SHOCK-WAVE

WATER CANNON

USER MANUAL



MANUFACTURER INFORMATION

Product Name: Shock-Wave Water Cannon
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ABOUT THESE OPERATING INSTRUCTIONS

GENERAL

Welcome to SHOCK-WAVE. The high-powered water cannon engineered for dynamic special effects in large-scale productions. Designed for stadiums, festivals, concerts, and immersive attractions, SHOCK-WAVE delivers a spectacular, high-energy blast of water that captivates audiences.

This manual is designed to guide you through the setup, operation, and maintenance of your SHOCK-WAVE system, ensuring safe and optimal performance. The system is built for high durability, offering adjustable firing angles, powerful projection up to 30 metres, and a versatile, portable structure for seamless integration into any event environment.

Whether you are using SHOCK-WAVE as a standalone effect or as part of a larger special effects sequence, this manual will provide detailed instructions on rigging, filling, pressurisation, safety measures, and control options.

Additionally, you will find troubleshooting guides and technical support information to help you manage any operational challenges.

Prepare to elevate your events with the unmatched power and spectacle of SHOCK-WAVE.

These instructions must be read and applied by every person that is authorised with tasks working with SHOCK-WAVE.

In addition to these Operating Instructions, the regulations concerning accident prevention and environmental protection are applicable in the respective country of use.

ABOUT

Before operating the Shock-Wave Water Cannon for the first time, or if you are authorised to perform tasks related to its operation, you must read these Operating Instructions in full.

Particular attention should be given to ‘General Safety Regulations’ to ensure the safe and proper use of the system.

These instructions are designed to help users:

- Familiarise themselves with the Shock-Wave Water Cannon and its intended operational capabilities.
- Operate the system safely and efficiently, reducing the risk of accidents and damage.
- Ensure compliance with safety procedures and recommended maintenance practices.
- Minimise downtime and repair costs by following correct handling guidelines.
- Extend the lifespan and reliability of the product through proper use and upkeep.

PRESENTATION OF INFORMATION

DESIGN OF WARNINGS

Signal word	Threat	Possible consequences if the safety note is not observed:
DANGER	Personal injuries (imminent threat)	Death or serious injury
WARNING	Personal injuries (possible dangerous situation)	Death or serious injury
CAUTION	Personal injuries	Minor injuries
NOTICE	Property damage	Damage to the machine and its surroundings

WARNING SIGN

Special safety notes are listed at the relevant points in each case. They are identified with the following symbols.



General hazard location
This sign precedes activities that bear the risk of personal injuries and extensive property damages.

If there is a unique hazard source, it is preceded by one of the following symbols.



Power current
This sign precedes activities that bear the risk of electrocution, with possible fatal consequences.



Hand injuries
This sign precedes activities that bear the risk of hand injuries.



Biohazard
This sign precedes activities that can cause a biological hazard.



Foot injuries
This sign precedes activities that that bear the risk of foot injuries.



Hearing hazard
This sign precedes activities that bear the risk of hearing hazards.



Slip hazard
This sign precedes activities that bear the risk of causing slip hazards.

GENERAL SAFETY REGULATIONS

SYSTEM DESCRIPTION

The SHOCK-WAVE Water Cannon is a high-powered, pneumatically driven special effects device, engineered for high-impact visual effects at festivals, concerts, stadium shows, and large-scale events. Designed to deliver a controlled, high-velocity water burst, the system can propel water up to 30 metres into the air, creating a striking, dynamic effect that captivates audiences.

OPERATING PRINCIPLE

The SHOCK-WAVE Water Cannon functions using compressed air or nitrogen as a propellant, following a three-step operational process:

- **Filling**: Water is introduced into the mortar tube via a quick-connect fill system.
- **Pressurisation**: An integrated air cylinder is charged to a maximum pressure of 16 bar.
- **Firing**: A high-speed valve rapidly releases the compressed air into the base of the mortar tube, propelling the stored water into the air in a controlled burst.

INTENDED USE

The SHOCK-WAVE Water Cannon is designed for professional special effects applications. It is intended to be used under the following conditions:

- **Environment**: Operated in outdoor venues or sufficiently large indoor spaces where water fallout will not pose a hazard to equipment, performers, or audiences.
- **Application**: Used as a theatrical special effect for concerts, festivals, stadium shows, theme parks, and immersive attractions, where dramatic, high-energy visual effects are required.
- **Qualified Operators**: Handled only by trained personnel with knowledge of high-pressure systems, pneumatic operation, and safe firing procedures.
- **Safety Conditions**: Operated with a clear line of sight to the firing area, ensuring that there are no obstructions, personnel, or vulnerable equipment within the water jet trajectory.

The SHOCK-WAVE Water Cannon must not be used in confined spaces, near electrical equipment, or in areas where uncontrolled water fallout could create safety hazards. Proper rigging, positioning, and operational safety checks must be conducted before each use to ensure safe and effective operation.

FORESEEABLE MISUSE

To ensure safe and reliable operation, the SHOCK-WAVE Water Cannon must be used strictly within its design specifications. The following misuses could result in serious injury, equipment damage, or system failure:

- **Over-Pressurisation**: Exceeding the maximum operating pressure of 16 bar can lead to component failure, ruptured seals, or uncontrolled air release, posing a significant safety hazard. Always adhere to manufacturer pressure limits.
- **Improper Positioning**: The cannon must never be fired directly at people, animals, structures, or sensitive equipment. Misaligned or unsafe placement could result in injuries, equipment damage, or unintended environmental impact.
- **Unsupervised Use**: Only trained and authorised operators should handle the system. Untrained personnel may incorrectly charge, position, or fire the unit, leading to unexpected hazards or accidents.
- **Faulty Connections**: The use of low-quality hoses, damaged fittings, or incorrect gas regulators can cause leaks, bursts, or pressure failures, increasing the risk of injury or operational failure. Ensure all compressed gas lines and fittings meet safety and quality standards.
- **Improper Water Quality**: Using contaminated, stagnant, or debris-filled water may cause filter clogging, internal corrosion, or bacterial growth (e.g., Legionella contamination), leading to reduced performance and potential health risks. Always use clean, potable water and follow system flushing protocols.

Operators must always conduct pre-use safety checks, follow correct pressurisation procedures, and ensure safe handling practices to prevent misuse and maintain operational integrity.

SAFETY REGULATIONS

GENERAL NOTES



Risk of Electric Shock
Direct contact with high-voltage components can cause life-threatening injuries, permanent disability, or fatality. Secondary risks include fire hazards from electrical shorts.

- Ensure the unit is properly earthed and bonded before use.
- Disconnect power before performing any maintenance.
- Only qualified electricians should inspect or service electrical components.
- Use only manufacturer-approved power cables and connectors.
- Inspect all electrical connections before each use for damage or wear.



Risk of Slipping and Falling Due to Water Fallout
Wet surfaces can cause loss of footing, slips, trips, and falls, potentially leading to sprains, fractures, head injuries, or equipment damage.

- Mark water fallout zones clearly with warning signs.
- Ensure the machine is positioned to direct water away from walkways and critical areas.
- Use high-friction, non-slip mats or coatings on surfaces prone to water accumulation.
- Require crew members working in affected areas to wear slip-resistant footwear.

PERSONAL PROTECTIVE EQUIPMENT



Risk of Crushing Injuries to Feet
Impact or crushing injuries may cause bruising, fractures, broken toes, or severe foot trauma, particularly if the unit is moved or lifted incorrectly.

- All operators and crew members must wear heavy-duty safety boots with steel toe protection.
- Ensure proper manual handling techniques when moving the unit.
- Use mechanical lifting aids where possible to avoid manual handling risks.
- Secure and stabilise the unit before transport or repositioning.



Risk of Loss of Grip and Handling Injuries
Slipping while handling the unit or its accessories may cause hand injuries, pinching, crushing, or dropping of heavy components.

- Use gloves with moisture-resistant and non-slip surfaces when handling wet components.
- Inspect gloves regularly and replace them if worn or damaged.
- Train operators in correct handling techniques to avoid accidental slips.



Risk of Hearing Damage
Prolonged or repeated exposure to loud noise levels may cause tinnitus (ringing in the ears), temporary threshold shifts, or permanent hearing impairment. Sudden loud bursts can also result in startle responses, potentially leading to accidents.

- Wear hearing protection (earplugs or earmuffs) rated for high-decibel environments.
- Ensure personnel are trained in hearing safety protocols.



Risk of Back Strain and Lifting Injuries
Lifting heavy loads without proper support may result in muscle strains, spinal injuries, herniated discs, or long-term back pain.

- Follow proper manual handling techniques, including bending at the knees and keeping the back straight.
- Use mechanical lifting aids such as trolleys, hoists, or forklifts whenever possible.
- Ensure team lifting is used for heavy or awkward loads.

FOR TRANSPORT



Risk of Instability and Handling Hazards Due to Unsafe Ground Conditions

Handling the unit on unsuitable terrain can lead to loss of balance, falls, or crushing injuries. Shifting or unstable ground may cause the machine to tip or become difficult to manoeuvre. Wet, loose, or obstructed surfaces may cause slips, trips, or sudden movement of the equipment.

A pre-movement risk assessment must be conducted before handling the unit.

- Operators must inspect the terrain for stability, slope, and potential hazards such as water, cables, or loose debris.
- Use additional stabilisation methods (e.g., levelling mats or securing straps) if the ground is uneven.

FOR INSTALLATION



Risk of Slips and Falls Due to Water Accumulation

Slipping on wet surfaces can lead to falls, causing sprains, fractures, or head injuries. Wet areas near electrical equipment may pose additional risks of electric shock. Reduced traction in high-traffic areas can increase the risk of unintentional movement or injury.

- Mark wet areas with highly visible "Caution: Slippery Surface" signs where water accumulation is expected.
  Regularly inspect and dry affected areas to minimize standing water.
- Use anti-slip mats, grates, or drainage solutions in water-prone zones.
- Ensure all personnel wear slip-resistant footwear when working in areas exposed to water fallout.



Risk of Tipping or Movement Due to Improper Securing

Unsecured equipment may move unexpectedly, leading to injuries, collisions, or equipment damage. Instability during firing may cause misalignment, inaccurate water projection, or unsafe operating conditions.

- The unit must be anchored, weighted or secured before use to prevent unintended movement.
- Perform a stability check before every operation to ensure the unit is properly positioned on level ground.
- Inspect all anchoring mechanisms before and after each use to ensure they remain effective.



Risk of Water Impact in High-Traffic Areas

Water accumulation in pedestrian areas increases the risk of slips, trips, and falls. Unexpected water exposure can soak electrical equipment, cables, or sensitive gear, causing malfunctions or damage. Personnel may be caught off guard if standing in or passing through an unmarked fallout zone.

- Position the machine so that the fallout zone is outside of walkways, work areas, and high-traffic paths.
- Mark fallout zones clearly with warning signs and barriers to prevent accidental entry.
- Conduct a pre-event test to assess where water fallout will accumulate, making adjustments as needed.
- Use ground drainage solutions or non-slip flooring in areas prone to water exposure.



Risk of High-Pressure Water Impact

Direct exposure to high-pressure water may cause bruising, lacerations, or blunt force trauma. Flying debris or objects caught in the water stream could pose secondary impact hazards. Uncontrolled ejection into crowds, equipment, or structures could result in injuries or property damage.

- Designate a permanent exclusion zone around the water ejection path, ensuring no personnel or objects enter the danger area.
- Clearly mark the exclusion zone with signage and physical barriers where possible.
- Operators must conduct pre-fire checks to confirm the path is clear before activation.
- Automated or remote firing systems should include a secondary confirmation step to prevent accidental discharge.
- Restrict unauthorised personnel from entering the exclusion zone during operation.
- Never enter the zone directly in front of the cannon when armed.

FOR COMMISSIONING



Risk of Electric Shock Due to Faulty Wiring or Water Exposure
Exposure to live electrical components can result in severe injury or death from electric shock. Short circuits may cause equipment damage, sparks, or fire. Water exposure near electrical connections increases the risk of electrocution and system failure.

- Install a residual current device (RCD) or ground fault circuit interrupter (GFCI) to automatically cut power if an electrical fault is detected.
- Ensure the electrical system is properly grounded and bonded before use.
- Perform regular electrical safety inspections, checking for damaged cables, exposed wiring, or moisture intrusion.
- Only use power connections rated for outdoor or wet conditions.



Risk of Contamination, Blockages, and Biological Hazards
Stagnant water can harbour bacteria such as Legionella, increasing the risk of airborne infection. Poor water quality may cause clogging of filters, pipes, or valves, leading to reduced performance or equipment failure. Chemical imbalances in treated water can lead to corrosion of internal components or unsafe exposure to biocides.

- Implement a water management plan, ensuring the system is flushed regularly to prevent stagnation.
- Maintain records of water quality checks, documenting pH levels, contamination risks, and maintenance actions.
- If chemical treatment is used, biocide levels must be monitored to prevent overexposure or under-treatment.
- Use only clean, potable water to minimise contamination risks.
- Inspect filters and drainage components routinely to ensure proper function.

DURING OPERATION



Risk of Accidental Firing and Unauthorised Use
Unintentional activation could cause the high-pressure water jet to fire unexpectedly, leading to serious injuries or equipment damage.
Unauthorized use by untrained personnel increases the risk of improper handling, incorrect pressurisation, or firing into restricted areas.

- Pre-fire safety checks must be performed before every use to confirm the area is clear of personnel and obstructions.
- Fire authorization procedures must be strictly followed, ensuring only trained personnel operate the system.
- Post-event power isolation is mandatory, requiring the unit to be fully powered down and depressurised after use.
- Operational logs should be maintained to track usage and confirm compliance with safety protocols.



Risk of Injury Due to Improper Use
Untrained operators may mishandle the system, causing accidental activation, over-pressurisation, or incorrect rigging.
Failure to follow safety guidelines may lead to serious injury or operational hazards.

- All operators must complete mandatory training on system safety, risk awareness, and emergency response before use.
- Training must cover safe pressurisation, firing procedures, and hazard identification.
- Refresher training should be conducted periodically to reinforce safety standards.
- Emergency shutdown and response drills must be included in the training programme.



Risk of Crowd Exposure to High-Pressure Water
Water ejected at incorrect angles may reach unintended areas, soaking or injuring audience members. Unexpected wind conditions can alter the water fallout trajectory, affecting crowd safety and comfort. Improper placement may result in water pooling in walkways, creating slip hazards for both event staff and attendees.

- Conduct pre-event risk assessments to ensure safe placement of the machine relative to the crowd.
- Account for environmental factors such as wind speed, direction, and terrain before positioning the unit.
- Establish clear boundaries between the firing zone and audience areas using barriers and exclusion zones.
- Adjust machine positioning based on real-time weather conditions and venue layout.
- Ensure trained personnel are present to monitor crowd safety during operation.



Risk of Injury or Equipment Damage Due to Obstructed Firing Path
Personnel in the firing path may be struck by high-velocity water, causing bruising, falls, or impact-related injuries. Unintended objects in the firing zone may be displaced or damaged by the force of the water blast. Failure to identify obstructions could lead to misdirected water fallout, slip hazards, or damage to nearby infrastructure.

- A pre-use clearance check must be conducted before firing to ensure no people or objects are in the firing path.
- Only authorised personnel should conduct the check and confirm all zones are clear.
- If necessary, install physical barriers to prevent accidental entry into the firing zone.
- Ensure operators have an unobstructed line of sight to the ejection area before triggering the system.

UPDATE, MAINTENANCE AND MONITORING TASKS



Risk of Electric Shock or System Failure Due to Faulty Wiring
Insufficient earth bonding can cause metal surfaces to become live, leading to electric shock or electrocution. Undetected wiring faults could cause power failures or malfunctions during operation.

- Require periodic electrical safety inspections to check earth bonding and insulation integrity.
- All inspections must be carried out by a qualified electrician.
- Use a PAT (Portable Appliance Testing) schedule where applicable to ensure compliance.
- Replace or repair damaged cables, connectors, or insulation immediately.
- Maintain inspection logs to track compliance and detect recurring issues.



Risk of System Failure, Over-Pressurisation, or Unexpected Release
Worn seals or valves can cause unexpected air or water discharge, potentially leading to injuries.
Over-pressurisation due to faulty pressure relief mechanisms may result in catastrophic failure or damage to components.

- Schedule routine maintenance of the pressure system according to manufacturer guidelines.
- Inspect seals, hoses, valves, and pressure regulators regularly for signs of wear or damage.
- Test pressure relief mechanisms to ensure proper operation.
- Maintain detailed service logs to track maintenance history and detect recurring issues.
- Only trained personnel should service or adjust the pressure system components.

SELECTION AND QUALIFICATION OF THE PERSONNEL

To ensure the safe and effective operation of the SHOCK-WAVE Water Cannon, only trained and authorised personnel should be permitted to handle, maintain, and operate the system.

Personnel selection should be based on technical competency, safety awareness, and operational training.

GENERAL PERSONNEL REQUIREMENTS

All individuals working with the SHOCK-WAVE Water Cannon must:

- Be physically capable of handling the equipment and associated components.
- Have a basic understanding of pneumatic systems, high-pressure handling, and rigging.
- Be trained in health and safety regulations relevant to special effects equipment.
- Demonstrate competence in manual handling and risk assessment procedures.
- Be familiar with emergency shutdown procedures and incident response protocols.

REQUIRED QUALIFICATIONS FOR KEY ROLES

Role	Qualifications / Competencies	Responsibilities
Operators	▪ Training in safe system operation and firing procedures. ▪ Knowledge of hazard zones and exclusion areas. ▪ Basic understanding of pneumatic and electrical safety. ▪ Familiarity with pre-use and post-use inspections.	▪ Conducts pre-fire safety checks. ▪ Ensures the unit is properly pressurised and secured. ▪ Monitors the firing area for clearance. ▪ Follows shutdown and depressurisation procedures.
Technical / Maintenance Personnel	▪ Qualified in mechanical and pneumatic system servicing. ▪ Certification or experience in pressure system maintenance. ▪ Knowledge of routine inspections, servicing, and troubleshooting.	▪ Performs scheduled maintenance and system checks. ▪ Inspects and replaces worn components. ▪ Ensures pressure relief systems are operational. ▪ Troubleshoots and repairs faulty components.
Supervisors / Safety Officers	▪ Certification in occupational health & safety (OH&S). ▪ Knowledge of risk assessments and hazard control methods. ▪ Training in first aid and emergency response. ▪ Experience in crowd and event safety management.	▪ Conducts pre-event safety briefings. ▪ Oversees operator compliance with safety protocols. ▪ Implements corrective measures if hazards are identified. ▪ Coordinates emergency response actions if needed.

SAFETY DEVICES

POSITION AND FUNCTION OF SAFETY DEVICES

The SHOCK-WAVE Water Cannon is equipped with a range of safety devices designed to prevent accidental operation, mitigate hazards, and ensure safe handling. These devices help protect operators, equipment, and surrounding personnel from potential risks associated with high-pressure systems, water ejection, and electrical components.



Safety Device	Position	Function
Pressure Relief Valve	Located on the side of the pressurised air cylinder	• Automatically releases excess pressure if it exceeds the 16-bar maximum operating pressure. • Can also be manually activated using a pull-ring release. • Ensure the pull ring does not prevent the unit from activating.
Manual Drain Valve	Base of the mortar tube	• Allows operators to drain residual water from the system after use.
Quick-Release Air Connection	Rear of the machine	• Ensures a secure yet easy-to-disconnect air supply connection.
Check Valve (Non-Return Valve)	Inside the water fill line	• Prevents pressurised water entering the supply line when the unit is fired.
Angle Adjustment Locking Mechanism	On the mortar tube pivot points	• Prevents unexpected movement of the firing angle during operation. • Ensures the cannon remains at the intended firing angle after adjustment.
Warning Signs	Around the machine	• Provides visual warnings to operators and bystanders.

MEASURES IN AN EMERGENCY

FIRE FIGHTING

Although the SHOCK-WAVE Water Cannon itself is not a fire hazard, the surrounding environment, pressurised systems, and electrical components may present fire risks under fault conditions. Proper fire prevention, detection, and response protocols must be in place to ensure the safety of personnel and equipment.

POSSIBLE EMISSIONS

The SHOCK-WAVE Water Cannon does not generate hazardous emissions under normal operation. However, in specific failure scenarios, there may be potential emissions that pose risks to personnel, equipment, or the environment.

POTENTIAL EMISSIONS AND ASSOCIATED RISKS

Type of Emission	Possible Cause	Risks / Effects	Prevention / Mitigation
Compressed Gas Release (Air/Nitrogen)	• Accidental rupture of high-pressure components • Failure of seals, hoses, or quick-release couplings • Manual over-pressurisation	• Sudden high-pressure release, posing impact and hearing hazards • Asphyxiation risk in confined spaces if oxygen is displaced • Risk of flying debris due to forceful expulsion	• Regular pressure system inspections for leaks or wear • Ensure pressure relief valve is functional • Follow safe pressurisation procedures and avoid overfilling • Operators must wear hearing protection
Water Discharge / Leakage	• Failed seal or hose connection • Blockage causing unintended release • Failure of drainage system	• Water pooling around electrical components may lead to shock or fire risks • Risk of slip hazards near the machine • Uncontrolled water spray affecting nearby personnel	• Inspect all hoses, seals, and connections before operation • Use non-slip flooring or drainage systems • Ensure electrical components are waterproofed or shielded
Noise Emissions	• Over-pressure valve activation • High-speed gas or water ejection	• Hearing damage for personnel close to the machine • Startle reaction increasing risk of accidental movements or falls	• Establish a hearing protection zone • Operators and nearby personnel must wear earplugs or earmuffs

Electrical Sparks / Short Circuit	• Faulty wiring or insulation failure • Water ingress into electrical components	• Potential fire hazard if flammable materials are nearby • Risk of electric shock if personnel are in contact with live parts	• Ensure proper grounding and insulation integrity • Use Residual Current Devices (RCDs) for automatic shutdown
Legionella or Bacterial Contamination (from stagnant water)	• Use of poor-quality water • Water left stagnant in pipes or tanks	• Aerosolised bacteria may pose a health hazard (e.g., Legionnaires' disease) • Blockages or buildup in the system affecting performance	• Implement a water management plan • Regularly flush the system and use biocides if necessary

SCOPE OF SUPPLY AND MACHINE IDENTIFICATION

TYPE PLATE



DESIGN AND FUNCTION

GENERAL OVERVIEW AND ASSEMBLIES



COMPONENT FUNCTIONS

Component	Function / Purpose	Additional Notes / Safety Considerations
Water Drain Valve	• Allows for manual draining of residual water from the system after use to prevent stagnation and contamination.	• Ensures proper system flushing. • Prevents bacterial buildup (e.g., Legionella risk).
Castors (x2)	• Provides mobility, allowing the unit to be easily repositioned for setup or storage.	
Water Fill Point	• Primary inlet for filling water into the mortar tube. • Connects to an external water supply hose.	• Fitted with a quick-release connector.
Water Filter	• Removes debris or contaminants from the incoming water supply before it enters the system.	• Prevents clogging of internal components. • Regular inspection and cleaning required.

Water Fill Valve	• Controls the flow of water into the system, allowing operators to open/close the supply as needed.	• Must be fully closed before pressurisation.
Safety Check Valve	• A non-return valve that prevents backflow of pressurised water into the supply line.	• Ensures one-way water flow.
Bolt Down Points (x4)	• Designed for securing the unit to the ground or stage surface to provide assured stability.	• Recommended for all installations.
Pressure Relief Valve	• Automatically releases excess pressure to prevent over-pressurisation of the system.	• Set to activate at 16 Bar for safety. • Can be manually operated.
Adjustable Support Leg	• Supports the mortar tube at various angles, allowing adjustment of the firing trajectory.	• Secured using locking pins. • Always verify stability before firing.
Main Output	• Primary ejection point where pressurised water is expelled to create the Shock-wave effect.	• Must be kept clear of obstructions. • Personnel must stay outside the firing zone.
Tank Inspection Point	• Allows internal visual inspection of the pressure tank for maintenance or safety checks.	• Ensures early detection of corrosion or damage. • Only to be accessed when depressurised.
Pressure Tank	• Stores compressed air or nitrogen, providing the energy required to propel water from the output.	• Avoid exceeding maximum pressure limits.
Pressure Gauge	• Displays real-time pressure levels in the system, allowing for accurate pressure monitoring.	• Operators must monitor pressure levels before firing. • Ensure gauge is calibrated periodically.
Gas Fill Handle	• Controls the input of pressurised gas into the system for charging the pressure tank.	• Must be fully closed before disconnecting gas supply. • Ensure correct gas type is used.
Trigger Input	• Electrical trigger mechanism used to initiate the water blast.	• Should only be activated when firing path is clear. • Must be kept secure from accidental activation.
Gas Input	• Connection point for compressed air or nitrogen, supplying pressure to the system.	• Fitted with high-pressure quick-release fittings.

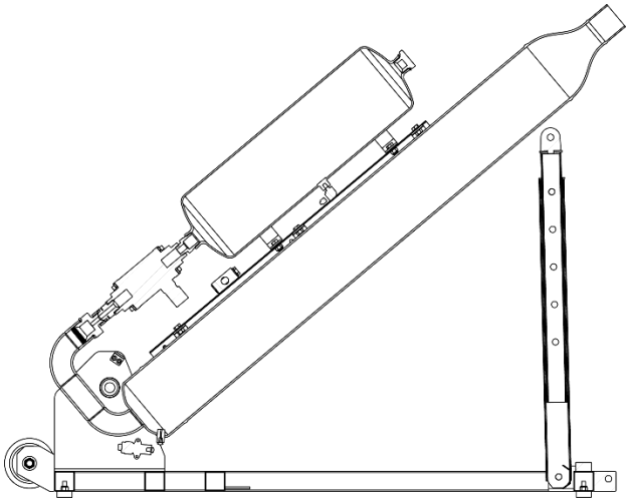
ACCESSORIES

Accessory	Description	Purpose / Use
Flight Case	Heavy-duty protective storage and transport case designed to fit the SHOCK-WAVE Water Cannon and key accessories.	• Protects the unit from damage during transport. • Ensures safe and organised storage.
Card End Caps & Tape	Disposable protective covers placed over the mortar output to prevent foreign objects from entering when not in use.	• Prevents debris, dust, and contaminants from entering the firing tube. • Ensures clean ejection when firing.
Water Fill Hose (10M)	Reinforced flexible hose used to connect the system to a water source.	• Allows quick and efficient water refilling. • Ensures secure and leak-free water transfer.
Water Fill Manifold (4-Way) with Valves	A multi-output water distributor that allows up to four units to be filled simultaneously.	• Improves operational efficiency by enabling multiple systems to be filled from one source. • Individual shutoff valves allow controlled flow to each unit.
Water Fill Submersible Pump	A high-flow electric pump designed to transfer water from IBCs, tanks, or open sources into the machine.	• Used when gravity-fed filling is not available. • Ensures fast and controlled water transfer.
Water Fill IBC (1000L)	A large-capacity water storage tank used to supply water to the system.	• Provides on-site water availability for large-scale events. • Ideal for use in locations without direct water supply.
Hose Adapter (1" to Hozelock)	A conversion fitting that allows a standard 1" water hose to connect to a Hozelock system.	• Ensures compatibility with various water supply fittings. • Reduces setup time and complexity.
Gas Regulator & Hose Kit	Pressure regulator and high-pressure hose for safely connecting nitrogen or compressed air bottles to the system.	• Ensures safe and controlled pressurisation. • Prevents over-pressurisation risks.
Gas Cylinder Trolley	A heavy-duty trolley designed to safely transport and position gas bottles.	• Reduces manual handling strain. • Ensures secure and stable gas supply positioning.
Water Testing Kit	Compact kit comprising of test strips and treatment chemicals suitable for the system.	• Provides system for users on site to follow to ensure water quality is kept high.

FUNCTIONAL FLOW DIAGRAM

The SHOCK-WAVE Water Cannon operates in a four-stage process, transitioning from an empty state to full pressurisation and ultimately firing the water blast. Below is a detailed description of each phase.

EMPTY STATE (IDLE / RESET POSITION)

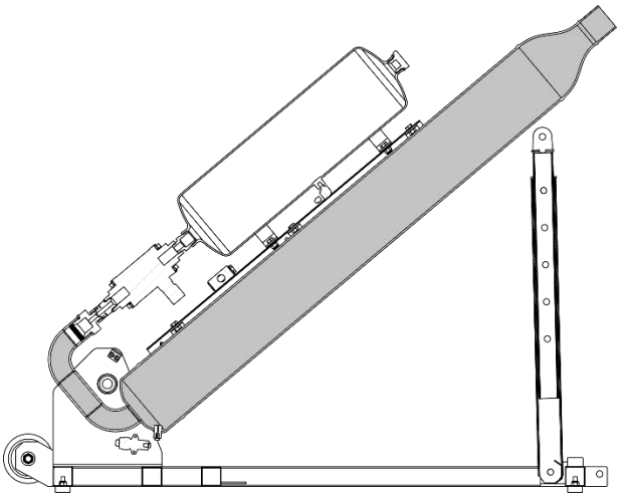


- The machine is unpressurised, and no water is present in the mortar tube.
- The pressure tank is at atmospheric pressure, ensuring a safe state for refilling or transport.
- All valves are closed, and the system is depressurised after the last firing cycle.
- This is the default state after a successful fire sequence or during storage/transport.

SYSTEM STATUS:

- No water in the system.
- No compressed air or nitrogen present.
- Safe to perform maintenance, refilling, or repositioning.

WATER FILL PHASE

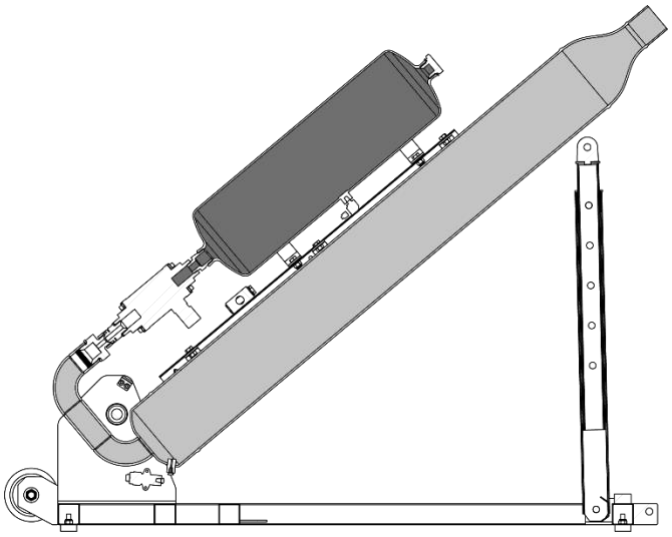


- The operator connects the water fill hose to the water fill point and opens the water fill valve.
- Water enters the mortar tube, filling it to the desired level.
- The safety check valve prevents any backflow contamination.
- The water filter ensures only clean, debris-free water enters the system.
- Once filled, the operator closes the water fill.

SYSTEM STATUS:

- Water is now present in the mortar tube, ready for pressurisation.
- The pressure tank remains unpressurised.
- The system is not yet armed for firing.

WATER & GAS FILL (PRESSURISATION PHASE)

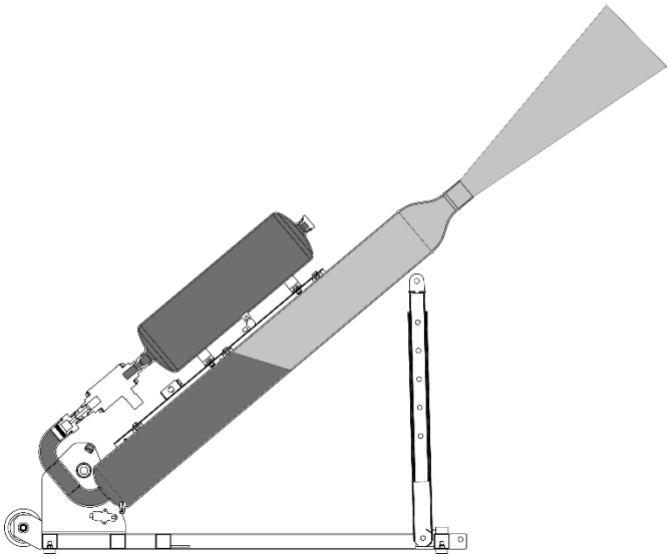


- The operator connects the compressed gas supply (air or nitrogen) to the gas input.
- The gas fill handle is opened, allowing gas to enter the pressure tank.
- The pressure gauge displays real-time system pressure, which should not exceed 16 bar.
- The pressure relief valve ensures that any excess gas pressure is safely vented if overfilled.
- Once the correct pressure is reached, the operator closes the gas fill handle, securing the system.

SYSTEM STATUS:

- The mortar tube is filled with water.
- The pressure tank is now charged with compressed gas.
- The system is armed and ready for firing.

FIRING PHASE (ACTIVATION OF WATER BLAST)



- The operator activates the trigger input, releasing compressed gas from the pressure tank into the mortar tube.
- The sudden release of high-pressure gas forces the water upwards and out of the main output.
- The water is ejected in a high-velocity blast, reaching distances of up to 30 metres.
- Once firing is complete, the system returns to an empty state, ready for the next fill cycle.

SYSTEM STATUS:

- The water has been ejected, creating the desired visual effect.
- The pressure tank has discharged its stored energy.
- The system now requires refilling and re-pressurisation for the next cycle.

TRANSPORT AND STORAGE

TRANSPORT

MANUAL HANDLING & SHORT-DISTANCE MOVEMENT

- The unit is equipped with two heavy-duty castors, allowing it to be rolled into position over smooth surfaces.
- If manual movement is required:
    - Use at least two operators to guide and control movement.
    - Only move on stable, even surfaces to prevent tipping.

VEHICLE TRANSPORTATION & SECURING FOR TRANSIT

- Secure transport is mandatory to prevent shifting during transit.
- If transported without a case, secure the unit with ratchet straps.
    - Always position the unit in a stable orientation.
    - Avoid placing heavy objects on top of the unit to prevent damage to sensitive components.

FORKLIFT OR PALLET TRUCK HANDLING

- For loading/unloading from vehicles, a pallet truck or forklift is recommended.
- Ensure lifting from the frame, not from sensitive components (e.g., pressure tank or output tube).
- Operators should be trained in safe lifting procedures to prevent crushing or impact hazards.

BEFORE THE TRANSPORT

DEPRESSURISATION & SAFETY CHECKS

Before transport, ensure that the machine is fully depressurised to prevent accidental gas release or high-pressure hazards.

- Shut off and disconnect the gas supply (compressed air or nitrogen).
- Manually release any remaining pressure via the pressure relief valve.
- Check the pressure gauge to confirm zero pressure before handling.
- Ensure all water has been fully drained from the system via the water drain valve.

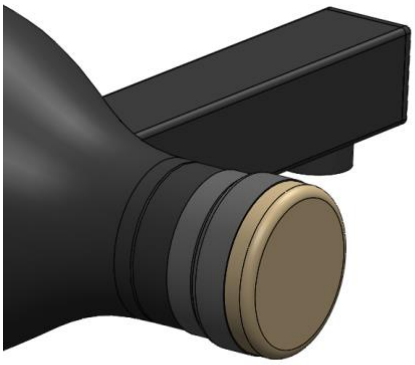
WARNING: Never transport the unit while pressurised—this is a serious safety risk.

SECURE LOOSE COMPONENTS & ACCESSORIES

- Disconnect all hoses and fittings (gas input, water fill hoses, trigger cables).
- Secure movable parts, such as the adjustable support leg and trigger input cable.
- Store in a locked and laid flat position for transport.
- Store accessories (e.g., hoses, regulators, safety gear) in a designated flight case or secure compartment.



- Cover the main output with a paper end cap and tape to prevent debris from entering.



STORAGE

REQUIREMENTS OF THE STORAGE SITE

To ensure the longevity, safety, and reliability of the SHOCK-WAVE Water Cannon, the storage site must be suitable for protecting the unit from environmental damage, unauthorised access, and deterioration. Proper storage also ensures quick deployment when needed.

ENVIRONMENTAL CONDITIONS & PROTECTION

Temperature Control:

- Store in a dry, temperature-controlled environment between 5°C and 35°C.
- Avoid freezing conditions (<0°C) as residual water can freeze and damage internal components.
- Avoid extreme heat (>40°C), which can degrade seals, hoses, and electrical components.

Humidity & Moisture Protection:

- Relative humidity should be kept below 60% to prevent corrosion of metal components.
- Ensure adequate ventilation to avoid condensation on internal parts.
- If stored in humid conditions, use dehumidifiers or silica gel packs inside the storage case.

Protection from Dust & Contaminants:

- Store in a clean, dust-free area or use a protective cover when not in use.
- Ensure airborne debris or construction dust does not enter the main output or water intake.

PHYSICAL STORAGE & POSITIONING

Flat, Stable Surface

- The unit must be stored on a solid, level surface to prevent tipping or stress on components.
- Avoid stacking other equipment on top of the unit, as excessive weight can damage the frame.

Secured Against Movement

- If stored in a flight case, ensure the case is properly latched and stored upright.
- If storing for long periods, consider using ratchet straps or clamps to prevent shifting.

Adequate Clearance & Access

- Maintain a clear area of at least 1 metre around the unit for easy maintenance access.
- Store in an area with clear labelling and identification for quick retrieval.

INSTALLATION AND COMMISSIONING

INSTALLATION

SAFETY PRECAUTIONS BEFORE THE INSTALLATION

Before installing the SHOCK-WAVE Water Cannon, it is essential to take safety precautions to prevent accidents, equipment damage, or operational failures.

PRE-INSTALLATION RISK ASSESSMENT

- Conduct a site risk assessment to identify potential hazards, including:
  - Uneven or unstable surfaces.
  - Presence of electrical hazards or high-traffic areas.
  - Proximity to other stage equipment, structures, or personnel.
- Ensure emergency access routes are available and clearly marked.
- Identify fire safety equipment and first aid locations on-site.
- Assess wind conditions if installing outdoors—adjust positioning if necessary.

WARNING: If the site does not meet minimum safety requirements, do not proceed with installation until corrective actions are taken.

SITE PREPARATION & CLEARANCE

- Mark the installation area with barriers or signage to restrict access to authorised personnel.
- Remove obstacles such as cables, debris, or trip hazards from the area.
- Ensure all water-sensitive electrical equipment is protected from potential water fallout.
- Designate exclusion zones for the machine's firing path and fallout area.

SAFETY EQUIPMENT & PPE REQUIREMENTS

- All personnel involved in installation must wear:
  - Safety boots (steel-toe recommended) to protect against crushing hazards.
  - High-grip gloves for safe handling of components.
  - Hearing protection (earplugs or earmuffs) if near firing operations.

ELECTRICAL SAFETY CHECKS

- Ensure all power supplies are switched off before connecting electrical components.
- Use only certified, grounded power connections that meet local electrical safety regulations (e.g., BS 7671 in the UK).
- If required, install a Residual Current Device (RCD) to cut power in case of electrical faults.
- Keep all power cables away from wet areas and secure them using cable covers or cable trays.

COMPRESSED GAS & PRESSURE SYSTEM SAFETY

- Use only approved gas cylinders and check they are stored upright and secured.
- Ensure pressure-rated hoses and fittings are used for gas and water connections.
- Inspect all pressure system components (valves, gauges, fittings) for leaks or damage before pressurisation.
- Position the machine away from heat sources or combustible materials.
- Ensure gas input connections are properly secured before opening valves.

ANCHOR POINTS & STABILITY REQUIREMENTS

For safe operation, the SHOCK-WAVE Water Cannon must be securely anchored or weighted to prevent movement, tipping, or instability during use.

BOLT-DOWN ANCHOR POINTS

The machine features four dedicated bolt-down points for securing to fixed surfaces. These points allow mechanical anchoring using bolts, heavy-duty stakes, or clamps.

Recommended Fixing Methods:

Stage Deck / Concrete Mounting: Use M12 expansion bolts or threaded inserts.
Soft Ground Anchoring: Use heavy-duty ground stakes or weighted ballast.
Temporary Securing: Use sandbags or stage weights.



ADJUSTABLE SUPPORT LEG FOR STABILITY

- The adjustable support leg allows for angle changes.
- Operators must verify proper locking before operation.

POSITIONING CONSIDERATIONS FOR STABILITY

- Avoid uneven terrain—use shims or adjustable supports to maintain level positioning.
- If positioned on a stage, ensure the decking meets weight load requirements.
- The unit should never be placed in high-wind zones without additional securing methods.

PREVENTING UNINTENDED MOVEMENT

- The unit must be fixed or weighted down for use in all scenarios.
- In high-vibration environments, additional securing measures (e.g., ratchet straps) may be required.
- Operators must check all fastenings before each use to ensure the unit remains fixed during operation.

SAFETY ZONES

It is very important to observe suitable distance zones for this equipment. The output of the device creates a high velocity jet of water that can cause serious injury or death.

The diagrams below illustrate the danger zones.

Outlet clearance distance:

At the outlet of the unit, ensure no persons are directly in line with the outlet and, observe a 1m diameter safety zone from the outlet.



Stay out of discharge zone when pressurised

All people, objects or other items that can be damaged must say clear of this discharge zone when the unit is pressurised.

Serious injury or death can occur in this location.



Safety zone:

Ensure that there is an adequate safety zone around the machine of at least 2m and that it is kept clear of personnel, objects or other items that could be damaged.



ADJUSTING THE FIRING ANGLE

STEP 1: ENSURE A SAFE WORK ENVIRONMENT

- Depressurise the system completely before making any adjustments.
- Ensure the ground is stable and that the unit is properly secured.

WARNING: Do not attempt angle adjustment while the machine is pressurised.

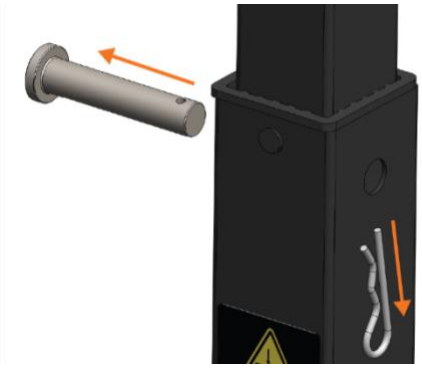
STEP 2: SUPPORT THE WEIGHT OF THE MORTAR TUBE

- Stand to the side of the unit—never in front of the output.
- Use both hands to support the mortar tube before removing any locking mechanisms.



STEP 3: UNLOCK THE SUPPORT LEG PIN

- Identify the adjustable support leg beneath the mortar tube.
- Locate the locking pin and R-clip securing the current angle.
- Remove the R-clip carefully, then slide out the locking pin.



STEP 4: ADJUST THE MORTAR TUBE TO THE DESIRED ANGLE

- Slowly raise or lower the front end of the mortar tube to the required angle.
- Align the support leg holes with the pre-drilled angle settings.
- Insert the locking pin back through the corresponding hole.
- Reinsert the R-clip to lock the pin in place.



DANGER: Firing with an incorrectly secured support leg may result in unexpected movement or loss of control.

STEP 5: FINAL SAFETY CHECK BEFORE USE

- Visually confirm that all locking mechanisms are engaged.
- Ensure the mortar tube is stable and does not shift under pressure.
- Perform a clearance check—verify that the firing path is unobstructed.
- Proceed with system pressurisation only after all safety checks are complete.

PROVIDING THE SUPPLIES

WATER SUPPLY REQUIREMENTS

WATER SOURCE SPECIFICATIONS

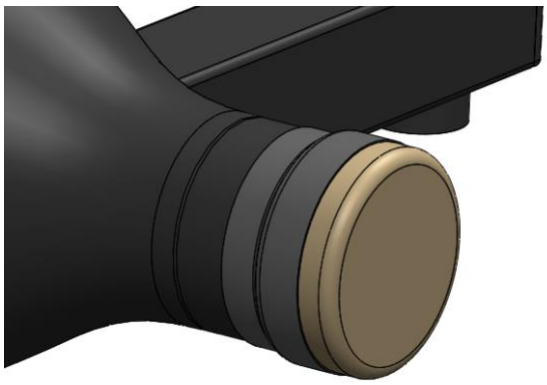
- Use clean, potable water to prevent clogging or contamination.
- Avoid using untreated or stagnant water—bacterial buildup can cause operational issues.
- If drawing from an external tank (e.g., IBC), ensure the water is filtered before entering the system.

MINIMUM WATER QUALITY REQUIREMENTS:

- No visible debris or sediment (use a pre-filter if necessary).
- pH between 6.5 – 8.5 (neutral to slightly alkaline).
- Temperature range: 5°C – 30°C (avoid freezing or overheating).

SAFETY CAP

- The unit may be used in areas where foreign objects might be placed in the mortar outlet.
- Protective caps are available along with tape to provide a covering for the opening.
- When fitting these, they must be fitted after the unit has been filled to prevent bursting off when filling.



PRESSURISED GAS REQUIREMENTS

APPROVED GAS TYPES

- Compressed air (filtered, oil-free, and moisture-free).
- Nitrogen (N_2) – Preferred for stable pressure delivery and consistency.

The unit operates from 8 to 16 bar.

At lower pressures, the water is not dissipated as much as at high pressures. Ensure a suitable pressure is being used for the application.

CAUTION: Do not use oxygen (O_2) or flammable gases—these pose serious explosion risks.

GAS CYLINDER CONNECTION

- Inspect the gas regulator and hose for any signs of damage or leaks.
- Connect the high-pressure hose to the gas input using a quick-release coupling.

WATER MANAGEMENT

The SHOCK-WAVE Water Cannon uses water as a consumable, which can pose a risk of bacterial contamination, particularly Legionella. Proper water treatment and system flushing are essential to ensure safe operation.

This section outlines common practices for preventing waterborne bacteria, treating water supplies, and flushing the system after use. Always consult a local specialist in your region for detailed advice on water treatment.

UNDERSTANDING THE RISK OF LEGIONELLA

Legionella bacteria thrive in stagnant, warm water (between 20°C and 45°C). If inhaled as an aerosol, it can cause Legionnaires' disease, a severe respiratory infection.

RISK FACTORS IN SPECIAL EFFECTS EQUIPMENT:

- Standing water in hoses, tanks, or pipework.
- Use of untreated or unfiltered water.
- Warm storage conditions promoting bacterial growth.

LEGIONELLA PREVENTION MEASURES

USE CLEAN, TREATED WATER

- Always use potable water or filtered water to fill the system.
- Avoid using stored water that has been standing for more than 24 hours.
- If drawing from an IBC tank, ensure it is regularly drained and refilled.

MAINTAIN COLD WATER STORAGE

- Keep water storage below 20°C to prevent bacterial growth.
- If stored in warm conditions, flush the system more frequently.
- Shade outdoor tanks to prevent heating from sunlight.

FLUSH AND DRAIN THE SYSTEM AFTER USE

- After each use, fully drain the mortar tube, hoses, and fill lines.
- If the unit is not being used for more than 24 hours, flush the system with clean water.
- If storing the machine for extended periods, perform a deep clean and disinfection cycle.

WATER TREATMENT PROCEDURES

WATER FILTRATION

- The SHOCK-WAVE Water Cannon includes an in-line water filter at the fill point.

- Check and clean the filter regularly to prevent blockages.
- If using water from a natural or untreated source, additional filtration may be needed.

BIOCIDE TREATMENT (IF REQUIRED)

- If water is stored in an IBC tank or external reservoir, consider using an approved water treatment biocide.
- Follow dosing instructions carefully to ensure safety for personnel and equipment.
- Regularly test biocide levels to prevent overuse or underuse.

WARNING: Do not use aggressive chemicals that may damage seals and components.

SYSTEM FLUSHING & DEEP CLEANING PROCEDURES

ROUTINE FLUSHING (AFTER EACH USE)

- Depressurise the system completely.
- Open the water drain valve and remove all residual water.
- Connect a clean water supply and flush through for at least 2 minutes.
- Check the water output to ensure no debris or contamination is present.
- Close the drain valve and allow the system to air dry if storing.

DEEP CLEANING & DISINFECTION (FOR LONG-TERM STORAGE OR SUSPECTED CONTAMINATION)

- Prepare a mild cleaning solution using an approved water system disinfectant.
- Fill the system with the cleaning solution and let it sit for 15–30 minutes.
- Flush the system thoroughly with clean water to remove any residue.
- Inspect and clean the water filter before reconnecting.
- Drain all water completely before storing to prevent bacterial regrowth.

DANGER: If Legionella contamination is suspected, do not use the machine until a full deep clean and test have been completed.

COMMISSIONING

Before using the SHOCK-WAVE Water Cannon, the system must go through a pre-use commissioning procedure.

This ensures mechanical integrity, stability, safety compliance, and functional readiness before pressurisation and operation.

Skipping these steps could result in unintended activation, equipment instability, or safety risks.

STEP-BY-STEP COMMISSIONING PROCESS

STEP 1: VERIFY THE UNIT'S STABILITY & POSITIONING

- Confirm the machine is on a stable, level surface (concrete, stage decking, or reinforced ground)
- Anchor the unit using the bolt-down points with suitable fixings or ground stakes or weights.

WARNING: If the unit shifts when applying pressure, it must be repositioned or secured further before proceeding.

STEP 2: CHECK ALL LOCKING PINS & MECHANICAL FASTENINGS

- Inspect the angle adjustment support leg—ensure the locking pin is fully inserted and secured with the R-clip.

DANGER: An unsecured support leg may cause unexpected movement during firing.

STEP 3: CHECK THE PERIMETER & SAFETY EXCLUSION ZONES

- Mark and enforce exclusion zones around the machine.
- Confirm that the firing path is clear—no objects, structures, or people should be within at least 10 metres of the projected output.
- Inspect the fallout zone to ensure the water will not create hazardous area.
- Verify that signage is in place for:
  - Hearing protection zones
  - Caution: High-pressure discharge
  - Slippery surface warnings

WARNING: If personnel or obstacles are within the ejection path or fallout zone, they must be moved before proceeding.

STEP 4: VERIFY THE TRIGGER SYSTEM & FIRE VALVE FUNCTIONALITY

Before pressurisation, test the trigger system by clicking out the firing valve to ensure smooth operation.

Connect the trigger line and confirm:

- The firing input is responding (listen for an audible valve actuation "click").
- No obstructions are inside the mortar or main output.
- The valve resets correctly when the trigger is disengaged.

If the valve does not respond correctly, do not proceed with pressurisation—inspect the trigger supply wiring and valve function.

DANGER: If the firing valve is sticking or failing to reset, do not pressurise the unit—this could cause an unintended discharge.

STEP 5: INSPECT ALL CONNECTIONS & HOSES

- Ensure the gas input and water fill connections are properly seated.
- Check for loose or damaged hoses—replace any that show cracks, leaks, or wear.
- Verify the pressure relief valve is intact and operational.

WARNING: Never bypass the safety relief valve—this can lead to over-pressurisation risks.

STEP 6: CONDUCT A FINAL SAFETY WALKAROUND

- Confirm that all locking pins, bolts, and mechanical parts are secure.
- Ensure all team members have appropriate PPE (hearing protection, gloves, safety boots).
- Confirm that the exclusion zone is actively monitored and remains clear.
- Perform a final stability test by applying light force to check for movement or shifting.

FINAL CHECK: The system must be verified as stable, secure, and functionally tested before any gas is introduced.

OPERATING THE MACHINE

To ensure safe and efficient operation, follow this step-by-step guide when using the SHOCK-WAVE Water Cannon.

STEP 1: FILL THE SYSTEM WITH WATER

- Open the water fill valve and allow water to enter the mortar tube.
- Monitor the fill level—ensure the tube is completely filled.
- Close the water fill valve once filling is complete.

NOTE: Ensure the mortar tube is filled complete to the top. Failure to fully fill the tube will result in poor discharge quality.

STEP 2: ISOLATE WATER SUPPLY & SECURE OUTPUT (IF REQUIRED)

- If the system is not being used immediately, isolate the water supply to prevent unintended refilling.
- If required, place a paper cap (held with masking tape) over the main output to prevent debris from entering.

STEP 3: PRESSURISE THE SYSTEM

- Slowly open the gas fill handle to introduce pressure into the system.
- Monitor the pressure gauge and do not exceed 16 bar.
- Once the desired pressure is reached, close the gas supply valve.

DANGER: Never exceed 16 bar—doing so can cause equipment failure or trigger the pressure relief valve.

STEP 4: INITIATE FIRING SEQUENCE

- Verify that the firing area is clear—conduct a final safety check.
- Ensure all personnel are outside the safety exclusion zone.
- Provide designated power to the trigger input for at least 3 seconds.
- The unit will activate, releasing compressed gas into the mortar tube and launching the water blast.

WARNING: Do not approach the machine during firing—high-pressure ejection occurs instantly.

STEP 5: POST-FIRING PROCEDURES

RE-FILL OR DRAIN RESIDUAL WATER

- After firing, check if additional shots are required.
- If firing again, repeat the water filling process before re-pressurising.
- If the unit is not being used again immediately, open the water drain valve to remove any residual water.

DEPRESSURISE THE SYSTEM (IF REQUIRED)

- If shutting down, manually vent pressure using the pressure relief valve if needed.
- Check the pressure gauge to confirm the system is fully depressurised.
- Disconnect the gas supply and store hoses safely.

HELP IN CASE OF FAULTS

PROCEDURES FOR FAULTS OR ERRORS

GENERAL FAULT RESPONSE PROCEDURE

- Immediately cease operation if a fault is detected.
- Depressurise the system by releasing gas through the fill hose pipework or pressure relief valve.
- Turn off power and disconnect all inputs (trigger, gas, water supply).
- Conduct a visual inspection of hoses, connectors, pressure tank, and control systems.
- Identify the fault type from the categories below and follow the corresponding resolution steps.

COMMON FAULTS & TROUBLESHOOTING PROCEDURES

Fault	Possible Cause	Resolution Steps
Unit does not fire when trigger is activated	• Trigger input not receiving power • Faulty wiring • Stuck firing valve	• Check trigger cable and power supply • Inspect wiring and connections • Manually test firing valve movement (depressurised)
Low or no water output	• Water supply blocked • Fill valve not fully open • Clogged water filter	• Ensure water supply is connected and operational • Open water fill valve completely • Clean or replace water filter
Gas does not pressurise system	• Gas supply empty • Faulty gas regulator • Leaking connections	• Check gas cylinder pressure • Inspect regulator for correct function • Tighten all gas connections, check for leaks
Over-pressurisation (above 16 bar)	• Faulty pressure relief valve • Incorrect gas regulator setting	• Manually release pressure using relief valve • Verify regulator settings before refilling
Water leakage from system	• Loose water fittings • Damaged O-rings or seals	• Tighten fittings • Inspect and replace damaged seals
Abnormal noises during firing (hissing, loud bangs, or vibrations)	• Partial gas blockage • Loose internal components	• Check all gas hoses and fittings • Inspect mounting brackets and bolts

Slower firing response than expected	• Low gas pressure • Partially blocked firing valve	• Ensure pressure gauge reads correct operating level • Clean and inspect firing valve
Unexpected or unintentional activation	• Electrical fault in trigger system • Operator error • Short circuit in power input	• Ensure power is not applied unintentionally • Inspect trigger circuit for faults • Implement lockout/tagout procedure when inactive

DANGER: If a serious fault (such as an electrical failure, gas leak, or structural damage) is detected, discontinue use immediately and contact technical support.

MAINTENANCE TASKS FOR TECHNICAL PERSONNEL

GENERAL NOTES

Regular maintenance and inspection of the SHOCK-WAVE Water Cannon are essential to ensure safe operation, optimal performance, and longevity of the equipment.

Only trained technical personnel should conduct maintenance tasks, and all procedures must follow safety protocols.

GENERAL MAINTENANCE SAFETY PRECAUTIONS

- Depressurise the system fully before conducting any maintenance.
- Turn off power and disconnect trigger input before servicing electrical components.
- Wear appropriate PPE, including gloves and eye protection when handling gas connections.
- Use only manufacturer-approved parts for replacements.
- Keep a maintenance log for tracking inspections, repairs, and part replacements.

WARNING: Failure to follow proper maintenance procedures may lead to malfunctions, accidental discharge or system damage.

MAINTENANCE SCHEDULE

Task	Description	Frequency
Visual Inspection	Check for loose bolts, wear, or visible damage to components.	**Before each use**
Pressure System Check	Inspect gas input hoses, regulator, and fittings for leaks or cracks.	**Before each use**
Water Filter Cleaning	Remove and clean the water filter to prevent clogging.	**Weekly**
Check Pressure Relief Valve	Test and ensure the overpressure valve activates properly.	**Monthly**
Lubricate Moving Parts	Apply light lubricant to hinges, locking pins, and mechanical joints.	**Monthly**
Inspect Electrical Connections	Verify wiring integrity, check for exposed cables or corrosion.	**Quarterly**
Full System Leak Test	Perform a full pressurisation test and check for gas or water leaks.	**Quarterly**
Replace Seals & O-Rings	Check and replace worn-out seals in gas and water fittings.	**Annually**
Full System Flush & Deep Cleaning	Flush water lines, clean tanks, and disinfect system to prevent contamination.	**Annually**

DANGER: If any part of the system fails an inspection, the unit must not be used until repairs are completed.

DECOMMISSIONING AND DISASSEMBLY

GENERAL NOTES

The SHOCK-WAVE Water Cannon must be properly decommissioned and disassembled when it is no longer in use, either for storage, transportation, or disposal.

This process ensures that all components are safely handled, pressurised systems are fully vented, and any potential environmental or safety risks are minimised.

GENERAL SAFETY PRECAUTIONS

- Depressurise the system fully before starting any disassembly.
- Turn off power and disconnect all electrical inputs.
- Remove gas supply and secure all hoses before transport.
- Drain all water from the system to prevent stagnation or freezing.
- Use appropriate PPE, including gloves and safety boots.
- Keep a record of the decommissioning process if the unit is being stored long-term or disposed of.

STEP-BY-STEP DECOMMISSIONING PROCESS

DEPRESSURISATION & POWER ISOLATION

- Turn off the gas supply and disconnect the gas input hose.
- Open the pressure relief valve to vent any remaining pressure.
- Check the pressure gauge—ensure it reads zero before proceeding.
- Disconnect the trigger input and isolate the power source.

DRAINING THE WATER SYSTEM

- Open the water drain valve to remove any remaining water.
- If the system will be stored long-term, flush it with clean water before draining.
- Disconnect the water fill hose and clean the water filter to prevent blockages.
- Wipe down any exposed metal parts to prevent corrosion.

DISPOSAL & END-OF-LIFE DECOMMISSIONING

If the unit is being permanently decommissioned and scrapped, follow these procedures:

- Remove all electrical components and dispose of them in accordance with WEEE (Waste Electrical and Electronic Equipment) regulations.
- Depressurise the pressure tank and dispose of it as per local hazardous waste guidelines.
- Separate metal parts for recycling where possible.

- Dispose of seals, hoses, and rubber components in appropriate waste streams.
- Keep a record of disposal actions to ensure compliance with environmental regulations.

CAUTION: Do not cut or dismantle the pressure tank unless it has been safely vented and certified as non-pressurised.

TECHNICAL DATA

GENERAL SPECIFICATIONS

Parameter	Specification
Product Name	SHOCK-WAVE Water Cannon
Trade Name	SHOCK-WAVE
Manufacturer	Luminous Show Technology Ltd
Model	PRT_34572061
Intended Use	High-impact special effects water cannon for professional entertainment applications.
Machine Weight (Empty) **Machine Weight (Full)**	55kg 71kg
Machine Dimensions (at 60deg) (L × W × H)	1240 mm × 1000 mm × 1340 mm
Machine Dimensions (stowed) (L × W × H)	1450 mm × 1000 mm × 425 mm
Construction	Steel frame, stainless steel mortar tube, powder-coated finish
Operating Environment	Outdoor and large indoor spaces

PERFORMANCE & OPERATING PARAMETERS

Parameter	Specification
Firing Distance	Approx. 30 metres
Firing Angle Range	Adjustable 40° – 60°
Firing Method	Pneumatic actuation with rapid compressed air release
Water Capacity	Approx. 16 litres per shot
Cycle Time Between Shots	Dependent on refill rate (approx. 30 - 60 seconds)
Recommended Safety Exclusion Zone	1m radius from unit + ejection path clearance

PNEUMATIC SYSTEM SPECIFICATIONS

Parameter	Specification
Operating Pressure	8 to 16 bar (110 to 232 psi)
Gas Type	Compressed air or nitrogen (N_2)
Pressure Relief Valve	Self-resetting safety valve set to 16 bar max
Gas Input Connection	¼” ISO A BSP quick-release coupling
Trigger Input	230V AC / 110V AC/ 12-24V DC (model dependent)

WATER SYSTEM SPECIFICATIONS

Parameter	Specification
Water Source	Clean potable water supply
Water Fill Connection	1” BSP Locking, quick-release coupling
Water Filter Type	Inline stainless steel mesh filter
Drain Valve	Manual drainage at base of mortar tube

ELECTRICAL SYSTEM SPECIFICATIONS

Parameter	Specification
Power Input Requirement	230V AC / 110V AC/ 12-24V DC (model dependent) trigger activation
Trigger Activation Duration	Minimum 3 seconds
Electrical Protection	Earth bonding
Control Connection	True1 and/or 4mm banana plug connectors (model dependent)
IP Rating	IP65 (for outdoor operation)

ENVIRONMENTAL CONDITIONS

Parameter	Specification
Operating Temperature	0°C to 45°C
Storage Temperature	5°C and 35°C
Humidity Tolerance	Up to 95% non-condensing
Wind Considerations	Firing trajectory affected by wind speed
Recommended Storage Conditions	Dry, ventilated area, away from direct sunlight

DECLARATION OF CONFORMITY

EC declaration of conformity

according to the Machinery Directive 2006/42/EC, Annex II 1. A

Original

The manufacturer bears the sole responsibility for issuing this declaration of conformity

Luminous Show Technology Ltd

Unit 14, Apple Lane, EXETER

GB - EX2 5GL Exeter

Person established in the Community authorised to compile the relevant technical documentation

Michael Badley

Luminous Show Technology Ltd

14 Apple Lane

GB - EX2 5GL EXETER

Description and identification of the machinery

Product / Article	Shock-wave water cannon
Machine number	PRT_34572061
Project number	PRJ-2025-03-08-0001
Commercial name	SHOCK-WAVE
Function	The Shockwave Water Cannon is a pneumatically powered water cannon designed for high-impact special effects on stages, festivals, and large-scale events. It produces a controlled high-velocity water blast up to 30 metres into the air using compressed air or nitrogen as a propellant. The machine operates by: Filling a mortar tube with water. Pressurising an air cylinder (up to 16 bar). Rapidly releasing compressed air into the mortar tube, launching water upwards. The machine provides an eco-friendly alternative to traditional CO or confetti effects, requiring only water as a consumable.

It is expressly declared that the machinery fulfils all relevant provisions of the following EU Directives or Regulations:

2006/42/EC	Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) Published in L 157/24 of 09.06.2006
2014/68/EU	Directive 2014/68/EU of the European Parliament and of the Council of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment Published in L 189/164 of 27.06.2014
2014/35/EU	Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits Published in 2014/L 96/357 of 29.03.2014

Reference to the harmonised standards used, as referred to in Article 7 (2):

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)
EN ISO 4413:2010	Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)

Exeter, 10.03.2025

Place, Date

Signature
Michael Badley
Director



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