



TORQUE VALUES FOR RESILIENT SEATED GATE VALVES & METAL SEATED GATE VALVES, PN16/250PSI

Operation

To avoid increased closing/operation torque or seizure of the internal parts of the valve, it is recommended to operate the valves in a regular basis to ensure long life and durability.

AVK recommend:

- Valves for water and gas every year
- Valves for wastewater and industry every third month.

After operation, the valve must be left in fully open position with stem released from stress or in closed position with closing torque as stated in the table on the following pages. Do not over torque the valve as this may permanently damage the valve.

Content / Definitions

AVK offers resilient seated gate valves (**RSGV**) and metal seated gate valves (**MSGV**) to different standard worldwide. Due to the different design demands, depending on the relevant standard, the characteristics of the valves are different with respect to strength, closing torque, number of turns etc.



| | |
|-----------------------------------|---|
| Table 1. | Gate valves (RSGV) according to European standard, drinking water applications, hand wheel operation. |
| Table 2. | Gate valves (RSGV) according to European standard, drinking water applications, ring key and bar application. |
| Table 3. | Gate valves (RSGV) according to American standard, for water supply service and fire protection service. |
| Table 4. | Gate valves (RSGV) according to Australian standard, for waterworks purpose. |
| Table 5.1 and 5.2. | Service connection valves (RSGV) European design. |
| Table 6. | Gate valves (MSGV) according to European standard, drinking water applications. |
| Table 7.1 and 7.2. | Gate valves (RSGV) according to European standard, designed for gas applications. |
| MOT: | Maximum operational torque required to open/close the valve against full unbalanced pressure. |
| MST: | Minimum strength torque, the valve still being functional and complying with the standard. |
| AVK – Open/Close: | Maximum torque required to close the valve against full unbalanced pressure. |
| AVK – Free running torque: | Torque required for the spindle to rotate freely (no flow). |
| AVK – Rupture torque: | Min. strength torque, not making permanent damage to the valve. |
| AVK – Turns: | Number of turns required to completely open or close the valve. |

TORQUE VALUES, RSGV, PN16

AVK Technical Information – Water Valves

European Standards

Table 1: Water – EN 1074-2 Annex A, EN 1171-Cat. 2, DIN 3352-4, BS 5163-Type A


| | Standards | | | AVK | | | | | | | |
|---|--|----------|----------|---|---|-----------|--|--|--------------|-----------|-------|
| | DN [mm] | MOT [Nm] | MST [Nm] | Open/Close [Nm] | Rupture [Nm] | Free [Nm] | Turns | New generation gate valve** | | | |
| | | | | | | | | Open/Close [Nm] | Rupture [Nm] | Free [Nm] | Turns |
|  | 40 | 40 | 90 | 40 | 400 | 6 | 11 | 25 | 250 | 3 | 12 |
| | 50 | 50 | 100 | 40 | 400 | 6 | 11 | 25 | 250 | 3 | 12 |
| | 65 | 65 | 130 | 60 | 400 | 6 | 14 | 25 | 250 | 3 | 17 |
| | 80 | 80 | 160 | 60 | 400 | 6 | 17 | 35 | 400 | 3 | 17 |
| | 100 | 100 | 200 | 80 | 400 | 6 | 21 | 35 | 400 | 3 | 21 |
| | 125 | 125 | 250 | 80 | 500 | 6 | 26 | 40 | 500 | 3 | 26 |
| | 150 | 150 | 300 | 80 | 600 | 12 | 26 | 40 | 600 | 3 | 26 |
| | 200 | 200 | 400 | 120/100 ⁵⁾ | 800 | 12 | 33/35 ⁵⁾ | 80 | 800 | 3 | 33 |
| | 250 | 250 | 500 | 180 ⁷⁾ | 1000 | 12 | 37 | 90 | 1000 | 6 | 37 |
| | 300 | 300 | 600 | 200 ⁷⁾ | 1200 | 16 | 44 | 120 | 1200 | 6 | 44 |
| | 350 | 350 | 700 | 300 ^{1), 6)} | 1400 | 24 | 59 | 250 | 1400 | 24 | 59 |
| | 400 | 400 | 800 | 300 ^{1), 6)} | 1600 | 24 | 59/50 ⁴⁾ | 250 | 1600 | 24 | 59 |
| | 450 | 450 | 900 | 300 ^{1)/450^{2)/500³⁾}} | 1600 | 25 | 59 ^{1)/43^{2)/39³⁾}} | 450 | 1600 | 25 | 43 |
| |  | 500 | 500 | 1000 | 300 ^{1)/450^{2)/500³⁾}} | 1600 | 25 | 59 ^{1)/43^{2)/43³⁾}} | 450 | 1600 | 25 |
| 600 | | NA | 1200 | 500 ^{2)/700³⁾} | 1600 | 25 | 53 ^{1)/52^{2)/53³⁾}} | 500 | 1600 | 25 | 52 |
| 700 | | NA | 1400 | 850 | 3000 | 60 | 60 | | | | |
| 800 | | NA | 1600 | 850 | 3000 | 60 | 70 | | | | |
| 900 | | NA | 1800 | 800/800/1100 ¹⁾ | 4000 | 300 | 85 | | | | |
| 1000 | | NA | 2000 | 800/800/1100 ¹⁾ | 4000 | 300 | 85 | | | | |

¹⁾ Series 02 & 20, ²⁾ Series 06 & 26, ³⁾ Series 55, ⁴⁾ Series 36, ⁵⁾ Series 15, ⁶⁾ Series 15/7X, ⁷⁾ Series 18/00 DN250/300 = 150 Nm.

* 6 bar/10bar/16bar

** For actuator sizing on ISO-flange valves series 21/37 and 21/38 new generation gate valves type A, use torque values from Table 2.


Table 2: Water – EN1074-2 Annex B, EN 1171-Cat. 4, BS 5163-Type B

| | Standards | | | AVK | | | | | | | |
|---|-----------|----------|-------------------|-------------------|--------------|-----------|-------|---------------------------|--------------|-----------|-------|
| | DN [mm] | MOT [Nm] | MST [Nm] | Open/Close [Nm] | Rupture [Nm] | Free [Nm] | Turns | New generation gate valve | | | |
| | | | | | | | | Open/Close [Nm] | Rupture [Nm] | Free [Nm] | Turns |
|  | 40 | 100 | 500 | 90 | 500 | 6 | 4 | - | - | - | - |
| | 50 | 110 | 550 | 90 | 550 | 6 | 5 | 40 | 550 | 6 | 5 |
| | 65 | 125 | 625 | 90 | 625 | 6 | 7 | 50 | 625 | 6 | 7 |
| | 80 | 140 | 700 | 120 | 700 | 6 | 8 | 60 | 700 | 6 | 8 |
| | 100 | 160 | 800 | 135 | 800 | 6 | 9 | 70 | 800 | 6 | 9 |
| | 125 | 185 | 925 | 155 | 925 | 12 | 12 | - | - | - | - |
| | 150 | 210 | 1050 | 180 | 1050 | 12 | 14 | 110 | 1050 | 12 | 14 |
| | 200 | 260 | 1300 | 210 | 1300 | 12 | 18 | 190 | 1300 | 12 | 18 |
| | 250 | 310 | 1550 | 210 | 1550 | 16 | 22 | 200 | 1550 | 16 | 22 |
| | 300 | 360 | 1800 | 210 | 1800 | 24 | 26 | 200 | 1800 | 24 | 26 |
| | 350 | 410 | 2050 | 300 | 2050 | 24 | 31 | 300 | 2050 | 24 | 31 |
| | 400 | 460 | 2300 | 450 | 2300 | 25 | 35 | 370 | 2300 | 25 | 35 |
| | 450 | 510 | 2550 | 500 ¹⁾ | 2550 | 25 | 39 | 450 | 2550 | 25 | 39 |
| | 500 | 560 | 2800 | 500 ¹⁾ | 2800 | 25 | 43 | 450 | 2800 | 25 | 43 |
| 600 | NA | 3300 | 700 ¹⁾ | 3300 | 25 | 53 | 500 | 3300 | 25 | 53 | |

¹⁾ Series 55

TORQUE VALUES, RSGV, PN16/250PSI AVK Technical Information – Water Valves American & Australian Standards


Table 3: Water – AWWA C509 & C515, UL-262

| | DN [inch] | Standards | | AVK | | | |
|---|--------------|-----------------|-----------------|------------------------|---------------------|--------------------------|--|
| | | MOT [ft-lbs] | MST [ft-lbs] | Open/Close [ft-lbs] | Rupture [ft-lbs] | Free running [ft-lbs] | Turns |
|  | 3" | 52 | 250 | 55 | 294 | 4,5 | 12 ¹⁾ /15.5 ²⁾ /18.5 ³⁾ |
| | 4" | 75 | 250 | 74 | 294 | 4,5 | 14 ¹⁾ /17.5 ²⁾ /22 ³⁾ |
| | 6" | 110 | 350 | 111 | 441 | 9 | 21 ¹⁾ /24.5 ²⁾ /27 ³⁾ |
| | 8" | 150 | 350 | 147 | 588 | 9 | 26 ¹⁾ /27.5 ²⁾ /35 ³⁾ |
| | 10" | 185 | 350 | 184 | 735 | 12 | 32 ¹⁾ /34.5 ²⁾ |
| | 12" | 225 | 350 | 221 | 882 | 18 | 38 ¹⁾ /41.5 ²⁾ |
| | 14" | 225 | 400 | 221 | 1029 | 18 | 44 |
| | 16" | 275 | 400 | 221 | 1176 | 18,5 | 51 |
| | 18" | NA | 400 | 370 | 1176 | 18,5 | 39 |
| | 20" | NA | 400 | 370 | 1176 | 18,5 | 43 |
| | 24" | NA | 400 | 516 | 1176 | 18,5 | 53 |
| | 30" | NA | 500 | 625 | 1838 | 44 | 60 |
| 36" | NA | 600 | 809 | 1838 | 220 | 70 | |

Note: 1 ft-lbs = 1,36 Nm

¹⁾ Series 45, ²⁾ Series 65, ³⁾ Series 145

Table 4: Water – AS 2638.2

| | DN [mm] | Standards | | AVK | | | |
|---|------------|-------------|-------------|----------------------------|-----------------|----------------------|-------|
| | | MOT [Nm] | MST [Nm] | Open/Close [Nm] | Rupture [Nm] | Free running [Nm] | Turns |
|  | 80 | 75 | 100 | 60 | 400 | 6 | 17 |
| | 100 | 100 | 300 | 80 | 400 | 6 | 21 |
| | 150 | 150 | 450 | 120 | 600 | 12 | 26 |
| | 200 | 200 | 600 | 160 | 800 | 12 | 33 |
| | 225 | 200 | 600 | 180 | 1000 | 16 | 37 |
| | 250 | 250 | 750 | 200 | 1000 | 16 | 37 |
| | 300 | 300 | 900 | 240 | 1200 | 6 | 44 |
| | 375 | 500 | 1500 | 500 | 1500 | 24 | 59 |
| | 400 | 550 | 1650 | 500 | 1650 | 24 | 59 |
| | 450 | 600 | 1800 | 450 | 2400 | 25 | 43 |
| | 500 | 660 | 1980 | 450 | 2400 | 25 | 43 |
| | 600 | 800 | 2400 | 500 | 2400 | 25 | 52 |
| | 750 | 1000 | 3000 | 850 | 3000 | 60 | 65 |
| | 900 | NA | NA | 800/800/1100 ^{*)} | 4000 | 300 | 85 |
| | 1000 | NA | NA | 800/800/1100 ^{*)} | 4000 | 300 | 85 |

^{*)} 6 bar/10bar/16bar

TORQUE VALUES, RSGV, PN16/250PSI
AVK Technical Information – Water Valves
European design

Table 5.1: Water – Service Connection Valves (RSGV)
Ductile iron Series 03, Brass Series 16



| | DN [mm] | AVK | | | |
|---|------------|--------------------|-----------------|--------------|-------|
| | | Open/Close [Nm] | Rupture [Nm] | Free [Nm] | Turns |
|  | 25 | 40 | 200 | 3 | 7 |
| | 32 | 45 | 200 | 3 | 9 |
| | 40 | 50 | 200 | 4 | 11 |
| | 50 | 50 | 200 | 4 | 14 |

Table 5.2: Water – Service Connection Valves (RSGV)
POM series 16

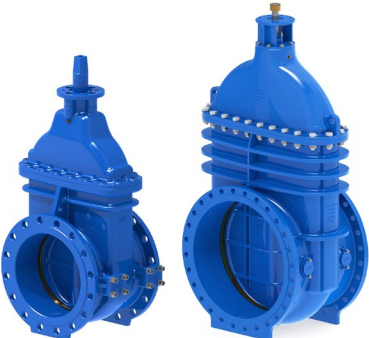
| | DN [mm] | AVK | | | |
|--|------------|--------------------|-----------------|--------------|-------|
| | | Open/Close [Nm] | Rupture [Nm] | Free [Nm] | Turns |
|  | 25 | 40 | 200 | 3 | 7 |
| | 32 | 40 | 200 | 3 | 9 |
| | 40 | 40 | 200 | 4 | 11 |
| | 50 | 40 | 200 | 4 | 14 |

TORQUE VALUES, MSGV, PN16

AVK Technical Information – Water Valves

European Standards

Table 6: Water - Metal Seated Gate Valves, EN 1074-2 Annex A


| | DN [mm] | Open/Close [Nm] | | | | | | | |
|--|------------|-----------------|-------|-------|-------|--------|--------|--------|-------|
| | | 2 bar | 4 bar | 6 bar | 8 bar | 10 bar | 12 bar | 14 bar | 16bar |
|  <p>DN350-450 DN700-1200</p> | 350 | 50 | 100 | 160 | 210 | 270 | 320 | 380 | 430 |
| | 400 | 100 | 170 | 250 | 320 | 400 | 470 | 550 | 630 |
| | 450 | 90 | 190 | 300 | 400 | 510 | 620 | 720 | 830 |
| | 500 | 90 | 200 | 310 | 420 | 530 | 640 | 750 | 860 |
| | 600 | 230 | 370 | 500 | 640 | 780 | 920 | 1060 | 1200 |
| | 700 | 390 | 640 | 880 | 1120 | 1370 | 1610 | 1850 | 2100 |
| | 800 | 590 | 940 | 1280 | 1630 | 1970 | 2320 | 2660 | 3010 |
| | 900 | 690 | 1030 | 1370 | 1710 | 2050 | 2380 | 2720 | 3060 |
| | 1000 | 780 | 1260 | 1740 | 2220 | 2690 | 3170 | 3650 | 4130 |
| | 1200 | 1860 | 2850 | 3840 | 4840 | 5830 | 6820 | 7810 | 8800 |

TORQUE VALUES, RSGV, PN16/250PSI

AVK Technical Information – Gas Valves


European Standards

Table 7.1: Gas - RSGV – EN 13774, EN 1171- Cat. 2 (DIN 3230-5)

| | DN [mm] | Standards | | AVK | | | |
|---|------------|-------------|-------------|--------------------------------------|--------------|------------------------------------|------------------------------------|
| | | MOT [Nm] | MST [Nm] | Open/Close [Nm] | Free [Nm] | Rupture [Nm] | Turns |
|  | 40 | 40 | 90 | 40 | 9 | 400 | 11 |
| | 50 | 50 | 100 | 40 | 9 | 400 | 11 |
| | 65 | 65 | 130 | 60 | 9 | 400 | 14 |
| | 80 | 80 | 160 | 60 | 9 | 400 | 17 |
| | 100 | 100 | 200 | 80 | 9 | 400 | 21 |
| | 125 | 125 | 250 | 80 | 9 | 500 | 26 |
| | 150 | 150 | 300 | 80 | 18 | 600 | 26 |
| | 200 | 200 | 400 | 120 | 18 | 800 | 33 |
| | 250 | 250 | 500 | 180 | 18 | 1000 | 37 |
| | 300 | 300 | 600 | 200 | 18 | 1200 | 44 |
| | 350 | 350 | 700 | 300 | 24 | 1400 | 59 |
| | 400 | 400 | 800 | 300 | 24 | 1600 | 50 ³⁾ /59 |
| | 450 | 450 | 900 | 300 ¹⁾ /450 ²⁾ | 25 | 1600 | 59 ¹⁾ /39 ²⁾ |
| | 500 | 500 | 1000 | 300 ¹⁾ /450 ²⁾ | 25 | 1600 | 59 ¹⁾ /43 ²⁾ |
| 600 | 600 | NA | 500 | 25 | 3200 | 53 ¹⁾ /52 ²⁾ | |

Series 02, ²⁾ Series 06 + Series 15 + Series 46, ³⁾ Series 36

Table 7.2: Gas – Service Connection Valves (RSGV) – Ductile Iron Series 03

| | DN [mm] | Standard | AVK | | | |
|---|------------|-------------|--------------------|--------------|-----------------|-------|
| | | MST [Nm] | Open/Close [Nm] | Free [Nm] | Rupture [Nm] | Turns |
|  | 25 | 80 | 40 | 3 | 200 | 7 |
| | 32 | 90 | 45 | 3 | 200 | 9 |
| | 40 | 100 | 50 | 4 | 200 | 11 |
| | 50 | 100 | 50 | 4 | 200 | 14 |