



Service and Filling Instructions for ABC Cartridge Type Fire Extinguishers



Figure 1: Dismantled 6kg Powder Cartridge Operated Fire Extinguisher

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|----------------------|-------------------|
| 1. Discharge hose | 8. Dip Tube |
| 2. Valve | 9. LA Tube |
| 3. Safety pin | 10. Cylinder |
| 4. O-ring | 11. Nozzle |
| 5. Spindle | 12. Cylinder belt |
| 6. Spring | 13. CO2 cartridge |
| 7. Cartridge adaptor | |



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Introduction

- Powder fire extinguishers
 - Powders are commonly made from Mono Ammonium Phosphate (MAP).
 - There are various types of powders which uses a different ratio of ammonium to phosphate, depending on the grade of the powder.
 - Cartridge operated fire extinguishers uses a carbon dioxide propellant which is stored in a cartridge inside the cylinder. When the valve is operated, it would puncture a hole in the cartridge, causing the carbon dioxide in the cartridge to fill and pressurize the cylinder.

Safety Precautions

- Cartridge operated fire extinguishers should only be opened after any residual pressure has been released.

Note: To release pressure without discharging, or to release residual pressure, unscrew the head and valve assembly slowly for two or three turns only, to allow the pressure to escape via the venting arrangement. Do not unscrew further until all pressure is released.
- Handle the carbon dioxide gas cartridges with care.
- Use a clamping unit when servicing the fire extinguisher.
- Do not mix different powders. Some of the mixtures would produce water and carbon dioxide, which would cause caking of the powder and rise in pressure in the cylinder.



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Initial Operations

1. Safety pin and cable tie

- Check the safety clip and cable tie to determine whether the portable fire extinguisher may have been operated.

2. External examination

- Inspect for corrosion, dents, gouges, or damage that could impair the safe operation of the portable fire extinguisher.

3. Hose and nozzle

- Check the discharge hoses for condition and fitness for use and ensure that the nozzles and hoses if fitted are unobstructed and not cracked, worn, or damaged.
- Renew if necessary.
- Ensure there is no residual powder in the discharge hose to avoid contamination.

4. Operating instructions

- Check the operating instructions for correctness and legibility.

Charge Operations

Note: Remove pressure from cylinder before unscrewing valve, according to the method stated in the Safety Precautions.

5. Powder charges (for powder fire extinguishers)

- Examine the powder of the portable fire extinguisher.
- Agitate the powder by inverting and shaking the portable fire extinguisher taking care to avoid spillage.
- If there is any evidence of caking, lumps, or foreign bodies, or if it is not free flowing, or if there is any doubt at all, discard all the powder and recharge.
- The use of sieves or machines to remove foreign bodies, caked or lumpy material is not recommended since this will involve considerable exposure to atmospheric humidity with a risk of subsequent caking.



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6. Weight control

- Pour out the powder content of the fire extinguisher.
- Weigh the extinguishing agent compare the content weight with the weight stated on the cylinder.
- If more than 10% of the content is loss, refill the cylinder with new extinguishing agent.
- Powder fire extinguishers should only be opened in the driest available conditions and for the minimum time necessary for examination, to minimize the effect of atmospheric moisture on the powder.
- Powder refills should only be opened immediately before use, and bulk refills should be resealed immediately after use.

Internal Operations

7. Operating mechanism and air passages

- Clean valve if necessary and pass air through the other parts, paying particular attention to the vent holes (or other venting devices) in the cap.
- Ensure that the dip tube is unobstructed and remove any residual powder if present.
- Renew dip tube if necessary.
- The dip tube needs to be renewed every three to five years.
- Check the valve and handle for free movement, clean, rectify or renew as necessary.
- Protect moving parts and threads against corrosion with a lubricant.

8. Gas cartridge

- Examine the gas cartridge externally for corrosion or damage.
- If the gas cartridge suffered mechanical damage or is corroded, replace the gas cartridge.
- Weigh the gas cartridge and check the mass against that marked on the gas cartridge.
- If the cartridge weighs less than 90% of the gross weight, replace the gas cartridge.

9. O-rings and washers

- Check all O-rings and washers and renew if necessary.
- O-rings must be renewed every three to five years, or when the condition is not satisfactory.



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10. Cylinder body

- Inspect the inner surface of the cylinder with the aid of an illuminated probe.
- Check for corrosion or any damage.
- Check internal lining of water/foam fire extinguishers and ensure the lining is not damaged.

Final Operations

11. Reassemble

- Reassemble the fire extinguisher.
 - Insert O-ring into valve.
 - Insert spindle into valve.
 - Place spring at the back of the spindle.
 - Screw tube holder into valve.
 - Screw dip tube into tube holder.
 - Insert the dip tube and valve assembly into the filled cylinder and tighten.
 - Insert new cartridge.
 - Refit the safety pin or device to prevent inadvertent operation and fit new cable tie as necessary.
 - Clean the fire extinguisher with a cloth.

12. Maintenance label

- Complete the details on the maintenance label.

13. Wall bracket/stand

- Check condition of wall bracket or stand and rectify if necessary.



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Maintenance

The service and maintenance of the extinguishers should be done in accordance to the national regulations as specified in BS 5306-3 / NFPA 10. The following steps listed below are available as recommendation but should NOT supersede any national regulations.

- The user should ensure that extinguishers, gas cartridges and replacement charges are inspected, serviced and maintained regularly by a competent maintenance and servicing organization.
- A record of maintenance performed shall be kept.

Maintenance Intervals

TYPE OF FIRE EXTINGUISHER	BASIC SERVICE	EXTENDED SERVICE AND RECHARGING
Powder	Every year	Every 5 years

- Basic service: date of commissioning or the date of last service.
- Extended service:
Powder: 5 years from the date of commissioning or 6 years from the date of manufacture. Subsequently every 5 years from the date of last extended service;
- The replacement of parts does not affect these intervals.

Hydrostatic Test Intervals for Extinguishers

TYPE OF FIRE EXTINGUISHER	TEST INTERVALS
Powder	10 YEARS

- The pressure in a hydrostatic test of a cylinder shall be maintained for a minimum of 30 seconds, but for no less time than is required for complete expansion of the cylinder and to complete the visual examination of the cylinder.
- Test pressure shall be hydrostatically tested to the pressure specified on the extinguisher.
- All valves, internal parts, and hose assemblies shall be removed, and the fire extinguisher shall be emptied before testing.
- All traces of extinguishant agents must be removed before filled with water.
- A complete internal and external visual examination shall be conducted before any hydrostatic test.