

Technical Specification for Portable Backpack Area Sanitization Equipment

The portable backpack sanitization equipment may be used for spraying disinfectant solution for sanitization of suspected contaminated areas. This system incorporates low pressure twin fluid (air & disinfectant liquid) technology generating very fine mist for disinfecting the affected area of approx 300 m².

Application areas can include hospital reception, doctors chambers, corridors, office buildings, pathways, airports, metro & railway stations, bus stations etc.

Technical Specifications

- Water / solution storage cylinder (Main cylinder) Capacity : 9 L
 - Working Pressure : 8-10 bar
 - MOC of main cylinder: SS 316 L
 - Lancing Distance : 12-14 m.
 - Weight of the system: 25 - 26 kg.
 - Compressed air cylinder : 4.7 L capacity @ 300 bar,
 - MOC of cylinder: Carbon Composite
- One 4.7 ltrs cylinder can be used thrice in the backpack*





USER MANUAL

PORTABLE BACKPACK AREA SANITIZATION EQUIPMENT: CAPACITY 9 LITRES

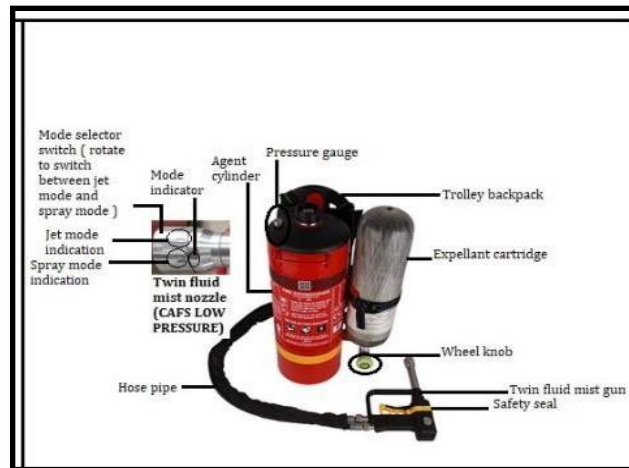


Fig.1 System Components

Instructions to approach the affected area

It is most helpful to approach the area with a simple plan in advance and take precautions to safely disinfect any small area. Let's look at these steps by step.

Step 1) Make sure the area is not blocked for the personnel exit route.

Step 2) Observe the size and type of area, try and approach the affected area from the side where the approach is accessible and the user should keep in mind that instruction in step 1 are always followed. If the area is closed from three sides then sanitization may be carried out while retracting towards open access. This shall have various advantages: -

- User is always safe.
- Maximum range of equipment is achieved.
- Disinfectant solution covers maximum floor area.
- Maximum visibility is achieved.

Step 3) Ideal distance from the affected area for operating the equipment can be decided as per the following: -

- Expected intensity of contaminants in the affected area can often determine how far or close user can be to the area. A safe distance which does not bring user in harm's way or gets affected is most advised.
- The range of the equipment as mentioned on product specification sheet defines the maximum distance from which the sanitization can be tackled. At this distance maximum benefit of coverage can be achieved. This could be the starting point as you move closer to the area, the disinfectant solution can be applied to the floor area more effectively.

Step 4) While sanitization is going on, user should not enter the sanitized zone for at least 5 minutes for chemical to neutralize any contamination. User access during sanitization will make the sanitization activity ineffective as well as unnecessarily expose user to sanitization chemical. If necessary, move with extreme

caution, keeping the following points into consideration.

- Wash skin and eyes repeatedly and thoroughly (irrigation), to eliminate any remaining hazardous compound.
- Following this, a suitable skin or eye ointment may be used to treat the exposure.

Preparation of Disinfectant Solution

1% Sodium hypochlorite solution, referred as “disinfectant solution” is being recommended for area sanitization. This chemical can be sourced from the trade/industry at a higher concentration (say ‘C%’) such as 4% to 6% or higher, will be referred as “disinfectant concentrate” in this document. Following method is used for dilution of disinfectant concentrate with water (DM/RO).

1. Calculate the volume (Litres) of disinfectant solution (say ‘X’) required for sanitization based on area assessment.
2. Accordingly calculate volume (Litres) of disinfectant concentrate (X/C) and water [X-(X/C)] to make X Litres of disinfectant solution.
3. Measure X/C litres of disinfectant concentrate in one container 1.
4. Measure and add X-(X/C) litres of water in the container 2 having volume X or more.
5. Slowly pour the disinfectant concentrate, using funnel, into water and mix thoroughly after closing the lid, to make the required solution.
6. Transfer the prepared 9 liters of solution to the agent cylinder of the equipment.

Example:

Disinfectant Concentration (C) = 5%

Solution Required (X) = 9L

Disinfectant Concentrate Required = $9/5=1.8$ L

Water to be added = $9-1.8=6.2$ L

Requirements

- Empty container 1 for disinfectant concentrate of volume at least X/C litres
- Relatively large container 2 for preparing disinfectant solution having volume X or more liters
- One funnel and a measurement arrangement based on the requirement
- Protective gloves, goggles and safety shoes

Operational Instructions

- Before accessing your sanitization equipment, charge your equipment with 1% disinfectant solution (1% Hypochlorite Solution) up to the mark.
- Before operating the equipment open the expellant (compressed air) cylinder valve. To open the expellant cylinder, pull the knob and then turn the wheel knob on the cylinder in the direction as indicated on the knob.
- After charging your sanitization equipment please check if the needle of the pressure gauge on the cylinder is in green zone.
- Use the next available sanitization equipment if the needle in the pressure gauge is in red zone or the safety seal has been tampered or broken.
- Pick up the equipment from the handle provided and carry it on your back like a backpack. Unwind the hose and hold the twin fluid mist gun in your natural working hand.
- Apply pressure on the trigger provided on the gun to start disinfectant solution to discharge. You

can switch between two modes by operating the “mode selector” provided on the nozzle of twin fluid mist gun (Jet mode and mist mode). Use Jet mode to disinfect area from a greater distance and spray mode to disinfect from a closer distance with a wider coverage area.

- Spray on the infected area floor such that the disinfectant enters the floor zone and move closer as the infected area floor is covered by the disinfectant and thus decreasing the effect of virus/bacteria.

Application of disinfectant solution in the affected area

- Open the valve of expellant (Compressed air) cartridge by pulling it out and then turning the wheel knob in the direction as stated on the knob so that disinfectant solution container get pressurize.
- Carry the cylinder on your Back or put the cylinder on the ground in upright position. Hold the gun in your working hand and with the other hand provide a rigid support to the gun (without bending your elbow to avoid hurting it). For applying the disinfectant solution the discharge gun has got two modes, viz. jet mode and mist mode
- Aim the gun at the base of the area or surface of the source which is required to be disinfected and depress the discharge lever/trigger on the gun.
- Aim gun towards floor area closest to you then move forward to fully utilize the disinfectant solution. Spray from left to right or moving around the area to cover the entire floor base of the area or uneven surfaces completely with the disinfectant solution.
- Your equipment allows you to stop and go control including throw control by adjusting by how much you depress the operating lever/trigger.
- If in case, sanitization on wall is required, it should be carried out from bottom and then towards upward at a maximum height of 3-4 feet, keeping safety and the potential damage to the wall into consideration.
- The disinfectant solution being corrosive in nature necessitates that any metal exposed to the agent including the agent container shall be thoroughly rinsed with fresh water.

Note: - Guide lines above are safe practices but a real disinfection scenario might require instant decisions to be made such scenarios demand proper training, experience, practice and guidance. The personnel should always make use of personal protective clothing and personal protective gears and in no case do disinfection if the handling personnel is wearing loose or any other clothing.

Maintenance Schedule & Tasks

The portable backpack area sanitization equipment is to be checked regularly by a qualified person at least every 12 months to ensure that it functions properly, working according to the following test scope. The qualified person must be legitimized by CFEES, DRDO Delhi.

Task & Scope

Test Interval Task Type	After Every Use	Regularly	Annual Service
	TP	TP	TP
General condition, cleanness.	VI/C	VI/C	VI/C
Legible, complete wording. (Instruction sticker.)	VI/R	VI/R	VI/R
Hydraulic pressure test.	NA	NA	R every 3rd year (As per IS:2190).
Fittings, hoses, and safety features.	VI/R	VI/R	VI/R

Protective coating if any (e.g. corrosion).	VI/R	VI/R	VI/R
Trigger and interruption features (ball valve).	I/R	I/R	I/R
Threaded connections for mechanical damage and easy running.	I/R	I/R	I/R
Check functions of pressure gauge.	I/R	I/R	I/R
Function of overpressure valve.	VI/R	VI/R	VI/R
Continued suitability of the extinguishing agent; condition of the inside.	I/R	I/R	I/R
Safety features for any signs of damage.	I/R	I/R	I/R
Sealed surfaces and seals.	I/R	I/R	I/R
Refill/Repair agent cylinder if the seal has been tampered or broken	I/R	I/R	I/R
Weight of propellant cylinder/expellant cartridge. If weight reduced by 10%, replace/repair	I/R	I/R	I/R
Affix servicing evidence (test stamp) after servicing and filling have been completed.	I/R	I/R	I/R

TP= CFEES trained personnel, R= Replacement OR Repair, VI= Visual Inspection, C= Clean & Polish, I= Inspection

Maintenance of Container and Compressed air cylinder

All activities necessary for preserving the proper working status of pressure vessels or become necessary as part of servicing and repair work must be performed by the authorized personnel only as per norms of the land.

Troubleshooting & Remedy

Fault	Possible Causes	Remedy
No or low or high pressure in the disinfectant solution container.	Pressure Gauge non-functional. Relief valve released pressure. Cylinder discharged.	Investigate reason for high pressure. (e.g. high temperature. Contact CFEES or Fire Services or Firm forrefill.
Gun does not spray.	Gun ducts clogged.	Contact CFEES, DRDO Delhi for rectification.
Nozzle does not spray.	Gun trigger not pulled through completely. Cylinder valve not open.	Pull gun trigger completely towards yourself. The gun to check discharge.
Other faults	Contact CFEES, DRDO Delhi.	

Repair

- Repair work can be necessary or inevitable to maintain trouble free proper operation of the disinfection system. It is in the interests of the operator's safety to use original spare parts; this also protects personnel and the environment from unforeseeable dangers.
- If repair work is not performed at all or in correctly or if original spare parts are not used. CFEES is not liable for any damage caused when using the product.
- Repairs should only be carried out by CFEES or the firms trained personnel only!!

First Aid Measures for 4-6% Sodium hypochlorite Solution- disinfectant concentrate

- Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
- Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes
- Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.
- Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.