

# neyco

VACUUM & MATERIALS



## ELECTRICAL ISOLATORS



## Description

Electrical isolators, sometimes referred to as 'breaks' or 'envelopes', consist of metal sleeves brazed to each end of an insulating ceramic tube. These assemblies provide electrical isolation of system components that operate within a common environment. They can also be used to act as a conduit to introduce gases or liquids into hermetic systems.

- Cryogenic isolators are used to introduce cryogenic fluids into a system and to provide electrical isolation of line components.
- Water isolators are used to introduce water or other fluids into a system and to provide electrical isolation of line components.
- Vacuum isolators are used to provide an electrical break between the vacuum system and other external components.

## Standard Specifications

- Voltages up to 75 kV DC
- Temperature Range: -269°C to 450°C
- Internal IDs to 8 inches
- Internal Pressure  $1 \times 10^{-10}$  torr to 1000 psig

## Extreme / Custom Design

- Voltages in excess of 180 kV
- Pressures to 10,000 psig
- Insulator IDs in excess of 15 inches
- Special fittings
- Radiation resistant
- Non-circular geometries
- Fluted configurations



## Installation

Standard installation mountings include:

- Weld (Pulse-TIG, TIG, Laser, E-Beam)
- ISO KF flange
- ConFlat flange

## Applications

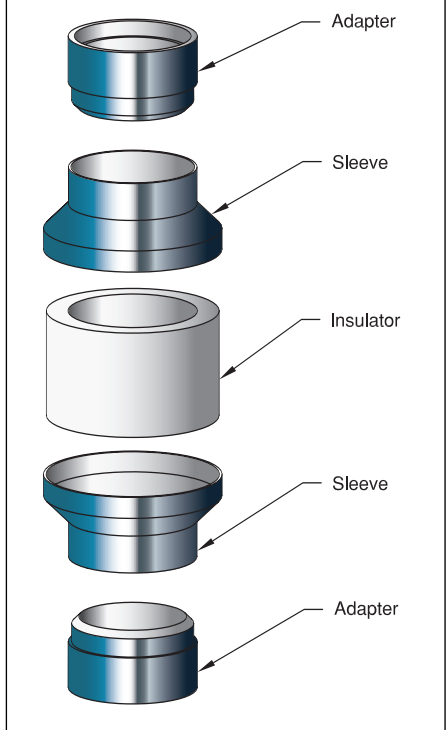
A few of the many applications in which these isolators are commonly used are:




- Semiconductor processing equipment
- Particle accelerators
- Furnaces
- Analytical equipment
- Beam line tubes
- Aerospace
- Telecommunications

## New Products

- Newly designed water isolators with higher pressure ratings
- Standard non-magnetic isolators

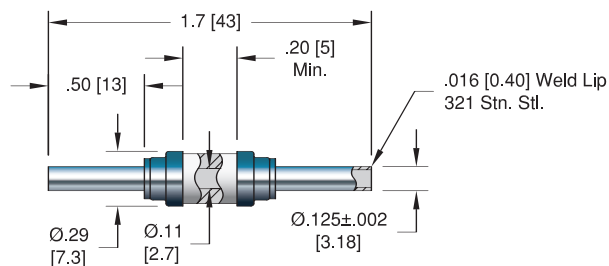
## Typical Isolator Construction



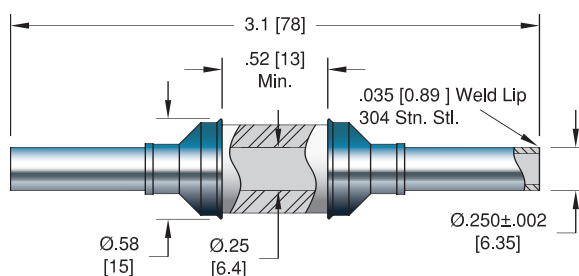
Type	Voltage DC	Pressure Rating (@ 20° C)	Temperature Range	Isolator ID (inches)	Sub-section	Section Pages
	to 13 kV	to 1000 psig	-269°C to 450°C	.11 to .41	Cryogenic	E.1 156-157
	5 kV	to 450 psig	0°C to 100°C	.32 to .57	Water	E.2 158-159
	to 75 kV	to 900 psig	-269°C to 450°C	.31 to 8.0	Vacuum	E.3 160-167



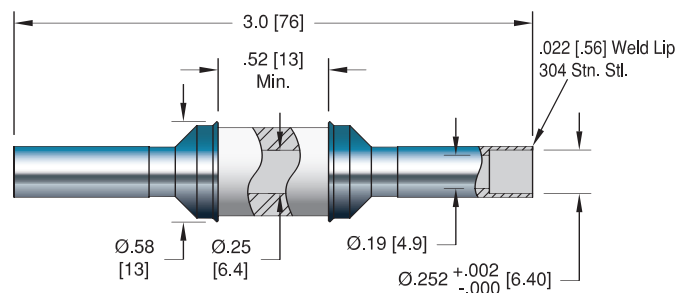
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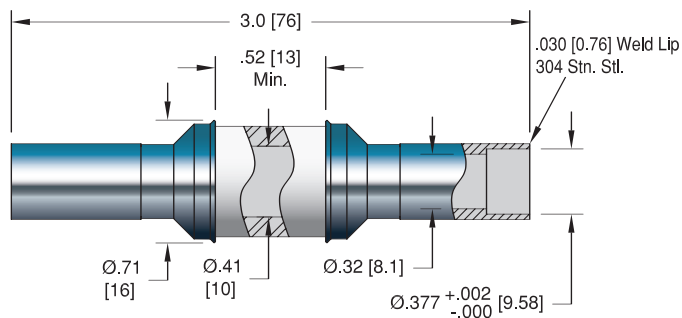
Cryogenic - ID: .25 [6.4]



Cryogenic - ID: .25 [6.4]



Cryogenic - ID: .41 [10]



## Specifications

### Materials

#### Tube:

- .11 ID: 321 Stainless steel
- .25 ID: 304 Stainless steel
- .41 ID: 304 Stainless steel

#### Cap: 42 Nickel iron

Insulation: Alumina ceramic

Magnetic Materials: Yes

**Voltage Rating** See table

**Temperature Range** -269°C to 450°C

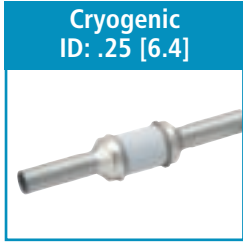
**Pressure @ 20°C** See table



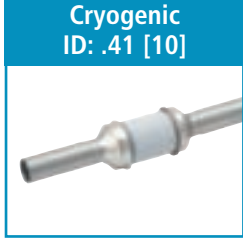
VOLTAGE DC	INSTALLATION	PRESSURE		PART NUMBER
		PSIG	BAR	
6 kV	Weld	1000	68	0858-01-W



13 kV	Weld	900	61	17108-01-W
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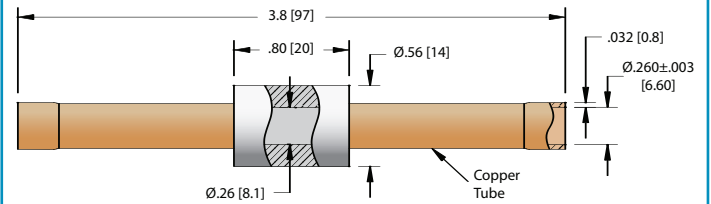
13 kV	Weld	900	61	8002-01-W
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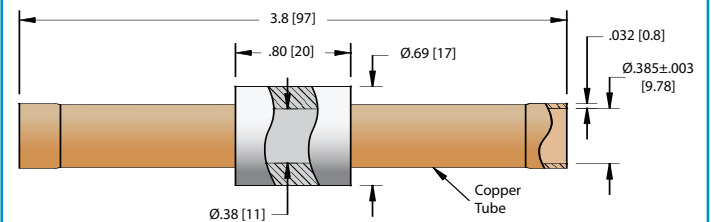
13 kV	Weld	400	27	8002-02-W
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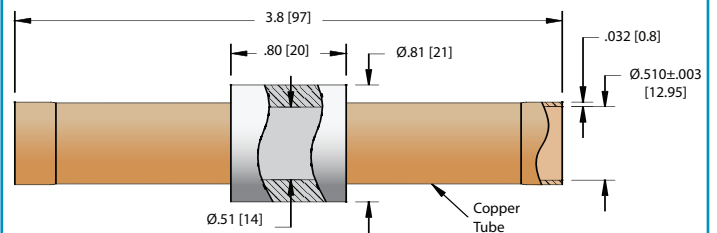
Water - ID: .26 [8.1]



Water - ID: .38 [11]



Water - ID: .51 [14]



## Specifications

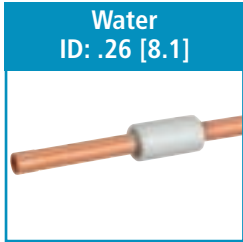
### Materials

Tube: Copper  
 Insulation: Alumina ceramic  
 Magnetic Materials: No

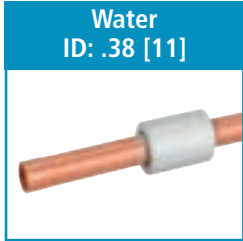
**Voltage Rating** 5 kV DC

**Temperature Range** 0°C to 100°C

**Pressure @ 20°C** See table



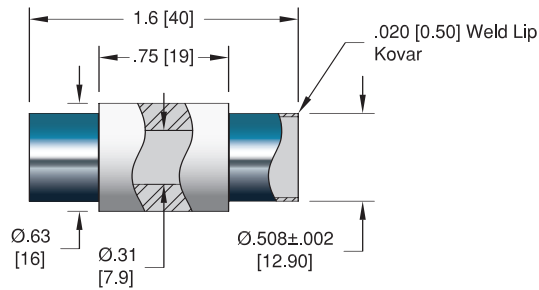
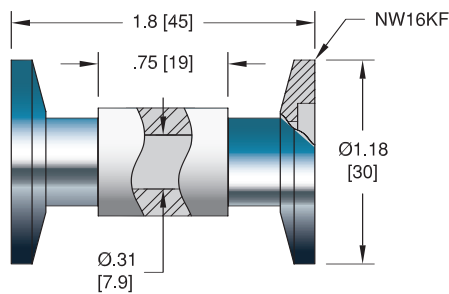
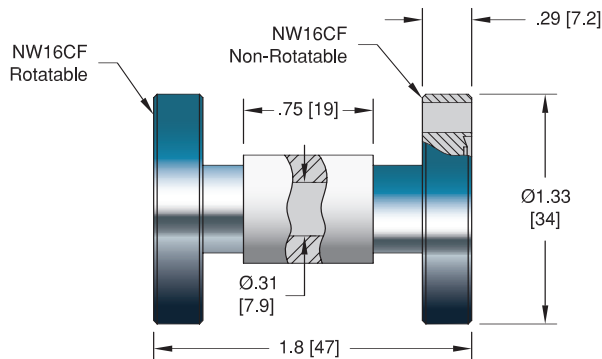
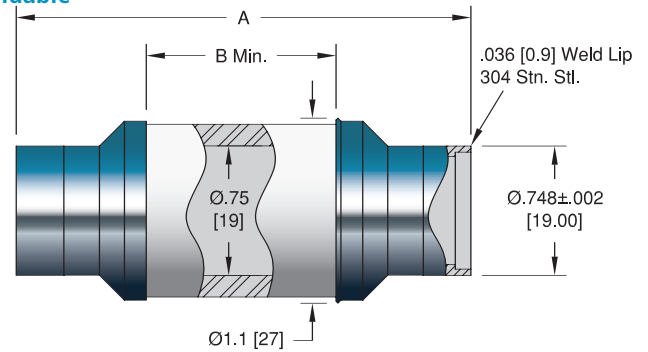
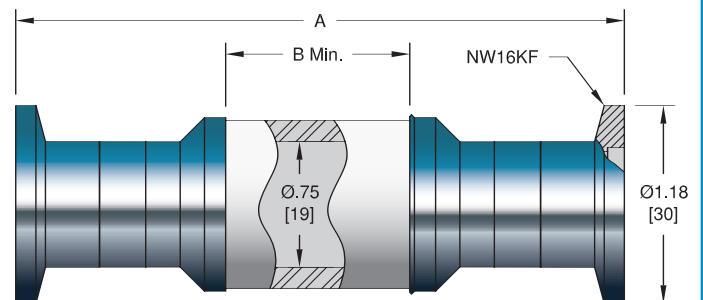
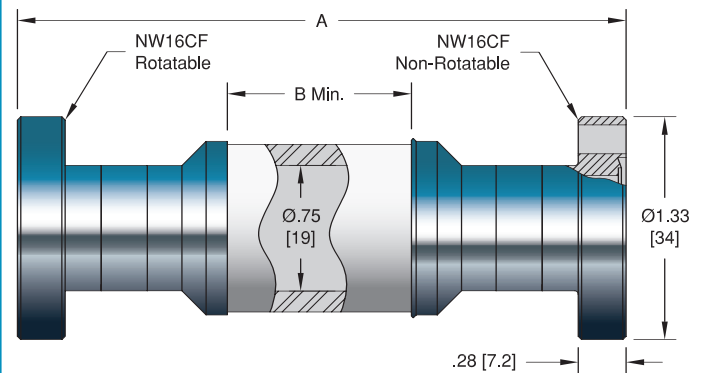
VOLTAGE DC	INSTALLATION	PRESSURE @ 20°C		PART NUMBER
		PSIG	BAR	
5 kV	Braze or Solder	450	30	17228-01-B



5 kV	Braze or Solder	300	20	17229-01-B
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5 kV	Braze or Solder	200	13	17230-01-B
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**Insulator ID: .31 [7.9]****Weldable****ISO KF****ConFlat****Insulator ID: .75 [19]****Weldable****ISO KF****ConFlat****Specifications - Insulator ID: .31 [7.9]****Materials**

Tube: Kovar  
 Insulation: Alumina ceramic  
 Magnetic Materials: Yes

**Voltage Rating** 15 kV DC**Temperature Range** -55°C to 450°C, ISO KF -25°C to 205°C**Pressure @ 20°C** See table**Specifications - Insulator ID: .75 [19]****Materials**

Tube: Stainless steel  
 Insulation: Alumina ceramic  
 Magnetic Materials: See table

**Voltage Rating** See table**Temperature Range** See table**Pressure @ 20°C** See table





VOLTAGE DC	INSTALLATION	PRESSURE @ 20 °C BAR		PART NUMBER
15 kV	Weld	900	61	9997-05-W



ISO FLANGE				
15 kV	NW16KF	-	-	17235-01-KF



CONFLAT FLANGE				
15 kV	1 1/3" (NW16CF)	900	61	4511-01-CF



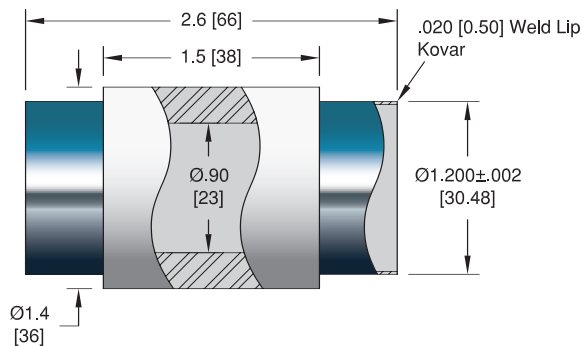
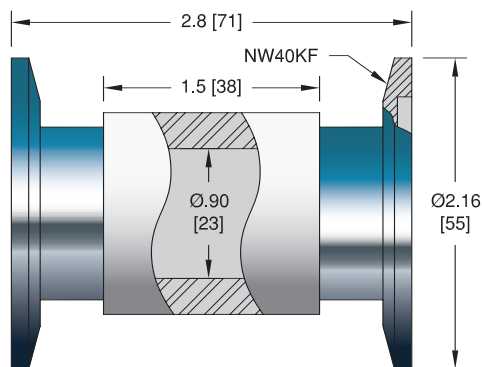
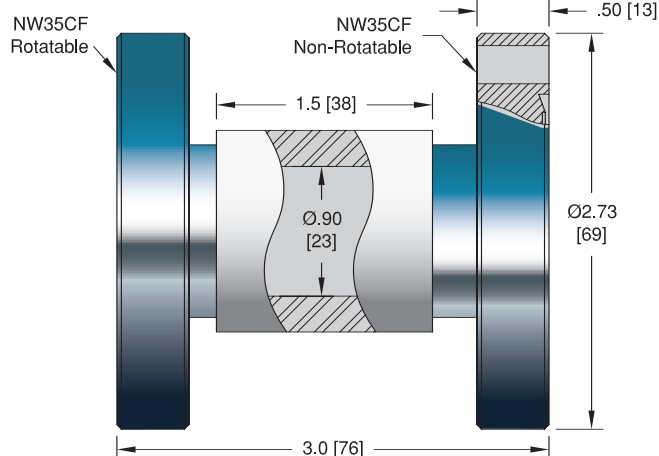
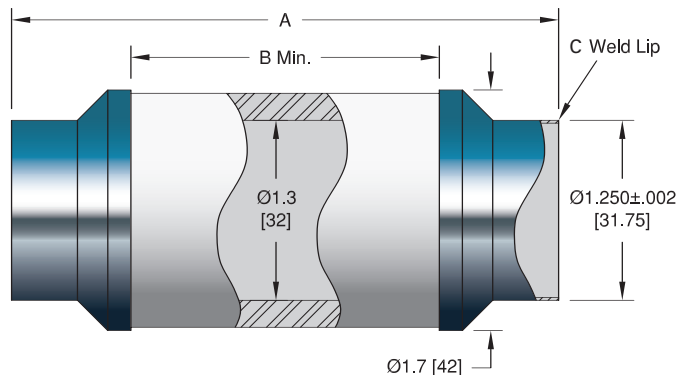
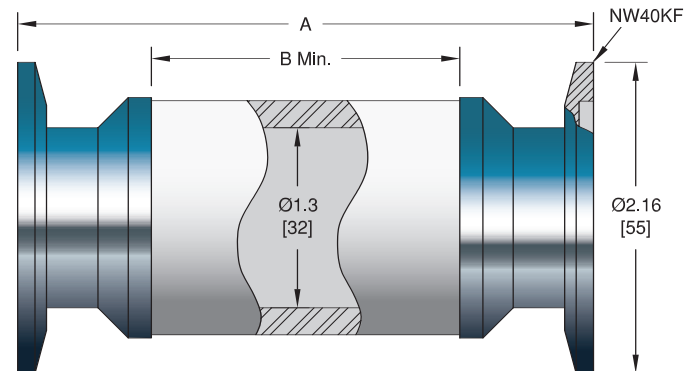
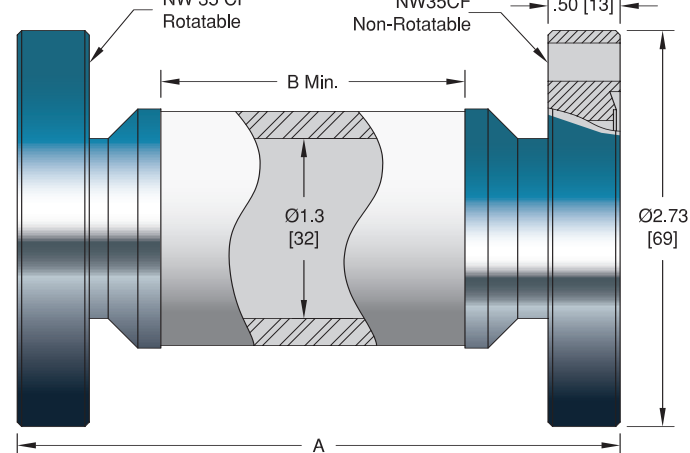
VOLTAGE DC	INSTALLATION	DIMENSIONS A B		PRESSURE @ 20 °C PSIG BAR		TEMP °C MIN MAX		MAGNETIC MATERIALS	PART NUMBER
6 kV	Weld	1.9 [48]	0.25 [6.3]	500	34	-55	450	Yes	9998-04-W
20 kV	Weld	2.6 [67]	1.0 [25]	500	34	-55	450	Yes	9998-01-W
35 kV	Weld	3.6 [92]	2.0 [51]	500	34	-55	450	Yes	9998-03-W
6 kV	Weld	1.9 [48]	0.25 [6.3]	350	24	-269	450	No	9998-06-W
20 kV	Weld	2.6 [67]	1.0 [25]	350	24	-269	450	No	9998-07-W
35 kV	Weld	3.6 [92]	2.0 [51]	350	24	-269	450	No	9998-08-W



ISO FLANGE									
6 kV	NW16KF	2.9 [73]	0.25 [6.3]	-	-	-25	205	Yes	17236-01-KF
20 kV	NW16KF	3.6 [92]	1.0 [25]	-	-	-25	205	Yes	17236-02-KF
35 kV	NW16KF	4.6 [118]	2.0 [51]	-	-	-25	205	Yes	17236-03-KF
6 kV	NW16KF	2.9 [73]	0.25 [6.3]	-	-	-25	205	No	17236-04-KF
20 kV	NW16KF	3.6 [92]	1.0 [25]	-	-	-25	205	No	17236-05-KF
35 kV	NW16KF	4.6 [118]	2.0 [51]	-	-	-25	205	No	17236-06-KF



CONFLAT FLANGE									
6 kV	1 1/3" (NW16CF)	2.9 [73]	0.25 [6.3]	500	34	-55	450	Yes	8000-04-CF
20 kV	1 1/3" (NW16CF)	3.6 [92]	1.0 [25]	500	34	-55	450	Yes	8000-02-CF
35 kV	1 1/3" (NW16CF)	4.6 [118]	2.0 [51]	500	34	-55	450	Yes	8000-03-CF
6 kV	1 1/3" (NW16CF)	2.9 [73]	0.25 [6.3]	350	24	-269	450	No	8000-06-CF
20 kV	1 1/3" (NW16CF)	3.6 [92]	1.0 [25]	350	24	-269	450	No	8000-07-CF
35 kV	1 1/3" (NW16CF)	4.6 [118]	2.0 [51]	350	24	-269	450	No	8000-08-CF

**Insulator ID: .90 [23]****Weldable****ISO KF****ConFlat****Insulator ID: 1.3 [32]****Weldable****ISO KF****ConFlat****Specifications - Insulator ID: .90 [23]****Materials**

Tube: Kovar  
 Insulation: Alumina ceramic  
 Magnetic Materials: Yes

**Voltage Rating** 30 kV DC**Temperature Range** -55°C to 450°C, ISO KF -25°C to 205°C**Pressure @ 20°C** See table**Specifications - Insulator ID: 1.3 [32]****Materials**

Tube: Kovar or 304 stainless steel  
 Insulation: Alumina ceramic  
 Magnetic Materials: See table

**Voltage Rating** See table**Temperature Range** See table**Pressure @ 20°C** See table

**Weldable**  
ID: .90 [23]



VOLTAGE DC	INSTALLATION	PRESSURE @ 20 °C		PART NUMBER
		PSIG	BAR	
30 kV	Weld	360	24	9997-09-W

**ISO KF**  
ID: .90 [23]



**ISO FLANGE**

30 kV	NW40KF	-	-	17237-01-KF
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**ConFlat**  
ID: .90 [23]



**CONFLAT FLANGE**

30 kV	2 3/4" (NW35CF)	360	24	4511-02-CF
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**Weldable**  
ID: 1.3 [32]



VOLTAGE DC	INSTALLATION	DIMENSIONS			PRESSURE @ 20 °C		TEMP °C		MAGNETIC MATERIALS	PART NUMBER	
		A	B	C	PSIG	BAR	MIN	MAX			
5 kV	Weld	1.9 [49]	0.6 [4.0]	.020 [0.50]	Kovar	350	24	-55	450	Yes	9999-03-W
35 kV	Weld	3.8 [96]	2.0 [50]	.020 [0.50]	Kovar	350	24	-55	450	Yes	9999-01-W
65 kV	Weld	5.7 [144]	3.9 [99]	.020 [0.50]	Kovar	350	24	-55	450	Yes	9999-04-W
5 kV	Weld	1.9 [49]	0.6 [4.0]	.035 [0.90]	Stn.Stl.	250	17	-269	450	No	17199-01-W
35 kV	Weld	3.8 [96]	2.0 [50]	.035 [0.90]	Stn.Stl.	250	17	-269	450	No	17199-02-W
65 kV	Weld	5.7 [144]	3.9 [99]	.035 [0.90]	Stn.Stl.	250	17	-269	450	No	17199-03-W

**ISO KF**  
ID: 1.3 [32]



**ISO FLANGE**

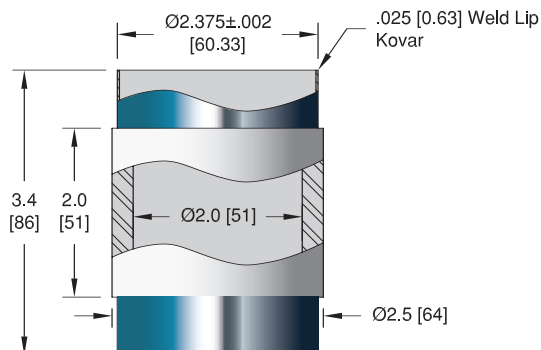
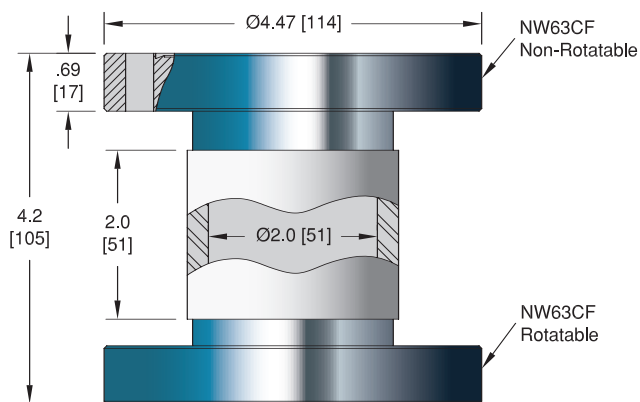
5 kV	NW40KF	2.1 [54]	0.16 [4.0]	-	-	-	-	-25	205	Yes	17238-01-KF
35 kV	NW40KF	4.0 [101]	2.0 [50]	-	-	-	-	-25	205	Yes	17238-02-KF
65 kV	NW40KF	5.9 [149]	3.9 [99]	-	-	-	-	-25	205	Yes	17238-03-KF
5 kV	NW40KF	2.1 [54]	0.16 [4.0]	-	-	-	-	-25	205	No	17238-04-KF
35 kV	NW40KF	4.0 [101]	2.0 [50]	-	-	-	-	-25	205	No	17238-05-KF
65 kV	NW40KF	5.9 [149]	3.9 [99]	-	-	-	-	-25	205	No	17238-06-KF

**ConFlat**  
ID: 1.3 [32]



**CONFLAT FLANGE**

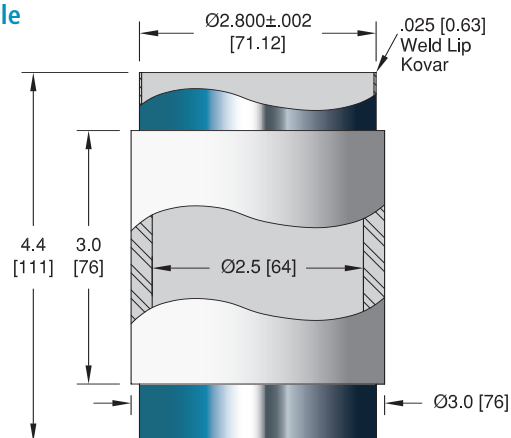
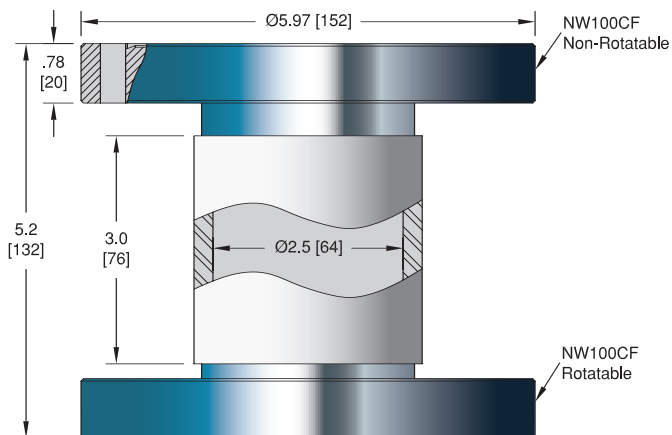
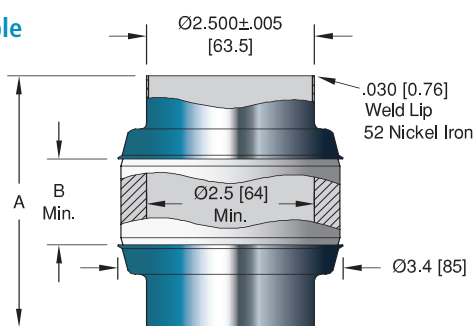
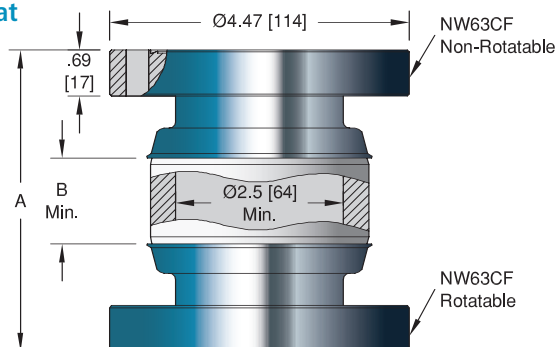
5 kV	2 3/4" (NW35CF)	2.3 [59]	0.16 [4.0]	-	350	24	-55	450	Yes	8001-03-CF
35 kV	2 3/4" (NW35CF)	4.2 [107]	2.0 [50]	-	350	24	-55	450	Yes	8001-02-CF
65 kV	2 3/4" (NW35CF)	6.1 [155]	3.9 [99]	-	350	24	-55	450	Yes	8001-04-CF
5 kV	2 3/4" (NW35CF)	2.3 [59]	0.16 [4.0]	-	250	17	-269	450	No	8001-06-CF
35 kV	2 3/4" (NW35CF)	4.2 [107]	2.0 [50]	-	250	17	-269	450	No	8001-07-CF
65 kV	2 3/4" (NW35CF)	6.1 [155]	3.9 [99]	-	250	17	-269	450	No	8001-08-CF

**Insulator ID: 2.0 [51]****Weldable****ConFlat****Specifications - Insulator ID: 2.0 [51]****Materials**

Tube: Kovar  
 Insulation: Alumina ceramic  
 Magnetic Materials: Yes

**Voltage Rating** 40 kV DC**Temperature Range** -55°C to 450°C**Pressure @ 20°C** 180 PSIG (12 Bar)**Specifications - Insulator ID: 2.5 [64]****Materials**

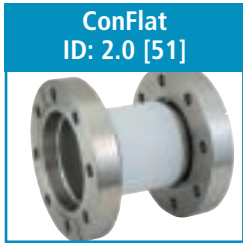
Tube: Kovar or 52 Nickel iron  
 Insulation: Alumina ceramic  
 Magnetic Materials: Yes

**Voltage Rating** See table**Temperature Range** See table**Pressure @ 20°C** See table**Insulator ID: 2.5 [64]****Weldable****ConFlat****Weldable****ConFlat**



VOLTAGE DC	INSTALLATION
40 kV	Weld

PART NUMBER
9997-21-W

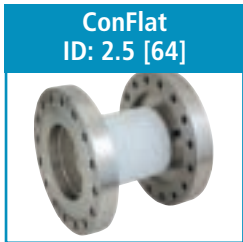


CONFLAT FLANGE		
40 kV	4 1/2" (NW63CF)	4511-03-CF



VOLTAGE DC	INSTALLATION	PRESSURE @ 20 °C		TEMP °C	
		PSIG	BAR	MIN	MAX
60 kV	Weld	150	10	-55	450

PART NUMBER
9997-25-W

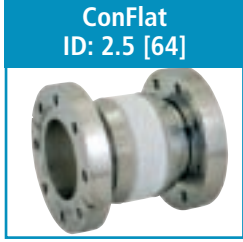


CONFLAT FLANGE		
60 kV	6" (NW100CF)	4511-05-CF

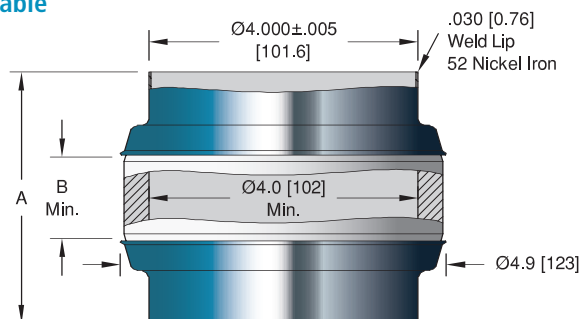
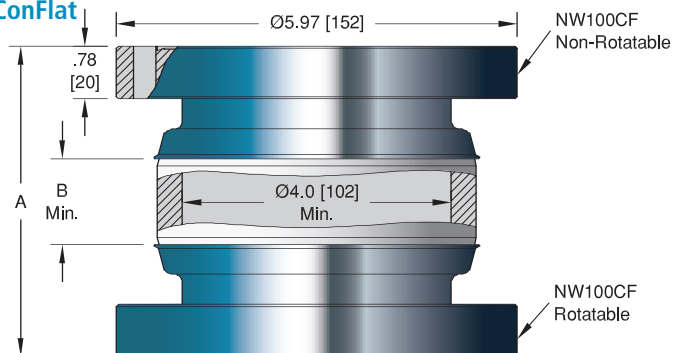
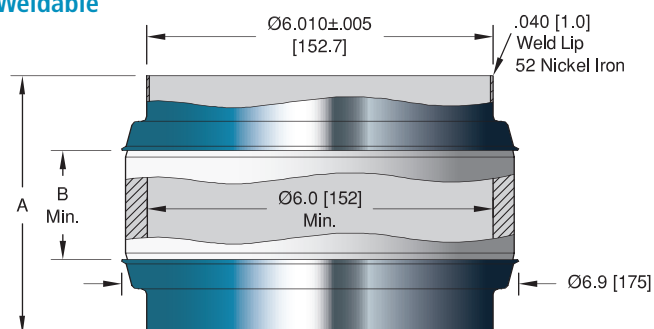
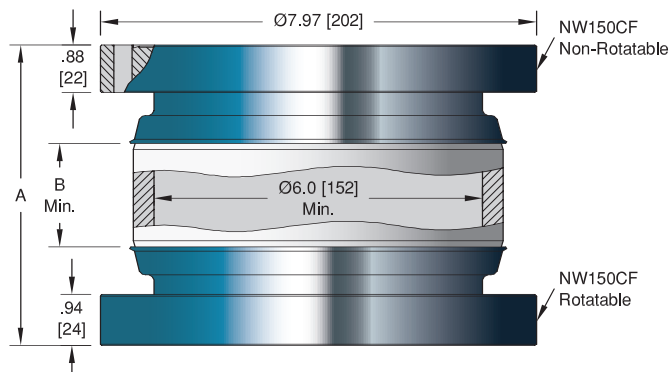
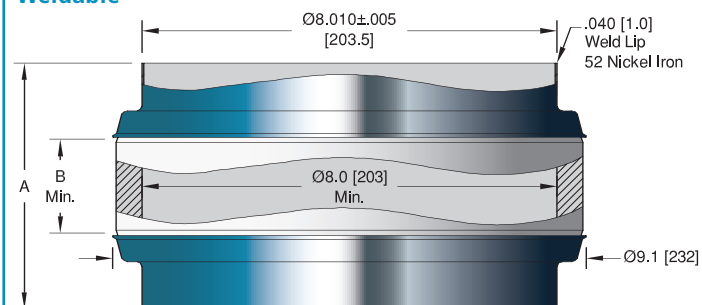
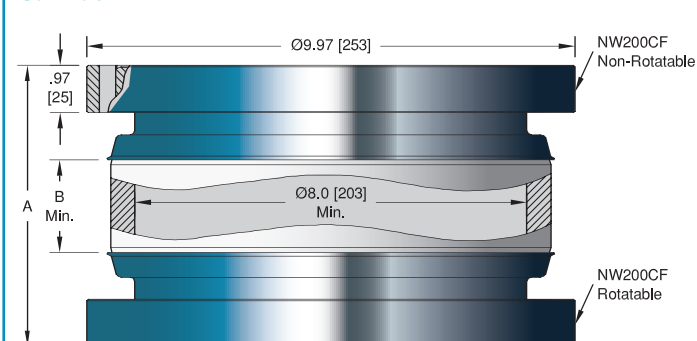


VOLTAGE DC	INSTALLATION	DIMENSIONS		PRESSURE @ 20 °C		TEMP °C	
		A	B	PSIG	BAR	MIN	MAX
20 kV	Weld	3.7 [95]	0.90 [22.8]	80	5	-269	450
60 kV	Weld	6.5 [165]	3.65 [92.7]	80	5	-269	450

PART NUMBER
17140-01-W
17140-02-W



CONFLAT FLANGE		
20 kV	4 1/2" (NW63CF)	17144-01-CF
60 kV	4 1/2" (NW63CF)	17144-02-CF

**Insulator ID: 4.0 [102]****Weldable****ConFlat****Insulator ID: 6.0 [152]****Weldable****ConFlat****Insulator ID: 8.0 [203]****Weldable****ConFlat****Specifications****Materials**

Tube: 52 Nickel iron

Insulation: Alumina ceramic

Magnetic Materials: Yes

**Voltage Rating** See table**Temperature Range** -269°C to 450°C**Pressure @ 20°C**

Insulator ID: 4.0 [102] – 60 PSIG (4 Bar)

Insulator ID: 6.0 [152] – 40 PSIG (2.7 Bar)

Insulator ID: 8.0 [203] – 30 PSIG (2 Bar)



VOLTAGE DC	INSTALLATION	DIMENSIONS		PART NUMBER
		A	B	
20 kV	Weld	3.7 [95]	0.90 [22.8]	17141-01-W
60 kV	Weld	6.5 [165]	3.65 [92.7]	17141-02-W



**CONFLAT FLANGE**

20 kV	6" (NW100CF)	4.6 [117]	0.90 [22.8]	17145-01-CF
60 kV	6" (NW100CF)	7.4 [187]	3.65 [92.7]	17145-02-CF



VOLTAGE DC	INSTALLATION	DIMENSIONS		PART NUMBER
		A	B	
30 kV	Weld	4.5 [114]	1.5 [38]	17142-01-W
55 kV	Weld	6.0 [152]	3.0 [76]	17142-02-W
75 kV	Weld	7.5 [191]	4.5 [114]	17142-03-W



**CONFLAT FLANGE**

30 kV	8" (NW150CF)	5.5 [140]	1.5 [38]	17146-01-CF
55 kV	8" (NW150CF)	7.0 [178]	3.0 [76]	17146-02-CF
75 kV	8" (NW150CF)	8.5 [216]	4.5 [114]	17146-03-CF



VOLTAGE DC	INSTALLATION	DIMENSIONS		PART NUMBER
		A	B	
30 kV	Weld	4.75 [121]	1.5 [38]	17143-01-W
55 kV	Weld	6.25 [159]	3.0 [76]	17143-02-W
75 kV	Weld	7.75 [197]	4.5 [114]	17143-03-W



**CONFLAT FLANGE**

30 kV	10" (NW200CF)	5.8 [146]	1.5 [38]	17147-01-CF
55 kV	10" (NW200CF)	7.3 [184]	3.0 [76]	17147-02-CF
75 kV	10" (NW200CF)	8.8 [222]	4.5 [114]	17147-03-CF