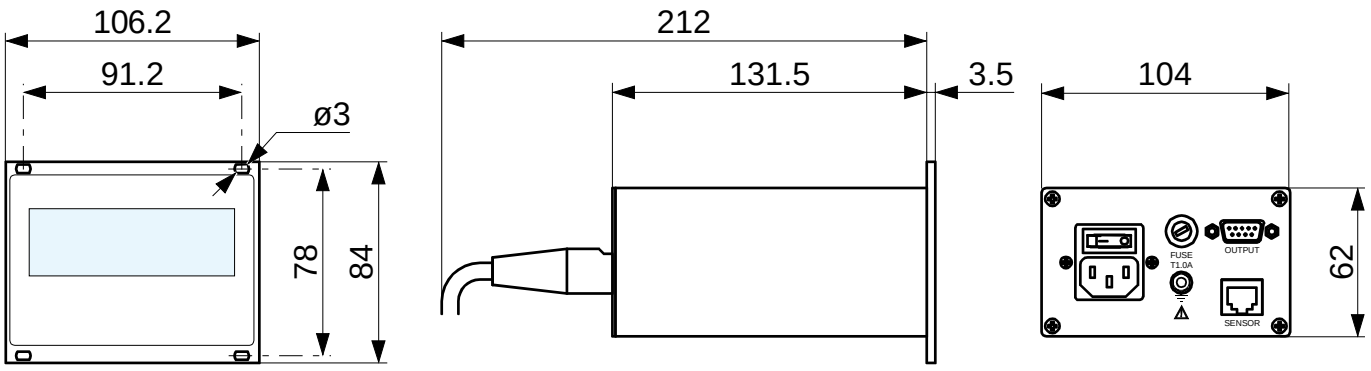
PGD500 (continued)

Specifications

Measurement channels (sensors to connect)		1 (PSG5xx, PCG5xx or MPG series)
Display		LED
Range	Pa	5×10^{-2} … 1×10^{5}
	mbar	5×10^{-4} … 1000
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

mm (in.)



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	VSA100A
DN 16 ISO-KF, complete with 3 m (9.9 ft.) cable	**399-001**

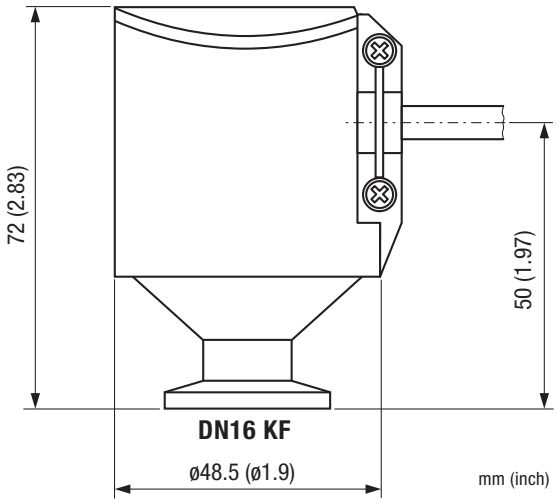
VSA100A – continued

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.	V (dc) / V (ac)	24/24
Current max.	mA	30 (24 V (dc)) / 100 (24 V (ac))
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 ($in.^3$)	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 x 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

3SA1-F51-9700

FS Unit

1000	Torr	F	5
1100	mbar	G	6

Flange

DN 16 ISO-KF	1
4 VCR male	C
4 VCR female	D

Setpoint value

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
C [1]		

[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

3SD1-M51-B200

Unit

Torr	5
mbar	6

Flange

DN 16 ISO-KF	1
4 VCR male	C
4 VCR female	D

Setpoint value

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

Sign

A	+ (plus)
B	– (minus)

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

VSA200, VSD200 – continued

Specifications

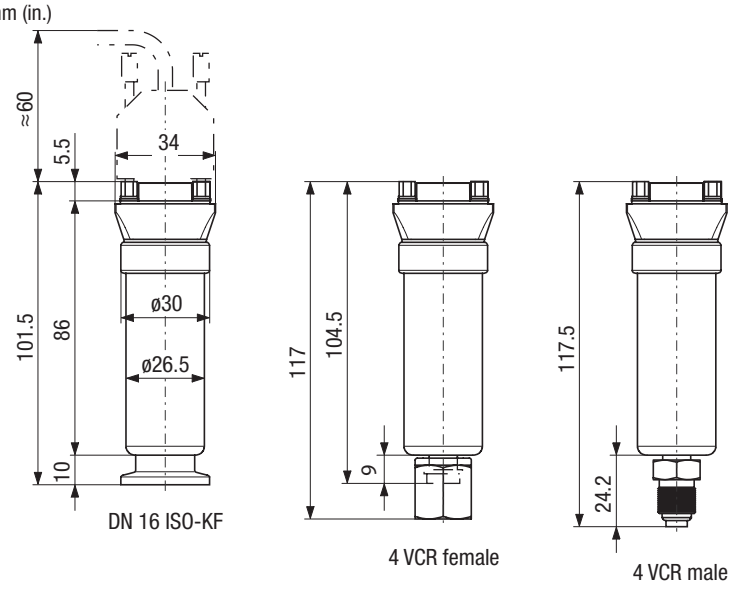
		VSA200		VSD200	
Full Scale (F.S.)	mbar (absolute)	–	1100	–	–
	Torr (absolute)	1000	–	–	–
Differential range [1]	mbar	–	–	–	–100 … +50
	Torr	–	–	–100 … +50	–
Setpoint range	mbar		30 … 1060		–99 … +46
	Torr	20 … 970	–	–99 … +46	–
Admissible pressure	bar (absolute)	5		2	
Setpoint relay					
Relay output		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 ($in.^3$)	2.81 (0.17)			
4 VCR	cm^3 ($in.^3$)	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

mm (in.)



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 INFICON Vacuum Switch VSC150 is an absolute pressure switch with an adjustable electrical switching contact from 0.5 to 2000 mbar. the mechanical design allows short therm overload of 3000 mbar without impairing the switching accuracy of ±0.1 mbar. INFICON offers customer specific adjustment of pressure switch.

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	VSC150A
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

		VSC150A 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.

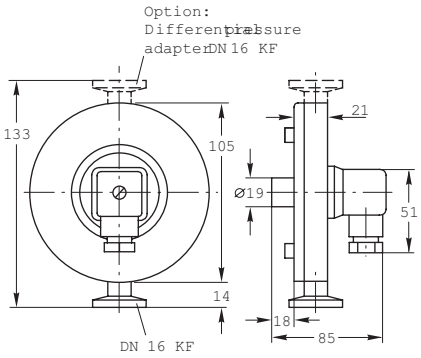
Specifications

		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

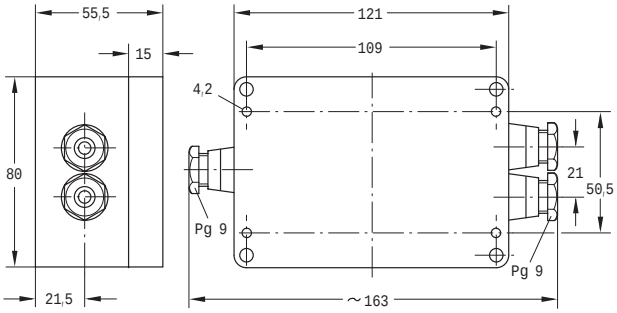
Dimensions

VSC150A Vacuum Switch



mm

SV Switching Amplifier



mm

Pirani Gauge Enhanced – Passive

PGE050

The INFICON Pirani Gauge Enhanced 050 (PGE050) is the passive version of our active convection enhanced Pirani gauges PGE300 and PGE500. Equipped with the same sensor technology, the PEG050 works in conjunction with our VGC031 passive gauge controller unit to produce the same higher accuracy readings in the measurement range between 100 to 1000 mbar.
With its wider measuring range and higher accuracy, especially at lower pressures, the PGE050 is the first choice when replacing thermocouple gauges in your vacuum system. The rugged gauge and sensor design makes the PGE050 a high value/low cost of ownership choice and qualifies this gauge for many applications where an economical vacuum measurement form low to high vacuum range is required.

Advantages

- Convection Enhanced Pirani Technology for wide measurement range and higher accuracy near atmosphere
- Gold plated tungsten filament
- Mechanical strengh, highly robust and less susceptible to mechanical shock and vibration
- Choice of flange options
- Compliance & standards: CE, RoHS
- Direkt drop in replaces Granville-Phillips® Convectron® gauge sensor (same plug/ pinouts)
- PGE050 accepts Granville-Phillips® Convectron® controllers, cables and modules
- Ideal gauge sensor for upgrading your installed thermocouple gauges

Applications

- Fore vacuum pressure measurement
- General vacuum measurement and control from low to the high vacuum range

Ordering Information

Type	MPG400 Tungsten gold-plated
DN 16 ISO-KF	**352-500**
DN 25 ISO-KF	**352-501**
DN 40 ISO-KF	**352-502**
DN 16 CF-R	**352-503**
DN 40 CF-R	**352-504**
4 VCR female	**352-505**
8 VCR female	**352-506**
1/8" NPT	**352-507**

PEG050 (continued)

Specifications

Type		PEG050
Filament		**Tungsten gold-plated**
Measurement range	mbar	1.3×10^{-4} … 1333
	Torr	1×10^{-4} … 1000
	Pa	1.3×10^{-2} … 133000
Accuracy (N_2) [1]		
1.3×10^{-4} … 1.3×10^{-3} mbar		0.1×10^{-3} mbar resolution
1.3×10^{-3} … 530 mbar	% of reading	±10
530 … 1333 mbar	% of reading	±2.5
1×10^{-4} … 1×10^{-3} Torr		0.1 mTorr resolution
1×10^{-3} … 400 Torr	% of reading	±10
400 … 1000 Torr	% of reading	±2.5
Repeatability (N_2) [1]	% of reading	±2
Temperature		
Operation (ambient)	°C	0 … +50
Bakeout [2]	°C	≤150
Materials exposed to vacuum		gold-plated tungsten, 304 & 316 stainless steel, glass, nickel, Teflon®
Internal volume	cm^3 ($in.^3$)	26 (1.589)
Internal surface area	cm^2 ($in.^2$)	59.7 (9.25)
Weight	g (oz)	85 (3)

[1] typically
[2] non-operating, with electronics cable detached

Dimensions

mm (in.)

Dimension A	mm	(in)
DN 16 ISO-KF	33	(1.3)
DN 25 ISO-KF	33	(1.3)
DN 40 ISO-KF	33	(1.3)
DN 16 CF-R	27.4	(1.08)
DN 40 CF-R	37.3	(1.47)
4 VCR female	47.2	(1.86)
8 VCR female	44.5	(1.75)
1/8" NPT male	25.4	(1)

Vacuum Gauge Controller

VGC031

The INFICON Vacuum Gauge Controller 031 (VGC031) is designed for use in conjunction with the INFICON Pirani Gauge Enhanced 050 (PGE050) and acts as a convenient power supply, control and readout. VGC031 and PGE050 are a felxible combination to monitor your vacuum system in the range from 1.3 x 10^{-4} up to 1333 mbar (1 x 10^{-4} up to 1000 Torr). The VGC031 with its space saving panel mount housing supports a variety of technical features as 2 set point relays, 4 user selectable analog outputs and offers additionally RS232 / RS485 digital interfaces. The bright, sharp and clear OLED display with the integrated keypad user interface rounds out this user friendly vacuum gauge controller package. The rugged industrial design makes the VGC031 in combination with the convection enhanced PGE050 gauge sensor a very good choice for many vacuum applications were economical vacuum measurement from low to high vacuum range is required.

Advantages

- Display's and controls wide measurement range from 1.3 x 10^{-4} up to 1333 mbar (1 x 10^{-4} up to 1000 Torr).
- Bright digital OLED display with keypad for simple set up and operation
- 4 user selectable analog output signals
- 2 set point relays
- RS232 / RS485 digital interface
- Space saving design - 1/8-Din panel mount housing for rack mount installation or as standalone unit
- Powered through user supplied 12 to 28 V (dc) or by INFICON's VGC031 Power SUpply
- Compliance & standards: CE, RoHS
- VGC031 controller and PGE050 convection enhanced vacuum gauge sensor and cable can direct drop in replace Granville-Phillips® 375 and 475 controllers and 275 Convectron® gauge sensors and gauge cable (Remote interface, relay and power connectors are different)

Applications

- Fore vacuum pressure measurement
- General vacuum measurement and control from low to the high vacuum range

Ordering Information

Type	VGC031
	399-570

VGC031 – continued

Accessories

Gauges	PGE050 (see PEG050)
Power supply for VGC031 [1]	**399-575**
Cable VGC031 to PGE050 in m (ft) [2]	
3 (10)	**399-580**
8 (25)	**399-581**
15 (50)	**399-582**
Mating connector kit for PGE050	**399-591**

[1] The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide
[2] Other length on request

Specifications

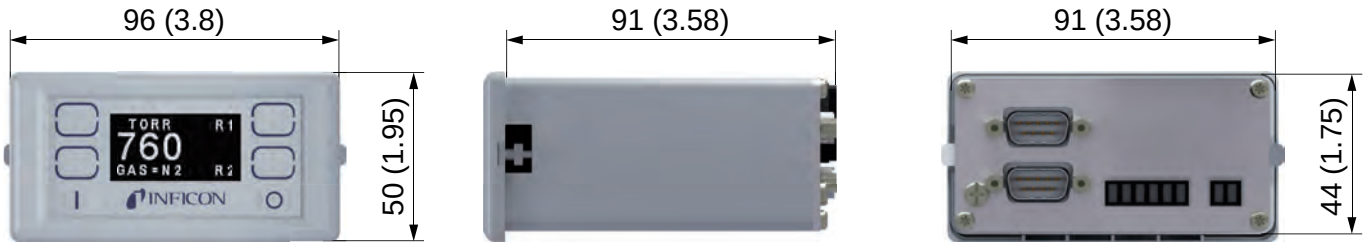
Type		VGC031
Measurement channels		1
Display		OLED
Display update rate	1/s	0.5s
Connectable gauge with display range		
PGE050 (see PGE050)	mbar	1.3×10^{-4} … 1333
	Torr	1×10^{-4} … 1000
	Pa	1.3×10^{-2} … 133000
Connector	gauge	9-pin D-Sub female [1]
	analog output, serial interface	9-pin D-Sub male
	relay outputs	6-pin pluggable terminal block [2]
	power	2-pin pluggable terminal block [2]
Measurement unit (selectable)		mbar, Torr, Pa
Setpoint relay		2 (single-pole double-throw relays (SPDT)) 1 A at 30 V (dc) resistive, or V (ac) non-inductive
Analog output		
Range (selectable)	V (dc)	0 … 7 or 1 … 8 (log-linear, 1 V/decade)
	V (dc)	0 … 10 (linear)
	V (dc)	0.375 … 5.659 (non-linear S-curve)
	V (dc)	0 … 9 (non-linear S-curve)
Interface (digital)		RS232, RS485
Supply voltage	V (dc)	+12 … +28 [3]
Temperature		
Operation (ambient)	°C	0 … 40
Storage	°C	–40 … +70
Housing		1/8-DIN panel-mount enclosure (aluminum extrusion)
Weight	g (oz)	250 (9)

[1] mating connector provided as part of the gauge cable
[2] mating connector included
[3] 2 W protected against power reversal and transient over-voltages

VGC031 – continued

Dimensions

mm (in.)



Accessories

Power supply for VGC031 [1]	**352-575**

Input power:	V (ac)	100 … 240
Output power:	V (dc)	+24
Cable length:	m (ft)	2 (6)

[1] The IEC 60320 AC power entry receptacle allows use with any user supplied AC mains cord set available worldwide

Bayard Alpert Vacuum Gauge Heads – Passive

BAG050, BAG051, BAG052, BAG053

The INFICON Bayard-Alpert passive vacuum gauge heads BAG050, BAG051, BAG052 and BAG053 are designed for use with the INFICON Vacuum Gauge Controller VGC083A & VGC083B. Yttria coated iridium filaments are offered for general vacuum applications in air and inert gases such as N_2 and argon. Select tungsten filaments for gases that are not compatible with yttria coated iridium filaments. BAG05x gauges may also be operated with compatible vacuum gauge controllers from other manufacturers. The INFICON passive Bayard-Alpert ionization vacuum gauges (BAG05x) are offered in three different configurations:
BAG050 is a EB-degas UHV nude ionization vacuum gauge capable of pressure measurement as low as 2×10^{-11} Torr
BAG051 is a resistive degas (I^2R) nude ionization vacuum gauge capable of pressure measurement as low as 4×10^{-10} Torr
BAG052 and BAG053 are resistive degas (I^2R) glass enclosed ionization vacuum gauges capable of pressure measurement as low as 4×10^{-10} Torr.

Advantages

- Reliable and proven gauge head design
- Drop in for most nude hot ion guage heads
- Wide range of emission currents (100 µA to 10 mA)
- Available with single / dual yttria coated iridium and dual tungsten filament cathode assemblies
- Degas: All models can be degased using EB (electron bombardment).
  BAG051, BAG052 and BAG053 can also be degased using resistive degas (I^2R)

Applications

- UHV and research
- Industrial coating
- General vacuum measurement and control in the low to ultra high vacuum range

BAG050, BAG051, BAG052, BAG053 (continued)

Ordering Information BAG050 HOT ION GAUGE

Type	BAG050
BA nude EB-degas, DN40CF, **dual iridium** filament (Ir)	**399-720**
BA nude EB-degas, DN40CF, **dual tungsten** filament (W)	**399-721**
Spare **dual iridium** filament (Ir)	**399-730**
Spare **dual tungsten** filament (W)	**399-731**

Ordering Information BAG051 HOT ION GAUGE

Type	BAG051
BA nude I^2R, DN40CF, **single iridium** filament (Ir)	**399-725**
BA nude I^2R, DN40CF, **dual iridium** filament (Ir)	**399-726**
BA nude I^2R, DN40CF, **dual tungsten** filament (W)	**399-727**
Spare **V-iridium** filament (Ir)	**399-735**
Spare **dual iridium** filament (Ir)	**399-736**
Spare **dual tungsten** filament (W)	**399-737**

Ordering Information BAG052 HOT ION GAUGE

Type	BAG052
BA glass I^2R, **¾" Kovar metal inlet port**, single iridium filament (Ir)	**399-740**
BA glass I^2R, **1" Kovar metal inlet port**, single iridium filament (Ir)	**399-741**
BA glass I^2R, **¾" glass inlet port**, single iridium filament (Ir)	**399-742**
BA glass I^2R, **1" glass inlet port**, single iridium filament (Ir)	**399-743**
BA glass I^2R, **DN25KF**, single iridium filament (Ir)	**399-744**
BA glass I^2R, **DN40KF**, single iridium filament (Ir)	**399-745**
BA glass I^2R, **DN16CF**, single iridium filament (Ir)	**399-746**
BA glass I^2R, **DN40CF**, single iridium filament (Ir)	**399-747**

Ordering Information BAG053 HOT ION GAUGE

Type	BAG053
BA glass I^2R, **¾" Kovar metal inlet port**, dual tungsten filament (W)	**399-750**
BA glass I^2R, **1" Kovar metal inlet port**, dual tungsten filament (W)	**399-751**
BA glass I^2R, **¾" glass inlet port**, dual tungsten filament (W)	**399-752**
BA glass I^2R, **1" glass inlet port**, dual tungsten filament (W)	**399-753**
BA glass I^2R, **DN25KF**, dual tungsten filament (W)	**399-754**
BA glass I^2R, **DN40KF**, dual tungsten filament (W)	**399-755**
BA glass I^2R, **DN16CF**, dual tungsten filament (W)	**399-756**
BA glass I^2R, **DN40CF**, dual tungsten filament (W)	**399-757**

BAG050, BAG051, BAG052, BAG053 (continued)

Specifications (Torr based standard products)

Typ		BAG050	BAG051	BAG052	BAG053
Measurement range	mbar	2.7×10^{-11} … 1.3×10^{-3}	5.3×10^{-10} … 1.3×10^{-3}		
	Torr	2×10^{-11} … 1×10^{-3}	4×10^{-10} … 1×10^{-3}		
	Pa	2.7×10^{-9} … 1.3×10^{-1}	5.3×10^{-8} … 1.3×10^{-1}		
Accuracy (N_2)	%	20			
X-ray limit	Torr	2×10^{-11}	4×10^{-10}		
Sensitivity (N_2)	Torr	25^{-1}	10^{-1}		
Degas					
EB (electr. bombardment)	W	≤40	70 nominal, ≤100	≤100	
I^2R (resistance heated)		-	6.3 … 7.5 V (ac) at 10 A		
Filament					
Current	A	2.5 … 3.5	4 … 6		
Voltage	V (dc)	3 … 5	3 … 5		
Potential	V (dc)	+30	+30		
Grid potential	V (dc)	+180			
Collector potential	V	0			
Bakeout temperature	°C	450			
Collector		tungsten (W), ø0.005”	tungsten (W), ø0.010”		
Filament		dual iridium (Ir), or dual tungsten (W)	single hairpin iridium (Ir) or dual hairpin iridium (Ir), or dual tungsten (W)	single hairpin iridium (Ir)	dual hairpin tungsten (W)
Grid		photo etched closed grid	non-sag double helical 0.025” tungsten (W) grid		
Insulator		ceramic		glass to metal	
Glass envelope		-		2 1/4” dia x 5” long	
Mounting orientation		any			
Length					
Overall	in.	4 1/8		6	
Insertion	in.	3		-	
Flange		2 ¾” CF / NW35CF Conflat		¾” Kovar metal port 1” Kovar metal port ¾” glass port 1” glass port NW25KF NW40KF 1 1/3” / NW16CF Mini-Conflat 2 ¾” CF / NW35CF Conflat	
Flange material		stainless steel 304		glass Nonex 7720	

Vacuum Gauge Controller

VGC083A, VGC083B

The INFICON Vacuum Gauge Controller VGC083 is designed for use with passive gauge heads BAG05x and PGE050 in a fixed combination of two PGE050 gauges and one BAG05x gauge. The VGC083 controlls and monitors vacuum pressure from ATM down to 2.7 x 10^{-11} mbar using the BAG and PGE gauges. Six (6) single-pole relays assignable to any of the gauge heads along with RS232 and RS485 interfaces aid in system integration. The rugged industrial design of the VGC083 in combination with the passive gauge heads provide a reliable and economical system for vacuum applications requiring a wide vacuum measurement range.

Advantages

- Simple operation with special OLED display for parameter, sensor or general settings with softkeys
- Very bright and clear LED display for long distance vacuum pressure read-out
- Three analog outputs, user assignable to any of the gauges
- Degas electron bombardment or I^2R resistive heating for gauge conditioning depending on gauge head type
- Remote digital I/O sensor & emission on/off
- Sensor 1 can be automatically turned on/off from sensor 2 or 3
- Three definable setpoints per channel with adjustable hysteresis
- RS232 / RS485 serial communication
- 6 assignable single pole double through setpoint relays
- Ion gauge overpressure protection
- Alternative active gauge use
- User selectable filament
- Direct drop in replaces Granville-Phillips® 307 Bayard-Alpert Gauge Controller

Ordering Information

Type	VGC083A	VGC083B
Vacuum Gauge Controller	**399-700**	**399-701**
Power supply VGC083A/B	**399-710**	**399-710**
Rack mount adapter one VGC083A/B	**399-714**	**399-714**
Rack mount adapter two VGC083A/B	**399-715**	**399-715**

VGC083A, VGC083B (continued)

Specifications

Type		VGC083A	VGC083B
Measurement channels		3	
Display			
Pressure indication		LED - 3 independent pressure display channels	
Programming & set-up screen		OLED	
Connectable gauges with display range			
PGE050	mbar/Torr	1.3×10^{-4} … 1333 / 1×10^{-4} … 1000	1.3×10^{-4} … 1333 / 1×10^{-4} … 1000
BAG050	mbar/Torr	2×10^{-11} … 1.3×10^{-3} / 2×10^{-11} … 1×10^{-3}	-
BAG051	mbar/Torr	-	4×10^{-10} … 1333 / 4×10^{-10} … 1000
BAG052, BAG053	mbar/Torr	-	4×10^{-10} … 1333/ 4×10^{-10} … 1000
Sensor 1 over pressure protection		turns hot ion gauge off at the following factory default settings 1×10^{-3} Torr at 100 µA emission current 5×10^{-4} Torr at 4 µA emission current 1×10^{-4} Torr at 10 µA emission current	
Connectors	BAG supply	CPC [1]	
	BAG col	BNC [1]	
	PGE050	D-sub, 9 p-pin female	
	Remote digital I/0	D-sub, 9 p-pin male	
	RS232	D-sub, 9 p-pin female	
	RS485	D-sub, 9 p-pin male	
	Analog out	2 pole pluggable	
	Analog in	3 pole pluggable	
	Relay	each 3 pole pluggable	
	DC power	3 pole pluggable terminal block, mating connectors included	
Measurement unit (selectable)		mbar (default), Torr, Pa	
Setpoint relays		6 single-pole double-throw relays (SPDT), user assignable to any of the gauges	
Contact rating		5 A at 30 V (dc), 5 A at 250 V (ac), resistive load	
Analog output			
BAG analog output	V (dc)	0 … 10 (log-linear, 1 V/decade)	
	V (dc)	1.7 … 9.3 (nominal 1.8 ... 8.7 (log-linear, 0.8 V/decade)	
	V (dc)	0 … 10 (linear, usable over 3 decades)	
Combination BAG & PEG analog	V(dc)	0.5 … 7 (log-linear, 0.5 V/decade)	
PEG analog output	V (dc)	1 … 8 (log-linear, 1 V/decade)	
	V (dc)	0 … 7 (log-linear, 1 V/decade)	
	V (dc)	0 … 10 (linear, usable over 3 decades)	
	V (dc)	0.375 … 5.659 (non-linear, S-curve usable over 3 decades)	
Interface (digital)		RS232, RS485 [2]	
Supply voltage (external)	V (dc)	+20 … +28 [3]	
Temperature			
Operation (ambiance)	°C	+0 … +40	
Storage	°C	-40 … +70	
Humidity		0 … 95% relative humidity, non-condensing	
Housing		aluminium housing	
Weight	kg / lb.	0.7 / 1.7	

1) Gauge cable assemblies provided by INFICON
2) Command protocol compatibility with GP307
3) 200 W protected against power reversal and transient over-voltages

VGC083A, VGC083B (continued)

Connectable Gauges

BAG050 Hot Ion Gauge	VGC083A	VGC083B
BA nude EB-degas, DN40CF, **dual iridium** filament (Ir)	**399-720**	–
BA nude EB-degas, DN40CF, **dual tungsten** filament (W)	**399-720**	–
BAG051 Hot Ion Gauge		
BA nude I^2R, DN40CF, **single iridium** filament (Ir)	–	**399-725**
BA nude I^2R, DN40CF, **dual iridium** filament (Ir)	–	**399-726**
BA nude I^2R, DN40CF, **dual tungsten** filament (W)	–	**399-727**
BAG052 Hot Ion Gauge		
BA glass I^2R, **¾" Kovar metal inlet port**, single iridium filament (Ir)	–	**399-740**
BA glass I^2R, **1" Kovar metal inlet port**, single iridium filament (Ir)	–	**399-741**
BA glass I^2R, **¾" glass inlet port**, single iridium filament (Ir)	–	**399-742**
BA glass I^2R, **1" glass inlet port**, single iridium filament (Ir)	–	**399-743**
BA glass I^2R, **DN25KF**, single iridium filament (Ir)	–	**399-744**
BA glass I^2R, **DN40KF**, single iridium filament (Ir)	–	**399-745**
BA glass I^2R, **DN16CF**, single iridium filament (Ir)	–	**399-746**
BA glass I^2R, **DN40CF**, single iridium filament (Ir)	–	**399-747**
BAG053 Hot Ion Gauge		
BA glass I^2R, **¾" Kovar metal inlet port**, dual tungsten filament (W)	–	**399-750**
BA glass I^2R, **1" Kovar metal inlet port**, dual tungsten filament (W)	–	**399-751**
BA glass I^2R, **¾" glass inlet port**, dual tungsten filament (W)	–	**399-752**
BA glass I^2R, **1" glass inlet port**, dual tungsten filament (W)	–	**399-753**
BA glass I^2R, **DN25KF**, dual tungsten filament (W)	–	**399-754**
BA glass I^2R, **DN40KF**, dual tungsten filament (W)	–	**399-755**
BA glass I^2R, **DN16CF**, dual tungsten filament (W)	–	**399-756**
BA glass I^2R, **DN40CF**, dual tungsten filament (W)	–	**399-757**
PGE050 Pirani Gauge Enhanced		
Pirani Gauge, **DN 16 ISO-KF**, tungsten filament (W)	**352-500**	**352-500**
Pirani Gauge, **DN 25 ISO-KF**, tungsten filament (W)	**352-501**	**352-501**
Pirani Gauge, **DN 40 ISO-KF**, tungsten filament (W)	**352-502**	**352-502**
Pirani Gauge, **DN 16 CF-R**, tungsten filament (W)	**352-503**	**352-503**
Pirani Gauge, **DN 40 CF-R**, tungsten filament (W)	**352-504**	**352-504**
Pirani Gauge, **4 VCR female**, tungsten filament (W)	**352-505**	**352-505**
Pirani Gauge, **8 VCR female**, tungsten filament (W)	**352-506**	**352-506**
Pirani Gauge, **1/8" NPT**, tungsten filament (W)	**352-507**	**352-507**

VGC083A, VGC083B (continued)

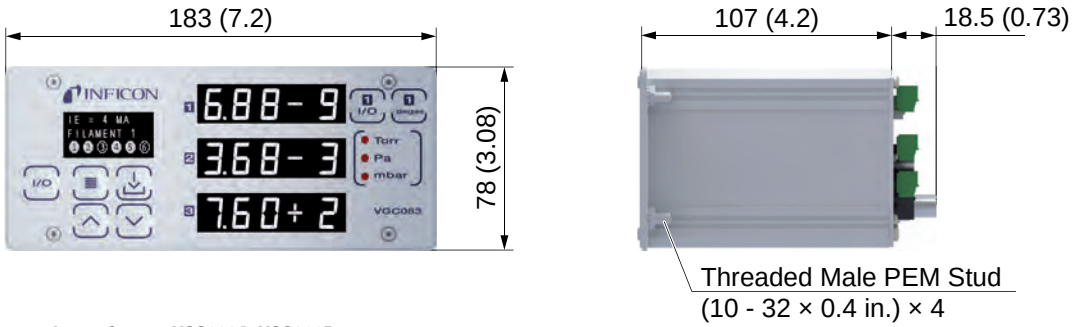
Accessories

Cable to VGC083A/B for	BAG050/051 200 °C	BAG050/051 50 °C	BAG052/053 50 °C	PGE050 50 °C
3 m (9.0 ft)	399-770	399-780	399-790	399-580
8 m (25.0 ft)	399-771	399-781	399-791	399-581
15 m(50.0 ft)	399-772	399-782	399-792	399-582

Other lengths on request

Dimensions

VGC083A, VGC083B mm (in.)



Optional rack mount adapter for one VGC083A, VGC083B
Optional rack mount adapter panel (aluminium - power paint finish) for installation of one VGC083A/B as a left-mount or a right-mount in a 2U, 19 inch wide rack.

Optional rack mount adapter for two VGC083A, VGC083B
Optional rack mount adapter panel (aluminium - power paint finish) for installation of two VGC083A/B side-by-side in a 2U, 19 inch wide rack.

Calibration Service

Vacuum Gauges

INFICON offers calibration services for vacuum gauges. DAkks (Deutsche Akkreditierungsstelle; according to DIN EN ISO/IEC 17025:2005) calibration certificate or factory calibration certificate can be issued.

All issued inspection documents are in compliance with the European Standard EN 10204

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

DAkks Calibration

The German Calibration Service (DAkks) 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 DK calibration facility are checked regularly (recalibrated) by the PTB.

Factory Calibration

Factory calibrations traced back to DAkks transfer standards.

CDG gauges are calibrated on a special tool with traceability to national standards at PTB.

Thus traceability to national standards is ensured in both cases.

Other Calibrations

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

Ordering Information

Calibration Service for	Calibration Range [mbar], [Torr]	DAkks Calibration [1]	Factory Calibration [1]
Pirani, Pirani Combination Gauges	1 x 10^{-3} … 30	**398-900**	**398-910**
Capacitance Diaphragm Gauges	1 x 10^{-3} … 1000	–	**398-913**
Capacitance Diaphragm Gauges (gauges with measurement cable to controller)	1 x 10^{-3} … 1000	–	**398-914**
Bayard Alpert, Cold Cathode, High Pressure and Combination Gauges	1 x 10^{-6} … 30	**398-902**	–
Bayard Alpert, Cold Cathode, High Pressure and Combination Gauges	5 x 10^{-7} … 1000	–	**398-912**

[1] Pressure media: Nitrogen

Inspection Documents Service

Vacuum Control

INFICON offers a inspection documents service for Vacuum Control products.

All issued inspection documents are in compliance with the European Standard EN 10204

Advantages

- Choice of three different inspection documents for customers individual needs
- Inspection documents according to European Standard EN 10204

Ordering Information

Designation of Inspection Document	Type	Ordering Number
Declaration of compliance with the order (Werksbescheinigung 2.1)	**EN 10204-2.1**	**211-801**
Test report (Werkszeugnis 2.2)	**EN 10204-2.2**	**211-802**
Inspection certificate (Abnahmeprüfzeugnis 3.1)	**EN 10204-3.1**	**211-800**

Please check with the given information in the following chart the right inspection document for your specific needs and order your choice of inspection document together with the corresponding Vacuum Control product you need it for.

The inspection document will be issued and delivered together with your goods and / or can be sent as pdf file for your attention. For pricing or specific questions concerning inspection documents please call our customer service center.

Inspection Documents Service

INSPECTION DOCUMENTS	EN 10204-2.1	EN 10204-2.2	EN 10204-3.1
Inspection document	Declaration of compliance with the order	Test report	Inspection certificate
Kind of inspection	Non-specific inspection. The products inspected are not necessarily the products actually supplied.	Non-specific inspection. The products inspected are not necessarily the products actually supplied.	Specific inspection. The products inspected are the products, or part of the products, actually supplied.
Contents of inspection document	Manufacturer's declaration that the products supplied are in compliance with the requirements of the order, without inclusion of test results.	Manufacturer's declaration that the products supplied are in compliance with the requirements of the order, with test results based on non-specific inspection.	Manufacturer's declaration that the products supplied are in compliance with the require ments of the order, with test results based on specific inspection.
Conditions of delivery	In accordance with conditions of order.	In accordance with conditions of order.	According to regulations of authorities and the corresponding technical rules.
Inspection document confirmed by	The manufacturer	The manufacturer	The manufacturer's authorized inspection representative, independent of the manufacturing department
Example for ordering at INFICON	Add ordering number **211-801** to your order in a separate order position directly after the order position of the corresponding parts you like to have the declaration of compliance for.	Add ordering number **211-802** to your order in a separate order position directly after the order position of the corresponding parts you like to have the test report for.	Add ordering number **211-800** to your order in a separate order position directly after the order position of the corresponding parts you like to have the certificate for.
Notes by INFICON	If this declaration is needed for all of your purchase order items you simply can add the ordering number **211-801** at the and of your order in the last position and state that it should be valid for the whole order	The test report just can be issued to a specific part number you have ordered. It can't be valid for multiple part numbers. It should be ordered along with the corresponding product it belongs to (add ordering number **211-802** directly after the product it belongs to).	This certificate just can be issued to a specific part number you have ordered. It can't be valid for multiple part numbers. It strictly has to be ordered along with the corresponding product it belongs to (add ordering number **211-800** directly after the product it be longs to). The original certificate always comes along with the corresponding product it belongs to. On customer request we can send it in addition to our shipment as pdf file by email or by post (copies).
Inspection document available for	All INFICON Vacuum Control products	All INFICON Vacuum Control products	Majority of our vacuum fittings (usually this certificate is asked for fittings made of stainless steel and aluminium and their specific chemical composition). Other Vacuum Control products on request and according feasibility. Please define in your request values you like to have tested and confirmed Standard prices apply for this type of certificate, however we reserve the right to apply further charges for any additional work that maybe required.

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

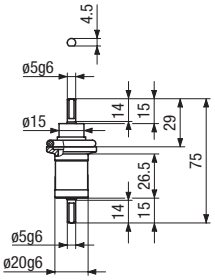
Transferable torque	Nm	1.5	6	25	100
Rotational speed [1]	rpm	1500	1000	750	500
Idling torque under vacuum	Ncm	≤3	≤4	≤5	≤10
Starting torque under vacuum	Ncm	≤6	≤8	≤10	≤20
Shaft load vacuum sided					
Radial force	N	60	150	250	500
Axial force	N	30	50	60	100
Service life	Revolutions	20 000 000	20 000 000	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 6082 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

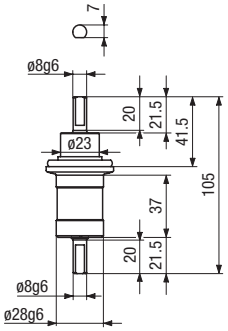
FRH DN 16 – DN 63 (continued)

Dimensions

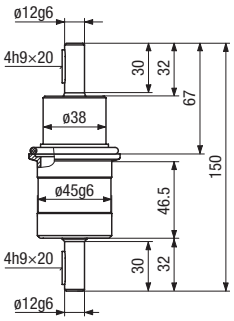
FRH016-H



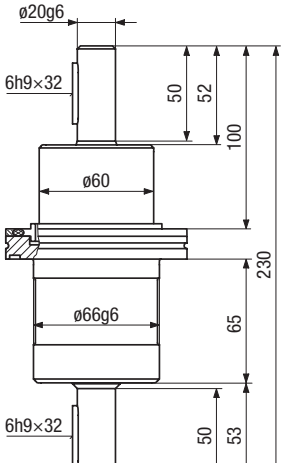
FRH025-H



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**

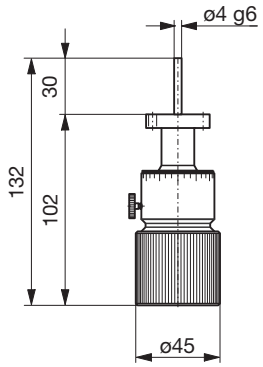
Specifications

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	304L/1.4306 304/1.4301 303/1.4305
Weight	kg	0.3	1.5	3.0

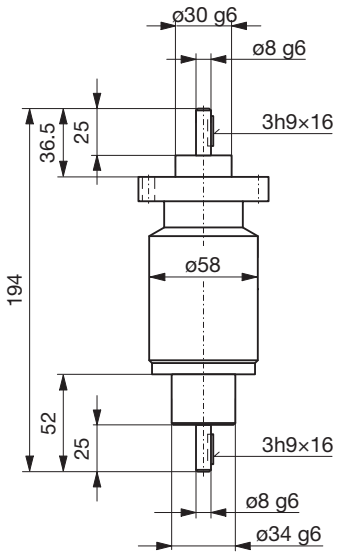
FRU DN 16 – DN 40 (continued)

Dimensions

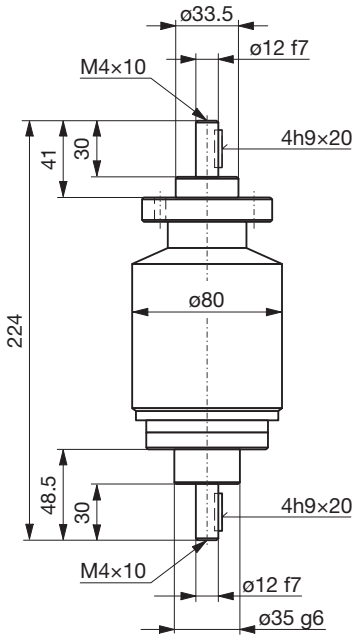
FRU016-H



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**

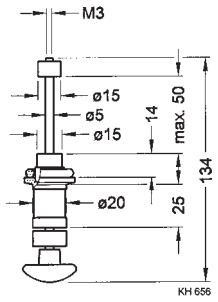
Specifications

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 to process media			Stainless steel 304/1.4301 Aluminum 6082	
Weight	kg	0.1	0.2	0.3

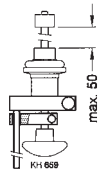
FCH DN 16 – DN 40 (continued)

Dimensions

FCH016-H

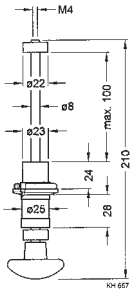


Feedthrough

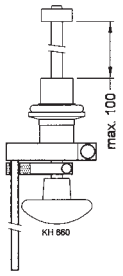


Anti-rotation device

FCH025-H

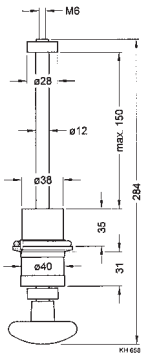


Feedthrough

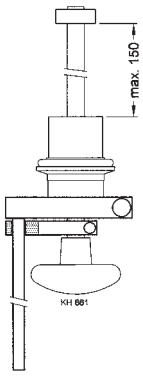


Anti-rotation device

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**

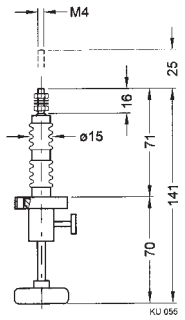
Specifications

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/1.4306 stainless steel 316Ti/1.4571			
Weight	kg	0.15	0.75	0.25	1

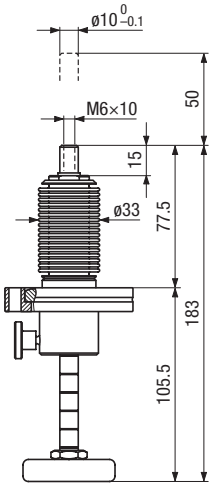
FPU DN 16 – DN 40 (continued)

Dimensions

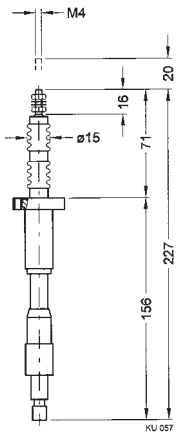
FPU016-H



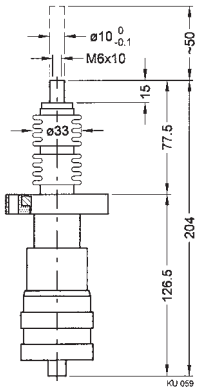
FPU040-H



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**

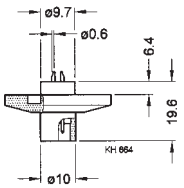
Specifications

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 brass / bonze / inox	

DN 16 ISO–KF (continued)

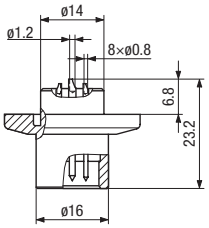
Dimensions

214-111



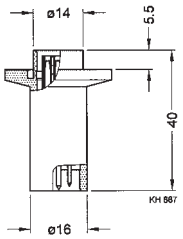
Feedthrough

214-112



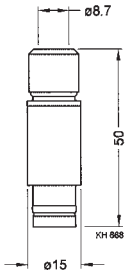
Feedthrough

214-113



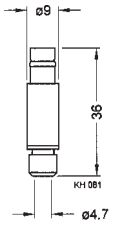
Feedthrough

214-191

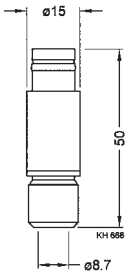


Connector:
vacuum side

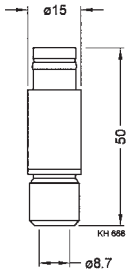
214-171



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**

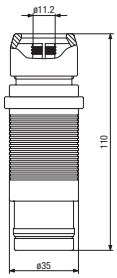
Specifications

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)		1×10^{-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)

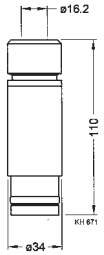
Dimensions

214-193



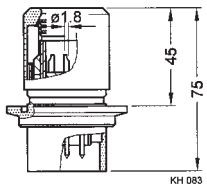
Connector:
vacuum side

214-194



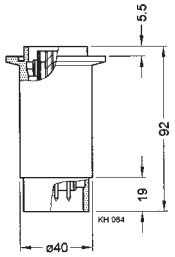
Connector:
vacuum side

214-121



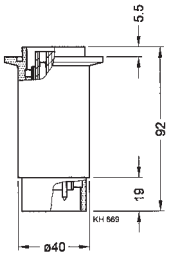
Feedthrough

214-122



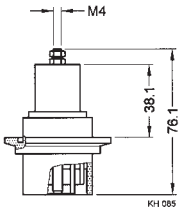
Feedthrough

214-123



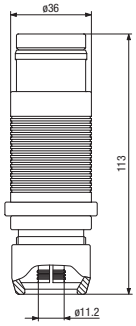
Feedthrough

214-131



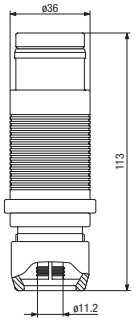
Feedthrough

214-174



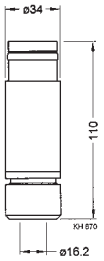
Connector:
air side

214-174



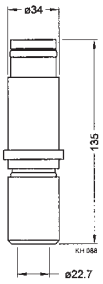
Connector:
air side

214-175



Connector:
air side

214-180



Connector:
air side

Electrical Feedthroughs

DN 16 CF-F

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**

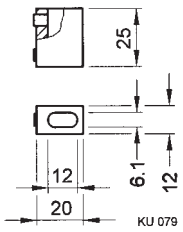
Specifications

Bakeout temperature	°C	400
Tightness	mbar l/s	5×10^{-11}
Pressure (absolute)		1×10^{-10} mbar ... 2 bar
Flange		Stainless steel 304L/1.4306
Conductor		OF-copper 2.0040
Insulator		Aluminum oxide ceramic Al_2O_3
Weight		0.15
Connection piece: vacuum side		2
Current max.	A	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	V (ac) / V (dc)	Not insulated
Bakeout temperature	°C	150
Contact		Silver-plated brass

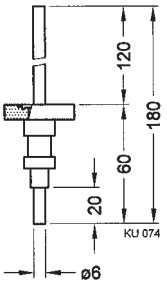
DN 16 CF–F (continued)

Dimensions

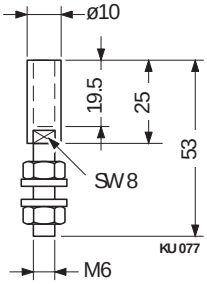
214-195



214-126



214-176



Electrical Feedthroughs

DN 40 CF-F

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	4	1	1
Current per pole	A	70	200/1000 [1]	150	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**	**–**	**–**	**–**

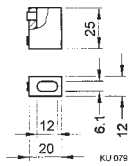
Specifications

Bakeout temperature	°C	400				
Tightness	mbar l/s	5×10^{-11}				
Pressure (absolute)		1×10^{-10} mbar ... 2 bar				
Flange		304L	304L	304L	304L	304L
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	2.0060	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	V (ac) / V (dc)	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)

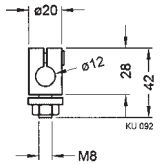
Dimensions

214-195



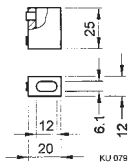
Connector vacuum side

214-196



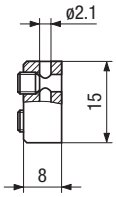
Connector vacuum side

214-195



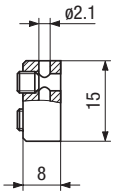
Connector vacuum side

214-192



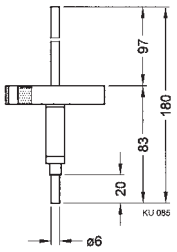
Connector vacuum side

214-198



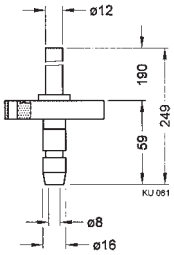
Connector vacuum side

214-136



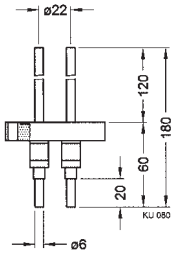
Feedthrough

214-127



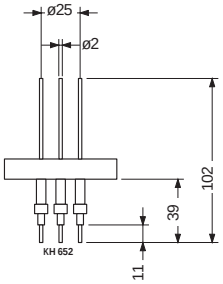
Feedthrough

214-128



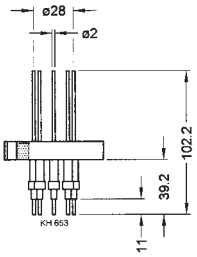
Feedthrough

214-116



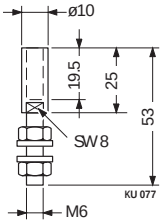
Feedthrough

214-117



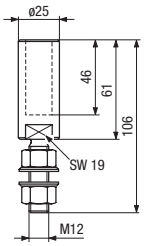
Feedthrough

214-176



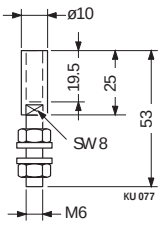
Connector air side

214-177



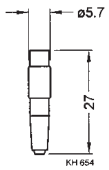
Connector air side

214-176



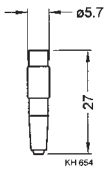
Connector air side

214-173



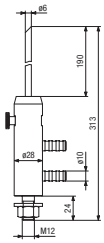
Connector air side
With soldered joint

214-181



Connector air side
With soldered joint

214-178



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

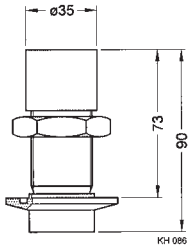
Specifications

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 6082
Insulator		thermoplast and thermoset
Seal		FPM

DN 40 ISO KF (continued)

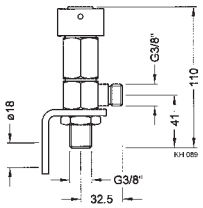
Dimensions

214-141



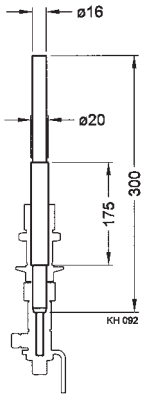
Feedthrough

214-145



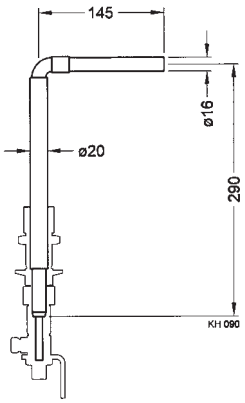
Current connection
with water cooling
copper/brass

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

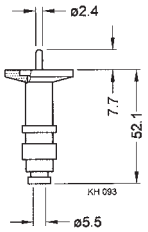
Voltage						
AC, 50 Hz	kV	0.35	3.5	0.35	3.5	3.5
DC	kV	0.5	5	0.5	5	5
Current	A	3	3	3	3	3
Frequency	MHz	150		150		
Impedance	Ω	50-60		50-60		
Insulation resistance at 20°C	Ω	10^{10}	10^{10}	10^{10}	10^{10}	10^{10}
Tightness	mbar l/s	1×10^{-9}	1×10^{-9}	1×10^{-10}	1×10^{-10}	1×10^{-10}
Pressure (absolute) [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

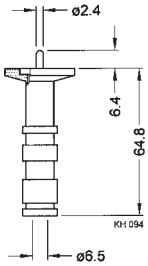
BNC / MHV DN 16 – 40 (continued)

Dimensions

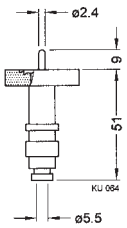
214-151



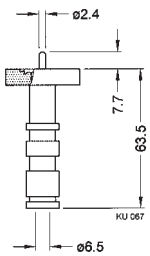
214-152



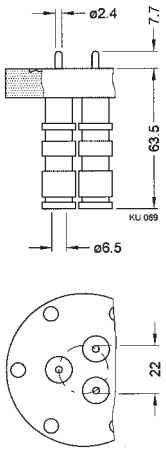
214-155



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

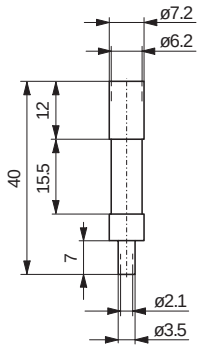
Insulator		Al_2O_3	Al_2O_3	Al_2O_3	Al_2O_3
Connection					
a		Fe-Ni	Ni-Co	Ni-Co	Fe-Ni
b		Fe-Ni	stainless steel 304/1.4301	stainless steel 304/1.4301	stainless steel 304/1.4301
Bakeout temperature	°C	400	400	400	400
Tightness	mbar l/s	5×10^{-11}	5×10^{-11}	5×10^{-11}	5×10^{-11}
Weight	g	5	12	25	90

[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.

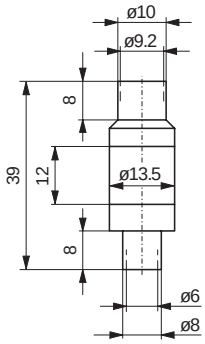
Metal–Ceramic Connections (continued)

Dimensions

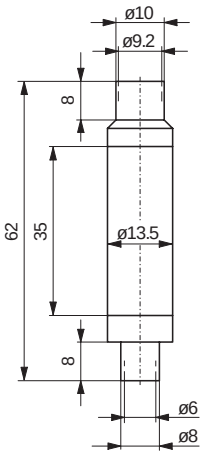
214-161



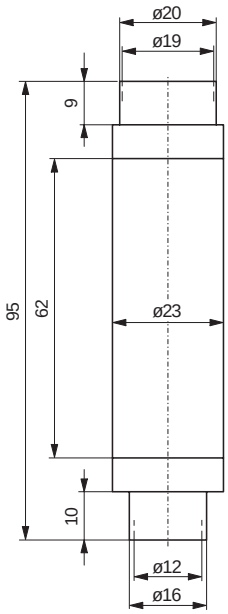
214-162



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**

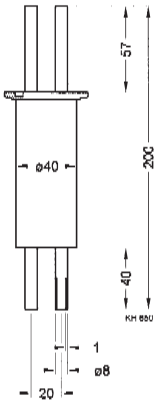
Specifications

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	0.3

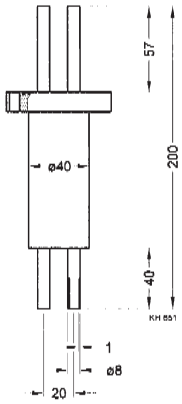
DN 40 (continued)

Dimensions

214-101

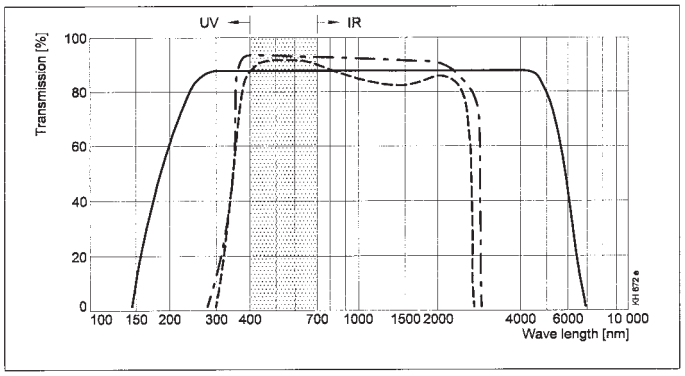


214-102



Viewports

DN 16 – DN 50 ISO-KF



Average transmittance curve

——— Sapphire

—·— Kodial

– – – Borosilicate

Properties

- Wide viewing angle

Selection Data

Vacuum connection		DN16 ISO-KF	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.	**214-002**	**214-003**	**214-004**	**214-005**

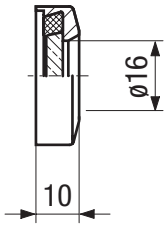
Specifications

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	15	20	30	50

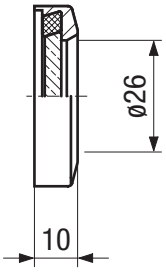
DN 16 – DN 50 ISO–KF – continued

Dimensions

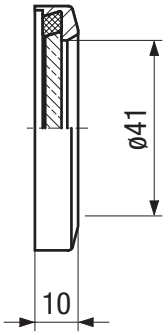
214-002



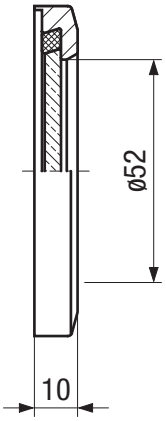
214-003



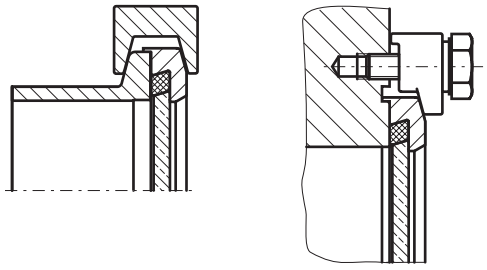
214-004



214-005



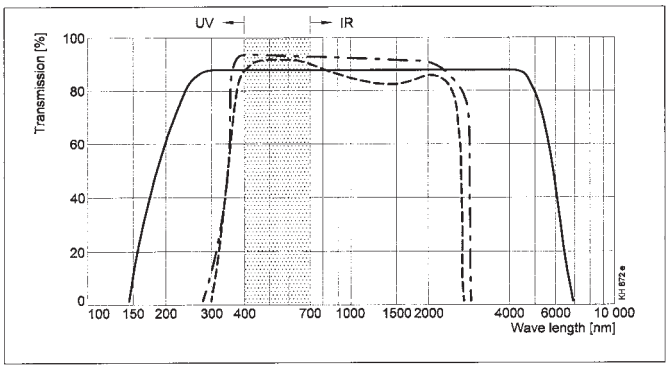
Mounting



Claws, screws and clamping ring not included

Viewports

DN 63 – DN 160 ISO-K



Average transmittance curve
Sapphire
Kodial
Borosilicate

Properties

- Wide viewing angle
- 2011/65/EU RoHS compliant

Selection Data

Vacuum connection		DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Window			Borosilicate glass	
Seal			FPM	
Flange			Aluminum 6082	
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	8	10
Weight	kg	0.3	0.4

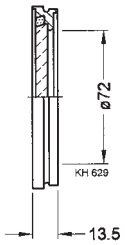
[1] Claws not included

DN 63 – DN 160 ISO-K (continued)

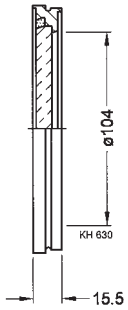
Dimensions

[mm]

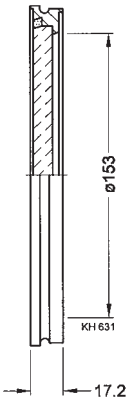
214-006



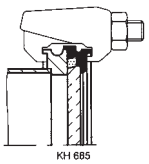
214-007



214-008

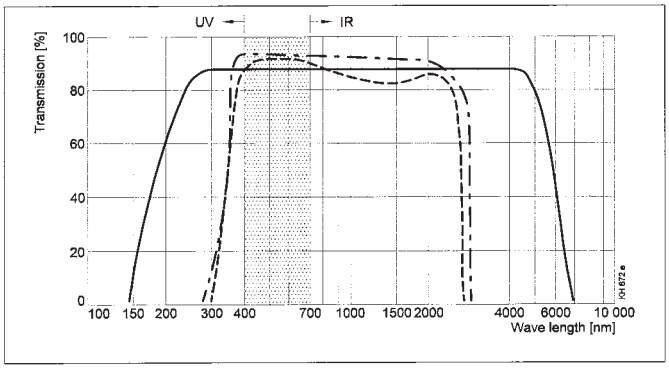


Mounting



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

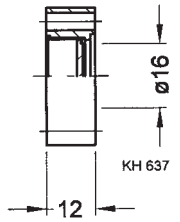
Tightness	mbar l/s	5×10^{-11}					
Pressure (absolute)							
Min.	mbar	1×10^{-10}					
Max.	bar	2					
Max. at 400°C	bar	1					
Window thickness	mm	1.5	3	3	3.5	6	8
Weight	kg	0.04	0.24	0.35	0.85	1.4	2.8

DN 16 – DN 160 CF (continued)

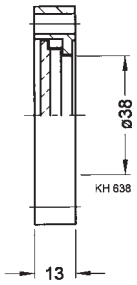
Dimensions

[mm]

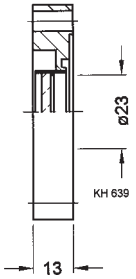
214-021



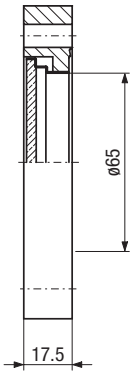
214-022



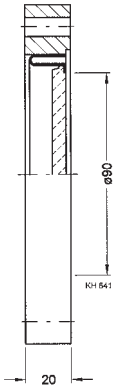
214-032



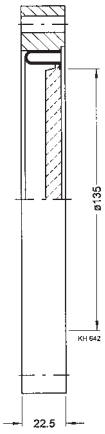
214-023



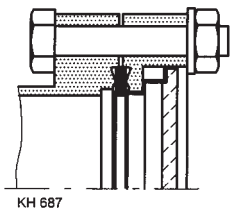
214-024



214-025

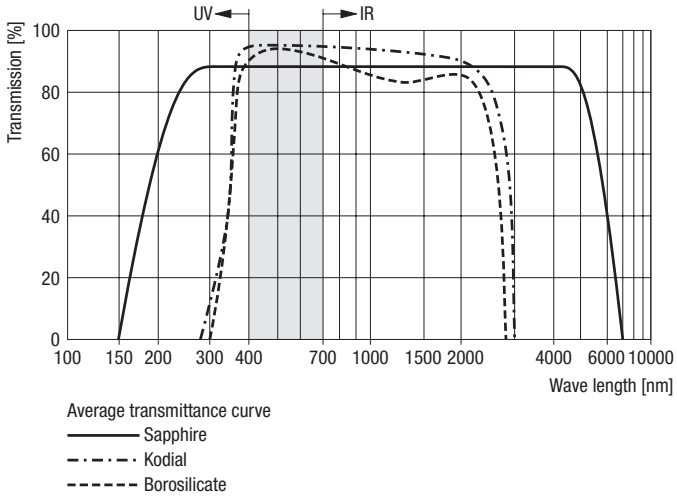


Mounting



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 6082	
Centering ring			Aluminum 6082	
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

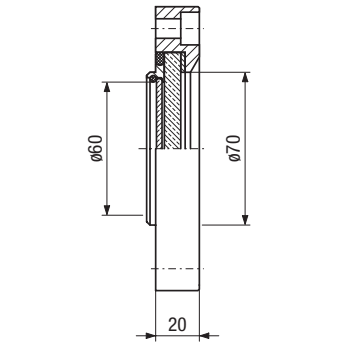
Tightness	mbar l/s		1×10^{-9}	
Pressure (absolute)			1×10^{-8} mbar ... 2 bar	
Max. at 150°C	bar		1	
Window thickness	mm	7.5	11	15
Protective glass thickness	mm	2.3	2.3	2.3
Weight	kg	0.8	1.4	3

DN 63 – DN 160 ISO–F (continued)

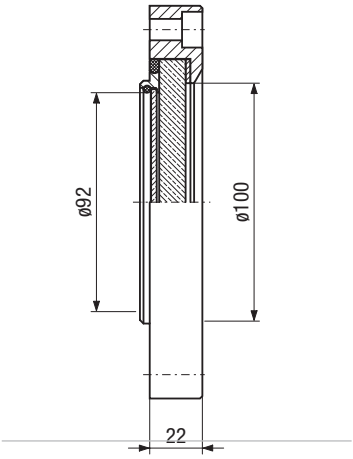
Dimensions

[mm]

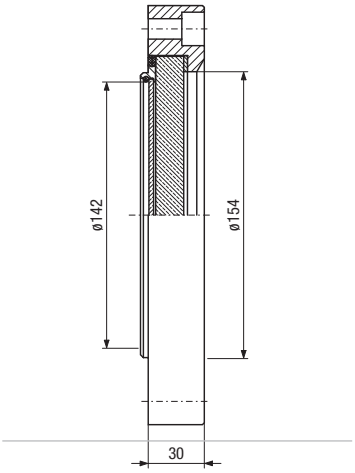
214-016



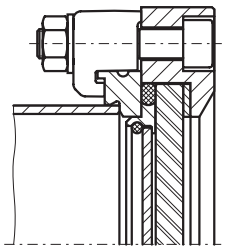
214-017



214-018



Mounting



Vacuum Feedthroughs

Vacuum Ball Bearings

Properties

- Especially 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		
Inner ring, outer ring, balls	AISI/DIN	Stainless steel – /1.4037
Cage	AISI/DIN	Stainless steel 430 / 1.4016
Coating (dry lubrication)		
Inner ring, outer ring, cage		Wolfratherm®

[1] At half load and >1000 rpm
[2] At -200°C reduction of tenacity

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 [1]							
Static load rating (Co)	N	400	400	800	1000	1500	2000
Dynamic load rating (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

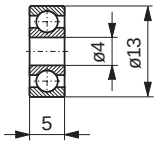
[1] At 20°C; half value at 300°C

Vacuum Ball Bearings (continued)

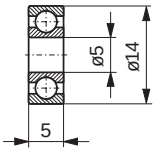
Dimensions

[mm]

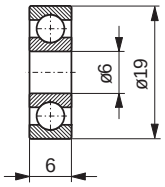
214-211



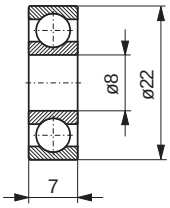
214-212



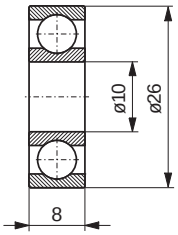
214-213



214-214



214-215



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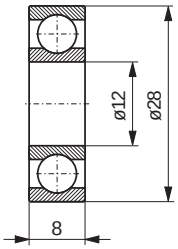


Vacuum Feedthroughs

Lubricants and Sealing Materials

High Temperature Lubricant

- Prevents seizing of stainless steel screw connections at atmosphere even at high temperatures
- Remains fully effective for 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
Version		Paste
In packages of	g	100

Ordering Information

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

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 Fittings

High– and Ultra–High Vacuum Components

Vacuum Fittings

Specifications

ISO-KF Small Flange Components

ISO-K Clamp Flange Components

ISO-F Fixed Flange Components

UHV CF Components

Inspection Documents Service

Specifications

Seals

Seal Material		Temperature	Reusability
Elastomer			
NBR	°C	-30 - +90	Yes
CR	°C	-40 - +100	Yes
FPM	°C	-15 - +150	Yes
Metal			
Indium	°C	-196 - +60	Yes
Aluminum	°C	-196 - +200	No
Copper	°C	-196 - +200	No
Silver-plated copper	°C	-196 - +450	No

Pressure Range

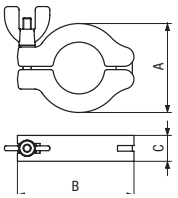
Code Designation		Pressure Range (mbar - bar)	Tightness (mbar l/s)	Centering	Connection
ISO-KF	Aluminum	10^{-7} - 2	10^{-8}	inside	Clamping ring
		10^{-7} - 5	10^{-8}	outside	Clamping ring
		10^{-7} - 10	10^{-8}	outside	Clamping element / chain clamp
	Stainless steel	10^{-8} - 2	10^{-9}	inside	Clamping ring
		10^{-8} - 5	10^{-9}	outside	Clamping ring
		10^{-8} - 10	10^{-9}	outside	Clamping element / chain clamp
ISO-K	Stainless steel	10^{-8} - 2	10^{-9}	inside	Clamping screw, claw grips
CF-F/R	Stainless steel	10^{-12} -1	10^{-9}	---	screws

ISO-KF Small Flange Components

Connection Elements

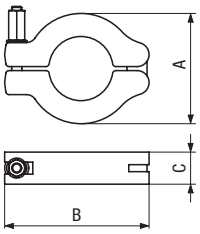
Clamping Ring Wing Nut

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

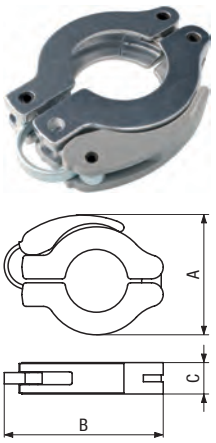


Connection Elements (continued)

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	20 – 25	**211-006**	61	81	16
Lever:	polyamide	32 – 40	**211-007**	75	98	18

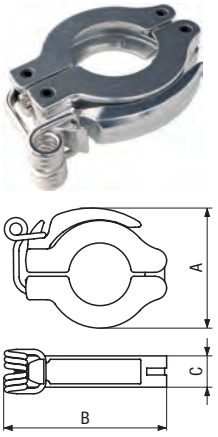
Temperature ≤80°C



Rapid Fastening Clamp All Metal

		DN ... ISO-KF	Part No.	A	B	C
Spring:	stainless steel	10 – 16	**211-036**	53	71	16
Clamping ring half:	aluminum 380.0	20 – 25	**211-037**	61	82	16
Lever:	aluminum –/3.2582	32 – 40	**211-038**	78	99	18

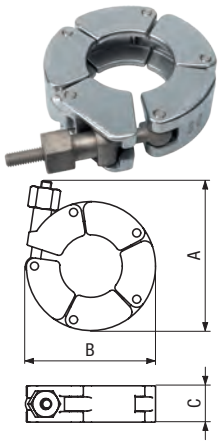
Temperature ≤150°C



Chain Clamp

		DN ... ISO-KF	Part No.	A	B	C	D*
Chain link:	aluminum 6081	10 – 16	**211-021**	72	52	18	2.5 / 2.5 Nm
Screw & nut & bolts:	steel 1.6582 / nitro	20 – 25	**211-022**	82.5	62	18	3.5 / 3 Nm
	gas carburized	32 – 40	**211-023**	88	77	18	5 / 3 Nm
		50	**211-024**	119	95	20	6 / 3 Nm

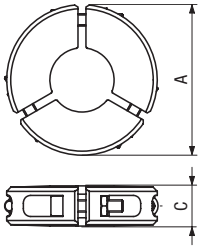
* aluminum max / elastomer max



Connection Elements (continued)

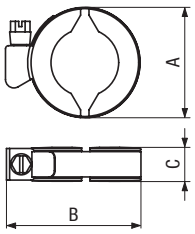
Clamping Element

		DN ... ISO-KF	Part No.	A	C
Clamping Element:	aluminum 380.0	10 – 16	**211-008**	52	18
Bolt:	stainless steel	20 – 25	**211-009**	75	20
Nut:	steel zinc plated	32 – 40	**211-010**	90	23
		50	**211-011**	115	28



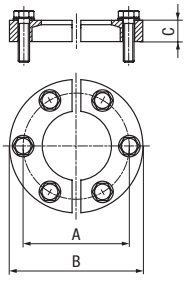
Hose Clip Clamping Ring

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



Bulkhead Clamp with Metric Screws

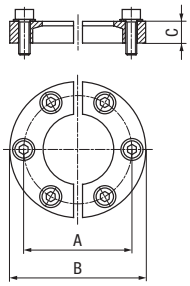
		DN ... ISO-KF	Part No.	A	B	C	Screws
Clamping Element:	aluminum 6082	10 – 16	**211-541**	38.1	51	9.5	6 pcs.
Bolt:	Hexagon head screw;	20 – 25	**211-542**	48	61	9.5	6 pcs.
	DIN933, A2, M5x20;	32 – 40	**211-543**	62	75	9.5	6 pcs.
	silver plated	50	**211-544**	82.55	95	10	8 pcs.
Washer:	Washer DIN 125 A A2, 5.3/10x1						



Connection Elements (continued)

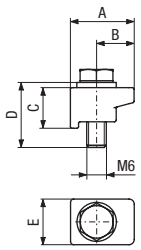
Bulkhead Clamp with Inch Screws

		DN ... ISO-KF	Part No.	A	B	C	Screws
Clamping Element:	aluminum 6082	10 – 16	**211-545**	38.1	51	9.5	6 pcs.
Bolt:	Hexagon socket head	20 – 25	**211-546**	48	61	9.5	6 pcs.
	cap screw; Inox,	32 – 40	**211-547**	62	75	9.5	6 pcs.
	10-32 UNF x 5/8'';	50	**211-548**	82.55	95	10	8 pcs.
	silver plated						
Washer:	Washer DIN 125 A						
	A2, 5.3/10x1						



Claw Grip

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

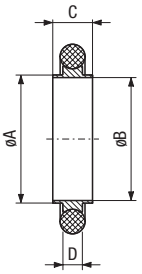


ISO–KF Small Flange Components

Seals

Centering Ring Aluminum

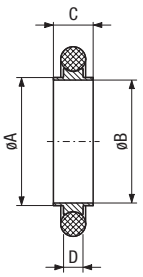
	DN … ISO-KF	Part No.	A	B	C	D
Ring: **aluminum** 6026 Seal: elastomer **CR**	10	**211-051**	12	10	8	3.9
	16	**211-052**	17	16	8	3.9
	20	**211-053**	22	20	8	3.9
	25	**211-054**	26	25	8	3.9
	32	**211-055**	34	32	8	3.9
	40	**211-056**	41	40	8	3.9
	50	**211-057**	52	50	8	3.9
Ring: **aluminum** 6026 Seal: elastomer **FPM**	10	**211-058**	12	10	8	3.9
	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: **aluminum** 6026 Seal: elastomer **NBR**	10	**211-651**	12	10	8	3.9
	16	**211-652**	17	16	8	3.9
	20	**211-653**	22	20	8	3.9
	25	**211-654**	26	25	8	3.9
	32	**211-655**	34	32	8	3.9
	40	**211-656**	41	40	8	3.9
	50	**211-657**	52	50	8	3.9
Ring: **aluminum** 6026 Seal: elastomer **EPDM**	10	**211-658**	12	10	8	3.9
	16	**211-659**	17	16	8	3.9
	20	**211-660**	22	20	8	3.9
	25	**211-661**	26	25	8	3.9
	32	**211-662**	34	32	8	3.9
	40	**211-663**	41	40	8	3.9
	50	**211-664**	52	50	8	3.9
Ring: **aluminum** 6026 Seal: elastomer **VMQ** (silicone)	10	**211-665**	12	10	8	3.9
	16	**211-666**	17	16	8	3.9
	20	**211-667**	22	20	8	3.9
	25	**211-668**	26	25	8	3.9
	32	**211-669**	34	32	8	3.9
	40	**211-670**	41	40	8	3.9
	50	**211-671**	52	50	8	3.9



Seals (continued)

Centering Ring Stainless Steel 303

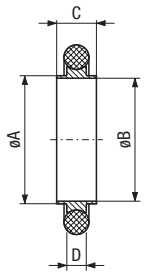
	DN … ISO-KF	Part No.	A	B	C	D
Ring: **stainless steel** 303/1.4305 Seal: elastomer **CR**	10	**211-672**	12	10	8	3.9
	16	**211-673**	17	16	8	3.9
	20	**211-674**	22	20	8	3.9
	25	**211-675**	26	25	8	3.9
	32	**211-676**	34	32	8	3.9
	40	**211-677**	41	40	8	3.9
	50	**211-678**	52	50	8	3.9
Ring: **stainless steel** 303/1.4305 Seal: elastomer **FPM**	10	**211-065**	12	10	8	3.9
	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
Ring: **stainless steel** 303/1.4305 Seal: elastomer **NBR**	10	**211-679**	12	10	8	3.9
	16	**211-680**	17	16	8	3.9
	20	**211-681**	22	20	8	3.9
	25	**211-682**	26	25	8	3.9
	32	**211-683**	34	32	8	3.9
	40	**211-684**	41	40	8	3.9
	50	**211-685**	52	50	8	3.9
Ring: **stainless steel** 303/1.4305 Seal: elastomer **EPDM**	10	**211-686**	12	10	8	3.9
	16	**211-687**	17	16	8	3.9
	20	**211-688**	22	20	8	3.9
	25	**211-689**	26	25	8	3.9
	32	**211-690**	34	32	8	3.9
	40	**211-691**	41	40	8	3.9
	50	**211-692**	52	50	8	3.9
Ring: **stainless steel** 303/1.4305 Seal: elastomer **VMQ** (silicone)	10	**211-693**	12	10	8	3.9
	16	**211-694**	17	16	8	3.9
	20	**211-695**	22	20	8	3.9
	25	**211-696**	26	25	8	3.9
	32	**211-697**	34	32	8	3.9
	40	**211-698**	41	40	8	3.9
	50	**211-699**	52	50	8	3.9



Seals (continued)

Centering Ring Stainless Steel 316L

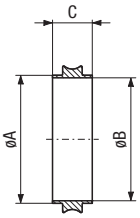
	DN … ISO-KF	Part No.	A	B	C	D
Ring: **stainless steel** 316L/1.4404 Seal: elastomer **CR**	10	**211-735**	12	10	8	3.9
	16	**211-736**	17	16	8	3.9
	20	**211-737**	22	20	8	3.9
	25	**211-738**	26	25	8	3.9
	32	**211-739**	34	32	8	3.9
	40	**211-740**	41	40	8	3.9
	50	**211-741**	52	50	8	3.9
Ring: **stainless steel** 316L/1.4404 Seal: elastomer **FPM**	10	**211-742**	12	10	8	3.9
	16	**211-743**	17	16	8	3.9
	20	**211-744**	22	20	8	3.9
	25	**211-745**	26	25	8	3.9
	32	**211-746**	34	32	8	3.9
	40	**211-747**	41	40	8	3.9
	50	**211-748**	52	50	8	3.9
Ring: **stainless steel** 316L/1.4404 Seal: elastomer **NBR**	10	**211-749**	12	10	8	3.9
	16	**211-750**	17	16	8	3.9
	20	**211-751**	22	20	8	3.9
	25	**211-752**	26	25	8	3.9
	32	**211-753**	34	32	8	3.9
	40	**211-754**	41	40	8	3.9
	50	**211-755**	52	50	8	3.9
Ring: **stainless steel** 316L/1.4404 Seal: elastomer **EPDM**	10	**211-756**	12	10	8	3.9
	16	**211-757**	17	16	8	3.9
	20	**211-758**	22	20	8	3.9
	25	**211-759**	26	25	8	3.9
	32	**211-760**	34	32	8	3.9
	40	**211-761**	41	40	8	3.9
	50	**211-762**	52	50	8	3.9
Ring: **stainless steel** 316L/1.4404 Seal: elastomer **VMQ** (silicone)	10	**211-763**	12	10	8	3.9
	16	**211-764**	17	16	8	3.9
	20	**211-765**	22	20	8	3.9
	25	**211-766**	26	25	8	3.9
	32	**211-767**	34	32	8	3.9
	40	**211-768**	41	40	8	3.9
	50	**211-769**	52	50	8	3.9



Seals (continued)

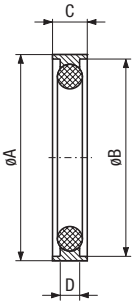
Centering Ring without O-Ring

	DN … ISO-KF	Part No.	A	B	C
Aluminum 6026/EN AW-6026 T6	10	**201-301**	12	10	8
	16	**201-302**	17	16	8
	20	**201-303**	22	20	8
	25	**201-304**	26	25	8
	32	**201-305**	34	32	8
	40	**201-306**	41	40	8
	50	**201-307**	52	50	8
Stainless steel 303/1.4305	10	**201-308**	12	10	8
	16	**201-309**	17	16	8
	20	**201-310**	22	20	8
	25	**201-311**	26	25	8
	32	**201-312**	34	32	8
	40	**201-313**	41	40	8
	50	**201-314**	52	50	8
Stainless steel 316L/1.4404	10	**201-375**	12	10	8
	16	**201-376**	17	16	8
	20	**201-377**	22	20	8
	25	**201-378**	26	25	8
	32	**201-379**	34	32	8
	40	**201-380**	41	40	8
	50	**201-381**	52	50	8



External Centering Ring

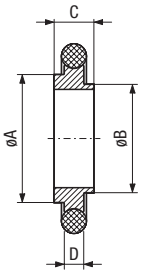
	DN … ISO-KF	Part No.	A	B	C	D
Ring: **aluminum** 6026 Seal: elastomer **CR**	10-16	**211-081**	32	30.2	7	3.9
	20-25	**211-082**	42	40.2	7	3.9
	32-40	**211-083**	57	55.2	7	3.9
	50	**211-084**	77	75.2	7	3.9
Ring: **aluminum** 6026 Seal: elastomer **FPM**	10-16	**211-085**	32	30.2	7	3.9
	20-25	**211-086**	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
Ring: **aluminum** 6026 Seal: elastomer **NBR**	10-16	**211-700**	32	30.2	7	3.9
	20-25	**211-701**	42	40.2	7	3.9
	32-40	**211-702**	57	55.2	7	3.9
	50	**211-703**	77	75.2	7	3.9
Ring: **aluminum** 6026 Seal: elastomer **EPDM**	10-16	**211-704**	32	30.2	7	3.9
	20-25	**211-705**	42	40.2	7	3.9
	32-40	**211-706**	57	55.2	7	3.9
	50	**211-707**	77	75.2	7	3.9
Ring: **aluminum** 6026 Seal: elastomer **VMQ** (silicone)	10-16	**211-708**	32	30.2	7	3.9
	20-25	**211-709**	42	40.2	7	3.9
	32-40	**211-710**	57	55.2	7	3.9
	50	**211-711**	77	75.2	7	3.9



Seals (continued)

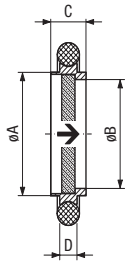
Reducing Centering Ring

		DN … ISO-KF	Part No.	A	B	C	D	E
Ring:	**aluminum** 6026	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** 6026	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:	**aluminum** 6026	10 / 16	**211-712**	17	10	12	8	3.9
Seal:	elastomer **NBR**	20 / 25	**211-713**	26	20	22	8	3.9
		32 / 40	**211-714**	41	32	34	8	3.9
Ring:	**aluminum** 6026	10 / 16	**211-715**	17	10	12	8	3.9
Seal:	elastomer **EPDM**	20 / 25	**211-716**	26	20	22	8	3.9
		32 / 40	**211-717**	41	32	34	8	3.9
Ring:	**aluminum** 6026	10 / 16	**211-718**	17	10	12	8	3.9
Seal:	elastomer **VMQ** (silicone)	20 / 25	**211-719**	26	20	22	8	3.9
		32 / 40	**211-720**	41	32	34	8	3.9
Ring:	**stainless steel** 303/1.4305	10 / 16	**211-721**	17	10	12	8	3.9
Seal:	elastomer **CR**	20 / 25	**211-722**	26	20	22	8	3.9
		32 / 40	**211-723**	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
Ring:	**stainless steel** 303/1.4305	10 / 16	**211-724**	17	10	12	8	3.9
Seal:	elastomer **NBR**	20 / 25	**211-725**	26	20	22	8	3.9
		32 / 40	**211-726**	41	32	34	8	3.9
Ring:	**stainless steel** 303/1.4305	10 / 16	**211-727**	17	10	12	8	3.9
Seal:	elastomer **EPDM**	20 / 25	**211-728**	26	20	22	8	3.9
		32 / 40	**211-729**	41	32	34	8	3.9
Ring:	**stainless steel** 303/1.4305	10 / 16	**211-730**	17	10	12	8	3.9
Seal:	elastomer **VMQ** (silicone)	20 / 25	**211-731**	26	20	22	8	3.9
		32 / 40	**211-732**	41	32	34	8	3.9



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/1.4404	25	**211-092**	26	23	8	3.9	4.2m³/h
		40	**211-094**	41	38	8	3.9	11.3m³/h
		50	**211-095**	52	48	8	3.9	18.1m³/h



Pore size: 0.02 mm

* Air at 20°C, 200 mbar differential pressure

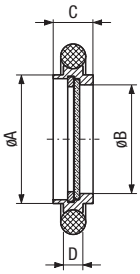
→ Recommended gas flow direction

Seals (continued)

Centering Ring With Fine Filter

Inner ring: stainless steel 303/1.4305
Snab ring: stainless steel 304/1.4301
Seal: elastomer FPM
Filter: stainless steel 316L/1.4404

DN … ISO-KF	Part No.	A	B	C	D
10	**211-096**	12	9	8	3.9
16	**211-097**	17	13	8	3.9
25	**211-098**	26	22	8	3.9
40	**211-099**	41	35.5	8	3.9
50	**211-100**	52	45.7	8	3.9

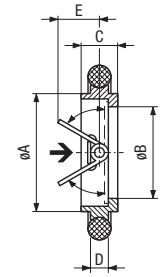


Pore size: 0.004 mm
Degree of separation at 0.001 mm up to 98%

Centering Ring With Throttle

Ring: aluminum 6082
Inner parts: stainless steel 301/1.4310
stainless steel 303/1.4305
Seal: elastomer FPM

DN … ISO-KF	Part No.	A	B	C	D	E
16	**211-622**	17	13	8	3.9	6.2
25	**211-623**	26	18	8	3.9	9
40	**211-624**	41	30	8	3.9	14.3
50	**211-625**	52	42	8	3.9	19.9

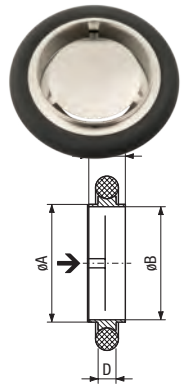


→ Recommended gas flow direction

Centering Ring with Baffle

RIng: stainless steel 303 / 1.4305
Baffle: stainless steel 301 / 1.4310
Seal: FPM

DN ... ISO-KF	Part No.	A	B	C
20 – 25	**211-113**	26	25	8

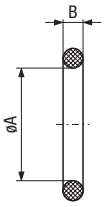


→ Recommended gas flow direction

Seals (continued)

O-Ring

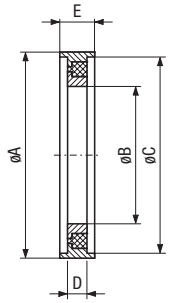
	DN … ISO-KF	Part No.	A	B	Set of
Elastomer CR	10	**211-146**	15	5	10 pcs.
	16	**211-147**	18	5	10 pcs.
	20	**211-148**	25	5	10 pcs.
	25	**211-149**	28	5	10 pcs.
	32	**211-150**	40	5	10 pcs.
	40	**211-151**	42	5	10 pcs.
	50	**211-152**	55	5	10 pcs.
Elastomer FPM	10	**211-153**	15	5	10 pcs.
	16	**211-154**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

Inner ring: stainless steel 304/1.4301
Outer ring: aluminum 5012/–
Seal: indium

DN … ISO-KF	Part No.	A	B	C	D	E
10-16	**211-162**	32	18	30	3.9	7
20-25	**211-163**	42	28	40	3.9	7
32-40	**211-164**	57	43	55	3.9	7
50	**211-165**	77	63	75	3.9	7

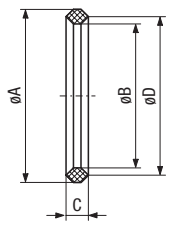


Working temperature -196° … +60°C

Aluminum Seal

Aluminum annealed 6082

DN … ISO-KF	Part No.	A	B	C	D	*
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	211-172
32-40	**211-169**	50.6	44.6	4.5	47.6	211-173
50	**211-170**	65.6	59.6	4.5	62.6	211-174

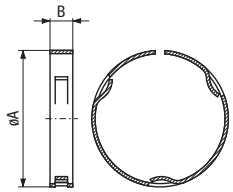


Set of 3 pieces
* With support ring

Seals (continued)

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
	50	**211-174**	77	7	211-170



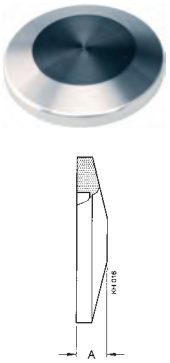
Reusable

ISO–KF Small Flange Components

Flanges

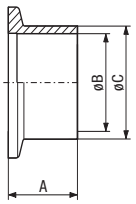
Blank Flange

	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
Stainless steel 316L/1.4404	10	**211-791**	5
	16	**211-792**	5
	25	**211-793**	5
	40	**211-794**	5
	50	**211-795**	6



Flange with Tube, Short

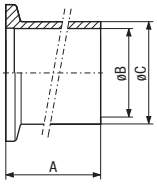
	DN ... ISO-KF	Part No.	A	B	C
Steel –/1.0037	10	**211-201**	20	12	16
	16	**211-202**	20	16	20
	25	**211-203**	20	26	30
	40	**211-204**	20	41	45
	50	**211-205**	20	51	55
Stainless steel 304/1.4301	10	**211-211**	20	12	16
	16	**211-212**	20	16	20
	25	**211-213**	20	26	30
	40	**211-214**	20	41	45
	50	**211-215**	20	50	54
Stainless steel 316L/1.4404	10	**211-826**	20	12	16
	16	**211-827**	20	16	20
	25	**211-828**	20	26	30
	40	**211-829**	20	41	45
	50	**211-830**	20	50	54



Flanges (continued)

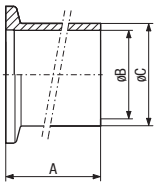
Flange with Tube, Medium

	DN ... ISO-KF	Part No.	A	B	C
Stainless steel 304/1.4301	10	**211-221**	30	12	16
	16	**211-222**	30	16	20
	25	**211-223**	30	26	30
	40	**211-224**	30	41	45
	50	**211-225**	30	50	54
Stainless steel 316L/1.4404	10	**211-831**	30	12	16
	16	**211-832**	30	16	20
	25	**211-833**	30	26	30
	40	**211-834**	30	41	45
	50	**211-835**	30	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
Stainless steel 316L/1.4404	10	**211-836**	70	12	16
	16	**211-837**	70	16	20
	25	**211-838**	70	26	30
	40	**211-839**	70	41	45
	50	**211-840**	70	50	54

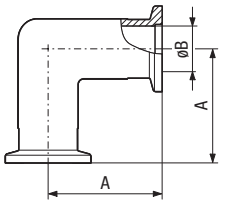


ISO-KF Small Flange Components

Pipe Fittings

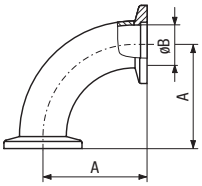
Elbow 90° Aluminum

	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



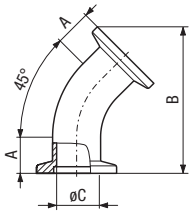
Elbow 90° Stainless Steel

	DN ... ISO-KF	Part No.	A	B
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°

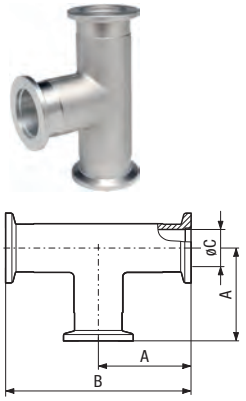
	DN ... ISO-KF	Part No.	A	B	C
Stainless steel 304/1.4301	16	**211-307**	13.6	55	15
	25	**211-308**	16.7	68.8	25
	40	**211-309**	15.1	87.7	37



Pipe Fittings (continued)

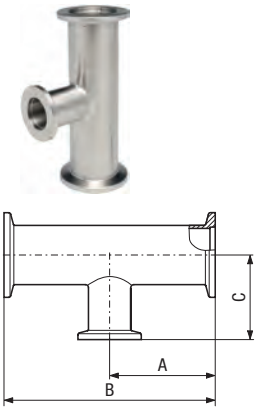
Tee

	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



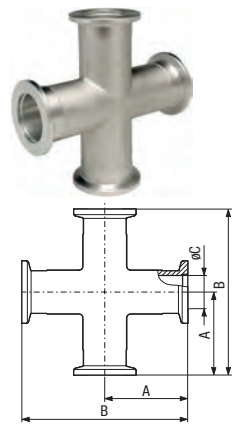
Reducing Tee

	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



Cross

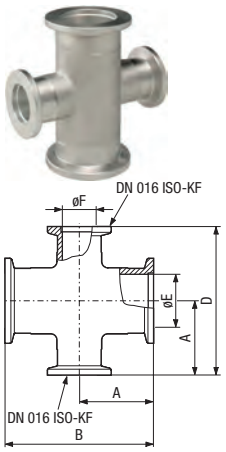
	DN ... ISO-KF	Part No.	A	B	C
Aluminum 6082	10	**211-266**	30	60	12
	16	**211-267**	40	80	16
	25	**211-268**	50	100	25
	40	**211-269**	65	130	39
Stainless steel 304/1.4301	10	**211-296**	30	60	12
	16	**211-297**	40	80	16
	25	**211-298**	50	100	25
	40	**211-299**	65	130	40.5
	50	**211-300**	70	140	53



Pipe Fittings (continued)

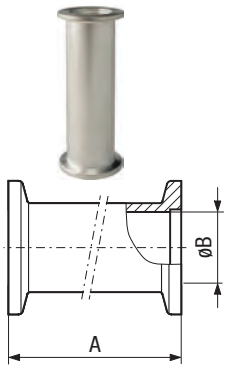
Reducing Cross

	DN ... ISO-KF	Part No.	A	B	C	D	E	F
Aluminum 6082	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



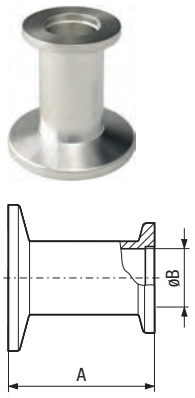
Intermediate Piece

	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	211-599	76.2	40.5
	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

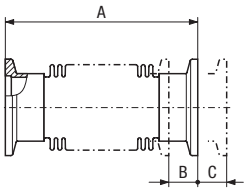


ISO-KF Small Flange Components

Bellows/Hose With Flanges

Bellows

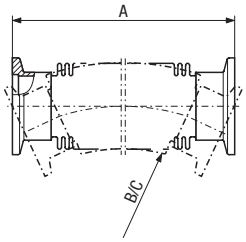
	DN ... ISO-KF	Part No.	A	B	C	D	E
Flanges: stainless steel 304/1.4301	10	**211-326**	70	3.5	3	23°	5
Bellows: stainless steel 316Ti/1.4571	16	**211-327**	70	6.4	4.1	21°	4
	25	**211-328**	80	8	5	17°	3.5
	40	**211-329**	100	11	7	15°	7
	50	**211-330**	100	10	6	15°	8



Max. internal pressure: 4 bar
A = unstressed length
D = max. deviation from axis
E = lateral displacement

Metal Hose, High Flexible

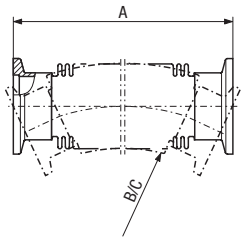
	DN ... ISO-KF	Part No.	A	B	C
Flanges: stainless steel 304/1.4301	10	**211-331**	250	100	17
Bellows: stainless steel 316L/1.4404	10	**211-332**	500	100	17
	10	**211-333**	750	100	17
	10	**211-334**	1000	100	17
	16	**211-335**	250	70	50
	16	**211-336**	500	70	50
	16	**211-337**	750	70	50
	16	**211-338**	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
Max. internal pressure: 4 bar	50	**211-348**	500	200	130
B = radius for multiple bending	50	**211-349**	750	200	130
C = radius for single bend	50	**211-350**	1000	200	130



Bellows/Hose With Flanges (continued)

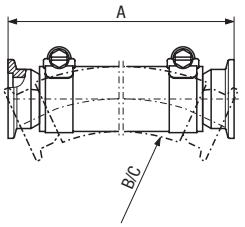
Metal Hose, Flexible

	DN ... ISO-KF	Part No.	A	B
Flanges: 316/(304)	10	**211-851**	250	40
Bellows: 316L/(316Ti)	10	**211-852**	500	40
	10	**211-853**	750	40
	10	**211-854**	1000	40
	16	**211-857**	250	60
	16	**211-858**	500	60
	16	**211-859**	750	60
	16	**211-860**	1000	60
	16	**211-861**	1500	60
	16	**211-862**	2000	60
	25	**211-863**	250	115
	25	**211-864**	500	115
	25	**211-865**	750	115
	25	**211-866**	1000	115
	25	**211-867**	1500	115
	25	**211-868**	2000	115
	40	**211-869**	250	149
	40	**211-870**	500	149
	40	**211-871**	750	149
	40	**211-872**	1000	149
Max. internal pressure: 4 bar	40	**211-873**	1500	149
B = radius for single bend	40	**211-874**	2000	149



PVC Hose

		DN ... ISO-KF	Part No.	A	B	C
Hose:	PVC with cast in steel spiral	16	**211-406**	500	130	65
Nipple:	aluminum 6082/–	16	**211-407**	1000	130	65
Hose clamp:	stainless steel 430/–	16	**211-509**	1500	130	65
		25	**211-408**	500	200	100
		25	**211-409**	1000	200	100
		25	**211-412**	2000	200	100
B = radius for multiple bending		40	**211-410**	500	260	130
C = radius for single bend		40	**211-411**	1000	260	130

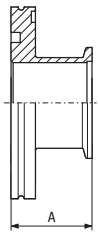


ISO-KF Small Flange Components

Transition Pieces

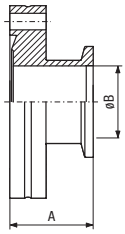
Adaptor ISO-KF/ISO-K

	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
	25 / 63	**212-176**	50



Adaptor ISO-KF/CF-F

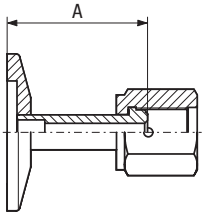
	ISO-KF/CF-F	Part No.	A	B
Stainless steel 304L/1.4306	16 / 16	**213-251**	35	16
	25 / 16	**213-252**	35	16
	16 / 40	**213-254**	30	16
	25 / 40	**213-255**	30	26
	40 / 40	**213-256**	50	37
	40 / 63	**213-259**	35	41
	40 / 100	**213-262**	50	41



Adaptor ISO-KF/VCR Female

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

Width across flats in inch

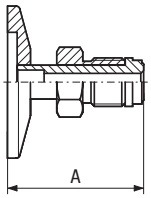


Transition Pieces (continued)

Adaptor ISO-KF/VCR Male

Flange: stainless steel 304/1.4301
Nut: stainless steel 316L/1.4435

ISO-KF/VCR	Part No.	A
16 / 1/4 in.	**211-362**	35.8
25 / 1/4 in.	**211-481**	35.8
25 / 1/2 in.	**211-363**	40.6
40 / 3/4 in.	**211-364**	53.3

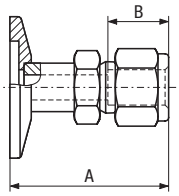


Width across flats in inch

Adaptor ISO-KF/Swagelok

Flange: stainless steel 304/1.4301
Nut: stainless steel 316L/1.4435

ISO-KF/Swagelok	Part No.	A	B
16 / 6 mm	**211-356** [1]	37	15.3
25 / 10 mm	**211-357** [1]	45	17.2
40 / 16 mm	**211-358** [1]	53	24.4
16 / 1/8 in.	**211-476** [2]	35	12.7
25 / 1/4 in.	**211-477** [2]	37	15.5
40 / 1/4 in.	**211-478** [2]	37	15.5
40 / 1/2 in.	**211-479** [2]	47	23

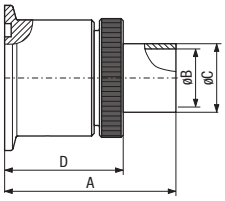


[1] Width across flats metric (SI)
[2] Width across flats in inch

Glass Tube Connection

Flange: aluminum 6082/–
Sealing: elastomer FPM
Tube: glas Pyrex

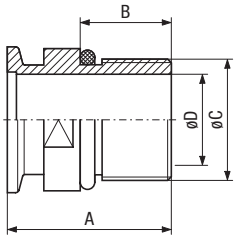
DN ... ISO-KF	Part No.	A	B	C	D
10	**211-351**	50	8	10	30
40	**211-353**	65	22	26	45



Transition Pieces (continued)

Screw-in Flange

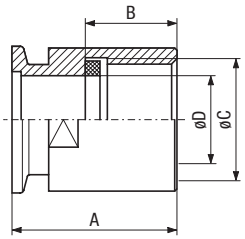
	ISO-KF/DN	Part No.	A	B	C	D
Flange: stainless steel 303/1.4305	16 / M16x1.5	**211-372**	42	11.5	M16x1.5	10.5
Sealing: elastomer FPM	10 / G 3/8 in.	**211-366**	35	15	G 3/8 in.	12
	16 / G 1/2 in.	**211-367**	35	15	G 1/2 in.	16
	25 / G 1 in.	**211-368**	45	25	G 1 in.	25
	40 / G 1 1/2 in.	**211-369**	50	30	G 1 1/2 in.	41



Width across flats metric (SI)

Screw-on Flange

	ISO-KF/DN	Part No.	A	B	C	D
Flange: stainless steel 303/1.4305	10 / G 3/8 in.	**211-376**	35	15	G 3/8 in.	10
Sealing: elastomer FPM	16 / G 1/2 in.	**211-377**	35	15	G 1/2 in.	15
	25 / G 1 in.	**211-378**	45	25	G 1 in.	24
	40 / G 1 1/2 in.	**211-379**	50	30	G 1 1/2 in.	38



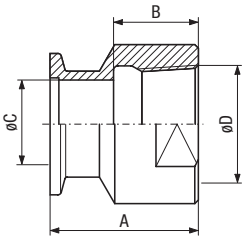
Width across flats metric (SI)

Transition Pieces (continued)

Adaptor ISO-KF/NPT Female

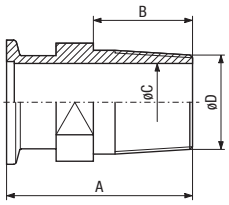
	ISO-KF/NPT	Part No.	A	B	C	D
Stainless steel 303 / 1.4305	16 / 1/8 in.	**211-566**	19	10	12	1/8-27 NPT
	16 / 1/4 in.	**211-567**	19	13	15	1/4-18 NPT
	25 / 1/8 in.	**211-569**	19	10	12	1/8-27 NPT
	25 / 1/4 in.	**211-570**	19	13	15	1/4-18 NPT
	25 / 1/2 in.	**211-571**	26	18	25	1/2-14 NPT
	25 / 1 in.	**211-572**	42	24	25	1-11 1/2 NPT
	40 / 1/4 in.	**211-574**	19	13	15	1/4-18 NPT
	40 / 1/2 in.	**211-575**	26	18	25	1/2-14 NPT
	40 / 1 in.	**211-576**	26	23	29	1-11 1/2 NPT

Width across flats in inch



Adaptor ISO-KF/NPT Male

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



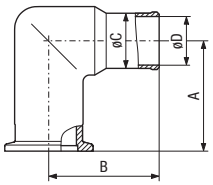
ISO-KF Small Flange Components

Hose, Hose Connection

Hose Adaptor 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

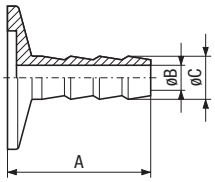
C = nominal connection for sleeve / hose



Hose Adaptor 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

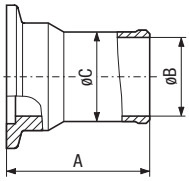
C = nominal connection for hose



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

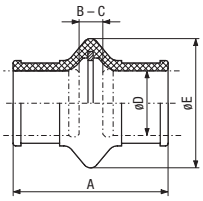


Hose, Hose Connection (continued)

Sleeve with Hose Clamp

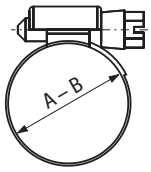
	DN ... ISO-KF	Part No.	A	B	C	D	E
Hose clamp: stainless steel	16	**211-417**	58	7	14	16	44
Sleeve: elastomer CR	25	**211-418**	60	9	16	25	50
	40	**211-419**	64	13	20	40	68

Max. internal pressure: 1 bar



Hose Clamp

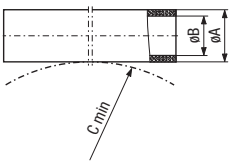
	DN ... ISO-KF	Part No.	A	B
Stainless steel 430/–	16	**211-461**	13	32
	25	**211-462**	19	44
	40	**211-463**	26	76



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
	40	**211-444**	50	40	260

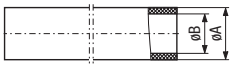
or vacuum applications
Indicate length in meters



Rubber Hose

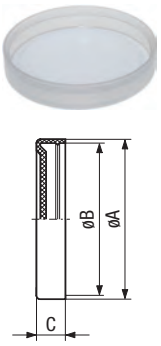
	DN ... ISO-KF	Part No.	A	B
For vacuum applications	10	**211-451**	17	7
	16	**211-452**	25	10
	20	**211-453**	32	16

Indicate length in meters
Hardness: 45 ± 5 Shore A
Temperature: -30 … +75 °C



Hose, Hose Connection (continued)

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

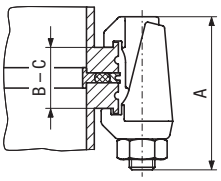


ISO–K Clamp Flange Components

Connection Elements

Clamp

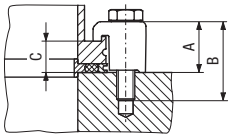
	DN ... ISO-K	Part No.	A	B	C	Set of	Thread
Steel zinc plated 1045/–	63-250	**212-225**	60	17	27	4 pcs.	M10
	320-500	**212-226**	78	27	39	4 pcs.	M10
	630	**212-227**	88	31	49	4 pcs.	
Stainless steel 316/–	63-250	**212-228**	61	18	28	4 pcs.	
	320-630	**212-240**	82	29	47	4 pcs.	



Clamp
Without groove

	DN ... ISO-K	Part No.	A	B	C	Set of
Clamp: aluminum 6082/–	160-250	**212-432**	23	35	13.9	4 pcs.
Screw: steel zinc plated 1045/–						
Clamp: steel zinc plated 1045/–	63-100	**212-231**	22.5	35	13.9	4 pcs.
Screw: steel zinc plated 1045/–	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.

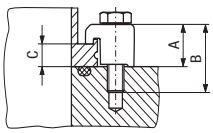
Clamping flange and base plate without groove



Clamp
Base plate with groove

	DN ... ISO-K	Part No.	A	B	C	Set of
Clamp: steel zinc plated 1045/–	63-100	**212-235**	18.6	30	10	4 pcs.
Screw: steel zinc plated 1045/–	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.

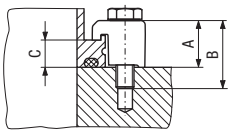
Clamping flange / base plate with groove



Connection Elements (continued)

Clamp Flange with groove

	DN ... ISO-K	Part No.	A	B	C	Set of
Steel zinc plated 1045/–	63-100	**212-247**	20.6	30	12	4 pcs.
	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.

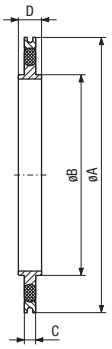


Clamping flange with groove / base plate

ISO–K Clamp Flange Components

Seals

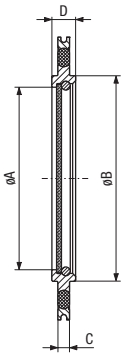
Centering Ring		DN ... ISO-K	Part No.	A	B	C	D
Inner ring:	aluminum 6082/–	63	**212-251**	96	70	3.9	8
Outer ring:	aluminum 6082/–	80	**212-091**	109	83	3.9	8
Seal:	elastomer CR	100	**212-252**	128	102	3.9	8
		160	**212-253**	179	153	3.9	8
		200	**212-254**	239	213	3.9	8
		250	**212-255**	287	261	3.9	8
		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 ring:	aluminum 6082/–	63	**212-261**	96	70	3.9	8
Outer ring:	aluminum 6082/–	80	**212-092**	109	83	3.9	8
Seal:	elastomer FPM	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

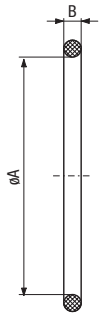
		DN ... ISO-K	Part No.	A	B	C	D
Inner ring:	stainless steel 304/–	63	**212-291**	62	69.8	3.9	8
Outer ring:	aluminum 6082/–	100	**212-292**	94	101.8	3.9	8
Seal:	elastomer FPM						
Snap ring:	stainless steel 304/–						
Filter grit:	stainless steel 304/–						
Filter:	stainless steel 316L/–						



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.
Elastomer FPM	63	**212-392**	75.6	5.3	5 pcs.
	80	**212-393**	88.3	5.3	5 pcs.
	100	**212-394**	107.2	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.
	320	**212-366**	329.6	7	–
	400	**212-367**	405.3	7	–
	500	**212-368**	506.9	7	–
	630	**212-369**	658.9	7	–

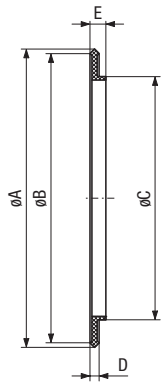


Seals (continued)

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

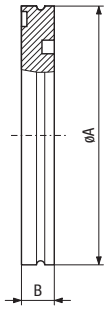


ISO-K Clamp Flange Components

Flanges

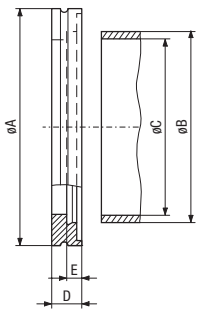
Blank Flange

	DN ... ISO-K	Part No.	A	B
Aluminum 6082	63	**212-441**	95	12
	100	**212-442**	130	12
	160	**212-443**	180	12
	200	**212-444**	240	12
	250	**212-445**	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



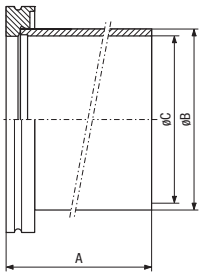
Welding Flange

	DN ... ISO-K	Part No.	A	B	C	D	E
Steel –/1.0831	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	213.1	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	254	250	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 –/1.0831	63	**212-041**	100	76.1	70.3
Tube: steel –/1.0308	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	212.7
	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

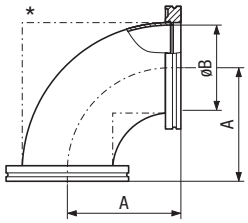


ISO-K Clamp Flange Components

Pipe Fittings

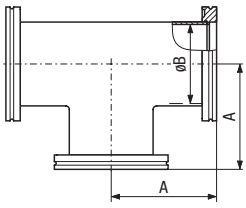
Elbow 90°

	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



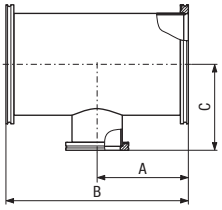
Tee

	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

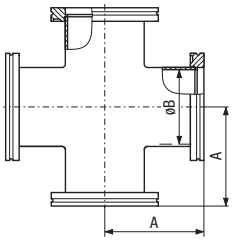
	DN ... ISO-K	Part No.	A	B	C
Stainless steel 304/–	160/63	**212-196**	138	276	130
	160/100	**212-197**	138	276	131
	250/200	**212-198**	190	380	208



Pipe Fittings (continued)

Cross

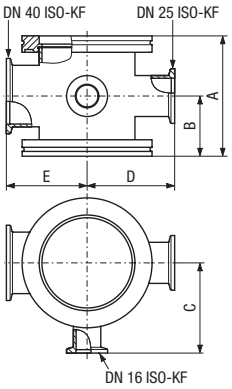
	DN ... ISO-K	Part No.	A	B
Stainless steel 304/–	63	**212-121**	88	66
	100	**212-122**	108	100
	160	**212-123**	138	150
	200	**212-124**	178	213
	250	**212-125**	208	250



Reducing Cross

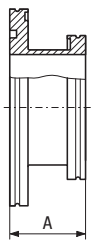
	DN ... ISO-K	Part No.	A	B	C	D	E
Stainless steel 304/–	63	**212-131**	88	44	66	64	59
	100	**212-132**	100	50	82	80	77
	160	**212-133**	100	50	107	107	105

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



Reducer

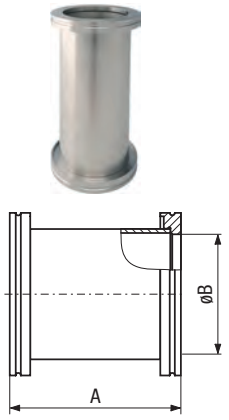
	DN ... ISO-K	Part No.	A
Stainless steel 303/–	80/63	**212-084**	50
	100/63	**212-161**	50
	160/100	**212-163**	50
	200/160	**212-166**	50
	250/160	**212-169**	50
	250/200	**212-170**	50



Pipe Fittings (continued)

Intermediate Piece

	DN ... ISO-K	Part No.	A	B
Stainless steel 304/–	63	**212-191**	100	70
	63	**212-192**	176	70
	63	**212-193**	500	70

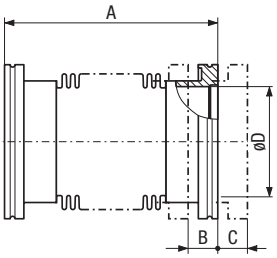


ISO–K Clamp Flange Components

Bellows / Hose With Flanges

Bellows

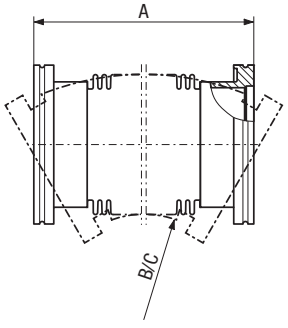
	DN ... ISO-K	Part No.	A	B	C	D	E
Flanges: stainless steel 304/–	63	**212-201**	132	20	20	66	30°
Bellows: stainless steel 316Ti/–	100	**212-202**	132	28	28	95	30°
	160	**212-203**	150	22	22	153	14°
	200	**212-204**	150	20	20	213	12°
	250	**212-205**	200	30	30	261	13°
	320	**212-206**	250	50	50	313	7.5°



Max. internal pressure 1.5 bar
A = unstressed length
E = max. deviation from axis

Metal Hose

	DN ... ISO-K	Part No.	A	B	C
Flanges: stainless steel 304/–	63	**212-211**	250	330	90
Bellows: stainless steel 316Ti/–	63	**212-212**	500	330	90
	63	**212-213**	750	330	90
	63	**212-214**	1000	330	90
	100	**212-215**	250	530	130
	100	**212-216**	500	530	130
	100	**212-217**	750	530	130
	100	**212-218**	1000	530	130
	160	**212-222**	1000	1050	215



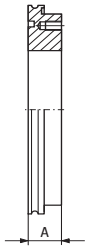
Max. internal pressure 1.5 bar
B = radius for multiple bending
C = radius for single bending

ISO-K Clamp Flange Components

Transition Pieces

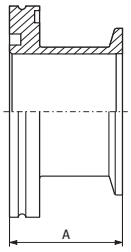
Adaptor Flange ISO-K/ISO-F

	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



Adaptor Flange ISO-K/ISO-KF

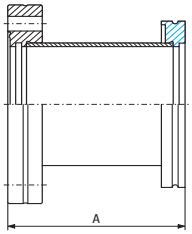
	ISO-K / ISO-KF	Part No.	A
Aluminum 6082/–	63/40	**212-171**	40
	63/50	**212-172**	45
Stainless steel 303/–	63/25	**212-176**	50
	63/40	**212-173**	40
	63/50	**212-174**	45
	100/40	**212-175**	40



Transition Pieces (continued)

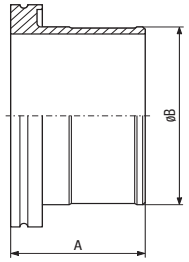
Adaptor Flange CF/ISO-K

	ISO-CF / ISO-K	Part No.	A	B	C
Stainless steel 304L/1.4306	63/63	**213-271**	90	1	1
	100/100	**213-272**	90	1	1
	160/160	**213-273**	90	1.5	1.5



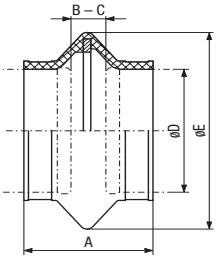
Adaptor Flange DN/ISO-K

	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 304	100	**212-187**	72	8	26	106	150
		160	**212-188**	72	8	26	155	200

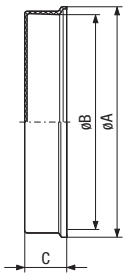


Max. internal pressure: 1 bar

ISO-K Clamp Flange Components

Protective Lids

Protective Lid	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

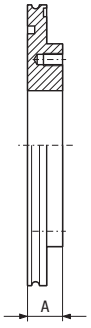
Flange Components

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

Adaptor Flange 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

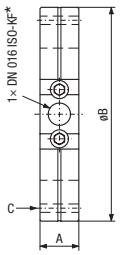


Flange Components (continued)

Measurement Flange

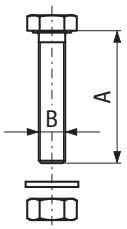
	DN ... ISO-F	Part No.	A	B	C
Aluminum 6082/3.2315	100	**212-142**	30	165	M 8
	160	**212-143**	30	225	M 10
Stainless steel 304/1.4301	63	**212-146**	30	130	M 8
	100	**212-147**	30	165	M 8
	160	**212-148**	30	225	M 10

*Claw grip DN 16 ISO-KF included



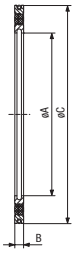
Set of Hexagon Bolts

	DN ... ISO-F	Part No.	A	B	Set of
Steel zinc plated	63-100	**212-241**	40	M8	8 pcs.
	160-250	**212-242**	50	M10	12 pcs.
	320-500	**212-243**	70	M12	16 pcs.
	630	**212-244**	80	M12	20 pcs.



Sealing Disk

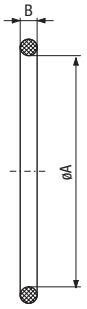
	DN ... ISO-F	Part No.	A	B	C
Disk: aluminum 6082/3.2315	63	**212-321**	73	3.9	98
O-Ring: elastomer CR	100	**212-322**	107	3.9	132
	160	**212-323**	160	3.9	185
	250	**212-325**	270	3.9	295
	320	**212-326**	330	5.6	375
	400	**212-327**	415	5.6	460
	500	**212-328**	515	5.6	560
	630	**212-329**	656	5.6	701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



Flange Components (continued)

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	



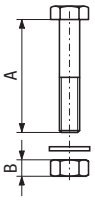
UHV CF Components

Connection Elements

Hexagonal Bolts with Nuts

Bolt: stainless steel 316/1.4401
Washer: stainless steel 304/1.4301
Nut: stainless steel 316/1.4401

DN ... CF	Part No.	A	B	Set of	C*
16	**213-401**	20	3.2	25 x M4	3.5 Nm
40	**213-402**	35	5	25 x M6	10 Nm
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

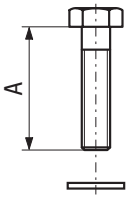


* Tightening torque

Hexagonal Bolts without Nuts

Bolt: stainless steel 316/1.4401
Washer: stainless steel 304/1.4301

DN ... CF	Part No.	A	Set of	B*
16	**213-411**	16	25 x M4	4 Nm
40	**213-412**	25	25 x M6	10 Nm
63-160	**213-413**	35	25 x M8	20 Nm

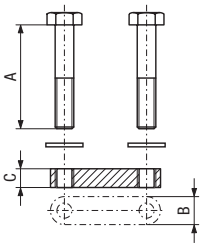


* Tightening torque

Hexagonal Bolts with Duo Nuts

Bolt: stainless steel 316/1.4401
Washer: stainless steel 304/1.4301
Duo nut: stainless steel 316/1.4401

DN...CF	Part No.	A	B	C	Duo nut	D*
16	**213-421**	20	7	4	6 x M4/3	4 Nm
40	**213-422**	35	10	5	6 x M6/3	10 Nm
63	**213-423**	45	12	8	8 x M8/4	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

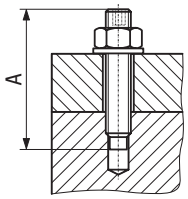


* Tightening torque

Connection Elements (continued)

Set of Stud Screws

		DN ... CF	Part No.	A	Set of	B*
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



* Tightening torque

Thread Lubricant

		Part No.	Temperature resistance
C100	28g	**214-231**	1000°C

Remains fully effective for at least 10 bakeout cycles

UHV CF Components

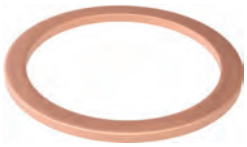
Seals

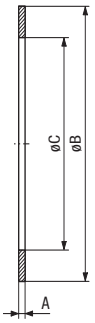
Quality copper gaskets and silver plated copper gaskets are strictly designed for use in high-end UHV applications. These gaskets, made of OFHC copper, are inspected, cleaned and individually packed to ensure the highest quality.

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.
	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.

Individually packed

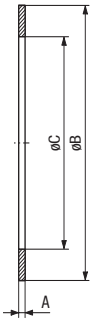




Copper Gasket Silver Plated

	DN ... CF	Part No.	A	B	C	Set of
High quality	16	**213-461**	2.1	21.3	16.2	10 pcs.
Copper OFHC –/2.0040	40	**213-462**	2.1	48.1	39	10 pcs.
Double silver plated	63	**213-463**	2.1	82.4	63.6	10 pcs.
	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.

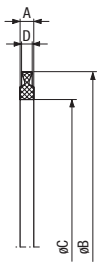
Individually packed



Seals (continued)

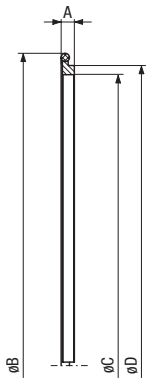
FPM Seal

	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 Support ring: aluminum 6082/–	250	**213-397**	5	266.5	248.3	256.2	1 pcs.

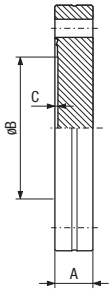


UHV CF Components

Flanges

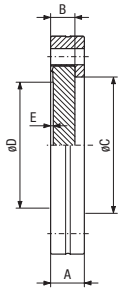
Blank Flange

	DN ... CF-F	Part No.	A	B	C
Stainless steel 304L/1.4306	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**	24.5	256	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

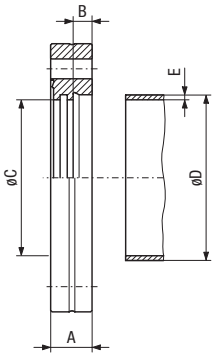
	DN ... CF-R	Part No.	A	B	C	D	E
Stainless steel 304L/1.4306	16	**213-011**	7.5	5.8	18.6	14	1.4
	40	**213-012**	13	7.6	41	38	1.4
	63	**213-013**	17.5	12.6	71	66	1.4
	100	**213-014**	20	14.3	109	104	1.4
	160	**213-015**	22	15.8	160	155	1.4
	200	**213-016**	24.5	17.1	206	205	1.4
	250	**213-017**	24.5	18	257	256	1.4
Plate: Stainless steel 316LN/1.4429 External ring: 304L/1.4306	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)

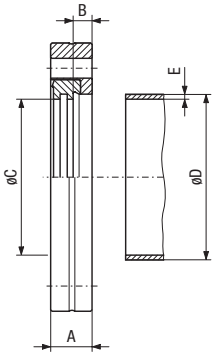
Welding Flange

	DN ... CF-F	Part No.	A	B	C	D	E
Stainless steel 304L/1.4306	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

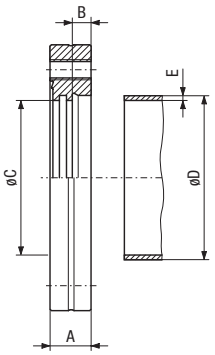
	DN ... CF-R	Part No.	A	B	C	D	E
Stainless steel 304L/1.4306	16	**213-041**	7.5	3.3	17.2	18	1
	40	**213-042**	13	7.5	39.5	40	1.5
	63	**213-043**	17.5	8	66	70	2
	100	**213-044**	20	9	104	108	2
	160	**213-045**	22	10	155	159	2
	200	**213-046**	24.5	12	205	205	2.5
	250	**213-047**	24.5	12	256	256	3
Internal ring: Stainless steel 316LN/1.4429	16	**213-141**	7.5	3.3	17.2	18	1
External ring: 304L/1.4306	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)

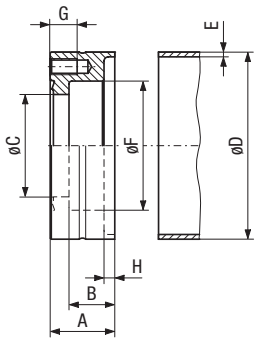
Welding Flange with Tapped Holes

	DN ... CF-F	Part No.	A	B	C	D	E	
Stainless steel 304L/1.4306	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

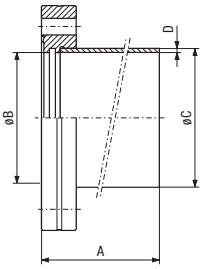
	DN ... CF-F	Part No.	A	B	C	D	E	F	G	F
Stainless steel 304L/1.4306	40	**213-092**	24	17	38	69.5	1.75	48	10	6xM6



Flanges (continued)

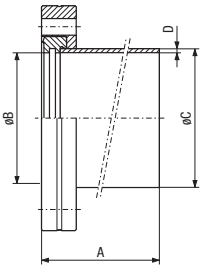
Flange with Tube

	DN ... CF-F	Part No.	A	B	C	D
Stainless steel 304L/1.4306	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

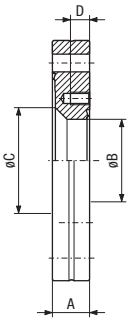
	DN ... CF-R	Part No.	A	B	C	D
Stainless steel 304L/1.4306	16	**213-061**	38	17.2	18	1
	40	**213-062**	63	39.5	40	1.6
	63	**213-063**	105	66	70	2
	100	**213-064**	135	104	108	2
	160	**213-065**	167	155	159	2



Flanges (continued)

Reducing Flange CF-F/CF-F

	DN ... CF-F	Part No.	A	B	C	D	
Stainless steel 304L/1.4306	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
	160/63	**213-079**	24	66	85	13	8xM8
	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

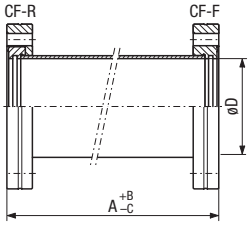


UHV CF Components

Pipe Fittings

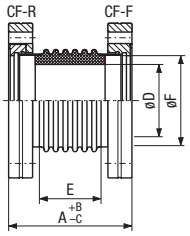
Intermediate Piece

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304L/1.4306	16	**213-201**	76	0.5	0.5	16
	40	**213-202**	126	1	1	37
	63	**213-203**	210	1	1	66
	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 304L/1.4306	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									

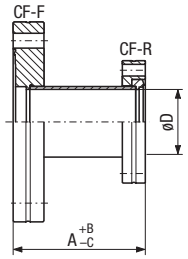


Pipe Fittings (continued)

Reducer CF-F/CF-R

Stainless steel 304L/1.4306

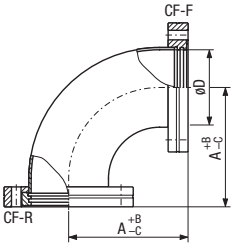
DN ... CF	Part No.	A	B	C	D
40/16	**213-221**	45	1	1	16
63/40	**213-223**	75	1	1	37
100/40	**213-225**	75	1	1	37
100/63	**213-226**	95	1	1	66
160/100	**213-230**	105	1.5	1.5	104



Elbow 90°

Stainless steel 304L/1.4306

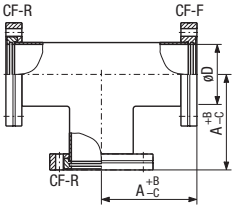
DN ... CF	Part No.	A	B	C	D
16	**213-301**	38	0.5	0.5	15
40	**213-302**	63	0.5	0.5	38
63	**213-303**	105	1	1	66
100	**213-304**	135	1	1	100
160	**213-305**	167	1.5	1.5	150



TEE

Stainless steel 304L/1.4306

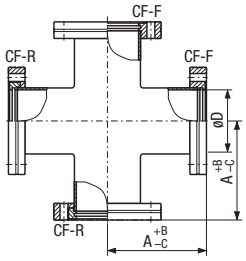
DN ... CF	Part No.	A	B	C	D
16	**213-311**	38	0.5	0.5	15
40	**213-312**	63	0.5	0.5	38
63	**213-313**	105	1	1	66
100	**213-314**	135	1	1	100
160	**213-315**	167	1.5	1.5	150



Pipe Fittings (continued)

Cross

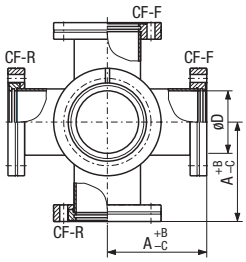
	DN ... CF	Part No.	A	B	C	D
Stainless steel 304L/1.4306	16	**213-321**	38	0.5	0.5	15
	40	**213-322**	63	0.5	0.5	38
	63	**213-323**	105	1	1	66
	100	**213-324**	135	1	1	100
	160	**213-325**	167	1.5	1.5	150



Double Cross Piece

	DN ... CF	Part No.	A	B	C	D
Stainless steel 304L/1.4306	40	**213-332**	63	0.5	0.5	38
	63	**213-333**	105	1	1	66
	100	**213-334**	135	1	1	100
	160	**213-335**	167	1.5	1.5	150

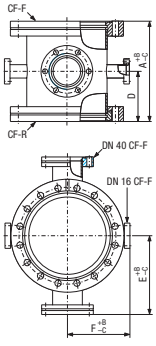
3 × rotatable flanges
3 × fix flanges



Reducing Cross

	DN ... CF	Part No.	A	B	C	D	E	F
Stainless steel 304L/1.4306	100	**213-342**	135	1	1	67.5	106	84

2 × DN 16 CF-F
2 × DN 40 CF-F



INFICON

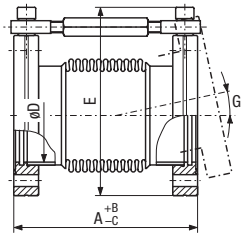
UHV CF Components

Bellows / Hose With Flanges, Compensator

Compensator

	DN...CF-F	Part No.	A	B	C	D	E	F	G
Flanges: stainless steel 304L/1.4306	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	92	192	13	12°

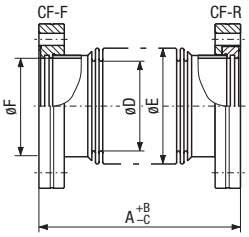
Max. internal pressure for DN 40: 4 bar
Max. internal pressure for DN 63/100: 1.5 bar



Bellows

	DN...CF	Part No.	A	B	C	D	E	F	G
Flanges: stainless steel 304L/1.4306	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°
	63	**213-353**	139	2	2	62	80	66	37°
	100	**213-354**	142	2	2	92	116	102	28°
	160	**213-355**	250	3	3	154	187	153	16°

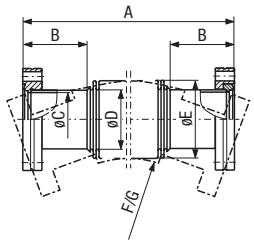
A = unstressed length
Max. internal pressure for DN 40: 4 bar
Max. internal pressure for DN 63 … 106: 1.5 bar



Flexible Metal Hose

	DN...CF	Part No.	A	B	C	D	E	F	G
Flanges: stainless steel 304L/1.4306	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
	40	**213-365**	250	46	36.8	40.5	53	130	100
	40	**213-366**	500	46	36.8	40.5	53	130	100
	40	**213-367**	750	46	36.8	40.5	53	130	100
	40	**213-368**	1000	46	36.8	40.5	53	130	100

F = radius for multiple bending
G = radius for single bending
Max. internal pressure: 5 bar

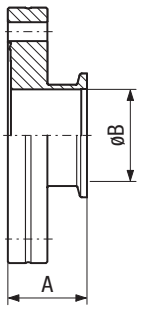


UHV CF Components

Transition Pieces

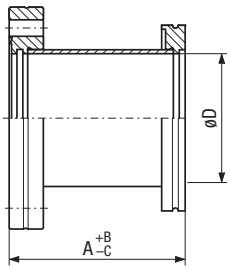
Adaptor CF-F/ISO-KF

	DN...CF-F/ISO-KF	Part No.	A	B
Stainless steel 304L/1.4306	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



Adaptor CF-F/ISO-K

	DN ... CF-F/ISO-K	Part No.	A	B	C	D
Stainless steel 304L/1.4306	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	155



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**	262	253	26.5
	250	**213-447**	308.5	303.5	30.9