Danfoss SEMCO FIRE PROTECTION

Total Solution Provider of Certified Fixed Fire Fighting Systems

Low-Pressure CO_2 Fire Fighting System

Low-pressure CO_2 fire fighting system

Danfoss Semco low-pressure CO_2 systems are intended for use where large machinery and cargo spaces require protection with carbon dioxide. The advantage of the low-pressure system is that one single tank replaces a large number of CO_2 cylinders with an approximate saving of 50% in weight. The tank, main valves, distribution valves, refrigerators, and associated controls are supplied prewired and ready assembled on a common steel frame.

The quantity of carbon dioxide is shown directly by an electronic gauge indicating the actual tons of CO_2 in the tank. The gauge unit is fitted with alarm contacts for warning at low CO_2 contents in the tank. Recharging after use is made directly from a truck.

For large vessels the installation cost of a low-pressure CO_2 system is considerably lower compared to the installation costs of a high-pressure CO_2 system.

The system is designed to meet the requirements of the appropriate classification societies to which the vessel is being built.

Tank

The tank is constructed as a steel pressure vessel in accordance with the classification society requirements. The tank is equipped with two safety valves, which are fitted to a three way change over valve, thus one safety valve is connected to the vessel if the other one is out of operation. The tank unit is supplied complete and ready for use, installed on a rectangular steel framework and held in position by thermally insulated supports. The tank is insulated with non-flammable polyurethane foam protected by an aluminium cover.

Cooling units

The cooling units are installed at the end of the tank on the support frame and are completely duplicated both mechanically and electrically. The refrigerant is environmentally friendly and the cooling circuits on the compressors and condensers are suitable for either seawater, fresh water or air-cooling. The tank is maintained at a temperature of –18°C, which is equivalent to a CO_2 storage pressure of 2.1 MPa.

CO_2 level indication

An electrical capacitance type liquid gauge is fitted and the meter is calibrated from zero tank contents to tank full. The indicator has an accuracy of +/- 2% and is fitted with an alarm switch indicating minimum filling level.

To meet rule requirements an overfill valve and a level sight tube with isolation valve is fitted.

Controls

A pre-wired operating panel is installed at the end of the tank on the support frame, at which are grouped all controls and overload relays for the cooling units, tank pressure, level indicators, and various indicators and warning lamps. The panel is completely watertight and fitted with cable glands.

Valves and filling connections

The automatically operated main valve and distribution valves are ball valves fitted with manual override. The valves are sized so that the appropriate quantity of carbon dioxide will be discharged in accordance with the class requirements. To prevent ice formation on the valves the main outlet pipe from the tank is located at the top of the tank as a continuation of the tank dip tube. The tank is filled by a truck through twin filling and balancing lines led from the tank to deck level port and/or starboard. Isolation valves and hose connections are fitted to these lines.

Release of carbon dioxide

Remote release of the required quantity of gas to a particular space is made from master control boxes located as required. The release system utilises the CO_2 pressure from the tank to actuate the main valve and the distribution valve via pressure operated control valve, and these valves are arranged for remote operation from the master control box. When the appropriate quantity of carbon dioxide has been discharged, the distribution valve is closed automatically by means of a solenoid operated control valve actuated by the electronic timer.

Distribution system

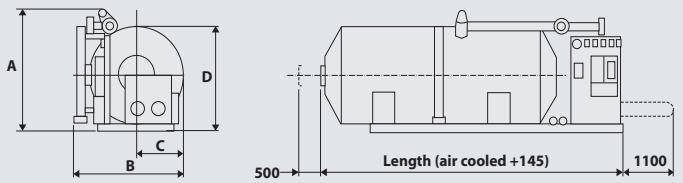
The distribution valve is connected to a computer calculated piping system within the protected space and to which the CO_2 nozzles are connected. The piping is dimensioned so that the required quantity of gas will be discharged within the prescribed time and at no point in the piping system will the pressure fall below 1.05 MPa which would cause freezing at the nozzles.

All designs and sizes are available on request

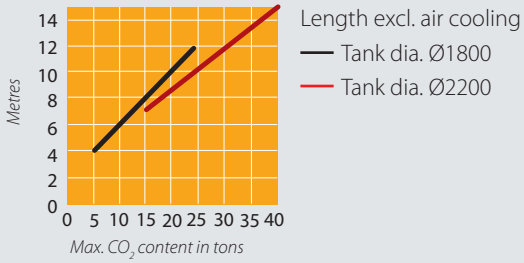
Quality assurance

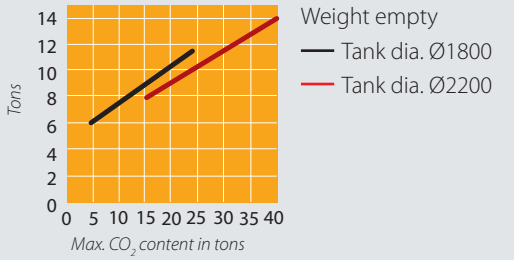
Danfoss Semco HSE&Q system is in accordance with DS/EN ISO 9001:2008, DS/EN 14001:2004, and DS/OHSAS 18001:2008 and is certified by DNV.

Our ongoing internal training programs make our employees – naval architects, sales engineers, project managers, service engineers etc. – fully qualified to handle our fire fighting systems for the marine industry. An important element is the use of an approved computer program for hydraulic calculations, which secures a quick and precise system design.



	TANK Ø1800	TANK Ø1900	TANK Ø2200	TANK Ø2400
A	2600 mm	2800 mm	3000 mm	3200 mm
B	2415 mm	2460 mm	2805 mm	3000 mm
C	1025 mm	1080 mm	1225 mm	1340 mm
D	2270 mm	2420 mm	2695 mm	2900 mm





Total Solution Provider of Certified Fixed Fire Fighting Systems

Danfoss Semco A/S

History

Danfoss Semco A/S is a global leader in the sale, development, production and service/commissioning of certified fixed fire fighting systems. In 2006, two leading firms in the field, Danfoss A/S and Semco Maritime A/S, joined forces to form the present company, with Semco Maritime boasting over half a century of expertise in designing and installing fixed fire fighting systems. All the while, Danfoss has developed and delivered key components for the high-tech systems.

Today Danfoss Semco is an integral part of the Danfoss Group, Denmark's largest industrial manufacturing company with a daily output of more than 250,000 finished components. With more than 24,000 employees worldwide, Danfoss is truly a global company.

Business areas

Our company is located in Odense, Denmark, and operates three main business areas.

Our water mist division comprises two business areas: the marine division and the industrial and commercial division. The former has pushed the boundaries for development and design to offer a wide range of solutions for numerous application areas on almost any type of vessel.

Within the industrial and commercial area, Danfoss Semco has a successful track record with different applications, ranging from complex fire fighting systems for museums and heritage sites to industrial applications, office buildings and universities.

Our gas and foam division is one of the world's largest low-pressure CO_2 based fire fighting systems supplier for the marine industry. This division supplies gas, foam and dry chemical powder systems worldwide.

In-house manufacturing of key components

Danfoss Semco operates in-house research, development and manufacturing facilities of all critical components to ensure uncompromising performance and cost-effective systems. This puts us in a unique position to maintain our technological leadership in the future.

Proven experience

Danfoss Semco has supplied fire fighting systems to more than 1,500 vessels, including world class ships, such as:

- *Allure of the Seas* and *Oasis of the Seas,* the world's largest cruise liners when built
- *Mærsk Mc-Kinney Møller,* the world's largest container ship when built
- *INS Vikrant,* the largest and first aircraft carrier built in India for the Indian navy
- *Seven Viking,* ship of the year 2013
- *The Atlantic Mercy,* Mercy Ships' newest hospital ship for delivering free healthcare

Danfoss Semco is a trusted supplier of low-pressure CO_2 fire fighting systems to major ship owners for container vessels and car carriers

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