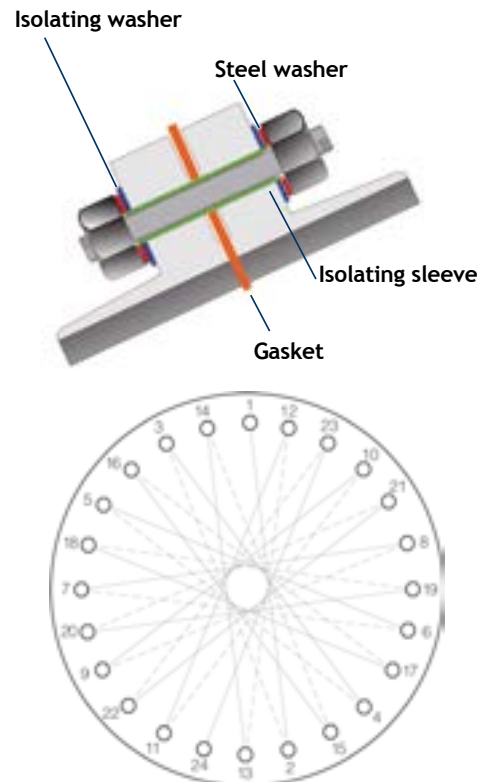


EN INSTALLATION INSTRUCTION

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 over-tighten 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.



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		

Please take the torque moments from the chart on the left.

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.

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 ambiente 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 ambiente 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.