

Operation/Maintenance: Torque Values

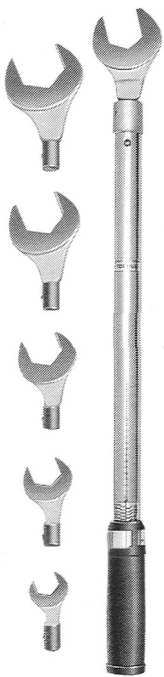
Medium & High Pressure Connection, Valve Packing, Running and Seating

Parker Autoclave Engineers Micrometer Adjustable Torque Wrenches

Torque Wrench	Torque Range
P-1680	20 to 150 ft. lbs (27 to 203 Nm)
91020	75 to 250 ft. lbs (102 to 339 Nm)
See Heavy Duty Torque Wrenches on Page 15	100 to 600 ft. lbs (136 to 814 Nm)

Accurate tightening for all Parker Autoclave Engineers valve packing glands and tube nuts is essential. The wrench can be adjusted to the ranges shown above and is used with interchangeable wrench adapters for hex sizes from 1/2" through 1-7/8". Part numbers for wrench adapters are listed below.

Wrench adapters sold separately.

Standard Wrench Adapters		
Wrench Adapter Number	Packing Gland or Tube Nut Hex Size (inches)	
P-1681	1/2	
P-1682	9/16	
P-1683	5/8	
P-9813	3/4	
P-1685	13/16	
P-1686	7/8	
P-1687	15/16	
P-9901	1	
P-1688	1-1/16	
P-1689	1-3/16	
P-1690	1-3/8	
P-6040	1-1/2	
91269 †	1-3/4	
P-10076 †	1-7/8	

† Part numbers shown for replacement requirements only. For new orders use Heavy Duty wrench adapters and Wrench found on page 15.

Heavy Duty Torque Wrenches and Open Face Wrench Adapters are available.

Please see page 15 for product detail and part numbers

Full Pressure Connection Gland Torque

(For CW 316 Stainless Steel & Medium Pressure 2507 Super Duplex Materials)

	Connection Type	Gland Nut Hex Size (inches)	Required Torque ¹	Required Torque Dry-Moly Coated	Pressure MAWP PSI (Bar)
			ft.-lbs. (N.m)		
Medium Pressure	SF250CX (1/4" MP)	1/2	20 (27)	15 (21)	20,000
	SF375CX (3/8" MP)	5/8	30 (41)	20 (27)	20,000
	SF562CX10 (9/16" MP)	15/16	55 (75)	40 (55)	15,000
	SF562CX20 (9/16" MP)	15/16	55 (75)	40 (55)	20,000
	SF750CX10 (3/4" MP)	1-3/16	75 (102)	55 (75)	15,000
	SF750CX20 (3/4" MP)	1-3/16	90 (122)	70 (95)	20,000
	SF1000CX10 (1" MP)	1-3/8	135 (187)	100 (136)	15,000
	SF1000CX20 (1" MP)	1-3/8	135 (187)	100 (136)	20,000
	SF1500CX (1-1/2" MP)	1-7/8	200 (272)	160 (217)	15,000

High Pressure	F250C (1/4" HP)	5/8	25 (34)	-	60,000
	F375C (3/8" HP)	13/16	50 (68)	-	60,000
	F562C (9/16" HP)	1-3/16	75 (102)	-	60,000
	F562C40 (9/16" HP-40K)	1-3/16	60 (82)	-	40,000
	F1000C43 (1" HP-43K)	1-3/8	180 (244)	-	43,000

Ultra High Pressure	F250C100 (1/4" UHP-100K)	3/4	50 (68)	-	100,000
	F375C100 (3/8" UHP-100K)	3/4	105 (143)	-	100,000
	F562C100 (9/16" UHP-100K)	1-3/16	125 (170)	-	100,000
	F312C150 (5/16" UHP-150K)	3/4	70 (95)	-	150,000

¹ Required torque shown is for manually lubricated (liquid or paste anti-seize) glands. For torque reduction when using glands supplied with Dry-Moly coating see "Reduced Pressure/Special Material" Chart on next page.

For torques at lower working pressures (specialty materials) see "Special Material" Torque Chart on next page.

Operation/Maintenance: Torque Values

Reduced Pressure/Special Material Torque Table: Pressure psi (bar) vs. Torque ft.-lbs. (N.m)

Note: ALL Parker Autoclave Engineers Pressure Containing products will have Maximum Allowable Working Pressure (@ Room Temperature) indelibly marked at an easy to read location. Most "Special Materials" are rated to a pressure less than our standard Cold Worked UNS S31600/S31603 316/316L Stainless Steel Material and use of the chart below is necessary for proper installation of Cone & Thread Connections at these lower pressures.

Use of this chart is also recommended when application pressure is less than the MAWP rating on the part. This will create a seal circle in the connection at a point before max insertion depth is reached - enhancing the lifetime of the product.

Connection	Pressure psi (bar) vs. Torque ft-lb (N.m)										** Dry-Moly Coat Torque Reduction
	Minimum	5,000 (345)	10,000 (690)	15,000 (1034)	20,000 (1379)	25,000 (1724)	30,000 (2068)	40,000 (2758)	50,000 (3447)	60,000 (4137)	
SF250CX (1/4" MP)	10 (13.6)	10 (13.6)	10 (13.6)	15 (20.3)	20 (27.1)	-	-	-	-	-	25%
SF375CX (3/8" MP)	10 (13.6)	10 (13.6)	15 (20.3)	25 (33.9)	30 (40.7)	-	-	-	-	-	30%
SF562CX10 (9/16" MP)	20 (27.1)	30 (40.7)	45 (61)	55 (74.6)	-	-	-	-	-	-	30%
SF562CX20 (9/16" MP)	15 (20.3)	15 (20.3)	30 (40.7)	40 (54.2)	55 (74.6)	-	-	-	-	-	
SF750CX10 (3/4" MP)	25 (33.9)	40 (54.2)	60 (81.3)	75 (101.7)	-	-	-	-	-	-	30%
SF750CX20 (3/4" MP)	20 (27.1)	25 (33.9)	45 (61)	70 (94.9)	90 (122)	-	-	-	-	-	
SF1000CX10 (1" MP)	40 (54.2)	65 (88.1)	115 (156)	135 (183)	-	-	-	-	-	-	25%
SF1000CX20 (1" MP)	35 (47.5)	50 (67.8)	100 (136)	115 (156)	135 (183)	-	-	-	-	-	
SF1500CX (1-1/2" MP)	110 (149)	110 (149)	160 (217)	200 (271)	-	-	-	-	-	-	20%
F250C (1/4" HP)	10 (13.6)	10 (13.6)	10 (13.6)	10 (13.6)	10 (13.6)	15 (20.3)	15 (20.3)	20 (27.1)	25 (33.9)	25 (33.9)	N/A
F375C (3/8" HP)	10 (13.6)	10 (13.6)	10 (13.6)	15 (20.3)	20 (27.1)	25 (33.9)	25 (33.9)	35 (47.5)	45 (61)	50 (67.8)	N/A
F562C (9/16" HP)	15 (20.3)	15 (20.3)	15 (20.3)	20 (27.1)	25 (33.9)	35 (47.5)	40 (54.2)	50 (67.8)	65 (88.1)	75 (102)	N/A
F562C40 (9/16" HP)	15 (20.3)	15 (20.3)	15 (20.3)	25 (33.9)	30 (40.7)	40 (54.2)	45 (61)	60 (81.3)	-	-	N/A
F1000C43 (1" HP 43K)	30 (40.7)	50 (67.8)	65 (88.1)	75 (101.7)	100 (136)	125 (170)	150 (203)	180 (244)	-	-	25%
	-	-	-	-	-	60,000 (4137)	70,000 (4825)	80,000 (5515)	100,000 (6895)	150,000 (10340)	
F250C100 (1/4" UHP)	-	-	-	-	-	20 (27)	30 (41)	35 (48)	50 (68)	-	N/A
F375C100 (3/8" UHP)	-	-	-	-	-	40 (54)	60 (81)	75 (102)	105 (143)	-	N/A
F562C100 (9/16" UHP)	-	-	-	-	-	75 (102)	90 (122)	100 (136)	125 (170)	-	N/A
F312C150 (5/16" UHP)	-	-	-	-	-	35 (48)	35 (48)	35 (48)	45 (61)	70 (95)	N/A

**All special material glands dry moly coated will have lower set torques. Reduce the torque found or computed from chart above percentages shown in this column.

Needle Valve Stem Maximum Running and Seating Torques * (Typical Values)

Valve Series	Tube Size (inches)	Running Torque	Seating Torque	Pressure psi (bar)
		inch-lbs. (N.m)		
10V (1/4" to 1/2" For Reference Only)	1/8	25 (3)	35 (4)	15,000 (1034)
	1/4	40 (5)	50 (6)	15,000 (1034)
	3/8	40 (5)	50 (6)	15,000 (1034)
	1/2	60 (7)	80 (9)	10,000 (690)
SW	1/4	25 (3)	35 (4)	15,000 (1034)
	3/8	40 (5)	50 (6)	15,000 (1034)
	1/2	70 (8)	90 (10)	10,000 (690)
15SM 10P12-16 15QS12 & 16	9/16	60 (7)	105 (12)	15,000 (1034)
	3/4	210 (24)	290 (34)	15,000 (1034)
	1	180 (20)	580 (64)	15,000 (1034)
	1-1/2	1100 (124)	1560 (176)	15,000 (1030)
20SM 15P4-9 15QS4-9 20DBNV12	1/4, 3/8	40 (5)	55 (6)	20,000 (1379)
	9/16	60 (67)	110 (12)	20,000 (1379)
	3/4	300 (34)	360 (41)	20,000 (1379)
	1	360 (41)	600 (68)	20,000 (1379)
15Y	Various	65 (7)	144 (16)	15,000 (1034)
43Y	1	25 (3)	45 (5)	43,000 (2965)
50Y	9/16	85 (10)	180 (20)	50,000 (3450)
20GV	Various	50 (6)	55 (6)	20,000 (1379)
30GV	Various	50 (6)	55 (6)	30,000 (2068)
30SC	1	360 (41)	600 (68)	30,000 (2068)
43SC	1	720 (82)	800 (90)	43,000 (2965)
40SC	9/16	360 (41)	445 (50)	40,000 (2758)
30VM 20DBNV	1/4	40 (5)	55 (6)	30,000 (2068)
	3/8	45 (5)	55 (6)	30,000 (2068)
	9/16	50 (6)	55 (6)	30,000 (2068)
40VM	9/16	40 (5)	55 (6)	40,000 (2758)
60VM	1/4, 3/8, 9/16	65 (7)	70 (8)	60,000 (4137)
100VM	1/4, 5/16, 3/8	100 (11)	120 (14)	100,000 (6895)
	9/16	460 (52)	520 (59)	100,000 (6895)
150V	5/16	312 (35)	384 (43)	150,000 (10340)

* These are not specifications.

Note: All valve stem torques are based on standard PTFE packing.
For valves with option "TG" (PTFE Glass) or "GY" (graphite, yarn packing), the following equations should be used to estimate torques.

Option "TG"

Running Torque = Running Torque (x 1.1)

Seating Torque = Running Torque (x 1.1) + Seating Torque - Running Torque

Option "GY"

Running Torque = Running Torque (x 2)

Seating Torque = Running Torque (x 2) + Seating Torque - Running Torque

Parker AE Flat Top/Bottom Adapters

	Size (inches)	Maximum Working Pressure psi (bar)	Connection	Required Torque ft. - lbs. (N.m)
Flat Top Gasket	9/16-18	10,000 (690)	F562FT	60 (81.3)
Flat Bottom Gasket	7/16-20	10,000 (690)	F437FB	25 (33.9)
	9/16-18	10,000 (690)	F562FB	40 (54.2)
	3/4-16	5,000 (345)	F750FB	60 (81.3)

Parker AE Packing Glands

	Tube/Pipe O.D. Size (inches)	Packing Gland Hex (inches)	Required Torque ¹ ft. - lbs. (N.m)
10V (1/4" to 1/2" For Reference Only)	1/8	1/2	12 (16)
	1/4	13/16	40 (54)
	3/8	13/16	40 (54)
	1/2	13/16	30 (41)
SW	1/4	5/8	30 (41)
	3/8	5/8	40 (54)
	1/2	13/16	50 (68)
15P 10P 15SM 20SM 15QS	1/4, 3/8	5/8	40 (54)
	9/16	13/16	80 (109)
	3/4	13/16	Note 2
	1	1-3/8	20 (27)
	1-1/2	1-5/16	550 (745)
20DBNV	3/8, 9/16	13/16	40 (54)
	3/4	15/16	Note
15Y	3/4	15/16	130 (176)
	1	1-1/16	150 (203)
43Y	1	1	150 (203)
50Y	9/16	15/16	85 (115.2)
20GV	Various	13/16	40 (54)
30GV	Various	13/16	40 (54)
30SC/43SC	1	1-3/8	230 (312)
40SC	9/16	15/16	140 (190)
30VM	1/4, 3/8, 9/16	13/16	40 (54)
40VM	9/16	13/16	40 (54)
60VM	1/4, 3/8, 9/16	13/16	60 (81)
100VM	1/4, 3/8	15/16	60 (81)
	9/16	15/16	150 (203)
150V	5/16	1-3/8	150 (203)
10VRMM	9/16	9/16	20 (27)
30VRMM	3/4	13/16	50 (68)
60VRMM	1/4, 3/8	13/16	50 (68)
15PVRMM	1/2 NPT	13/16	40 (54)

Note 1: Torque may vary $\pm 10\%$. Torque values apply to standard PTFE packing.
For graphite yarn packing, add 25% to the above values.

Note 2: 3/4 turn past finger tight with hex wrench.