

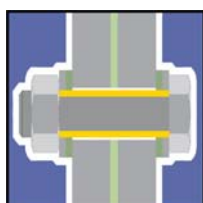


General Information

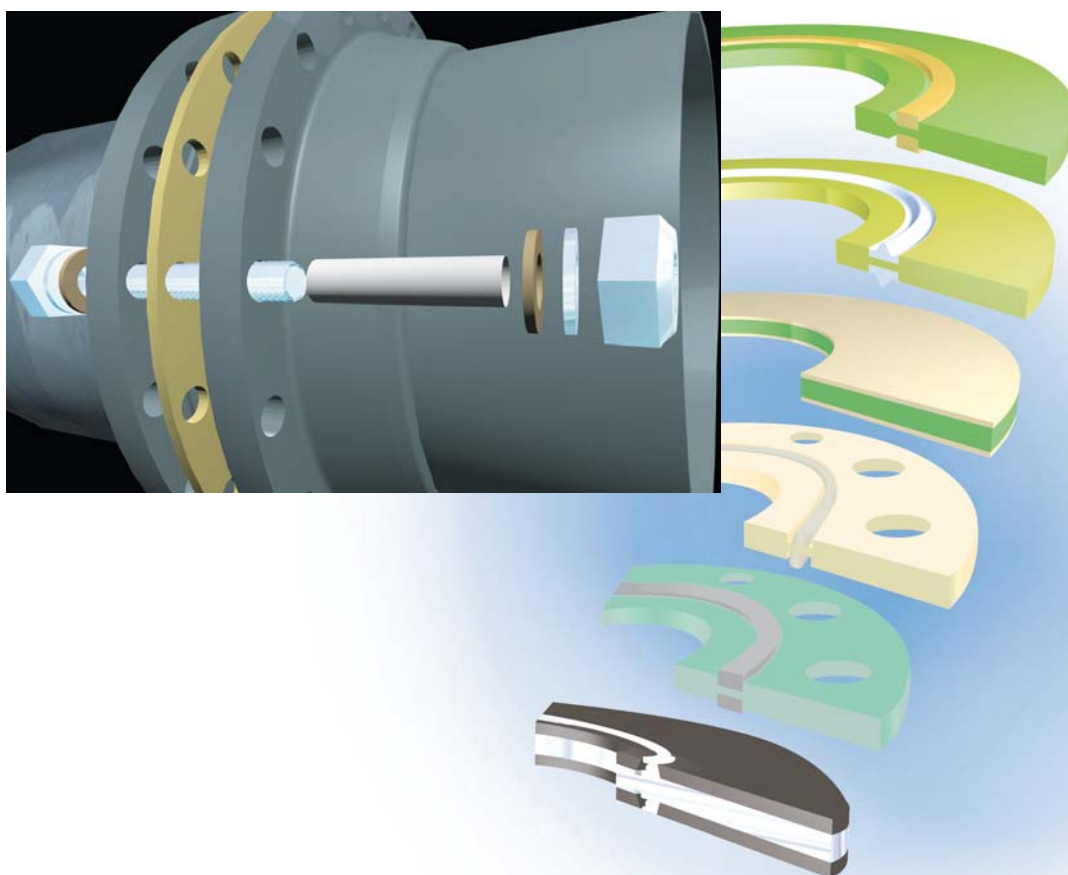
Selection Guide

Technical Data

Installation Instruction



PSI Flange Isolation - Accessories



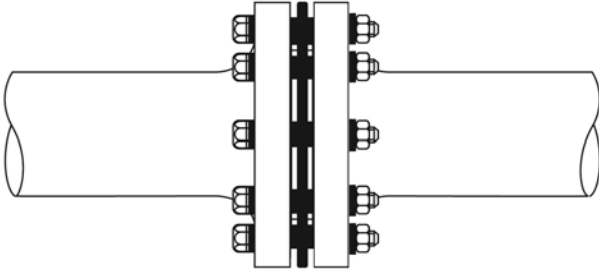
Pipeline Accessories

PSI Flange Isolation Accessories

General Information



Flange connection for electrical isolation and against contact corrosion



Double Washer Set

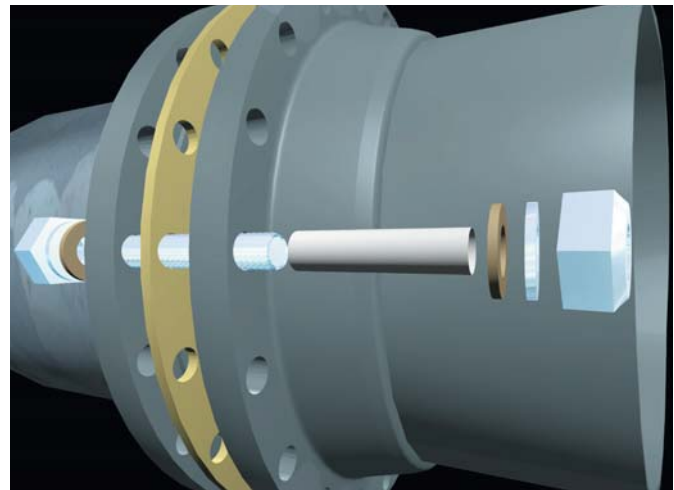
Double washer configurations may be used for added protection against the possibility of “shorting out” the nuts and bolts. In addition, double washer sets electrically isolate the nuts and bolts from both flanges. Another important reason is to protect several flange metal qualities against contact corrosion.

With PSI flange isolation sets it is possible to turn a normal flange connection into an isolation joint. The applications are not restricted to new flange joints. PSI flange isolation is also suitable for retrofitting existing joints easily and quickly without having to modify the joint.

PSI flange isolation sets are available to fit all standards, sizes and pressure ratings.

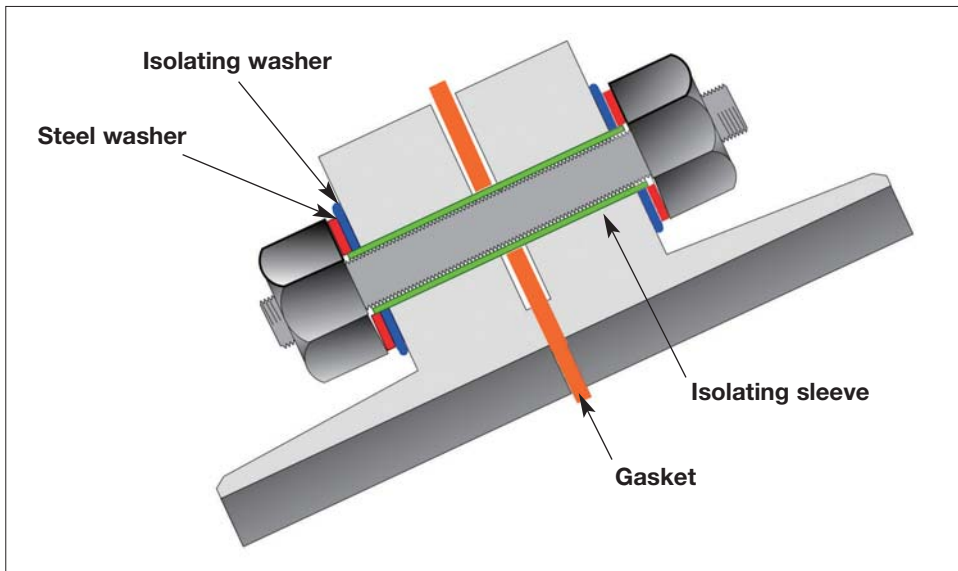
The isolating gaskets can be delivered without the isolating set (only) or with isolating set (DW). One isolating set DW consists of one bolt sleeve, 2 isolating washer and 2 steel washers per screw hole.

PSI flange isolation kits can be provided for non-standard flanges (incl. extra sleeve length).



PSI Flange Isolation Kits

Sleeves and washers



Isolating Sleeves

Isolating sleeves are available in the following materials:

- Mylar
- Nomex 410
- Phenolic
- Glimmer ST / HLT
- G – 7 silicone glass
- G – 10 epoxy glass

Designed to easily fit over standard size flange bolts/studs within standard size bolt holes. PSI isolating sleeves have a wall thickness of 0.3 - 0.8 mm and are used with separate isolating and steel washers. They are available for standard American bolt sizes from 1/2" (12.7 mm) to 3 1/2" (88.9 mm) as well as metric bolt sizes from M12 to M52 and larger. Other sizes on request.

Isolier Washers

Isolating washers are available in the following materials:

- Phenol
- G – 7 silicone glass
- G – 10 epoxy glass
- Glimmer ST / HLT

Designed to provide strong, positive isolation. They are made to slide over the isolating sleeves. PSI isolating washers are available for bolt sizes from 1/2" (12.7 mm) to 3 1/2" (88.9 mm) as well as metric bolt sizes from M12 to M52 and larger. Other sizes on request.



Steel Washers

Steel washers are designed to slide over the isolating sleeve.

Steel washers are available in the following materials:

- Carbon steel, hot rolled steel galvanised (standard isolating kit)
- Stainless steel, hot rolled stainless steel (special isolating kit)

PSI Screw Isolation

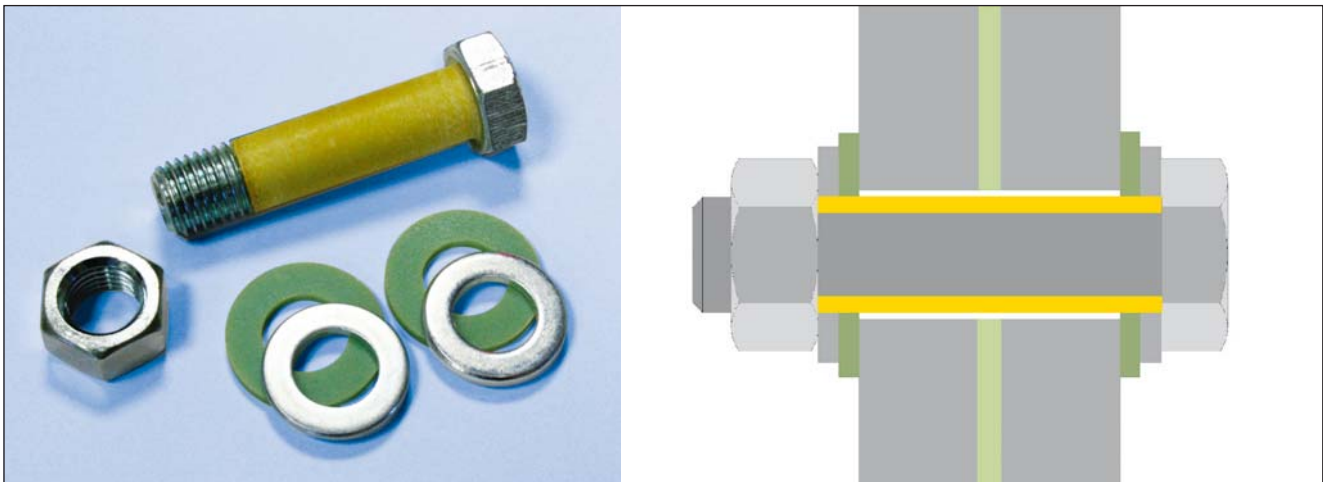
Isolation screws/ -bolts



- Advantages:**
- optimum electrical disconnection
 - extreme firmness
 - no increase of the screw diameter
 - ideal for application on site

Isolation screws respectively for flange isolations for applications up to 200°C.
 (Isolation screws respectively for flange isolations for applications up to 290°C on request)

Screw bolts according to DIN 1025 and special screws on request.
 Screw dimensions analogous to the DIN/ANSI-flange standards.
 Screw material: quality class 5.6, 8.8 CK35, 42 CrMo4, UNC – special material on request.



Isolation

Characteristic data		Testing method	Unit	Values
material	epoxy/glass			
colour	white/yellow			
glass fibre per cm				30
breaking load in B-stage			N/cm	>2,000
breaking load after curing	min.		N/cm	>2,500
resilience module			Mpa	ca. 50,000
permanent operating temperatur			°C	180
specific volume resistance			Ω/cm	10ex14
isolation resistance at dipping in water		IEC168	Ohm	1x10ex12
water absorption		ISO 62/1	mg	<20

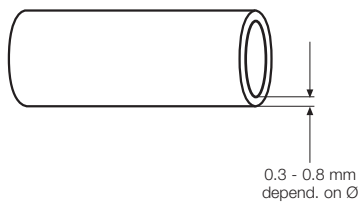
Production:

Screw and threaded bolt respectively is dressed to size to the valid diameter and afterwards covered with epoxy resin glass fibre coating. The epoxy glass fibre coating will be cured through heat and adequately calibrated by finishing.

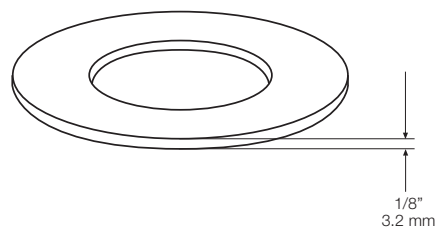
PSI Flange Isolation Spare Parts



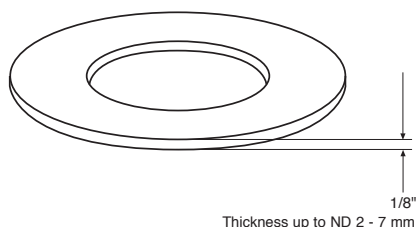
Bolt Sleeves



Isolating washers



Steel washers



Mylar

Standard:	spiral wound polyester	
Dielectrical strength:	DIN/VDE 0303 T2/ICE 243	280,000 V/mm
Water absorption:	DIN 53495	< 0.8%
Operating temp.:	DIN VDE 0304 part 2	- 40 °C to + 130 °C

Nomex 410

Special:	Armid spiral wound paper	
Dielectrical strength:	DIN/VDE 0303 T2/ICE 243	22,500 V/mm
Water absorption:	DIN 53495	< 0.1%
Operating temp.:	DIN VDE 0304 part 2	- 196 °C to + 220 °C

Glimmer ST

High temperature version:	Glimmer	
Dielectric strength:	DIN/VDE 0303 T2/IEC 243	25,000 V/mm
Water absorption:	DIN 53495	< 0.5%
Operating temp.:	DIN VDE 0304 part 2	+23 °C to +371 °C

Glimmer HLT

High temperature Version:	Glimmer	
Dielectrical strength:	DIN/VDE 0303 T2/IEC 243	25,000 V/mm
Water absorption:	DIN 53495	< 0.5%
Operating temp.:	DIN VDE 0304 part 2	-250 °C to +600 °C

Isolating washers

Standard version for Phenolic gaskets and GLV-UniSeal		
Standard:	laminated phenolic resin	
Dielectrical strength:	DIN/VDE 0303 Teil 2/IEC 243	20,000 V/mm
Water absorption:	DIN 53495	max. 1.6%
max. operating temp.:	DIN VDE 0304 part 2	+20 °C to +120 °C

Isolating washers G10

Standard:	Epoxy resin glass fabric	
Dielectrical strength:	DIN/VDE 0303 Teil 2/IEC 243	20,000 V/mm
Water absorption:	DIN 53495	< 1.0%
Operating temp.:	DIN VDE 0304 part 2	-60 °C to +130 °C

Isolating washers G7

Special:	Silicone resin glass fabric	
Dielectric strength:	DIN/VDE 0303 T2/IEC 243	10,100 V/mm
Water absorption:	DIN 53495	< 0.13 %
Operating temp.:	DIN VDE 0304 part 2	- 60 °C to +180 °C

Isolating washers Glimmer ST

High temperature version:	Glimmer	
Dielectric strength:	DIN/VDE 0303 T2/IEC 243	25,000 V/mm
Water absorption:	DIN 53495	< 0.5 %
Operating temp.:	DIN VDE 0304 part 2	+23 °C to +371 °C

Isolating washers Glimmer HLT

High temperature Version:	Glimmer	
Dielectrical strength:	DIN/VDE 0303 T2/IEC 243	25,000 V/mm
Water absorption:	DIN 53495	< 0.5 %
Operating temp.:	DIN VDE 0304 part 2	-250 °C to +600 °C

Steel washers

Standard:	carbon steel hot rolled steel galvanised
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Steel washers (V4A)

Special:	hot rolled stainless steel
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The I.D. of the steel washers corresponds to the O.D. of the bolt-sleeves. Isolating gaskets, -sleeves and -washers can be combined with each other according to temperature.

Standard isolating kit DW

Bolt-sleeve:	Mylar
Isolating washer:	laminated Phenol
Steel washers:	Carbon steel

Special isolating kit DW

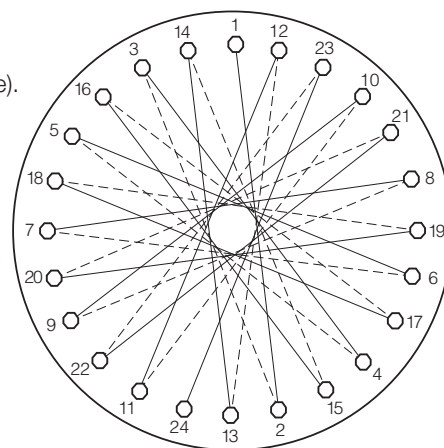
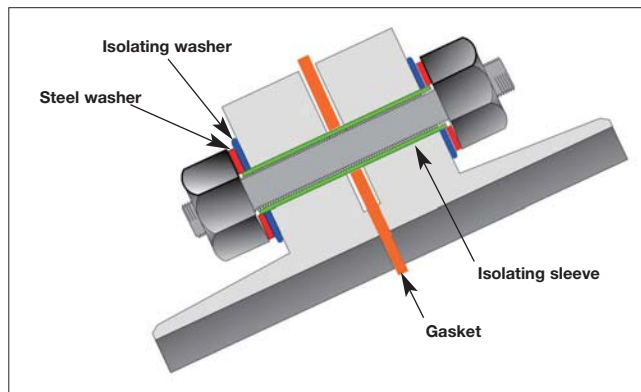
Bolt-sleeve:	Mylar/Nomex/Glimmer
Isolating washer:	G10/G7/Glimmer
Steel washers:	Stainless steel

PSI Flange Isolation Installation Instruction



How to tighten the flange bolts

1. Clean flanges.
2. Insert gasket between flange faces.
3. Insert isolating sleeves in bolt holes.
Isolation sleeve length to be calculated as follows:
2x flange thickness including raised face + 1x thickness of the flange isolation + 2x thickness of the isolation washer
4. (If using stud bolts run one nut on one end until end of nut is flush with stud bolt). Place one steel washer and one isolating washer over bolt and insert in bolt hole.
5. Fit one isolating washer and one steel washer on protruding bolt end. Hand-tighten the nuts.
6. In order to achieve an even distribution of pressure at the flange sealing ring we recommend to tighten the bolts as shown above until the flange faces and the sealing ring are in contact.
7. Tighten bolts alternately across the diameter of the flange (see drawing above).
8. Always use torque wrench to ensure even tightening.
9. Do not overtighten or leakage may occur.
10. Ensure that bolts are well lubricated. No grease on sealing surfaces.



The example shows 24 bolts. With flanges having a different number of bolts you should generally follow the same procedure.

In order to achieve an even distribution of pressure at the flange sealing ring we recommend tightening the bolts as shown above until the flange faces and the sealing ring are in contact.

Please take the torque moments from the chart below.

Please ensure that the bolts are greased/lubricated sufficiently so as to avoid damage to the threads by friction. In gas applications, it is advisable to use a PTFE based grease to ensure good readings when measuring gas with gasometers.

Metric Size	Tightening torque (Nm)						INCH Size	Tightening torque (Nm) A 193 B7
	5.6 Ck 35	8.8	10.9	12.9	A2 - 70	42 CrMo 4 A 320 L7M 40 CrMoV 47		
M4	1	3	4	5	2	2		
M5	3	6	8	10	4	4		
M6	5	10	15	17	7	6		
M8	10	24	36	42	17	15		
M10	21	50	70	85	34	30		
M12	37	85	120	145	59	52	1/2 -13 UNC	80
M16	90	210	300	350	145	128	5/8 -11 UNC	160
M20	180	410	570	690	280	264	3/4 -10 UNC	320
M22	240	550	780	940	380	360	7/8 -9 UNC	480
M24	310	700	1,000	1,200	480	456	1 -8 UNC	750
M27	450	1,050	1,480	1,775	-	672	1-1/8 -7 UNC	1,050
M30	610	1,400	2,000	2,400	-	912	1-1/4 -7 UNC	1,450
M33	830	1,900	2,700	3,250	-	1,240	1-3/8 -6 UNC	1,900
M36	1,060	2,500	3,450	4,200	-	1,600	1-1/2 -6 UNC	2,500
M39	1,380	3,200	4,500	5,400	-	2,080	1-3/4 -8 UNC	4,600
M42	1,700	4,000	5,600	6,700	-	2,560	2 -8 UNC	8,400
M45	2,120	5,000	7,000	8,400	-	3,200	2-1/4 -8 UNC	9,800
M48	2,570	6,000	8,450	10,150	-	3,840		
M52	3,310	7,750	10,800	13,000	-	4,960		
M56	4,120	9,600	13,500	16,200	-	6,200		
M60	5,130	12,000	16,800	20,200	-	7,680		

The max. tightening torques are calculated at 85 % of the apparent yield point with coefficient to friction from $\mu = 0.140$ slightly lubricated.

If relatively soft and flexible gaskets are used and tightened in a cold condition, the sealing material may relax when the system is put into operation, and the bolts may turn loose. We therefore recommend to retighten the bolts after the operating temperature has been reached - if possible without the operating pressure and at ambient temperature. In any case the bolts should be checked and re-tightened, if required, after the initial operation and before bringing the system back from ambient temperature to the operating temperature.

Warning!

The utilization of a screw recommended ≥ 8.8 with the max. tightening torque on DIN- flanges could deform the flange face. We advise to use 80% of the max. tightening torque for the bolts.

PSI Flange Isolation Order / Inquiry



Inquiry Order No. _____

Required ordering details

Operating condition	Flange
Medium	Standard type (DIN, EN, ANSI/ASME, RTJ, etc)
Operating temp. (°C)	Dimension (ND, inch)
Working pressure (bar, lbs)	Pressure rate (PN, Class)
Test pressure (bar, lbs)	

PSI Flange Isolation

- * only: only gasket without washers or sleeves
- ** DW: gasket, per bolt one isolating sleeve, 2 isolating washers and 2 steel washers
- ***Material combination (see next diagram)

Standard Isolating Kit DW	Special Isolating Kit DW several possible combination
Bolt sleeves: Mylar	Bolt sleeves: Mylar/Nomex/Glimmer
Isolating washer: laminated Phenolic	Isolating washer: G10/G7/Glimmer
Steel washers: carbon steel	Steel washers: stainless steel

Selection **just** for
Isolating Kit according
to flange information



Gasket Type E (FF)
Sealing gasket with screw bolt holes according to the flange standard (Full Face)



Gasket Type F (IBC)
Sealing gasket with screw bolt holes according to the flange standard (I.B.C.)

Type selection	Type E / F	Retrainer	Seal	only*	Isolating Kit		pcs.
					DW** Standard	Special***	
GLV-UniSeal® T		-	-				
GLV-UniSeal® GGr		-	-				
Rubber Faced Phenolic		-	-				
LineBacker®							
GasketSeal®							
LineSeal™							
EPDM		-	-				
Requested approvals (DVGW, KTW, TA-Luft-Konform, BAM, etc)							
Requested min. leak age rate							

PSI Screw Isolation

Bolt sleeves	Selection special***	without flange information	
		Screw dimension (ND / inch)	pcs. (m)/[piece(length)]
Mylar			
Nomex 410			
Glimmer ST			
Glimmer HLT			
Laminated Phenol			
G - 7			
G - 10			

Special Isolating Kit DW***
pcs. kit

Standard Isolating Kit DW
pcs. kit

PSI Flange Isolation

Order / Inquiry



Isolating washers	Selection special***	without flange information	
		Screw-Dimension (ND / INCH)	pcs. [m]/[piece(length)]
Laminated Phenol			
G - 7			
G - 10			
Glimmer ST			
Glimmer HLT			

Steel washers	Selection special***	without flange information	
		Screw-Dimension (ND / INCH)	pcs. [m]/[piece(length)]
Carbon steel			
Stainless steel			

Isolating screws/-bolts	
Dimensions (Metric)	
Quality class	
Pcs.	
Operating temperature	

Electrical isolation required

Notes

Company
Contact
Address
Country
Tel.
Fax
E-mail

Stamp / Signature