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ENGINEERING  
TOMORROW

*Danfoss*

Firefighting | High Pressure Pumps & Valves

Rely on less maintenance and leading durability. **Firefighting with high-pressure water mist**

High-pressure components from Danfoss ensure high reliability in your water-mist system.

**Oil-free**

To ensure less maintenance, high reliability and a long service life



## 90% reduction in water use

With the right pumps and valves a high-pressure water-mist system uses 90% less water than a traditional sprinkler system. That is better for the economy, the environment and, not least, the immediate area affected by the fire. Less water means less damage and, therefore, less reconstruction.

# Fires don't play by the rules

A fire can occur anywhere – anytime. With no respect for rules or regulations. And the consequences for both humans and assets can be catastrophic.

A fire can have devastating consequences wherever it breaks out: offshore, on board a container ship, in a crowded office or hospital building, or in essential infrastructure, such as a transformer station. And even if the fire is put out quickly, the water from traditional firefighting sprinklers could end up causing serious damage to valuable assets.

Using high-pressure water mist is the most effective way to fight fires. And at the same time, the mist isn't as devastating to the immediate surroundings and assets than tonnes of water spread by traditional sprinklers.

Danfoss offers high-pressure components for water-mist systems that are suitable for commercial and industrial applications in infrastructure, marine & offshore and various building types.

### Fast firefighting and total suffocation of the fire

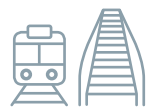
Instead of just cooling the heat like traditional sprinklers, high-pressure water mist both removes the heat and blocks the oxygen that fuels the fire. This is the most effective way to completely suffocate the fire with water.



Various  
building types

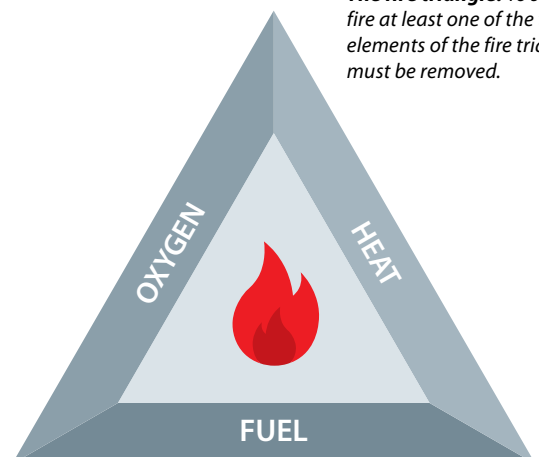


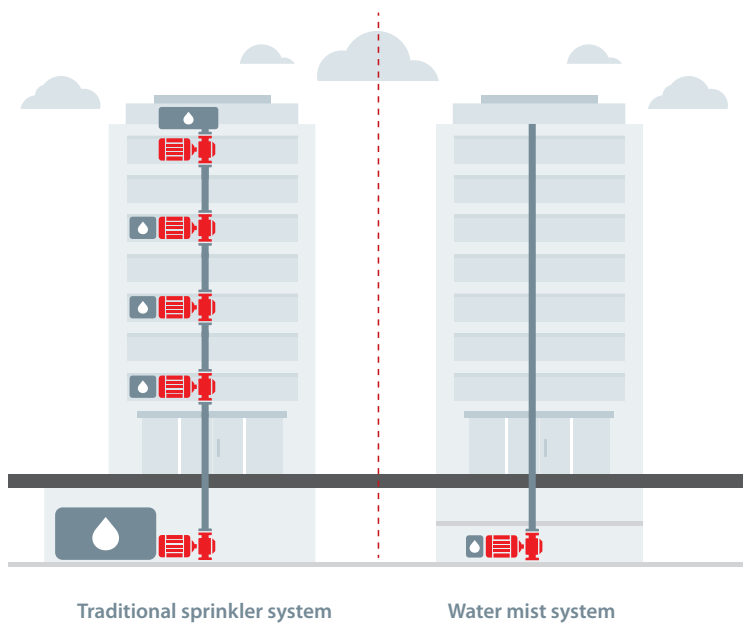
Marine and  
offshore



Infrastructure

**The fire triangle:** To stop a fire at least one of the three elements of the fire triangle must be removed.





## Pressure up to 160 bar

Due to the minimal amount of used water, a high-pressure water-mist system only needs one small water tank to cover several floors or huge areas.

With a pressure of up to 160 bar, Danfoss high-pressure pumps transport water from one tank to the entire system, regardless of whether it is covering a platform in the middle of the ocean, huge hospital buildings or a busy railway station. The high-quality pumps, therefore, ensure less complexity and top reliability in your firefighting system.

The small size of the water tank leaves space for other purposes and makes it easy to install in tight places.

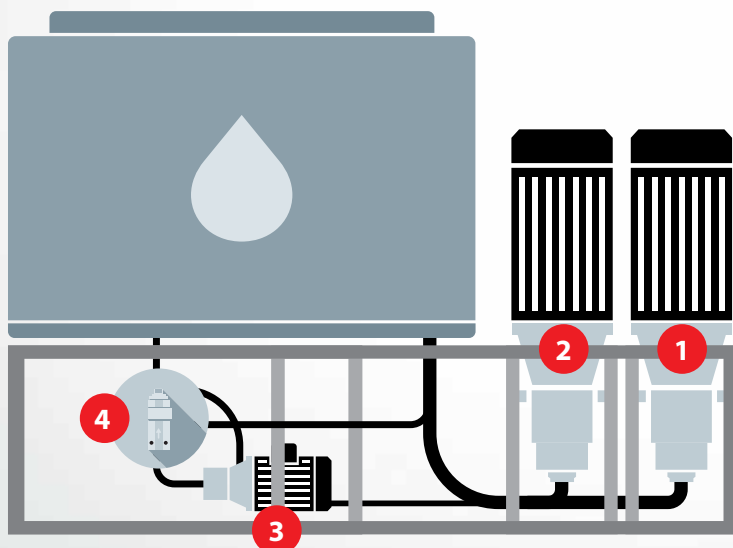
## When failure is not an option

Reliability is everything, when it comes to firefighting. It is all about safety, quality and efficiency in the components to make sure that the system delivers every time without any reason for failure.

With years of experience and world-class technology, Danfoss has the best solutions for your firefighting system. The Danfoss high-pressure product range covers both jockey pumps, main pumps,

valves, check valves and relief valves to ensure top safety, quality and efficiency in your high-pressure water-mist system.

Danfoss high-pressure components can be certified for marine applications on request.



- 1 **Main pump (PAH)**
- 2 **Redundancy via extra pump (PAH)**
- 3 **Jockey pump (PAH)**
- 4 **Valves:**
  - High-pressure zone valves (VDHT) are placed in the different zones e.g. on each floor in a high-rise building
  - Pressure-relief valves (VRH)
  - Check valves (VCH)

## The PAH pumps

# Versatile pumps

The high-performance level of all Danfoss high-pressure pumps ensures optimum reliability in your firefighting solution. All PAH pumps are easy to maintain with a long service life and there is no risk of contamination, because they use water as a lubricant, with no need for oil.

Danfoss PAH pumps can be used both as jockey pumps and main pumps. The jockey pumps keep a constant pressure in the system, while the main pumps are used for actual firefighting.

Pumps come as clockwise and counterclockwise to fit both electric motors and diesel engines.



### Less maintenance

The pump needs less maintenance, is corrosion resistant and there is no risk of contamination. All due to stainless steel, few components, no oil and the fact that the pump is designed to run 8000 hours without service.



### Easy installation

The pump leaves space for other purposes and is easy to install in tight places. It easily runs in parallel and can be placed both horizontally and vertically.



## The PAH range

	PAH 2-6.3	PAH 10-12.5	PAH 20-32	PAH 50-100
<b>Flow</b>				
l/min, 1500 rpm	2.0-8.7	13.4-17.2	28.9-45.9	72.1-146.9
(gpm, 1800 rpm)	(0.7-2.8)	(4.3-5.5)	(9.1-14.5)	(22.7-35.9)
<b>Speed</b>				
RPM	700-1800	700-1800	700-1800	700-2400*
<b>Max outlet pressure</b>				
bar	140	160	160**	160**
(psi)	(2031)	(2321)	(2321)	(2321)

\* For PAH 50 RPM up to 1800, for PAH 100 RPM up to 1500

\*\* For PAH 20, 50 and 100 max outlet pressure: 80 (1160)







### **Unrivalled reliability**

The pump, currently operating in a large number of systems worldwide, is based on known and widely acknowledged Danfoss technology. And it is certified according to the automotive quality standard IATF 16949.



### **Low complexity**

The higher number of pistons, compared to triplex pumps, has a positive impact on the pulsation level in the system. With low pulsations, there is no need for a pulsation dampener, and a belt drive is unneeded because the pump is connected directly to the electric motor.



## The VDHT valves

# High-pressure control

The VDHT valves are used to control the flow in high-pressure water applications. The valves are electrically automated in their on/off operation, although a manual bypass is also an option if required. All valves are available for a wide range of flows and pressure to match your exact system.



### Less maintenance

The valve needs less maintenance and is corrosion resistant due to the fact that it only contains few components and is made of stainless steel to ensure a long lifetime and high durability. Easy service without disconnecting the piping.



### Unrivalled reliability

The valve is made from stainless steel. It is IATF 16949-certified and the coil meets the IP67 standard as dust- and waterproof.



### Easy installation

The valve is light, compact and available in block design, which makes it easy to install in several applications.

## The VDHT range

	VDHT 1/4	VDHT 3/8 – 1/2	VDHT with manual bypass
<b>Flow</b>			
l/min	2-15	30-60	120-150
(gpm)	(0.5-4.0)	(8-16)	(32-40)
<b>Max pressure</b>			
bar	90-100	160-210	140
(psi)	(1300-1450)	(2321-3046)	(2031)
<b>Temperature</b>			
°C	90	90	90
(°F)	(194)	(194)	(194)
<b>Connection</b>			
inch	1/4	3/8-1/2	3/4-1



Case

# Hotel Alsik, Denmark

## Low maintenance and long service intervals were crucial

Hotel Alsik opened to rave reviews in May, 2019. Fortunately, the fire-suppression system has not been called upon to put out any fires, but it has passed all its routine tests with flying colors.



We specified the Danfoss PAH high-pressure pumps because low maintenance and long service intervals were critical for this installation. In addition to industry-leading dependability, the pumps usually require no maintenance for the first 8,000 operational hours and very little after that compared to alternative technologies.

Peter Knudsen  
Market Solution Manager  
Danfoss Fire Safety



The VCH valves

## Check Valves for PAH Pumps

The function of the non-return valve is to allow flow in one direction while protecting the pump from pressure returning to the pump outlet. The valves are available for flows of 30 to 150 l/min.

The non-return valve is produced in stainless steel AISI 304 to ensure high quality and reliability.

	VCH 30	VCH 60	VCH 120	VCH 150
<b>Flow continuously</b>				
l/min	30	60	120	150
(gpm)	(8)	(16)	(32)	(40)
<b>Max pressure</b>				
bar	300	300	300	160
(psi)	(4351)	(4351)	(4351)	(2321)
<b>Opening pressure</b>				
bar	0.5	0.3	0.5	0.5
(psi)	(7.3)	(4.4)	(7.3)	(7.3)
<b>Pressure loss at max flow</b>				
bar	2.5	2.5	2.5	2.5
(psi)	(36.3)	(36.3)	(36.3)	(36.3)

The VRH valves

## Reliable valves for pressure relief



The relief valve is used to protect the components of a system against overload as a result of a pressure peak. Furthermore, the valve is designed to control the system pressure by draining off the surplus water from the pressure side.

All VRH valves are corrosion resistant, easy to clean and have a built-in dampening chamber for stable pressure control.

	VRH 5	VRH 30	VRH 60	VRH 120
<b>Flow</b>				
l/min	5	30	60	120
(gpm)	(1.3)	(8)	(16)	(32)
<b>Max pressure</b>				
bar	30-120	10-210	25-140	25-140
(psi)	(435-1740)	(145-3046)	(363-2031)	(363-2031)
<b>Temperature</b>				
°C	50	50	50	50
(°F)	(122)	(122)	(122)	(122)





## Reliable firefighting with Danfoss

Danfoss High Pressure Pumps is a fast-growing division of the Danfoss Group that is committed to engineering sustainable solutions to help shape the world of tomorrow.

We have pioneered the development of axial piston pump technology to bring all the advantages of positive displacement pumps to high-pressure applications like reverse osmosis, cleaning, humidification, gas turbine inlet air cooling and firefighting.

To support professionals in the optimization of firefighting, Danfoss offers a wide range of high-pressure pumps and valves to the firefighting industry.

As one of the largest and leading companies in the business, our products are engineered to offer you world-class reliability and efficiency – all to assist you in achieving your business goals and in making a positive global impact.

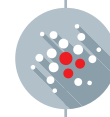
### Do you want to know more?

Visit [hpp.danfoss.com](http://hpp.danfoss.com) to learn more about Danfoss high-pressure pumps and valves.

### Danfoss High Pressure Pumps



Firefighting



Humidification



Cleaning



Gas turbines



Reverse Osmosis