

Integrated

Series 76

ISO-UNIVERSAL FITTINGS
SIZES NW 63 TO NW 630
(2½" TO 25")

Process Solutions

WWW.MKSINST.COM



Series 76 ISO-Universal components are a vacuum flanging system for 63 mm to 1000 mm fittings. The dimension criteria are based on requirements established by the International Standards Organization (ISO). There are two flange styles in the ISO-Universal system: Multi-Fastener (MF) and Bolted. The flange family is also called: ISO-MF, ISO-PF or ISO-K. Figure 1 illustrates the components of this flange system.

This catalog features a large variety of components such as elbows, tees, crosses, reducers and adapters having ISO-MF flanges. Currently there is no ISO standard for the flange face to centerline distance in this system. There is however, an industry standard followed by several manufacturers. MKS Instruments follows these standards in designing the Series 76 ISO-Universal components.

There are several advantages in the use of ISO components. One advantage is that the flange is "sexless." The seal is on a symmetrical centering ring that interfaces with two identical flanges. In addition, ISO-Universal flanges are more compact than ASA flanges, which were designed for pressure and are unnecessarily massive for vacuum use. Since these flanges are an ISO standard, they can be used with components from other manufacturers.

Applications

The Series 76 ISO-Universal component system is used in a variety of industries from process manufacturing to semiconductor fabrication to thin film deposition. Some uses in vacuum systems are:

1. Roughing and foreline plumbing for large vacuum systems
2. High vacuum, high conductance, interconnections
3. Modular systems which will be modified frequently
4. Experimental systems in research laboratories

ISO-Universal flange components using elastomer seals are primarily designed for use at subatmospheric pressure. When elastomer seals are used without baking, typical limiting pressures may be around 10^{-6} Torr. Baked systems using Viton can be used to 10^{-8} Torr.

Standard components can be used to a slight over pressure. MF flanges may be used at a maximum pressure of 30 psig if the metal spacer ring is used and the flange clamps are firmly retained.

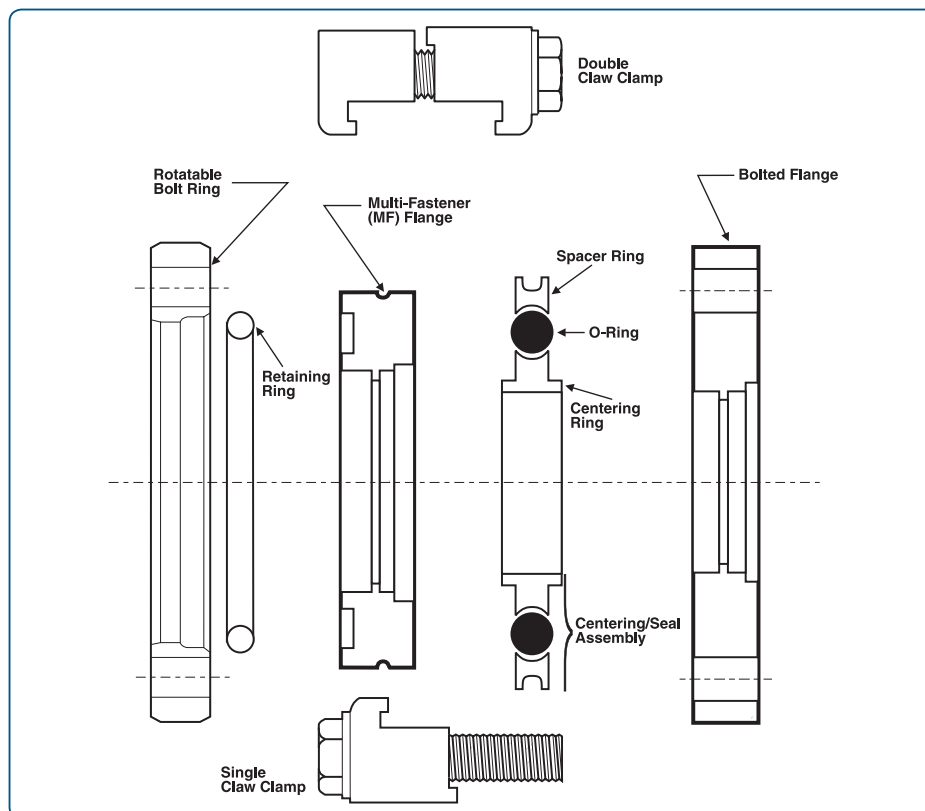


Figure 1 —
Component Nomenclature for the ISO Universal Flange System



Ordering Information

Description

Series 76 ISO-Universal flanges and components in this catalog are made of type 304 stainless steel. Centering ring and seal assemblies are offered with an aluminum centering ring and spacer ring, or with a stainless centering ring and an aluminum spacer ring. Rotatable bolt rings and clamps are made of aluminum alloy. Retaining rings are made of steel.

Flange seal surfaces are carefully machined and inspected for defects. They are cleaned and packaged to remain clean and protected in shipping. The user should observe precaution as required to prevent seal surface harm. This is especially important for used components returned to storage.

Installation

The Series 76 ISO-Universal flange components can be connected in various ways. The figures below illustrate some possibilities. Figure 2a shows a pair of MF flanges retained by double claw clamps. This is usually the most economical arrangement. In Figure 2b an MF flange with a rotatable bolt ring is joined to a bolted flange using nuts and bolts. In Figure 2c an MF flange is joined to a tapped bolt flange using single claw clamps. Tapped flanges are found on some valve bodies. Alternatively, a rotatable bolt ring could have been used with an MF flange to obtain the same result shown in Figure 2c. Last, Figure 2d shows a pair of bolted flanges joined in the usual way by nuts and bolts.

In attaching a rotatable bolt ring to an MF flange as in Figure 2b, the ring is first passed over the flange with the larger bore of the ring facing outward from the open port. The split retaining ring is then snapped into the groove on the periphery of the MF flange. Then the bolt ring is pulled forward into position. Pairs of bolted flanges may also be used.

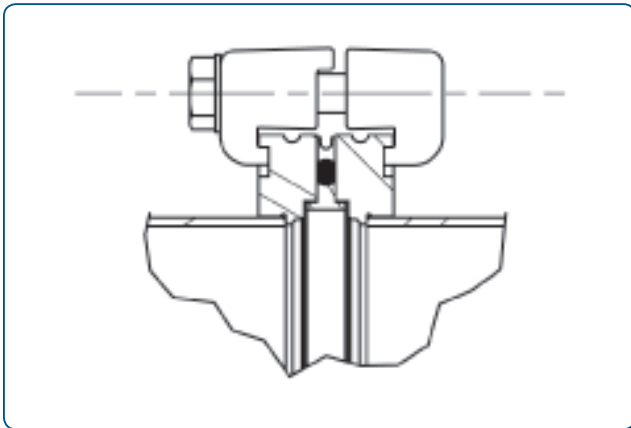


Figure 2a

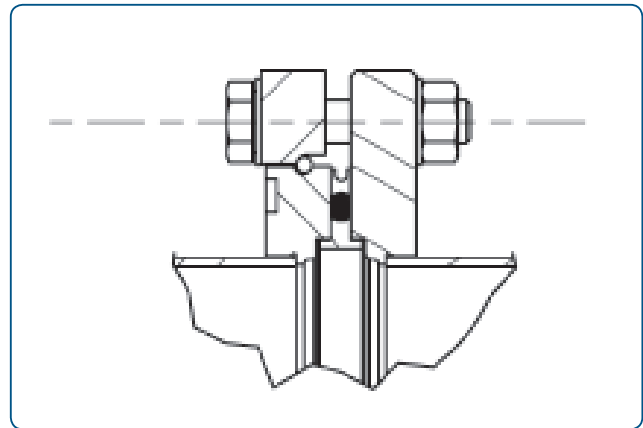


Figure 2b

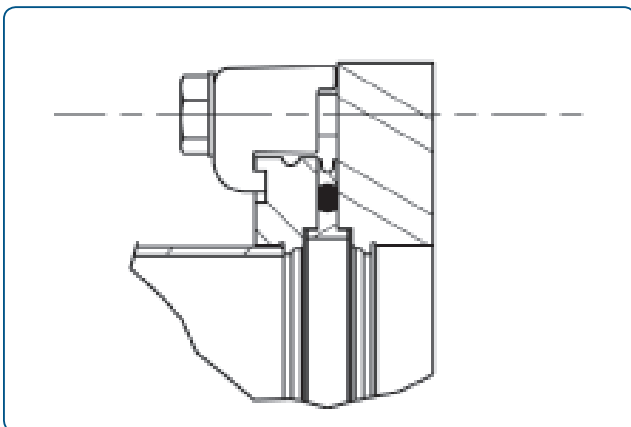


Figure 2c

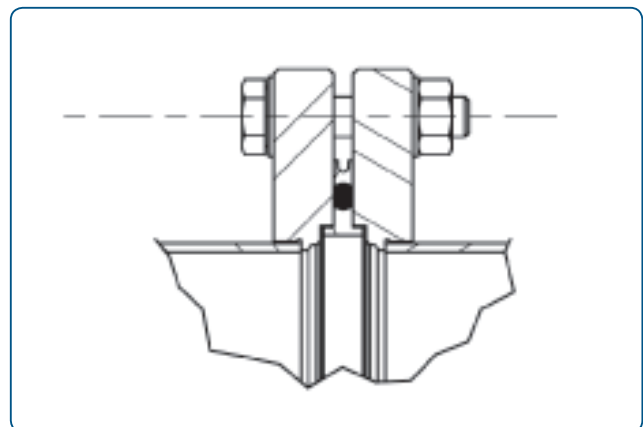


Figure 2d



Figure 3 shows the dimensions of ISO Universal flange components for sizes from 63 to 630 mm, which are standard in this catalog. The maximum size for an MF flange is NW 500, while the bolted flange can run up to NW 1000. The recommended number of clamps to be used with MF flanges are also listed.

Flanges and seals are designed to be tightened to metal to metal contact. It is important that the clamps or bolts not be over tightened or warping of the flanges could result.

The torque rating for clamps and bolts is 7 to 10 pounds per foot.

There are a variety of choices available when selecting centering ring assemblies. Two types of elastomers are available, Buna-N and Viton. Use Viton where temperatures, chemical resistance or long installed life make it beneficial. Use Buna-N where temperatures are moderate, and installed useful life is consistent with this material. The centering ring is available in two types of metal: stainless steel and aluminum. Use stainless steel where chemical resistance is needed.

MKS Instruments presently supplies Series 76 ISO-Universal flanges drilled for inch dimension tubing and pipe. Weld assembly should be by an experienced TIG or MIG welder. Bored flanges have been designed for assembly by internal fusion welding without the use of filler

metal. Tacking is advisable. A weld rotator aides in making attractive welds with minimum warping. Excessive current or non uniform rotation can cause warping of the flange face. When there is a concern about warping, use a flange with a stub. Butt welding to stubs in sizes up to 10 inch diameter with a wall thickness of 1/8 inch can also be by fusion. Internal purge gas will prevent excessive oxidation.

Remove any oxidation by wire brushing. This should be done while the part is still slightly warm, since the oxides are nearly impossible to remove later. Use only a stainless steel wire brush or wheel, since ordinary steel brushes leave iron residue which will then rust.

Since the centering ring grooves on the NW 100 and NW 160 flange happen to be almost exactly the diameters of the tubing to be used with these sizes, the flange can be inadvertently welded on backwards. When working with the MF flange, note that the clamp retaining groove goes to the rear (tube) side. Working with the bolted flange requires more care. Close inspection of the weld prep detail will show the recess from the tube side to have a negligible radius, while there is a small radius visible on the seal side.

The technical staff of MKS Instruments is available to help you with system design and any special needs you may encounter. Call 800-345-1967 for a quotation.

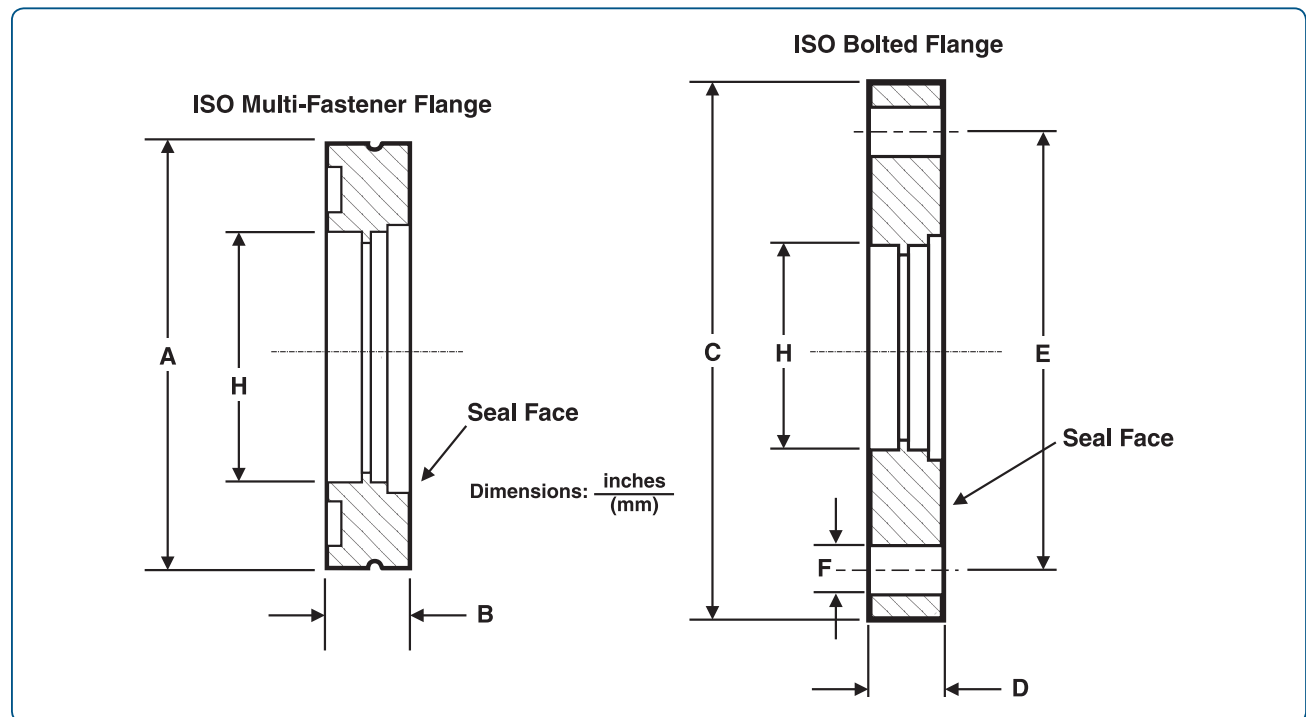


Figure 3



Series 76

Nominal* Flange Size (mm)	H Suggested Table/Pipe Dims: ** O.D. x Wall (inches)	ISO Multi-Fastener Flange (ISO-MF)			ISO Bolted Flange (ISO-BF)					
		A (O.D.)	B (Thickness)	# Clamps Required	C (O.D.)	D (Thickness)	E (Bolt Circle)	F (Bolt Holes)	N (# Holes)	Wrench (mm)
NW 63	2.5 x .065	3.74 (95)	.47 (12)	3-4	5.12 (130)	.47 (12)	4.33 (110)	.35 (9)	4	13
NW 80	3.0 x .065	4.33 (110)	.47 (12)	4-8	5.71 (145)	.47 (12)	4.92 (125)	.35 (9)	8	13
NW 100	4.0 x .065	5.12 (130)	.47 (12)	4-8	6.50 (165)	.47 (12)	5.71 (145)	.35 (9)	8	13
NW 160	6.0 x .083	7.09 (180)	.47 (12)	4-8	8.86 (225)	.63 (16)	7.87 (200)	.43 (11)	8	17
NW 200	8.0 x .120	9.45 (240)	.47 (12)	6-12	11.22 (285)	.63 (16)	10.24 (260)	.43 (11)	12	17
NW 250	10.0 x .125	11.42 (290)	.47 (12)	6-12	13.19 (335)	.63 (16)	12.20 (310)	.43 (11)	12	17
NW 320	12.75 x .165	14.57 (370)	.67 (17)	8-12	16.73 (425)	.79 (20)	15.55 (395)	.55 (14)	12	19
NW 400	16.0 x .188	17.72 (450)	.67 (17)	8-16	20.08 (510)	.79 (20)	18.90 (480)	.55 (14)	16	19
NW 500	20.0 x .188	21.65 (550)	.67 (17)	12-16	24.02 (610)	.79 (20)	22.83 (580)	.55 (14)	16	19
NW 630	25.0 x .250	---	---	---	29.53 (750)	.94 (24)	28.35 (720)	.55 (14)	20	19

* NW is retained here by convention. It does not specify the flange type but is from the German "Nennweite," meaning nominal diameter.

** Schedule 5 pipe is for sizes 320 and above.

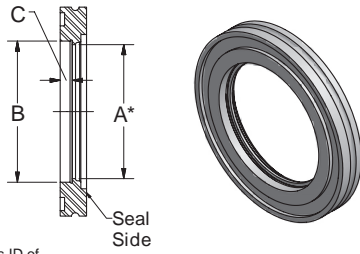
Elastomer Comparison		
	Buna-N	Viton®
Compound	N674-70	V747-75
Color	Black	Black
Bakeout	80°C	150°C
Benefits	Seals easier, lower cost	High temperature, lasts longer

Specifications	
Maximum Pressure (with spacer ring)	30 psig
Minimum Pressure	10 ⁻⁸ Torr
Leak Check	>10 ⁻⁹ std-cc/s
Torque Rating (clamps and bolts)	7-10 lbs/foot
Materials	
Fittings	304 stainless steel
Retaining Rings	Steel
Clamps	Aluminum alloy
Rotatable Bolt Rings	Aluminum alloy
Seal Assembly	Aluminum spacer ring, choice of aluminum or stainless steel centering ring, choice of Viton or Buna-N elastomer seal



Flange, Bored

in./(mm)



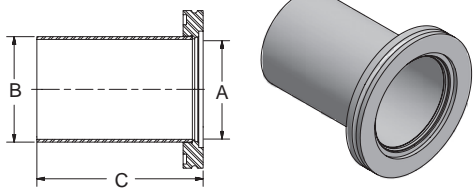
* Given as ID of suggested tubing

- Stainless steel type 304
- For internal weld
- Infinitely rotatable
- Made for inch tube and pipe diameters
- Use with clamps or rotatable bolt ring

Flange Size (ISO)	Nominal Bore	A	B	C	Part Number
NW 63	2½"	2.37 (60)	2.50 (64)	0.22 (6)	100760206
NW 80	3"	2.87 (73)	3.00 (76)	0.22 (6)	100760208
NW 100	4"	3.87 (98)	4.00 (102)	0.22 (6)	100760210
NW 160	6"	5.83 (148)	6.00 (152)	0.22 (6)	100760216
NW 200	8"	7.76 (197)	8.00 (203)	0.22 (6)	100760220
NW 250	10"	9.75 (248)	10.00 (254)	0.22 (6)	100760225
NW 320	12¾"	12.42 (315)	12.75 (324)	0.30 (8)	100760232
NW 400	16"	15.62 (397)	16.00 (406)	0.30 (8)	100760240
NW 500	20"	19.62 (498)	20.00 (508)	0.30 (8)	100760250

Flange, Long Weld Stub

in./(mm)

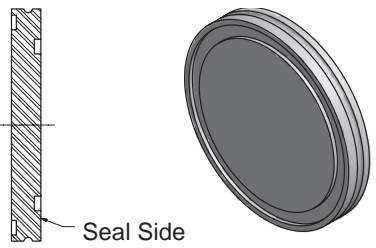


- Stainless steel type 304
- For butt weld
- Standard inch diameters
- Use with clamps or rotatable bolt ring

Flange Size (ISO)	Nominal Bore	A	B	C	Part Number
NW 63	2½"	2.37 (60)	2.50 (64)	3.94 (100)	100760406
NW 80	3"	2.87 (73)	3.00 (76)	3.94 (100)	100760408
NW 100	4"	3.87 (98)	4.00 (102)	3.94 (100)	100760410
NW 100	4" (.065" wall)	3.87 (98)	4.00 (102)	3.94 (100)	100760411
NW 100	4" (.083" wall)	3.87 (98)	4.00 (102)	3.94 (100)	100760411
NW 160	6"	5.83 (148)	6.00 (152)	3.94 (100)	100760416
NW 200	8"	7.76 (197)	8.00 (203)	3.94 (100)	100760420
NW 250	10"	9.75 (248)	10.00 (254)	3.94 (100)	100760425
NW 320	12¾"	12.42 (315)	12.75 (324)	3.94 (100)	100760432
NW 400	16"	15.62 (397)	16.00 (406)	3.94 (100)	100760440
NW 500	20"	19.62 (498)	20.00 (508)	3.94 (100)	100760450

Flange, Blank-Off

in./(mm)

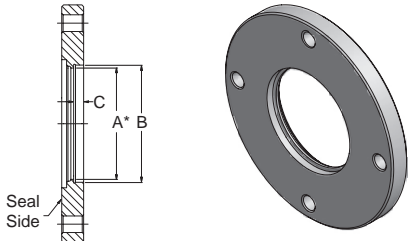


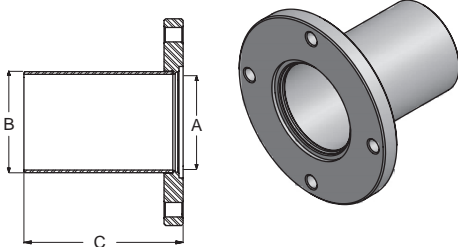
- Stainless steel type 304
- Infinitely rotatable
- To close off unused ports
- Use with clamps or rotatable bolt ring

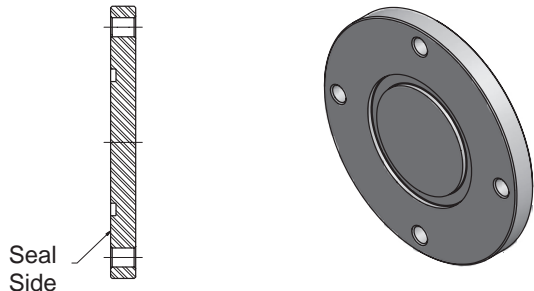
Flange Size (ISO)	Part Number
NW 63	100760106
NW 80	100760108
NW 100	100760110
NW 160	100760116
NW 200	100760120
NW 250	100760125
NW 320	100760132
NW 400	100760140
NW 500	100760150



Ordering Information

Flange, Bolted, Bored							in./(mm)
 <p>* Given as ID of suggested tubing</p> <ul style="list-style-type: none"> Stainless steel type 304 For use with bolts only For internal weld Made for inch tube and pipe diameters Tapped bolt holes on special order 	Flange Size (ISO)	Nominal Bore	A	B	C	Part Number	
	NW 63	2½"	2.37 (60)	2.50 (64)	0.22 (6)	100762406	
	NW 80	3"	2.87 (73)	3.00 (76)	0.22 (6)	100762408	
	NW 100	4"	3.87 (98)	4.00 (102)	0.22 (6)	100762410	
	NW 160	6"	5.83 (148)	6.00 (152)	0.37 (10)	100762416	
	NW 200	8"	7.76 (197)	8.00 (203)	0.37 (10)	100762420	
	NW 250	10"	9.75 (248)	10.00 (254)	0.41 (11)	100762425	
	NW 320	12¾"	12.42 (315)	12.75 (324)	0.41 (11)	100762432	
	NW 400	16"	15.62 (397)	16.00 (406)	0.41 (11)	100762440	
	NW 500	20"	19.62 (498)	20.00 (508)	0.41 (11)	100762450	
	NW 630	24"	23.50 (597)	24.00 (610)	0.57 (15)	100762463	

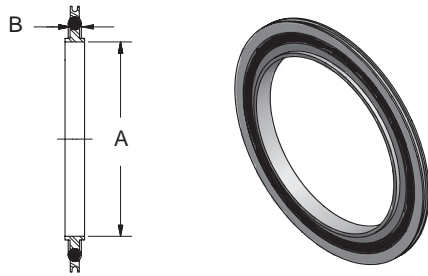
Flange, Bolted, Weld Stub							in./(mm)
 <ul style="list-style-type: none"> Stainless steel type 304 For butt weld For use with bolts only Made for inch tube and pipe diameters 	Flange Size (ISO)	Nominal Bore	A	B	C	Part Number	
	NW 63	2½"	2.37 (60)	2.50 (64)	3.94 (100)	100762706	
	NW 80	3"	2.87 (73)	3.00 (76)	3.94 (100)	100762708	
	NW 100	4"	3.87 (98)	4.00 (102)	3.94 (100)	100762710	
	NW 160	6"	5.83 (148)	6.00 (152)	3.94 (100)	100762716	
	NW 200	8"	7.76 (197)	8.00 (203)	3.94 (100)	100762720	
	NW 250	10"	9.75 (248)	10.00 (254)	3.94 (100)	100762725	
	NW 320	12¾"	12.42 (315)	12.75 (324)	3.94 (100)	100762732	
	NW 400	16"	15.62 (397)	16.00 (406)	3.94 (100)	100762740	
	NW 500	20"	19.62 (498)	20.00 (508)	3.94 (100)	100762750	
	NW 630	24"	23.50 (597)	24.00 (610)	3.94 (100)	100762763	

Flange, Bolted, Blank		in./(mm)
 <ul style="list-style-type: none"> Stainless steel type 304 To close off unused ports or for special boring For use with bolts only Tapped bolt holes on special order 	Flange Size (ISO)	Part Number
	NW 63	100760306
	NW 80	100760308
	NW 100	100760310
	NW 160	100760316
	NW 200	100760320
	NW 250	100760325
	NW 320	100760332
	NW 400	100760340
	NW 500	100760350
NW 630	100760363	



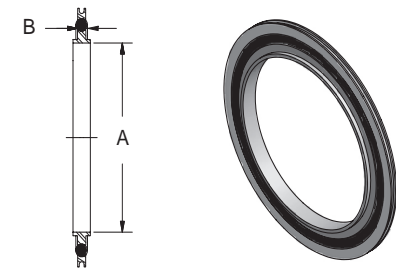
Seal, Centering Ring Assembly, Stainless Steel/Viton®

in./ (mm)

 <ul style="list-style-type: none"> Stainless steel centering ring Replaceable Viton O-Ring Aluminum spacer ring Rated to 150°C max 	Flange Size (ISO)	A	B	Part Number
		NW 63	2.63 (67)	0.15 (4)
	NW 80	3.14 (80)	0.15 (4)	100760508
	NW 100	3.89 (99)	0.15 (4)	100760510
	NW 160	5.90 (150)	0.15 (4)	100760516
	NW 200	8.26 (210)	0.15 (4)	100760520
	NW 250	10.14 (258)	0.15 (4)	100760525
	NW 320	12.30 (312)	0.22 (6)	100760532
	NW 400	15.53 (395)	0.22 (6)	100760540
	NW 500	19.51 (496)	0.22 (6)	100760550
	NW 630	25.41 (645)	0.22 (6)	100760563

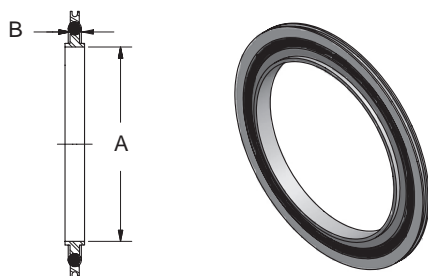
Seal, Centering Ring Assembly, Aluminum/Buna-N

in./ (mm)

 <ul style="list-style-type: none"> Aluminum centering ring Replaceable Buna-N O-Ring Aluminum spacer ring Rated to 80°C max. 	Flange Size (ISO)	A	B	Part Number
		NW 63	2.63 (67)	0.15 (4)
	NW 80	3.14 (80)	0.15 (4)	100760708
	NW 100	3.89 (99)	0.15 (4)	100760710
	NW 160	5.90 (150)	0.15 (4)	100760716
	NW 200	8.26 (210)	0.15 (4)	100760720
	NW 250	10.14 (258)	0.15 (4)	100760725
	NW 320	12.30 (312)	0.22 (6)	100760732
	NW 400	15.53 (395)	0.22 (6)	100760740
	NW 500	19.51 (496)	0.22 (6)	100760750
	NW 630	25.41 (645)	0.22 (6)	100760763

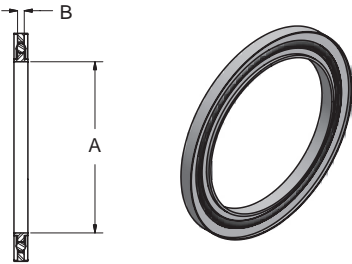
Seal, Centering Ring Assembly, Aluminum/Viton®

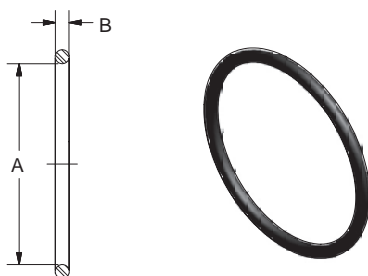
in./ (mm)

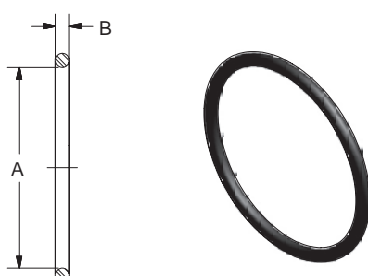
 <ul style="list-style-type: none"> Aluminum centering ring Replaceable Viton O-Ring Aluminum spacer ring Rated to 150°C max 	Flange Size (ISO)	A	B	Part Number
		NW 63	2.63 (67)	0.15 (4)
	NW 80	3.14 (80)	0.15 (4)	100760608
	NW 100	3.89 (99)	0.15 (4)	100760610
	NW 160	5.90 (150)	0.15 (4)	100760616
	NW 200	8.26 (210)	0.15 (4)	100760620
	NW 250	10.14 (258)	0.15 (4)	100760625
	NW 320	12.30 (312)	0.22 (6)	100760632
	NW 400	15.53 (395)	0.22 (6)	100760640
	NW 500	19.51 (496)	0.22 (6)	100760650
	NW 630	25.41 (645)	0.22 (6)	100760663



Ordering Information

Seal, Overpressure Assembly				in./(mm)
 <ul style="list-style-type: none"> Stainless steel centering ring Replaceable Viton O-Ring Includes aluminum overpressure ring 	Flange Size (ISO)	A	B	Part Number
	NW 80	3.14 (80)	0.15 (4)	100938657
	NW 100	3.89 (99)	0.15 (4)	100938658
	NW 160	5.90 (150)	0.15 (4)	100937685

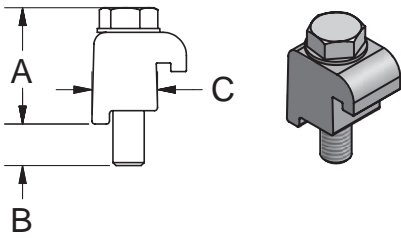
Seal, Replacement O-Ring, Viton®					in./(mm)
 <ul style="list-style-type: none"> Viton Standard US O-Ring sizes Bakeable to 150°C Replaceable seal for centering ring assembly 	Flange Size (ISO)	Standard Number	A	B	Part Number
	NW 63	2-336	2.85 (72)	0.21 (5)	100762006
	NW 80	2-340	3.35 (85)	0.21 (5)	100762008
	NW 100	2-346	4.10 (104)	0.21 (5)	100762010
	NW 160	2-361	5.98 (152)	0.21 (5)	100762016
	NW 200	2-371	8.48 (215)	0.21 (5)	100762020
	NW 250	2-378	10.48 (266)	0.21 (5)	100762025
	NW 320	2-454	12.48 (317)	0.28 (7)	100762032
	NW 400	2-460	15.48 (393)	0.28 (7)	100762040
	NW 500	2-468	19.46 (494)	0.28 (7)	100762050
	NW 630	2-474	24.94 (634)	0.28 (7)	100762063

Seal, Replacement O-Ring, Buna-N					in./(mm)
 <ul style="list-style-type: none"> Buna-N Standard US O-Ring sizes Bakeable to 80°C Replaceable seal for centering ring assembly 	Flange Size (ISO)	Standard Number	A	B	Part Number
	NW 63	2-336	2.85 (72)	0.21 (5)	100761906
	NW 80	2-340	3.35 (85)	0.21 (5)	100761908
	NW 100	2-346	4.10 (104)	0.21 (5)	100761910
	NW 160	2-361	5.98 (152)	0.21 (5)	100761916
	NW 200	2-371	8.48 (215)	0.21 (5)	100761920
	NW 250	2-378	10.48 (266)	0.21 (5)	100761925
	NW 320	2-454	12.48 (317)	0.28 (7)	100761932
	NW 400	2-460	15.48 (393)	0.28 (7)	100761940
	NW 500	2-468	19.46 (494)	0.28 (7)	100761950
	NW 630	2-474	24.94 (634)	0.28 (7)	100761963



Clamp, Single Claw

n./(mm)

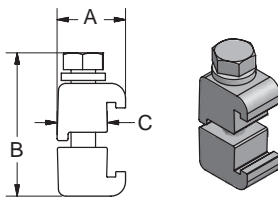


- Aluminum clamp
- Stainless steel bolt
- Stainless steel washer
- To join an MF flange to a tapped bolted flange

Flange Size (ISO)	Bolt Size	A	B	C	Part Number
NW 63	M 8	1.20 (30)	0.39 (10)	0.62 (16)	100761006
NW 80	M 8	1.20 (30)	0.39 (10)	0.62 (16)	100761006
NW 100	M 8	1.20 (30)	0.39 (10)	0.62 (16)	100761006
NW 160	M 10	1.25 (32)	0.39 (10)	0.80 (20)	100761016
NW 200	M 10	1.25 (32)	0.39 (10)	0.80 (20)	100761016
NW 250	M 10	1.25 (32)	0.39 (10)	0.80 (20)	100761016
NW 320	M 12	1.57 (40)	0.72 (18)	1.04 (26)	100761032
NW 400	M 12	1.57 (40)	0.72 (18)	1.04 (26)	100761040
NW 500	M 12	1.57 (40)	0.72 (18)	1.04 (26)	100761040

Clamp, Double Claw

in./(mm)

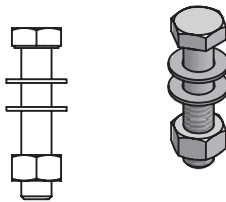


- Aluminum clamp
- Stainless steel bolt
- Stainless steel washer
- To join a pair of MF flanges

Flange Size (ISO)	A	B	C	Part Number
NW 63	0.95 (24)	1.98 (50)	0.63 (16)	100761106
NW 80	0.95 (24)	1.98 (50)	0.63 (16)	100761106
NW 100	0.95 (24)	1.98 (50)	0.63 (16)	100761106
NW 160	1.10 (28)	2.05 (52)	0.80 (20)	100761116
NW 200	1.10 (28)	2.05 (52)	0.80 (20)	100761116
NW 250	1.10 (28)	2.05 (52)	0.80 (20)	100761116
NW 320	1.34 (34)	2.56 (65)	1.04 (26)	100761132
NW 400	1.34 (34)	2.56 (65)	1.04 (26)	100761140
NW 500	1.34 (34)	2.56 (65)	1.04 (26)	100761140

Bolt and Nut Set

in./(mm)

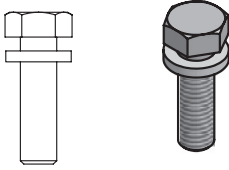


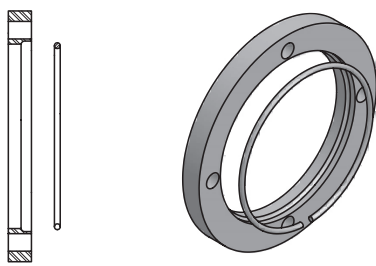
- Stainless steel
- To join two bolted flanges
- Nuts and washers included

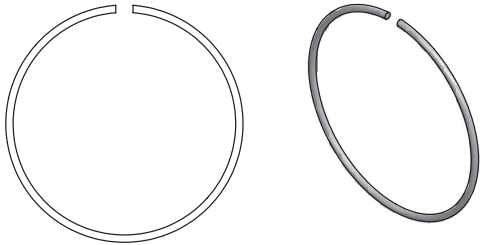
Flange Size (ISO)	Bolt Size	No. in Set	Pitch (mm)	Part Number
NW 63	M 8 x 40	4	1.25	100761206
NW 80	M 8 x 40	8	1.25	100761208
NW 100	M 8 x 40	8	1.25	100761208
NW 160	M 10 x 50	8	1.50	100761216
NW 200	M 10 x 50	12	1.50	100761220
NW 250	M 10 x 50	12	1.50	100761220
NW 320	M 12 x 60	12	1.75	100761232
NW 400	M 12 x 60	16	1.75	100761240
NW 500	M 12 x 60	16	1.75	100761240
NW 630	M 12 x 65	20	1.75	100761263



Ordering Information

Bolt Set					in./(mm)
 <ul style="list-style-type: none"> Stainless steel Bolted flange to tapped flange Includes washer 	Flange Size (ISO)	Bolt Size	No. in Set	Pitch (mm)	Part Number
	NW 63	M 8 x 30	4	1.25	100761306
	NW 80	M 8 x 30	8	1.25	100761308
	NW 100	M 8 x 30	8	1.25	100761308
	NW 160	M 10 x 35	8	1.50	100761316
	NW 200	M 10 x 35	12	1.50	100761320
	NW 250	M 10 x 35	12	1.50	100761320
	NW 320	M 12 x 45	12	1.75	100761332
	NW 400	M 12 x 45	16	1.75	100761340
	NW 500	M 12 x 45	16	1.75	100761340
NW 630	M 12 x 55	20	1.75	100761363	

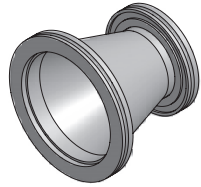
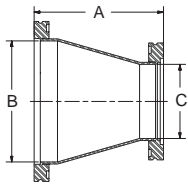
Ring, Rotatable Bolt		in./(mm)
 <ul style="list-style-type: none"> Aluminum Use with MF flange Steel retaining ring included O.D. and bolt pattern same as bolted flange 	Flange Size (ISO)	Part Number
	NW 63	100762806
	NW 80	100762808
	NW 100	100762810
	NW 160	100762816
	NW 200	100762820
	NW 250	100762825
	NW 320	100762832
	NW 400	100762840
	NW 500	100762850

Ring, Retaining		in./(mm)
 <ul style="list-style-type: none"> Stainless steel Retains bolt ring 	Flange Size (ISO)	Part Number
	NW 63	100762906
	NW 80	100762908
	NW 100	100762910
	NW 160	100762916
	NW 200	100762920
	NW 250	100762925
	NW 320	100762932
	NW 400	100762940
	NW 500	100762950



Conic Reducer

in./(mm)

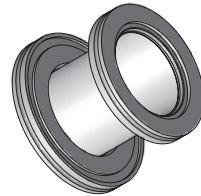
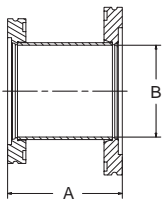


- Stainless steel type 304
- Other combinations available on request
- High conductance adapter

Flange Size (ISO)	A	B	C	Part Number
NW 63 to NW 80	4.14 (105)	2.87 (73)	2.37 (60)	100764906
NW 63 to NW 100	4.14 (105)	3.83 (97)	2.37 (60)	100764917
NW 80 to NW 100	4.14 (105)	3.83 (97)	2.87 (73)	100764908
NW 80 to NW 160	9.52 (242)	5.78 (147)	2.87 (73)	100764927
NW 100 to NW 160	9.52 (242)	5.78 (147)	3.83 (97)	100764910

Step Reducer

in./(mm)

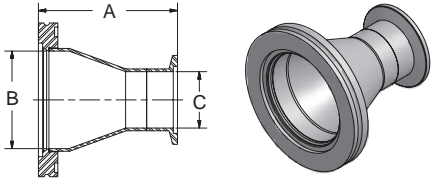


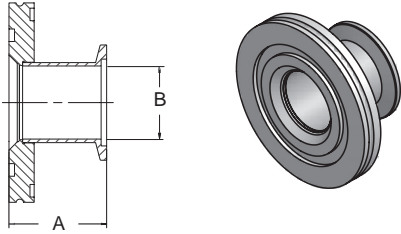
- Stainless steel type 304
- Short overall length

Flange Size (ISO)	A	B	Part Number
NW 63 to NW 80	2.95 (75)	2.31 (59)	100762506
NW 63 to NW 100	2.95 (75)	2.31 (59)	100762517
NW 63 to NW 160	2.95 (75)	2.31 (59)	100762527
NW 80 to NW 100	2.95 (75)	2.87 (73)	100762508
NW 100 to NW 160	2.95 (75)	3.87 (98)	100762510



Ordering Information

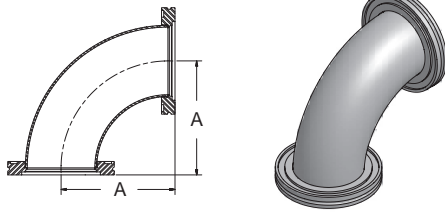
Conic Adapter, ISO-MF Flange to ISO-KF Flange					in./(mm)
 <ul style="list-style-type: none"> Stainless steel type 304 Special adapters available upon request High conductance adapter 	Flange Size (ISO)	A	B	C	Part Number
	NW 63 to NW 40	3.39 (86)	2.37 (60)	1.37 (35)	100765006
	NW 63 to NW 50	3.39 (86)	2.37 (60)	1.87 (47)	100765017
	NW 80 to NW 40	4.64 (118)	2.87 (73)	1.37 (35)	100765016
	NW 80 to NW 50	4.64 (118)	2.87 (73)	1.87 (47)	100765008
	NW 100 to NW 50	4.64 (118)	3.83 (97)	1.87 (47)	100765018

Step Adapter, ISO-MF Flange to ISO-KF Flange				in./(mm)
 <ul style="list-style-type: none"> Stainless steel type 304 With O-ring groove Special adapters available upon request Short overall length 	Flange Size (ISO)	A	B	Part Number
	NW 63 to NW 40	1.77 (45)	1.37 (35)	100762606
	NW 63 to NW 50	1.77 (45)	1.87 (47)	100762617
	NW 80 to NW 40	1.77 (45)	1.37 (35)	100762616
	NW 80 to NW 50	1.77 (45)	1.87 (47)	100762608
	NW 100 to NW 40	1.77 (45)	1.37 (35)	100762620
NW 100 to NW 50	1.77 (45)	1.87 (47)	100762618	



90° Elbow, Smooth Radius

in./(mm)



- Stainless steel type 304
- ISO-MF flanges, same size both ports

Flange Size (ISO)

A

Part Number

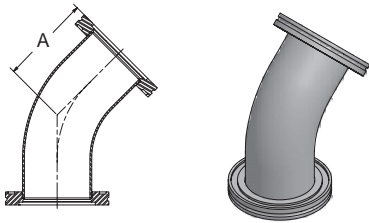
NW 63
NW 80
NW 100
NW 160

4.00 (102)
4.74 (120)
6.24 (158)
9.24 (235)

100764606
100764608
100764610
100764616

45° Elbow, Smooth Radius

in./(mm)



- Stainless steel type 304
- ISO-MF flanges, same size both ports

Flange Size (ISO)

A

Part Number

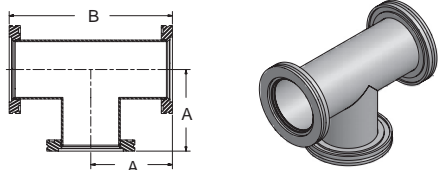
NW 63
NW 80
NW 100
NW 160

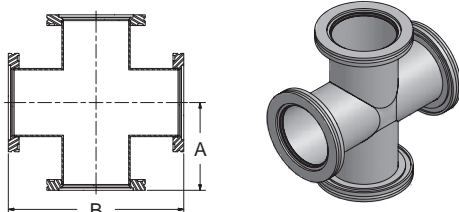
3.25 (83)
3.93 (100)
5.03 (128)
5.49 (139)

100764406
100764408
100764410
100764416

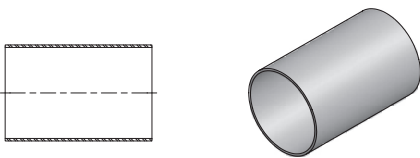


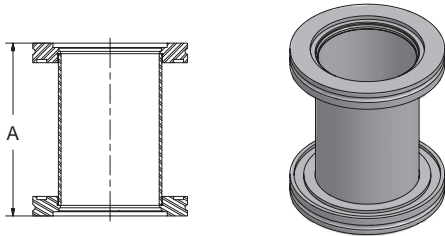
Ordering Information

Tee		in./(mm)			
		Flange Size (ISO)	A	B	Part Number
 <ul style="list-style-type: none"> Stainless steel type 304 ISO-MF flanges, same size all ports Standard flange face to centerline dimensions Larger sizes available on request 	NW 63	3.46 (88)	6.92 (176)	100761406	
	NW 80	3.86 (98)	7.72 (196)	100761408	
	NW 100	4.25 (108)	8.50 (216)	100761410	
	NW 160	5.43 (138)	10.86 (276)	100761416	
	NW 200	6.61 (168)	13.22 (336)	100761420	
	NW 250	8.19 (208)	16.38 (416)	100761425	
	NW 320	12.60 (320)	25.20 (640)	100761432	

Cross		in./(mm)			
		Flange Size (ISO)	A	B	Part Number
 <ul style="list-style-type: none"> Stainless steel type 304 ISO-MF flanges, same size all ports Standard flange face to centerline dimensions Larger sizes available on request 	NW 63	3.46 (88)	6.92 (176)	100761506	
	NW 80	3.86 (98)	7.72 (196)	100761508	
	NW 100	4.25 (108)	8.50 (216)	100761510	
	NW 160	5.43 (138)	10.86 (276)	100761516	
	NW 200	6.61 (168)	13.22 (336)	100761520	
	NW 250	8.19 (208)	16.38 (416)	100761525	
	NW 320	12.60 (320)	25.20 (640)	100761532	

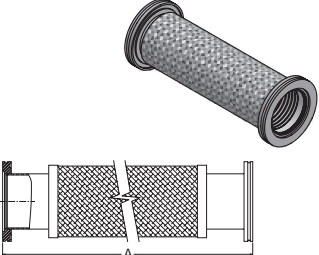


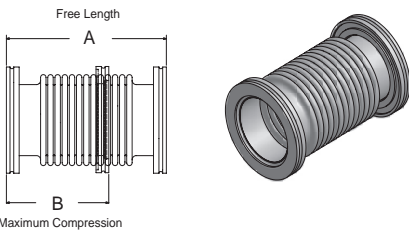
Tubing				in./(mm)
 <ul style="list-style-type: none"> Stainless steel type 304 Tube ends deburred, cleaned and capped Price per 10 foot length of tube 	Flange Size (ISO)	A	B	Part Number
	NW 63	2½"	.065"	100764506
	NW 80	3"	.065"	100764508
	NW 100	4"	.065"	100764510
	NW 100	4"	.083"	100764511
	NW 160	6"	.083"	100764516
	NW 200	8"	.120"	100764520
	NW 250	10"	.125"	100764525

Straight Section				in./(mm)
 <ul style="list-style-type: none"> Stainless steel type 304 Special lengths to order MF type flanges 	Flange Size (ISO)	A	Part Number	
	NW 63	6.92 (176)	100761706	
	NW 63	4.18 (106)	100761707	
	NW 80	7.72 (196)	100761708	
	NW 80	4.18 (106)	100761709	
	NW 100	8.50 (216)	100761710	
	NW 100	4.18 (106)	100761711	
	NW 160	10.86 (276)	100761716	
	NW 160	4.18 (106)	100761717	
	NW 200	13.22 (336)	100761720	
	NW 200	4.18 (106)	100761721	
	NW 250	16.38 (416)	100761725	
NW 250	4.18 (106)	100761726		



Ordering Information

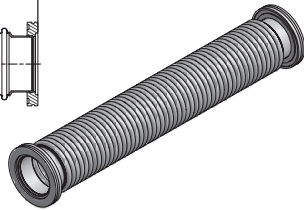
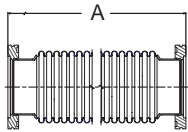
Braided Metal Hose				in./(mm)
 <ul style="list-style-type: none"> • Ideal for rough pumping line • Stainless steel • Flexible, yet resistant to contraction 	Flange Size (ISO)	A	Static Bend Radius	Part Number
	NW 63	10.74 (273)	7.50 (191)	100766006
	NW 63	20.74 (527)	7.50 (191)	100766106
	NW 63	40.74 (1035)	7.50 (191)	100766206
	NW 80	10.74 (273)	8.75 (222)	100766008
	NW 80	20.74 (527)	8.75 (222)	100766108
	NW 80	40.74 (1035)	8.75 (222)	100766208
	NW 100	10.74 (273)	10.00 (254)	100766010
	NW 100	20.74 (527)	10.00 (254)	100766110
	NW 100	40.74 (1035)	10.00 (254)	100766210

Bellows, Section				in./(mm)
 <ul style="list-style-type: none"> • CAUTION: Flanges must be supported to prevent collapsing when subjected to vacuum • Stainless steel • Formed bellows • Bellows butt welded • Thin wall • Flexible 	Flange Size (ISO)	A	B	Part Number
	NW 63	5.90 (150)	4.50 (115)	100763506
	NW 80	5.90 (150)	4.50 (115)	100763508
	NW 100	5.90 (150)	4.50 (115)	100763510
	NW 160	7.90 (200)	5.70 (145)	100763516
	NW 200	9.80 (250)	6.90 (175)	100763520
	NW 250	11.80 (300)	8.10 (205)	100763525



Metal Hose, Thick Wall

in./(mm)

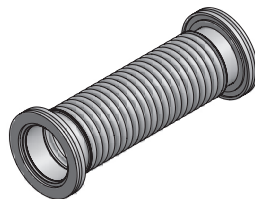
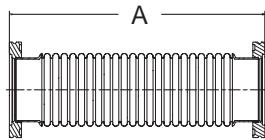


- CAUTION:**
Flanges must be supported to prevent collapsing when subjected to vacuum
- Unsheathed
 - Stainless steel
 - Formed metal
 - Special lengths on request
 - Hose buttwelded

Flange Size (ISO)	Static Bend Radius	A	Part Number
NW 63	6½"	19.69 (500)	100763606
NW 63	6½"	39.40 (1000)	100763706
NW 80	7"	19.69 (500)	100763608
NW 80	7"	39.40 (1000)	100763708
NW 100	11"	19.69 (500)	100763610
NW 100	11"	39.40 (1000)	100763710
NW 160	17"	19.69 (500)	100763616
NW 160	17"	39.40 (1000)	100763716
NW 200	18"	19.69 (500)	100763620
NW 200	18"	39.40 (1000)	100763720
NW 250	24"	19.69 (500)	100763625
NW 250	24"	39.40 (1000)	100763725

Metal Hose, Thin Wall

in./(mm)



- **CAUTION:**
Flanges must be supported to prevent collapsing when subjected to vacuum
- Unsheathed
- Stainless steel
- Formed metal
- Flexible
- Hose buttwelded

Flange Size (ISO)	A	Part Number
NW 63	9.84 (250)	100763806
NW 63	19.69 (500)	100763906
NW 63	39.40 (1000)	100764006
NW 80	9.84 (250)	100763808
NW 80	19.69 (500)	100763908
NW 80	39.40 (1000)	100764008
NW 100	9.84 (250)	100763810
NW 100	19.69 (500)	100763910

Flange Protector Cap

in./(mm)

- Protects flange faces
- Plastic

Flange Size (ISO)	Part Number
NW 63	100760006
NW 80	100760008
NW 100	100760010
NW 160	100005788



Numerical Listing

10005788	Flange Protector Cap, NW 160	100760732	Seal, Centering Ring Assy, NW 320, Aluminum/Buna-N
100760006	Flange Protector Cap, NW 63	100760740	Seal, Centering Ring Assy, NW 400, Aluminum/Buna-N
100760008	Flange Protector Cap, NW 80	100760750	Seal, Centering Ring Assy, NW 500, Aluminum/Buna-N
100760010	Flange Protector Cap, NW 100	100760763	Seal, Centering Ring Assy, NW 630, Aluminum/Buna-N
100760106	Flange, Blank-Off, NW 63	100761006	Single Claw Clamp, NW 63, Aluminum
100760108	Flange, Blank-Off, NW 80	100761006	Single Claw Clamp, NW 80, Aluminum
100760110	Flange, Blank-Off, NW 100	100761006	Single Claw Clamp, NW 100, Aluminum
100760116	Flange, Blank-Off, NW 160	100761016	Single Claw Clamp, NW 160, Aluminum
100760120	Flange, Blank-Off, NW 200	100761016	Single Claw Clamp, NW 200, Aluminum
100760125	Flange, Blank-Off, NW 250	100761016	Single Claw Clamp, NW 250, Aluminum
100760132	Flange, Blank-Off, NW 320	100761032	Single Claw Clamp, NW 320, Aluminum
100760140	Flange, Blank-Off, NW 400	100761040	Single Claw Clamp, NW 400, Aluminum
100760150	Flange, Blank-Off, NW 500	100761040	Single Claw Clamp, NW 500, Aluminum
100760206	Flange, Bored, NW 63	100761106	Double Claw Clamp, NW 63, Aluminum
100760208	Flange, Bored, NW 80	100761106	Double Claw Clamp, NW 80, Aluminum
100760210	Flange, Bored, NW 100	100761106	Double Claw Clamp, NW 100, Aluminum
100760216	Flange, Bored, NW 160	100761116	Double Claw Clamp, NW 160, Aluminum
100760220	Flange, Bored, NW 200	100761116	Double Claw Clamp, NW 200, Aluminum
100760225	Flange, Bored, NW 250	100761116	Double Claw Clamp, NW 250, Aluminum
100760232	Flange, Bored, NW 320	100761132	Double Claw Clamp, NW 320, Aluminum
100760240	Flange, Bored, NW 400	100761140	Double Claw Clamp, NW 400, Aluminum
100760250	Flange, Bored, NW 500	100761140	Double Claw Clamp, NW 500, Aluminum
100760306	Flange, Bolted, Blank, NW 63	100761206	Bolt and Nut Set, NW 63, Stainless Steel
100760308	Flange, Bolted, Blank, NW 80	100761208	Bolt and Nut Set, NW 80, Stainless Steel
100760310	Flange, Bolted, Blank, NW 100	100761208	Bolt and Nut Set, NW 100, Stainless Steel
100760316	Flange, Bolted, Blank, NW 160	100761216	Bolt and Nut Set, NW 160, Stainless Steel
100760320	Flange, Bolted, Blank, NW 200	100761220	Bolt and Nut Set, NW 200, Stainless Steel
100760325	Flange, Bolted, Blank, NW 250	100761220	Bolt and Nut Set, NW 250, Stainless Steel
100760332	Flange, Bolted, Blank, NW 320	100761232	Bolt and Nut Set, NW 320, Stainless Steel
100760340	Flange, Bolted, Blank, NW 400	100761240	Bolt and Nut Set, NW 400, Stainless Steel
100760350	Flange, Bolted, Blank, NW 500	100761240	Bolt and Nut Set, NW 500, Stainless Steel
100760363	Flange, Bolted, Blank, NW 630	100761263	Bolt and Nut Set, NW 630, Stainless Steel
100760406	Flange, Long Weld Stub, NW 63	100761306	Bolt Set, for tapped bolted flanges, NW 63
100760408	Flange, Long Weld Stub, NW 80	100761308	Bolt Set, for tapped bolted flanges, NW 80
100760410	Flange, Long Weld Stub, NW 100, .065" wall	100761308	Bolt Set, for tapped bolted flanges, NW 100
100760411	Flange, Long Weld Stub, NW 100, .083" wall	100761316	Bolt Set, for tapped bolted flanges, NW 160
100760416	Flange, Long Weld Stub, NW 160	100761320	Bolt Set, for tapped bolted flanges, NW 200
100760420	Flange, Long Weld Stub, NW 200	100761320	Bolt Set, for tapped bolted flanges, NW 250
100760425	Flange, Long Weld Stub, NW 250	100761332	Bolt Set, for tapped bolted flanges, NW 320
100760432	Flange, Long Weld Stub, NW 320	100761340	Bolt Set, for tapped bolted flanges, NW 400
100760440	Flange, Long Weld Stub, NW 400	100761340	Bolt Set, for tapped bolted flanges, NW 500
100760450	Flange, Long Weld Stub, NW 500	100761363	Bolt Set, for tapped bolted flanges, NW 630
100760506	Seal, Centering Ring Assy, NW 63, SS/Viton	100761406	Tee, NW 63, Stainless Steel
100760508	Seal, Centering Ring Assy, NW 80, SS/Viton	100761408	Tee, NW 80, Stainless Steel
100760510	Seal, Centering Ring Assy, NW 100, SS/Viton	100761410	Tee, NW 100, Stainless Steel
100760516	Seal, Centering Ring Assy, NW 160, SS/Viton	100761416	Tee, NW 160, Stainless Steel
100760520	Seal, Centering Ring Assy, NW 200, SS/Viton	100761420	Tee, NW 200, Stainless Steel
100760525	Seal, Centering Ring Assy, NW 250, SS/Viton	100761425	Tee, NW 250, Stainless Steel
100760532	Seal, Centering Ring Assy, NW 320, SS/Viton	100761432	Tee, NW 320, Stainless Steel
100760540	Seal, Centering Ring Assy, NW 400, SS/Viton	100761506	Cross, NW 63, Stainless Steel
100760550	Seal, Centering Ring Assy, NW 500, SS/Viton	100761508	Cross, NW 80, Stainless Steel
100760563	Seal, Centering Ring Assy, NW 630, SS/Viton	100761510	Cross, NW 100, Stainless Steel
100760606	Seal, Centering Ring Assy, NW 63, Aluminum/Viton	100761516	Cross, NW 160, Stainless Steel
100760608	Seal, Centering Ring Assy, NW 80, Aluminum/Viton	100761520	Cross, NW 200, Stainless Steel
100760610	Seal, Centering Ring Assy, NW 100, Aluminum/Viton	100761525	Cross, NW 250, Stainless Steel
100760616	Seal, Centering Ring Assy, NW 160, Aluminum/Viton	100761532	Cross, NW 320, Stainless Steel
100760620	Seal, Centering Ring Assy, NW 200, Aluminum/Viton	100761706	Straight Section, NW 63, 6.92" length
100760625	Seal, Centering Ring Assy, NW 250, Aluminum/Viton	100761707	Straight Section, NW 63, 4.18" length
100760632	Seal, Centering Ring Assy, NW 320, Aluminum/Viton	100761708	Straight Section, NW 80, 7.72" length
100760640	Seal, Centering Ring Assy, NW 400, Aluminum/Viton	100761709	Straight Section, NW 80, 4.18" length
100760650	Seal, Centering Ring Assy, NW 500, Aluminum/Viton	100761710	Straight Section, NW 100, 8.5" length
100760663	Seal, Centering Ring Assy, NW 630, Aluminum/Viton	100761711	Straight Section, NW 100, 4.18" length
100760706	Seal, Centering Ring Assy, NW 63, Aluminum/Buna-N	100761716	Straight Section, NW 160, 10.86" length
100760708	Seal, Centering Ring Assy, NW 80, Aluminum/Buna-N	100761717	Straight Section, NW 160, 4.18" length
100760710	Seal, Centering Ring Assy, NW 100, Aluminum/Buna-N	100761720	Straight Section, NW 200, 13.22" length
100760716	Seal, Centering Ring Assy, NW 160, Aluminum/Buna-N	100761721	Straight Section, NW 200, 4.18" length
100760720	Seal, Centering Ring Assy, NW 200, Aluminum/Buna-N	100761725	Straight Section, NW 250, 16.38" length
100760725	Seal, Centering Ring Assy, NW 250, Aluminum/Buna-N	100761726	Straight Section, NW 250, 4.18" length



Numerical Listing

100761906	Seal, Replacement O-Ring, NW 63, Buna-N	100762940	Retaining Ring, NW 400
100761908	Seal, Replacement O-Ring, NW 80, Buna-N	100762950	Retaining Ring, NW 500
100761910	Seal, Replacement O-Ring, NW 100, Buna-N		
100761916	Seal, Replacement O-Ring, NW 160, Buna-N	100763506	Bellows, NW 63, 5.9" length
100761920	Seal, Replacement O-Ring, NW 200, Buna-N	100763508	Bellows, NW 80, 5.9" length
100761925	Seal, Replacement O-Ring, NW 250, Buna-N	100763510	Bellows, NW 100, 5.9" length
100761932	Seal, Replacement O-Ring, NW 320, Buna-N	100763516	Bellows, NW 160, 7.9" length
100761940	Seal, Replacement O-Ring, NW 400, Buna-N	100763520	Bellows, NW 200, 9.8" length
100761950	Seal, Replacement O-Ring, NW 500, Buna-N	100763525	Bellows, NW 250, 11.8" length
100761963	Seal, Replacement O-Ring, NW 630, Buna-N		
		100763606	Thick Wall Metal Hose, NW 63, 19.69" length
100762006	Seal, Replacement O-Ring, NW 63, Viton	100763608	Thick Wall Metal Hose, NW 80, 19.69" length
100762008	Seal, Replacement O-Ring, NW 80, Viton	100763610	Thick Wall Metal Hose, NW 100, 19.69" length
100762010	Seal, Replacement O-Ring, NW 100, Viton	100763616	Thick Wall Metal Hose, NW 160, 19.69" length
100762016	Seal, Replacement O-Ring, NW 160, Viton	100763620	Thick Wall Metal Hose, NW 200, 19.69" length
100762020	Seal, Replacement O-Ring, NW 200, Viton	100763625	Thick Wall Metal Hose, NW 250, 19.69" length
100762025	Seal, Replacement O-Ring, NW 250, Viton	100763706	Thick Wall Metal Hose, NW 63, 39.40" length
100762032	Seal, Replacement O-Ring, NW 320, Viton	100763708	Thick Wall Metal Hose, NW 80, 39.40" length
100762040	Seal, Replacement O-Ring, NW 400, Viton	100763710	Thick Wall Metal Hose, NW 100, 39.40" length
100762050	Seal, Replacement O-Ring, NW 500, Viton	100763716	Thick Wall Metal Hose, NW 160, 39.40" length
100762063	Seal, Replacement O-Ring, NW 630, Viton	100763720	Thick Wall Metal Hose, NW 200, 39.40" length
		100763725	Thick Wall Metal Hose, NW 250, 39.40" length
100762406	Flange, Bolted, Bored, NW 63	100763806	Thin Wall Metal Hose, NW 63, 9.84" length
100762408	Flange, Bolted, Bored, NW 80	100763808	Thin Wall Metal Hose, NW 80, 9.84" length
100762410	Flange, Bolted, Bored, NW 100	100763810	Thin Wall Metal Hose, NW 100, 9.84" length
100762416	Flange, Bolted, Bored, NW 160	100763906	Thin Wall Metal Hose, NW 63, 19.69" length
100762420	Flange, Bolted, Bored, NW 200	100763908	Thin Wall Metal Hose, NW 80, 19.69" length
100762425	Flange, Bolted, Bored, NW 250	100763910	Thin Wall Metal Hose, NW 100, 19.69" length
100762432	Flange, Bolted, Bored, NW 320	100764006	Thin Wall Metal Hose, NW 63, 39.40" length
100762440	Flange, Bolted, Bored, NW 400	100764008	Thin Wall Metal Hose, NW 80, 39.40" length
100762450	Flange, Bolted, Bored, NW 500		
100762463	Flange, Bolted, Bored, NW 630	100764406	45° Elbow, Smooth Radius, NW 63
		100764408	45° Elbow, Smooth Radius, NW 80
100762506	Step Reducer, NW 63 to NW 80	100764410	45° Elbow, Smooth Radius, NW 100
100762508	Step Reducer, NW 80 to NW 100	100764416	45° Elbow, Smooth Radius, NW 160
100762510	Step Reducer, NW 100 to NW 160		
100762517	Step Reducer, NW 63 to NW 100	100764506	Tubing (price per 10 foot), NW 63, 0.065 wall, Stainless Steel
100762527	Step Reducer, NW 63 to NW 160	100764508	Tubing (price per 10 foot) NW 80, 0.065 wall, Stainless Steel
		100764510	Tubing (price per 10 foot) NW 100, 0.065 wall, Stainless Steel
100762606	Step Adapter, NW 63 to NW 40, w/Groove	100764511	Tubing (price per 10 foot) NW 100, 0.083 wall, Stainless Steel
100762608	Step Adapter, NW 80 to NW 50, w/Groove	100764516	Tubing (price per 10 foot) NW 160, 0.083 wall, Stainless Steel
100762616	Step Adapter, NW 80 to NW 40, w/Groove	100764520	Tubing (price per 10 foot) NW 200, 0.120 wall, Stainless Steel
100762617	Step Adapter, NW 63 to NW 50, w/Groove	100764525	Tubing (price per 10 foot) NW 250, 0.125 wall, Stainless Steel
100762618	Step Adapter, NW 100 to NW 50, w/Groove		
100762620	Step Adapter, NW 100 to NW 40, w/Groove	100764606	90° Elbow, Smooth Radius, NW 63
		100764608	90° Elbow, Smooth Radius, NW 80
100762706	Flange, Bolted, Weld Stub, NW 63	100764610	90° Elbow, Smooth Radius, NW 100
100762708	Flange, Bolted, Weld Stub, NW 80	100764616	90° Elbow, Smooth Radius, NW 160
100762710	Flange, Bolted, Weld Stub, NW 100		
100762716	Flange, Bolted, Weld Stub, NW 160	100764906	Conic Reducer, NW 63 to NW 80
100762720	Flange, Bolted, Weld Stub, NW 200	100764908	Conic Reducer, NW 80 to NW 100
100762725	Flange, Bolted, Weld Stub, NW 250	100764910	Conic Reducer, NW 100 to NW 160
100762732	Flange, Bolted, Weld Stub, NW 320	100764917	Conic Reducer, NW 63 to NW 100
100762740	Flange, Bolted, Weld Stub, NW 400	100764927	Conic Reducer, NW 80 to NW 160
100762750	Flange, Bolted, Weld Stub, NW 500		
100762763	Flange, Bolted, Weld Stub, NW 630	100765006	Conic Adapter, NW 63 to NW 40
		100765008	Conic Adapter, NW 80 to NW 50
100762806	Rotatable, Bolted Ring Assy, NW 63	100765016	Conic Adapter, NW 80 to NW 40
100762808	Rotatable, Bolted Ring Assy, NW 80	100765017	Conic Adapter, NW 63 to NW 50
100762810	Rotatable, Bolted Ring Assy, NW 100	100765018	Conic Adapter, NW 100 to NW 50
100762816	Rotatable, Bolted Ring Assy, NW 160		
100762820	Rotatable, Bolted Ring Assy, NW 200	100766006	Braided Metal Hose, NW 63, 10.74" length
100762825	Rotatable, Bolted Ring Assy, NW 250	100766008	Braided Metal Hose, NW 80, 10.74" length
100762832	Rotatable, Bolted Ring Assy, NW 320	100766010	Braided Metal Hose, NW 100, 10.74" length
100762840	Rotatable, Bolted Ring Assy, NW 400	100766106	Braided Metal Hose, NW 63, 20.74" length
100762850	Rotatable, Bolted Ring Assy, NW 500	100766108	Braided Metal Hose, NW 80, 20.74" length
		100766110	Braided Metal Hose, NW 100, 20.74" length
100762906	Retaining Ring, NW 63	100766206	Braided Metal Hose, NW 63, 40.74" length
100762908	Retaining Ring, NW 80	100766208	Braided Metal Hose, NW 80, 40.74" length
100762910	Retaining Ring, NW 100	100766210	Braided Metal Hose, NW 100, 40.74" length
100762916	Retaining Ring, NW 160		
100762920	Retaining Ring, NW 200	100937685	Seal, Overpressure Assembly, NW 160
100762925	Retaining Ring, NW 250	100938657	Seal, Overpressure Assembly, NW 80
100762932	Retaining Ring, NW 320	100938658	Seal, Overpressure Assembly, NW 100



MKS Instruments, Inc. Global Headquarters

2 Tech Drive, Suite 201
Andover, MA 01810

Tel: 978.645.5500
Tel: 800.227.8766 (in USA)
Web: www.mksinst.com

MKS Instruments, Inc. Integrated Process Solutions

5330 Sterling Drive
Boulder, CO 80301

Tel: 303.449.9861
Tel: 800.345.1967 (in USA)