



Maintenance Instruction

Dry Chemical powder Fire Suppression System



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Amendments

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1 FOREWORD

This manual is written for those who design, install and maintain Autronica Fire and Security Dry Chemical Powder (DCP) Fire Suppression Systems

IMPORTANT

Autronica Fire and Security AS assume no responsibility for application of any system other than those addressed in this manual. The technical data concerned herein is limited strictly for information purposes only. Autronica Fire and Security AS believe this data to be accurate, but it is published and presented without any guarantee or warranty whatsoever. Autronica Fire and Security AS disclaim any liability for any use that may be made of the data and information contained herein by any and all other parties.

The Autronica Fire and Security Local Protection Fire Suppression Systems are to be designed, installed, inspected, tested and recharged by qualified and trained personnel in accordance with the following.

All instructions, limitations, etc. contained in this manual.

Storage, handling, transportation, service, maintenance, recharge and test of agent storage containers shall be performed only by qualified and trained personnel in accordance with the information in this manual and the relevant compressed gas standard.

Regulations imposed by the class, flag state or Authorities Having Jurisdiction for the hazard to be protected.

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2 MAINTENANCE INSTRUCTION

2.1 Introduction.

The system is designed for minimum maintenance; however, in order to keep the system ready for use at all times, it is important to establish regular inspection routines. Also, be sure that nothing has occurred which could compromise the effectiveness of the system.

By involving the persons likely to use the system in emergencies in these routines, valuable time may be saved in case of a real fire situation.

Inspection routines will vary on different installations, but the following is intended as a general minimum.

2.2 Precautions.

Make sure that the personnel executing the regular maintenance are familiar with the system and that they are authorised by the supplier to carry out such work.



ANY UNAUTHORISED ALTERNATIONS TO THE PROTECTED AREA OR EQUIPMENT OR TO THE SYSTEM DESIGN MAY RENDER THE FIRE SUPPRESSION SYSTEM INEFFECTIVE OR NON-OPERATIONAL. CONTACT Autronica Fire and Security AS OR THEIR AUTHORISED REPRESENTATIVES IF ANY MODIFICATIONS ARE CONTEMPLATED

2.3 Starting up a new installation.

- To ensure a safe operation of the system it is important that qualified personnel carry out a thorough check of the installation after completion. It is assumed that all required NDT (Non Destructive Testing) of piping has been carried out before proceeding.
- Check that all the components in the system are mounted properly.
- Blow through all the pipes with dry compressed air or nitrogen to check free flow, and to remove any foreign objects in the piping. Disconnect all hose stations, monitors, valves etc., to avoid foreign objects to enter these, before blowing through the pipes.
- Check the filling of the dry chemical tank and the nitrogen cylinders.
- Check manual operation of all valves and other equipment, such as monitors, hose-reels etc.

2.4 Full scale test.

In some cases, a full-scale test is required to prove the system's function after installation or to check that the functions are maintained, typically 5 years after installation.

- Check that powder, nitrogen or any other consumable necessary for recharging is available.
- Check any necessary permission required to discharge powder and warn all personnel in the affected area.
- Prepare timing and weighing equipment, and make necessary arrangements for recording the required data.
- Release the system as if actual fire and make necessary recordings for discharge time, discharge patterns etc. After finished discharge, check that the powder tank has been completely emptied.

2.5 System settings.

Set point for the system equipment shall be as follows:

Description	Set point
Nitrogen pressure regulator	16 Bar
In-Line check valve on pilot line to tank valve	10 Bar
Pilot pressure regulator to tank valve	5,5 – 6 Bar
Design pressure DCP tank	16 Bar

2.6 What to do after discharge.

- Blow through all used powder discharge piping with nitrogen or dry air until no powder is visible from the discharge device.
- Refill all used nitrogen cylinders.
- Set all valves in correct position.
- Replace bursting disc in powder container outlet if provided.
- Refill the powder tank through the top lid. Use the same powder as originally supplied. If this is not available, do contact Autronica Fire and Security AS for alternatives. Do not mix different types of powder unless approved by Autronica Fire and Security AS.

2.7 Schedule for periodical control of the dry chemical suppression system.

Onboard maintenance and inspections should be carried out in accordance with the maintenance plan, which should include the minimum elements listed in the following sections.

The following sections are valid for dry chemical powder systems.

2.7.1 Monthly inspection.

Description
<p>Visually inspect all accessible components for proper condition.</p> <ul style="list-style-type: none"> ✱ Check thoroughly for corrosion ✱ Check nitrogen cylinder pressure. To be min. 120 Bar. Re-fill if required. Nominal pressure to be 150 Bar. ✱ Operate the dry chemical powder tank main valve using the manual declutchable wheel.

2.7.2 Annual inspection and testing.

Description

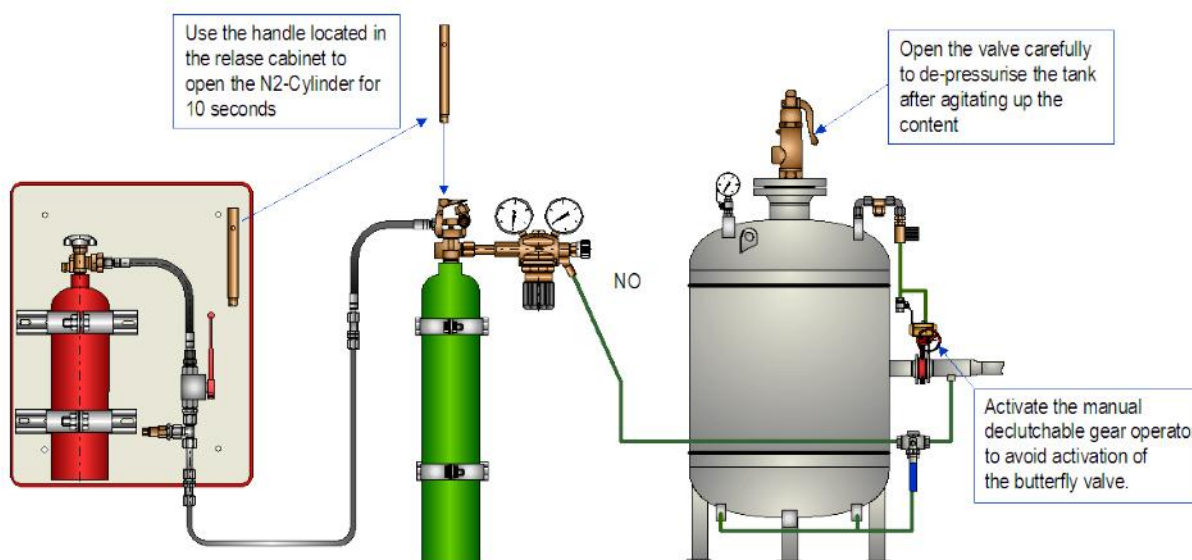
Visually inspect all accessible components for proper condition.

- Dry chemical powder tank, external corrosion
- Dry chemical powder tank outlet valve, no physical damage.
- Pneumatic release cabinet, condition.
- CO₂-Pilot cylinder, remove and weigh the cylinder.
- Nitrogen pressure regulator in proper condition
- Agitate the dry chemical powder charge with nitrogen as described in 2.6.2.1.

2.7.2.1 “Blowing-up” dry chemical tank content.

1. Activate the declutchable gear operator on the dry chemical powder tank outlet valve. This will avoid the valve opening when the tank is pressurized.
2. Open the release cabinet door.
3. Remove the handle inside and insert it into the nitrogen cylinder valve.
4. Open the nitrogen cylinder valve for a maximum of 10 seconds by pulling the handle. It might be advisable to use a separate nitrogen test cylinder to avoid de-creasing the pressure in the system nitrogen cylinder.
5. Wait for 5 minutes.
6. Open the safety valve carefully to de-pressurize the dry chemical powder tank.
7. Re-store the system to normal operation. Check nitrogen cylinder pressure.

Note: due to the powder's affinity for moisture, any nitrogen gas introduced for agitation must be moisture free.



2.7.3 Two year inspection and testing

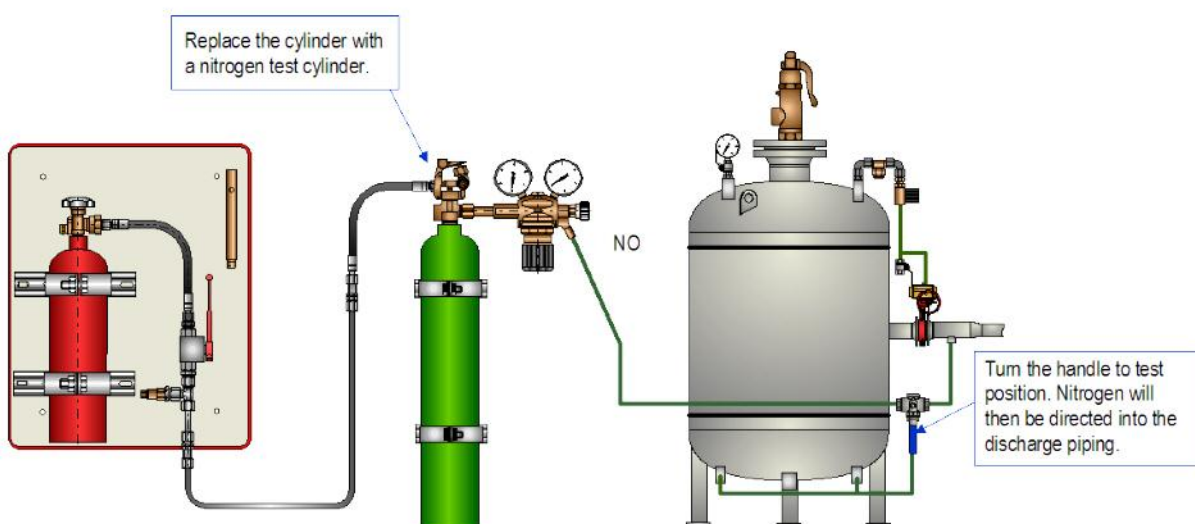
Description

Visually inspect all accessible components for proper condition.

- Blow dry nitrogen through the system to confirm the pipe work and nozzles are clear of any obstructions.
- Operationally test local and remote controls and section valves..
- Verify the content of propellant gas. Minimum pressure at the nitrogen cylinder to be 120 Bar. Nominal pressure to be 150 Bar.
- CO2-Pilot cylinder, remove and weigh the cylinder.
- Test a sample of the dry chemical powder for moisture content.
- Test the safety valve set point, to be 16,5 bar.
- Check outlet pressure setting on nitrogen pressure regulator. To be 16 Bar.

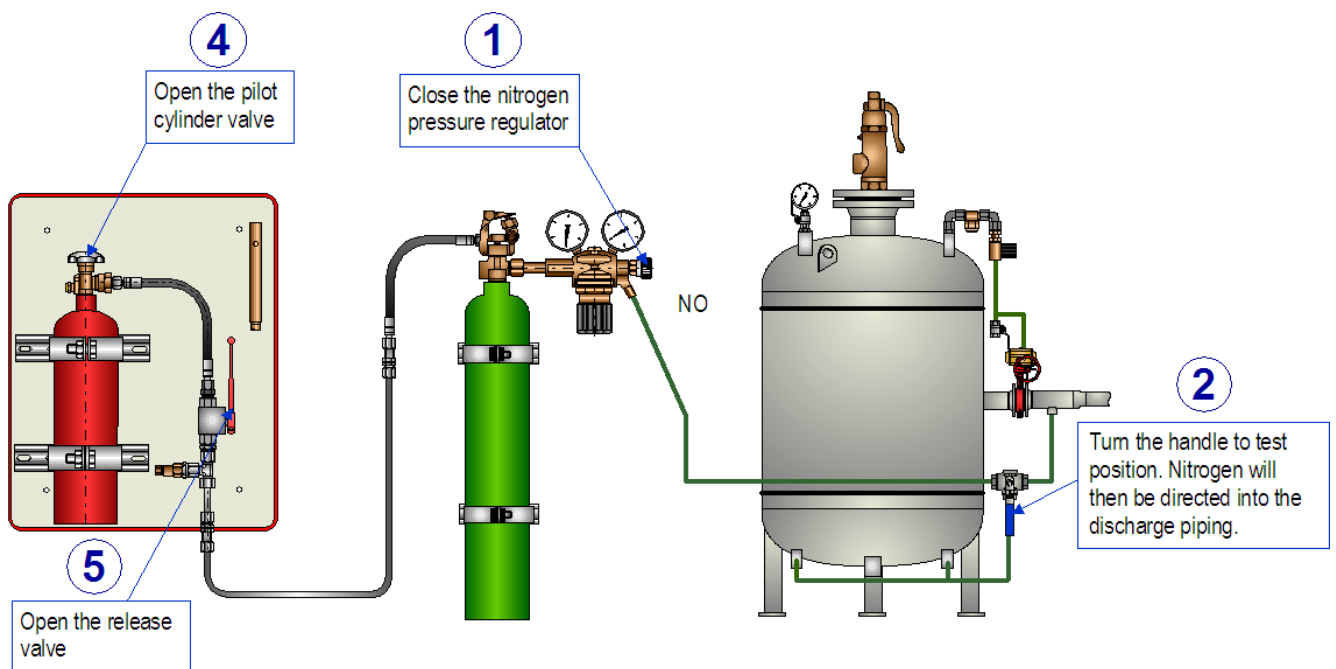
2.7.3.1 Blowing through pipe work.

1. Turn the three-way valve to test position.
2. Replace the Nitrogen cylinder with a nitrogen test cylinder.
3. Open for nitrogen and blow through the piping.
4. Check that all nozzles and piping are clean.
5. Re-store the system.



2.7.3.2 Test of pneumatic release system.

1. Close the nitrogen cylinder pressure regulator.
2. Turn the three-way test valve to test position.
3. Open the release cabinet door.
4. Open the pilot cylinder.
5. Open the release valve by pulling the handle outwards.
6. Nitrogen cylinder valve shall open.
7. Close the pilot cylinder.
8. Loosen carefully the pilot hose at the nitrogen cylinder to purge the pilot line.
9. Close the nitrogen cylinder valve by using the handle stored inside the release cabinet.
10. Open the nitrogen pressure regulator. The remaining nitrogen will be discharge through the piping system.
11. Re-store the system. Make sure that the pilot cylinder and the nitrogen cylinder are fully charged.



2.7.3.3 Test of dry chemical powder

Percentage of foreign particles:

Use a sieving with a 1000 micron sieve. Particles which remains on this is usually not initial part of the dry chemical powder.

Dry chemicals powder of different origin.

The best control is to get the dry chemical powder from the original supplier. Mixed batches in one single pressure vessel are difficult to recognize, mostly only with the assistance of a fully equipped laboratory. One item of course is the colour of the dry chemical powder.

Never mix ABC and BC dry chemical powders. In order to control this, add acetic acid to the dry chemical powder sample. If there is no development of CO₂, no BC dry chemical powder is involved.

2.7.4 Ten year service

Description
Hydrostatic test. <ul style="list-style-type: none"> • all powder containment vessels to hydrostatic or non-destructive • The dry chemical powder vessel shall be hydrostatic testing by an accredited service agent. • The nitrogen cylinder shall be hydrostatic testing by an accredited service agent. • The CO₂-pilot cylinder shall be hydrostatic testing by an accredited service agent

2.8 Dry chemical powder data Furex K

BC Products		Furex K
Main component		Potassium bicarbonate
Share in efficient substance	ca. % %	90 +/- 3
Standard colour		Light blue
Bulk density (acc DIN)	gr/10 ml	>80
Grain size distribution <63 µ	ca. %	75 - 95
Flow behaviour (acc. TL 4210-0098)	g/sec	>70
Temperature resistance from - to	°C	-60 to +55

Autronica Fire and Security is an international company, headquartered in Trondheim, one of the largest cities in Norway.

Our products cover a broad range of systems for integrated solutions, including fire detection systems, integrated fire and gas detection systems, control and presentation systems, voice alarm systems, public address systems, emergency light systems, plus suppression systems.

All products are easily adaptable to a wide variety of applications, among others, hospitals, airports, churches and schools, as well as to heavy industry and high-risk applications such as power plants, computer sites, offshore installations and to the marine market, world wide.

The company's strategy and philosophy is plainly manifested in the business idea:

Protecting life, environment and property.

Quality Assurance

Stringent control throughout Autronica Fire and Security assures the excellence of our products and services. Our products are CE marked and developed for worldwide standards and regulations, and conform to the CEN regulation EN54 in addition to IMO, classification societies and marine administrations. Our quality system conforms to the Quality System Standard NS-EN ISO 9001:2000 and is valid for the following product and service ranges: marketing, sales, development, engineering, manufacture, installation, commissioning and servicing of suppression, integrated fire and gas detection and alarm systems, plus petrochemical, oil and gas instrumentation systems for monitoring and control.

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