GLOBAL WATER GROUP (GWG)

BUTTERFLY VALVE

Installation, Operation & Maintenance Manual

Including Gearbox Replacement & Stem Extension Installation

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Applicable to	GWG BVW Wafer, BVF Flanged & BVL Lugged Butterfly Valves — DN50 to DN600
Accessories	GWG BVES Stem Extensions | GWG BVGS/BVGR Gearboxes
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1. Scope and Purpose

This manual covers the safe installation, commissioning, operation, maintenance, gearbox replacement, and stem extension installation of GWG butterfly valves as supplied by Global Water Group (GWG). It applies to the following product families:

Product	Series	Body Style	Size Range	Seat Type
BVW	BVWNL / BVWNG	Wafer	DN50–DN600	NBR Phenolic Hard Back Cartridge
BVF	BVFNL / BVFNG	Flanged	DN50–DN600	NBR Vulcanised (Seal on Body)
BVLV	BVLVNL / BVLVNG	Lugged	DN50–DN600	NBR Vulcanised (Seal on Body)
BVL	BVLVNL / BVLVNG	Lugged	DN50–DN600	NBR Phenolic Hard Back Cartridge

All GWG butterfly valves are hydraulically wet-tested at rated pressure before despatch to confirm bubble-tight shut-off. Any field modification — including installation of a stem extension or gearbox change — alters the assembly and requires the compensating inspection described in Section 7.

2. Safety Instructions

Read this manual in full before commencing any work. Failure to follow these instructions may result in personal injury, equipment damage, or an uncontrolled release of fluid.

⚠ WARNING

Never perform any work while the valve is under pressure.

Isolate and fully depressurise the pipeline before any installation, maintenance, or modification.

Never lift a valve by its gearbox, actuator, lever handle, or stem extension.

All work must be performed by qualified personnel.

⚠ CAUTION

The elastomer seat is sensitive to heat — never weld on a pipeline while the valve is installed.

Do not exceed the rated working pressure or temperature of the valve.

The BVW and BVL range of valves is NOT suitable for end-of-line service unless a support flange is fitted on the open side to support the cartridge seat.

⚠ NOTE

GWG valves are supplied with fusion-bonded epoxy coating on all ductile iron bodies.

Take care not to damage the coating during handling and installation. Repair any bare metal areas with approved epoxy paint before installing in the pipeline.

3. Valve Description and Product Range

3.1 GWG BVW — Wafer Butterfly Valve (Phenolic Hard Back Cartridge Seat)

The BVW is a wafer-style concentric butterfly valve with a phenolically-backed NBR cartridge seat that is individually replaceable. The cartridge seat supports the disc on both the upstream and downstream faces.

⚠ NOTE

The BVW cartridge seat requires a flange on both sides of the valve at all times. It is NOT suitable for end-of-line or dead-end service unless a support flange is fitted on the open side.

Construction	Wafer Concentric Seal on Body
Size Range	DN50 to DN600
Pressure Rating	PN16 (16 Bar) — -0.8 Bar Vacuum to 16 Bar
Face to Face	According to API609
Flange Drilling	AS4087 PN16 (Table D) / AS2129 Table E / ANSI B16.5 #150
Coating	Fusion Bonded Epoxy
Mounting Pad	ISO 5211
Temperature	-10°C to 90°C (NBR seat)
Body/Shell Test	2.4 MPa
Seat Test	1.76 MPa
Suitable Media	Water, Oil, Gas (W.O.G.) etc.
Standards	Design & manufacture to API609; Inspection & test to API598

3.1.1 BVW Components

No.	Item	Material
1	Body	Ductile Iron
2	Disc	SS 316
3	Stem	SS 420
4	Stem Bushing	PTFE
5	Seat	NBR Cartridge
6	O-Ring	NBR
7	Pin	SS 316

3.1.2 BVW Controls

- Lever operation: DN50–DN300
- Gear operation: DN50–DN600
- Electric actuators: 12V, 24V, 240V, 415V
- Pneumatic actuators: single and double acting
- Stem extensions (BVES): 0.5 m, 1 m, 1.5 m, 2 m lengths

3.2 GWG BVF — Flanged Butterfly Valve (Vulcanised Seat)

The BVF is a flanged concentric butterfly valve with a vulcanised NBR seal-on-body design. The integral flanges make it suitable for end-of-line service without additional support. The seal-on-body design means no flange gaskets are required.

Construction	Flanged Concentric Seal on Body
Size Range	DN50 to DN600
Pressure Rating	PN16 (16 Bar) — -0.8 Bar Vacuum to 16 Bar
Face to Face	According to EN558-1 Series 13
Flange Drilling	AS4087 PN16 (Table D) / AS2129 Table E
Coating	Fusion Bonded Epoxy
Mounting Pad	ISO 5211
Temperature	-10°C to 90°C (NBR seat)
Body/Shell Test	2.4 MPa
Seat Test	1.76 MPa
Suitable Media	Water, Oil, Gas (W.O.G.) etc.
Standards	Inspection & test to ISO 5208; Top flange to ISO 5211

3.2.1 BVF Components

No.	Item	Material
1	Body	Ductile Iron
2	Disc	SS 316
3	Stem	SS 420
4	Stem Bushing	PTFE
5	Seat	NBR
6	O-Ring	NBR
7	Pin	SS 316

3.2.2 BVF Controls

- Lever operation: DN50–DN300
- Gear operation: DN50–DN600
- Electric actuators: 12V, 24V, 240V, 415V
- Pneumatic actuators: single and double acting
- Stem extensions (BVES): 0.5 m, 1 m, 1.5 m, 2 m lengths

3.3 GWG BVLV — Lugged Butterfly Valve (Vulcanised Seat)

The BVLV is a fully-lugged concentric butterfly valve with a vulcanised NBR seal-on-body design. The threaded lugs allow the valve to be installed as a dead-end service valve — one side of the pipeline can be disconnected without disturbing the other. No flange gaskets are required.

Construction	Lugged Concentric Seal on Body
Size Range	DN50 to DN600
Pressure Rating	PN16 (16 Bar) — -0.8 Bar Vacuum to 16 Bar
Face to Face	According to API609
Flange Drilling	AS4087 PN16 (Table D) / AS2129 Table E / ANSI B16.5 #150
Coating	Fusion Bonded Epoxy
Mounting Pad	ISO 5211
Temperature	-10°C to 90°C (NBR seat)
Body/Shell Test	2.4 MPa
Seat Test	1.76 MPa
Suitable Media	Water, Oil, Gas (W.O.G.) etc.
Standards	Design & manufacture to API609; Inspection & test to API598

3.3.1 BVL Components

No.	Item	Material
1	Body	Ductile Iron
2	Disc	SS 316
3	Stem	SS 420
4	Stem Bushing	PTFE
5	Seat	NBR
6	O-Ring	NBR
7	Pin	SS 316

3.3.2 BVLV Controls

- Lever operation: DN50–DN300
- Gear operation: DN50–DN600
- Electric actuators: 12V, 24V, 240V, 415V
- Pneumatic actuators: single and double acting
- Stem extensions (BVES): 0.5 m, 1 m, 1.5 m, 2 m lengths

3.4 GWG BVL — Lugged Butterfly Valve (Phenolic Hard Back Cartridge Seat)

The BVLV is a fully lugged concentric butterfly valve with a phenolically-backed NBR cartridge seat that is individually replaceable. The cartridge seat supports the disc on both the upstream and downstream faces.

Construction	Lugged Concentric Seal on Body
Size Range	DN50 to DN600
Pressure Rating	PN16 (16 Bar) — -0.8 Bar Vacuum to 16 Bar
Face to Face	According to API609
Flange Drilling	AS4087 PN16 (Table D) / AS2129 Table E / ANSI B16.5 #150
Coating	Fusion Bonded Epoxy
Mounting Pad	ISO 5211
Temperature	-10°C to 90°C (NBR seat)
Body/Shell Test	2.4 MPa
Seat Test	1.76 MPa
Suitable Media	Water, Oil, Gas (W.O.G.) etc.
Standards	Design & manufacture to API609; Inspection & test to API598

3.4.1 BVL Components

No.	Item	Material
1	Body	Ductile Iron
2	Disc	SS 316
3	Stem	SS 420
4	Stem Bushing	PTFE
5	Seat	NBR Cartridge
6	O-Ring	NBR
7	Pin	SS 316

3.4.2 BVL Controls

- Lever operation: DN50–DN300
- Gear operation: DN50–DN600
- Electric actuators: 12V, 24V, 240V, 415V
- Pneumatic actuators: single and double acting
- Stem extensions (BVES): 0.5 m, 1 m, 1.5 m, 2 m lengths

3.5 GWG BVES — Stem Extensions

GWG BVES stem extensions raise the operator above the valve body for below-grade or pit installations. They are available in 1 m, 1.5 m, and 2 m lengths and suit all BVW, BVF, and BVL valves DN50–DN600.

Construction	Ductile Iron Body
Suits Valves	BVW, BVF, BVL — DN50 to DN600
Lengths	1 m / 1.5 m / 2 m
Coating	Fusion Bonded Epoxy
Mounting Pad	ISO 5211

BVES shaft sizes by valve size:

Valve DN (mm)	ISO 5211 Flange	Shaft	H3 (mm)
50–80	F05	9 mm (square)	29
100–150	F07	11–14 mm (square)	29
200–300	F10	17–22 mm (square)	35
350	F10	31.6 mm Ø (round)	45
400–500	F14	33.15–41.15 mm Ø (round)	51.2–64.2
600	F16	50.65 mm Ø (round)	70.2

3.6 GWG BVGS/BVGR — Gearboxes

GWG supplies BVGS (compact, DN50–DN450) and BVGR (heavy-duty, DN350–DN1200) gearboxes to suit all GWG butterfly valves. Gearboxes are fitted as standard on DN350 and above and are available as an option on all smaller sizes.

Model	DN Range (mm)	Output Torque (Nm)	Drive Ratio	Turns	ISO 5211 Flange
BVGS50/65/80	50–80	150	24:1	6	F05
BVGS100	100	150	24:1	6	F07
BVGS125/150	125–150	150	24:1	6	F07
BVGS200	200	500	30:1	7.5	F10
BVGS250	250	500	30:1	7.5	F10
BVGS300	300	1200	50:1	12.5	F10
BVGR350	350	1200	50:1	12.5	F10
BVGR400	400	1800	80:1	20	F14
BVGR450	450	1800	80:1	20	F14
BVGR500	500	2500	640:1	160	F14
BVGR600	600	4000	640:1	160	F16

3.7 Factory Wet Test

Every GWG butterfly valve is hydraulically tested at the factory in the closed position before despatch. The test verifies:

- No seat leakage at rated working pressure (bubble-tight)
- Correct disc alignment and full travel without obstruction
- Operator (lever or gearbox) functions correctly through full travel

> ⚠ **NOTE**
>
> The factory wet test certificate is specific to the valve as assembled and configured at despatch.
>
> Any subsequent field modification that alters the stem, gearbox, or disc position invalidates the as-tested condition.
>
> A field verification inspection (Section 7) is mandatory after any such modification.

4. Storage

- Keep valves in original packaging until ready to install — this protects the seat and coating from dust and debris.
- Store in a cool, dry, well-ventilated location away from direct sunlight, UV sources, and ozone-generating equipment (motors, transformers).
- Do not stack heavy items on top of valves.
- Store the disc in the slightly open position (approximately 10°) to prevent compression set of the seat — except for spring-return actuator assemblies, which are stored in the fail position.
- If storing for more than 3 months, operate the valve through a full open/close cycle quarterly.
- Preferred storage temperature: 4°C to 30°C.
- Remove protective end-covers only immediately before installation.

5. Pre-Installation Checks

Confirm each of the following before installing any GWG butterfly valve:

- Valve size, pressure rating, and seat material match the application requirements.
- Flange drilling pattern matches the pipeline flanges (Table D / Table E / ANSI 150 as applicable).
- Body, disc, and seat are undamaged — no nicks on the disc sealing edge, no tears or distortion in the seat.
- Pipeline has been flushed — free of weld slag, scale, grit, and debris.
- All welding is complete and flanges have fully cooled to ambient temperature before inserting the valve.
- Flange faces are clean, smooth, and parallel — no raised weld beads or corrosion on the seating face.
- Pipe bore is not smaller than the nominal valve bore. If pipe bore is smaller, fit spacer rings between the flanges to prevent the disc striking the pipe wall on opening.
- Where the valve is directly adjacent to a pump, check valve, or elbow, allow a minimum of 5 × DN straight pipe upstream where possible.
- Where the valve is installed directly next to another valve or at a pump flange, fit a pipe spool piece of sufficient length to allow the disc to open fully without striking adjacent fittings.

> ⚠ **CAUTION**
>
> Complete all welding before installing the valve. Never weld on a flange while the valve is between the flanges — heat transfer will destroy the NBR seat.
>
> Allow flanges to cool fully to ambient temperature before inserting the valve.

6. Valve Installation

6.1 Valve Orientation

GWG butterfly valves may be installed in any orientation. The following guidelines apply:

- Preferred: stem horizontal, gearbox or actuator to the side or on top. This reduces shaft loading from operator weight, which is particularly important for larger sizes.
- For slurry, sediment, or particulate service: install with stem horizontal and the lower disc edge opening in the downstream direction. This allows sediment to pass under the disc rather than accumulating around the hub and shaft seal area.
- Upside-down mounting (gearbox directly below the valve) is not recommended for DN350 and above.
- When installing downstream of a bend, tee, or reducer: orient the stem perpendicular (90°) to the upstream fitting. This reduces hydrodynamic disc loading and helps prevent vibration.
- When installing multiple butterfly valves in series for control and isolation: orient the control valve stem perpendicular to the isolation valve stems to cancel out flow-drift effects and reduce noise and erosion.

6.2 BVW Wafer Installation

> ⚠ **NOTE**
> The BVW cartridge seat requires support from both flanges at all times. Do not leave a BVW valve installed with one flange removed — the cartridge seat will not retain its shape without support on both faces.
> For end-of-line or dead-end applications, use vulcanised seat or fit a flange on the open side of a BVW to support the cartridge.

1. Ensure the disc is in the partially open position (approximately 10°) before insertion — the disc edge must sit inside the seat face and not protrude beyond it.
2. Spread the pipe flanges sufficiently to allow the valve body to drop freely between them without the disc or seat face touching the flange bore.
3. Lower the valve between the flanges, centring it on the pipe bore axis. Support the valve body using a nylon sling or lift by the body — never by the gearbox or actuator.
4. Insert all bolts finger-tight. Rest the valve on the lower bolts to prevent it from falling through the gap.
5. Open the disc slowly to the fully open position and verify it clears the pipe bore on both sides. If the disc catches, re-centre the valve before tightening.
6. Tighten bolts in a diagonally opposite (cross) pattern — in stages to hand-tight, then 50% torque, then 100% torque — to ensure even compression of the seat face against both flanges.
7. After full tightening, operate the valve through a complete open/close/open cycle to confirm free travel.

6.3 BVF Flanged Installation

The BVF flanged valve installs like a conventional flanged component. The integral flanges and seal-on-body seat eliminate the need for flange gaskets.

8. Confirm flange faces are clean and parallel. No gaskets required or recommended.
9. Align the valve with the pipeline flanges, supporting the body weight independently for larger sizes.
10. Insert all flange bolts finger-tight. Do not use the bolts to pull misaligned flanges into position.
11. Open the disc to the fully open position and verify clearance around the full bore.
12. Tighten bolts in a cross pattern in stages to specified torque.
13. Operate through a full cycle to verify free travel.

6.4 BVLV Lugged Installation

The BVLV fully lugged valve uses threaded lugs to bolt directly to each flange independently, enabling dead-end service and one-side pipe removal.

14. For dead-end (end-of-line) installation: bolt each flange directly to the valve lugs. The valve body provides the end closure — no blind flange is required on the downstream side.
15. Confirm lug threads are clean and undamaged before fitting bolts. Use the correct bolt length for each flange thickness to ensure full thread engagement.
16. Proceed with steps 4–6 of the BVW procedure (disc clearance check, torque sequence, cycle test).

> ⚠ **NOTE**
> When removing one side of a pipeline connected to a BVL lugged valve in dead-end service, first confirm the upstream side is isolated and depressurised before removing the downstream bolts.

6.5 BVL Lugged Installation

> ⚠ **NOTE**
> The BVL cartridge seat requires support from both flanges at all times. Do not leave a BVL valve installed with one flange removed — the cartridge seat will not retain its shape without support on both faces.
> For end-of-line or dead-end applications, use vulcanised seat or fit a flange on the open side of a BVL to support the cartridge.

The BVL fully lugged valve uses threaded lugs to bolt directly to each flange independently, enabling dead-end service and one-side pipe removal.

17. For dead-end (end-of-line) installation: bolt each flange directly to the valve lugs. The valve body provides the end closure — no blind flange is required on the downstream side.
18. Confirm lug threads are clean and undamaged before fitting bolts. Use the correct bolt length for each flange thickness to ensure full thread engagement.
19. Proceed with steps 4–6 of the BVW procedure (disc clearance check, torque sequence, cycle test).

6.6 General Installation Notes

> ⚠ **NOTE**
> No flange gaskets are required on BVW, BVF, or BVL valves. The seat face provides the seal directly against the flange face. Using a gasket compresses the seat unevenly and can cause leakage or damage.
> Do not use grease, jointing compound, or thread tape on flange faces.

> ⚠ **CAUTION**
> Do not test the valve in the closed position above its rated working pressure (PN16 = 16 Bar / 1.6 MPa).
> The pipeline body may be hydrotested at the higher shell test pressure with the disc in the fully OPEN position.
> Closing the disc at pressures above PN16 can permanently deform the seat.

6.7 Bolt Torque and Flange Notes

- Steel flanges: tighten bolts to the torque specified for the bolt diameter and class per AS4087 or project specification.
- Plastic flanges (PVC/PE): do not over-tighten. Gradual, even tightening in a cross pattern is critical — over-tightening deflects the flange face and reduces seat compression, causing leakage.
- After the first pressurisation and thermal cycle, re-check bolt torque and re-tighten if required.

6.8 Post-Installation Field Test

20. Open the disc fully and apply system hydrostatic test pressure to the pipeline body — inspect all flange joints for leakage.
21. Reduce pressure to zero, then close the disc fully.
22. Slowly apply rated working pressure to the upstream face. Monitor the downstream side for seat leakage.
23. If seat leakage is observed, open the disc 10–15° to purge any debris from the seat face, re-close, and re-test.
24. If leakage persists after flushing, inspect for disc misalignment and adjust the gearbox or actuator close-stop as required.

7. Field Modification — Factory Wet Test Validity

All GWG butterfly valves are factory wet-tested as a complete assembly in the exact configuration shipped. Any field modification that changes the valve assembly — including gearbox replacement, stem extension installation, or actuator change — alters that assembly.

> ⚠ **WARNING**
>
> The GWG factory hydraulic test certificate is invalidated by any field modification affecting the stem, operator, or disc position.
>
> A field verification inspection of disc seating MUST be carried out after every such modification before the valve is returned to service.
>
> Returning a modified valve to service without completing this inspection is not authorised under GWG quality procedures.

7.1 Field Visual Disc Seating Inspection Procedure

This inspection confirms the disc is correctly seated and aligned after the field modification.

25. Before commencing the modification, operate the valve to the fully closed position. Using a permanent marker or centre-punch, mark the stem/gearbox input shaft position relative to the valve body. Record the disc closed position (indicator reading).
26. Complete the modification per Section 8 (gearbox) or Section 9 (stem extension).
27. With the pipeline depressurised and isolated, operate the valve to the fully closed position using the new or modified operator.
28. Visually inspect disc seating by one of the following methods (in order of preference):
    a. Pressure test method: slowly pressurise the upstream side to operating pressure and confirm zero leakage at the downstream side.
    b. Direct visual method (valve out of line): look through the bore — the disc should be concentric with the seat, with even contact around the full circumference.
    c. Torch inspection method (valve in line): shine a torch through the upstream open flange with the disc closed and confirm no light leakage around the seat. Re-open the upstream flange or nearest isolation point for access.
29. Check the gearbox or actuator close-stop is set to correctly arrest disc travel at the fully closed position. Adjust if required.
30. Complete the GWG Field Modification Record (Section 12) and retain with the valve documentation.

> ⚠ **NOTE**
>
> A full hydraulic pressure test to the original factory seat test pressure (1.76 MPa) is the only method that fully replaces the factory wet test certificate.
>
> Where a pressure test is not practicable, the visual disc inspection is the minimum acceptable verification.
>
> For valves used in critical isolation, fire-protection, or potable water service, a pressure test is strongly recommended after any field modification.

8. Gearbox Replacement

8.1 Applicable Products

GWG gearboxes are fitted as standard on DN350 and above. Optional gearboxes are available for DN50–DN300. The correct replacement gearbox must match the original model code, ISO 5211 flange size, input shaft size (square or round), and output torque rating. Refer to Section 3.5 for the GWG gearbox selection table.

8.2 Gearbox Removal

> ⚠ **WARNING**
>
> Fully depressurise and isolate the pipeline before removing a gearbox. The disc may shift when the gearbox is detached.

31. Operate the valve to the fully closed position and confirm the close-stop is engaged.
32. Mark the gearbox input shaft position relative to the ISO 5211 mounting flange with a permanent marker or centre-punch — this records the closed disc position for reassembly.
33. Remove the fasteners securing the gearbox to the valve ISO 5211 top flange.
34. For square-bore input shafts (DN50–DN300): lift the gearbox straight up off the stem.
35. For keyed/round input shafts (DN350 and above): support the gearbox and slide clear of the key or splined shaft.
36. Cover the exposed valve stem opening with tape or a clean cloth to prevent debris entry.

8.3 Gearbox Installation

37. Inspect the replacement gearbox: confirm the model code, ISO 5211 flange size, shaft bore, and output torque match the original specification.
38. Rotate the replacement gearbox input shaft to the fully closed position, matching the punch mark or position indicator established at removal.
39. Lower the gearbox onto the valve stem, aligning the bore with the stem profile. For keyed/round stems, engage the key before lowering.
40. Fit and tighten all mounting fasteners evenly in a cross pattern.
41. Operate the gearbox through a full open/close cycle. Confirm smooth operation with no binding or excessive resistance.
42. Check and adjust the open-stop and close-stop to ensure the disc travels to the correct fully open and fully closed positions without over-travel.

43. Perform the Field Visual Disc Seating Inspection per Section 7.1.
44. Complete the GWG Field Modification Record (Section 12).

> ⚠ **CAUTION**
> Excessive torque from an incorrectly set close-stop can damage the disc edge and seat.
> Always verify and adjust travel stops after fitting any replacement gearbox.

9. Stem Extension Installation (GWG BVES)

9.1 Purpose and Scope

GWG BVES stem extensions raise the gearbox or handwheel operator above the valve body for below-grade, pit, or underground installations. Extensions are available in 1 m, 1.5 m, and 2 m lengths and suit all GWG butterfly valves DN50–DN600. Select the correct BVES model to match the valve DN and ISO 5211 flange size — refer to the BVES product table in Section 3.4.

> ⚠ **WARNING**
> Stem extensions must be supported by external bracing. An unsupported extension may flex under operator load, causing disc misalignment and potential seat damage.
> For extensions exceeding 1.5 m, provide bracing at no greater than 1.2 m intervals.
> Install all bracing before fitting the operator.

9.2 Pre-Installation

45. Operate the valve to the fully closed position before commencing.
46. Remove the existing lever handle or gearbox from the valve ISO 5211 flange. Record the closed disc position (mark the stem relative to the body with a punch mark or permanent marker).
47. Confirm the BVES extension H3 dimension matches the valve ISO 5211 flange H3 — refer to the BVES table in Section 3.4.
48. For sealed extension kits: verify that all O-rings are correctly seated in the Seal Carrier Adapter grooves before assembly.

9.3 Installation

49. Align the stem extension base with the valve ISO 5211 top flange. Match the disc position indicator on the extension to the disc position indicator on the valve — both must show closed.
50. For sealed kits: insert the Seal Carrier Adapter into the recess around the valve stem before lowering the extension base.
51. Lower the extension socket onto the valve stem, maintaining alignment throughout.
52. Secure the extension base to the valve ISO 5211 flange using the supplied hex bolts, flat washers, nuts, and lock washers. Tighten to 20 Nm.
53. For two-piece extensions: place the second Seal Carrier Adapter between the lower and upper extension sections, join using the same bolt procedure, and tighten to 20 Nm.
54. Install all required external bracing to the extension column before proceeding.

55. Fit the gearbox or handwheel operator to the top of the extension tower using the original or replacement hardware. Ensure the operator is set to the closed position before engagement.
56. Operate through a full open/close cycle to confirm free travel, correct indication, and no flex or vibration in the extension column.
57. Perform the Field Visual Disc Seating Inspection per Section 7.1.
58. Complete the GWG Field Modification Record (Section 12).

> ⚠ **NOTE**
> Seal Carrier Adapters may only fit in one orientation — check fit direction before assembly.
> For two-piece BVES assemblies, two Seal Carrier Adapters are required: one at the valve/extension interface and one at the lower/upper extension interface.

10. Operation

- Do not operate the valve above its rated working pressure (PN16 — 16 Bar).
- Open and close the valve smoothly. Rapid closure of large diameter valves generates water hammer — use gearbox operation on DN200 and above to control closing speed.
- For full isolation, close the disc completely. Prolonged throttling at partial opening accelerates disc edge and seat wear.
- If a valve jams between open and closed: check the actuator or gearbox. Remove the operator if necessary and manually turn the stem to diagnose. Check the bore for foreign objects if the stem will not turn freely.
- For dry applications (compressed air, gas): lubricate the disc edge and seat periodically with a silicone-based lubricant compatible with NBR.
- Cycle all infrequently-used valves through a full open/close stroke at least once per month to prevent the seat taking a compression set against the disc.

11. Maintenance

11.1 Routine Schedule

Frequency	Task
Monthly	Operate full open/close cycle — confirm free travel and correct indication.
Quarterly	Inspect stem seals and gearbox for signs of leakage or corrosion. Check and re-apply grease to gearbox grease nipple (where fitted).
Annually	Inspect disc edge, seat face, and body coating. Check bolt torque on flange connections. Replace seat if wear, swelling, or hardening is observed.
After events	Inspect seat and disc after any significant water hammer event or pipeline surge.

11.3 Fault Finding

Symptom	Likely Cause	Corrective Action
Seat leakage at close	Debris on seat face	Open 10–15° to flush debris then reclose and retest.
Seat leakage at close	Disc misaligned	Check alignment; adjust close-stop on gearbox/actuator.
Seat leakage at close	Seat worn or damaged	Replace seat per Section 11.2 (BVW) or contact GWG (BVF/BVL).
Disc catches on pipe bore	Valve not centred between flanges	Re-centre valve and re-torque bolts in cross pattern.
High operating torque	Excessive flange bolt pressure	Reduce bolt torque incrementally; check seat compression.
High operating torque	Debris in pipeline bore	Flush pipeline; inspect disc edge for damage.
Gearbox will not turn	Travel stop set incorrectly	Adjust open and close stops; check for obstructions in bore.
Stem leakage	Stem O-ring or seal worn	Replace stem seals; contact GWG for parts.
Body coating damage	Mechanical damage or corrosion	Repair bare areas with compatible fusion-bonded epoxy or cold-applied epoxy paint.
BVW or BVL seat falls out	Both flanges not fitted	Replace valve and or have the cartridge seat replaced. Refit and ensure a flange on open side. Do not operate BVW or BVL without support on both faces.

12. GWG Field Modification Record

Complete this record after any field modification and retain with the valve documentation or project file. Return a copy to GWG Poly.

Date of Modification	
GWG Order / Job Number	
Customer / Project Name	
Valve Tag / ID	
Valve Series	BVW / BVF / BVL (circle one)
Valve Size (DN)	
Modification Performed	Gearbox Replacement / Stem Extension Installation / Other: _____
Replacement Part Model No.	
Disc Seating Inspection	Pressure Test / Direct Visual / Torch Inspection (circle one)
Inspection Result	PASS / FAIL (circle one)
Notes / Observations	
Technician Name	
Technician Signature	
Date	
GWG Authorising Representative	
Signature	
Date	

⚠ NOTE

Return a copy of this record to: GWG Poly Technical — sales@globalwatergroup.com — +61 7 3517 5595
Original to be filed with project documentation.

Appendix A — Quick Reference: Critical Steps

Task	Critical Requirement
All GWG BV installations	Disc at ~10° open before inserting between flanges
BVW wafer only	BOTH flanges must be present at all times — never one-sided
BVF flanged / BVL lugged	No gaskets required or permitted — seat face IS the seal
All installations	Cross-pattern bolt tightening in stages to specified torque
All installations	Operate full open/close cycle before applying pressure
Hydrostatic pipeline body test	Disc OPEN — test body at system test pressure
Seat/sealing test	Disc CLOSED — rated working pressure only (≤ PN16 / 16 Bar)
Slurry/sediment service	Stem horizontal; lower disc edge opens downstream
Gearbox replacement	Mark stem position before removal; adjust travel stops after fitting; Section 7 inspection
Stem extension (BVES)	All disc position indicators aligned to closed; external bracing fitted; Section 7 inspection
Any field modification	Complete GWG Field Modification Record (Section 12) — copy to GWG Poly
Seat leakage observed	Flush at 10–15° open before replacing seat

Appendix B — GWG Valve Torque Reference

Close-off torque values for GWG BVW / BVF / BVL butterfly valves with NBR seat (Nm, measured in water at 20°C at rated pressure). These values do not include actuator safety factor — multiply by 1.35–1.5 for actuator sizing.

DN (mm)	Torque at PN10 (Nm)	Torque at PN16 (Nm)
50	9.1	11.7
65	14.3	18.2
80	18.2	28.6
100	29.9	44.2
125	52	66.3
150	67.6	101.4
200	110.5	149.5
250	175.5	227.5
300	234	377

DN (mm)	Torque at PN10 (Nm)	Torque at PN16 (Nm)
350	824.2	859.3
400	943.8	1458.6
450	1372.8	1721.2
500	2402.4	2745.6
600	2745.6	3088.8