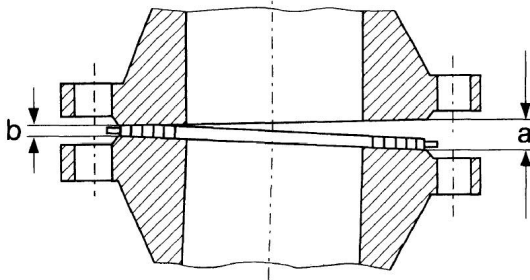


This file has been prepared for printout as brochure.

Procedure: Print double-sided; cut out along the dotted line and fold along the broken line.

Flange gap and reference values for allowable gap = a – b



DN	a – b [mm]
10 – 25	0.4
32 – 150	0.6
200 – 300	0.8
350 – 500	1.0

Source:

Working Group of the Chemical Industry; Guideline for Bolted Flanged Joint Assembly in Process Plants (May 2014)

Tightening torques to be applied

The specified tightening torques apply to bolts fabricated from 25CrMo4, A2-70 or other steel grades of comparable strength. Run down and snug up the bolts by hand. Place hardened washers to DIN EN ISO 7089, minimum hardness class 200 HV, under the nuts.

Thread	Tightening torque [Nm]		Tightening method
	Flat gasket: ^a PN10-PN25 (without inner flare) PN40 (inner flare)	Tongue and groove: PN10-PN40 Grooved metal/ spiral-wound gasket: PN10-PN100	
M12	50	50	Manual wrench using a suitable extension, if required
M16	125 ^b	80	
M20	240 ^c	150	
M24	340	200	Torque wrench or other controlled torqueing methods
M27	500	250	
M30	700	300	
M33	900	500	
M36	1200	750	
M39	1400	900	
M45	2000	1200	
M52	3000	-	

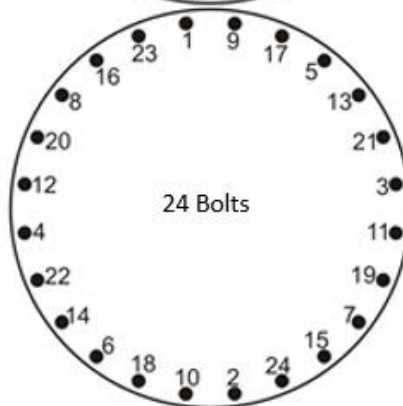
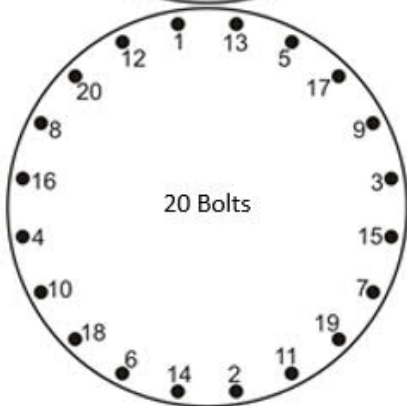
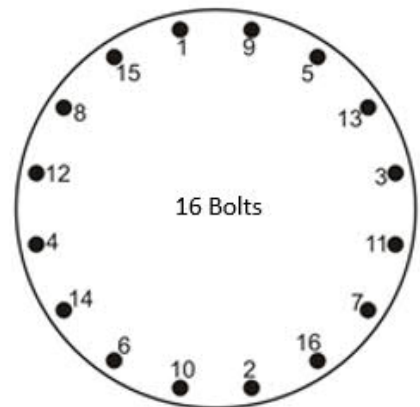
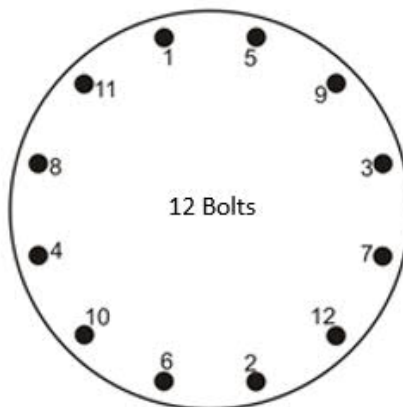
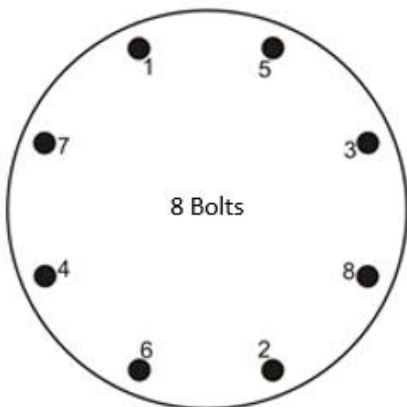
^a Corrugated ring gaskets up to PN 40 are covered by the specified torques.

^b Recommended lever length 300 mm

^c Recommended lever length 550 mm

Assembly instructions for bolt tightening method 1

Bolt tightening method 1: Criss-cross tightening pattern

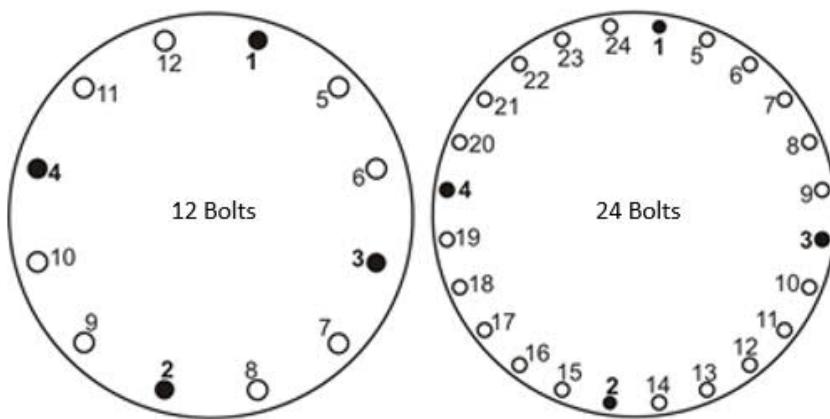


Tightening sequence:

- 30 % of target tightening torque in a criss-cross pattern,
 - 60 % of target tightening torque in a criss-cross pattern,
 - full tightening torque in a criss-cross pattern, and
 - once again, full tightening torque in a circular pattern, bolt by bolt.
- Repeat until no additional turning can be observed in the nuts when applying the full tightening torque.

Assembly instructions for bolt tightening method 2

Bolt tightening method 2: Alternative bolt tightening method from DN 200



Tightening sequence:

- Tighten 4 bolts applying 20 % of the target torque.
- Torque the four bolts to 60 % of the target torque.
- Torque the four bolts to 105 % of the target torque.
- Tighten all remaining bolts to 105 % of the target torque in a circular pattern.
- Repeat circular torqueing at 105 %.

Revision note:

The following changes have been made relative to the previous edition:

- a) Correction in Table, 2nd column: PN10+PN25 changed to PN10-PN25