



Installation 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 Dry Chemical Powder 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 GENERAL.

This manual gives general instructions for installation of the components in Dry Chemical Powder System.

Prior to installation, check all equipment thoroughly for any visible damage and report to the supplier immediately for repair or supply of new parts.

2.1 Qualifications of technicians.

Installation can be carried out by pipefitters (and electricians if applicable), having the qualifications required by the authorities having jurisdiction. AFS's specialists are available for advice on locations of equipment for optimum performance and for supervision of the installation.

2.2 Tools.

No special tools are required for the installation.

2.3 Maximum working pressures.

Nitrogen propelling gas, high pressure lines:	20 MPa (200 bar).
Nitrogen propelling gas, low pressure lines:	1,6 Map (16 bar).
Powder discharge piping:	1,6 Map (16 bar).
Pneumatic release lines:	10,0 Map (100 bar).

2.4 Piping and gasket materials.

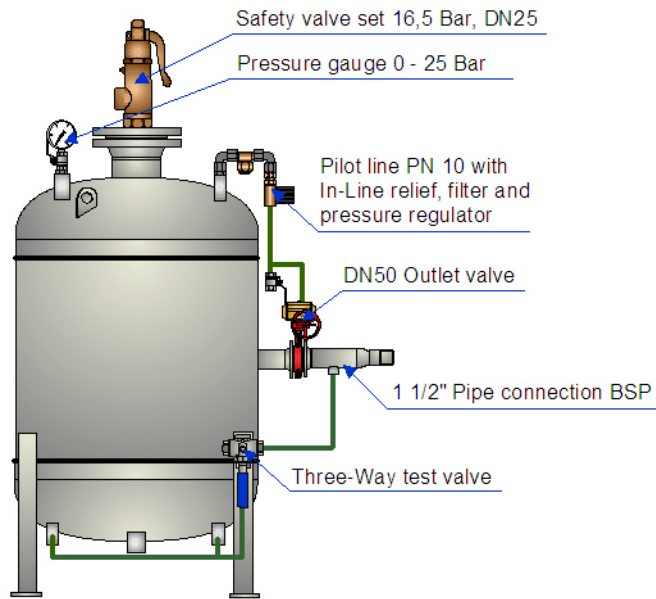
The dry chemical is not corrosive and it will therefore be the ambient conditions that determine the piping material qualities to be used.

- General recommendations:
- Powder discharge lines and nitrogen propelling gas lines: Galvanised steel pipe
- Pneumatic release lines: Stainless steel tubing, Ø 8,0 x 1 mm.

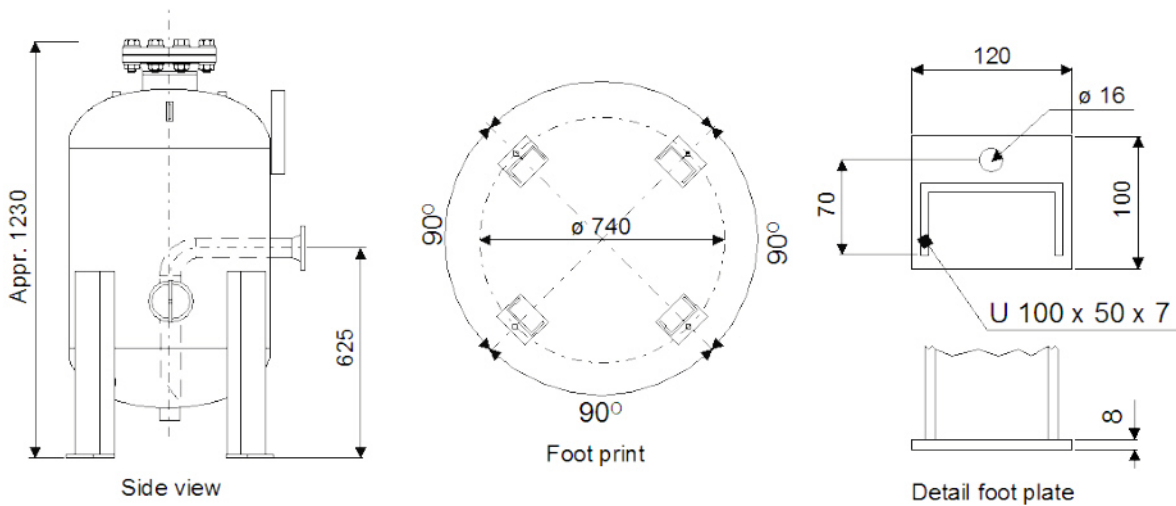
2.5 Dry Chemical Powder tank.

The dry chemical powder tank is a vertical cylindrical tank with 4 legs with bolting holes for bolting to the deck. Necessary space must be available above and around the tank for maintenance and refilling.

The dry chemical powder tank is normally supplied with following accessories mounted:



The dry chemical powder tank shall be bolted to the deck using suitable bolts, typically M14 in 8.8. Quality, hot dipped galvanized. The foot plate is 120 x 100 x 8 mm steel plate with \varnothing 16 mm hole.

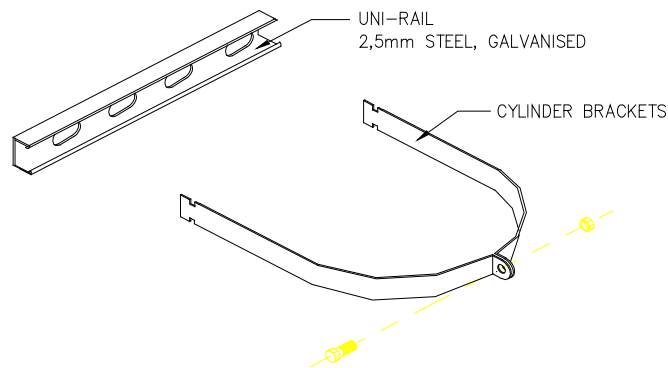


2.6 Nitrogen gas cylinders.

2.6.1 Cylinder clamping.

The cylinders are normally supplied with UNI-clamps and installed as shown below. The cylinders must be aligned with respect to outlet direction and pulling direction for any manual quick-opening valve.

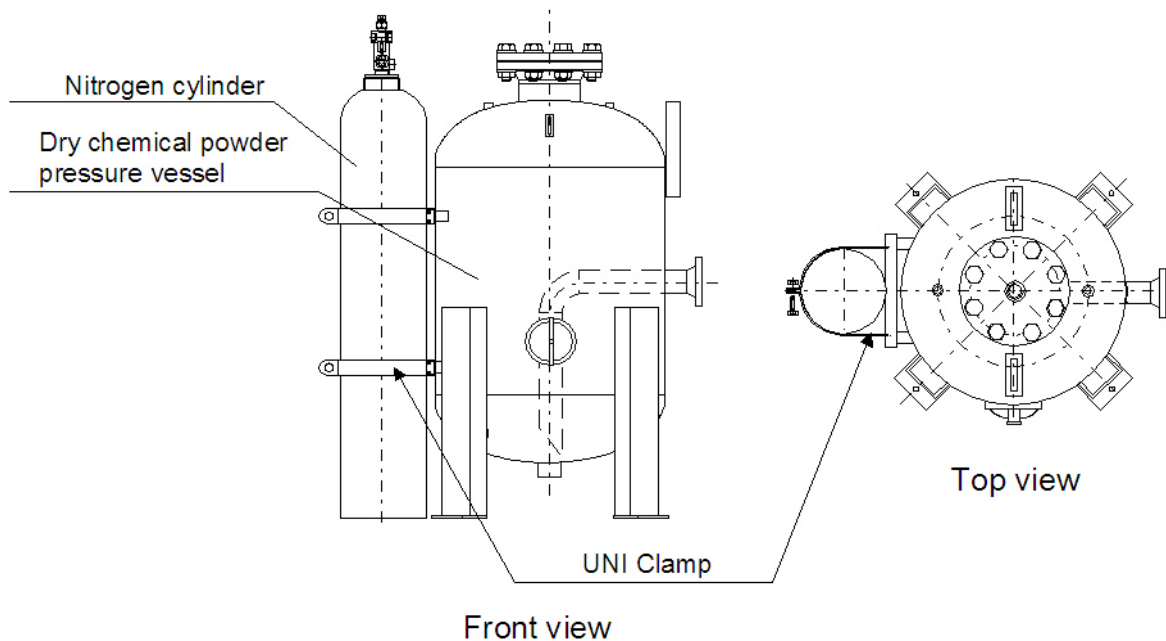
In addition to the Uni-channels, each cylinder is supplied with two clamps. Each clamp consists of two parts and a bolt with nut as shown below.



The clamps are inserted in the Uni-channel and then bolted in front. Be sure that the bolt is tightened properly so that there is no possibility for the cylinder to rotate.

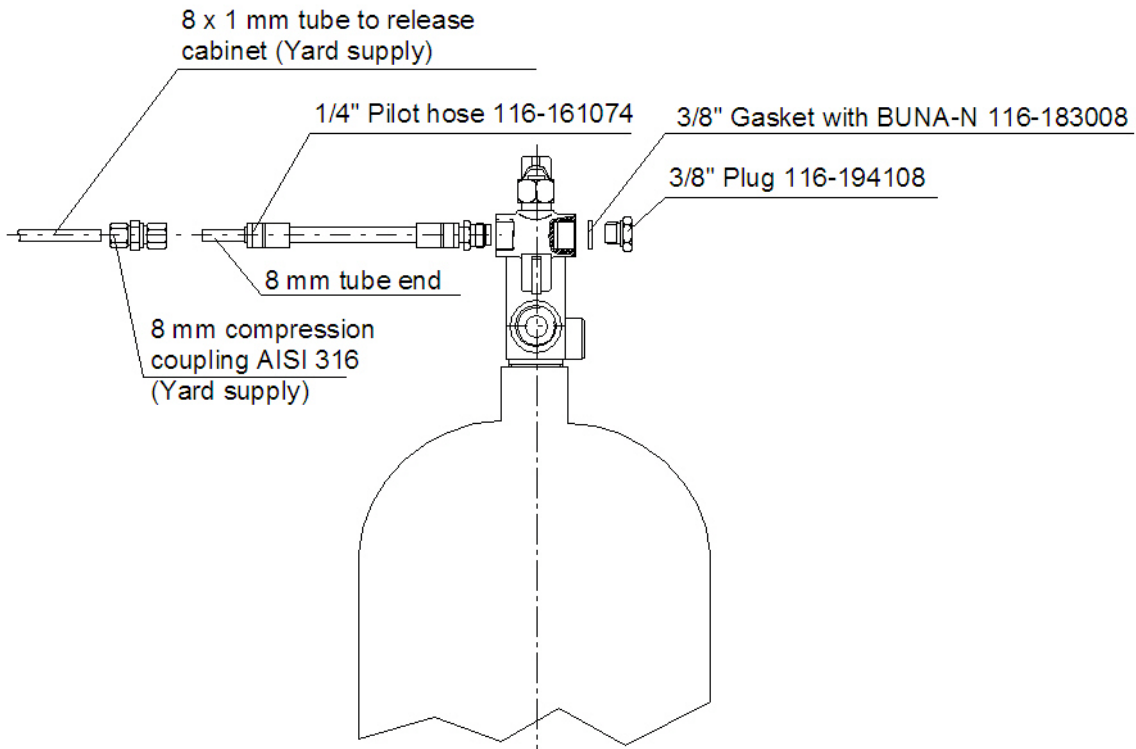
2.6.2 Installing nitrogen cylinder.

The nitrogen cylinder shall be fixed to the dry chemical powder pressure vessel as shown below. The dry chemical powder pressure vessel is prepared with 2 off UNI-Channel for the UNI cylinder clamp.



2.6.3 Pilot hose.

The nitrogen cylinder is supplied with one pilot hose, 300 mm which shall be connected to the nitrogen cylinder valve as shown below.

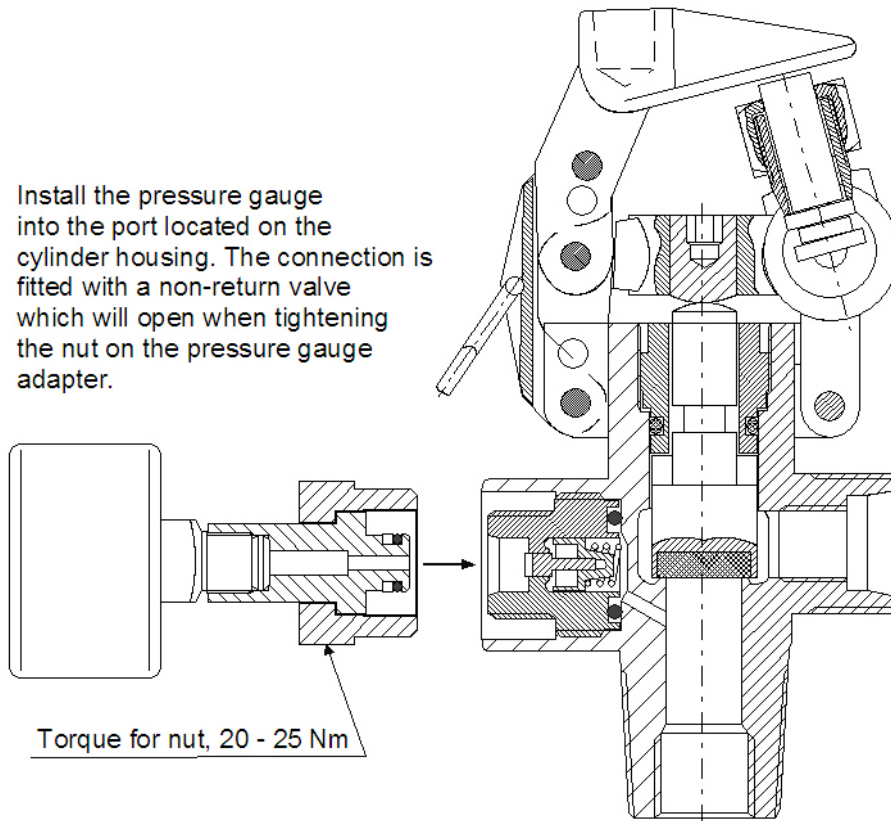


Install the 3/8" plug with gasket on one side of the actuator and the pilot hose to the other side. Tighten both connections.

Install the 8 x 1 mm stainless steel tube between the pilot hose and the release cabinet, using proper 8 mm stainless steel compression couplings single or twin ferrule.

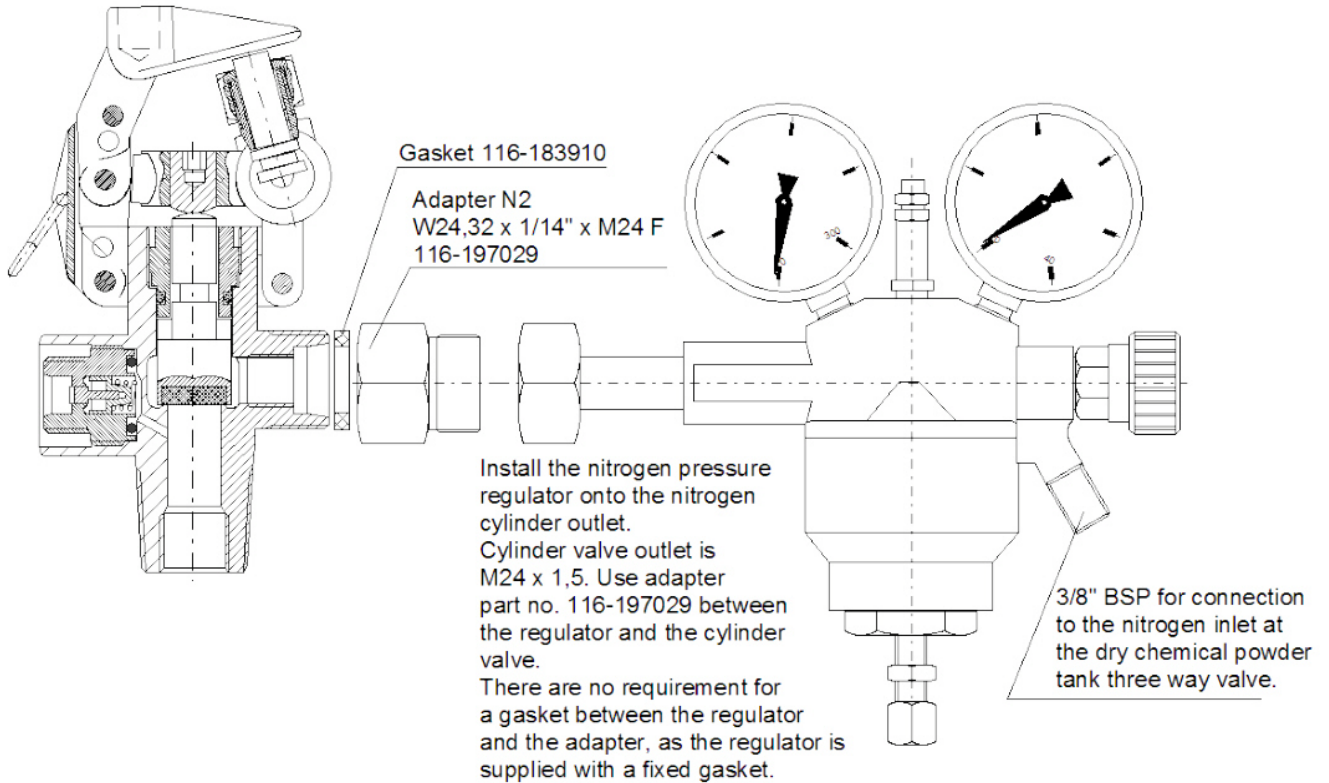
2.6.4 Nitrogen cylinder pressure gauge.

The nitrogen cylinder are supplied with a loose pressure gauge including adapter. This unit has to be fitted to the nitrogen cylinder after installation. This to make sure that the unit is not damaged during transport of the cylinder. If the cylinder shall be sent for refilling, the unit has to be removed and the cylinder protection cap has to be fitted.



2.6.5 Nitrogen cylinder pressure regulator

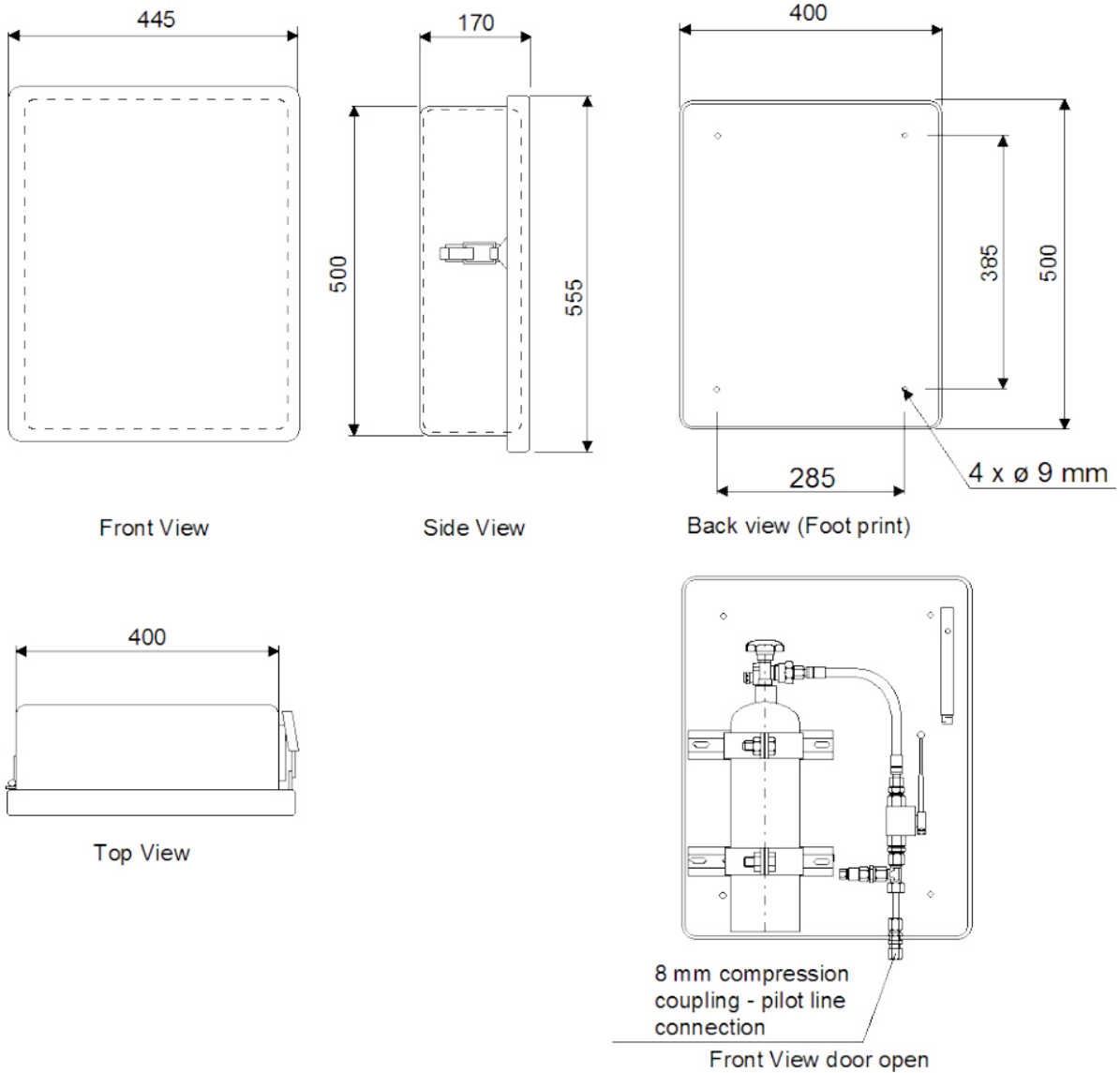
The nitrogen cylinder pressure regulator is supplied as a loose item. It shall be fitted to the nitrogen cylinder outlet. Between the regulator and nitrogen cylinder valve outlet, an adapter has to be fitted.



2.7 Release cabinet

The GRP Release cabinet shall be properly bolted to the bulkhead. The cabinet is supplied without any drilled holes in the back. 9 mm holes should be drilled as marked below.

Pilot line between the release cabinet and the nitrogen cylinder valve to be \varnothing 8 mm x 1 mm stainless steel instrument tube.



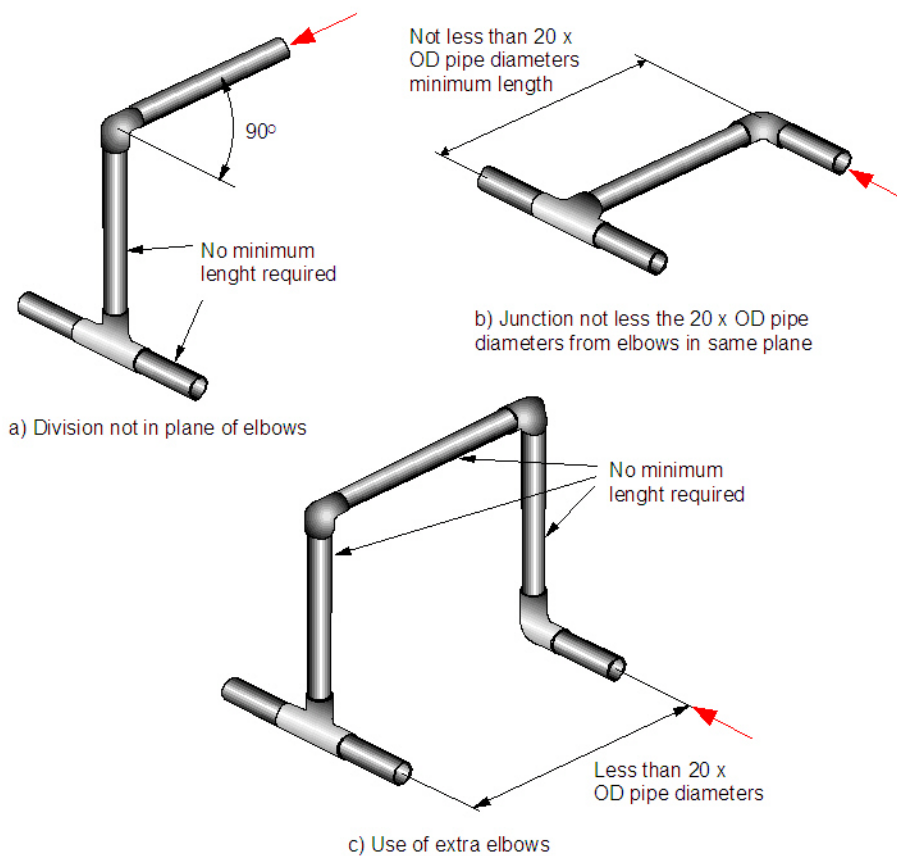
Blow through all tubing with dry air or nitrogen before connecting it to the valves/actuators.

2.8 Pipework design.

The pipe size are designed to avoid blocking of powder in the pipe work taking the minimum velocity and the pressure loss along the complete network into consideration. The design is based on tests performed by AFS.

2.8.1 Elbows and tees

To maintain a non-surfing two phase flow of powder and expellant gas, all bends and tees shall be right-angled and set out as shown in the below figure.



NOTE: When the distance between parallel pipes in less than 20 pipe diameters, arrangement b) should not be used; to avoid separation of flow arrangement)c should be used.

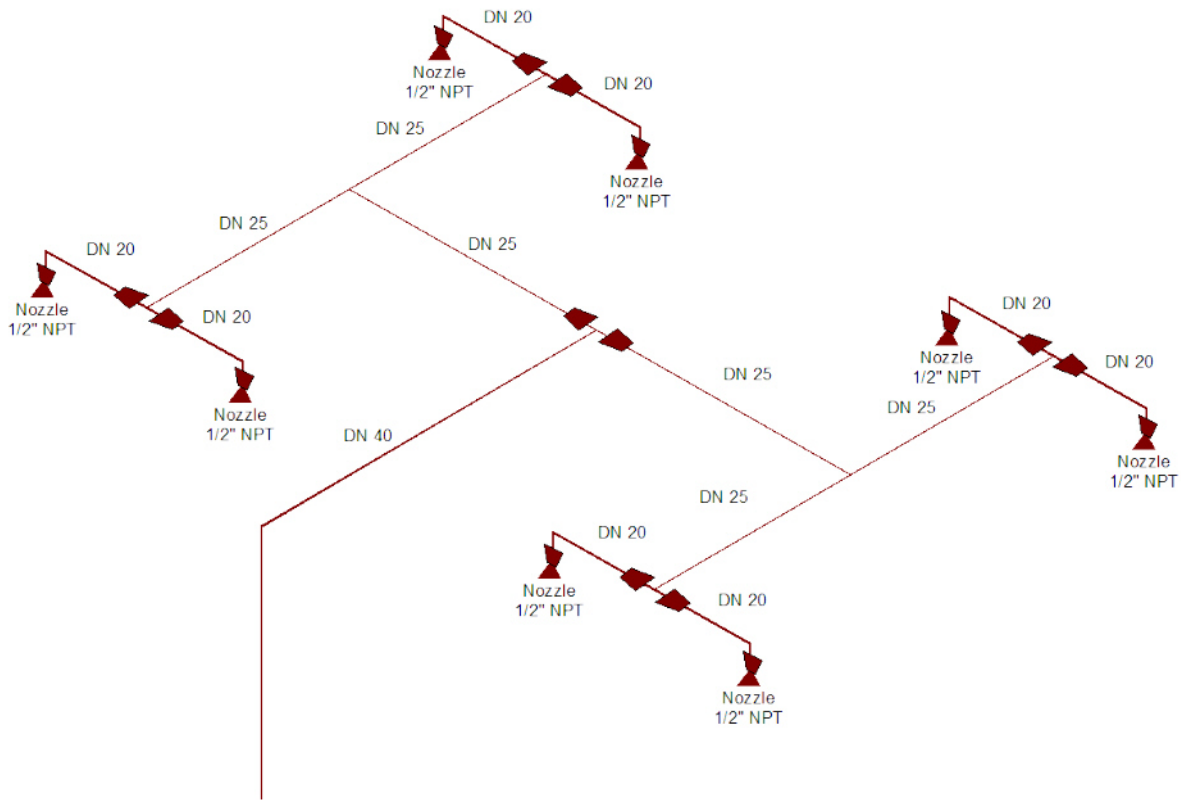
2.8.2 Pipes and fittings

Recommended pipes as described below:

Pipe size	OD x WT mm Seamless DIN 2448	OD x WT mm Seamless ANSI	Pipe material	Fittings	Pressure test
1 ½" – DN 40	48,3 x 3,6	48,3 x 3,7 (Sch. 40)	Stainless steel AISI 316	NPT or BSP threaded or butt weld or socket weld	24 bar for 30 minutes with fresh water. Purge with dry nitrogen after pressure test.
1" – DN 25	33,7 x 3,2	33,4 x 3,4 (Sch. 40)			
¾" – DN 20	26,9 x 3,2	26,7 x 2,9 (Sch. 40)			

2.8.3 Nozzle arrangement and selection

Nozzles shall be arranged in accordance with the principles illustrated in the below figures.



NOTE: This provides uniform distribution of powder.

2.8.4 Installation of pipework

Before final assembly, pipe and fittings shall be dry and shall be inspected visually to ensure that no foreign matter is inside and the full bore is clean. After assembly the system shall be thoroughly blown through.

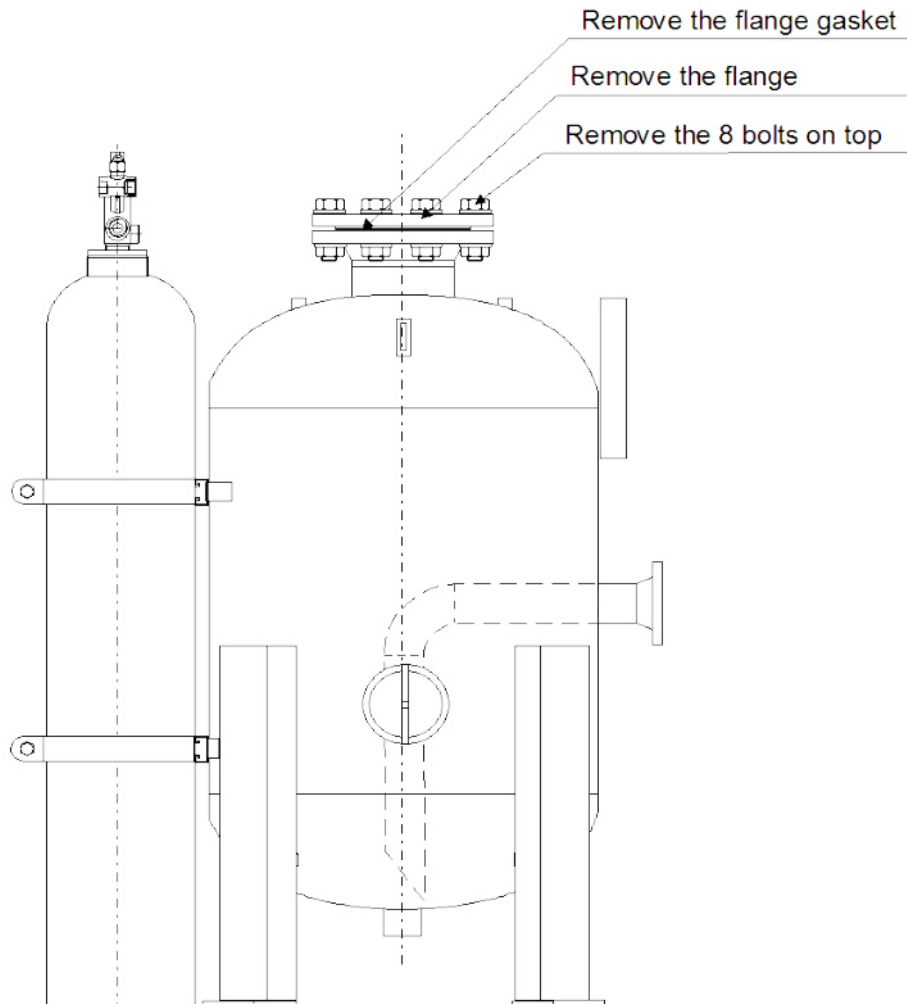
2.8.5 Pipework support

The maximum distance between supports to take into account the mass of pipe and powder should be given in the below table.

Pipe size mm	Maximum span m
12 mm	1,20 m
15 mm	1,50 m
20 mm	1,80 m
25 mm	2,10 m
32 mm	2,40 m
40 mm	2,70 m
50 mm	3,40 m

2.9 Dry chemical powder charging

The dry chemical powder is supplied in 25 kg paper bags. To charge the dry chemical powder tank, the DN100 top flange has to be removed. When removed, charge the tank with 200 kg of dry chemical powder.



When the charging is completed, set the system back to normal operation. Make sure to tighten the top flange properly.

Blow up the dry chemical as described in the maintenance manual, section 2.6.2.1 after the flange is properly installed. This to check that the flange is properly installed and that the gasket is in good condition. If there is a leakage on the top flange, try to retighten. If this is not working, the gasket has to be replaced.

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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