

# Технические характеристики

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Ижевск (3412)26-03-58	Набережные Челны (8552)20-53-41	Севастополь (8692)22-31-93	Череповец (8202)49-02-64
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Россия (495)268-04-70	Киргизия (996)312-96-26-47	Казахстан (7172)727-132	

# AGILENT VACUUM VALVE SOLUTIONS

Agilent offers a range of vacuum valves that are engineered for reliability, performance, and value. These valves also optimize conductance, operate in a wide variety of applications, and employ a minimum of moving parts. This reduces wear and particle generation which contributes to their performance and reliability. Agilent valves are manufactured using the highest quality vacuum materials and provide a choice of actuation, and a variety of mounting flanges.

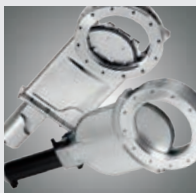
## Agilent High Performance Valves

We are pleased to add to our offering valve products manufactured to the highest international standards. The Series 26 Aluminum Block Valves, Series 11 and 12 Gate Valves, and Series 54 UHV All-Metal Valves are the proven workhorses in their respective application segments. These are easily ordered with any of Agilent's vacuum pumps or other components.

### Agilent High Performance Valves



**Series 26 Aluminum Block Valves**  
Multi-purpose, high cycle life valves; position indication.



**Series 11 Stainless Steel Gate Valves and Series 12 Aluminum Gate Valves**  
Robust, compact, high conductance means of isolating a high vacuum pump.



**Series 54 UHV All-Metal Valves**  
Extreme High Vacuum (XHV) compatible with dynamic all-metal sealing system.

### Agilent Vacuum Valves



**Stainless Steel Tube Valves**  
Provide maximum conductance, low outgassing, and easy installation.



**Electromagnetic Block Valves**  
Rapid spring closure, service-free; eliminate the need for compressed air.



**Variable Leak Valve**  
Unique device provides extremely precise control of gas flow to vacuum system.



# VACUUM VALVES

## Common Applications

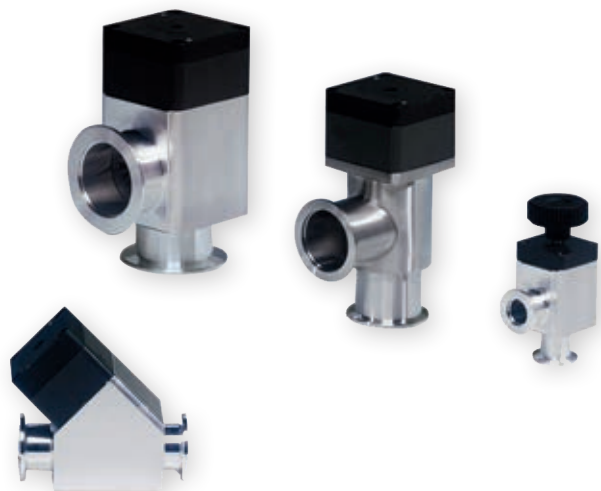
- **Rough Vacuum**
  - Freeze drying
  - Food processing
  - Metal ore refining
  - Steam plant condensers
  - Vacuum distillation
- **Medium Vacuum**
  - Decorative coatings
  - Functional coatings
  - Chemical processes
  - Electron microscopes
  - Microscopy sample processing
- **High/Ultrahigh Vacuum**
  - Physics research
    - Optics
    - High energy
  - Semiconductor manufacturing
  - Electron tube manufacturing
  - Surface analysis (Auger Spectroscopy)
  - Molecular beam epitaxy
  - Outer space simulation



Vacuum Range	Valve Type	Housing Material	Size Range	Feed-through	Flange Options	Actuation	Page
<b>Primary/Medium to High Vacuum</b>							
Atm - 10 <sup>-6</sup> Torr	Block, Right Angle	Aluminum	0.75 in. to 1.0 in.	Shaft	ISO-KF	Electromagnetic	400-401
Atm - 10 <sup>-9</sup> Torr	Block, Right Angle	<i>Series 26</i> Aluminum	0.75 in. to 1.5 in.	Bellows	ISO-KF	Manual/Air	376-381
Atm - 10 <sup>-9</sup> Torr	Block, In-Line	<i>Series 26</i> Aluminum	0.75 in. to 1.0 in.	Bellows	ISO-KF	Manual/Air	376-381
Atm - 10 <sup>-9</sup> Torr	Tube, Right Angle	Stainless Steel	0.63 in. to 1.5 in.	Bellows	CF, ISO-KF	Manual/Air	396-399
Atm - 10 <sup>-9</sup> Torr	Tube, In-Line	Stainless Steel	0.63 in. to 1.5 in.	Bellows	CF, ISO-KF	Manual/Air	396-399
Atm - 10 <sup>-10</sup> Torr	Gate	<i>Series 11</i> Stainless Steel	4.0 in. to 6.0 in.	Bellows	ISO, CF	Manual/Air	383-387
Atm - 10 <sup>-9</sup> Torr	Gate	<i>Series 12</i> Aluminum	2.5 in. to 10 in.	Shaft	ISO, ASA	Manual/Air	388-392
<b>Ultra High Vacuum</b>							
Atm - 10 <sup>-11</sup> Torr	UHV, All-Metal Angle	<i>Series 54</i> Stainless Steel	0.75 in. to 1.5 in.	Bellows	CF	Manual	393-395
<b>Special Purpose</b>							
Atm - 10 <sup>-11</sup> Torr	Variable Leak	Stainless Steel		Bellows	CF	Manual	402

## AGILENT HIGH PERFORMANCE VALVES

### ► Agilent Aluminum Block Valves - Series 26



Thank you for choosing Agilent Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that Agilent Valves will meet your most demanding vacuum control needs.

The valves are available in manually-operated and pneumatically-operated versions. The pneumatic valve is also available with a position indicator.

The position indicator delivers an electrical output signal when the valve cycles, and is user-set in either the normally-open or normally-closed position.

#### Technical Specifications

<b>Cycles until first service</b>	
with manual actuator	10 000
with closing spring	3 million
<b>Maximum temperature</b>	
Valve body	≤ 150 °C
Manual and pneumatic actuator	≤ 120 °C
Solenoid valve, position indicator	≤ 80 °C
<b>Material</b>	
Valve body aluminum	EN AW-6060 (3.3206)
Plate	AISI 316L (1.4404, 1.4435)
Bellows	AISI 316L (1.4404, 1.4435), AISI 316 Ti (1.4571)
<b>Seal: bonnet, plate</b>	FKM (Viton)
<b>Mounting orientation</b>	any
<b>Solenoid valve</b>	24 VDC, 115 VAC, 220 VAC; 2.5 W
<b>Position indicator: contact rating</b>	
Voltage	5–50 VAC / DC
Current	5–100 mA
<b>Valve position indication</b>	visual (mechanical)
<b>Leak rate: valve body, valve seat</b>	< 1 · 10 <sup>-9</sup> mbar ls <sup>-1</sup>
<b>Pressure range, series 26 (bellows)</b>	1 · 10 <sup>-8</sup> mbar to 5 bar (abs)
<b>Differential pressure on the plate</b>	
In opening direction	≤ 2.0 bar
In closing direction	≤ 5.0 bar
<b>Differential pressure at opening</b>	≤ 1 bar

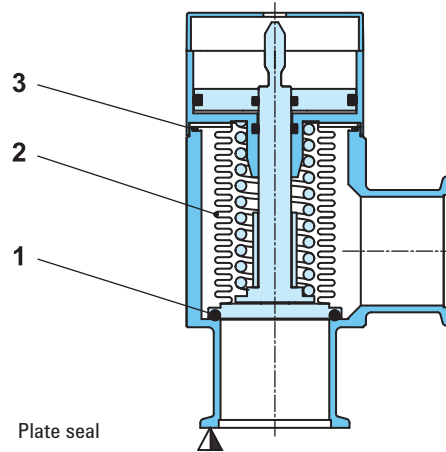
# VACUUM VALVES

## Features

- Body material: aluminum
- Angle and inline version
- Bellows
- Resistant against differential pressure
- Long lifetime

## Aluminum Block Valves Functional Principle

NW 16–40 with pneumatic actuator NC



- 1 Plate seal
- 2 Bellows
- 3 Bonnet seal
- ▼ Valve seat side

## Angle valves

NW (nominal I. D.) mm (in.)	Conductance (molecular flow) ls <sup>-1</sup>	Valve with manual actuator		Valve with pneumatic actuator, single acting with closing spring (NC)				
		Turns per stroke n	Weight Aluminum body kg (lbs)	Compressed air min.–max. overpressure bar (psi)	Volume of pneumatic actuator l ft <sup>3</sup>		Closing time s	Weight Aluminum body kg (lbs)
16 (5/8)	5	3.6	0.20 (0.44)	4–8 (58–116)	0.004	0.0001	0.10	0.28 (0.62)
25 (1)	14	3.8	0.27 (0.60)	4–8 (58–116)	0.011	0.0004	0.20	0.41 (0.90)
40 (1 1/2)	45	4.5	0.60 (1.32)	4–8 (58–116)	0.035	0.0012	0.55	0.97 (2.14)

## Inline valves

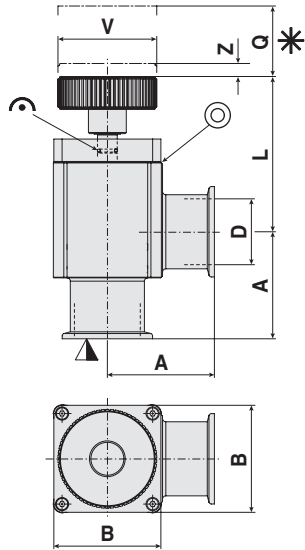
NW (nominal I. D.) mm (in.)	Conductance (molecular flow) ls <sup>-1</sup>	Valve with manual actuator		Valve with pneumatic actuator, single acting with closing spring (NC)				
		Turns per stroke n	Weight Aluminum body kg (lbs)	Compressed air min.–max. overpressure bar (psi)	Volume of pneumatic actuator l ft <sup>3</sup>		Closing time s	Weight Aluminum body kg (lbs)
16 (5/8)	5	3.6	0.28 (0.62)	4–8 (58–116)	0.004	0.0001	0.10	0.50 (1.10)
25 (1)	14	3.8	0.42 (0.93)	4–8 (58–116)	0.011	0.0004	0.20	0.60 (1.32)
40 (1 1/2)	45	4.5	1.00 (2.20)	4–8 (58–116)	0.035	0.0012	0.55	1.40 (3.09)

# AGILENT HIGH PERFORMANCE VALVES

## Dimensions

### Angle valve with manual actuator

NW 16–40 (5/8" – 1 1/2") ISO-KF



Models	NW 16 (5/8)	NW 25 (1)	NW 40 (1 1/2)
<b>A</b>	40 (1.57)	50 (1.97)	65 (2.56)
<b>B</b>	40 (1.57)	48 (1.89)	65 (2.56)
<b>D</b>	16 (0.63)	25 (0.98)	40 (1.57)
<b>L</b>	64.90 (2.56)	60.90 (2.40)	94.30 (3.71)
<b>Q</b>	46 (1.81)	44 (1.73)	73.50 (2.89)
<b>V</b>	40 (1.57)	40 (1.57)	60 (2.36)
<b>Z*</b>	3.60 (0.14)	4.70 (0.19)	7.90 (0.31)

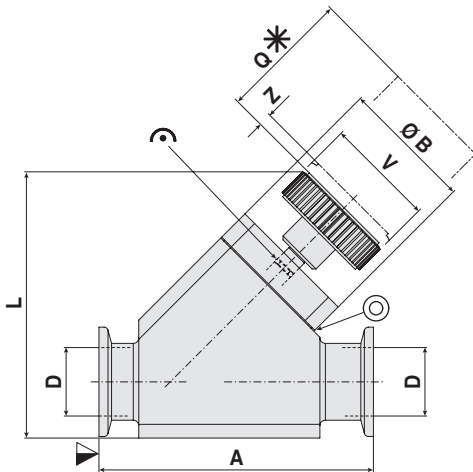
\* Gate stroke is longer due to transmission

- ▽ Valve seat side
- \* Required for dismantling
- ↻ Mechanical position indication
- Leak detection hole

Dimensions: millimeters (inches)

### Inline valve with manual actuator

NW 16–40 (5/8" – 1 1/2") ISO-KF



Models	NW 16 (5/8)	NW 25 (1)	NW 40 (1 1/2)
<b>A</b>	80 (3.15)	100 (3.94)	130 (5.12)
<b>B</b>	40 (1.57)	48 (1.89)	65 (2.56)
<b>D</b>	16 (0.63)	25 (0.98)	40 (1.57)
<b>L</b>	90.60 (3.57)	97 (3.82)	143.50 (5.65)
<b>Q</b>	46 (1.81)	44 (1.73)	73.50 (2.89)
<b>V</b>	40 (1.57)	40 (1.57)	60 (2.36)
<b>Z</b>	3.60 (0.14)	4.70 (0.19)	7.90 (0.31)

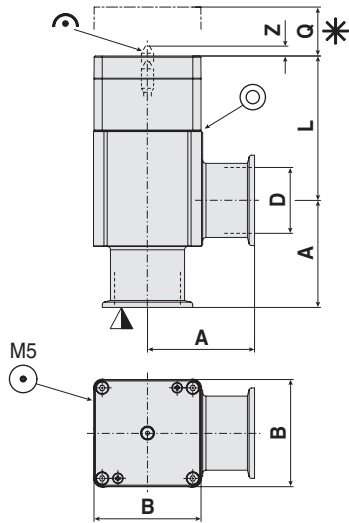
Dimensions: millimeters (inches)

# VACUUM VALVES

## Dimensions

**Angle valve with pneumatic actuator, single acting with closing spring**

NW 16–40 ( $\frac{5}{8}$ " – 1  $\frac{1}{2}$ " ISO-KF)



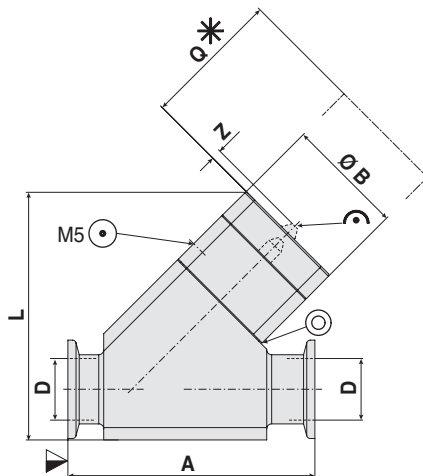
Models	NW 16 ( $\frac{5}{8}$ )	NW 25 (1)	NW 40 (1 $\frac{1}{2}$ )
<b>A</b>	40 (1.57)	50 (1.97)	65 (2.56)
<b>B</b>	40 (1.57)	48 (1.89)	65 (2.56)
<b>D</b>	16 (0.63)	25 (0.98)	40 (1.57)
<b>L (with closing spring)</b>	65.20 (2.57)	60.60 (2.39)	87.70 (3.45)
<b>Q</b>	46 (1.81)	44 (1.73)	73.50 (2.89)
<b>Z</b>	2 (0.08)	4 (0.16)	9.50 (0.37)

- ▽ Valve seat side
- \* Required for dismantling
- ⊙ Compressed air connection
- ⊕ Mechanical position indication
- ⊙ Leak detection hole

Dimensions: millimeters (inches)

**Inline valve with pneumatic actuator, single acting with closing spring**

NW 16–40 ( $\frac{5}{8}$ " – 1  $\frac{1}{2}$ " ISO-KF)



Models	NW 16 ( $\frac{5}{8}$ )	NW 25 (1)	NW 40 (1 $\frac{1}{2}$ )
<b>A</b>	80 (3.15)	100 (3.94)	130 (5.12)
<b>B</b>	40 (1.57)	48 (1.89)	65 (2.56)
<b>D</b>	16 (0.63)	25 (0.98)	40 (1.57)
<b>L (with closing spring)</b>	91.50 (3.60)	100.30 (3.95)	140.90 (5.55)
<b>Q</b>	46 (1.81)	44 (1.73)	73.50 (2.89)
<b>Z</b>	2 (0.08)	4 (0.16)	9.50 (0.37)

Dimensions: millimeters (inches)

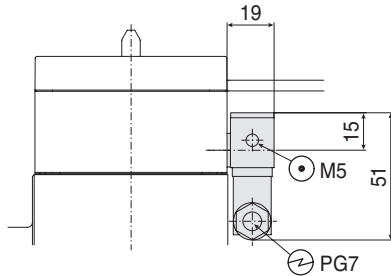


# AGILENT HIGH PERFORMANCE VALVES

## Solenoid valve

### Solenoid valve

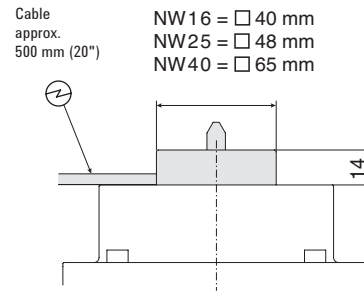
NW 16–40 (5/8" – 1 1/2")



## Position indicator

### Position indicator

NW 16–40 (5/8" – 1 1/2")



One closing contact each for the open and closed valve positions

## Ordering Information

Description: Aluminum Right Angle Block Valves Series 26	Part Number
Valve, Block, Aluminum, Right Angle, Hand-operated, NW16	X3202-60031
Valve, Block, Aluminum, Right Angle, Hand-operated, NW25	X3202-60032
Valve, Block, Aluminum, Right Angle, Hand-operated, NW40	X3202-60033
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, without Solenoid	X3202-60034
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, without Solenoid	X3202-60035
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, without Solenoid	X3202-60036
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, 115VAC	X3202-60037
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, 115VAC	X3202-60038
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, 115VAC	X3202-60039
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, 220VAC	X3202-60040
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, 220VAC	X3202-60041
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, 220VAC	X3202-60042
Valve, Block, Aluminum, Right Angle, Air-operated, NW16, 24VDC	X3202-60043
Valve, Block, Aluminum, Right Angle, Air-operated, NW25, 24VDC	X3202-60044
Valve, Block, Aluminum, Right Angle, Air-operated, NW40, 24VDC	X3202-60045
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, without Solenoid	X3202-60051
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, without Solenoid	X3202-60052
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, without Solenoid	X3202-60053
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, 115VAC	X3202-60054
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, 115VAC	X3202-60055
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, 115VAC	X3202-60056
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, 220VAC	X3202-60057
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, 220VAC	X3202-60058
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, 220VAC	X3202-60059
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW16, 24VDC	X3202-60060
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW25, 24VDC	X3202-60061
Valve, Block, Aluminum, Right Angle, Air-operated, Position Indicator, NW40, 24VDC	X3202-60062



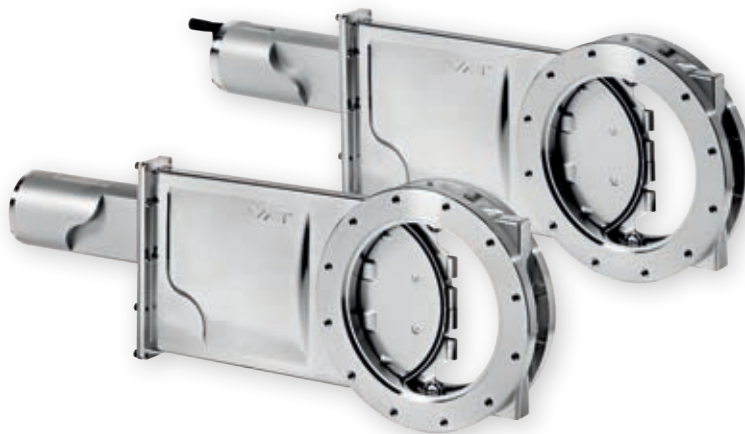
# VACUUM VALVES

## Ordering Information

<b>Description: Aluminum Inline Block Valves Series 26</b>	<b>Part Number</b>
Valve, Block, Aluminum, In-line, Hand-operated, NW16	X3202-60063
Valve, Block, Aluminum, In-line, Hand-operated, NW25	X3202-60064
Valve, Block, Aluminum, In-line, Hand-operated, NW40	X3202-60065
Valve, Block, Aluminum, In-line, Air-operated, NW16, without Solenoid	X3202-60066
Valve, Block, Aluminum, In-line, Air-operated, NW25, without Solenoid	X3202-60067
Valve, Block, Aluminum, In-line, Air-operated, NW40, without Solenoid	X3202-60068
Valve, Block, Aluminum, In-line, Air-operated, NW16, 115VAC	X3202-60069
Valve, Block, Aluminum, In-line, Air-operated, NW25, 115VAC	X3202-60070
Valve, Block, Aluminum, In-line, Air-operated, NW40, 115VAC	X3202-60071
Valve, Block, Aluminum, In-line, Air-operated, NW16, 220VAC	X3202-60072
Valve, Block, Aluminum, In-line, Air-operated, NW25, 220VAC	X3202-60073
Valve, Block, Aluminum, In-line, Air-operated, NW40, 220VAC	X3202-60074
Valve, Block, Aluminum, In-line, Air-operated, NW16, 24VDC	X3202-60075
Valve, Block, Aluminum, In-line, Air-operated, NW25, 24VDC	X3202-60076
Valve, Block, Aluminum, In-line, Air-operated, NW40, 24VDC	X3202-60077
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, without Solenoid	X3202-60078
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, without Solenoid	X3202-60079
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, without Solenoid	X3202-60080
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, 115VAC	X3202-60081
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, 115VAC	X3202-60082
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, 115VAC	X3202-60083
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, 220VAC	X3202-60084
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, 220VAC	X3202-60085
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, 220VAC	X3202-60086
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW16, 24VDC	X3202-60087
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW25, 24VDC	X3202-60088
Valve, Block, Aluminum, In-line, Air-operated, Position Indicator, NW40, 24VDC	X3202-60089
<b>Spare Parts</b>	<b>Part Number</b>
Seal Kit, Aluminum Block Valve Series 26, NW16	X3202-60103
Seal Kit, Aluminum Block Valve Series 26, NW25	X3202-60104
Seal Kit, Aluminum Block Valve Series 26, NW40	X3202-60105
O-Ring Removal Tool, Aluminum Block Valve Series 26	X3202-60106

## AGILENT HIGH PERFORMANCE VALVES

### ► Agilent Stainless Steel Gate Valves - Series 11



Thank you for choosing Agilent Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that Agilent Valves will meet your most demanding vacuum control needs.

The valves are available in manual, push-rod operation and double acting pneumatic operation. The pneumatic valves are available with solenoid (pilot) valves at 24 VDC, and a position indicator. See operator's manual for more information.

#### Technical Specifications

<b>Leak rate: valve body, valve seat</b>	< 1 · 10 <sup>-9</sup> mbar ls <sup>-1</sup>	
<b>Pressure range</b>	ISO 100–160	
		1 · 10 <sup>-8</sup> mbar to 1.6 bar (abs)
<b>Differential pressure on the gate</b>	ISO 100–160	
		≤ 1.6 bar
<b>Differential pressure at opening</b>	≤ 30 mbar	
<b>Cycles until first service</b>	ISO 100–160	
		200 000
<b>Temperature*</b>		
Valve body		< 150 °C
Manual and pneumatic actuator		≤ 80 °C
Solenoid valve		≤ 50 °C
Position indicator		≤ 50 °C
<b>Heating and cooling rate</b>	≤ 50 °C h <sup>-1</sup>	
<b>Material</b>		
Valve body	ISO 100–160	AISI 304 (1.4301)
Mechanism	ISO 100–160	AISI 316L (1.4404)
<b>Seal: bonnet, gate</b>	FKM (Viton)	
<b>Feedthrough</b>	bellows	
<b>Mounting orientation</b>	any	
<b>Solenoid valve</b>	24 VDC, 5.4 W	
<b>Position indicator: contact rating</b>		
Voltage		10–30 VDC
Current		max 200 mA
<b>Valve position indication</b>	LED	

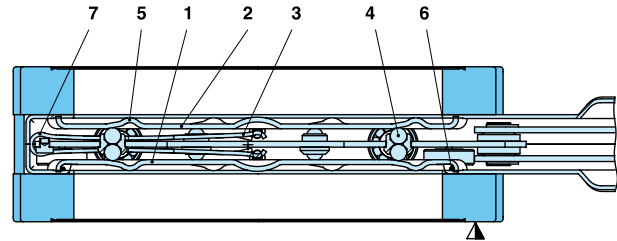
\* Maximum values: depending on operating conditions and sealing materials

# VACUUM VALVES

## Features

- Body material: stainless steel
- Low cost bellows-sealed valve
- DN100-160 with vulcanized seal

Stainless Steel Gate Valves Functional Principle



- |                 |                   |
|-----------------|-------------------|
| 1 Gate          | 6 Ball detents    |
| 2 Counter-plate | 7 Gate seal       |
| 3 Leaf springs  | 8 Spring stop     |
| 4 Ball pairs    | ▽ Valve seat side |
| 5 Ball detents  |                   |

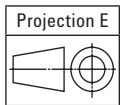
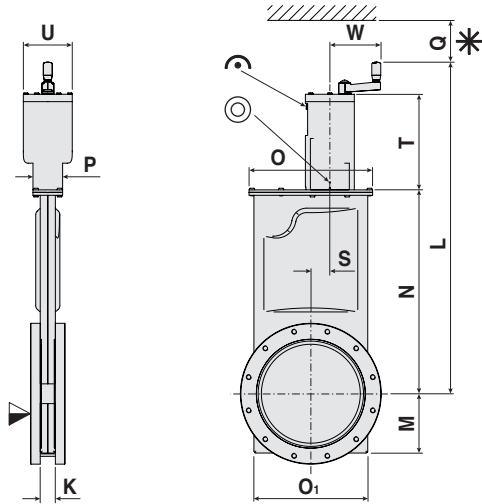
DN (nominal I. D.) mm (in.)	Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type) ls <sup>-1</sup>	Valve with manual actuator		Valve with pneumatic actuator				
			Turns per stroke n	Weight kg (lbs)	Compressed air min. – max. overpressure bar (psi)	Volume of pneumatic actuator l ft <sup>3</sup>		Closing or opening time s	Weight kg (lbs)
100 (4)	See page 386	1740	14	10.00 (22.00)	4–7 (58–102)	0.127	0.0045	1.5	10.50 (23.00)
160 (6)		1880	17	12.00 (27.00)	4–7 (58–102)	0.150	0.0053	2.5	13.00 (30.00)

# AGILENT HIGH PERFORMANCE VALVES

## Main Dimensions

Valve with manual actuator: crank handle

DN 100–160 (4"–6")



Models	DN 100	DN 160
	(4)	(6)
<b>K</b>	25.55 (1.01)	25.55 (1.01)
<b>L</b>	472.60 (18.61)	601.40 (23.68)
<b>M</b>	69 (2.72)	94.50 (3.72)
<b>N</b>	238 (9.37)	328.40 (12.93)
<b>O</b>	155 (6.10)	205 (8.07)
<b>O1</b>	134.60 (5.30)	184.80 (7.28)
<b>P</b>	60 (2.36)	60 (2.36)
<b>Q</b>	190 (7.48)	270 (10.63)
<b>S</b>	9 (0.35)	25 (0.98)
<b>T</b>	179.20 (7.06)	203.20 (8.00)
<b>U</b>	89 (3.50)	89 (3.50)
<b>W</b>	76.50 (3.01)	92.50 (3.64)

Flange dimensions: see page 386

- ▼ Valve seat side
- \* Required for dismantling
- ↻ Mechanical position indication
- ◎ Leak detection hole

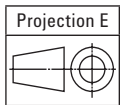
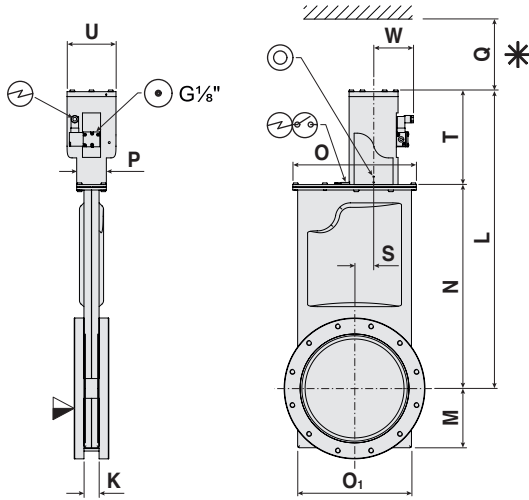
Dimensions: millimeters (inches)

# VACUUM VALVES

## Main Dimensions

Valve with pneumatic actuator: double acting

DN 100–160 (4"–6")



Models	DN 100	DN 160
	<b>(4)</b>	<b>(6)</b>
<b>K</b>	25.55 (1.01)	25.55 (1.01)
<b>L</b>	409 (16.10)	523 (20.59)
<b>M</b>	69 (2.72)	94.50 (3.72)
<b>N</b>	238.3 (9.38)	328.40 (12.93)
<b>O</b>	155 (6.10)	205 (8.07)
<b>O1</b>	134.60 (5.30)	184.80 (7.28)
<b>P</b>	60 (2.36)	60 (2.36)
<b>Q</b>	190 (7.48)	270 (10.63)
<b>S</b>	9 (0.35)	25 (0.98)
<b>T</b>	170.80 (6.72)	194.30 (7.65)
<b>U</b>	89 (3.50)	89 (3.50)
<b>W</b>	78.90 (3.11)	78.90 (3.11)

Flange dimensions: see page 386

- ▼ Valve seat side
- \* Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊗ Position indicator
- ⊙ Leak detection hole

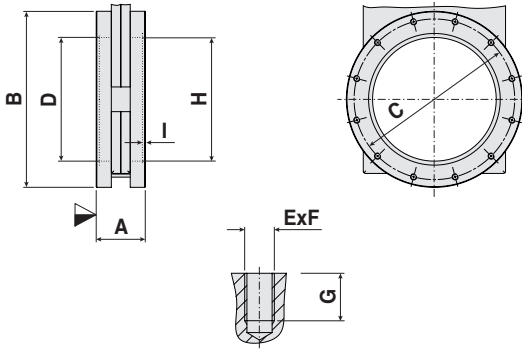
Dimensions: millimeters (inches)

# AGILENT HIGH PERFORMANCE VALVES

## Flange Dimensions

### ISO-F

DN 100–160 (4"–6")

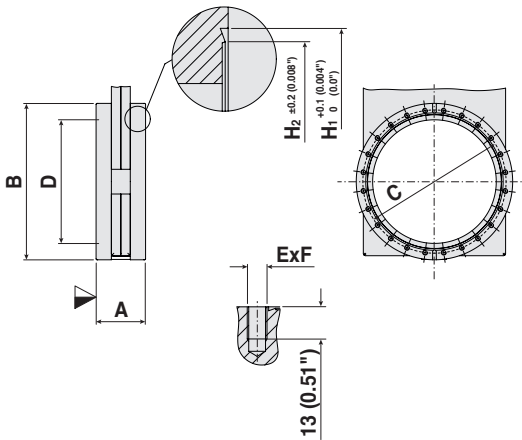


Models	DN 100	DN 160
	(4)	(6)
A	70 (2.76)	70 (2.76)
B	165 (6.50)	225 (8.86)
C	145 (5.71)	200 (7.87)
D	100 (3.94)	150 (5.91)
E x F	8 x M8	8 x M10
G	13 (0.51)	13 (0.51)
H	102 (4.02)	153 (6.02)
I	3 (0.12)	5 (0.20)

Dimensions: millimeters (inches)

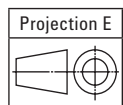
### CF-F, metric threads

DN 100–160 (4"–6")



Models	DN 100	DN 160
	(4)	(6)
O.D.	(6)	(8)
A	70 (2.76)	70 (2.76)
B	151.60 (5.97)	202.40 (7.97)
C	130.20 (5.13)	181 (7.13)
D	100 (3.94)	150 (5.91)
E x F	16 x M8	20 x M8
H1	120.70 (4.75)	171.45 (6.75)
H2	115.50 (4.55)	166 (6.54)

Dimensions: millimeters (inches)



▽ Valve seat side

# VACUUM VALVES

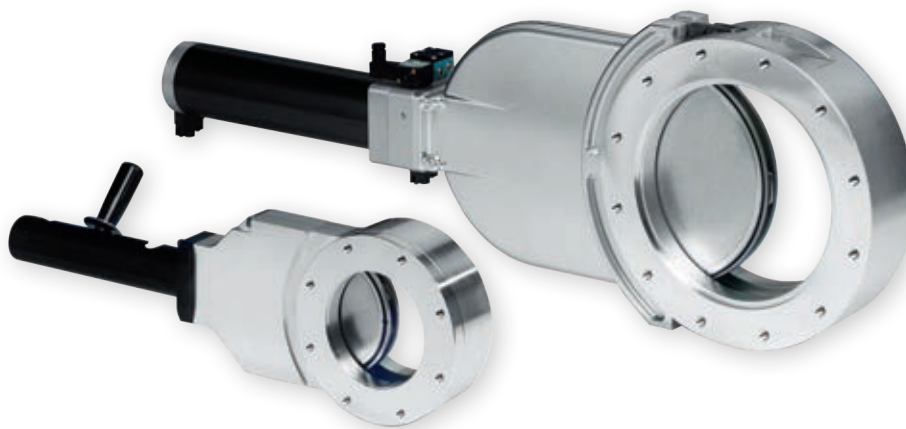
## Ordering Information

<b>Description</b>	<b>Stainless Steel Gate Valves - Series 11</b>	<b>Part Number</b>
HV Gate valve SS 6 inch CFF Hand Operated		X3204-60005
HV Gate valve SS 6 inch CFF air operated with Position Indicator		X3204-60006
HV Gate valve SS 6 inch CFF air operated with Position Indicator & 115V solenoid valve		X3204-60007
HV Gate valve SS 6 inch CFF air operated with Position Indicator & 24VDC solenoid valve		X3204-60008
HV Gate valve SS 6 inch CFF air operated with Position Indicator & 220V solenoid valve		X3204-60009
HV Gate valve SS ISO100F Hand Operated		X3204-60035
HV Gate valve SS ISO100F air operated with Position Indicator		X3204-60036
HV Gate valve SS ISO100F air operated with Position Indicator & 115V solenoid valve		X3204-60037
HV Gate valve SS ISO100F air operated with Position Indicator & 24VDC solenoid valve		X3204-60038
HV Gate valve SS ISO100F air operated with Position Indicator & 220V solenoid valve		X3204-60039
HV Gate valve SS 8 inch CFF Hand Operated		X3204-60010
HV Gate valve SS 8 inch CFF air operated with Position Indicator		X3204-60011
HV Gate valve SS 8 inch CFF air operated with Position Indicator & 115V solenoid valve		X3204-60012
HV Gate valve SS 8 inch CFF air operated with Position Indicator & 24VDC solenoid valve		X3204-60013
HV Gate valve SS 8 inch CFF air operated with Position Indicator & 220V solenoid valve		X3204-60014
HV Gate valve SS ISO160F Hand Operated		X3204-60044
HV Gate valve SS ISO160F air operated with Position Indicator		X3204-60043
HV Gate valve SS ISO160F air operated with Position Indicator & 115V solenoid valve		X3204-60040
HV Gate valve SS ISO160F air operated with Position Indicator & 24VDC solenoid valve		X3204-60041
HV Gate valve SS ISO160F air operated with Position Indicator & 220V solenoid valve		X3204-60042



## AGILENT HIGH PERFORMANCE VALVES

### ► Agilent Aluminum Gate Valves - Series 12



Thank you for choosing Agilent Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that Agilent Valves will meet your most demanding vacuum control needs.

The valves are available in manual, push-rod operation and double acting pneumatic operation. The pneumatic valves are available with solenoid (pilot) valves at 115 VAC, 220 VAC and 24 VDC, and a position indicator. See operator's manual for more information.

#### Technical Specifications

<b>Leak rate: valve body, valve seat</b>	< 1 · 10 <sup>-9</sup> mbar ls <sup>-1</sup>	
<b>Pressure range</b>		
ISO 63–160	1 · 10 <sup>-7</sup> mbar to 1.6 bar (abs)	
ISO 250	1 · 10 <sup>-7</sup> mbar to 1.2 bar (abs)	
<b>Differential pressure on the gate</b>		
ISO 63–160	≤ 1.6 bar	
ISO 250	≤ 1.2 bar	
<b>Differential pressure at opening</b>	≤ 30 mbar	
<b>Cycles until first service</b>		
ISO 63–160	200 000	
ISO 250	100 000	
<b>Temperature*</b>		
Valve body	≤ 120 °C	
Manual and pneumatic actuator	≤ 80 °C	
Solenoid valve	≤ 50 °C	
Position indicator	≤ 80 °C	
<b>Heating and cooling rate</b>	≤ 30 °C h <sup>-1</sup>	
<b>Material</b>		
Valve body	ISO 63–160	EN AW-5083 (3.3547), -6061 (3.3211)
	ISO 250	EN AC-42100 (3.2371)
Mechanism	ISO 63–160	AISI 304 (1.4301)
	ISO 250	EN AW-6082 (3.2315)
<b>Seal: bonnet, gate</b>	FKM (Viton)	
<b>Feedthrough</b>	shaft feedthrough	
<b>Mounting orientation</b>	any	
<b>Solenoid valve</b>	24 VDC, 115 V, 220 V, 5.4 W	
<b>Position indicator: contact rating</b>		
Voltage	≤ 250 VAC	≤ 50 VDC
Current	≤ 2 A	≤ 1.2 A
<b>Valve position indication</b>	visual (mechanical)	

\* Maximum values: depending on operating conditions and sealing materials

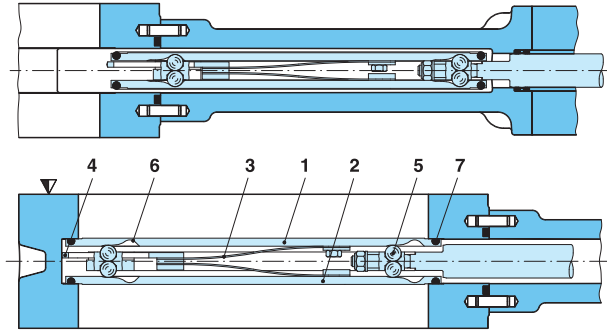
# VACUUM VALVES

## Features

- Body material: aluminum
- Low cost gate valve
- Split body for easy cleaning
- VATLOCK configuration

### Aluminum Gate Valves Functional Principle

Body style ISO 63-250  
Gate mechanism ISO 160-250



- |                 |                   |
|-----------------|-------------------|
| 1 Gate          | 5 Ball pairs      |
| 2 Counter-plate | 6 Ball detents    |
| 3 Leaf springs  | 7 Gate seal       |
| 4 Spring stop   | ▽ Valve seat side |

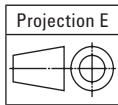
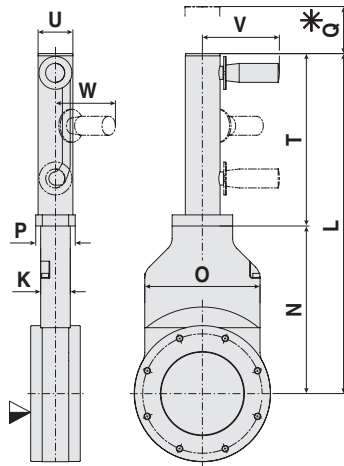
DN (nominal I. D.) mm (in.)	Standard flanges	Conductance (molecular flow) (depending on A-dimension and flange type) ls <sup>-1</sup>	Valve with manual actuator	Valve with pneumatic actuator				
			Weight kg (lbs)	Compressed air min. – max. overpressure bar (psi)	Volume of pneumatic actuator l      ft <sup>3</sup>		Closing or opening time s	Weight kg (lbs)
63 (2 ½)	See page 392	550	3.00 (7.00)	4–7 (58–102)	0.16	0.006	1.5	3.00 (7.00)
100 (4)		2000	4.50 (10.00)	4–7 (58–102)	0.22	0.008	2	4.50 (10.00)
160 (6)		6000	9.00 (20.00)	4–7 (58–102)	0.50	0.018	2	9.00 (20.00)
250 (10)		22000	N/A (N/A)	4–7 (58–102)	1.50	0.053	5	25.00 (55.00)

# AGILENT HIGH PERFORMANCE VALVES

## Main Dimensions

### Valve with manual actuator: push rod

DN 63–100 (2½"–4")

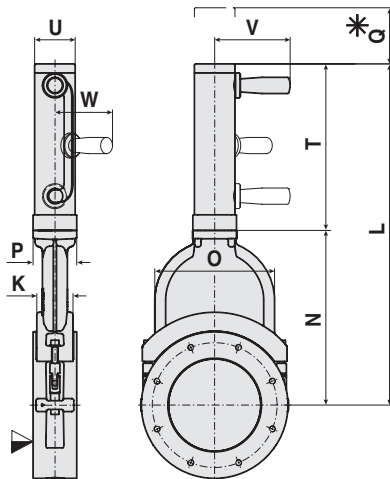


Models	DN 63 (2 ½)	DN 100 (4)	DN 160 (6)
<b>K</b>	36 (1.42)	36 (1.42)	58 (2.28)
<b>L</b>	329.50 (12.97)	413 (16.26)	547 (21.54)
<b>N</b>	155.50 (6.12)	203.50 (8.01)	280 (11.02)
<b>O</b>	100 (3.94)	140 (5.51)	192 (7.56)
<b>P</b>	48 (1.89)	48 (1.89)	70 (2.76)
<b>Q</b>	25 (0.98)	25 (0.98)	60 (2.36)
<b>T</b>	174 (6.85)	209.50 (8.25)	267 (10.51)
<b>U</b>	43 (1.69)	43 (1.69)	65 (2.56)
<b>V</b>	94 (3.70)	94 (3.70)	122 (4.80)
<b>W</b>	75 (2.95)	75 (2.95)	95 (3.74)

Flange dimensions: see page 392

### Valve with manual actuator: push rod

DN 160 (6")



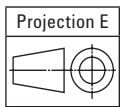
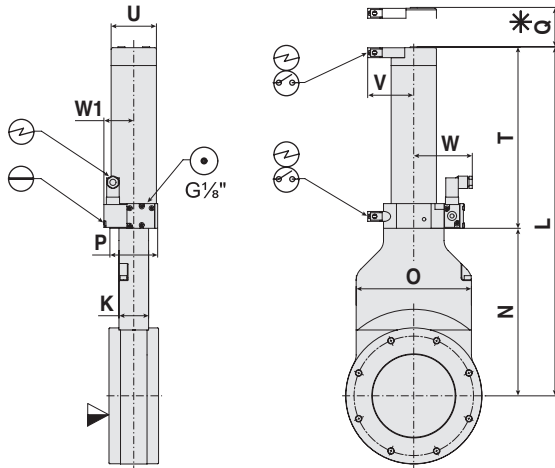
- ▽ Valve seat side
- \* Required for dismantling

Dimensions: millimeters (inches)

# VACUUM VALVES

## Main Dimensions

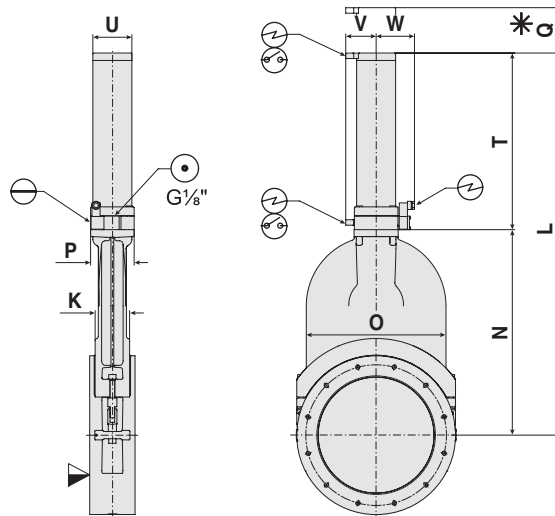
Valve with pneumatic actuator: double acting  
ISO 63–100 (2½"–4")



Models	ISO 63 (2 ½)	ISO 100 (4)	ISO 160 (6)	ISO 250 (10)
<b>K</b>	36 (1.42)	36 (1.42)	58 (2.28)	76 (2.99)
<b>L</b>	341.50 (13.45)	425 (16.69)	547 (21.54)	843 (33.19)
<b>N</b>	155.50 (6.12)	203.50 (8.01)	280 (11.02)	453 (17.83)
<b>O</b>	100 (3.94)	140 (5.51)	192 (7.56)	308 (12.13)
<b>P</b>	58 (2.28)	58 (2.28)	70 (2.76)	96 (3.78)
<b>Q</b>	25 (0.98)	25 (0.98)	60 (2.36)	100 (3.94)
<b>T</b>	186 (7.32)	221.50 (8.72)	267 (10.51)	390 (15.35)
<b>U</b>	55 (2.17)	55 (2.17)	65 (2.56)	86 (3.39)
<b>V</b>	56 (2.20)	56 (2.20)	57 (2.24)	67 (2.64)
<b>W</b>	72 (2.83)	72 (2.83)	71.50 (2.82)	84.50 (3.33)
<b>W1</b>	36.50 (1.44)	36.50 (1.44)	–	–

Flange dimensions: see page 392

Valve with pneumatic actuator: double acting  
ISO 160 (6")–250 (10")



- ▼ Valve seat side
- \* Required for dismantling
- ⊙ Compressed air connection
- ⊕ Electrical connection
- ⊖ Position indicator
- ⊗ Emergency operation

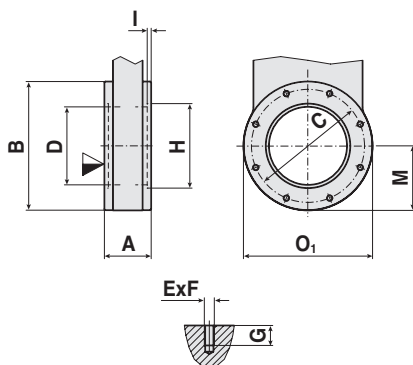
Dimensions: millimeters (inches)

# AGILENT HIGH PERFORMANCE VALVES

## Flange Dimensions

### ISO-F

ISO 63–250 (2½" –10")



Models	ISO 63	ISO 100	ISO 160	ISO 250
	(2 ½)	(4)	(6)	(10)
<b>A</b>	60 (2.36)	60 (2.36)	70 (2.76)	100 (3.94)
<b>B</b>	130 (5.12)	165 (6.50)	235 (9.25)	350 (13.78)
<b>C</b>	110 (4.33)	145 (5.71)	200 (7.87)	310 (12.20)
<b>D</b>	65 (2.56)	100 (3.94)	150 (5.91)	261 (10.27)
<b>E x F</b>	4 x M8	8 x M8	8 x M10	12 x M10
<b>G</b>	12 (0.47)	12 (0.47)	16 (0.63)	16 (0.63)
<b>H</b>	70 (2.76)	102 (4.02)	153 (6.02)	–
<b>I</b>	3 (0.12)	3 (0.12)	5 (0.20)	–
<b>M</b>	65.50 (2.58)	83 (3.27)	117.50 (4.63)	175 (6.89)
<b>O1</b>	131 (5.16)	166 (6.54)	237 (9.33)	352 (13.86)

Dimensions: millimeters (inches)

## Ordering Information

Description Aluminum Gate Valves - Series 12	Part Number
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, 115VAC	X3202-60000
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, 220VAC	X3202-60001
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, 24VDC	X3202-60002
Valve, Gate, Aluminum, 63 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60003
Valve, Gate, Aluminum, 63 ISO, Hand-operated	X3202-60004
Valve, Gate, Aluminum, 100 ISO, Air-operated, Position Indicator, 115VAC	X3202-60010
Valve, Gate, Aluminum, 100 ISO, Air-operated, 220VAC, Position Indicator	X3202-60011
Valve, Gate, Aluminum, 100 ISO, Air-operated, 24VDC, Position Indicator	X3202-60012
Valve, Gate, Aluminum, 100 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60013
Valve, Gate, Aluminum, 100 ISO, Hand-operated	X3202-60014
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, 115VAC	X3202-60020
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, 220VAC	X3202-60021
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, 24VDC	X3202-60022
Valve, Gate, Aluminum, 160 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60025
Valve, Gate, Aluminum, 160 ISO, Hand-operated	X3202-60026
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, 115VAC	X3202-60027
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, 220VAC	X3202-60028
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, 24VDC	X3202-60029
Valve, Gate, Aluminum, 250 ISO, Air-operated, Position Indicator, without Solenoid	X3202-60030
Spare Parts	Part Number
Seal Kit, Aluminum Gate Valve Series 12, ISO 63	X3202-60099
Seal Kit, Aluminum Gate Valve Series 12, ISO 100	X3202-60100
Seal Kit, Aluminum Gate Valve Series 12, ISO 160	X3202-60101
Seal Kit, Aluminum Gate Valve Series 12, ISO 250	X3202-60102

# VACUUM VALVES

## ► Agilent UHV All Metal Valves - Series 54



Thank you for choosing Agilent's High Performance Valves. These valves are designed with the highest international vacuum standards and manufactured with uncompromising quality. We are confident that you will find these valves meet your most demanding vacuum control needs.

The valves are manually operated with a standard Hex wrench, so no Torque Wrench is required. Thanks to the "hard-on-hard" metal seals, these valves can be operated thousands of times before requiring maintenance.

### Technical Specifications

<b>Leak rate: valve body, valve seat</b>	$< 1 \cdot 10^{-10}$ mbar ls <sup>-1</sup>
<b>Pressure range</b>	XHV to 2 bar (abs)
<b>Differential pressure on the gate</b>	$\leq 2$ bar
<b>Differential pressure at opening</b>	$\leq 1$ bar*
<b>Lifetime</b>	$\geq 1000$ cycles
<b>Bake-out temperature**</b>	$\leq 300$ °C open and closed
<b>Heating and cooling rate</b>	$\leq 60$ °C h <sup>-1</sup>
<b>Material</b>	
valve body, mechanism, bellows	AISI 316L (1.4404, 1.4435)
<b>Seal: bonnet, plate</b>	metal
<b>Feedthrough</b>	bellows
<b>Mounting orientation</b>	any
<b>Valve position indication</b>	visual (mechanical)
<b>Conductance (molecular flow)</b>	NW 16: 5 ls <sup>-1</sup> / NW 40: 50 ls <sup>-1</sup>
<b>Closing force</b>	closes at a mechanical stop
<b>Weight: NW 16 / 40</b>	kg (lbs) 0.4 (0.9) / 1.9 (4.2)

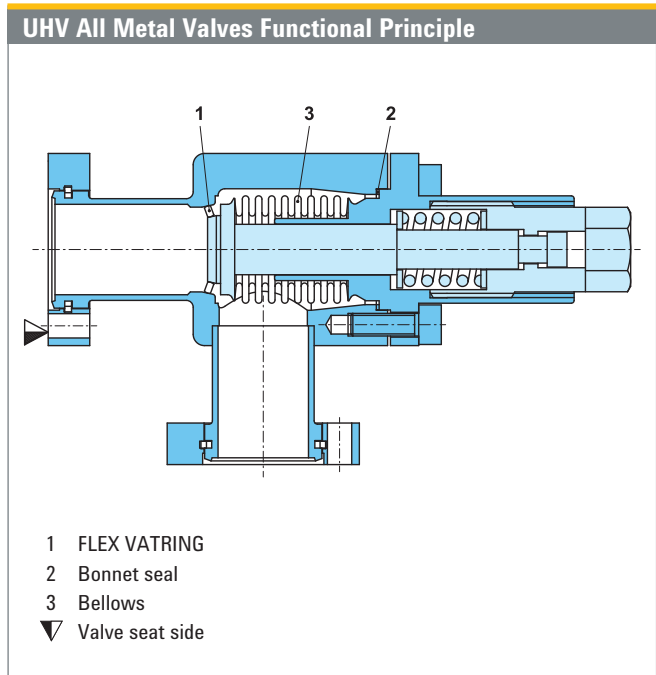
\*  $> 1$  bar with reduced number of cycles

\*\* Maximum values: depending on operating conditions and sealing materials

# AGILENT HIGH PERFORMANCE VALVES

## Features

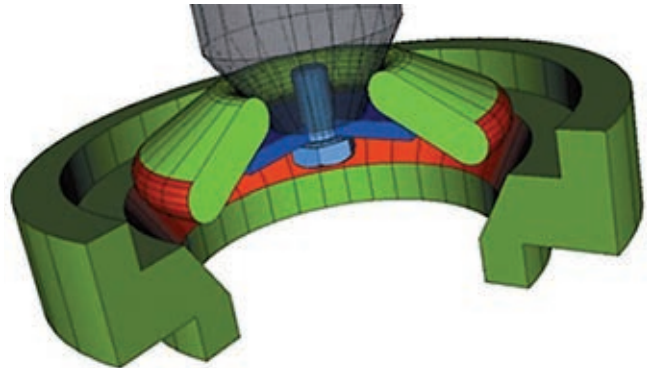
- Body material: stainless steel
- FLEX VATRING configuration: see below
- Sealing surfaces are only elastically deformed
- Convenient operation with a standard hexagon wrench – no torque wrench required
- High conductance
- FLEX VATRING exchangeable twice



## FLEX VATRING

This dynamic, all-metal sealing system is characterized by consistent sealing and closing forces. It enables achieving high sealing forces with comparably low axial forces. The seal mating surfaces are in stainless steel, and deformed elastically only.

The FLEX VATRING system is suitable for extreme UHV. It may be baked to 300 °C in open and closed position and reaches a lifetime of > 1 000 cycles if operated under clean conditions.



## Ordering Information

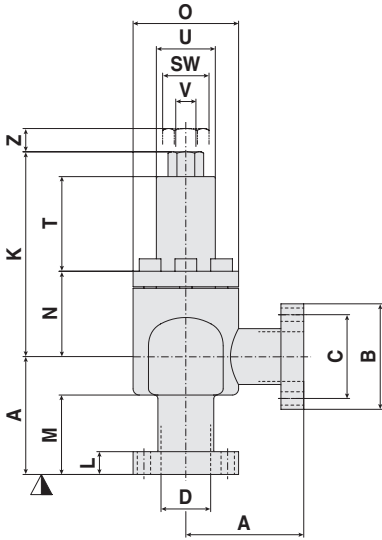
Description UHV All Metal Valves	Part Number
Valve, 3/4 Metal/Mini CFF	X3202-60097
Valve, All-Metal, 1 1/2", RT-Angle	X3202-60098
Spare Parts	Part Number
Seal Kit, 1 <sup>st</sup> Replacement, UHV Series 54, 3/4"	X3202-60107
Seal Kit, 2 <sup>nd</sup> Replacement, UHV Series 54, 3/4"	X3202-60109
Seal Kit, 1 <sup>st</sup> Replacement, UHV Series 54, 1 1/2"	X3202-60108
Seal Kit, 2 <sup>nd</sup> Replacement, UHV Series 54, 1 1/2"	X3202-60110



# VACUUM VALVES

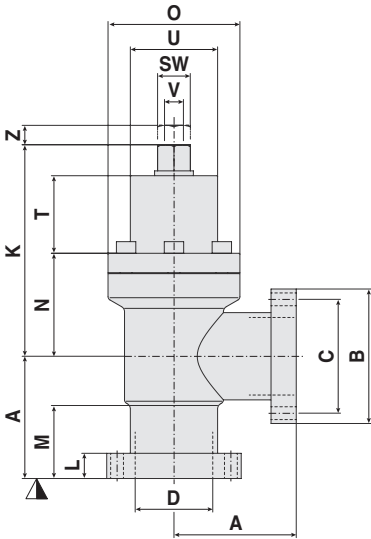
## Dimensions

Valve NW 16 (5/8")

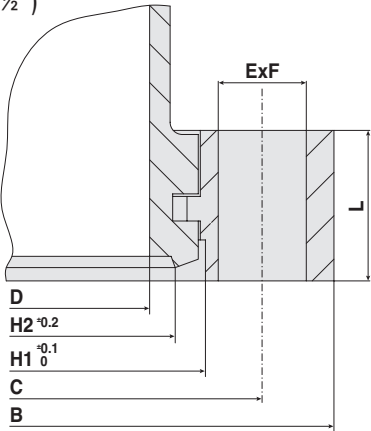


Models	DN 16 (5/8)	DN 40 (1 1/2)
<b>A M</b>	25.60 (1.01)	37.60 (1.48)
<b>N</b>	27.50 (1.08)	53.10 (2.09)
<b>O</b>	34 (1.34)	68 (2.68)
<b>SW</b>	10 (0.39)	17 (0.67)
<b>T</b>	30.50 (1.20)	40 (1.57)
<b>U</b>	19 (0.75)	45 (1.77)
<b>V</b>	6.35 (0.25)	9.53 (0.38)
<b>Z</b>	8.50 (0.33)	20 (0.79)

Valve NW 40 (1 1/2")



Flange NW 16-63 (5/8" - 2 1/2")

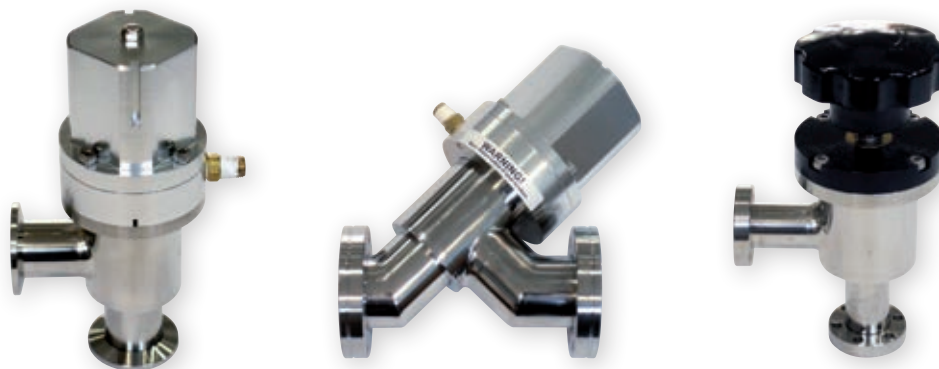


▼ Valve seat side

Dimensions: millimeters (inches)

# STAINLESS STEEL TUBE VALVES

## ► Agilent Stainless Steel Valves



Agilent's family of vacuum stainless steel tube and in-line valves are designed to connect our rough vacuum and high vacuum pumps to your system. Delivering maximum conductance and sized for easy, convenient installation, these valves are ideally suited for systems requiring high reliability with low outgassing.

Excellent low outgassing characteristics are derived from the valve's fusion welded 304 stainless steel body, welded AM-350 stainless steel nesting bellows and small cross section elastomers and do not contain any blind internal cavities.

In combination with our popular hardware products, the new stainless steel valves offer a complete, bundled solution for

your vacuum system, making it possible for convenient one-stop shopping for everything required to connect Agilent vacuum pumps to your system.

### A selection of port mounts...

Standard port mounts include:

- **Conflat metal seal flanges**, recommended for ultra-high vacuum service
- **KF and ISO flanges** for quick elastomer seal flanges, ideal for high vacuum applications that require frequent assembly and disassembly. See range of sizes in specifications table
- **Solenoids and position indicators** are optional and are sold separately.

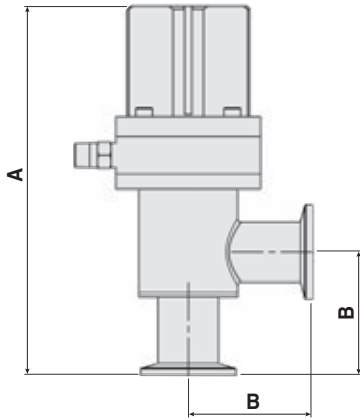
## Technical Specifications

<b>Pressure range</b>	Atmosphere to $1 \times 10^{-8}$ mbar ( $7.5 \times 10^{-9}$ Torr)					
<b>Leak rate</b>	$<1 \times 10^{-9}$ std cc/sec He					
<b>Service life</b> (bellows)	1.5 million cycles (minimum)					
<b>Mounting position</b>	any					
<b>Baking temperature</b>	Valve open 200 °C (392 °F)	Valve closed 150 °C (302 °F)	Position indicator (A/O optional) 70 °C (158 °F)		Solenoid (A/O optional) 60 °C (140 °F)	
<b>Conductance</b>	¾ in. Angle 6 l/sec	¾ in. In-line 5 l/sec	1 in. Angle 15 l/sec	1 in. In-line 13 l/sec	1½ in. Angle in. 48 l/sec	1½ in. In-line 44 l/sec
<b>Materials</b>	Valve body 304L SS	Bellows AM-350	Bellow flange 304 SS	Seal plate 304 SS	Bonnet gasket Viton (V747)	O-rings Viton (V747)
<b>Pneumatic</b>						
<b>Air connection</b>	¼ in. NPT					
<b>Air pressure</b>	60 psig (minimum)			80 psig (maximum)		
<b>Open/Close time</b>	¾ in. Valve <0.5 seconds		1 in. Valve <0.5 seconds		1½ in. Valve <0.8 seconds	
<b>Solenoid</b> (optional)	Supply Voltages: 110/120 V, 50/60 Hz; 220/240 V, 50/60 Hz; 24 VDC					
<b>Volume of air</b>	¾ in. Valve		1 in. Valve		1½ in. Valve	
<b>Cylinder</b>	0.049 L		0.049 L		0.1 L	
<b>Valve position</b>	No mechanical indicator (see optional position indicator)					
<b>Position indicator</b> (optional)	Voltage 5-240V DC/AC	Current 100 mA (maximum)		Power 10 W (maximum)		Visual Indicator Green LED
<b>Switching logic</b>	SPST normally open					

# VACUUM VALVES

## Dimensions

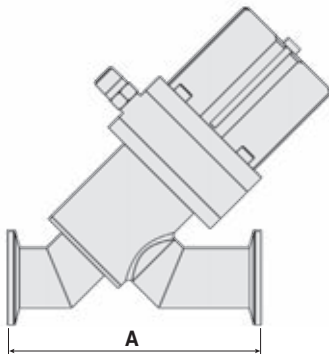
### Angle valves pneumatic



Size	A	B
<b>NW 16</b>	157.58 (6.22)	50.8 (8.2)
<b>NW 25</b>	155.7 (6.13)	52.07 (2.05)
<b>NW 40</b>	176.36 (6.94)	65 (2.56)
<b>CF 1.33</b>	162.02 (6.38)	55.25 (2.18)
<b>CF 2.12</b>	156.29 (6.15)	52.63 (2.07)
<b>CF 2.75</b>	177.87 (7.00)	66.51 (2.62)
<b>¾ in.</b>	157.58 (6.25)	50.8 (2.00)
<b>1 in.</b>	151.9 (5.98)	48.27 (1.9)
<b>1½ in.</b>	172.56 (6.79)	61.2 (2.41)

Dimensions: millimeters (inches)

### In-line valves pneumatic



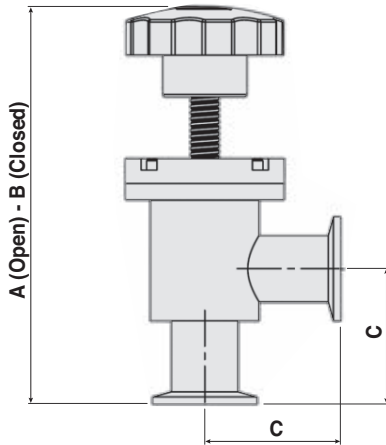
Size	A
<b>NW16</b>	101.6 (4.0)
<b>NW25</b>	106.7 (4.2)
<b>NW40</b>	130.05 (5.12)
<b>CF 1.33</b>	119.41 (4.70)
<b>CF 2.12</b>	107.79 (4.24)
<b>CF 2.75</b>	133.07 (5.24)
<b>¾ in.</b>	94 (3.7)
<b>1 in.</b>	99.1 (3.9)
<b>1½ in.</b>	122.4 (4.82)

Dimensions: millimeters (inches)

# STAINLESS STEEL TUBE VALVES

## Dimensions

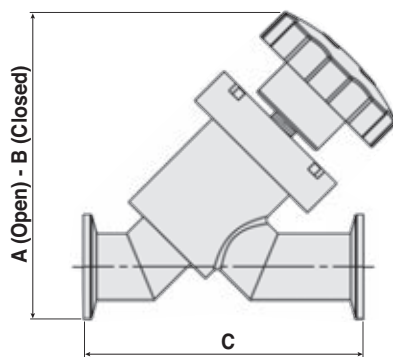
### Angle valves hand-operated



Size	A	B	C
<b>NW 16</b>	158.08 (6.22)	137.75 (5.42)	54.6 (2.15)
<b>NW 25</b>	152.4 (6.0)	132.07 (5.2)	52.07 (2.05)
<b>NW 40</b>	188.07 (7.41)	163.71 (6.45)	65 (2.56)
<b>CF 1.33</b>	158.72 (6.25)	138.27 (5.44)	55.12 (2.17)
<b>CF 2.12</b>	152.96 (6.02)	132.59 (5.22)	52.63 (2.07)
<b>CF 2.75</b>	189.58 (7.46)	165.22 (6.5)	66.51 (2.62)
<b>¾ in.</b>	154.28 (6.07)	133.75 (5.27)	50.8 (2.00)
<b>1 in.</b>	148.6 (5.85)	128.07 (5.04)	48.27 (1.90)
<b>1½ in.</b>	182.27 (7.18)	159.91 (6.3)	61.2 (2.41)

Dimensions: millimeters (inches)

### In-line valves hand-operated



Size	A	B	C
<b>NW 16</b>	119.89 (4.72)	99.56 (3.92)	101.6 (4.0)
<b>NW 25</b>	117.66 (4.63)	97.33 (3.83)	106.7 (4.2)
<b>NW 40</b>	138.28 (5.44)	122.76 (4.83)	130.5 (5.12)
<b>CF 1.33</b>	119.87 (4.72)	99.54 (3.92)	119.4 (4.7)
<b>CF 2.12</b>	117.64 (4.63)	97.31 (3.83)	107.8 (4.24)
<b>CF 2.75</b>	147.28 (5.8)	122.76 (4.83)	133.07 (5.24)
<b>¾ in.</b>	119.89 (4.72)	99.56 (3.92)	94 (3.7)
<b>1 in.</b>	117.66 (4.63)	97.33 (3.83)	99.08 (3.9)
<b>1½ in.</b>	147.28 (5.8)	122.76 (4.83)	122.45 (4.82)

Dimensions: millimeters (inches)

# VACUUM VALVES

## Ordering Information

### Ordering Instructions:

- Use only the Product Number list in the Product Number column.
- Numbers in the Option Number column are for reference only; use Short Description for ordering options.

**Example Order:** for a right angle, 1 1/3" pneumatic valve with position indicator for the valve, and a spare position indicator:

*Item 1:*

X3200A: Agilent Stainless Steel Tube Valve, Right Angle

Option: Pneumatically Operated, 1 1/3" ConFlat (021)

Option: Position indicator with LED light (060)

*Item 2:*

X3200-63000: Position indicator (as a separate spare part)

**Note:** Items are delivered as separate items in the same box, for assembly upon arrival.

For assistance with assembly, please see the video on **Agilent Chem Vacuum YouTube Channel**.

Configuration	Product Number	Option Number	Actuation	Size	Flange	Short Description
Right Angle Stainless Steel Tube Valve	X3200A	001	Manual	3/4"	ConFlat, 1 1/3"	Manually operated, 1 1/3" ConFlat
In-line Stainless Steel Tube Valve	X3201A	002	Manual	1"	ConFlat, 2 1/8"	Manually operated, 2 1/8" ConFlat
		003	Manual	1 1/2"	ConFlat, 2 3/4"	Manually operated, 2 3/4" ConFlat
		004	Manual	3/4"	Tube End, 3/4"	Manually operated, 3/4" Tube End
		005	Manual	1"	Tube End, 1"	Manually operated, 1" Tube End
		006	Manual	1 1/2"	Tube End, 1 1/2"	Manually operated, 1 1/2" Tube End
		007	Manual	3/4"	NW16	Manually operated, NW16
		008	Manual	1"	NW25	Manually operated, NW25
		009	Manual	1 1/2"	NW40	Manually operated, NW40
		021	Pneumatic	3/4"	ConFlat, 1 1/3"	Pneumatically operated, 1 1/3" ConFlat*
		022	Pneumatic	1"	ConFlat, 2 1/8"	Pneumatically operated, 2 1/8" ConFlat*
		023	Pneumatic	1 1/2"	ConFlat, 2 3/4"	Pneumatically operated, 2 3/4" ConFlat*
		024	Pneumatic	3/4"	Tube End, 3/4"	Pneumatically operated, 3/4" Tube End*
		025	Pneumatic	1"	Tube End, 1"	Pneumatically operated, 1" Tube End*
026	Pneumatic	1 1/2"	Tube End, 1 1/2"	Pneumatically operated, 1 1/2" Tube End*		
027	Pneumatic	3/4"	NW16	Pneumatically operated, NW16*		
028	Pneumatic	1"	NW25	Pneumatically operated, NW25*		
029	Pneumatic	1 1/2"	NW40	Pneumatically operated, NW40*		

\* For pneumatically operated valves choose Solenoid and Position Indicator Options if desired - See Accessories Options table below.

Accessory Options (shipped with valves for installation upon arrival)	Add Option Number
Solenoid, 24VDC	050
Solenoid, 110VAC	051
Solenoid, 220VAC	052
Position Indicator with LED	060

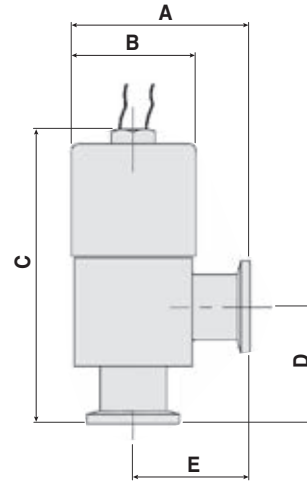
Service Parts (Ordered separately)	Order Part Number
Solenoid, 24VDC	X3200-63024
Solenoid, 110VAC	X3200-63110
Solenoid, 220VAC	X3200-63220
Position Indicator with LED	X3200-63000

Spare Parts	Part Number
Bellows Replacement Kit, NW16/25	X3200-67000
Bellows Replacement Kit, NW40	X3200-67001

# ELECTROMAGNETIC BLOCK VALVES

## ▶ Agile Electromagnetic Block Valves



Models	A	B	C	D	E
NW16	64	58	113	40	40
	(2.50)	(2.28)	(4.43)	(1.58)	(1.58)
NW25	76	58	123	50	50
	(2.98)	(2.28)	(4.83)	(1.98)	(1.98)

*Dimensions: millimeters (inches)*

### Features

- Reliable design
- Low cost
- Rapid spring-closed actuator
- KF Flange connections
- Single coil

### Benefits

- Service-free operation
- Economical
- System protection on loss of power
- Ease of Installation
- Compact construction
- Rapid cycling

# VACUUM VALVES

## Technical Specifications

<b>Vacuum range</b>	Cleaned aluminum: atm to $10^{-6}$ Torr
<b>Leak rate</b>	$<1 \times 10^{-9}$ std cc/sec. (helium)
<b>Operating temperature</b>	15 °C min to 40 °C maximum
<b>Bakeable to –</b>	Non-operating (closed) 125 °C
<b>Pulse voltage/Hold voltage</b>	23 Watts
<b>Service life</b>	250,000 cycles
<b>Conductance</b>	NW16 – 2.2 l/s NW25 – 3.5 l/s
<b>Speed to Open/Close</b>	Open – 50 ms Close – 25 ms
<b>Loss of power</b>	Valve closes (in $< 25$ m/sec)

## Ordering Information

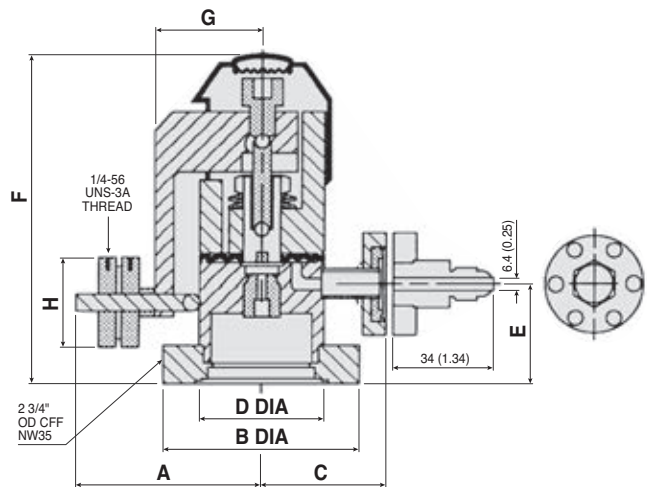
Size	Voltage Option	Part Number	Shipping Weight kg (lbs)
<b>Aluminum Body</b>			
<b>NW16</b>	115 V; 50/60 Hz	L9940302	0.7 (1.5)
	220 V; 50/60 Hz	L9940304	0.7 (1.5)
	24 VDC	L9940306	0.7 (1.5)
	240 V; 50 Hz	L9940308	0.7 (1.5)
<b>NW25</b>	115 V; 50/60 Hz	L9942302	0.9 (2.0)
	220 V; 50/60 Hz	L9942304	0.9 (2.0)
	24 VDC	L9942306	0.9 (2.0)
	240 V; 50 Hz	L9942308	0.9 (2.0)

Description	Part Number	Shipping Weight kg (lbs)
<b>Spare Parts</b>		
Plunger Assembly – includes shaft, spring, and seal	L9987008	0.5 (1.0)
Operator, EMB, 115 V, 50/60 Hz	L9987002	0.5 (1.0)
Operator, EMB, 220 V, 50/60 Hz	L9987004	0.5 (1.0)
Operator, EMB, 240 V, 50 Hz	L9987009	1.0 (2.0)
Operator, EMB, 24 VDC	L9987006	0.5 (1.0)



# VARIABLE LEAK VALVES

## ▶ Agilent Variable Leak Valve



	A	B	C	D	E	F	G	H
mm	67	70	44	44	33	114	39	32
Inches	2 <sup>21</sup> / <sub>34</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>2</sub>	1 <sup>17</sup> / <sub>32</sub>	1 <sup>1</sup> / <sub>4</sub>

The variable leak valve includes a movable piston with an optically flat sapphire that meets a captured metal gasket. This forms a seal completely free from friction, seizing, and shear. The sapphire's movement is controlled through a threaded shaft-and-lever mechanism which provides a mechanical advantage of 13,000 to 1.

### Technical Specifications

<b>Controlled leak rate</b>	10 <sup>-10</sup> Torr-l/sec (minimum)
<b>Vacuum range</b>	Atmosphere to below 10 <sup>-11</sup> Torr (mbar)
<b>Leak rate</b>	No leak detectable on a helium mass spectrometer leak detector with sensitivity of 1 x 10 <sup>-10</sup> std cc/sec
<b>Max flow conductance</b>	6 l/m
<b>Bakeable to –</b>	450 °C

### Ordering Information

Description	Part Number	Shipping Weight kg (lbs)
Sapphire-sealed variable leak valve and valve adjustment tools		
With 1 <sup>1</sup> / <sub>3</sub> in. (NW16) CFF gas inlet	9515106	1.8 (4.0)
Adapter kit, 1 <sup>1</sup> / <sub>3</sub> in. (NW16) CFF-to-flare-fitting adapter kit	9515117	0.5 (1.0)
Replacement gasket assembly	9535050	0.1 (0.3)
Replacement sapphire assembly	9530072	0.5 (1.0)
Sapphire removal tool	SR0061417400	0.2 (0.5)
Repair and tool kit includes fine screw assembly, handle, and collar adjusting knobs and spring driver assembly springs, sapphire assembly and gasket removal tool, brush, lubricant, 1/4 and 5/16 hex key wrenches and instruction manual	9620014	2.3 (5.0)

# FLANGES

## Agilent Vacuum Flanges and Fittings

- Superior Quality Construction
- High Reliability
- Immediate Delivery



### ConFlat Flanges & Fittings

Agilent's ConFlat Flanges have set the industry standard for vacuum flange performance. These flanges are available in rotatable and non-rotatable models, and in sizes from 1.33 in. to 13.25 in. OD.

Agilent utilizes unique manufacturing processes and techniques to ensure leak-free performance in ConFlat Flanges. Our unbending commitment to quality assures you of trouble-free vacuum performance of the Agilent ConFlat Flange.



### Klamp Flanges & Fittings

Designed in accordance with ISO standards the Agilent KF flange can be used in a variety of applications from atmospheric pressure to high vacuum. The KF flange is manufactured from 304 stainless steel and has a leak rate less than  $1E^{-9}$  std cc/sec and can be baked to 150 °C when using a Viton O-Ring.



### ISO Flanges & Fittings

ISO flanges and fittings are designed for applications requiring frequent disassembly and where tubing requirements generally exceed 2 in. OD. All ISO flanges and fittings listed are made of 304L stainless steel. These flanges can be used in a variety of applications from atmospheric to  $E^{-8}$  Torr. They can sustain a bakeout temperature of 150 °C when using Viton o-rings.



### Feedthroughs

Rotary motion feedthrough.  
High voltage feedthrough.



### Supplies

Greases and lubricants.  
Diffusion and mechanical pump fluids.

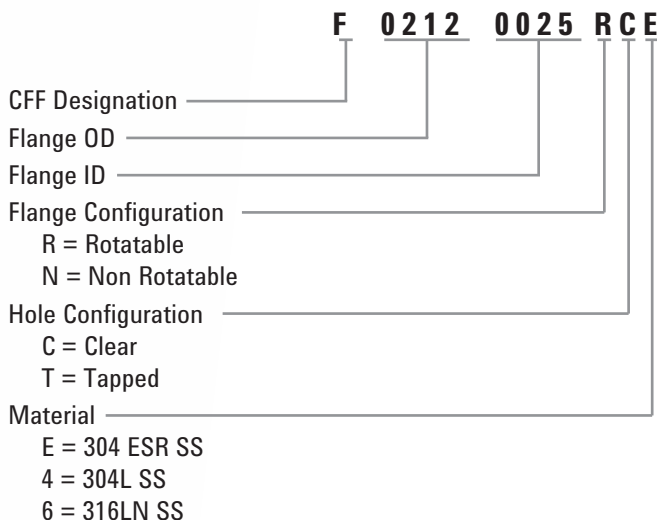
## CONFLAT FLANGES

Agilent's extensive offering in vacuum flanges and fittings features an intuitive part numbering format. These part numbering format allows the customer to identify the product by the characters contained within the part number.

Depending on the product, the number and format of the characters in the part number will vary.

Please see the examples below:

### CFF Example



### CFF Nipple Example



## VACUUM COMPONENTS

ConFlat Flanges & Fittings	Page
ConFlat Flanges .....	406
Reducing Flanges.....	420
ConFlat Flange Accessory Dimensions.....	422
Bolt/Nut Sets – Reducing Flanges.....	423
Bolt Torques .....	423
Reducing Nipples – 304 Steel and 316LN SS .....	424
Half Nipples .....	425
Nipples .....	426
Elbows (90°).....	427
Tees .....	428
Crosses (4-Way).....	428
Flexible Couplings .....	429
CFF to KF Adapters .....	431
UHV Compression Ports .....	434
ConFlat to Compression Port Adapters .....	435
O-Ring Sealed Vacuum Compression Ports and Blank-offs.....	436
Viewports .....	437
Glass Adapters .....	439

# CONFLAT FLANGES

## ▶ 1 1/3 in. (NW16CF) Non-Rotatable

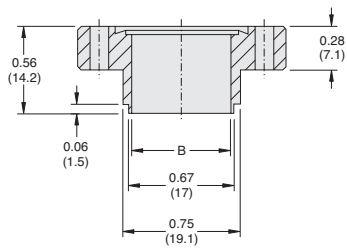


Fig. 3

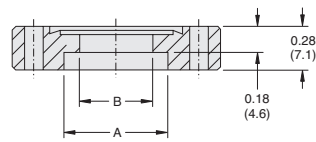


Fig. 4

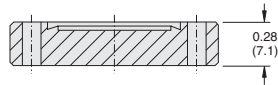


Fig. 1

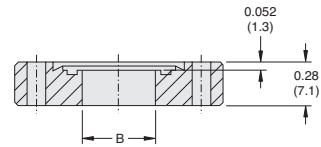


Fig. 2

Thru holes: 6 holes 0.172 (4.4) dia. thru, eq. spaced on 1.062 (26.9) dia. B.C.  
 Tapped holes: 6 holes tapped 8-32 thru, eq. spaced on 1.062 (26.9) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F01330000NC4	F01330000NCE	1	–	–	0.5 (0.2)
	F01330025NC4	F01330025NCE	2	–	0.26 (6.48)	0.5 (0.2)
	F01330038NC4	F01330038NCE	2	–	0.38 (9.70)	0.5 (0.2)
	F01330050NC4	N/A	2	–	0.51 (12.82)	0.5 (0.2)
	F01330075NC4W	F01330075NCEW	3	–	0.63 (16.00)	0.5 (0.2)
	F01330075NC4B	F01330075NCEB	4	0.76 (19.20)	0.63 (16.00)	0.5 (0.2)
Non-Rotatable Tapped	F01330000NT4	F01330000NTE	1	–	–	0.5 (0.2)
	F01330038NT4	N/A	2	–	0.38 (9.70)	0.5 (0.2)
	F01330050NT4	N/A	2	–	0.51 (12.82)	0.5 (0.2)
	F01330075NT4W	N/A	3	–	0.63 (16.00)	0.5 (0.2)
	F01330075NT4B	F01330075NTEB	4	0.76 (19.20)	0.63 (16.00)	0.5 (0.2)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG0133CI	FG0133CIS	N/A	10	1.0 (0.5)
Package set	N/A	N/A	FG0133VU	5	0.5 (0.2)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

# VACUUM COMPONENTS

## ▶ 1 1/3 in. (NW16CF) Rotatable

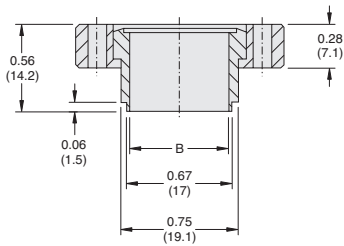


Fig. 7

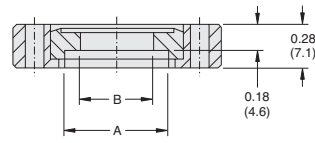


Fig. 8

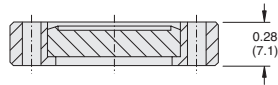


Fig. 5

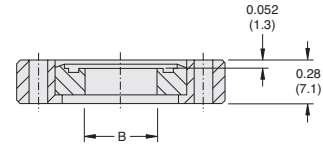


Fig. 6

Thru holes: 6 holes 0.172 (4.4) dia. thru, eq. spaced on 1.062 (26.9) dia. B.C.  
Tapped holes: 6 holes tapped 8-32 thru, eq. spaced on 1.062 (26.9) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Rotatable	F01330000RC4	F01330000RCE	5	—	—	0.5 (0.2)
	F01330025RC4	N/A	6	—	0.26 (6.48)	0.5 (0.2)
	F01330038RC4	F01330038RCE	6	—	0.38 (9.70)	0.5 (0.2)
	F01330050RC4	F01330050RCE	6	—	0.51 (12.82)	0.5 (0.2)
	F01330075RC4W	F01330075RCEW	7	—	0.63 (16.00)	0.5 (0.2)
	F01330075RC4B	F01330075RCEB	8	0.76 (19.20)	0.63 (16.00)	0.5 (0.2)

### Accessories

Description	Thread/Length	Socket Head Part Number	Silver Plated Socket Head Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>					
Clear hole flanges*	8-32 x 3/4	FB0133C	FB0133CS	25	2.0 (0.9)
Tapped hole flanges**	8-32 x 1/2	FB0133T	FB0133TS	25	1.0 (0.5)
<b>Plate Nut Sets</b>					
12 plate nuts/24 bolts/washers		FP0133K	N/A	12/24	2.0 (0.9)
24 plate nuts only		FP0133N	N/A	24	1.0 (0.5)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

# CONFLAT FLANGES

## ▶ 2 3/4 in. (NW35CF) Non-Rotatable

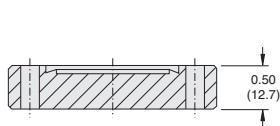


Fig. 1

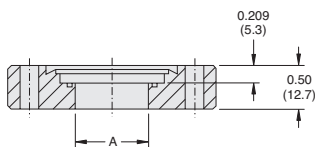


Fig. 2

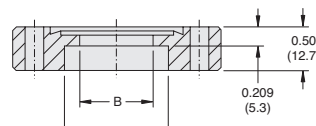


Fig. 3

Thru holes: 6 holes 0.265 (6.7) dia. thru, eq. spaced on 2.312 (58.7) dia. B.C.

Tapped holes: 6 holes tapped 1/4-28 thru, eq. spaced on 2.312 (58.7) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F02750000NC4	F02750000NCE	1	–	–	0.8 (0.4)
	F02750025NC4W	N/A	2	0.26 (6.48)	–	0.8 (0.4)
	F02750050NC4W	N/A	2	0.51 (12.83)	–	0.8 (0.4)
	F02750075NC4B	N/A	3	0.76 (19.30)	0.69 (17.53)	0.8 (0.4)
	F02750075NC4W	F02750075NCEW	2	0.76 (19.30)	–	0.8 (0.4)
	F02750100NC4B	F02750075NCEB	3	1.01 (25.65)	0.88 (22.23)	0.5 (0.2)
	F02750100NC4W	F02750100NCEW	2	1.01 (25.65)	–	0.8 (0.4)
	F02750125NC4	F02750125NCE	3	1.26 (32.00)	1.13 (28.56)	0.5 (0.2)
	F02750150NC4	F02750150NCE	3	1.51 (38.35)	1.38 (34.93)	0.5 (0.2)
	F02750162NC4	N/A	3	1.64 (41.53)	1.50 (38.10)	0.5 (0.2)
	F02750175NC4	F02750175NCE	3	1.76 (44.70)	1.63 (41.28)	0.5 (0.2)
	Non-Rotatable Tapped	F02750000NT4	F02750000NTE	1	–	–
	F02750075NT4B	N/A	3	0.76 (19.30)	0.69 (17.53)	0.8 (0.4)
	F02750100NT4W	N/A	2	1.01 (25.65)	–	0.8 (0.4)
	F02750125NT4	N/A	3	1.26 (32.00)	1.13 (28.56)	0.5 (0.2)
	F02750150NT4	F02750150NTE	3	1.51 (38.35)	1.38 (34.93)	0.5 (0.2)
	F02750162NT4	N/A	3	1.64 (41.53)	1.50 (38.10)	0.5 (0.2)
	F02750175NT4	N/A	3	1.76 (44.70)	1.63 (41.28)	0.5 (0.2)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG0275CI	FG0275CIS	N/A	10	0.5 (0.2)
10-pack, solid blank-off	FG0275CUB	N/A	N/A	10	1.0 (0.5)
Package set	N/A	N/A	FG0275VU	5	0.5 (0.2)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

# VACUUM COMPONENTS

## ▶ 2 3/4 in. (NW35CF) Rotatable

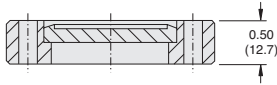


Fig. 4

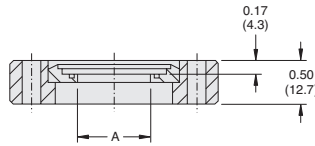


Fig. 5

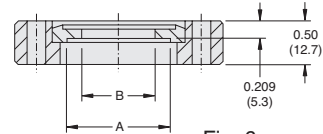


Fig. 6

Thru holes: 6 holes 0.265 (6.7) dia. thru, eq. spaced on 2.312 (58.7) dia. B.C.

Tapped holes: 6 holes tapped 1/4-28 thru, eq. spaced on 2.312 (58.7) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Rotatable	F02750000RC4	F02750000RCE	4	—	—	0.8 (0.4)
	F02750025RC4	N/A	5	.26 (6.48)	—	0.8 (0.4)
	F02750050RC4	N/A	5	.51 (12.83)	—	0.8 (0.4)
	F02750075RC4	N/A	6	.76 (19.30)	.63 (16.00)	0.8 (0.4)
	F02750100RC4	F02750100RCEB	6	1.01 (25.65)	.88 (22.23)	0.5 (0.2)
	N/A	F02750100RCEW	5	1.01 (25.65)	—	0.8 (0.4)
	F02750125RC4	F02750125RCE	6	1.26 (32.00)	1.13 (28.56)	0.5 (0.2)
	F02750150RC4	F02750150RCE	6	1.51 (38.35)	1.38 (34.93)	0.5 (0.2)
	F02750162RC4	N/A	6	1.65 (41.53)	1.50 (38.10)	0.5 (0.2)
	F02750175RC4	N/A	6	1.76 (44.70)	1.63 (41.28)	0.5 (0.2)

See page 415 for Accessories Ordering Information

### Accessories

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges*	1/4-28 x 1 1/4	FB0275C06	FB0275C12	FB0275C12S	25	1.0 (0.5)
Tapped hole flanges**	1/4-28 x 7/8	FB0275T06	FB0275T12	FB0275T12S	25	0.5 (0.2)
<b>Plate Nut Sets</b>						
12 plate nuts/24 bolts/24 washers		FP0275K06	FP0275K12	N/A	12/24	2.0 (0.9)
24 plate nuts only		FP0275N	N/A	N/A	12/24	2.0 (0.9)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

# CONFLAT FLANGES

## ▶ 3<sup>3</sup>/<sub>8</sub> in. (NW50CF) Non-Rotatable

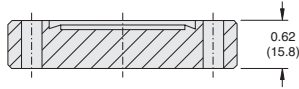


Fig. 1

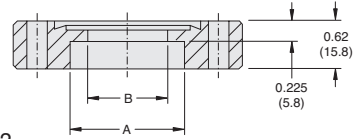


Fig. 2

Thru holes: 8 holes 0.332 (8.4) dia. thru, eq. spaced on 2.850 (72.4) dia. B.C.  
 Tapped holes: 8 holes tapped 5/16-24 thru, eq. spaced on 2.850 (72.4) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F03380000NC4	N/A	1	–	–	2.0 (0.9)
	F03380200NC4	N/A	2	2.01 (51.18)	1.88 (47.63)	1.5 (0.7)
Non-Rotatable Tapped	F03380000NT4	N/A	1	–	–	2.0 (0.9)
	F03380200NT4	N/A	2	2.01 (51.18)	1.88 (47.63)	1.5 (0.7)



# VACUUM COMPONENTS

## ▶ 3<sup>3</sup>/<sub>8</sub> in. (NW50CF) Rotatable

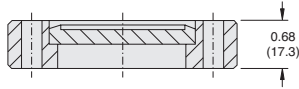


Fig. 3

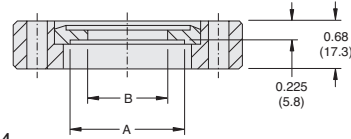


Fig. 4

Thru holes: 8 holes 0.332 (8.4) dia. thru, eq. spaced on 2.850 (72.4) dia. B.C.  
Tapped holes: 8 holes tapped 5/16-24 thru, eq. spaced on 2.850 (72.4) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Rotatable	F03380000RC4	N/A	3	—	—	2.0 (0.9)
	F03380150RC4	N/A	4	1.51 (38.35)	1.38 (34.93)	1.5 (0.7)
	F03380200RC4	N/A	4	2.02 (51.18)	1.88 (47.63)	1.5 (0.7)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG0338CI	FG0338CIS	N/A	10	1.0 (0.5)
1-pack	N/A	N/A	FG0338VU	1	0.5 (0.2)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges*	5/16-24 x 1 3/4	FB0338C06	FB0338C12	FB0338C12S	25	2.0 (0.9)
Tapped hole flanges**	5/16-24 x 1 3/4	FB0450T06	FB0450T12	FB0450T12S	25	2.0 (0.9)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

# CONFLAT FLANGES

## ▶ 4 ½ in. (NW63CF) Non-Rotatable

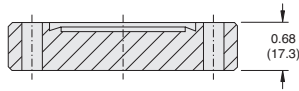


Fig. 1

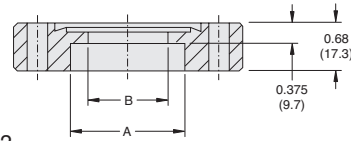


Fig. 2

Thru holes: 8 holes 0.332 (8.4) dia. thru, eq. spaced on 3.628 (92.2) dia. B.C.  
 Tapped holes: 8 holes tapped 5/16-24 thru, eq. spaced on 3.628 (92.2) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F04500000NC4	F04500000NCE	1	–	–	3.0 (1.4)
	F04500150NC4	N/A	2	1.51 (38.35)	1.38 (34.93)	2.5 (1.1)
	F04500200NC4	N/A	2	2.01 (51.05)	1.88 (47.63)	2.5 (1.1)
	F04500250NC4	F04500250NCE	2	2.51 (63.75)	2.38 (60.33)	2.5 (1.1)
Non-Rotatable Tapped	F04500000NT4	F04500000NTE	1	–	–	3.0 (1.4)
	F04500150NT4	N/A	2	1.51 (38.35)	1.38 (34.93)	2.5 (1.1)
	F04500200NT4	N/A	2	2.01 (51.05)	1.88 (47.63)	2.5 (1.1)
	F04500250NT4	N/A	2	2.51 (63.75)	2.38 (60.33)	2.5 (1.1)

# VACUUM COMPONENTS

## ▶ 4 1/2 in. (NW63CF) Rotatable

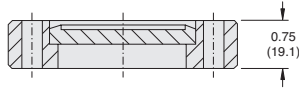


Fig. 3

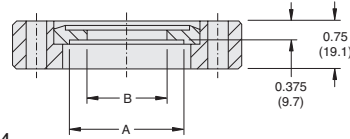


Fig. 4

Thru holes: 8 holes 0.332 (8.4) dia. thru, eq. spaced on 3.628 (92.2) dia. B.C.  
Tapped holes: 8 holes tapped 5/16-24 thru, eq. spaced on 3.628 (92.2) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Rotatable	F04500000RC4	N/A	3	—	—	3.0 (1.4)
	F04500200RC4	N/A	4	2.01 (51.05)	1.88 (47.63)	2.5 (1.1)
	F04500250RC4	N/A	4	2.51 (63.75)	2.38 (60.33)	2.5 (1.1)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG0450CI	FG0450CIS	N/A	10	2.0 (0.9)
1-pack	N/A	N/A	FG0450VU	1	0.5 (0.2)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges*	5/16-24 x 2	FB0450C06	FB0450C12	FB0450C12S	25	1.5 (0.7)
Tapped hole flanges**	5/16-24 x 1 1/4	FB0450T06	FB0450T12	FB0450T12S	25	1.5 (0.7)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

# CONFLAT FLANGES

## ► 6 in. (NW100CF) Non-Rotatable

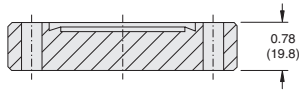


Fig. 1

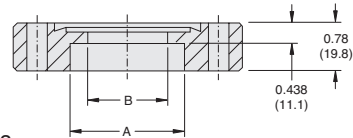


Fig. 2

Thru holes: 16 holes 0.332 (8.4) dia. thru, eq. spaced on 5.128 (130.3) dia. B.C.  
 Tapped holes: 16 holes tapped  $\frac{5}{16}$ -24 thru, eq. spaced on 5.128 (130.3) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F06000000NC4	F06000000NCE	1	—	—	6.5 (2.9)
	F06000400NC4	F06000400NCE	2	4.01 (101.85)	3.81 (96.77)	4.5 (2.0)
Non-Rotatable	F06000000NT4	N/A	1	—	—	6.5 (2.9)
Tapped	F06000400NT4	N/A	2	4.01 (101.85)	3.81 (96.77)	4.5 (2.0)

## ► 6 in. (NW100CF) Rotatable

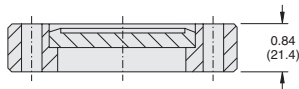


Fig. 3

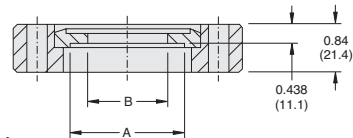


Fig. 4

Thru holes: 16 holes 0.332 (8.4) dia. thru, eq. spaced on 5.128 (130.3) dia. B.C.  
 Tapped holes: 16 holes tapped  $\frac{5}{16}$ -24 thru, eq. spaced on 5.128 (130.3) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Rotatable	F06000000RC4	F06000000RCE	3	—	—	6.5 (2.9)
	F06000400RC4	N/A	4	4.01 (101.85)	3.81 (96.77)	4.5 (2.0)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG0600CI	FG0600CIS	N/A	10	1.5 (0.7)
1-pack	N/A	N/A	FG0600VU	1	1.0 (0.5)
Gasket clip set	GC0275S	N/A	N/A	10	.5 (0.2)

# VACUUM COMPONENTS

## Accessories (Cont'd)

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges						
Non-rotatable*	5/16-24 x 2	FB0450C06	FB0450C12	FB0450C12S	25	2.0 (0.9)
Clear hole flanges						
Rotatable*	5/16-24 x 2 1/4	FB0600C06	FB0600C12	FB0600C12S	25	2.0 (0.9)
Tapped hole flanges**	5/16-24 x 1 1/4	FB0450T06	FB0450T12	FB0450T12S	25	1.5 (0.7)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

## ▶ 6 3/4 in. (NW130CF) Non-Rotatable

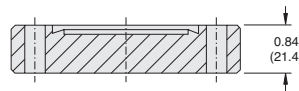


Fig. 1

Thru holes: 18 holes 0.332 (8.4) dia. thru, eq. spaced on 5.969 (151.6) dia. B.C.

Tapped holes: 18 holes tapped 5/16-24 thru, eq. spaced on 5.969 (151.6) dia. B.C.

Dimensions: inches (millimeters)

## Ordering Information

Type	304L SS	304 ESR SS	Fig. Number	Dimensions		Weight lbs (kg)
	Part Number	Part Number		A in. (mm)	B in. (mm)	
Non-Rotatable	F06750000NC4	F06750000NCE	1	-	-	8.0 (3.6)

## Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-Pack, individually sealed	FG0675CI	FG0675CIS	N/A	10	2.0 (0.9)
1-pack	N/A	N/A	FG0675VU	1	1.0 (0.5)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges*	5/16-24 x 2 1/4	FB0600C06	FB0600C12	FB0600C12S	25	2.0 (0.9)
Tapped hole flanges**	5/16-24 x 1 3/4	FB0800T06	N/A	FB0800T12S	25	2.0 (0.9)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

# CONFLAT FLANGES

## ► 8 in. (NW150CF) Non-Rotatable

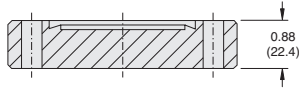


Fig. 1

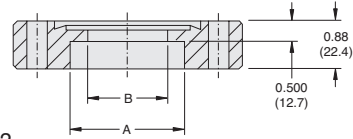


Fig. 2

Thru holes: 20 holes 0.332 (8.4) dia. thru, eq. spaced on 7.128 (181.1) dia. B.C.

Tapped holes: 20 holes tapped  $\frac{5}{16}$ -24 thru, eq. spaced on 7.128 (181.1) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F08000000NC4	F08000000NCE	1	–	–	12.5 (5.6)
	F08000600NC4	N/A	2	6.02 (152.91)	5.81 (147.57)	5.8 (2.6)
Non-Rotatable Tapped	F08000000NT4	N/A	1	–	–	12.5 (5.6)
	F08000600NT4	N/A	2	6.02 (152.91)	5.81 (147.57)	5.8 (2.6)

# VACUUM COMPONENTS

## ► 8 in. (NW150CF) Rotatable

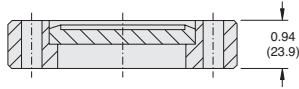


Fig. 3

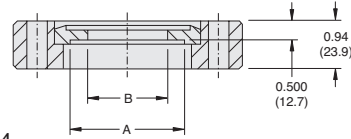


Fig. 4

Thru holes: 20 holes 0.332 (8.4) dia. thru, eq. spaced on 7.128 (181.1) dia. B.C.  
 Tapped holes: 20 holes tapped  $\frac{5}{16}$ -24 thru, eq. spaced on 7.128 (181.1) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Rotatable	F08000000RC4	N/A	3	—	—	10.0 (4.5)
	F08000600RC4	F08000600RCE	4	6.02 (152.91)	5.81 (147.57)	7.0 (3.2)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG0800CI	FG0800CIS	N/A	10	2.5 (1.1)
1-pack	N/A	N/A	FG0800VU	1	1.0 (0.5)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges*	$\frac{5}{16}$ -24 x 2 $\frac{1}{4}$	FB0600C06	FB0600C12	FB0600C12S	25	2.0 (0.9)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only

# CONFLAT FLANGES

## ▶ 10 in. (NW200CF) Non-Rotatable

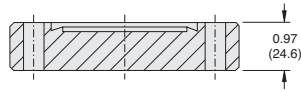


Fig. 1

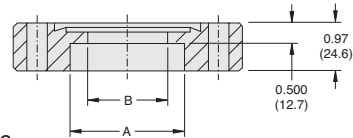


Fig. 2

Thru holes: 24 holes 0.332 (8.4) dia. thru, eq. spaced on 9.128 (231.9) dia. B.C.  
 Tapped holes: 24 holes tapped  $\frac{5}{16}$ -24 thru, eq. spaced on 9.128 (231.9) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F10000000NC4	F10000000NCE	1	–	–	21.0 (9.5)
	F10000800NC4	N/A	2	8.04 (204.22)	7.81 (198.37)	8.0 (3.6)
Non-Rotatable Tapped	F10000000NT4	N/A	1	–	–	21.0 (9.5)

### Accessories

Description	Copper Part Number	Silver Plated Copper Part Number	Viton Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>					
10-pack, individually sealed	FG1000CI	FG1000CIS	N/A	10	3.0 (1.3)
1-pack	N/A	N/A	FG1000VU	1	1.0 (0.5)
Gasket clip set	GC0275S	N/A	N/A	10	0.5 (0.2)

Description	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Silver Plated 12-Point Bolt Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>						
Clear hole flanges*	$\frac{5}{16}$ -24 x 2 $\frac{1}{2}$	FB1000C06	FB1000C12	FB1000C12S	25	2.0 (0.9)
Tapped hole flanges**	$\frac{5}{16}$ -24 x 1 $\frac{3}{4}$	FB0800T06	N/A	FB0800T12S	25	1.5 (0.7)

\* Includes nuts, washers, and bolts

\*\* Includes washers and bolts only



# VACUUM COMPONENTS

## ▶ 13¼ in. (NW275CF) Non-Rotatable

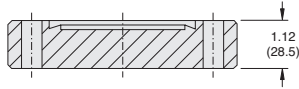


Fig. 1

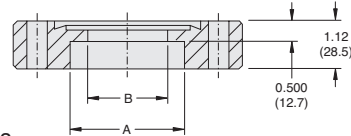


Fig. 2

Thru holes: 30 holes 0.390 (9.9) dia. thru, eq. spaced on 12.060 (306.3) dia. B.C.  
Tapped holes: 30 holes tapped 3/8-24 thru, eq. spaced on 12.060 (306.3) dia. B.C.

Dimensions: inches (millimeters)

### Ordering Information

Type	304L SS Part Number	304 ESR SS Part Number	Fig. Number	Dimensions		Weight lbs (kg)
				A in. (mm)	B in. (mm)	
Non-Rotatable	F13250000NC4	F13250000NCE	1	—	—	41.0 (18.6)
	F13251000NC4	N/A	2	10.03 (254.76)	9.86 (250.44)	18.0 (8.2)

### Accessories

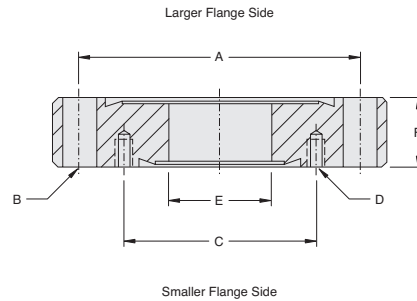
Description	Copper Part Number	Qty/Pkg	Weight lbs (kg)
<b>Gaskets</b>			
1-pack, individually sealed	FG1325CI	1	0.5 (0.2)
Gasket clip set	GC0275S	10	0.5 (0.2)

Description	Thread/Length	Hex Head Part Number	Qty/Pkg	Weight lbs (kg)
<b>Nut and Bolt Sets</b>				
Clear hole flanges*	3/8-24 x 3	FB1325C06	30	2.0 (0.9)

\* Includes nuts, washers, and bolts

# CONFLAT FLANGES

## ▶ 2¾ in. - 10 in. Reducing



### Ordering Information

Size	304L SS Part Number	304 ESR SS Part Number	Larger Flange Dimensions		
			Bolt Circle A in. (mm)	# of Holes	Hole Diam. B in. (mm)
2¾ in.	N/A	FR02750133E	2.31 (58.72)	6	0.27 (6.73)
4½ in.	N/A	FR04500133E	3.63 (92.15)	8	0.33 (8.43)
	N/A	FR04500275E	3.63 (92.15)	8	0.33 (8.43)
6 in.	FR060001334	N/A	5.13 (130.25)	16	0.33 (8.43)
	FR060002754	FR06000275E	5.13 (130.25)	16	0.33 (8.43)
	FR060003384	N/A	5.13 (130.25)	16	0.33 (8.43)
	FR060004504	FR06000450E	5.13 (130.25)	16	0.33 (8.43)
8 in.	FR080001334	N/A	7.13 (181.05)	20	0.33 (8.43)
	FR080002754	FR08000275E	7.13 (181.05)	20	0.33 (8.43)
	FR080004504	FR08000450E	7.13 (181.05)	20	0.33 (8.43)
	FR080006004	FR08000600E	7.13 (181.05)	20	0.33 (8.43)
	FR080006754T*	N/A	7.13 (181.05)	20	<sup>5</sup> / <sub>16</sub> -24
10 in.	FR100001334	N/A	9.13 (231.85)	24	0.33 (8.43)
	FR100002754	N/A	9.13 (231.85)	24	0.33 (8.43)
	FR100003384	N/A	9.13 (231.85)	24	0.33 (8.43)
	FR100004504	N/A	9.13 (231.85)	24	0.33 (8.43)
	FR100006004	N/A	9.13 (231.85)	24	0.33 (8.43)
	FR100008004	N/A	9.13 (231.85)	24	0.33 (8.43)

\* Both sets of bolt holes are tapped.

# VACUUM COMPONENTS

Smaller Flange Dimensions					
Bolt Circle C	# of Holes	Thread D	ID E	Thickness F	Weight
in. (mm)			in. (mm)	in. (mm)	lbs (kg)
1.06 (27.00)	6	8-32	0.62 (15.75)	0.50 (12.70)	0.8 (0.3)
1.06 (26.98)	6	8-32	0.62 (15.75)	0.68 (17.27)	3.0 (1.4)
2.31 (58.73)	6	¼-28	1.50 (38.10)	0.68 (17.27)	2.5 (1.1)
1.06 (26.98)	6	8-32	0.62 (15.75)	0.78 (19.81)	6.0 (2.7)
2.31 (58.73)	6	¼-28	1.50 (38.10)	0.78 (19.81)	5.5 (2.5)
2.85 (72.39)	8	⅝-24	1.88 (47.63)	0.78 (19.81)	5.0 (2.3)
3.63 (92.15)	8	⅝-24	2.50 (63.50)	0.78 (19.81)	4.5 (2.0)
1.06 (26.98)	6	8-32	0.62 (15.75)	0.88 (22.35)	12.0 (5.4)
2.31 (58.73)	6	¼-28	1.50 (38.10)	0.88 (22.35)	12.0 (5.4)
3.63 (92.15)	8	⅝-24	2.50 (63.50)	0.88 (22.35)	11.0 (5.0)
5.13 (130.25)	16	⅝-24	4.00 (101.60)	0.88 (22.35)	10.0 (4.5)
5.97 (151.61)	18	⅝-24	5.00 (127.00)	0.88 (22.35)	10.0 (4.5)
1.06 (26.98)	6	8-32	0.62 (15.75)	0.97 (24.64)	20.0 (9.0)
2.31 (58.73)	6	¼-28	1.50 (38.10)	0.97 (24.64)	20.0 (9.0)
2.85 (72.40)	8	⅝-24	2.00 (50.80)	0.97 (24.64)	20.0 (9.0)
3.63 (92.11)	8	⅝-24	2.50 (63.50)	0.97 (24.64)	20.0 (9.0)
5.13 (130.25)	16	⅝-24	4.00 (101.60)	0.97 (24.64)	17.0 (7.7)
7.13 (181.05)	20	⅝-24	6.00 (152.40)	0.97 (24.64)	17.0 (7.7)

# CONFLAT FLANGES

## ► Accessories

### Accessories – Gaskets

Size	Gasket Material	Description	Part Number	Qty/Pkg	Weight lbs (kg)
<b>1 1/8 in.</b>	Copper	Individually sealed	FG0133CI	10	1.0 (0.5)
	Viton	Packaged together	FG0133VU	5	0.5 (0.2)
	Silver plated copper	Packaged together	FG0133CIS	10	1.0 (0.5)
		Clip set	GC0275S	10	1.0 (0.5)
<b>2 1/8 in.</b>	Copper	Individually sealed	FG0212CI	10	1.0 (0.5)
	Viton	Packaged together	FG0212VU	5	0.5 (0.2)
	Silver plated copper	Individually sealed	FG0212CIS	10	1.0 (0.5)
		Clip set	GC0275S	10	0.5 (0.2)
<b>2 3/8 in.</b>	Copper	Individually sealed	FG0275CI	10	1.0 (0.5)
	Viton	Packaged together	FG0275VU	5	0.5 (0.2)
	Silver plated copper	Packaged together	FG0275CIS	10	1.0 (0.5)
		Clip set	GC0275S	10	1.0 (0.5)
<b>3 3/8 in.</b>	Copper	Individually sealed	FG0338CI	10	1.0 (0.5)
	Viton	Individually sealed	FG0338VU	1	0.5 (0.2)
	Silver plated copper	Packaged together	FG0338CIS	10	1.0 (0.5)
		Clip set	GC0275S	10	1.0 (0.5)
<b>4 1/2 in.</b>	Copper	Individually sealed	FG0450CI	10	1.0 (0.5)
	Viton	Individually sealed	FG0450VU	1	0.5 (0.2)
	Silver plated copper	Packaged together	FG0450CIS	10	1.0 (0.5)
		Clip set	GC0275S	10	1.0 (0.5)
<b>4 7/8 in.</b>	Copper	Individually sealed	FG0462CI	10	1.0 (0.5)
	Viton	Individually sealed	FG0462VU	1	0.5 (0.2)
	Silver plated copper	Individually sealed	FG0462CIS	10	2.0 (0.9)
		Clip set	GC0275S	10	0.5 (0.2)
<b>6 in.</b>	Copper	Individually sealed	FG0600CI	10	2.0 (0.9)
	Viton	Individually sealed	FG0600VU	1	0.5 (0.2)
	Silver plated copper	Packaged together	FG0600CIS	10	2.0 (0.9)
		Clip set	GC0275S	10	1.0 (0.5)
<b>6 3/4 in.</b>	Copper	Individually sealed	FG0675CI	10	2.0 (0.9)
	Viton	Individually sealed	FG0675VU	1	0.5 (0.2)
	Silver plated copper	Packaged together	FG0675CIS	10	2.0 (0.9)
		Clip set	GC0275S	10	1.0 (0.5)
<b>8 in.</b>	Copper	Individually sealed	FG0800CI	10	2.0 (0.9)
	Viton	Individually sealed	FG0800VU	1	0.5 (0.2)
	Silver plated copper	Packaged together	FG0800CIS	10	2.0 (0.9)
		Clip set	GC0275S	10	1.0 (0.5)
<b>10 in.</b>	Copper	Individually sealed	FG1000CI	10	2.5 (1.1)
	Viton	Individually sealed	FG1000VU	1	0.5 (0.2)
	Silver plated copper	Packaged together	FG1000CIS	10	2.5 (1.1)
		Clip set	GC0275S	10	1.0 (0.5)
<b>12 in.</b>	Copper	Individually sealed	FG1200CI	1	2.5 (1.1)
	Viton	Individually sealed	FG1200VU	1	0.5 (0.2)
	Silver plated copper	Individually sealed	FG1200CIS	1	2.0 (0.9)
		Clip set	GC0275S	10	0.5 (0.2)
<b>13 1/4 in.</b>	Copper	Individually sealed	FG1325CI	1	3.5 (1.6)

### Recommended Torque Specifications for Tightening ConFlat Bolts

Flange Size	Size/Thread	Torque – inch lbs
For ConFlats 1 1/8 in.	(8-32)	51
For ConFlats 2 1/8 in. and 2 3/8 in.	(1/4-28)	96
For ConFlats 3 3/8 in. to 12 in.	(5/16-24)	192
For ConFlats 13 1/4 in.	(3/8-24)	345

# VACUUM COMPONENTS

## Accessories – Bolt Sets for Double-Sided Flanges

Size	Nut and Bolt Sets	Thread/Length	Hex Head Part Number	12-Point Bolt Part Number	Qty/Pkg	Shipping Weight lbs (kg)
2 3/4 in.	Clear hole flanges*	1/4-28 x 2 1/4	FB0275CD06	FB0275CD12	6	1.0 (0.5)
4 1/2 in.	Clear hole flanges*	5/16-24 x 2 1/2	FB0450CD06	FB0450CD12	10	1.0 (0.5)
6 in.	Clear hole flanges*	5/16-24 x 2 3/4	FB0600CD06	N/A	16	2.0 (0.9)
8 in.	Clear hole flanges*	5/16-24 x 3 1/4	FB0800CD06	N/A	20	3.0 (1.4)
10 in.	Clear hole flanges*	5/16-24 x 3 1/2	FB1000CD06	N/A	24	3.5 (1.6)
13 1/4 in.	Clear hole flanges*	3/8-24 x 4	FB1325CD06	N/A	30	4.0 (1.8)

\* Includes nuts, washers, and bolts

## Accessories – Bolt Sets for CF to KF Adapters

Size	Nut and Bolt Sets	Hex Head Part Number	12-Point Bolt Part Number	Qty/Pkg	Shipping Weight lbs (kg)
1 1/3 in.	Clear hole flanges	N/A	FB0133C**	25	0.5 (0.2)
	Tapped hole flanges	N/A	FB0133T**	25	0.5 (0.2)
2 1/8 in.	Clear hole flanges	FB0275C06	FB0275C12	25	1.0 (0.5)
	Tapped hole flanges	FB0275T06	FB0275T12	25	1.0 (0.5)
2 3/4 in.	Clear hole flanges	FB0275C06	FB0275C12	25	1.0 (0.5)
	Tapped hole flanges	FB0275T06	FB0275T12	25	1.0 (0.5)
3 3/8 in.	Clear hole flanges	FB0338C06	FB0338C12	25	2.0 (0.9)
	Tapped hole flanges	FB0450T06	FB0450T12	25	2.0 (0.9)
4 1/2 in.	Clear hole flanges	FB0450C06	FB0450C12	25	2.0 (0.9)
	Tapped hole flanges	FB0450T06	FB0450T12	25	2.0 (0.9)
4 5/8 in.	Clear hole flanges non rot.	FB0450C06	FB0450C12	25	1.5 (0.7)
	Clear hole flanges rot.	FB0600C06	FB0600C12	25	1.5 (0.7)
	Tapped hole flanges	FB0450T06	FB0450T12	25	1.5 (0.7)

\* Includes nuts, washers, and bolts

\*\* Only available in socket head

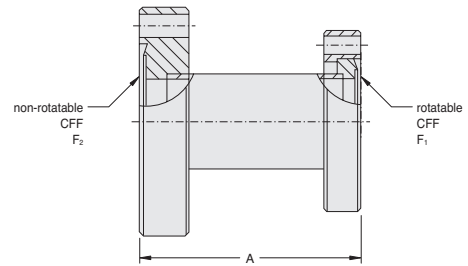
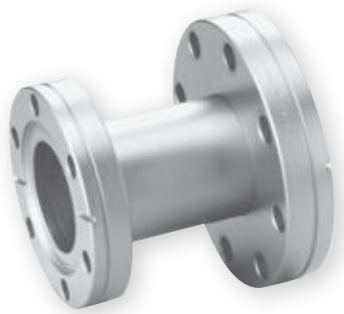
## Accessories – Bolt Sets for Reducing Flanges

Flange Size	Part Number	Small Flange	Large Flange	Weight lbs (kg)
2 3/4 in. to 1 1/2 in.	FB02750133CR12	6 bolts/washers	6 bolts/washers	2.0 (0.9)
3 3/8 in. to 2 3/4 in.	FB03380275CR12	6 bolts	8 bolts	3.0 (1.4)
4 1/2 in. to 2 3/4 in.	FB04500275CR12	6 bolts/washers	8 bolts/washers/nuts	3.0 (1.4)
6 in. to 2 3/4 in.	FB06000275CR12	6 bolts/washers	16 bolts/washers/nuts	4.0 (1.8)
6 in. to 3 3/8 in.	FB06000338CR12	8 bolts/washers	16 bolts/washers/nuts	4.0 (1.8)
6 in. to 4 1/2 in.	FB06000450CR12	8 bolts/washers	16 bolts/washers/nuts	4.0 (1.8)
8 in. to 2 3/4 in.	FB08000275CR12	6 bolts/washers	20 bolts/washers/nuts	4.0 (1.8)
8 in. to 4 1/2 in.	FB08000450CR12	8 bolts/washers	20 bolts/washers/nuts	4.0 (1.8)
10 in. to 2 3/4 in.	FB10000275CR12	6 bolts/washers	24 bolts/washers/nuts	5.0 (2.3)
10 in. to 8 in.	FB10000800CR12	20 bolts/washers	24 bolts/washers/nuts	5.0 (2.3)

**NOTE** • Reducing flange bolt sets include sockets, 6 point and 12 point bolts dependent on size:  
1.33 bolts are socket keyed (SH), 6.75 in. and 13.25 in. bolts are hex head.  
All other sizes are 12 point heads.

# CONFLAT FITTINGS

## ▶ Reducing Nipples - 304 Stainless Steel



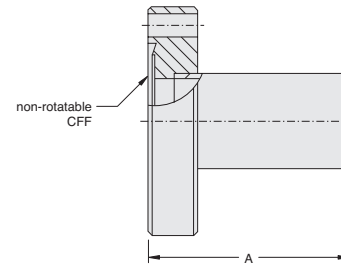
### Ordering Information

Flange Size	Part Number	Length A in. (mm)	Non-Rotatable F2	Rotatable F1	Shipping Weight lbs (kg)
2 ¾ in.	FA02750133	2.50 (63.50)	2 ¾	1 ⅓	1.5 (0.7)
	FA02750212	2.75 (69.85)	2 ¾	2 ⅛	1.5 (0.7)
4 ½ in.	FA04500133	2.50 (63.50)	4 ½	1 ⅓	4.0 (1.8)
	FA04500275	2.50 (63.50)	4 ½	2 ¾	4.0 (1.8)
	FA04500275L	3.00 (76.20)	4 ½	2 ¾	4.0 (1.8)
6 in.	FA06000133	2.50 (63.50)	6	1 ⅓	8.0 (3.6)
	FA06000275	3.25 (82.55)	6	2 ¾	8.0 (3.6)
	FA06000450	2.50 (63.50)	6	4 ½	10.0 (4.5)
8 in.	FA08000275L	4.00 (101.60)	8	2 ¾	14.0 (6.3)
	FA08000450	2.50 (63.50)	8	4 ½	16.0 (7.2)
	FA08000600	2.50 (63.50)	8	6	18.0 (8.1)
	FA08000600L	4.50 (114.30)	8	6	16.0 (7.2)
10 in.	FA10000800	4.75 (120.65)	10	8	20.0 (9.0)

**NOTE** • Clear Hole ConFlat Flange

# VACUUM COMPONENTS

## ► Half Nipples



### Ordering Information – Half Nipples, Standard Tube Size

Tube Size	Part Number	Flange OD	Overall Length A in. (mm)	Tube OD in. (mm)	Tube ID in. (mm)	Shipping Weight lbs (kg)
¾ in.	FNH0075	1 ⅓	1.50 (38.10)	0.75 (19.05)	0.68 (17.27)	0.8 (0.3)
1 in.	FNH01000275	2 ¾	2.46 (62.48)	1.00 (25.40)	0.87 (19.81)	1.0 (0.5)
1 ½ in.	FNH0150S	2 ¾	2.46 (62.48)	1.50 (38.10)	1.37 (34.80)	1.0 (0.5)
	FNH0150	2 ¾	4.71 (119.63)	1.50 (38.10)	1.37 (34.80)	1.0 (0.5)
2 in.	FNH0200	3 ⅞	3.21 (81.53)	2.00 (50.80)	1.87 (47.50)	2.0 (0.9)
2 ½ in.	FNH0250S	4 ½	3.38 (85.85)	2.50 (63.50)	2.37 (60.20)	6.0 (2.7)
	FNH0250	4 ½	4.12 (104.65)	2.50 (63.50)	2.37 (60.20)	6.0 (2.7)
3 in.	FNH0300S	4 ⅝	3.53 (89.66)	3.00 (76.20)	2.87 (72.90)	7.0 (3.2)
4 in.	FNH0400S	6	4.32 (109.73)	4.00 (101.60)	3.83 (97.28)	11.0 (4.9)
6 in.	FNH0600S	8	5.50 (139.70)	6.00 (152.40)	5.83 (148.08)	19.0 (8.6)
	FNH0600	8	6.56 (166.62)	6.00 (152.40)	5.83 (148.08)	19.0 (8.6)
8 in.	FNH0800	10	8.00 (203.20)	8.00 (203.20)	7.83 (198.88)	26.0 (11.8)

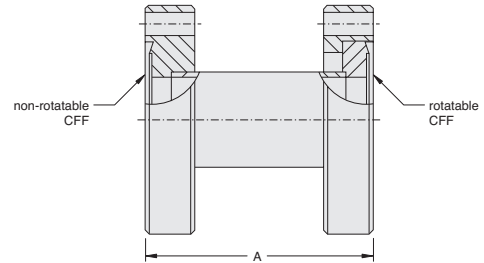
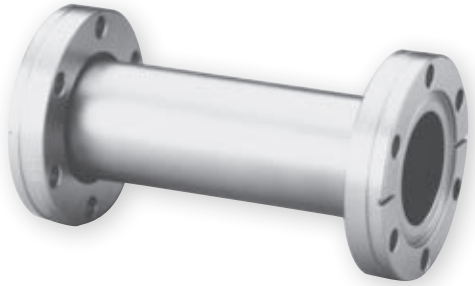
### Ordering Information – Half Nipples, Rotatable Flanges

Tube Size	Part Number	Flange OD	Overall Length A in. (mm)	Tube OD in. (mm)	Tube ID in. (mm)	Shipping Weight lbs (kg)
1 ½ in.	FNH0150R	2 ¾	2.36 (60.00)	1.50 (38.10)	1.37 (34.80)	1.0 (0.5)

**NOTE** • Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ► Nipples



### Ordering Information

Tube Size	Part Number	Flange OD	Overall Length A in. (mm)	Tube OD in. (mm)	Tube ID in. (mm)	Shipping Weight lbs (kg)
¾ in.	FNF0075	1 ⅓	3.00 (76.20)	0.75 (19.05)	0.62 (17.27)	1.5 (0.7)
1 ½ in.	FNF0150	2 ¾	4.93 (125.22)	1.50 (38.10)	1.37 (34.80)	2.0 (0.9)
2 in.	FNF0200	3 ⅞	6.43 (163.32)	2.00 (50.80)	1.87 (47.50)	4.0 (1.8)
2 ½ in.	FNF0250	4 ½	8.25 (209.55)	2.50 (63.50)	2.37 (60.20)	8.0 (3.6)
	FNF0250S	4 ½	6.76 (171.70)	2.50 (63.50)	2.37 (60.20)	8.0 (3.6)
4 in.	FNF0400	6	10.63 (270.00)	4.00 (101.60)	3.83 (97.28)	15.0 (6.8)
	FNF0400S	6	8.64 (219.46)	4.00 (101.60)	3.83 (97.28)	13.0 (5.9)
6 in.	FNF0600	8	13.13 (333.50)	6.00 (152.40)	5.83 (148.08)	24.0 (10.8)
	FNF0600S	8	11.00 (279.40)	6.00 (152.40)	5.83 (148.08)	24.0 (10.8)
8 in.	FNF0800	10	16.00 (406.40)	8.00 (203.20)	7.83 (198.88)	30.0 (13.5)

**NOTE** • Clear Hole ConFlat Flange



# VACUUM COMPONENTS

## ► Elbows (90°)

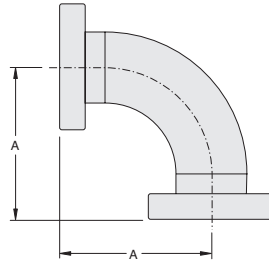


Fig. 1

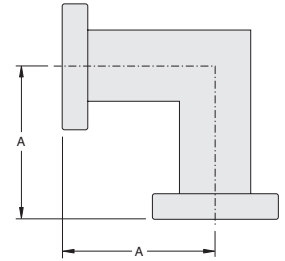


Fig. 2

### Ordering Information

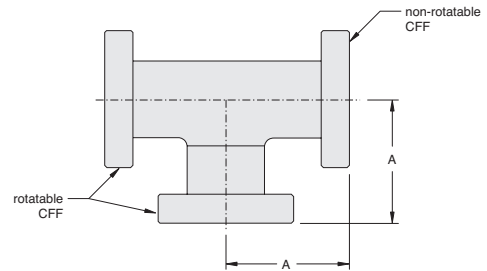
Nominal Tube Size	Part Number	Flange Size	Fig. Number	Dimension A in. (mm)	Shipping Weight lbs (kg)
¾ in.	FE0075	1 ⅓	1	1.50 (38.10)	1.5 (0.7)
1 ½ in.	FE0150	2 ¾	1	2.46 (62.48)	2.0 (0.9)
2 ½ in.	FE0250	4 ½	2	4.13 (104.90)	8.0 (3.6)
4 in.	FE0400	6	2	5.31 (134.87)	15.0 (6.8)
6 in.	FE0600	8	2	6.56 (166.62)	24.0 (10.8)

**NOTE**

- All flanges are rotatable
- Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ▶ Tees

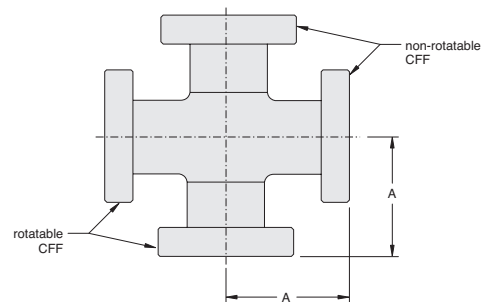


### Ordering Information

Nominal Tube Size	Part Number	Flange Size	Dimension A in. (mm)	Shipping Weight lbs (kg)
¾ in.	FT0075	1 ½	1.50 (38.10)	2.0 (0.9)
1 ½ in.	FT0150	2 ¾	2.46 (62.50)	4.0 (1.8)
2 ½ in.	FT0250	4 ½	4.13 (104.90)	11.0 (4.9)
4 in.	FT0400	6	5.31 (134.87)	21.0 (9.5)
6 in.	FT0600	8	6.56 (166.62)	34.0 (15.4)

**NOTE** • Clear Hole ConFlat Flange

## ▶ Crosses (4-Way)



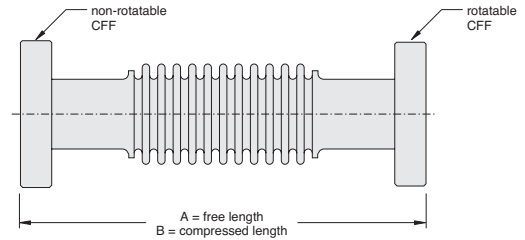
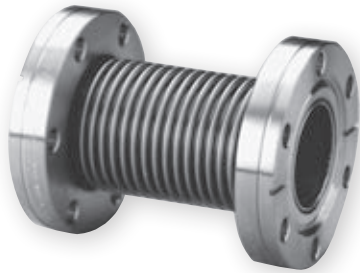
### Ordering Information

Nominal Tube Size	Part Number	Flange Size	Dimension A in. (mm)	Shipping Weight lbs (kg)
¾ in.	FC0075	1 ½	1.50 (38.10)	2.3 (1.0)
1 ½ in.	FC0150	2 ¾	2.46 (62.50)	4.0 (1.8)
2 in.	FC0200	3 ¾	3.21 (81.53)	9.0 (4.1)
2 ½ in.	FC0250	4 ½	4.13 (104.90)	14.0 (6.3)
4 in.	FC0400	6	5.31 (134.87)	26.0 (11.8)
6 in.	FC0600	8	6.56 (166.62)	44.0 (19.9)

**NOTE** • Clear Hole ConFlat Flange

# VACUUM COMPONENTS

## ► Flexible Couplings (Non-Braided)



### Specifications

- Vacuum-compatible stainless steel
- Sizes ¼ in. – 6 in.
- Full penetration vacuum welds

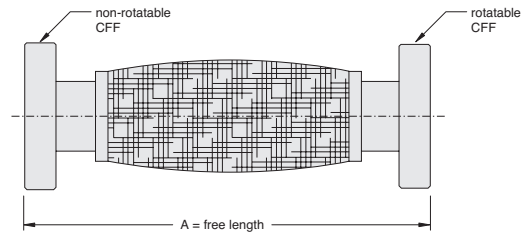
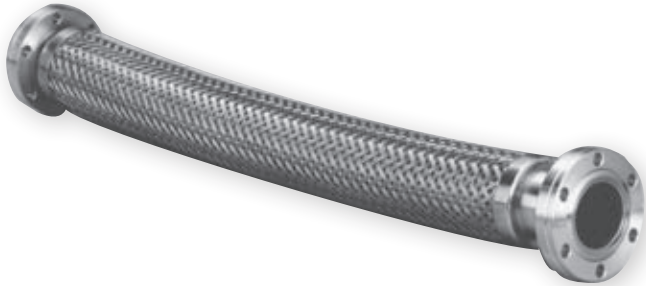
### Ordering Information

Nominal O.D.	Part Number	Flange Size	Length Free A in. (mm)	Length Compressed B in. (mm)	Static Bend Radius in. (mm)	Bellows Wall Thickness in.	Nominal ID in. (mm)	Shipping Weight lbs (kg)
¾ in.	FL00750300	1½	3.0 (76)	2.8 (71)	0.8 (20)	0.008	0.5 (12.7)	1.5 (0.7)
	FL00750600	1½	6.0 (152)	5.5 (140)	0.8 (20)	0.008	0.5 (12.7)	1.5 (0.7)
	FL00751000	1½	10.0 (254)	9.1 (231)	0.8 (20)	0.008	0.5 (12.7)	2.0 (0.9)
	FL00751200	1½	12.0 (305)	10.9 (271)	0.8 (20)	0.008	0.5 (12.7)	2.0 (0.9)
	FL00751800	1½	18.0 (457)	16.3 (414)	0.8 (20)	0.008	0.5 (12.7)	3.0 (1.4)
	FL00752000	1½	20.0 (508)	18.1 (460)	0.8 (20)	0.008	0.5 (12.7)	4.0 (1.8)
	FL00752400	1½	24.0 (610)	21.7 (551)	0.8 (20)	0.008	0.5 (12.7)	4.0 (1.8)
	FL00753600	1½	36.0 (914)	32.5 (826)	0.8 (20)	0.008	0.5 (12.7)	5.0 (2.3)
	FL00754800	1½	48.0 (1219)	43.3 (1100)	0.8 (20)	0.008	0.5 (12.7)	5.0 (2.3)
1½ in.	FL01500334	2¾	3.3 (85)	3.2 (80)	6.0 (152)	0.006	1.5 (38.1)	2.0 (0.9)
	FL01500400	2¾	4.0 (102)	3.7 (95)	6.0 (152)	0.006	1.5 (38.1)	2.0 (0.9)
	FL01501200	2¾	12.0 (305)	10.9 (278)	2.2 (56)	0.010	1.5 (38.1)	3.0 (1.4)
	FL01501800	2¾	18.0 (457)	16.3 (415)	2.2 (56)	0.010	1.5 (38.1)	4.0 (1.8)
	FL01502000	2¾	20.0 (508)	18.1 (461)	2.2 (56)	0.010	1.5 (38.1)	4.0 (1.8)
	FL01502400	2¾	24.0 (610)	21.7 (552)	2.3 (56)	0.010	1.5 (38.1)	5.0 (2.3)
	FL01503600	2¾	36.0 (914)	32.5 (827)	2.2 (56)	0.010	1.5 (38.1)	6.0 (2.7)
	FL01504800	2¾	48.0 (1220)	43.3 (1101)	2.2 (56)	0.010	1.5 (38.1)	6.0 (2.7)
2 in.	FL02000600	3¾	6.0 (152)	5.6 (142)	7.5 (191)	0.006	2.0 (50.8)	2.0 (0.9)
	FL02001200	3¾	12.0 (305)	11.0 (279)	2.6 (66)	0.012	2.0 (50.8)	5.0 (2.3)
2½ in.	FL02500625	4½	6.3 (159)	5.9 (149)	10.0 (254)	0.006	2.5 (63.5)	7.0 (3.2)
	FL02501200	4½	12.0 (305)	11.0 (280)	3.2 (81)	0.012	2.5 (63.5)	8.0 (3.6)
	FL02502400	4½	24.0 (610)	21.8 (554)	3.2 (81)	0.012	2.5 (63.5)	9.0 (4.1)
	FL02503600	4½	36.0 (914)	32.6 (829)	3.2 (81)	0.012	2.5 (63.5)	10.0 (4.5)
4 in.	FL04000763	6	7.6 (194)	7.1 (180)	19.0 (483)	0.010	4.0 (101.6)	14.0 (6.4)

**NOTE** • Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ► Flexible Couplings (Braided)



### Specifications

- Vacuum-compatible stainless steel
- Sizes ¼ in. – 6 in.
- Full penetration vacuum welds

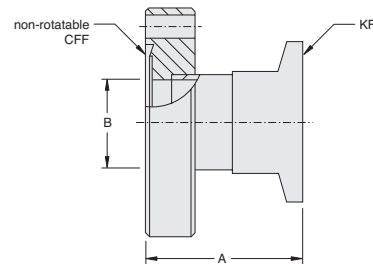
### Ordering Information

Nominal O.D.	Part Number	Flange Size	Length Free A in. (mm)	Static Bend Radius in. (mm)	Bellows Wall Thickness in.	Nominal ID in. (mm)	Shipping Weight lbs (kg)
¾ in.	FLB00751200	1½	12.0 (305)	2.1 (53)	0.008	0.75 (19.1)	2.0 (0.9)
	FLB00751800	1½	18.0 (457)	2.1 (53)	0.008	0.75 (19.1)	3.0 (1.4)
	FLB00753600	1½	36.0 (914)	2.1 (53)	0.008	0.75 (19.1)	5.0 (2.3)
	FLB00754800	1½	48.0 (1219)	2.1 (53)	0.008	0.75 (19.1)	5.0 (2.3)
1½ in.	FLB01500600	2¾	6.0 (152)	3.9 (99)	0.010	1.50 (38.1)	2.0 (0.9)
	FLB01501200	2¾	12.0 (305)	3.9 (99)	0.010	1.50 (38.1)	3.0 (1.4)
	FLB01501875	2¾	18.8 (478)	3.9 (99)	0.010	1.50 (38.1)	4.0 (1.8)
	FLB01502400	2¾	24.0 (610)	3.9 (99)	0.010	1.50 (38.1)	5.0 (2.3)
	FLB01503600	2¾	36.0 (914)	3.9 (99)	0.010	1.50 (38.1)	6.0 (2.7)
	FLB01504800	2¾	48.0 (1219)	3.9 (99)	0.010	1.50 (38.1)	6.0 (2.7)
2½ in.	FLB02502400	4½	24.0 (610)	5.9 (150)	0.012	2.50 (63.5)	9.0 (4.1)
	FLB02503600	4½	36.0 (914)	5.9 (150)	0.012	2.50 (63.5)	10.0 (4.5)

**NOTE** • Clear Hole ConFlat Flange

# VACUUM COMPONENTS

## ► CFF to KF Adapters



### Ordering Information

CFF Size	Part Number	CFF OD	KF Flange		Overall Length A in. (mm)	Tube ID B in. (mm)	Weight lbs (kg)
			NW	Size OD			
1½ in.	FA0133NW16S	1.33	NW16	1.18	1.57 (39.88)	0.68 (17.27)	1.0 (0.5)
	FA0133NW16	1.33	NW16	1.18	2.00 (50.80)	0.68 (17.27)	1.0 (0.5)
	FA0133NW16L	1.33	NW16	1.18	2.07 (52.70)	0.68 (17.27)	1.0 (0.5)
	FA0133NW25	1.33	NW25	1.57	2.00 (50.80)	0.68 (17.27)	1.5 (0.7)
	FA0133NW40	1.33	NW40	2.16	1.57 (39.88)	0.68 (17.27)	1.5 (0.7)
2¾ in.	FA0275NW16S	2.73	NW16	1.18	1.78 (45.21)	0.68 (17.27)	1.5 (0.7)
	FA0275NW16	2.73	NW16	1.18	2.00 (50.80)	0.68 (17.27)	1.5 (0.7)
	FA0275NW16L	2.73	NW16	1.18	2.36 (59.94)	0.68 (17.27)	1.5 (0.7)
	FA0275NW25S	2.73	NW25	1.57	1.78 (45.21)	0.87 (22.10)	1.5 (0.7)
	FA0275NW25	2.73	NW25	1.57	2.00 (50.80)	0.87 (22.10)	1.5 (0.7)
	FA0275NW25L	2.73	NW25	1.57	2.36 (59.94)	0.87 (22.10)	1.5 (0.7)
	FA0275NW40S	2.73	NW40	2.16	1.78 (45.21)	1.37 (34.80)	2.0 (0.9)
	FA0275NW40	2.73	NW40	2.16	2.00 (50.80)	1.37 (34.80)	2.0 (0.9)
	FA0275NW40L	2.73	NW40	2.16	2.55 (64.77)	1.37 (34.80)	2.0 (0.9)
4½ in.	FA0450NW40	4.47	NW40	2.16	2.00 (50.80)	1.37 (34.80)	3.0 (1.4)
	FA0450NW50L	4.47	NW50	2.95	2.00 (50.80)	1.87 (47.50)	3.0 (1.4)
	FA0450NW50	4.47	NW50	2.95	1.95 (49.53)	1.87 (34.80)	3.0 (1.4)

### Accessories

Size	Description	Part Number	Qty/Pkg	Shipping Weight lbs (kg)
NW16	Viton centering ring	KC16SV	1	0.5 (0.2)
NW25	Viton centering ring	KC25SV	1	0.5 (0.2)
NW40	Viton centering ring	KC40SV	1	0.5 (0.2)
NW50	Viton centering ring	KC50SV	1	0.5 (0.2)
NW16	KF clamp	KQ16AR	1	0.5 (0.2)
NW25	KF clamp	KQ25AR	1	0.5 (0.2)
NW40	KF clamp	KQ40AR	1	1.0 (0.5)
NW50	KF clamp	KQ50AR	1	1.0 (0.5)

**NOTE** • Clear Hole ConFlat Flange

## CONFLAT FITTINGS

### ► Adapters: ConFlat to Swagelok



#### Ordering Information

Flange Size	Tube Size	Part Number	Length in. (mm)	Shipping Weight lbs (kg)
1½ in.	¼ in.	FASW0250133	1.37 (34.8)	0.5 (0.22)
2¾ in.	¼ in.	FASW0250275	1.53 (38.9)	1.0 (0.45)
1½ in.	⅜ in.	FASW0375133	1.66 (42.2)	0.5 (0.22)
2¾ in.	⅜ in.	FASW0375275	1.69 (42.9)	1.0 (0.45)
2¾ in.	½ in.	FASW0500275	1.83 (46.5)	1.0 (0.45)
2¾ in.	¾ in.	FASW0750275	2.20 (55.9)	1.0 (0.45)

**NOTE** • Clear Hole ConFlat Flange

# VACUUM COMPONENTS

## ► Adapters: ConFlat to VCR - Male & Female



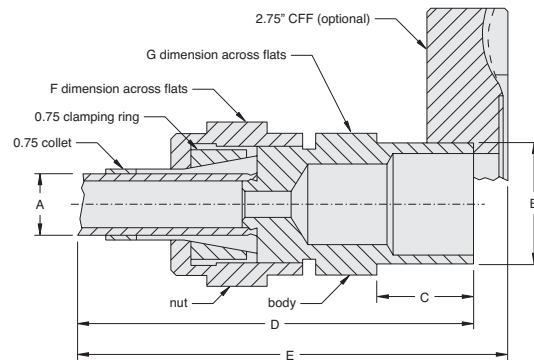
### Ordering Information

Flange Size	Tube Size	Part Number	Length in. (mm)	Shipping Weight lbs (kg)
<b>Male</b>				
1 1/2 in.	1/4 in.	FAVM0250133	1.36 (34.5)	0.5 (0.22)
2 3/4 in.	1/4 in.	FAVM0250275	1.52 (38.6)	1.0 (0.45)
1 1/2 in.	1/2 in.	FAVM0500133	1.55 (39.4)	0.5 (0.22)
2 3/4 in.	1/2 in.	FAVM0500275	1.71 (43.4)	1.0 (0.45)
2 3/4 in.	1 in.	FAVM1000275	2.43 (61.7)	1.0 (0.45)
<b>Female</b>				
1 1/2 in.	1/4 in.	FAVF0250133	1.36 (34.5)	0.5 (0.22)
2 3/4 in.	1/4 in.	FAVF0250275	1.52 (38.6)	1.0 (0.45)
2 3/4 in.	3/8 in.	FAVF0375275	1.71 (43.4)	1.0 (0.45)
1 1/2 in.	1/2 in.	FAVF0500133	1.55 (39.4)	0.5 (0.22)
2 3/4 in.	1/2 in.	FAVF0500275	1.71 (43.4)	1.0 (0.45)
2 3/4 in.	1 in.	FAVF1000275	2.43 (61.7)	1.0 (0.45)

**NOTE** • Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ► UHV Compression Ports



	A	B	C	D	E	F	G
3/8" assy	0.75 (19.1)	1.00 (24.5)	0.66 (16.7)	2.63 (66.8)	3.00 (76.2)	1.38 (35.0)	1.19 (30.2)
3/8" assy	0.38 (9.7)	0.75 (19.1)	0.63 (16.0)	2.31 (55.7)	2.53 (64.3)	0.88 (22.4)	0.77 (19.6)
1/2" assy	0.50 (12.7)	0.75 (19.1)	0.65 (16.5)	2.63 (66.8)	2.81 (71.4)	1.13 (28.7)	1.00 (25.4)

*Dimensions: inches (millimeters)*

### Specifications

- Vacuum range:  $10^{-11}$  Torr (mbar)
- Bakeout Temperature: 500 °C

### Ordering Information

Description	Part Number	Shipping Weight lbs (kg)
<b>Compression Port with Felpro Lubricant</b>		
3/8 in. (9.9 mm) port on 2.75 (NW35) ConFlat	FCP0038UHV	3.0 (1.3)
1/2 in. (12.7 mm) port	CP0050UHV	2.0 (0.9)
1/2 in. (12.7 mm) port on 2.75 (NW35) ConFlat	FCP0050UHV	3.0 (1.3)
3/4 in. (19 mm) port	CP0075UHV	2.0 (0.9)
3/4 in. (19 mm) port on 2.75 (NW35) ConFlat	FCP0075UHV	3.0 (1.3)
<b>Combination Compression Port Body and Nut</b>		
3/4 in. (19 mm) Assembly		
Includes collet, clamping ring, and Felpro lubricant	CP0075UHVA	1.0 (0.5)
<b>Compression Port Rebuild Kits</b>		
3/8 in. (9.9 mm) ports	CP0038RK	1.0 (0.5)
1/2 in. (12.7 mm) ports	CP0050RK	1.0 (0.5)
<b>OFHC Copper Tubulations 6 in. (152.4 mm) Long</b>		
3/8 in. (9.9 mm) OD, .032 wall thickness	CP0038CT	1.0 (0.5)
1/2 in. (12.7 mm) OD, .035 wall thickness	CP0050CT	1.0 (0.5)
3/4 in. (19 mm) OD, .035 wall thickness	CP0075CT	2.0 (0.9)
<b>OFHC Copper Adapters</b>		
3/8 in. (9.9 mm) port adapter with 1.33 (NW16) ConFlat gasket/package of 4	CP00380133CA	1.5 (0.7)



# VACUUM COMPONENTS

## ► ConFlat to Compression Port Adapters

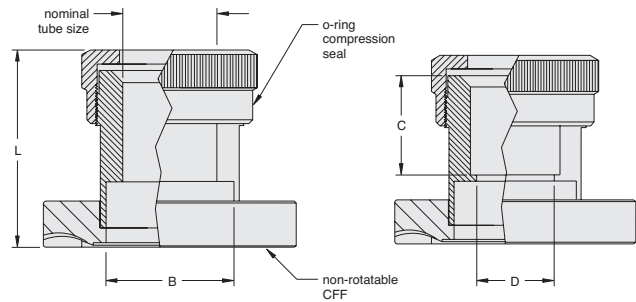


Fig. 1

Fig. 2

### Specifications

- Stainless steel
- Viton o-ring
- Use with glass gauges or standard metal tubing
- Hand-tightened compression fitting

### Ordering Information

Nominal Tube Size	Part Number	Bore ID B in. (mm)	Length L in. (mm)	Flange Size	ID C in. (mm)	Tube Stop D in. (mm)	Fig. Number	Weight lbs (kg)
3/16 in.	FCP01900275	0.63 (16.00)	1.71 (43.43)	2.75	—	—	1	2.0 (0.9)
1/4 in.	FCP02500133	0.63 (16.00)	1.67 (42.67)	1.33	—	—	1	2.0 (0.9)
	FCP02500275	0.63 (16.00)	1.71 (43.43)	2.75	—	—	1	2.0 (0.9)
3/8 in.	FCP03750133	0.63 (16.00)	1.67 (42.67)	1.33	—	—	1	2.0 (0.9)
	FCP03750275	0.63 (16.00)	1.71 (43.43)	2.75	—	—	1	2.0 (0.9)
1/2 in.	FCP05000133	0.63 (16.00)	1.67 (42.67)	1.33	—	—	1	2.0 (0.9)
	FCP05000275	0.63 (16.00)	1.71 (43.43)	2.75	—	—	1	2.0 (0.9)
3/4 in.	FCP07500275	1.38 (35.05)	2.02 (51.31)	2.75	0.63 (16.00)	1.13 (28.70)	2	2.0 (0.9)
1 in.	FCP10000275	1.38 (35.05)	2.08 (52.83)	2.75	0.88 (22.35)	1.13 (28.70)	2	2.0 (0.9)
1 1/2 in.	FCP11250275	1.38 (35.05)	2.08 (52.83)	2.75	—	—	1	2.0 (0.9)

**NOTE** • Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ► O-Ring Sealed Vacuum Compression Ports and Blank-offs

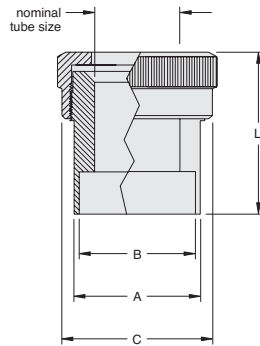


Fig. 1

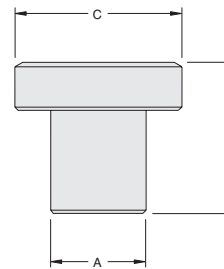


Fig. 3

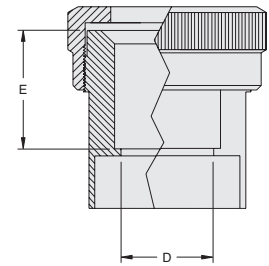


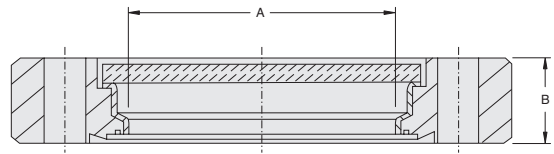
Fig. 2

### Ordering Information

Nominal Tube Size	Part Number	Fig. Number	Body OD		OD		Length		I.D.		Tube Stop E in. (mm)	Weight lbs (kg)
			A in. (mm)	B in. (mm)	C in. (mm)	L in. (mm)	D in. (mm)	E in. (mm)				
¼ in.	CP0250S	1	0.75 (19.05)	0.63 (16.00)	1.14 (28.96)	1.50 (38.10)	—	—	—	—	1.0 (0.5)	
⅝ in.	CP0312S	1	0.75 (19.05)	0.63 (16.00)	1.14 (28.96)	1.50 (38.10)	—	—	—	—	1.0 (0.5)	
¾ in.	CP0375S	1	0.75 (19.05)	0.63 (16.00)	1.14 (28.96)	1.50 (38.10)	—	—	—	—	1.0 (0.5)	
½ in.	CP0500S	1	0.75 (19.05)	0.63 (16.00)	1.14 (28.96)	1.50 (38.10)	—	—	—	—	1.0 (0.5)	
⅝ in.	CP0625S	1	0.75 (19.05)	0.63 (16.00)	1.14 (28.96)	1.50 (38.10)	—	—	—	—	1.0 (0.5)	
¾ in.	CP0750S	1	1.50 (38.10)	1.38 (35.05)	1.89 (48.01)	1.88 (47.75)	—	—	—	—	1.0 (0.5)	
1 in.	CP1000S	2	1.50 (38.10)	1.38 (35.05)	1.89 (48.01)	1.88 (47.75)	0.88 (22.35)	1.13 (28.70)	—	—	1.0 (0.5)	
1 ⅛ in.	CP1125S	1	1.50 (38.10)	1.38 (35.05)	1.89 (48.01)	1.88 (47.75)	—	—	—	—	1.0 (0.5)	
1 ¼ in.	CP1250S	1	1.50 (38.10)	1.38 (35.05)	1.89 (48.01)	1.88 (47.75)	—	—	—	—	1.0 (0.5)	

# VACUUM COMPONENTS

## ► Zero-Length Glass Viewports



### Specifications

- Transmission Range: 0.32 to 2.7 microns (approx.)
- Vacuum Range: To below  $10^{-11}$  Torr (mbar)
- Viewport Type: 7056 Glass
- Bakeout Temperature: 400 °C

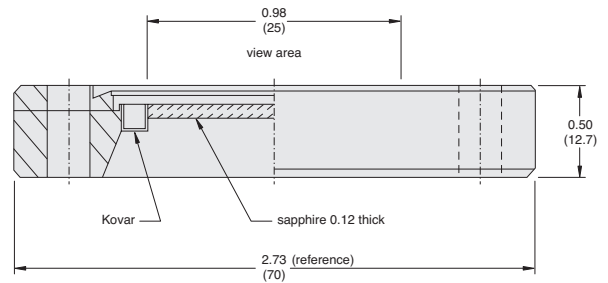
### Ordering Information

Description	ConFlat Size	Part Number	Nominal Port Diameter in. (mm)	A in. (mm)	B in. (mm)	Weight lbs (kg)
<b>¾ in. (14 mm) Viewport</b>	1.33 in. (NW16)	FVG0075	0.75 (19.05)	0.63 (16)	0.29 (7.37)	1.0 (0.5)
<b>1 ½ in. (36 mm) Viewport</b>	2.75 in. (NW35)	FVG0150	1.50 (38.10)	1.50 (38)	0.50 (12.70)	2.0 (0.9)
<b>2 ½ in. (63.5 mm) Viewport</b>	4.50 in. (NW63)	FVG0250	2.50 (63.50)	2.48 (63)	0.68 (17.40)	5.0 (2.3)
<b>4 in. (98 mm) Viewport</b>	6 in. (NW100)	FVG0400	4.00 (101.60)	3.50 (89)	0.78 (19.90)	6.0 (2.7)
<b>6 in. (137 mm) Viewport</b>	8 in. (NW150)	FVG0600	6.00 (152.40)	5.35 (136)	0.92 (23.37)	9.0 (4.0)

**NOTE** • Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ► Sapphire Viewports - Zero Length



Dimensions: inches (millimeters)

### Specifications

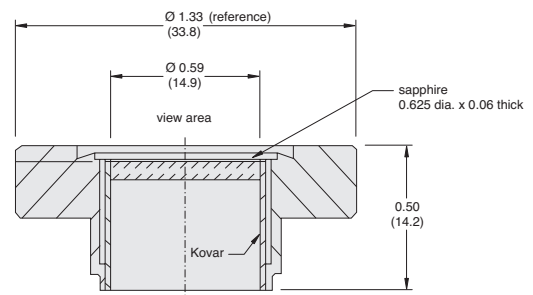
- Transmission Range: 0.25 to 5.5 microns (approx.)
- Vacuum Range: To below  $10^{-11}$  Torr (mbar)
- Bakeout Temperature: 450 °C

### Ordering Information

Description	Part Number	Weight lbs (kg)
<b>1 in. (25.4 mm) Zero Length Sapphire/Kovar Viewport</b> on 2.75 (NW35) ConFlat flange	FVS0100	2.0 (0.9)

**NOTE** • Clear Hole ConFlat Flange

## ► Sapphire Viewports - Standard Length



Dimensions: inches (millimeters)

### Specifications

- Transmission Range: .25 to 5.5 microns (approx.)
- Vacuum Range: To below  $10^{-11}$  Torr (mbar)
- Bakeout Temperature: 450 °C

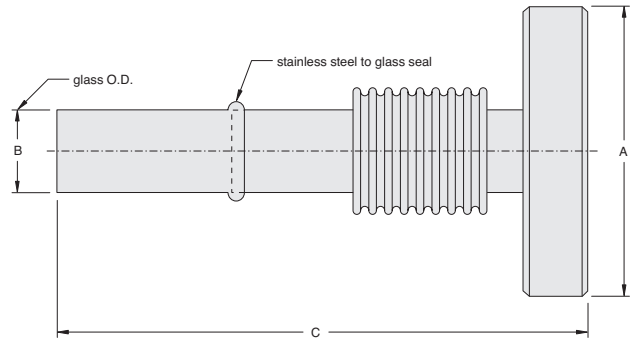
### Ordering Information

Description	Part Number	Shipping Weight lbs (kg)
<b>5/8 in. (15.8 mm) Standard Length Sapphire/Kovar Viewport</b> on 1.33 (NW13) ConFlat flange	FVS0062	1.0 (0.5)

**NOTE** • Clear Hole ConFlat Flange

# VACUUM COMPONENTS

## ► Glass Adapters with Bellows



### Specifications

- Vacuum Range: To below  $10^{-11}$  Torr (mbar)
- Bakeout Temperature: 400 °C
- Pyrex 7740 Glass

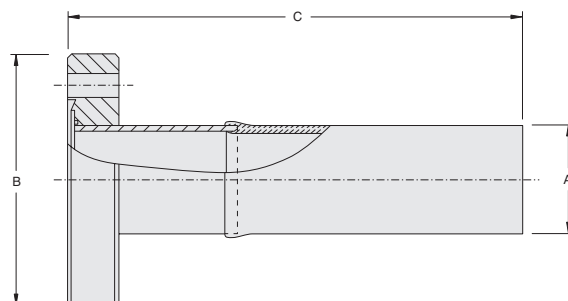
### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm) (Reference)	C in. (mm)	Shipping Weight lbs (kg)
<b>6 mm OD Glass Adapter</b>					
with bellows and mini ConFlat flange	FGAB7	1.33 (34.0)	0.24 (6.0)	6.69 (170.0)	1.0 (0.5)
<b>10 mm OD Glass Adapter</b>					
with bellows and mini ConFlat flange	FGAB10	1.33 (34.0)	0.39 (10.0)	5.50 (140.0)	1.0 (0.5)
<b>13 mm OD Glass Adapter</b>					
with bellows and mini ConFlat flange	FGAB13	1.33 (34.0)	0.51 (13.0)	6.69 (170.0)	2.0 (0.9)
<b>19 mm OD Glass Adapter</b>					
with bellows and 2.75 ConFlat flange	FGAB19	2.75 (70.0)	0.75 (19.0)	7.48 (190.0)	2.0 (0.9)

**NOTE** • Clear Hole ConFlat Flange

# CONFLAT FITTINGS

## ► Glass Adapters



### Specifications

- Vacuum Range: To below  $10^{-11}$  Torr (mbar)
- Bakeout Temperature: 400 °C
- Glass Type: see ordering information table

### Ordering Information

Description	Part Number	A	B	C	Weight lbs (kg)
		in. (mm) Nom.	in. (mm) (Reference)	in. (mm)	
<b>¼ in. Kovar to Pyrex Glass Adapter</b>					
on 1.33 (NW16) ConFlat	FGA0025KP	0.24 (6.0)	1.33 (34.0)	3.94 (100.0)	1.5 (0.7)
<b>¼ in. Stainless Steel to Pyrex Glass Adapter</b>					
on 1.33 (NW16) ConFlat	FGA0025SP	0.24 (6.0)	1.33 (34.0)	4.88 (124.0)	1.5 (0.7)
<b>½ in. Kovar to Pyrex Glass Adapter</b>					
on 1.33 (NW16) ConFlat	FGA0050KP	0.51 (13.0)	1.33 (34.0)	3.94 (100.0)	1.5 (0.7)
<b>½ in. Stainless Steel to Pyrex Glass Adapter</b>					
on 1.33 (NW16) ConFlat	FGA0050SP	0.51 (13.0)	1.33 (34.0)	4.88 (124.0)	1.5 (0.7)
<b>¾ in. Kovar to Pyrex Glass Adapter</b>					
on 1.33 (NW16) ConFlat	FGA0075KP	0.75 (19.0)	1.33 (34.0)	5.38 (137.0)	1.5 (0.7)
<b>¾ in. Stainless Steel to Pyrex Glass Adapter</b>					
on 1.33 (NW16) ConFlat	FGA0075SP	0.75 (19.0)	1.33 (34.0)	4.88 (124.0)	1.5 (0.7)
<b>1 in. Kovar to Pyrex Glass Adapter</b>					
on 2.75 (NW35) ConFlat	FGA0100KP	1.00 (25.0)	2.75 (70.0)	3.94 (100.0)	3.0 (1.4)
<b>1 in. Stainless Steel to Pyrex Glass Adapter</b>					
on 2.75 (NW35) ConFlat	FGA0100SP	1.00 (25.0)	2.75 (70.0)	4.88 (124.0)	3.0 (1.4)
<b>1½ in. Kovar to Pyrex Glass Adapter</b>					
on 2.75 (NW35) ConFlat	FGA0150KP	1.57 (40.0)	2.75 (70.0)	3.94 (100.0)	4.0 (1.8)
<b>1½ in. Stainless Steel to Pyrex Glass Adapter</b>					
on 2.75 (NW35) ConFlat	FGA0150SP	1.50 (38.0)	2.75 (70.0)	4.88 (124.0)	4.0 (1.8)
<b>2½ in. Stainless Steel to Pyrex Glass Adapter</b>					
on 4.5 (NW63) ConFlat	FGA0250SP	2.50 (64.0)	4.50 (114.0)	5.33 (137.0)	5.0 (2.3)

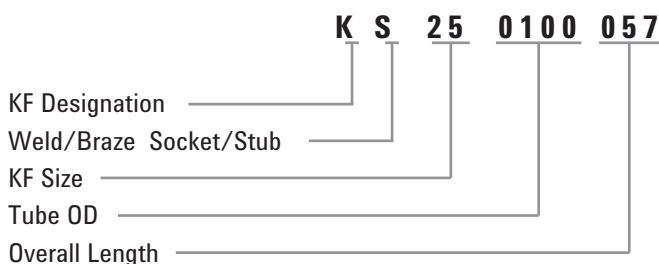
**NOTE** • Clear Hole ConFlat Flange

## KLAMPS FLANGES & FITTINGS

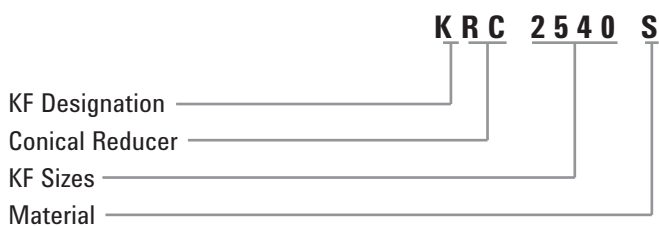
Agilent's introduction of its extensive offering in vacuum flanges and fittings features an intuitive part numbering format. This part numbering format allows the customer to identify the product by the characters contained within the part number.

Depending on the product, the number and format of the characters in the part number will vary. Please see the examples below:

### KF Flange Example



### KF25 to 40 Conical Reducer Example



S = Stainless Steel

A = Aluminum

## VACUUM COMPONENTS

### Klamp-Flanges

Designed in accordance with ISO standards the Agilent KF flange can be used in a variety of applications from atmospheric pressure to high vacuum. The KF flange is manufactured from 304 stainless steel and has a leak rate less than  $1E^{-9}$  std cc/sec and can be baked to 150 °C when using a Viton O-Ring.

### Klamp Fittings

Employing the easy release clamping design, these fittings offer a quick and simple solution to vacuum system design and assembly. Bakeable to 150 °C when using Viton O-Rings, these fittings are ideal for roughing or high vacuum applications.

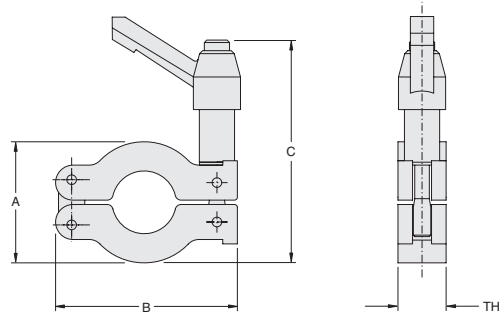
### Klamp-Flanges & Fittings

#### Page

Quick Clamps .....	442
Centering Rings .....	444
Replacement O-Rings .....	448
Blank-Off Flanges .....	449
Unbored Stubs .....	451
Weld Sockets .....	452
Weld Stubs.....	453
Nipples.....	455
Elbows.....	456
Tees.....	457
4-Way Crosses .....	458
Reducers .....	458
KF to CFF Adapters .....	460
Pipe Adapters .....	462
Flexible Couplings .....	466
Compression Port Adapters .....	468
Swagelok and VCR Adapters .....	470
PVC Cord-reinforced Flexible Vacuum Hose.....	472
Aluminum Hose Adapter .....	472

## KLAMPS FLANGES & FITTINGS

### ▶ Quick Clamps with Ratchet Closure NW10 - NW50 (ISO)



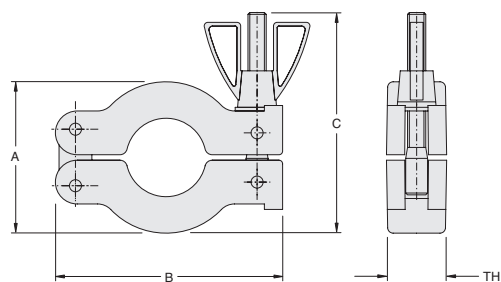
#### Specifications

- Aluminum
- Black or Metallic Finish

#### Ordering Information – (Black or Metallic Finish)

Description	Black	Metallic	A in. (mm)	B in. (mm)	C in. (mm)	Thickness in. (mm)	Weight lbs (kg)
NW10/16	KQ16AR	KQ16ARP	1.57 (40.00)	2.45 (62.30)	3.12 (79.25)	0.65 (16.50)	1.0 (0.5)
NW25	KQ25AR	KQ25ARP	2.13 (54.00)	2.85 (72.40)	3.38 (85.85)	0.65 (16.50)	1.0 (0.5)
NW40	KQ40AR	KQ40ARP	2.68 (68.00)	3.53 (89.70)	3.67 (93.22)	0.65 (16.50)	1.0 (0.5)
NW50	KQ50AR	KQ50ARP	3.54 (90.00)	4.80 (122.00)	4.42 (112.27)	0.91 (23.20)	1.0 (0.5)

### ▶ Quick Clamps with Wing-Nut Closure NW10 - NW50 (ISO)



#### Specifications

- Aluminum
- Black or Plain finish

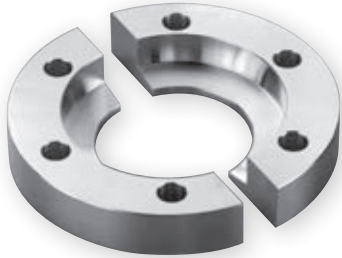
#### Ordering Information – (Black or Metallic Finish)

Description	Black	Metallic	A in. (mm)	B in. (mm)	C in. (mm)	Thickness in. (mm)	Weight lbs (kg)
NW10/16	KQ16AW	KQ16AWP	1.57 (40.00)	2.45 (62.30)	2.17 (55.19)	0.65 (16.50)	1.0 (0.5)
NW25	KQ25AW	KQ25AWP	2.13 (54.00)	2.85 (72.40)	2.37 (60.20)	0.65 (16.50)	1.0 (0.5)
NW40	KQ40AW	KQ40AWP	2.68 (68.00)	3.53 (89.70)	2.64 (67.06)	0.65 (16.50)	1.0 (0.5)
NW50	KQ50AW	KQ50AWP	3.54 (90.00)	4.80 (122.00)	3.60 (90.44)	0.91 (23.20)	1.0 (0.5)



# VACUUM COMPONENTS

## Bulkhead Clamps



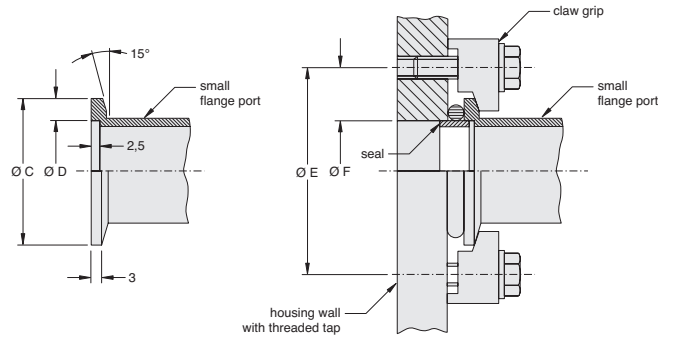
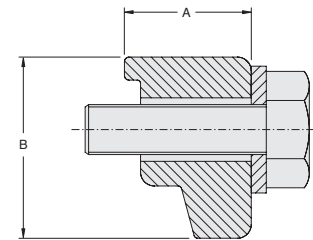
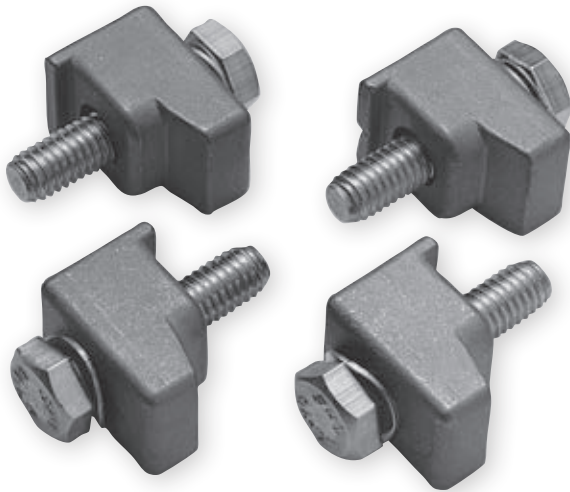
### Specifications

- Aluminum
- Provides simple and secure baseplate connection
- Stainless Steel bolts and washers included (10-32 x 5/8)

### Ordering Information

Description	Part Number	Bolts	Shipping Weight lbs (kg)
NW16	KBC16	6	0.5 (0.2)
NW25	KBC25	6	0.5 (0.2)
NW40	KBC40	6	0.5 (0.2)
NW50	KBC50	8	0.5 (0.2)

## Bulkhead Claw Clamp Kit



### Specifications

- Cast steel
- Spring loaded lock-washers, Single Claw Clamp Kit for bolting KF flanges to bulkheads
- Can be used instead of bulkhead clamps

Nominal Diameter	C	D	E	F	Nr. of Claw Grips
DN 10 KF	30	12.2	45	12.2	4
DN 16 KF	30	17.2	45	17.2	4
DN 25 KF	44	26.2	55	26.2	4
DN 40 KF	55	41.2	71	41.2	4
DN 50 KF	75	52.4	91	52.2	4

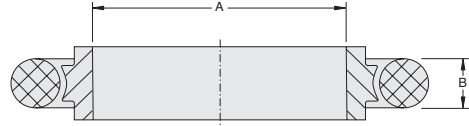
Dimensions: millimeters

### Ordering Information

Description	Part Number	Qty	A in. (mm)	B in. (mm)	Bolt	Shipping Weight lbs (kg)
NW25 to NW50	KF1050CCS	4	.55 (14)	.79 (20)	M6 x 20 mm	.11 (.05)

## KLAMPS FLANGES & FITTINGS

### ▶ Stainless Steel Centering Rings NW10 – NW50 (ISO)



#### Specifications

- 304 stainless steel centering ring
- Replaceable o-ring
- 100 °C maximum, Buna-N
- 200 °C maximum, Viton

#### Ordering Information – Centering Rings (Viton)

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW10	KC10SV	0.39 (9.91)	0.21 (5.33)	0.5 (0.2)
NW16	KC16SV	0.63 (16.00)	0.21 (5.33)	0.5 (0.2)
NW25	KC25SV	0.98 (24.89)	0.21 (5.33)	0.5 (0.2)
NW40	KC40SV	1.57 (39.88)	0.21 (5.33)	0.5 (0.2)
NW50	KC50SV	1.97 (50.04)	0.21 (5.33)	0.5 (0.2)

#### Ordering Information – Centering Rings (Buna-N)

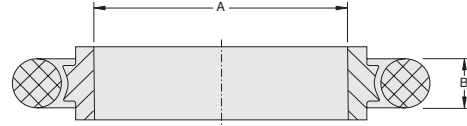
Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW10	KC10SB	0.39 (9.91)	0.21 (5.33)	0.5 (0.2)
NW16	KC16SB	0.63 (16.00)	0.21 (5.33)	0.5 (0.2)
NW25	KC25SB	0.98 (24.89)	0.21 (5.33)	0.5 (0.2)
NW40	KC40SB	1.57 (39.88)	0.21 (5.33)	0.5 (0.2)
NW50	KC50SB	1.97 (50.04)	0.21 (5.33)	0.5 (0.2)

# VACUUM COMPONENTS

## ▶ Aluminum Centering Rings NW10 – NW50 (ISO)

### Specifications

- 6061 T6 aluminum centering ring
- Replaceable o-ring
- 100 °C maximum, Buna-N
- 200 °C maximum, Viton



### Ordering Information – Centering Rings (Viton)

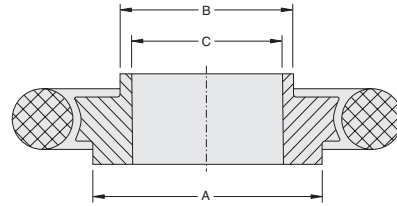
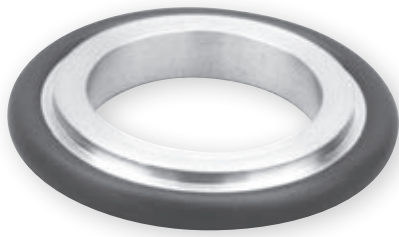
Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW10	KC10AV	0.39 (9.91)	0.21 (5.33)	0.5 (0.2)
NW16	KC16AV	0.63 (16.00)	0.21 (5.33)	0.5 (0.2)
NW25	KC25AV	0.98 (24.89)	0.21 (5.33)	0.5 (0.2)
NW40	KC40AV	1.57 (39.88)	0.21 (5.33)	0.5 (0.2)
NW50	KC50AV	1.97 (50.04)	0.21 (5.33)	0.5 (0.2)

### Ordering Information – Centering Rings (Buna-N)

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW10	KC10AB	0.39 (9.91)	0.21 (5.33)	0.5 (0.2)
NW16	KC16AB	0.63 (16.00)	0.21 (5.33)	0.5 (0.2)
NW25	KC25AB	0.98 (24.89)	0.21 (5.33)	0.5 (0.2)
NW40	KC40AB	1.57 (39.88)	0.21 (5.33)	0.5 (0.2)
NW50	KC50AB	1.97 (50.04)	0.21 (5.33)	0.5 (0.2)

## KLAMPS FLANGES & FITTINGS

### ► Adaptive Stainless Steel Centering Rings NW10 – NW40 (ISO)



#### Specifications

- 304 stainless steel centering ring
- Replaceable o-ring
- 100 °C maximum, Buna-N
- 200 °C maximum, Viton

#### Ordering Information – Adaptive Centering Rings (Viton)

Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW10 to NW16	KCA1016SV	0.67 (17.02)	0.47 (11.94)	0.39 (9.91)	0.5 (0.2)
NW20 to NW25	KCA2025SV	1.02 (25.91)	0.87 (22.10)	0.79 (20.01)	0.5 (0.2)
NW32 to NW40	KCA3240SV	1.61 (40.89)	1.34 (34.04)	1.26 (32.00)	0.5 (0.2)

#### Ordering Information – Adaptive Centering Rings (Buna-N)

Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW10 to NW16	KCA1016SB	0.67 (17.02)	0.47 (11.94)	0.39 (9.91)	0.5 (0.2)
NW32 to NW40	KCA3240SB	1.61 (40.89)	1.34 (34.04)	1.26 (32.00)	0.5 (0.2)

### ► Adaptive Aluminum Centering Rings NW10 – NW40 (ISO)

#### Specifications

- 6061 T6 aluminum centering ring
- Replaceable o-ring
- 100 °C maximum, Buna-N
- 200 °C maximum, Viton

#### Ordering Information – Adaptive Centering Rings (Viton)

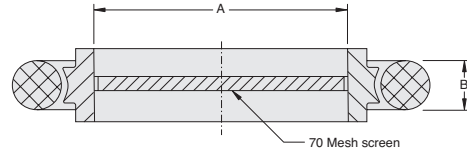
Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW10 to NW16	KCA1016AV	0.67 (17.02)	0.47 (11.94)	0.39 (9.91)	0.5 (0.2)
NW20 to NW25	KCA2025AV	1.02 (25.91)	0.87 (22.10)	0.79 (20.01)	0.5 (0.2)

#### Ordering Information – Adaptive Centering Rings (Buna-N)

Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW20 to NW25	KCA2025AB	1.02 (25.91)	0.87 (22.10)	0.79 (20.01)	0.5 (0.2)
NW32 to NW40	KCA3240AB	1.61 (40.89)	1.34 (34.04)	1.26 (32.00)	0.5 (0.2)

# VACUUM COMPONENTS

## ▶ Stainless Steel Centering Rings with Screen NW16 – NW50 (ISO)



### Specifications

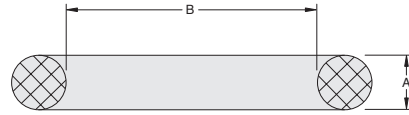
- 304 stainless steel centering ring
- Replaceable o-ring
- 200 °C maximum, Viton
- 70 mesh screen (0.2 x 0.2 x 0.15 mm)

### Ordering Information – Centering Rings (Viton)

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW16	KC16SV72M	0.37 (9.5)	0.25 (5)	0.5 (0.2)
NW25	KC25SV72M	0.77 (19.5)	0.25 (5)	0.5 (0.2)
NW40	KC40SV72M	1.26 (32.0)	0.25 (5)	0.5 (0.2)
NW50	KC50SV72M	1.67 (43.0)	0.25 (5)	0.5 (0.2)

## KLAMPS FLANGES & FITTINGS

### ► Replacement O-Rings NW10 – NW50 (ISO)



#### Specifications

- 100 °C maximum, Buna-N
- 200 °C maximum, Viton

#### Ordering Information – Replacement O-Rings (Viton)

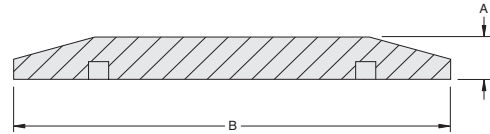
Description	Part Number	Qty/Pkg	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW10	KG10V	10	0.21 (5.33)	0.60 (15.24)	0.5 (0.2)
NW16	KG16V	10	0.21 (5.33)	0.73 (18.42)	0.5 (0.2)
NW25	KG25V	10	0.21 (5.33)	1.10 (27.94)	0.5 (0.2)
NW40	KG40V	10	0.21 (5.33)	1.60 (40.64)	0.5 (0.2)
NW50	KG50V	10	0.21 (5.33)	2.10 (53.34)	0.5 (0.2)

#### Ordering Information – Replacement O-Rings (Buna-N)

Description	Part Number	Qty/Pkg	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW10	KG10B	10	0.21 (5.33)	0.60 (15.24)	0.5 (0.2)
NW16	KG16B	10	0.21 (5.33)	0.73 (18.42)	0.5 (0.2)
NW25	KG25B	10	0.21 (5.33)	1.10 (27.94)	0.5 (0.2)
NW40	KG40B	10	0.21 (5.33)	1.60 (40.64)	0.5 (0.2)
NW50	KG50B	10	0.21 (5.33)	2.10 (53.34)	0.5 (0.2)

# VACUUM COMPONENTS

## ▶ Blank-Off Flanges NW10 – NW50 (ISO)



### Specifications

- 304 stainless steel
- 6061 T6 aluminum
- Use as blank-off port
- Can be machined and welded

### Ordering Information – Blank-Off Flanges (Stainless Steel)

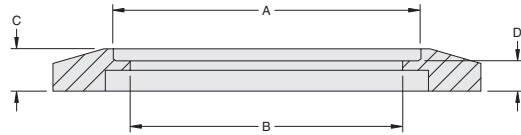
Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
<b>NW10/16</b>	KF160000SB	0.20 (5.08)	1.18 (29.97)	0.5 (0.2)
<b>NW25</b>	KF250000SB	0.20 (5.08)	1.58 (40.13)	0.5 (0.2)
<b>NW40</b>	KF400000SB	0.20 (5.08)	2.17 (55.12)	0.5 (0.2)
<b>NW50</b>	KF500000SB	0.20 (5.08)	2.95 (74.93)	0.5 (0.2)

### Ordering Information – Blank-Off Flanges (Aluminum)

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
<b>NW10/16</b>	KF160000AB	0.20 (5.08)	1.18 (29.97)	0.5 (0.2)
<b>NW25</b>	KF250000AB	0.20 (5.08)	1.58 (40.13)	0.5 (0.2)
<b>NW40</b>	KF400000AB	0.20 (5.08)	2.17 (55.12)	0.5 (0.2)
<b>NW50</b>	KF500000AB	0.20 (5.08)	2.95 (74.93)	0.5 (0.2)

# KLAMPS FLANGES & FITTINGS

## ► Bored Blank-Off Flanges NW16 – NW50 (ISO)



### Specifications

- Self-aligning
- 304 stainless steel
- Standard inch size tubing
- Standard tube weld prep

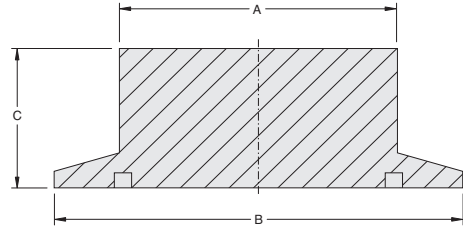
### Ordering Information

Description	Part Number	Tube Size A	B	C	D	Shipping Weight lbs (kg)
		in. (mm)	in. (mm)	in. (mm)	in. (mm)	
<b>NW16</b> (0.75 in. tubing)	KS160075BB	0.76 (19.30)	0.69 (17.53)	0.17 (4.32)	0.15 (3.81)	0.5 (0.2)
<b>NW25</b> (0.50 in. tubing)	KS250050BB	0.51 (12.95)	0.44 (11.18)	0.19 (4.82)	0.15 (3.81)	0.5 (0.2)
	(0.75 in. tubing)	KS250075BB	0.76 (19.30)	0.69 (17.53)	0.19 (4.82)	0.5 (0.2)
	(1.0 in. tubing)	KS250100BB	1.02 (25.91)	0.90 (22.86)	0.19 (4.82)	0.5 (0.2)
<b>NW40</b> (1.0 in. tubing)	KS400100BB	1.02 (25.91)	0.90 (22.86)	0.20 (5.08)	0.15 (3.81)	0.5 (0.2)
	(1.25 in. tubing)	KS400125BB	1.26 (32.00)	1.12 (28.45)	0.20 (5.08)	0.5 (0.2)
	(1.50 in. tubing)	KS400150BB	1.50 (38.10)	1.37 (34.80)	0.20 (5.08)	0.5 (0.2)
<b>NW50</b> (0.75 in. tubing)	KS500075BB	0.76 (19.30)	0.69 (17.53)	0.24 (6.10)	0.15 (3.81)	0.5 (0.2)
	(1.50 in. tubing)	KS500150BB	1.52 (38.62)	1.37 (34.80)	0.24 (6.10)	0.5 (0.2)
	(2.00 in. tubing)	KS500200BB	2.02 (51.31)	1.87 (47.50)	0.24 (6.10)	0.5 (0.2)



# VACUUM COMPONENTS

## ► Unbored Stubs NW16 – NW50 (ISO)



### Specifications

- 304 stainless steel
- 6061 T6 aluminum
- Stub can be turned, bored, or tapped to fit

### Ordering Information – Unbored Stubs (Stainless Steel)

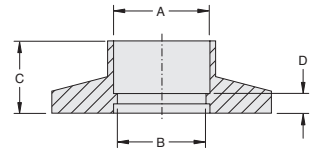
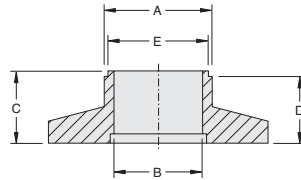
Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW16	KS160000SUB	0.75 (19.05)	1.18 (29.97)	0.75 (19.05)	0.5 (0.2)
NW25	KS250000SUB	1.00 (25.40)	1.58 (40.13)	0.75 (19.05)	0.5 (0.2)
NW40	KS400000SUB	1.50 (38.10)	2.17 (55.12)	1.00 (25.40)	0.5 (0.2)
NW50	KS500000SUB	2.00 (50.80)	2.95 (74.93)	1.00 (25.40)	0.5 (0.2)

### Ordering Information – Unbored Stubs (Aluminum)

Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW16	KS160000AUB	0.75 (19.05)	1.18 (29.97)	0.75 (19.05)	0.5 (0.2)
NW25	KS250000AUB	1.00 (25.40)	1.58 (40.13)	0.75 (19.05)	0.5 (0.2)
NW40	KS400000AUB	1.50 (38.10)	2.17 (55.12)	1.00 (25.40)	0.5 (0.2)
NW50	KS500000AUB	2.00 (50.80)	2.95 (74.93)	1.00 (25.40)	0.5 (0.2)

# KLAMPS FLANGES & FITTINGS

## ► Weld Sockets NW10 – NW50 (ISO)



### Specifications

- Self-aligning
- 304 stainless steel
- Socket weld
- Standard tube weld prep

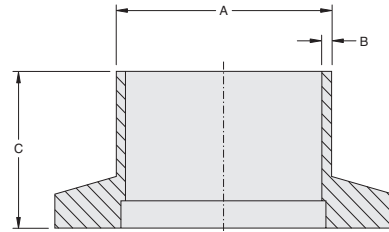
### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Weight lbs (kg)
<b>NW16 (.50 in. tubing)</b>	KS160050050SW	0.51 (12.95)	0.45 (11.43)	0.50 (12.70)	0.25 (6.35)	N/A	0.5 (0.2)
<b>NW16 (.75 in. tubing)</b>	KS160075050SW	0.76 (19.30)	0.68 (17.27)	0.50 (12.70)	0.25 (6.35)	N/A	0.5 (0.2)
<b>NW25 (1 in. tubing)</b>	KS250100047SW	1.02 (25.92)	0.90 (23.00)	0.47 (12.00)	0.17 (4.30)	N/A	0.5 (0.2)
	KS250100050SW	1.02 (25.92)	0.87 (22.10)	0.50 (12.70)	0.25 (6.40)	N/A	0.5 (0.2)
	KS250100052SW	1.02 (25.92)	0.90 (23.00)	0.52 (13.20)	0.22 (5.60)	N/A	0.5 (0.2)
<b>NW40 (1.5 in. tubing)</b>	KS400150030SW	1.51 (38.35)	1.37 (34.80)	0.30 (7.60)	0.21 (5.30)	N/A	0.5 (0.2)
	KS400150040SW	1.51 (38.35)	1.37 (34.80)	0.40 (10.20)	0.31 (7.80)	N/A	0.5 (0.2)
	KS400150050SW	1.51 (38.35)	1.37 (34.80)	0.50 (12.70)	0.21 (5.30)	N/A	0.5 (0.2)
	KS40015005ASW	1.51 (38.35)	1.37 (34.80)	0.50 (12.70)	0.25 (6.40)	N/A	0.5 (0.2)
<b>NW50 (2 in. tubing)</b>	KS500200050SW	2.02 (51.31)	1.87 (47.50)	0.50 (12.70)	0.25 (6.40)	N/A	0.5 (0.2)
	KS500200062SW	2.02 (51.31)	1.87 (47.50)	0.62 (15.70)	0.22 (5.60)	N/A	0.5 (0.2)

\* See Fig. 1; all other Part Numbers see Fig. 2.

# VACUUM COMPONENTS

## ▶ Short Weld Stubs NW16 – NW50 (ISO)



### Specifications

- Butt weld
- Standard and metric tube sizes

### Ordering Information – Short Weld Stubs (304 Stainless Steel)

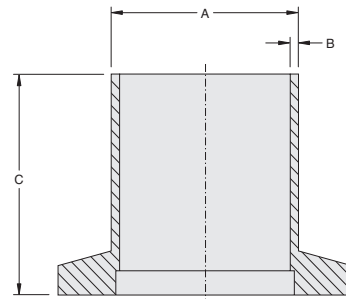
Description	Part Number	Tube Size A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
<b>NW16 (.50 in. tubing)</b>	KS160050050	0.50 (12.70)	0.065 (1.65)	0.50 (12.70)	0.5 (0.2)
<b>NW16 (.75 in. tubing)</b>	KS160075050	0.75 (19.05)	0.065 (1.65)	0.50 (12.70)	0.5 (0.2)
	KS160078078	0.78 (19.81)	0.080 (2.03)	0.78 (19.81)	0.5 (0.2)
<b>NW25 (1 in. tubing)</b>	KS250100050	1.00 (25.40)	0.065 (1.65)	0.50 (12.70)	0.5 (0.2)
	KS250100057	1.00 (25.40)	0.049 (1.24)	0.57 (14.48)	0.5 (0.2)
	KS250110078	1.10 (27.94)	0.077 (1.95)	0.78 (19.81)	0.5 (0.2)
<b>NW40 (1.50 in. tubing)</b>	KS400150057	1.50 (38.10)	0.065 (1.65)	0.57 (14.48)	0.5 (0.2)
	KS400150075	1.50 (38.10)	0.065 (1.65)	0.75 (19.05)	0.5 (0.2)
	KS400175100	1.75 (44.45)	0.078 (1.98)	1.00 (25.40)	0.5 (0.2)
<b>NW50 (2 in. tubing)</b>	KS500200057	2.00 (50.80)	0.065 (1.65)	0.57 (14.48)	0.5 (0.2)
	KS500220100	2.20 (55.88)	0.117 (2.97)	1.00 (25.40)	0.5 (0.2)

### Ordering Information – Short Weld Stubs (6061 T6 Aluminum)

Description	Part Number	Tube Size A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
<b>NW16 (.75 in. tubing)</b>	KS160075050A	0.75 (19.05)	0.065 (1.65)	0.50 (12.70)	0.5 (0.2)
<b>NW40 (1.5 in. tubing)</b>	KS400150075A	1.50 (38.10)	0.065 (1.65)	0.75 (19.05)	0.5 (0.2)

# KLAMPS FLANGES & FITTINGS

## ▶ Long Weld Stubs NW16 – NW50 (ISO)



### Specifications

- Butt weld
- Standard and metric tube sizes

### Ordering Information – Long Weld Stubs (304 Stainless Steel)

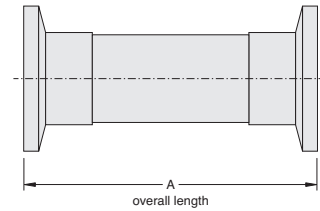
Description	Part Number	Tube Size A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
<b>NW16 (.50 in. tubing)</b>	KS160050157	0.50 (12.70)	0.065 (1.65)	1.57 (40.0)	0.5 (0.2)
<b>NW16 (.75 in. tubing)</b>	KS160075115	0.75 (19.05)	0.035 (0.89)	1.15 (29.2)	0.5 (0.2)
	KS160075157	0.75 (19.05)	0.065 (1.65)	1.57 (40.0)	0.5 (0.2)
	KS160078197	0.78 (19.81)	0.078 (1.98)	1.97 (50.0)	0.5 (0.2)
<b>NW25 (1 in. tubing)</b>	KS250100143	1.00 (25.40)	0.049 (1.24)	1.43 (36.6)	0.5 (0.2)
	KS250100157	1.00 (25.40)	0.065 (1.65)	1.57 (40.0)	0.5 (0.2)
	KS250100203	1.00 (25.40)	0.065 (1.65)	2.03 (51.6)	0.5 (0.2)
	KS250110197	1.10 (27.94)	0.077 (1.95)	1.97 (50.0)	0.5 (0.2)
<b>NW40 (1.50 in. tubing)</b>	KS400150157	1.50 (38.10)	0.065 (1.65)	1.57 (40.0)	0.5 (0.2)
	KS400150175	1.50 (38.10)	0.065 (1.65)	1.75 (44.5)	0.5 (0.2)
	KS400150246	1.50 (38.10)	0.065 (1.65)	2.46 (62.5)	1.0 (0.5)
	KS400175197	1.75 (44.45)	0.083 (2.11)	1.97 (50.0)	0.5 (0.2)
<b>NW50 (2 in. tubing)</b>	KS500200157	2.00 (50.80)	0.065 (1.65)	1.57 (40.0)	0.5 (0.2)
	KS500200169	2.00 (50.80)	0.065 (1.65)	1.69 (42.9)	0.5 (0.2)
	KS500220217	2.20 (55.88)	0.117 (2.97)	2.17 (55.1)	0.5 (0.2)

### Ordering Information – Long Weld Stubs (6061 T6 Aluminum)

Description	Part Number	Tube Size A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
<b>NW16 (.50 in. tubing)</b>	KS160050157A	0.50 (12.70)	0.065 (1.65)	1.57 (39.88)	0.5 (0.2)
<b>NW16 (.75 in. tubing)</b>	KS160075157A	0.75 (19.05)	0.065 (1.65)	1.57 (39.88)	0.5 (0.2)
<b>NW25 (1 in. tubing)</b>	KS250100157A	1.00 (25.40)	0.065 (1.65)	1.57 (39.88)	0.5 (0.2)
<b>NW40 (1.5 in. tubing)</b>	KS400150157A	1.50 (38.10)	0.083 (2.11)	1.57 (39.88)	0.5 (0.2)
<b>NW50 (2 in. tubing)</b>	KS500200157A	2.00 (50.80)	0.083 (2.11)	1.57 (39.88)	0.5 (0.2)

# VACUUM COMPONENTS

## ► Nipples NW16 – NW50 (ISO)



### Specifications

- 304 stainless steel
- ISO-KF flanges
- Same flanges on both ports
- Full penetration vacuum welds
- Custom lengths available

### Ordering Information

Description	Part Number	A in. (mm)	Shipping Weight lbs (kg)
<b>NW16</b>	KNF00750230	2.30 (58.42)	1.0 (0.5)
	KNF00750315	3.15 (80.01)	1.0 (0.5)
	KNF00750645	6.45 (163.83)	2.0 (0.9)
	KNF00751260	12.60 (320.04)	3.0 (1.4)
<b>NW25</b>	KNF01000394	3.94 (100.08)	1.0 (0.5)
	KNF01000406	4.06 (103.12)	1.0 (0.5)
	KNF01000408	4.08 (103.63)	1.0 (0.5)
	KNF01000803	8.03 (203.96)	2.0 (0.9)
	KNF01001260	12.60 (320.04)	3.0 (1.4)
<b>NW40</b>	KNF01500480	4.80 (121.92)	1.0 (0.5)
	KNF01500493	4.93 (125.22)	1.0 (0.5)
	KNF01500512	5.12 (130.05)	1.0 (0.5)
	KNF01501039	10.39 (263.91)	4.0 (1.8)
	KNF01501260	12.60 (320.04)	4.0 (1.8)
<b>NW50</b>	KNF02000551	5.51 (139.95)	1.0 (0.5)
	KNF02000630	6.30 (160.02)	1.0 (0.5)
	KNF02000643	6.43 (163.32)	1.0 (0.5)
	KNF02001118	11.18 (283.97)	4.0 (1.8)
	KNF02001260	12.60 (320.04)	4.0 (1.8)

# KLAMPS FLANGES & FITTINGS

## ► Elbows (90°) NW16 – NW50 (ISO)

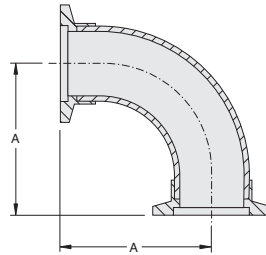


Fig. 1

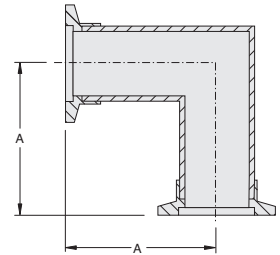


Fig. 2

### Specifications

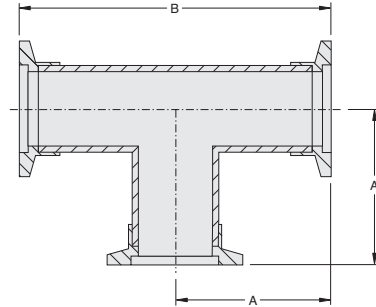
- 304 stainless steel
- ISO-KF Flanges
- Same flanges on both ports
- Full penetration vacuum welds
- Custom configurations available

### Ordering Information

Description	Part Number	A in. (mm)	Fig. Number	Shipping Weight lbs (kg)
<b>NW16</b>	KE00750150	1.50 (38.10)	1	1.0 (0.5)
	KE00750157	1.57 (39.88)	1	1.0 (0.5)
<b>NW25</b>	KE01000197	1.97 (50.04)	1	1.0 (0.5)
	KE01000204	2.04 (51.82)	1	1.0 (0.5)
<b>NW40</b>	KE01500246	2.46 (62.48)	1	2.0 (0.9)
	KE01500256	2.56 (65.02)	1	2.0 (0.9)
<b>NW50</b>	KE02000276	2.76 (70.10)	2	2.0 (0.9)
	KE02000321	3.21 (81.53)	2	2.0 (0.9)

# VACUUM COMPONENTS

## ► Tees NW16 – NW50 (ISO)



### Specifications

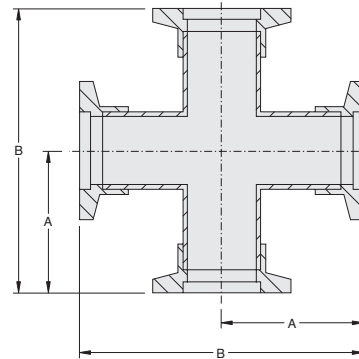
- 304 stainless steel
- ISO-KF flanges
- Same flanges on all ports
- Full penetration vacuum welds

### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW16	KT00750150	1.50 (38.10)	3.00 (76.20)	1.5 (0.7)
	KT00750157	1.57 (39.88)	3.15 (80.01)	1.5 (0.7)
NW25	KT01000197	1.97 (50.04)	3.94 (100.08)	2.0 (0.9)
	KT01000204	2.04 (51.82)	4.08 (103.63)	2.0 (0.9)
NW40	KT01500246	2.46 (62.48)	4.92 (124.97)	2.0 (0.9)
	KT01500256	2.56 (65.02)	5.12 (130.05)	2.0 (0.9)
NW50	KT02000276	2.76 (70.10)	5.52 (140.21)	3.0 (1.4)
	KT02000321	3.21 (81.53)	6.42 (163.07)	3.0 (1.4)

## KLAMPS FLANGES & FITTINGS

### ► 4-Way Crosses NW16 – NW50 (ISO)



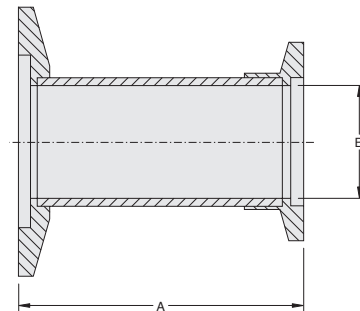
#### Specifications

- 304 stainless steel
- ISO-KF flanges
- Same flanges on all ports
- Full penetration vacuum welds

#### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
<b>NW16</b>	KC00750150	1.50 (38.10)	3.00 (76.20)	1.5 (0.7)
	KC00750157	1.57 (39.88)	3.14 (80.01)	1.5 (0.7)
<b>NW25</b>	KC01000197	1.97 (50.04)	3.94 (100.08)	2.0 (0.9)
	KC01000204	2.04 (51.82)	4.08 (103.63)	2.0 (0.9)
<b>NW40</b>	KC01500246	2.46 (62.48)	4.92 (124.97)	3.0 (1.4)
	KC01500256	2.56 (65.02)	5.12 (130.05)	3.0 (1.4)
<b>NW50</b>	KC02000276	2.76 (70.10)	5.52 (140.21)	3.0 (1.4)
	KC02000321	3.21 (81.53)	6.44 (163.60)	3.0 (1.4)

### ► Straight Reducers NW16 – NW50 (ISO)



#### Specifications

- 304 stainless steel
- Straight through

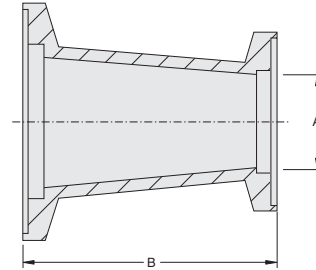
#### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
<b>NW16 to NW25</b>	KRS1625	1.57 (39.88)	0.69 (17.53)	1.0 (0.5)
<b>NW16 to NW40</b>	KRS1640	1.57 (39.88)	0.69 (17.53)	1.0 (0.5)
<b>NW16 to NW50</b>	KRS1650	1.57 (39.88)	0.69 (17.53)	1.0 (0.5)
<b>NW25 to NW40</b>	KRS2540	1.57 (39.88)	0.90 (22.86)	1.0 (0.5)
<b>NW25 to NW50</b>	KRS2550	1.57 (39.88)	0.90 (22.86)	1.0 (0.5)
<b>NW40 to NW50</b>	KRS4050	1.57 (39.88)	1.37 (34.80)	1.0 (0.5)



# VACUUM COMPONENTS

## ► Conical Reducers NW16 – NW50 (ISO)



### Specifications

- 304 stainless steel
- 6061 T6 aluminum

### Ordering Information – Conical Reducers (304 Stainless Steel)

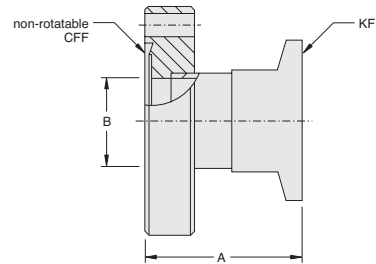
Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW16 to NW25	KRC1625S	0.62 (15.75)	1.65 (41.91)	1.0 (0.5)
NW16 to NW40	KRC1640S	0.62 (15.75)	1.65 (41.91)	1.0 (0.5)
NW16 to NW50	KRC1650S	0.62 (15.75)	1.65 (41.91)	1.0 (0.5)
NW25 to NW40	KRC2540S	0.87 (22.10)	1.65 (41.91)	1.0 (0.5)
NW25 to NW50	KRC2550S	0.87 (22.10)	1.65 (41.91)	1.0 (0.5)
NW40 to NW50	KRC4050S	1.37 (34.80)	1.65 (41.91)	1.0 (0.5)

### Ordering Information – Conical Reducers (6061 T6 Aluminum)

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW16 to NW25	KRC1625A	0.62 (15.75)	1.65 (41.91)	1.0 (0.5)
NW16 to NW40	KRC1640A	0.62 (15.75)	1.65 (41.91)	1.0 (0.5)
NW16 to NW50	KRC1650A	0.62 (15.75)	1.65 (41.91)	1.0 (0.5)
NW25 to NW40	KRC2540A	0.87 (22.10)	1.65 (41.91)	1.0 (0.5)
NW25 to NW50	KRC2550A	0.87 (22.10)	1.65 (41.91)	1.0 (0.5)
NW40 to NW50	KRC4050A	1.37 (34.80)	1.65 (41.91)	1.0 (0.5)

# KLAMPS FLANGES & FITTINGS

## ► KF to CFF Adapters



### Ordering Information

CFF Size	Part Number	CFF OD	KF Flange		Overall Length A in. (mm)	Tube ID B in. (mm)	Shipping Weight lbs (kg)
			NW	Size OD			
1 1/2 in.	FA0133NW16S	1.33	NW16	1.18	1.57 (39.88)	0.68 (17.27)	1.0 (0.5)
	FA0133NW16	1.33	NW16	1.18	2.00 (50.80)	0.68 (17.27)	1.0 (0.5)
	FA0133NW25	1.33	NW25	1.57	2.00 (50.80)	0.68 (17.27)	1.5 (0.7)
2 3/4 in.	FA0275NW16S	2.73	NW16	1.18	1.78 (45.21)	0.68 (17.27)	1.5 (0.7)
	FA0275NW16	2.73	NW16	1.18	2.00 (50.80)	0.68 (17.27)	1.5 (0.7)
	FA0275NW16L	2.73	NW16	1.18	2.36 (59.94)	0.68 (17.27)	1.5 (0.7)
	FA0275NW25S	2.73	NW25	1.57	1.78 (45.21)	0.87 (22.10)	1.5 (0.7)
	FA0275NW25	2.73	NW25	1.57	2.00 (50.80)	0.87 (22.10)	1.5 (0.7)
	FA0275NW25L	2.73	NW25	1.57	2.36 (59.94)	0.87 (22.10)	1.5 (0.7)
	FA0275NW40S	2.73	NW40	2.16	1.78 (45.21)	1.37 (34.80)	2.0 (0.9)
	FA0275NW40	2.73	NW40	2.16	2.00 (50.80)	1.37 (34.80)	2.0 (0.9)
	FA0275NW40L	2.73	NW40	2.16	2.55 (64.77)	1.37 (34.80)	2.0 (0.9)
4 1/2 in.	FA0450NW40	4.47	NW40	2.16	2.00 (50.80)	1.37 (34.80)	3.0 (1.4)
	FA0450NW50L	4.47	NW50	2.95	2.00 (50.80)	1.87 (47.50)	3.0 (1.4)
	FA0450NW50	4.47	NW50	2.95	1.95 (49.53)	1.87 (34.80)	3.0 (1.4)

# VACUUM COMPONENTS

## Accessories

Size	Gasket	Description	Part Number	Qty/Pkg	Shipping Weight lbs (kg)
1 1/8 in.	Copper	10-pack, individually sealed	FG0133CI	10	1.0 (0.5)
	Viton	5-pack	FG0133VU	5	0.5 (0.2)
2 1/8 in.	Copper	10-pack, individually sealed	FG0212CI	10	1.0 (0.5)
	Viton	5-pack	FG0212VU	5	0.5 (0.2)
2 3/8 in.	Copper	10-pack, individually sealed	FG0275CI	10	1.0 (0.5)
	Viton	5-pack	FG0275VU	5	0.5 (0.2)
3 3/8 in.	Copper	10-pack, individually sealed	FG0338CI	10	1.0 (0.5)
	Viton	1-pack	FG0338VU	1	0.5 (0.2)
4 1/2 in.	Copper	10-pack, individually sealed	FG0450CI	10	2.0 (0.9)
	Viton	1-pack	FG0450VU	1	0.5 (0.2)

## Accessories

Size	Nut and Bolt Sets	Hex Head Part Number	12-Point Bolt Part Number	Qty/Pkg	Shipping Weight lbs (kg)
1 1/8 in.	Clear hole flanges	N/A	FB0133C**	25	0.5 (0.2)
	Tapped hole flanges	N/A	FB0133T**	25	0.5 (0.2)
2 1/8 in.	Clear hole flanges	FB0275C06	FB0275C12	25	1.0 (0.5)
	Tapped hole flanges	FB0275T06	FB0275T12	25	1.0 (0.5)
2 3/8 in.	Clear hole flanges	FB0275C06	FB0275C12	25	1.0 (0.5)
	Tapped hole flanges	FB0275T06	FB0275T12	25	1.0 (0.5)
3 3/8 in.	Clear hole flanges	FB0338C06	FB0338C12	25	2.0 (0.9)
	Tapped hole flanges	FB0450T06	FB0450T12	25	2.0 (0.9)
4 1/2 in.	Clear hole flanges	FB0450C06	FB0450C12	25	2.0 (0.9)
	Tapped hole flanges	FB0450T06	FB0450T12	25	2.0 (0.9)

\* Includes nuts, washers, and bolts

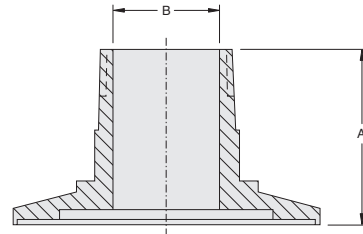
\*\* Only available in Socket Head

## Accessories

Size	Description	Part Number	Qty/Pkg	Shipping Weight lbs (kg)
NW16	Viton Centering Ring	KC16SV	1	0.5 (0.2)
NW25	Viton Centering Ring	KC25SV	1	0.5 (0.2)
NW40	Viton Centering Ring	KC40SV	1	0.5 (0.2)
NW50	Viton Centering Ring	KC50SV	1	0.5 (0.2)
NW16	KF Clamp	KQ16AR	1	0.5 (0.2)
NW25	KF Clamp	KQ25AR	1	0.5 (0.2)
NW40	KF Clamp	KQ40AR	1	1.0 (0.5)
NW50	KF Clamp	KQ50AR	1	1.0 (0.5)

## KLAMPS FLANGES & FITTINGS

### ▶ Stainless Steel Male Pipe Adapters NW16 – NW40 (ISO)



#### Specifications

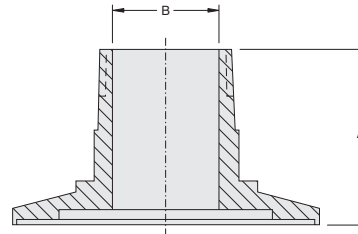
- 304 stainless steel
- Male pipe threads
- Wrench flats on shank

#### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)	
<b>NW16</b>	1/8 NPT	KAMP160125S	1.47 (37.34)	0.19 (4.83)	1.0 (0.5)
	1/4 NPT	KAMP160250S	1.47 (37.34)	0.28 (7.11)	1.0 (0.5)
	3/8 NPT	KAMP160375S	1.47 (37.34)	0.42 (10.70)	1.0 (0.5)
	1/2 NPT	KAMP160500S	1.69 (42.93)	0.58 (14.73)	1.0 (0.5)
	<b>NW25</b>	1/8 NPT	KAMP250125S	1.47 (37.34)	0.19 (4.83)
1/4 NPT		KAMP250250S	1.47 (37.34)	0.28 (7.11)	1.0 (0.5)
3/8 NPT		KAMP250375S	1.47 (37.34)	0.42 (10.70)	1.0 (0.5)
1/2 NPT		KAMP250500S	1.69 (42.93)	0.58 (14.73)	1.0 (0.5)
3/4 NPT		KAMP250750S	1.69 (42.93)	0.78 (19.81)	1.0 (0.5)
<b>NW40</b>	1/4 NPT	KAMP400250S	1.47 (37.34)	0.28 (7.11)	1.0 (0.5)
	3/8 NPT	KAMP400375S	1.47 (37.34)	0.42 (10.70)	1.0 (0.5)
	1/2 NPT	KAMP400500S	1.69 (42.93)	0.58 (14.73)	1.0 (0.5)
	3/4 NPT	KAMP400750S	1.69 (42.93)	0.78 (19.81)	1.0 (0.5)
	1NPT	KAMP401000S	1.69 (42.93)	1.02 (25.91)	1.0 (0.5)

# VACUUM COMPONENTS

## ▶ Aluminum Male Pipe Adapters NW16 – NW40 (ISO)



### Specifications

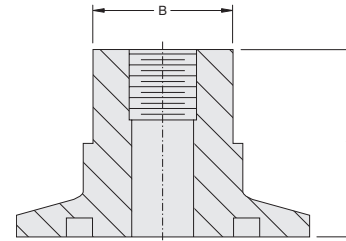
- 6061 T6 aluminum
- Male pipe threads
- Wrench flats on shank

### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)	
<b>NW16</b>	1/8 NPT	KAMP160125A	1.47 (37.34)	0.19 (4.83)	1.0 (0.5)
	1/4 NPT	KAMP160250A	1.47 (37.34)	0.28 (7.11)	1.0 (0.5)
	3/8 NPT	KAMP160375A	1.47 (37.34)	0.42 (10.70)	1.0 (0.5)
	1/2 NPT	KAMP160500A	1.69 (42.93)	0.58 (14.73)	1.0 (0.5)
	<b>NW25</b>	1/8 NPT	KAMP250125A	1.47 (37.34)	0.19 (4.83)
1/4 NPT		KAMP250250A	1.47 (37.34)	0.28 (7.11)	1.0 (0.5)
3/8 NPT		KAMP250375A	1.47 (37.34)	0.42 (10.70)	1.0 (0.5)
1/2 NPT		KAMP250500A	1.69 (42.93)	0.58 (14.73)	1.0 (0.5)
3/4 NPT		KAMP250750A	1.69 (42.93)	0.78 (19.81)	1.0 (0.5)
<b>NW40</b>	1/4 NPT	KAMP400250A	1.47 (37.34)	0.28 (7.11)	1.0 (0.5)
	3/8 NPT	KAMP400375A	1.47 (37.34)	0.42 (10.70)	1.0 (0.5)
	1/2 NPT	KAMP400500A	1.69 (42.93)	0.58 (14.73)	1.0 (0.5)
	3/4 NPT	KAMP400750A	1.69 (42.93)	0.78 (19.81)	1.0 (0.5)
	1NPT	KAMP401000A	1.69 (42.93)	1.02 (25.91)	1.0 (0.5)

## KLAMPS FLANGES & FITTINGS

### ► Stainless Steel Female Pipe Adapters NW16 – NW40 (ISO)



#### Specifications

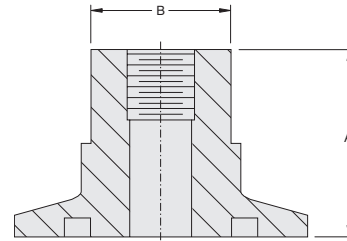
- 304 stainless steel
- Female pipe threads
- Wrench flats on shank

#### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)	
<b>NW16</b>	1/8 NPT	KAFP160125S	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	1/4 NPT	KAFP160250S	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	3/8 NPT	KAFP160375S	1.04 (26.42)	0.88 (22.23)	1.0 (0.5)
<b>NW25</b>	1/8 NPT	KAFP250125S	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	1/4 NPT	KAFP250250S	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	3/8 NPT	KAFP250375S	1.04 (26.42)	0.88 (22.23)	1.0 (0.5)
	1/2 NPT	KAFP250500S	1.04 (26.42)	1.13 (28.58)	1.0 (0.5)
<b>NW40</b>	1/8 NPT	KAFP400125S	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	1/4 NPT	KAFP400250S	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	3/8 NPT	KAFP400375S	1.04 (26.42)	0.88 (22.23)	1.0 (0.5)
	1/2 NPT	KAFP400500S	1.65 (41.91)	1.13 (28.58)	1.0 (0.5)
	3/4 NPT	KAFP400750S	1.65 (41.91)	1.25 (31.75)	1.0 (0.5)
	1NPT	KAFP401000S	1.65 (41.91)	1.56 (39.67)	1.0 (0.5)

# VACUUM COMPONENTS

## ▶ Aluminum Female Pipe Adapters NW16 – NW40 (ISO)



### Specifications

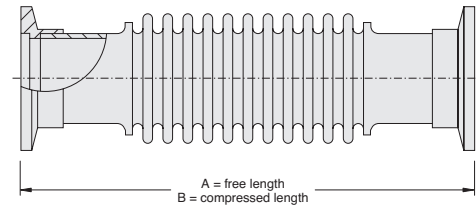
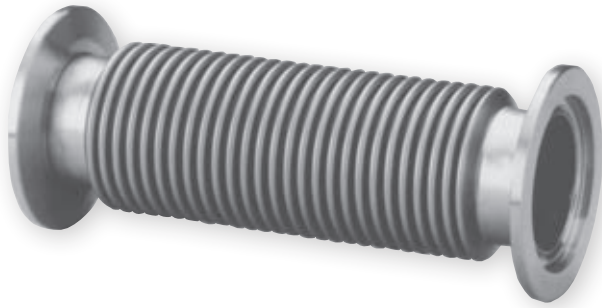
- 6061 T6 aluminum
- Female pipe threads
- Wrench flats on shank

### Ordering Information

Description	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)	
<b>NW16</b>	1/8 NPT	KAFP160125A	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	1/4 NPT	KAFP160250A	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	3/8 NPT	KAFP160375A	1.04 (26.42)	0.88 (22.23)	1.0 (0.5)
<b>NW25</b>	1/8 NPT	KAFP250125A	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	1/4 NPT	KAFP250250A	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	3/8 NPT	KAFP250375A	1.04 (26.42)	0.88 (22.23)	1.0 (0.5)
	1/2 NPT	KAFP250500A	1.04 (26.42)	1.13 (28.58)	1.0 (0.5)
<b>NW40</b>	1/8 NPT	KAFP400125A	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	1/4 NPT	KAFP400250A	1.04 (26.42)	0.75 (19.05)	1.0 (0.5)
	3/8 NPT	KAFP400375A	1.04 (26.42)	0.88 (22.23)	1.0 (0.5)
	1/2 NPT	KAFP400500A	1.65 (41.91)	1.13 (28.58)	1.0 (0.5)
	3/4 NPT	KAFP400750A	1.65 (41.91)	1.25 (31.75)	1.0 (0.5)
	1NPT	KAFP401000A	1.65 (41.91)	1.56 (39.67)	1.0 (0.5)

# KLAMPS FLANGES & FITTINGS

## ► Flexible Couplings (Non-Braided)



### Specifications

- Stainless steel
- Full penetration vacuum weld

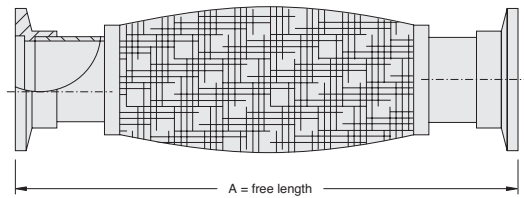
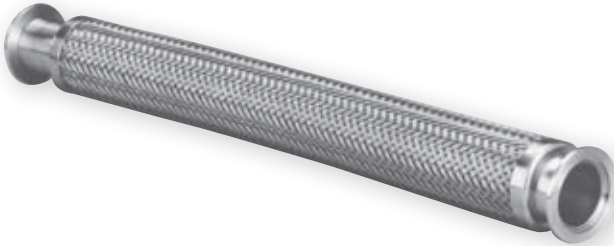
### Ordering Information

Flange Size	Part Number	Length Free A in. (mm)	Length Compressed B in. (mm)	Static Bend Radius in. (mm)	Bellows Wall Thickness in.	Nominal ID in. (mm)	Shipping Weight lbs (kg)
<b>NW16</b>	KL00750315	3.2 (81)	2.9 (75)	3.0 (76)	0.006	0.75 (19.1)	1.0 (0.5)
	KL00750394	3.9 (100)	3.7 (93)	3.0 (76)	0.006	0.75 (19.1)	1.0 (0.5)
	KL00750984	9.8 (250)	9.0 (228)	3.0 (76)	0.006	0.75 (19.1)	1.5 (0.7)
	KL00751969	19.7 (500)	17.8 (453)	1.3 (33)	0.008	0.75 (19.1)	3.0 (1.4)
	KL00753940	39.4 (1000)	35.6 (903)	1.3 (33)	0.008	0.75 (19.1)	4.0 (1.8)
	KL00754800	48.0 (1219)	43.3 (1100)	1.3 (33)	0.008	0.75 (19.1)	5.0 (2.3)
<b>NW25</b>	KL01000394	3.9 (100)	3.6 (92)	4.0 (102)	0.006	1.00 (25.4)	1.0 (0.5)
	KL01000984	9.8 (250)	8.9 (227)	4.0 (102)	0.006	1.00 (25.4)	1.0 (0.5)
	KL01001969	19.7 (500)	17.8 (452)	1.5 (38)	0.008	1.00 (25.4)	3.0 (1.4)
	KL01002400	24.0 (609)	21.7 (551)	1.5 (38)	0.008	1.00 (25.4)	3.0 (1.4)
	KL01003940	39.4 (1000)	35.5 (903)	1.5 (38)	0.008	1.00 (25.4)	4.0 (1.8)
	KL01004800	48.0 (1219)	43.3 (1100)	1.5 (38)	0.008	1.00 (25.4)	5.0 (2.3)
<b>NW40</b>	KL01500394	3.9 (100)	3.6 (92)	6.0 (152)	0.006	1.38 (35.1)	1.0 (0.5)
	KL01500512	5.1 (130)	4.7 (119)	6.0 (152)	0.006	1.50 (38.1)	1.5 (0.7)
	KL01500984	9.8 (250)	8.9 (227)	6.0 (152)	0.006	1.50 (38.1)	2.0 (0.9)
	KL01501200	12.0 (305)	10.9 (276)	6.0 (152)	0.006	1.50 (38.1)	2.5 (1.1)
	KL01501969	19.7 (500)	17.8 (452)	2.2 (56)	0.010	1.50 (38.1)	3.0 (1.4)
	KL01502400	24.0 (609)	21.7 (551)	2.2 (56)	0.010	1.50 (38.1)	3.5 (1.6)
	KL01503940	39.4 (1000)	35.5 (903)	2.2 (56)	0.010	1.50 (38.1)	4.0 (1.8)
	KL01504800	48.0 (1219)	43.3 (1100)	2.2 (56)	0.010	1.50 (38.1)	5.0 (2.3)
<b>NW50</b>	KL02000394	3.9 (100)	3.7 (93)	6.0 (152)	0.006	1.88 (47.8)	1.0 (0.5)
	KL02000551	5.5 (140)	5.1 (129)	7.5 (191)	0.006	2.00 (50.8)	1.5 (0.7)
	KL02000984	9.8 (250)	9.0 (228)	7.5 (191)	0.006	2.00 (50.8)	2.0 (0.9)
	KL02001969	19.7 (500)	17.8 (453)	2.6 (66)	0.012	2.00 (50.8)	3.0 (1.4)
	KL02003940	39.4 (1000)	35.6 (903)	2.6 (66)	0.012	2.00 (50.8)	4.0 (1.8)
	KL02004800	48.0 (1219)	43.3 (1100)	2.6 (66)	0.012	2.00 (50.8)	5.0 (2.3)



# VACUUM COMPONENTS

## ► Flexible Couplings (Braided)



### Specifications

- Stainless steel
- Braided sheathing
- Full penetration vacuum weld

### Ordering Information

Flange Size	Part Number	Length Free A in. (mm)	Static Bend Radius in. (mm)	Bellows Wall Thickness in.	Nominal ID in. (mm)	Shipping Weight lbs (kg)
<b>NW16</b>	KLB00751200	12.0 (305)	2.1 (53)	0.008	0.75 (19.1)	2.0 (0.9)
	KLB00751850	18.5 (470)	2.1 (53)	0.008	0.75 (19.1)	2.0 (0.9)
	KLB00752400	24.0 (610)	2.1 (53)	0.008	0.75 (19.1)	3.0 (1.4)
	KLB00753600	36.0 (914)	2.1 (53)	0.008	0.75 (19.1)	4.0 (1.8)
	KLB00754000	40.0 (1016)	2.1 (53)	0.008	0.75 (19.1)	5.0 (2.3)
	KLB00754800	48.0 (1219)	2.1 (53)	0.008	0.75 (19.1)	5.0 (2.3)
<b>NW25</b>	KLB01001000	10.0 (254)	2.5 (64)	0.008	1.00 (25.4)	3.0 (1.4)
	KLB01001200	12.0 (305)	2.5 (64)	0.008	1.00 (25.4)	3.0 (1.4)
	KLB01001850	18.5 (470)	2.5 (64)	0.008	1.00 (25.4)	3.0 (1.4)
	KLB01002000	20.0 (508)	2.5 (64)	0.008	1.00 (25.4)	3.0 (1.4)
	KLB01002400	24.0 (610)	2.5 (64)	0.008	1.00 (25.4)	3.0 (1.4)
	KLB01003600	36.0 (914)	2.5 (64)	0.008	1.00 (25.4)	4.0 (1.8)
	KLB01004000	40.0 (1016)	2.5 (64)	0.008	1.00 (25.4)	5.0 (2.3)
	KLB01004800	48.0 (1219)	2.5 (64)	0.008	1.00 (25.4)	5.0 (2.3)
<b>NW40</b>	KLB01501000	10.0 (254)	3.9 (99)	0.010	1.50 (38.1)	4.0 (1.8)
	KLB01501200	12.0 (305)	3.9 (99)	0.010	1.50 (38.1)	4.0 (1.8)
	KLB01501850	18.5 (470)	3.9 (99)	0.010	1.50 (38.1)	4.0 (1.8)
	KLB01502000	20.0 (508)	3.9 (99)	0.010	1.50 (38.1)	4.0 (1.8)
	KLB01502400	24.0 (610)	3.9 (99)	0.010	1.50 (38.1)	4.5 (2.1)
	KLB01503600	36.0 (914)	3.9 (99)	0.010	1.50 (38.1)	4.5 (2.1)
	KLB01504000	40.0 (1016)	3.9 (99)	0.010	1.50 (38.1)	5.0 (2.3)
	KLB01504800	48.0 (1219)	3.9 (99)	0.010	1.50 (38.1)	5.0 (2.3)
<b>NW50</b>	KLB02002400	24.0 (610)	4.7 (120)	0.012	2.00 (50.8)	6.0 (2.7)
	KLB02003600	36.0 (914)	4.7 (120)	0.012	2.00 (50.8)	7.0 (3.2)
	KLB02004000	40.0 (1016)	4.7 (120)	0.012	2.00 (50.8)	7.0 (3.2)
	KLB02004800	48.0 (1219)	4.7 (120)	0.012	2.00 (50.8)	8.0 (3.6)

# KLAMPS FLANGES & FITTINGS

## ► KF to Compression Port Adapters

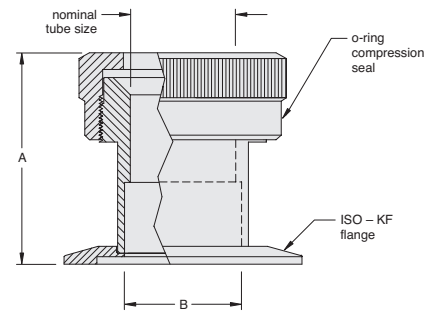


Fig. 1

### Specifications

- 304 stainless steel
- Knurled nut for hand-tightening
- ISO-KF Flanges
- Use for standard inch size tubulation

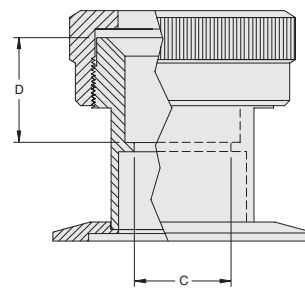


Fig. 2

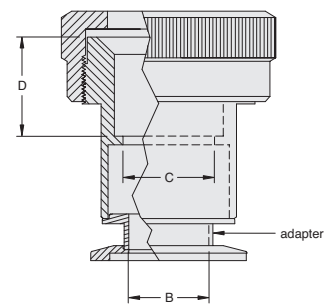


Fig. 3

# VACUUM COMPONENTS

## Ordering Information

Flange Size	Part Number	Nominal Tube Size	Length		Bore		ID		Tube Stop		Fig.	Weight lbs (kg)
			A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	D in. (mm)	D in. (mm)				
NW16	KCP160125	1/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP160190	3/16 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP160250	1/4 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP160375	3/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP160500	1/2 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP160625	5/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
NW25	KCP250062	1/16 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250125	1/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250190	3/16 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250250	1/4 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250312	5/16 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250375	3/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250500	1/2 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250625	5/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	1.0 (0.5)
	KCP250750	3/4 in.	2.37 (60.20)	0.90 (22.86)	0.63 (16.0)	1.13 (28.7)	—	—	—	—	3	1.0 (0.5)
NW40	KCP400125	1/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP400250	1/4 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP400375	3/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP400500	1/2 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP400625	5/8 in.	1.65 (41.91)	0.63 (16.00)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP400750	3/4 in.	2.02 (51.31)	1.38 (35.05)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP400880	7/8 in.	2.02 (51.31)	1.38 (35.05)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP401000	1 in.	2.02 (51.31)	1.38 (35.05)	0.88 (22.4)	1.13 (28.7)	—	—	—	—	2	2.0 (0.9)
	KCP401125	1 1/8 in.	2.02 (51.31)	1.38 (35.05)	—	—	—	—	—	—	1	2.0 (0.9)
	KCP401250	1 1/4 in.	2.02 (51.31)	1.38 (35.05)	—	—	—	—	—	—	1	2.0 (0.9)

## KLAMPS FLANGES & FITTINGS

### ► Adapters: KF to Swagelok

**NOTE** • KF flanges are 304L stainless steel



### Ordering Information

Flange Size	Tube Size	Part Number	Length in. (mm)	Shipping Weight lbs (kg)
NW16	¼ in.	KASW025016	1.47 (37.3)	0.2 (0.11)
NW25	¼ in.	KASW025025	1.47 (37.3)	0.2 (0.11)
NW40	¼ in.	KASW025040	1.47 (37.3)	0.2 (0.11)
NW50	¼ in.	KASW025050	1.47 (37.3)	0.2 (0.11)
NW16	⅜ in.	KASW037516	1.63 (41.4)	0.2 (0.11)
NW25	⅜ in.	KASW037525	1.63 (41.4)	0.2 (0.11)
NW40	⅜ in.	KASW037540	1.63 (41.4)	0.2 (0.11)
NW50	⅜ in.	KASW037550	1.63 (41.4)	0.2 (0.11)
NW16	½ in.	KASW050016	1.77 (45.0)	0.2 (0.11)
NW25	½ in.	KASW050025	1.77 (45.0)	0.2 (0.11)
NW40	½ in.	KASW050040	1.77 (45.0)	0.5 (0.22)
NW50	½ in.	KASW050050	1.77 (45.0)	0.5 (0.22)
NW40	½ in.	KASW075040	2.14 (54.4)	0.5 (0.22)
NW50	½ in.	KASW075050	2.14 (54.4)	0.5 (0.22)
NW40	1 in.	KASW100040	2.60 (66.0)	0.5 (0.22)

# VACUUM COMPONENTS

## ▶ Adapters: KF to VCR – Male & Female

**NOTE** • KF flanges are 304L stainless steel

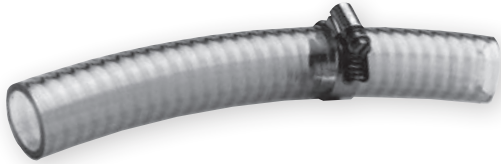


### Ordering Information

Flange Size	Tube Size	Part Number	Length in. (mm)	Shipping Weight lbs (kg)
<b>Male</b>				
NW16	¼ in.	KAVM025016	1.46 (37.1)	0.2 (0.11)
NW25	¼ in.	KAVM025025	1.46 (37.1)	0.2 (0.11)
NW40	¼ in.	KAVM025040	1.46 (37.1)	0.2 (0.11)
NW16	½ in.	KAVM050016	1.65 (41.9)	0.2 (0.11)
NW25	½ in.	KAVM050025	1.65 (41.9)	0.2 (0.11)
NW40	½ in.	KAVM050040	1.65 (41.9)	0.5 (0.22)
NW25	¾ in.	KAVM075025	2.15 (54.6)	0.2 (0.11)
<b>Female</b>				
NW16	¼ in.	KAVF025016	1.46 (37.1)	0.2 (0.11)
NW25	¼ in.	KAVF025025	1.46 (37.1)	0.2 (0.11)
NW40	¼ in.	KAVF025040	1.46 (37.1)	0.2 (0.11)
NW16	½ in.	KAVF050016	1.65 (41.9)	0.2 (0.11)
NW25	½ in.	KAVF050025	1.65 (41.9)	0.2 (0.11)
NW40	½ in.	KAVF050040	1.65 (41.9)	0.5 (0.22)
NW16	¾ in.	KAVF075016	2.15 (54.6)	0.2 (0.11)
NW25	¾ in.	KAVF075025	2.15 (54.6)	0.2 (0.11)

## KLAMPS FLANGES & FITTINGS

### ► PVC Cord-Reinforced Flexible Vacuum Hose



#### Features

- Lightweight
- Transparent
- Smooth surface inside and out

#### Technical Specifications

##### Vacuum Range

To  $1 \times 10^7$

##### Temperature Range

-25 °C to 45 °C

#### Ordering Information

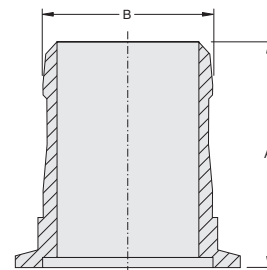
Part Number	I.D. in.	O.D. in.	Weight lbs (kg)
<b>Flexible Vacuum Hose</b>			
HFP075	0.75	1.00	0.2 (0.11)
HFP100	1.00	1.25	0.2 (0.11)
HFP125	1.25	1.62	0.2 (0.11)
HFP150	1.50	1.87	0.2 (0.11)
HFP200	2.00	2.50	0.2 (0.11)

Part Number	Size Range	Weight lbs (kg)
<b>Steel Worm Gear Hose Clamps</b>		
HFPC056	$\frac{9}{16}$ in. to $1 \frac{1}{4}$ in.	0.5 (0.22)
HFPC075	$\frac{3}{4}$ in. to $1 \frac{3}{4}$ in.	0.5 (0.22)
HFPC131	$1 \frac{5}{16}$ in. to $2 \frac{1}{4}$ in.	0.5 (0.22)
HFPC156	$1 \frac{9}{16}$ in. to $2 \frac{1}{2}$ in.	0.5 (0.22)

- NOTE**
- 10 per package
  - Use *Weld Stubs* (page 454) with this hose for correct fit

### ► Aluminum Male Rubber Hose Adapter

- NOTE**
- not intended for use with the PVC Cord-Reinforced Flexible Vacuum Hose; suitable for use with rubber hose.



#### Ordering Information

Flange Size	Hose Size in.	Part Number	A in.	B in.	Weight lbs (kg)
NW16	0.50 – 0.62	KAH16050A	1.65	0.625	0.5 (0.11)
NW16	0.62 – 0.75	KAH16075A	1.65	0.750	0.5 (0.11)
NW25	0.75 – 0.87	KAH25075A	1.73	0.875	0.5 (0.11)
NW40	1.50 – 1.62	KAH40150A	2.17	1.630	0.5 (0.11)
NW50	1.50 – 1.62	KAH50150A	2.17	1.630	0.5 (0.11)

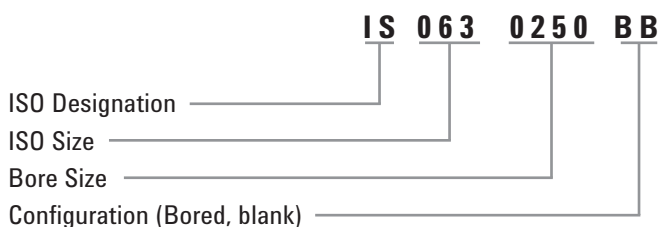
## ISO FLANGES & FITTINGS

Agilent's introduction of its extensive offering in vacuum flanges and fittings features an intuitive part numbering format. These part numbering format allows the customer to identify the product by the characters contained within the part number.

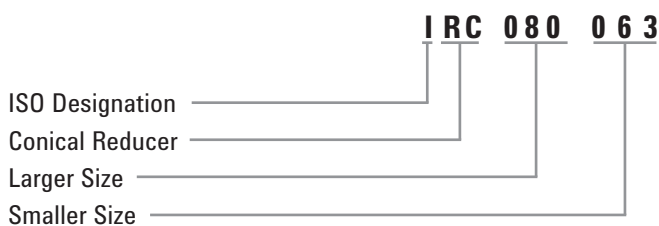
Depending on the product, the number and format of the characters in the part number will vary.

Please see examples below:

### ISO Flange Example



### ISO 80 to 63



## VACUUM COMPONENTS

ISO flanges and fittings are designed for applications requiring frequent disassembly and where tubing requirements generally exceed 2 in. OD. All ISO flanges and fittings listed are made of 304L stainless steel. These flanges can be used in a variety of applications from atmospheric to E<sup>-8</sup> Torr. They can sustain a bakeout temperature of 150 °C when using Viton o-rings.

### ISO-Flanges & Fittings

Page

Flange Fastening Options .....	474
MF Flanges.....	475
Bolted Flanges.....	476
Bolt Sets .....	476
Bolted Tapped Flanges .....	477
Bolt Sets for Tapped Flanges.....	477
Centering Rings .....	478
Clamps .....	479
O-Rings .....	481
Weld Stubs.....	482
Half Nipples .....	483
Nipples.....	483
Elbows.....	484
Tees.....	484
4-Way Cross.....	485
Reducing Nipple.....	485
Flexible Couplings.....	486
Conical Reducers .....	487
Adapters, ISO to ConFlat .....	488
Adapters, ISO to KF .....	489

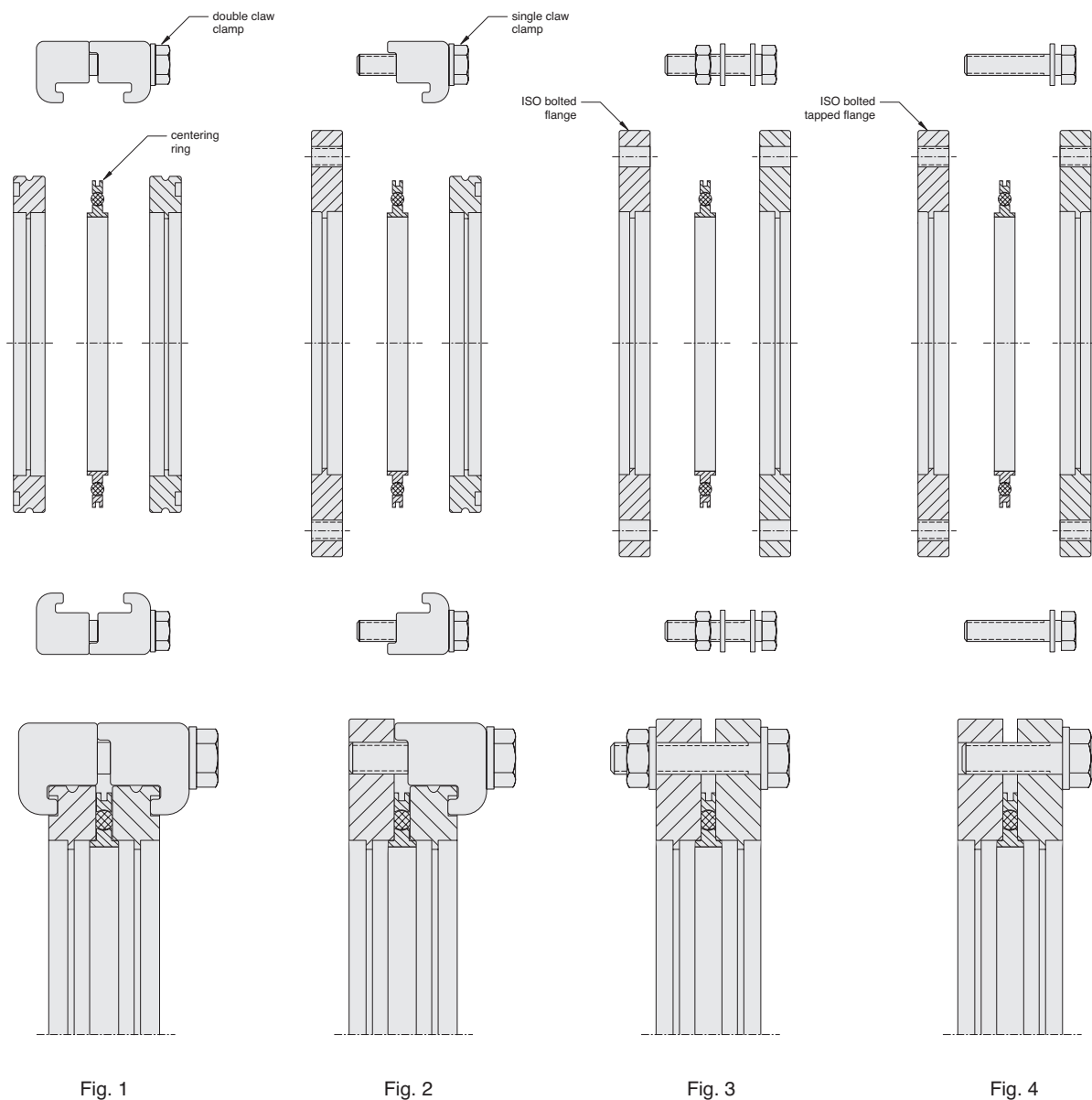
# ISO FLANGES & FITTINGS

## ▶ Flange Fastening Options

Flanges are available in these bolting/clamping options:  
Clamped Flanges (also called MF Flanges or Multi-Fastener) are fastened to each other with Double-Claw Clamps (Fig. 1), or to bolted tapped flanges with Single-Claw Clamps (Fig. 2). Bolted Flanges may be fastened to each other with Nut/Bolt Sets (Fig. 3), or bolted to ISO Bolted Tapped Flanges (Fig. 4).

**NOTE** • At 10" (NW250) and above, some manufacturers standards vary. Please check dimensions carefully.

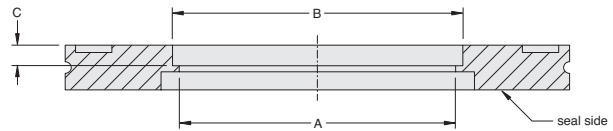
### Flange Fastening Options





# VACUUM COMPONENTS

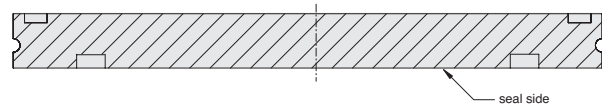
## ▶ MF Flanges-Bored



### Ordering Information

Size	Part Number	Nominal Bore	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
NW63	IS0630250BB	2.5 in.	2.37 (60.2)	2.53 (63.8)	0.22 (5.6)	1.0 (0.5)
NW100	IS1000400BB	4.0 in.	3.84 (97.5)	4.03 (101.9)	0.22 (5.6)	1.0 (0.5)
NW160	IS1600600BB	6.0 in.	5.85 (148.6)	6.03 (152.7)	0.22 (5.6)	2.0 (0.9)
NW200	IS2000800BB	8.0 in.	7.85 (199.4)	8.03 (203.5)	0.22 (5.6)	3.0 (1.4)
NW250	IS2501000BB	10.0 in.	9.86 (250.4)	10.04 (254.3)	0.22 (5.6)	4.0 (1.8)

## ▶ MF Flanges-Blank

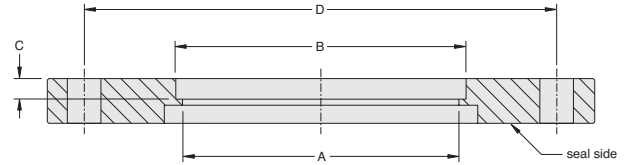


### Ordering Information

Size	Part Number	Outer Diameter	Thickness	Shipping Weight lbs (kg)
NW63	IS0630000BL	3.74 (95.0)	0.47 (12.0)	1.0 (0.5)
NW100	IS1000000BL	5.12 (130.0)	0.47 (12.0)	2.5 (1.1)
NW160	IS1600000BL	7.09 (180.0)	0.47 (12.0)	5.0 (2.3)
NW200	IS2000000BL	9.45 (240.0)	0.47 (12.0)	8.0 (3.6)
NW250	IS2500000BL	11.42 (290.0)	0.47 (12.0)	13.0 (5.9)

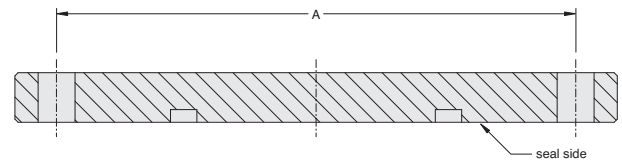
## ISO FLANGES & FITTINGS

### ▶ Bolted Clear Hole Flanges



#### Ordering Information – Bolted Flanges-Bored

Size	Part Number	Nominal Bore	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	Bolt Holes	Weight lbs (kg)
NW63	IS0630250BBB	2.5 in.	2.37 (60.2)	2.53 (63.8)	0.22 (5.6)	4.33 (110.0)	4 x M9	0.50 (0.2)
NW100	IS1000400BBB	4.0 in.	3.83 (97.5)	4.03 (101.9)	0.22 (5.6)	5.71 (145.0)	8 x M9	1.00 (0.5)
NW160	IS1600600BBB	6.0 in.	5.83 (148.6)	6.03 (152.7)	0.22 (5.6)	7.87 (200.0)	8 x M11	1.50 (0.7)
NW250	IS2501000BBB	10.0 in.	9.76 (250.4)	10.04 (254.3)	0.22 (5.6)	12.20 (310.0)	12 x M11	3.00 (1.4)



#### Ordering Information – Bolted Flanges-Blank

Size	Part Number	A in. (mm)	Bolt Holes	Shipping Weight lbs (kg)
NW100	IS1000000BLB	5.71 (145.0)	8 x M9	2.5 (1.1)
NW160	IS1600000BLB	7.87 (199.9)	8 x M11	5.0 (2.3)
NW250	IS2500000BLB	12.20 (309.9)	12 x M11	13.0 (5.9)

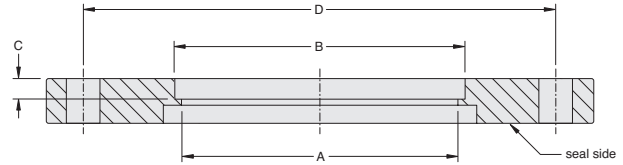
### ▶ Bolt Sets for Clear Hole Flanges

#### Ordering Information

Size	Part Number	Bolt Size	Qty/Pack	Shipping Weight lbs (kg)
NW160	IB160	M10 x 50 mm	8	0.50 (0.2)
NW200, NW250	IB200250	M10 x 50 mm	12	0.75 (0.3)

# VACUUM COMPONENTS

## ▶ Bolted Tapped Flanges



### Ordering Information

Size	Part Number	Nominal Bore	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	Bolt Holes	Weight lbs (kg)
NW63	IS0630250BBBT	2.5 in.	2.37 (60.2)	2.53 (63.8)	0.22 (5.6)	4.33 (110.0)	4 x M8	0.50 (0.2)
NW100	IS1000400BBBT	4.0 in.	3.83 (97.5)	4.03 (101.9)	0.22 (5.6)	5.71 (145.0)	8 x M8	1.00 (0.5)
NW200	IS2000800BBBT	8.0 in.	7.83 (199.4)	8.03 (203.5)	0.22 (5.6)	10.24 (260.0)	12 x M10	2.00 (0.9)
NW250	IS2501000BBBT	10.0 in.	9.76 (250.4)	10.04 (254.3)	0.22 (5.6)	12.20 (310.0)	12 x M10	3.00 (1.4)

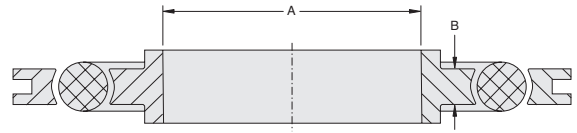
## ▶ Bolt Sets for Tapped Flanges

### Ordering Information

Size	Part Number	Bolt Size	Qty/Pack	Shipping Weight lbs (kg)
NW80, NW100	IB080100T	M8 x 30 mm	8	0.50 (0.2)
NW200, NW250	IB200250T	M10 x 35 mm	12	0.75 (0.3)

# ISO FLANGES & FITTINGS

## ► Centering Rings



### Ordering Information – Aluminum Ring, Viton O-Ring

Size	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW63	IC063AV	2.62 (66.8)	0.15 (3.8)	1.0 (0.5)
NW80	IC080AV	3.13 (79.8)	0.15 (3.8)	1.0 (0.5)
NW100	IC100AV	3.88 (98.8)	0.15 (3.8)	1.0 (0.5)
NW160	IC160AV	5.87 (149.9)	0.15 (3.8)	1.0 (0.5)
NW200	IC200AV	8.24 (209.8)	0.15 (3.8)	1.0 (0.5)
NW250	IC250AV	10.13 (257.6)	0.15 (3.8)	1.0 (0.5)

### Ordering Information – Aluminum Ring, Buna-N O-Ring

Size	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW63	IC063AB	2.62 (66.8)	0.15 (3.8)	1.0 (0.5)
NW100	IC100AB	3.88 (98.8)	0.15 (3.8)	1.0 (0.5)
NW160	IC160AB	5.87 (149.9)	0.15 (3.8)	1.0 (0.5)
NW200	IC200AB	8.24 (209.8)	0.15 (3.8)	1.0 (0.5)
NW250	IC250AB	10.13 (257.6)	0.15 (3.8)	1.0 (0.5)

### Ordering Information – Stainless Steel Ring, Viton O-Ring

Size	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW63	IC063SV	2.62 (66.8)	0.15 (3.8)	1.0 (0.5)
NW80	IC080SV	3.13 (79.8)	0.15 (3.8)	1.0 (0.5)
NW100	IC100SV	3.88 (98.8)	0.15 (3.8)	1.0 (0.5)
NW160	IC160SV	5.87 (149.9)	0.15 (3.8)	1.0 (0.5)
NW200	IC200SV	8.24 (209.8)	0.15 (3.8)	1.0 (0.5)
NW250	IC250SV	10.13 (257.6)	0.15 (3.8)	1.0 (0.5)

# VACUUM COMPONENTS

## ▶ Modified ISO Claw Clamps

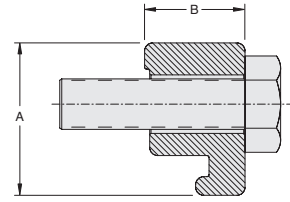
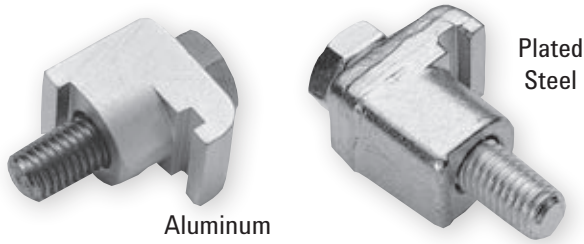


Fig. 1

### Features

- Heavy duty material
- Suitable for mounting equipment in any orientation and tight geometrics

### Ordering Information – Single Claw Clamp – For use with a Standard ISO Flange and Centering Ring (NOT for Turbo Pumps)

Size	Figure	Part Number	Per Package	A in. (mm)	B in. (mm)	Bolt Size	Shipping Weight lbs (kg)
NW63/100	1	ICS063100CC22X5S	4	0.925 (23.5)	0.87 (22.5)	M8 x 35 mm	1.0 (0.50)
NW160/250	1	ICS160250CC23X0A*	1	1.126 (28.6)	0.91 (23.1)	M10 x 35 mm	0.5 (0.20)

\* Aluminum

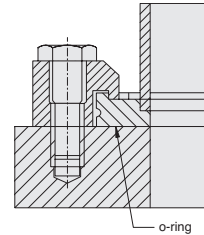


Fig. 2

### Ordering Information – Single Claw Clamp – For use with a Flange and Base Plate with Sealing Groove and O-ring (NOT for Turbo Pumps)

Size	Figure	Part Number	Per Package	A in. (mm)	B in. (mm)	Bolt Size	Shipping Weight lbs (kg)
NW160/250	1 & 2	ICS160250CC19X1S	1 & 2	1.14 (28.8)	.75 (19.1)	M10 x 35 mm	1.0 (0.5)

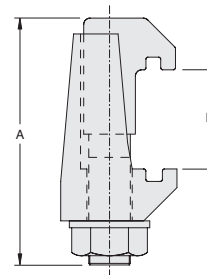
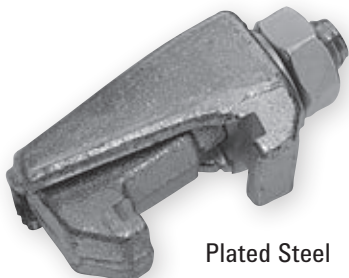


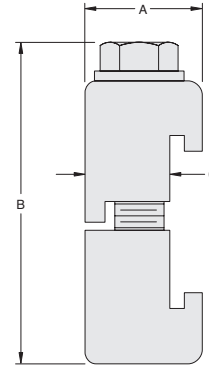
Fig. 3

### Ordering Information – Tapered Claw Clamp, ISO 63/250 (Suitable for Agilent Turbo Pumps)

Size	Part Number	A in. (mm)	B in. (mm)	Bolt Size	Shipping Weight lbs (kg)
NW63/250	IC63250DCMZ	2.34 (59.5)	0.67/1.05 (17.0/27)	M10	1.0 (0.5)

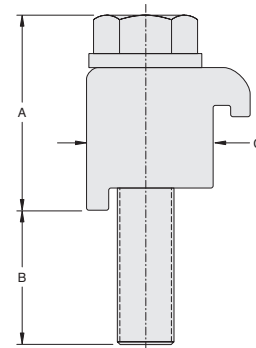
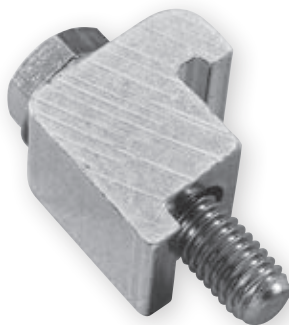
# ISO FLANGES & FITTINGS

## ► Standard ISO Claw Clamps



### Ordering Information – Double Claw (NOT for Turbo Pumps)

Size	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
For flange sizes NW63, 080, 100	IC063100A	0.95 (24.1)	1.98 (50.3)	0.63 (16.0)	0.5 (0.2)
For flange sizes NW160, 200, 250	IC160250A	1.10 (27.9)	2.05 (52.1)	0.80 (20.3)	0.5 (0.2)
For flange sizes NW400, 500	IC400500A	1.34 (34.0)	2.56 (65.0)	1.04 (26.4)	0.5 (0.2)



### Ordering Information – Single Claw (NOT for Turbo Pumps)

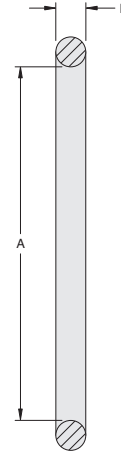
Size	Part Number	A in. (mm)	B in. (mm)	C in. (mm)	Shipping Weight lbs (kg)
For flange sizes NW63, 080, 100	ICS063100A	1.20 (30.4)	0.39 (9.9)	0.63 (16.0)	0.5 (0.2)
For flange sizes NW160, 200, 250	ICS160250A	1.25 (31.7)	0.39 (9.9)	0.80 (20.3)	0.5 (0.2)

**NOTE** • Use the chart below to determine proper quantities for all clamps on pages 479 and 480.

Flange Size	# of Clamps
NW63	4
NW100-160	8
NW250	12

# VACUUM COMPONENTS

## ▶ O-Rings



### Ordering Information – Viton

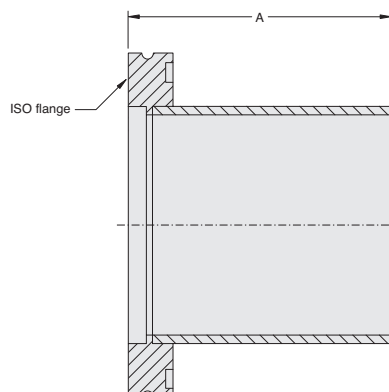
Size	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW63	I0063V	2.85 (72.4)	0.21 (5.33)	0.25 (0.1)
NW80	I0080V	3.35 (85.1)	0.21 (5.33)	0.25 (0.1)
NW100	I0100V	4.10 (104.1)	0.21 (5.33)	0.25 (0.1)
NW160	I0160V	5.98 (151.9)	0.21 (5.33)	0.25 (0.1)
NW250	I0250V	10.50 (266.2)	0.21 (5.33)	0.25 (0.1)

### Ordering Information – Silicone

Size	Part Number	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW100	I0100S	4.10 (104.1)	0.21 (5.3)	0.25 (0.1)

## ISO FLANGES & FITTINGS

### ► Weld Stubs



#### Ordering Information – Weld Stubs, MF Flanges

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
<b>NW63</b>	IWS063	2.5 in.	3.94 (100.1)	1.0 (0.5)
<b>NW100</b>	IWS100	4.0 in.	3.94 (100.1)	2.0 (0.9)
<b>NW160</b>	IWS160	6.0 in.	3.94 (100.1)	3.0 (1.4)

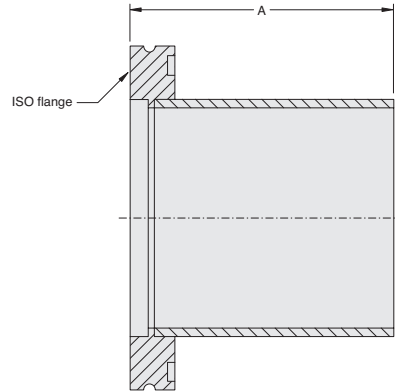
#### Ordering Information – Weld Stubs, Bolted Flanges

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
<b>NW160</b>	IWS160B	6.0 in.	3.94 (100.1)	3.0 (1.4)



# VACUUM COMPONENTS

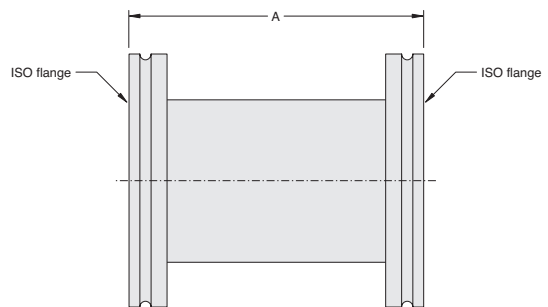
## ▶ Half Nipples



### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
NW100	INH1000400	4.0 in.	5.12 (130.0)	2.0 (0.9)
NW160	INH1600600	6.0 in.	6.31 (160.3)	4.0 (1.8)

## ▶ Nipples

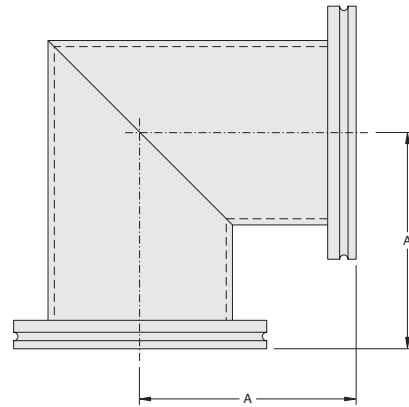


### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
NW63	INF0630250	2.5 in.	8.00 (203.2)	2.0 (0.9)
NW100	INF1000400	4.0 in.	10.24 (260.1)	3.0 (1.4)
NW160	INF1600600	6.0 in.	12.62 (320.5)	8.0 (3.6)

# ISO FLANGES & FITTINGS

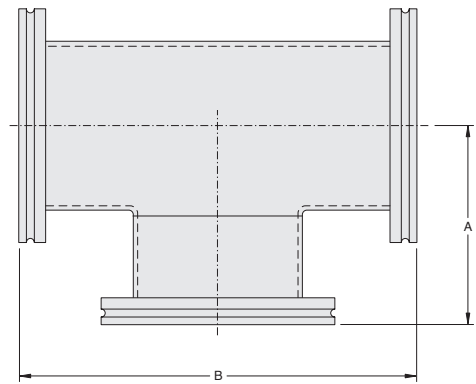
## ► Elbows 90°



### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
NW63	IE02500346	2.5 in.	3.46 (87.9)	2.0 (0.9)
NW100	IE04000425	4.0 in.	4.25 (108.0)	6.0 (2.7)
NW160	IE06000543	6.0 in.	5.43 (137.9)	10.0 (4.5)

## ► Tees

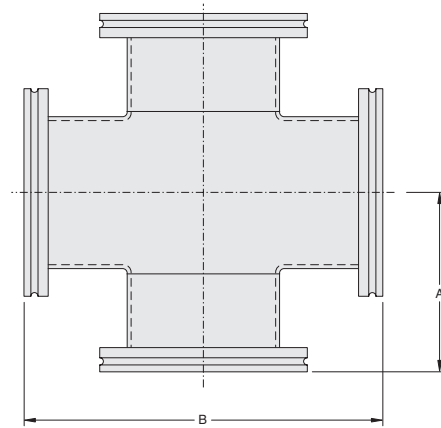


### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW63	IT02500346	2.5 in.	3.46 (87.9)	6.92 (175.8)	3.0 (1.4)
NW100	IT04000425	4.0 in.	4.25 (108.0)	8.50 (215.9)	8.0 (3.6)
NW160	IT06000543	6.0 in.	5.43 (137.9)	10.86 (275.8)	13.0 (5.9)

# VACUUM COMPONENTS

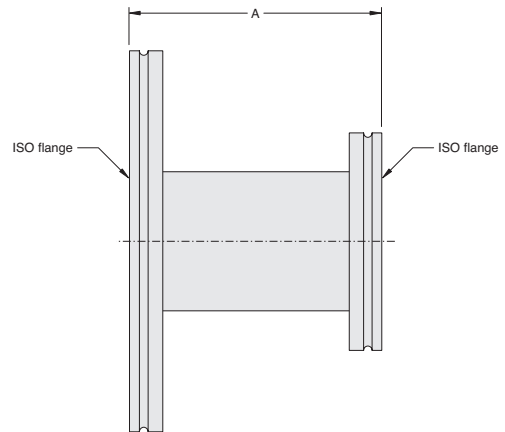
## ► 4-Way Cross



### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	B in. (mm)	Shipping Weight lbs (kg)
NW63	IC02500346	2.5 in.	3.46 (87.9)	6.92 (175.8)	6.0 (2.7)
NW100	IC04000425	4.0 in.	4.25 (108.0)	8.50 (215.9)	10.0 (4.5)
NW160	IC06000543	6.0 in.	5.43 (137.9)	10.86 (275.8)	15.0 (6.8)

## ► Reducing Nipple

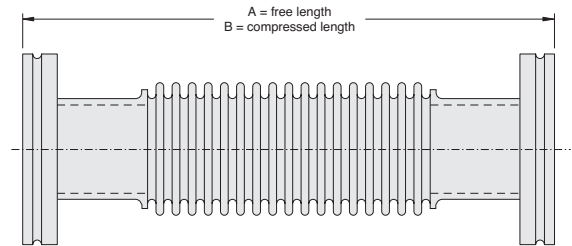


### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
NW100-63	INR100063	2.5 in.	4.0 (101.6)	4.5 (2.0)
NW160-63	INR160063	2.5 in.	4.0 (101.6)	6.0 (2.7)
NW160-100	INR160100	4.0 in.	4.0 (101.6)	10.5 (4.8)
NW200-160	INR200160	6.0 in.	4.0 (101.6)	13.5 (6.1)
NW250-200	INR250200	8.0 in.	4.0 (101.6)	18.0 (8.2)

# ISO FLANGES & FITTINGS

## ► Flexible Couplings



### Features

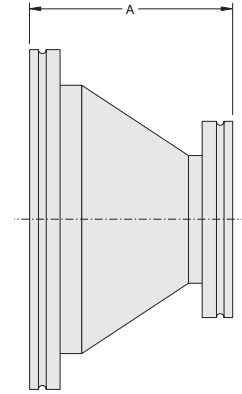
- Bellows Material: Type 321 SS

### Ordering Information – Flexible Couplings, Non-Braided, ISO

Flange Size	Part Number	Length Free	Length Compressed	Static Bend Radius in. (mm)	Bellows Wall Thickness in.	Nominal ID		Shipping Weight lbs (kg)
		A in. (mm)	B in. (mm)			in. (mm)	in. (mm)	
<b>ISO63</b>	IL02000600	6.0 (152)	5.5 (140)	10.0 (254)	0.006	2.5 (64)	2.0 (0.9)	
	IL02001200	12.0 (305)	10.9 (277)	10.0 (254)	0.006	2.5 (64)	2.0 (0.9)	
	IL02502000	20.0 (508)	18.1 (461)	3.2 (81)	0.015	2.5 (64)	3.0 (1.4)	
	IL02503000	30.0 (762)	24.0 (610)	3.2 (81)	0.015	2.5 (64)	3.0 (1.4)	
	IL02504000	40.0 (1016)	36.1 (917)	3.2 (81)	0.015	2.5 (64)	4.0 (1.8)	
<b>ISO100</b>	IL04000600	6.0 (152)	5.5 (141)	16.0 (406)	0.016	3.5 (89)	3.0 (1.4)	
	IL04001200	12.0 (305)	10.9 (277)	19.0 (483)	0.010	4.0 (102)	4.0 (1.8)	
	IL04002000	20.0 (508)	18.1 (460)	4.5 (114)	0.016	4.0 (102)	4.0 (1.8)	
	IL04003000	30.0 (762)	27.1 (688)	4.5 (114)	0.016	4.0 (102)	5.0 (2.3)	
	IL04004000	40.0 (1016)	36.1 (917)	4.5 (114)	0.016	4.0 (102)	5.0 (2.3)	
<b>ISO160</b>	IL06000600	6.0 (152)	5.5 (140)	21.0 (533)	0.010	6.0 (152)	4.0 (1.8)	
	IL06001200	12.0 (305)	10.9 (277)	21.0 (533)	0.010	6.0 (152)	5.0 (2.3)	

# VACUUM COMPONENTS

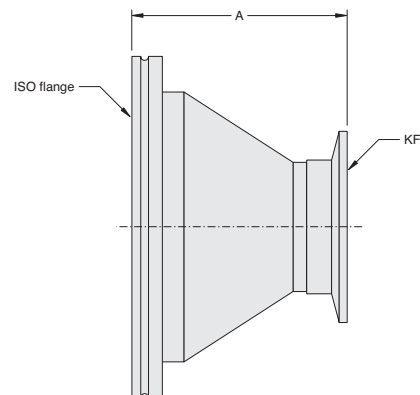
## ▶ Conical Reducers



### Ordering Information

Size	Part Number	A in. (mm)	Shipping Weight lbs (kg)
NW100-63	IRC100063	4.13 (104.9)	4.5 (2.0)
NW100-80	IRC100080	4.13 (104.9)	4.5 (2.0)
NW160-100	IRC160100	9.50 (241.3)	5.0 (2.3)

## ▶ Conical Reducers – ISO to KF

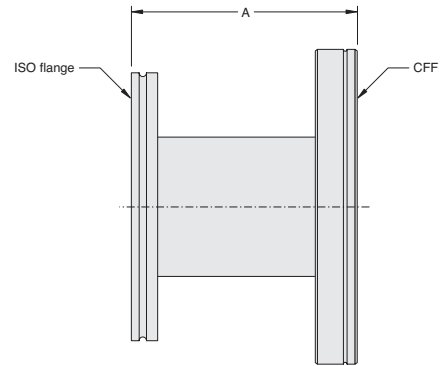
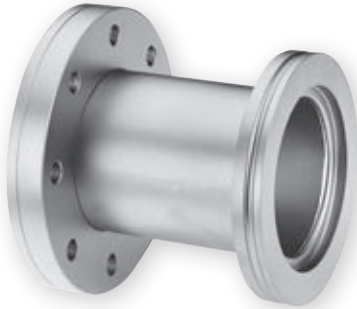


### Ordering Information

Size	Part Number	A in. (mm)	Shipping Weight lbs (kg)
NW63-NW40	IKRC063040	2.84 (72.1)	1.5 (0.7)
NW63-NW50	IKRC063050	2.85 (72.4)	2.5 (1.1)
NW80-NW40	IKRC080040	4.09 (103.9)	3.0 (1.4)
NW100-NW50	IKRC100050	4.10 (104.1)	3.5 (1.6)

## ISO FLANGES & FITTINGS

### ► Adapters – ISO to ConFlat

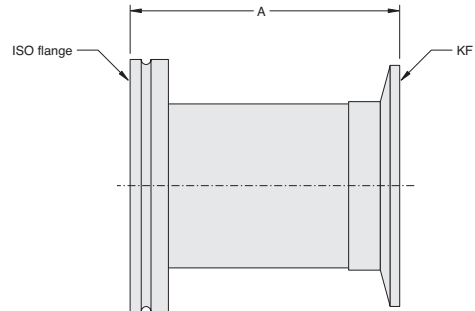


### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
NW63-4.5 in. CFF	IFA0630450	2.5 in.	4.13 (104.9)	3.5 (1.6)
NW100-6 in. CFF	IFA1000600	4.0 in.	4.19 (106.4)	5.5 (2.5)
NW160-8 in. CFF	IFA1600800	6.0 in.	4.25 (108.0)	9.0 (4.1)
NW200-10 in. CFF	IFA2001000	8.0 in.	4.25 (108.0)	16.0 (7.2)

# VACUUM COMPONENTS

## ▶ Adapters – ISO to KF, Short and Long

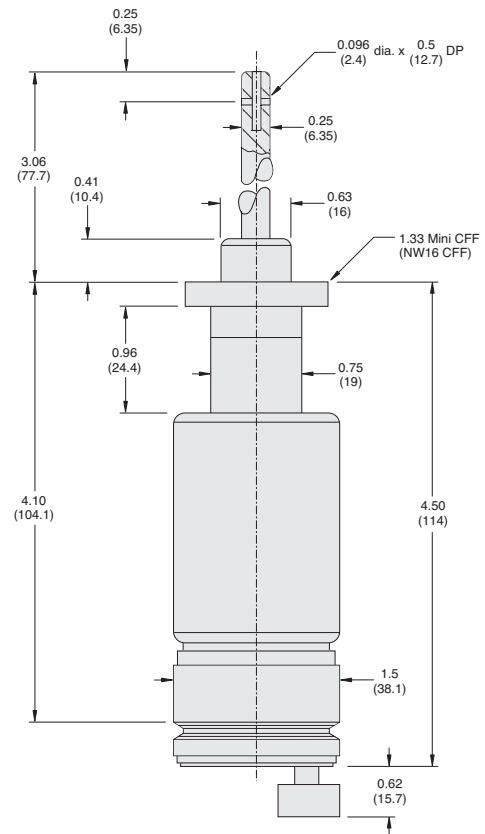


### Ordering Information

Size	Part Number	Tube Size	A in. (mm)	Shipping Weight lbs (kg)
<b>Long</b>				
NW63-NW40	IKA063040L	1.50 in.	2.71 (68.8)	1.0 (0.5)
<b>Short</b>				
NW63-NW16	IKA063016S	0.75 in.	1.75 (44.5)	1.0 (0.5)
NW63-NW25	IKA063025S	1.00 in.	1.75 (44.5)	1.0 (0.5)
NW63-NW40	IKA063040S	1.50 in.	1.75 (44.5)	1.0 (0.5)
NW63-NW50	IKA063050S	2.00 in.	1.75 (44.5)	1.5 (0.7)
NW80-NW25	IKA080025S	1.00 in.	1.75 (44.5)	1.5 (0.7)
NW100-NW25	IKA100025S	1.00 in.	1.75 (44.5)	2.0 (0.9)
NW100-NW40	IKA100040S	1.50 in.	1.75 (44.5)	2.0 (0.9)
NW100-NW50	IKA100050S	2.00 in.	1.75 (44.5)	2.5 (1.1)
NW160-NW40	IKA160040S	1.50 in.	1.75 (44.5)	5.0 (2.3)
NW160-NW50	IKA160050S	2.00 in.	1.75 (44.5)	6.0 (2.7)

# FEEDTHROUGHS

## ▶ Rotary Motion Feedthrough



Dimensions: inches (millimeters)

Especially well-suited for bakeable ultra-high vacuum applications, this rotary motion feedthrough is bellows-sealed and has a built-in lock. It is mounted on a 1.33 in. OD Mini-ConFlat flange (NW16 CFF).

### Technical Specifications

<b>Vacuum Range</b>	Atmosphere to $10^{-11}$ Torr (mbar)
<b>Torque Rating</b>	150 inch-ounces
<b>Speed</b>	200 RPM maximum
<b>Runout at Shaft Tip</b>	0.006" maximum (0.15 mm)
<b>Life</b>	50,000 total turns nominal 300 °C maximum (bakeout)
<b>Temperature</b>	-196 °C to +150 °C (operating)
<b>Rotation</b>	Continuously rotatable in either direction

### Ordering Information

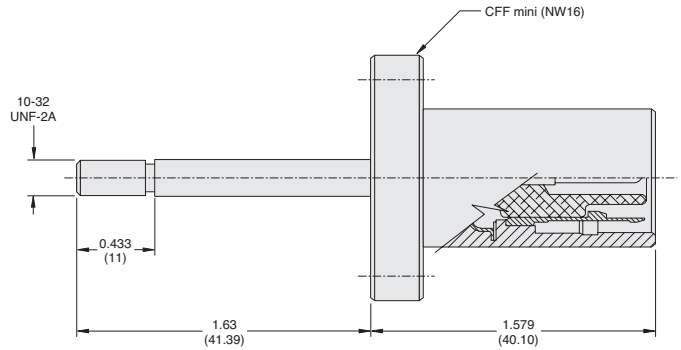
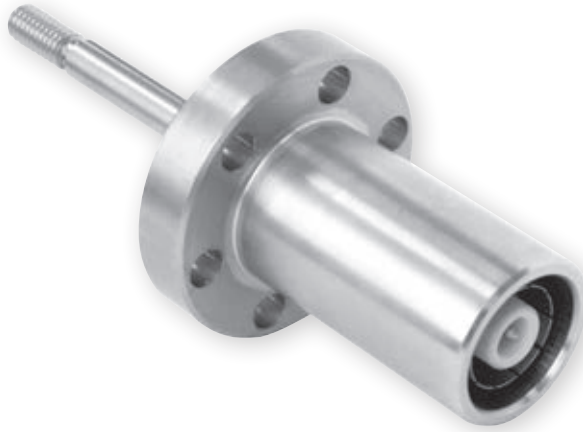
Description	Part Number	Shipping Weight lbs (kg)
<b>Rotary motion feedthrough</b>		
On 1 1/2 in. mini ConFlat flange (NW16 CFF)	L6691301	5.0 (2.3)
Gaskets for mini ConFlat flange (NW16 CFF), 10/pkg	FG0133CI	1.0 (0.5)



# VACUUM COMPONENTS

## ▶ 12 kV Fischer Feedthrough on Mini-ConFlat Flange

This high voltage feedthrough is rated at up to 12 kV (below  $10^{-4}$  Torr/mbar) and is provided with a Mini (1.33 in.) ConFlat flange (NW16 CFF).



Dimensions: inches (millimeters)

### Technical Specifications

<b>Voltage Rating (below <math>10^{-4}</math> Torr/mbar)</b>	12 kV F/T Fischer
<b>Current Rating</b>	1A maximum
<b>Temperature Range</b>	-196 °C to +450 °C
<b>Body Material</b>	Stainless Steel
<b>Mounting Flange</b>	1.33 in. O.D. mini (NW 16)

### Ordering Information

Description	Part Number	Shipping Weight lbs (kg)
<b>High voltage feedthrough, vacuum side mating connector,</b> With 1 1/2 in. Mini-ConFlat flange (NW16 CFF) (for Star-Cell Ion pumps, cables and connectors please see the Ion Pumps section) (external connector not included, please order separately)	9595125	1.0 (0.5)
Gaskets for Mini-ConFlat flange (NW16 CFF) 10/pkg	FG0133CI	1.0 (0.5)

## SUPPLIES, GREASES AND LUBRICANTS

### ▶ Torr Seal Low Vapor Pressure Resin Sealant

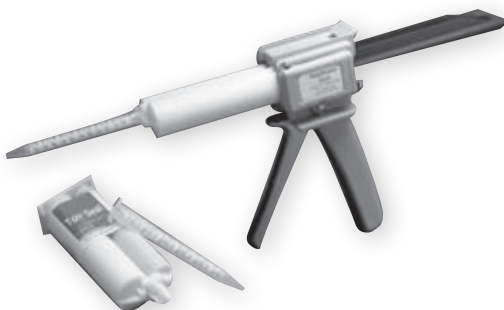


Torr Seal epoxy resin quickly seals leaks on any type of vacuum system or component. Provided in convenient tubes, Torr Seal is solvent-free and can be used at pressures of  $10^{-9}$  Torr (mbar) and below, at temperatures from  $-45^{\circ}\text{C}$  to  $120^{\circ}\text{C}$  (bakeable temperature). Additionally, Torr Seal permits leak checking immediately after curing and bonds with many materials including metal, ceramic, and glass.

#### Ordering Information

Description	Part Number	Weight lbs (kg)
Torr Seal base resin, 82 grams, and Torr Seal hardener, 36 grams	9530001	1.0 (0.45)

### ▶ Torr Seal Mixing System



The Torr Seal Mixing System includes an applicator gun, a premeasured Torr Seal cartridge, and an epoxy/resin mixer. The system uses the same low vapor pressure resin sealant as standard Torr Seal, while providing a systematic and scientific way of mixing the Torr Seal epoxy and resin. The applicator gun dispenses premeasured epoxy and resin from the cartridge through the mixer so that a uniform Torr Seal bead can be placed on any surface. As with the standard Torr Seal tubes, the mixing system can be used at pressures of  $10^{-9}$  Torr and below, and at temperatures from  $-45^{\circ}\text{C}$  to  $120^{\circ}\text{C}$  (bakeable temperature).

#### Ordering Information

Description	Part Number	Weight lbs (kg)
Applicator gun with Torr Seal cartridge (2 oz.) and three mixers	9530002	2.00 (0.91)
Applicator gun only	9530003	1.50 (0.68)
Torr Seal cartridge (2 oz.) and three mixers	9530004	0.75 (0.34)
Mixers only (six to a package)	9530005	0.25 (0.11)

### ▶ Fel-Pro Heavy Duty Anti-Seize

Fel-Pro Heavy Duty Anti-Seize is a high-temperature, anti-galling lubricant designed for screw threads and other mated components of all types. Generally used in applications that are external to vacuum systems, Fel-Pro is useful in temperature ranges of  $70^{\circ}\text{C}$  to  $+1315^{\circ}\text{C}$ .

#### Ordering Information

Description	Part Number	Weight lbs (kg)
Fel-Pro Heavy Duty Anti-Seize Lubricant	9530031	0.3 (0.13)

### ▶ Apiezon Vacuum Grease, Type L

Apiezon L is a general vacuum grease that has a vapor pressure from  $10^{-11}$  Torr (mbar) at  $20^{\circ}\text{C}$  to  $10^{-3}$  Torr (mbar) at  $300^{\circ}\text{C}$ , and has a melting point of  $< 50^{\circ}\text{C}$ .

#### Ordering Information

Description	Part Number	Weight lbs (kg)
Apiezon L vacuum grease, 1 oz.	695400004	1.0 (0.45)

### ▶ Agilent Vacuum Grease

This is a general purpose grease with a vapor pressure in the  $10^{-6}$  Torr range. It is a non-silicone grease that comes in two viscosities and two sizes.

#### Ordering Information

Description	Part Number	Weight lbs (kg)
Agilent Vacuum grease, Medium Weight, $\frac{1}{4}$ lb size	LGCMID025	1.0 (0.45)
Agilent Vacuum grease, Heavy Weight, $\frac{1}{4}$ lb size	LGCHEV025	1.0 (0.45)
Agilent Vacuum grease, Heavy Weight, 1 lb size	LGCHEV100	1.0 (0.45)

**По вопросам продаж и поддержки обращайтесь:**

Алматы (7273)495-231	Казань (843)206-01-48	Новокузнецк (3843)20-46-81	Смоленск (4812)29-41-54
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Астрахань (8512)99-46-04	Калуга (4842)92-23-67	Омск (3812)21-46-40	Ставрополь (8652)20-65-13
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Владивосток (423)249-28-31	Красноярск (391)204-63-61	Пермь (342)205-81-47	Тула (4872)74-02-29
Волгоград (844)278-03-48	Курск (4712)77-13-04	Ростов-на-Дону (863)308-18-15	Тюмень (3452)66-21-18
Вологда (8172)26-41-59	Липецк (4742)52-20-81	Рязань (4912)46-61-64	Ульяновск (8422)24-23-59
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Екатеринбург (343)384-55-89	Москва (495)268-04-70	Санкт-Петербург (812)309-46-40	Хабаровск (4212)92-98-04
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Иркутск (395)279-98-46	Нижний Новгород (831)429-08-12	Симферополь (3652)67-13-56	Ярославль (4852)69-52-93
Россия (495)268-04-70	Киргизия (996)312-96-26-47	Казахстан (7172)727-132	

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