

BD-402 SERIES

BD-402 | BD-402A | BD-402B

Portable Dental Unit

**Complete Operation, Installation, Cleaning, Maintenance & Troubleshooting
Manual**

English Edition - 2026

IMPORTANT: Document status

This is a compiled technical manual based on publicly available manufacturer product data and an available BD-402-series operation manual. It is not a manufacturer-issued Instructions for Use (IFU) and does not replace the exact manual, nameplate, local regulatory requirements, or the instructions supplied with your specific unit. Where variants differ, the unit nameplate and supplier documentation take precedence.

Document Control and Scope

Item	Details
Document title	BD-402 / BD-402A / BD-402B Portable Dental Unit - Complete Operation & Maintenance Manual
Language	English
Edition	2026 compiled edition
Applies to	BD-402, BD-402A, BD-402B portable dental units and closely related configurations
Primary sources	UMG product catalogue / product page; publicly available BD-402-series operation manual
Intended readers	Dentists, dental assistants, clinic operators, biomedical technicians and service personnel
Limitations	Exact electrical rating, pressure, dimensions, accessories and internal wiring may vary by production year and market. Verify the unit nameplate before installation.

How to Use This Manual

Read Sections 1-9 before first use. Operators should review Sections 10-15. Maintenance personnel should also review Sections 16-20. Use the appendices as checklists and service records.

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1. Safety Information

WARNING: Read before use

Read this manual before installing, commissioning, operating or maintaining the unit. Keep it available near the equipment.

1.1 Safety Signal Words

Signal	Meaning
DANGER	Immediate hazard that can cause death or serious injury.
WARNING	Potential hazard that can cause serious injury, electrical shock, fire or equipment damage.
CAUTION	Potential hazard that may cause minor injury or equipment damage.
NOTICE	Important operating or maintenance information.

1.2 Essential Safety Rules

- Use the unit only by trained dental personnel and only for its intended dental delivery functions.
- Match the mains voltage and frequency to the rating shown on the unit nameplate before connection. Do not assume that every unit is universal-voltage.
- Use a protective-earth grounded outlet. Never defeat the protective earth connection.
- Keep the unit dry. Do not expose it to rain, wet floors, splashing, or environments containing flammable/explosive gases, vapors, liquids or excessive dust.
- Do not touch the motor, compressor or exposed metal/electrical components inside the case while the unit is energized.
- Turn the power OFF and unplug the mains cable before filling/emptying bottles, cleaning internal parts, connecting internal accessories, or performing maintenance.
- Depressurize the water/air system before removing a pressurized bottle. A practical method from the source manual is to switch off power and vent pressure using the air function of the three-way syringe.
- Keep clean-water and waste bottles upright. Do not invert them; backflow can damage the pump/compressor and create electrical hazards.
- Do not allow the waste/sewage bottle to exceed approximately 75% full. Empty it promptly to prevent liquid entering the suction motor or pneumatic system.
- Do not fill the clean-water bottle above approximately 75% of its capacity unless the exact bottle supplied with your unit is explicitly marked otherwise.
- Do not exceed factory pressure limits. Never defeat, plug or modify a safety relief device.
- Do not lubricate the oil-free compressor motor. Handpieces, if supplied, must be maintained according to their own manufacturer instructions.
- Stop immediately if there is smoke, a burning smell, abnormal heat, a humming motor with no air output, electrical leakage/tingling, or severe abnormal vibration.
- Keep children and unauthorized personnel away from the equipment and power connections.
- Use only compatible accessories, tubing and replacement parts with equal or better pressure/electrical ratings.

1.3 Electrical Safety

The source manual warns that excessive supply voltage can damage the unit and create injury risk, while insufficient voltage can cause poor starting and motor damage. If supply quality is uncertain, have a qualified electrician verify voltage, frequency, protective earth and outlet condition before use.

WARNING: Electrical leakage

If the enclosure appears electrically live, stop using the device immediately, disconnect power without touching conductive surfaces unnecessarily, label the unit OUT OF SERVICE and have a qualified technician inspect protective earth and insulation resistance.

1.4 Pressure and Pneumatic Safety

A publicly available BD-402-series operation manual states a working compressor setting of about 4 bar and a safety relief pressure of about 6 bar for that version. Other product listings specify up to 0.6 MPa or 0.8 MPa depending on variant. Do not use these values as authorization to readjust an unverified pressure switch; use the nameplate and supplier specification for the actual unit.

2. Product Overview

The BD-402 series is a suitcase-style portable dental delivery system combining an oil-free air compressor, handpiece delivery tubing, three-way syringe, suction, clean-water supply, waste collection and foot control in a transportable enclosure. Typical applications include dental clinics, mobile/field services and locations where a conventional fixed dental unit is not available.

2.1 Intended Use

- Provide compressed air and regulated air/water to compatible high-speed and low-speed dental handpieces.
- Provide air/water spray through a three-way syringe.
- Provide saliva/low-volume or model-dependent suction.
- Provide a self-contained clean-water source and waste collection.
- Support portable dental treatment when used with independently approved dental instruments and local infection-control procedures.

2.2 Not Intended For

- Use as a life-support or anesthesia gas device.
- Operation in oxygen-enriched, explosive or flammable anesthetic environments.
- Connection to instruments whose pressure, flow, electrical or water requirements exceed the unit specification.
- Use with contaminated water or unapproved chemicals that can damage tubing, valves, seals or patients.

3. Model Identification and Differences

Feature	BD-402	BD-402A	BD-402B
General format	Portable suitcase unit	Trolley/tie-rod style in many market versions; portable	Upgraded trolley/tie-rod style in many market versions
Compressor	Oil-free	Oil-free	Oil-free

Feature	BD-402	BD-402A	BD-402B
Published power	550 W on current UMG product page	550 W	550 W
Published airflow	65 L/min on current UMG product page	130 L/min	130 L/min
Published pressure	0.6 MPa on current UMG product page	0.8 MPa in UMG catalogue	0.8 MPa in UMG catalogue
Control system	Conventional pneumatic/mechanical configuration	Conventional configuration	Electronic control system
Air tank	Market/version dependent; reseller comparisons often state no air tank	Air tank included in many variants	Built-in air tank; stainless steel on UMG catalogue
Water/drain containers	Plastic on UMG catalogue	Plastic in UMG catalogue; some reseller variants show stainless steel	Stainless-steel water bottle / air tank and stainless-steel drain bottle in UMG catalogue
Simultaneous handpiece + suction	Configuration dependent	Many reseller descriptions state not simultaneous	Published reseller descriptions state simultaneous operation
Optional equipment	High/low-speed handpieces, scaler, LED curing light depending on variant	High/low-speed handpieces, scaler; other options depend on variant	High/low-speed handpieces, scaler, LED curing light depending on variant

NOTE: Model variants

BD-402-series equipment has been sold in multiple production and private-label variants. Always identify the exact model, serial number, voltage and accessory configuration before service.

4. Technical Specifications

4.1 Manufacturer-Published / Catalogue Data

Parameter	BD-402	BD-402A	BD-402B
Mains supply	110-220 V, 50-60 Hz on current UMG page; verify nameplate	110 V/60 Hz or 220 V/50 Hz commonly listed; verify nameplate	110 V/60 Hz or 220 V/50 Hz commonly listed; verify nameplate
Power	550 W	550 W	550 W
Motor speed	1400 r/min	1400 r/min (commonly published)	1400 r/min (commonly published)
Airflow	65 L/min	130 L/min	130 L/min
Pressure	0.6 MPa	0.8 MPa	0.8 MPa
Noise	39 dB(A)	40 dB(A)	40 dB(A)

Parameter	BD-402	BD-402A	BD-402B
Weight	16 kg net / 20 kg gross on UMG page	Approx. 19 kg on multiple listings	Approx. 22 kg on multiple listings
Dimensions	47.5 x 34 x 37 cm on UMG page	Approx. 40 x 29 x 45 cm on multiple listings	Approx. 40 x 29 x 45 cm on multiple listings

Important: A separate publicly available operation manual lists a 402B variant at 550 W, 130 L/min at 0 MPa, 0.6 MPa, 40 dB(A), 24 kg and 49 x 38 x 52 cm. This illustrates why nameplate verification is mandatory.

5. Supplied and Optional Components

5.1 Typical Standard Components

Component	BD-402	BD-402A	BD-402B
High-speed handpiece tube	1	1	1
Low-speed handpiece tube	1	1	1
Three-way syringe	1	1	1
Oil-free air compressor	1	1	1
Clean-water container	1 plastic	1 plastic in UMG catalogue	1 stainless-steel water bottle
Air tank	Variant dependent	Included in many variants	Stainless-steel air tank
Suction system	1	1 high/low system	1 high/low system
Drain / waste container	1	1	1 stainless-steel drain bottle
Foot control	1	1	1
Power cable	1 typical	1 typical	1 typical

5.2 Optional Equipment

- High-speed handpiece (e.g., push-button / quick-connection type depending on supplier).
- Low-speed air motor with contra-angle and/or straight handpiece.
- Built-in ultrasonic scaler on supported variants.
- Built-in LED curing light on supported variants, especially BD-402B configurations.
- Fiber-optic handpiece tubing on certain market variants.
- External headlight or other accessories if specifically supplied and rated for the unit.

Optional instruments have their own cleaning, lubrication, sterilization, operating and service instructions. Those instructions take priority for the accessory itself.

6. Site and Utility Requirements

Requirement	Recommended / Required Condition
Surface	Stable, level, dry and strong enough to support the unit with the lid open and accessories deployed.
Ventilation	Leave adequate clearance around compressor vents. Do not cover ventilation openings.
Environment	Clean, dry, well ventilated, away from direct water spray, excessive dust, corrosive chemicals and heat sources.
Electrical outlet	Grounded outlet matching unit nameplate; accessible so power can be disconnected quickly.
Extension cords	Avoid if possible. If unavoidable, use a grounded heavy-duty cord with adequate current rating and minimal length; follow local electrical rules.
Water	Use purified/distilled/treated water only if compatible with local clinical protocol and the supplied bottle/tubing.
Drainage	Self-contained waste bottle; no direct drain connection unless the exact configuration is designed for it.
Clearance	Provide enough space to prevent tubing from being kinked, crushed or creating trip hazards.

7. Unpacking and Inspection

1. Place the shipping case upright on a stable surface.
2. Inspect the outer packaging for impact, puncture or water damage. Photograph damage before opening if shipping damage is suspected.
3. Open the case carefully and remove loose accessories. Do not pull components by tubing or electrical cords.
4. Verify the packing list against the order: unit, foot switch, power cable, handpiece tubes, three-way syringe, suction tube, clean-water bottle, waste bottle and optional accessories.
5. Inspect tubing for cuts, flattening, brittle sections or loose fittings. Inspect bottles for cracks, damaged threads, missing O-rings and distorted caps.
6. Verify the model and serial number, mains voltage/frequency, power rating and any pressure markings on the nameplate.
7. Do not energize a damaged unit. Tag it and contact the supplier if damage, missing safety parts or fluid contamination is found.

7.1 After Cold Transport

If the unit has been transported in cold conditions, allow it to reach room temperature before energizing. Condensation inside electrical or pneumatic components can cause insulation failure, corrosion and erratic operation.

8. Installation and Assembly

WARNING: Before installation

Power must remain OFF and unplugged during assembly. Do not remove or install pressurized bottles.

8.1 Positioning the Unit

8. Set the case upright on a stable, level surface.
9. Open and secure the lid. If the unit has a telescopic tie rod/wheels, lock or stabilize it so it cannot roll during treatment.
10. Arrange tubing so that instruments can reach the treatment area without tension or sharp bends.
11. Keep compressor ventilation paths unobstructed.

8.2 Install the Clean-Water Bottle

12. Verify the system is depressurized.
13. Inspect bottle, cap/connector and O-ring for cleanliness and damage.
14. Fill with suitable clean water to no more than about 75% unless the bottle is specifically marked otherwise.
15. Wipe the outside of the bottle dry.
16. Install the bottle upright and tighten firmly by hand. Do not cross-thread or use tools unless specified by the manufacturer.
17. Verify no leakage occurs during pressurization.

8.3 Install the Waste / Drain Bottle

18. Ensure the bottle is clean, empty and upright.
19. Inspect seals and threads.
20. Install securely and tighten by hand.
21. Make sure the suction line enters the correct waste connection and that the bottle cannot tip during use.

8.4 Connect the Foot Control

22. Locate the foot-pedal connection.
23. Align the plug correctly; do not force the connector.
24. Secure the connector if it has a threaded collar.
25. Route the cable to avoid trip hazards and chair wheels.

8.5 Connect Handpiece and Syringe Tubing

26. Identify high-speed and low-speed handpiece tubes and connect compatible handpieces only.
27. Seat the three-way syringe correctly in its hose/holder.
28. Connect the suction handpiece/ejector and confirm it hangs fully in its holder when inactive.
29. If a scaler or curing light is built in, connect only according to the accessory-specific instructions.

8.6 Electrical Connection

30. Confirm the power switch is OFF.
31. Verify mains voltage/frequency against the exact unit nameplate.
32. Inspect the mains cable and plug for damage.
33. Connect the cable to the unit, then to a grounded wall outlet.

34. Do not switch ON yet; proceed to commissioning.

9. Initial Commissioning

9.1 Pre-Start Checklist

- Unit stable and dry.
- Correct mains voltage confirmed.
- Protective-earth outlet available.
- Clean-water bottle filled and tightened.
- Waste bottle empty, tightened and upright.
- All tubes connected and placed in correct holders.
- Pressure regulator not set to an unknown high value.
- No shipping plugs, foam or packing material remain in ventilation areas.

9.2 First Power-On

- Place all handpieces and suction instruments in their holders.
- Switch the unit ON. Listen for smooth compressor operation.
- Allow the compressor/air tank, if fitted, to reach its normal cut-out pressure.
- Check all bottle connections, tubes and fittings for air or water leakage.
- Observe the pressure gauge for stable behavior.
- Briefly operate the three-way syringe air function, then water function, to confirm flow.
- Briefly test handpiece drive with no bur installed, using the foot control, and verify air/water response.
- Test suction. On BD-402/BD-402A configurations where air and suction are switched separately, follow the applicable air/suction changeover procedure. On BD-402B electronic variants, verify simultaneous operation only if the supplied configuration is designed for it.
- If any abnormal odor, smoke, severe vibration, electrical tingling, repeated breaker/fuse trip or uncontrolled pressure occurs, switch OFF and disconnect immediately.

9.3 Pressure Regulator Adjustment

The source operation manual instructs the operator to return the handpiece to its holder before pressure adjustment, pull up the regulator knob to unlock, turn clockwise to increase pressure or counterclockwise to decrease, then push the knob down to lock. Set only to the pressure required by the connected handpiece and within the unit/handpiece rating.

CAUTION: Do not over-adjust

Do not change compressor pressure-switch or safety-relief settings as an operator adjustment. Those are service settings.

10. Controls and Functional Description

Control / Part	Function and Use
Power switch	Turns electrical power to the unit ON/OFF.
Pressure gauge	Indicates regulated or system pressure depending on configuration.

Control / Part	Function and Use
Air adjuster / regulator	Adjusts working air pressure. Pull-to-unlock / push-to-lock style is common.
Left water switch / valve	Adjusts water flow to one handpiece line on typical configurations.
Right water switch / valve	Adjusts water flow to the other handpiece line on typical configurations.
Air switch	Enables pneumatic delivery on configurations with manual air/suction selection.
Suction switch	Enables suction on configurations with a separate suction mode. Source manual advises turning air OFF before turning suction ON on that variant.
Foot control	Starts handpiece/air delivery when depressed and stops when released. Avoid rapid repeated tapping.
Suction control valve	Adjusts suction level at the saliva ejector/suction handpiece.
Motor ball valve	Service/operator fine adjustment on some variants; affects output gas pressure and suction gas relationship. Opening more may reduce pressure on the documented variant.
Instrument holders	On some models act as pneumatic/electrical interlocks; instruments must be fully returned to stop/enable correct functions.

11. Normal Operating Procedure

11.1 Daily Start-Up

44. Inspect power cord, tubes, bottles and foot control.
45. Confirm waste bottle is empty and clean.
46. Fill clean-water bottle with appropriate water, staying below the maximum allowed level.
47. Tighten bottles and keep them upright.
48. Place all instruments in their holders.
49. Switch ON and allow system pressure to stabilize.
50. Flush water-bearing lines before patient use according to your infection-control policy and the connected instrument manufacturer instructions.
51. Test air, water, handpiece drive and suction away from the patient.
52. Set handpiece air and water only to the minimum effective levels required by the instrument manufacturer and procedure.

11.2 Between Patients

- Use new sterile/processed patient-contact instruments as required.

- Disinfect clinical contact surfaces using a compatible product; do not saturate switches, vents or electrical connectors.
- Flush or process waterlines/suction lines according to local infection-control protocol and chemical compatibility requirements.
- Inspect waste-bottle level; empty before it reaches 75%.
- Replace barriers and single-use suction tips as required.

12. Handpiece Operation

12.1 High-Speed Handpiece

53. Confirm the handpiece is compatible with the tubing connector and intended drive pressure.
54. Install a bur according to the handpiece manufacturer instructions; verify retention before use.
55. Remove the handpiece from its holder.
56. Set water spray to a low starting level, then adjust as needed.
57. Depress the foot control smoothly. Avoid rapid on/off stamping.
58. Confirm adequate air pressure, smooth rotation and water spray before entering the oral cavity.
59. Release the foot control fully to stop.
60. Return the handpiece completely to its holder after use.

NOTE: Handpiece lubrication

The portable unit compressor is oil-free and must not be lubricated. This does NOT mean a separately supplied air-turbine or low-speed handpiece is maintenance-free. Lubricate/sterilize the handpiece only according to its own IFU.

12.2 Low-Speed Handpiece / Air Motor

61. Confirm the correct air motor, straight/contra-angle attachment and tubing connection.
62. Set the pressure within the air-motor manufacturer range.
63. Operate with the foot control and verify smooth rotation before use.
64. Do not run attachments with damaged gears, abnormal heat or noise.
65. Process and lubricate the low-speed system according to its manufacturer IFU.

12.3 BD-402B Simultaneous Operation

Published reseller documentation for the BD-402B electronic-control configuration states that the dental handpiece and suction can operate simultaneously without mutual interference and that air/water stops promptly when the foot control is released. Verify this behavior on the exact unit before clinical use; not all BD-402/BD-402A configurations support simultaneous handpiece and suction operation.

13. Three-Way Syringe and Suction Operation

13.1 Three-Way Syringe

Use the syringe controls for air, water or combined spray as designed. Confirm the tip is securely installed. Keep the tip directed away from people when testing. If used for depressurizing the clean-water bottle, switch power OFF first and vent until pressure is fully released before loosening the bottle.

13.2 Suction / Saliva Ejector

66. Confirm the waste bottle is installed, empty and upright.
67. Pick up the saliva ejector/suction handpiece.
68. Adjust the suction control valve to the required level.
69. On configurations with separate Air and Suction switches, follow the documented sequence for that unit (the source manual instructs Air OFF before Suction ON).
70. Monitor the waste bottle continuously. Empty at or before approximately 75% full.
71. After use, return the suction instrument fully to its holder so interlocks can reset.

WARNING: Waste aspiration into motor

If waste liquid is suspected to have entered the motor/compressor or internal pneumatic system, stop use immediately. Do not simply dry the outside and continue. The unit requires technical inspection.

14. Shutdown Procedure

14.1 End of Patient / Short Shutdown

72. Release the foot control and return all instruments to holders.
73. Turn off suction/air mode as applicable.
74. Check waste level and empty if required.
75. Perform required surface and line cleaning.

14.2 End-of-Day Shutdown

76. Remove instruments for reprocessing according to their IFUs.
77. Flush/clean suction lines with a compatible dental suction cleaner if approved for the unit materials.
78. Empty and clean the waste bottle.
79. If your waterline protocol requires it, drain or treat the clean-water system.
80. Switch the unit OFF.
81. Disconnect the mains plug if the unit will remain unattended or stored. The source manual specifically warns against leaving the unit powered/standing by for long periods because heat can damage transformers and solenoid valves.
82. Depressurize the bottle/system before removing bottles.
83. Wipe external surfaces dry and allow the unit to ventilate before closing the case.

15. Cleaning, Disinfection and Infection Control

IMPORTANT: Clinical protocol

This section provides equipment-care guidance, not a complete infection-control policy. Follow applicable dental infection-control regulations and the disinfectant/instrument manufacturers instructions.

15.1 External Surfaces

84. Switch OFF and unplug.
85. Wear appropriate PPE.
86. Remove visible soil with a soft cloth and compatible detergent solution.

87. Apply a hospital/clinical surface disinfectant compatible with painted metal, aluminum alloy, plastics, rubber and labels.
88. Keep liquid out of vents, switches, connectors, gauges and the compressor. Never spray directly into the case.
89. Observe the disinfectant contact time, then wipe/dry if required by its label.

15.2 Clean-Water Bottle

- Depressurize before removal.
- Empty remaining water daily or according to clinic waterline policy.
- Clean and disinfect using a method compatible with the bottle material and O-rings.
- Rinse thoroughly if chemical residue could enter patient waterlines.
- Inspect for cracks, clouding, thread damage and seal deterioration. Replace damaged bottles.
- Do not autoclave a bottle unless it is explicitly marked autoclavable.

15.3 Waste Bottle and Suction Tubing

- Wear PPE because collected fluid is contaminated.
- Empty before 75% full and at the end of the day.
- Use a compatible suction-system cleaner/disinfectant at the concentration specified by its manufacturer.
- Do not use chemicals known to attack aluminum, stainless steel, plastics, seals or tubing.
- Rinse if required by chemical instructions.
- Inspect the bottle cap, gasket, float/interlock (if present) and suction tubing for blockage or leakage.

15.4 Handpieces, Syringe Tips, Scalars and Curing Lights

These are separate medical/dental instruments. Cleaning, packaging, sterilization, lubrication, tip replacement and optical cleaning must follow the manufacturer IFU for each accessory. Do not place electrical or non-autoclavable parts in a steam sterilizer.

15.5 Waterline Management

Portable units can still develop waterline biofilm. Use a documented clinic waterline program and only chemicals validated for the tubing, valves, bottles and connected handpieces. After chemical treatment, flush to the concentration/residual level required by the treatment-product instructions before patient use.

16. Preventive Maintenance

16.1 Recommended Schedule

Interval	Task
Before each day	Inspect mains cable, foot control, hoses, bottles, O-rings, holders and visible fittings. Verify waste bottle empty and water bottle clean.
Daily	Clean/disinfect external surfaces; empty/clean waste bottle; inspect for leaks; switch off and disconnect after work; keep unit dry.
Weekly	Inspect tubing for abrasion/kinks; inspect bottle threads and seals; check holder/interlock operation; clean dust from

Interval	Task
	external ventilation openings using a dry method.
Monthly	Check all accessible pneumatic fittings for leakage; confirm gauge response and regulator locking; inspect foot-control cable; inspect case hinges/latches/wheels/tie rod.
Every 3-6 months	Functional safety check by trained personnel: compressor cut-in/cut-out behavior, leakage, suction performance, regulator operation, relief path, electrical cord/earth integrity as applicable.
Annually or per local policy	Preventive maintenance by qualified biomedical/service technician, including electrical safety test where required, internal inspection, hose/seal condition, compressor mounts, pressure-control verification and replacement of worn parts.
After transport/impact	Inspect before energizing for loose compressor mounts, cracked bottles, shifted tubing, wiring damage and pressure leaks.

17. Detailed Maintenance Procedures

17.1 Leak Check

90. With the unit clean and dry, pressurize normally.
91. Listen for continuous hissing after normal pressure is reached.
92. Inspect accessible tube connections and bottle seals. A small amount of leak-detection solution/soapy water may be used on suitable external pneumatic joints; keep it away from electrical components.
93. Bubbles indicate a leak. Depressurize before tightening or replacing a seal.
94. If pressure drops rapidly with no visible external leak, remove the unit from service for valve/check-valve inspection.

17.2 O-Ring / Seal Replacement

95. Switch OFF, unplug and depressurize.
96. Remove the affected bottle/fitting.
97. Identify the exact O-ring size/material; do not substitute an oversized or incompatible seal.
98. Clean the groove and mating surface.
99. Install the new seal without twisting or cutting it. Use lubricant only if explicitly compatible and required.
100. Reassemble, pressurize and leak-test.

17.3 Fuse Replacement

WARNING: Service safety

Replace a fuse only with the exact type and rating specified on the unit/fuse holder. If the replacement fuse opens again, do not install a larger fuse; remove the unit from service.

101. Switch OFF and unplug.
102. Locate the accessible fuse holder if provided.
103. Confirm fuse rating from markings/manual.

104. Replace with identical type/rating.
105. Reconnect and test. If it blows again, stop and refer for electrical service.

17.4 Compressor Care

- The compressor is oil-free; do not add oil.
- Keep ventilation openings clean and unobstructed.
- Allow an overheated compressor to cool before restarting. Repeated overheating requires service.
- Inspect rubber mounts and fasteners if abnormal vibration develops.
- Do not alter pressure switch or safety valve settings without the service specification.

17.5 Regulator / Filter

If a filter-regulator is fitted, inspect for contamination or water accumulation according to its design. Depressurize before service. Clean or replace filter elements only with compatible parts. Confirm the regulator knob locks after setting.

17.6 Solenoid / Valve Service

A source troubleshooting table identifies a contaminated solenoid spool as a possible cause of compressor continuous running on certain variants. Solenoid disassembly is a technician task: disconnect power, depressurize, identify wiring and valve orientation, clean/replace the valve, then perform leakage and functional testing.

18. Storage and Transport

18.1 Preparing for Transport

106. Switch OFF and unplug.
107. Depressurize completely.
108. Empty the waste bottle and clean it.
109. Drain the clean-water bottle unless transport instructions require otherwise.
110. Dry bottles and fittings.
111. Secure handpieces/accessories so they cannot strike the case or compressor.
112. Coil cables loosely; do not kink tubing.
113. Close and latch the case.
114. Keep the unit upright when possible, especially if any fluid remains.

18.2 Storage Conditions

- Dry, clean, ventilated area.
- Protect from freezing, direct sunlight, corrosive vapors and excessive heat.
- Do not store with a full waste bottle.
- Avoid long-term storage while pressurized.
- Before return to service after storage, inspect seals, tubing, electrical cable and compressor start-up behavior.

19. Troubleshooting

WARNING: Stop conditions

Stop and disconnect immediately for smoke, burning smell, electrical shock/tingling, severe overheating, major fluid ingress, cracked pressure vessel/bottle, uncontrolled pressure rise or repeated fuse/breaker trip.

Symptom	Possible Causes	Checks	Corrective Action
Compressor does not start	No mains power; loose power cord; blown fuse; overheated compressor; low supply voltage; internal wiring fault	Verify outlet and power switch; inspect cord; verify fuse; allow cooling; measure supply voltage if qualified	Restore correct supply; replace identical fuse once; allow cooling; service wiring/motor if fault persists
Compressor hums but no air	Motor/compressor stalled or internal fault	Switch off immediately; check for overheating or burnt odor	Do not repeatedly restart. Refer for compressor/motor service
Compressor runs continuously	Air leak; bottle not sealed; instrument not correctly returned to holder; solenoid/valve fault; suction interlock not reset	Listen for leaks; check bottle tightness; return suction/handpiece to holder; inspect pressure rise	Correct leaks/holder position; technician to clean/replace valve if required
Pressure rises then drops quickly	Major tubing leak; check valve leak; loose bottle/seal	Leak test tubing and fittings; isolate visible leak	Tighten/replace tubing or O-rings; service check valve
Low handpiece power	Regulator set low; leak; low supply voltage; blocked line; handpiece fault	Check pressure gauge, tubing, supply voltage and handpiece on known-good source if available	Adjust within spec; fix leak/blockage; service handpiece
No water spray at handpiece	Water bottle empty; bottle not pressurized; water valve closed; blocked water valve/line; handpiece blockage	Check bottle and three-way syringe water flow; inspect water control	Fill/pressurize; open valve; clean/replace valve or line; service handpiece
Water leaks from handpiece when idle	Water-control cartridge/valve leaking; foot control not returning fully; damaged O-ring	Release foot switch; observe gauge; inspect valve	Free/repair foot control; replace cartridge/O-ring
Three-way syringe has no air	Air mode off; low pressure; blocked syringe/line	Check regulator and other air functions	Restore air supply; clean/service syringe per IFU
Three-way syringe has no water	Empty bottle; water valve closed; blockage	Check bottle and handpiece water flow	Fill bottle; open/clean valve; service syringe
Suction weak	Waste bottle near full; suction valve partly closed; tube kink/blockage; bottle leak; mode not enabled	Check bottle level, tubing, seals, valve and switch	Empty bottle; clear tubing; tighten/replace seals; enable suction
Suction will not stop	Suction instrument not fully in holder; holder valve/interlock stuck; electronic valve fault	Return instrument firmly to holder; inspect switch/holder	Correct holder position; service holder/valve
Abnormal vibration/noise	Low voltage; loose compressor mount; compressor wear; case contact	Verify voltage; inspect mounts after disconnecting	Correct supply; tighten/replace mounts; service compressor
Unit overheats	Blocked ventilation; extended duty; low/high voltage; compressor fault	Check vents and room temperature; allow cooling	Clear vents; improve ventilation; service if recurring
Enclosure feels electrically live	Protective earth fault; moisture/insulation failure	Do not continue using. Qualified electrical safety test required	Disconnect and service; dry/repair only after fault identification

Fuse or breaker repeatedly trips	Short circuit; motor fault; wrong voltage; incorrect fuse	Verify nameplate and supply; technician electrical test	Do not up-rate fuse. Repair cause before reuse
Bottle difficult to remove	System still pressurized	Switch off, unplug and vent with syringe air function until pressure is released	Remove only after full depressurization
Water/waste enters internal machine	Bottle inverted/overfilled; suction overflow; damaged separator	Stop immediately, disconnect and do not restart	Technical inspection, drying, contamination cleanup and electrical safety check required

20. Service, Repair and Parts

20.1 Operator-Serviceable Items

- External cleaning/disinfection.
- Clean-water and waste-bottle cleaning and routine replacement.
- Accessible O-ring/seal replacement where part identity is known.
- Approved tubing/tip replacement.
- Accessible fuse replacement with identical rating, one time only while troubleshooting.
- Routine leak inspection and holder/foot-control functional checks.

20.2 Qualified-Service Tasks

- Internal electrical wiring, transformer, relay or power switch repair.
- Compressor motor, capacitor, thermal protector or pump-head repair.
- Pressure switch or safety relief valve adjustment/replacement.
- Internal air-tank repair or pressure-vessel work.
- Solenoid and internal valve overhaul.
- Protective earth/insulation/electrical safety testing.
- Internal fluid contamination cleanup after waste backflow.

20.3 Parts Selection

Record model, serial number, supply voltage, production date (if marked), connector type and the original part markings before ordering. BD-402, BD-402A and BD-402B variants are not guaranteed to use interchangeable valves, bottles, pressure switches, tubing or electrical parts.

21. Decommissioning and Disposal

115. Remove the unit from clinical service and disconnect power.
116. Drain and disinfect clean-water and waste systems.
117. Remove single-use contaminated items for clinical waste disposal.
118. Separate batteries (if any optional accessories contain them), electronics, metal parts and plastics according to local waste rules.
119. Do not dispose of contaminated liquids into an inappropriate drain. Follow local clinical-waste requirements.
120. Mark the unit as decommissioned to prevent accidental reuse.

Appendix A - Pre-Use Checklist

Check Item	Status / Entry
Date / Unit ID	_____
Mains cable undamaged	[]
Correct voltage/nameplate verified	[]
Protective earth outlet available	[]
Clean-water bottle clean / filled / tight	[]
Waste bottle empty / clean / tight	[]
Tubing and fittings intact	[]
Handpieces and syringe correctly connected	[]
Suction correctly connected and in holder	[]
Foot control connected / returns freely	[]
Pressure stable / no leaks	[]
Air and water function tested	[]
Suction tested	[]
No abnormal odor/noise/heat	[]
Operator initials	_____

Appendix B - Daily / Weekly Maintenance Checklist

Task	Daily	Weekly	Initials / Notes
Empty and clean waste bottle	[]		
Inspect clean-water bottle / seals	[]		
Disinfect external surfaces	[]		
Inspect tubing for leaks/kinks	[]		
Check foot control return	[]		

Task	Daily	Weekly	Initials / Notes
Turn OFF and unplug after work	☐		
Inspect power cable and plug		☐	
Inspect holders/interlocks		☐	
Inspect ventilation openings		☐	
Check bottle threads/O-rings		☐	
Leak-check accessible fittings		☐	

Appendix C - Preventive Maintenance Record

Date	Running / Usage Notes	Work Performed	Parts Replaced	Technician	Next Due

Appendix D - Troubleshooting / Service Record

Date	Symptom	Checks / Measurements	Corrective Action	Result

Date	Symptom	Checks / Measurements	Corrective Action	Result

Appendix E - Model / Configuration Record

Field	Entry
Model	BD-402 / BD-402A / BD-402B
Serial number	_____
Supply voltage / frequency	_____
Rated power	_____
Rated pressure	_____
Handpiece connector type	_____
Scaler fitted	Yes / No / Model: _____
Curing light fitted	Yes / No / Model: _____
Water bottle material	Plastic / Stainless steel / Other
Air tank fitted	Yes / No
Supplier	_____
Purchase date	_____
Local service contact	_____

Appendix F - Technical Source Notes

This compiled manual was prepared from the following publicly accessible materials. Values are intentionally identified as source-dependent where documentation conflicts.

Source	Used For
Tangshan UMG Medical Instrument Co., Ltd. - BD-402 product page	Lists BD-402 supply 110-220 V / 50-60 Hz, 550 W, 1400 r/min, 65 L/min, 0.6 MPa, 39 dB(A), 16 kg net, 20 kg gross, 47.5 x 34 x 37 cm, and standard accessories.

Source	Used For
Tangshan UMG portable dental unit catalogue	Lists BD402A and BD-402B at 550 W, 130 L/min, noise 40, pressure 0.8; describes BD-402B as an electric control system with stainless-steel water bottle/air tank and drain bottle.
Publicly available BD-402-series Operation Manual (8 pages)	Provides safety warnings, bottle 75% rule, regulator/water/suction/foot control instructions, a 402B/402C technical table, packing list and troubleshooting table.
Multiple market listings for BD-402A / BD-402B	Commonly list 110 V/60 Hz or 220 V/50 Hz, 550 W, 1400 r/min, 130 L/min, 0.8 MPa, 40 dB(A), with approximate weights/dimensions; BD-402B listings describe simultaneous handpiece+suction operation and electronic control.

IMPORTANT: Final verification

Before installation or clinical use, compare this manual with the actual nameplate and any documentation shipped with the unit. If they conflict, the unit-specific manufacturer documentation takes priority.

dentalsalemall.com

Quick Reference - Safe Start / Safe Stop

SAFE START

121. Confirm correct voltage and grounded outlet.
122. Waste bottle empty; clean-water bottle filled no more than allowed and both upright/tight.
123. Connect foot control, handpieces, syringe and suction.
124. Place instruments in holders.
125. Power ON; allow pressure to stabilize.
126. Check for leaks, abnormal heat/noise and stable gauge.
127. Test air, water and suction before patient use.

SAFE STOP

128. Release foot control and return instruments to holders.
129. Turn OFF suction/air modes as applicable.
130. Power OFF and unplug for end-of-day.
131. Vent pressure before removing bottles.
132. Empty waste before 75%; clean/disinfect bottles and surfaces.
133. Keep unit dry, unpressurized and properly ventilated before closing for storage.

WARNING: Emergency stop

For smoke, burning smell, electrical leakage, severe overheating, uncontrolled pressure, major fluid ingress or repeated fuse/breaker trip: switch OFF, unplug if safe to do so, tag OUT OF SERVICE, and arrange qualified technical inspection.