

ENGINEERING  
TOMORROW

*Danfoss*

High Pressure Pumps | Humidification

# High-pressure pumps and valves set new standards within humidity and air temperature controls

**100%**

uptime is a must

Reliability and low maintenance play a major role

[hpp.danfoss.com](http://hpp.danfoss.com)

# High-pressure water mist

## The cost-efficient path to good indoor climate and significant energy savings

Controlling indoor humidity and temperature is critical to human health and well-being. At the same time, humidification plays an important role in many manufacturing processes, among others to control electrostatic charges and to suppress dust; and more

generally, to ensure consistent humidity and temperature in production and storage areas.

In a world with a growing focus on environmental issues, high-pressure water mist has turned into one of the most

cost-efficient ways to achieve a good indoor climate in residential, commercial and industrial environments. The water mist technology is rapidly gaining ground as a highly reliable and extremely energy efficient solution compared to traditional cooling and humidification technologies.

### Increase your bottom-line with Danfoss



#### Whatever your application, we can offer the optimum water mist solutions:

- **Industrial** - to avoid electrostatic charges, suppress dust and maintain accurate temperature and humidity control
- **Food retail** - to keep fruit and vegetables cool and fresh
- **Air conditioning** - for perfect indoor climate
- **Nurseries and greenhouses** - temperature and humidity control to optimize production

### Choosing the right high-pressure pump

The high-pressure pump is at the heart of the misting solution. What you need is a high-performing, oil free pump with fewer parts and long service intervals to keep the operation and maintenance costs at a minimum.

For more than 20 years, Danfoss has pioneered the development of axial piston pumps for demanding applications such as water mist humidification. Today, Danfoss is a world leader in high-pressure, oil-free pump

technologies bringing all the benefits of positive displacement pumps to water mist, humidification, and adiabatic cooling applications.

The axial piston pumps deliver outstanding reliability due to fewer moving parts and less maintenance. The pumps are oil free and run at least 8,000 hours before service. With up to 95 % volumetric efficiency, Danfoss PAHT pumps drastically reduce energy bills and lower CO2 emissions.

The low pulsation rate of the pumps eliminates the need for pulsation dampeners, reducing the number of components and the service required. The PAHT pumps offer the best power-to-footprint ratio on the market, allowing flexible configuration when space is a limit.

Danfoss also delivers the high-pressure valves for water mist applications – designed in high-quality materials for optimum durability.



## What's in it for you?

- Best in class reliability
- High energy efficiency, low CO2 emissions
- Compact pump design
- Long service intervals enable low operational costs
- Oil-free application
- Most durable materials used: stainless steel and carbon re-enforced PEEK
- Market leading Total Cost of Ownership (TCO)

# The Danfoss solution

## PAHT high-pressure pumps, VDH / VDHT solenoid and VRH pressure relief valves

### PAHT high-pressure pumps for ultra pure water applications

The PAHT pump range adheres to stringent hygiene requirements and is certified according to ISO 9001 and

ISO 14001. ATEX certification and API certification are available on request.

Pump type	Flow l/min [gpm]	Pressure barg [psig]
PAHT 2-6.3	0.7-18 [0.2-4.8]	30-100 [435-1,450]
PAHT 10-12.5	7.6-27.7 [2-7.2]	30-140 [435-2,031]
PAHT 20-32	16.9-73.5 [4.5-19.4]	30-160 [435-2,321]
PAHT 50-90	43.7-149.6 [11.5-39.5]	30-160 [435-2,321]
PAHT 256-308	89.6-354.2 [23.7-93.6]	30-120 [435-1,740]



### High-pressure valves for use in humidification and adiabatic cooling applications

The comprehensive range of stainless steel valves is the perfect accessory for your high-pressure system. The valves are dirt-tolerant, corrosion-

proof and easy to clean. Highly reliable, they withstand high temperatures as well as high coil density. Enclosure IP 67 [NEMA 4X].

Valve type	Flow l/min [gpm]	Pressure barg [psig]
<b>2/2-way solenoid valves</b>		
VDH 2E 1/4"	0-5 [0-0.7]	0-100 [0-1,450]
VDHT 1/4" E	0-15 [0-4]	0.3-100 [4.3-1,450]
VDHT 3/8 - 1/2"	1-60 [0.3-16]	3.5-210 [51-3,046]
VDHT 3/4 - 1"	1-150 [0.3-40]	3.5-210 [51-3,046]
<b>3/2-way solenoid valves</b>		
VDHT 2E	0-2 [0-0.5]	0-80 [0-1,160]
VDHT 15E	1-15 [0.3-4.0]	0-140 [0-2,030]
<b>Pressure-relief valves</b>		
VRH 5	5 [1.3]	25-100 [362-1,450]
VRH 30	30 [7.9]	10-210 [145-3,045]
VRH 60	60 [15.8]	25-140 [362-2,030]
VRH 120	120 [31.7]	25-140 [362-2,030]



**merlin®**  
SUPERIOR HUMIDIFICATION TECHNOLOGIES

"We have been using Danfoss PAHT pumps for more than 15 years. Of course, self-lubricating pumps are crucial for many of our applications, since there is no zero risk of oil contamination. But they are also far more energy efficient than any other pump, and so reliable, that we are confident in sending them all over the world."  
**Johann Reisinger**

**condair**

"We choose PAHT pumps for their cleanliness, but in a data center where 100% uptime is a must, reliability and low maintenance play a major role as well. We know how these pumps are made and how they perform; after all, Condair's engineers worked closely with Danfoss's to design them to our specifications."  
**Kasper Gissel**

**AE VAN DER ENDE GROEP**

"Since we know Danfoss PAHT pumps from many other projects - and we had tested the entire misting unit here prior to shipment and installation - we are confident the the Danfoss pumps will perform according to our expectations. Commissioning of the system went off without a hitch, and the pumps have performed perfectly thus far."  
**Paul van den Bos**



## Here today. Here tomorrow

Danfoss is a leading global player within the development and production of mechanical and electronic products and controls.

Since 1933, our extensive know-how has made modern life easier and we continue to break new ground in our core business areas.

Every day, more than 250,000 items are produced at 63 factories in 19 countries.

Impressive as these figures are, we are most proud of the way our dedicated employees apply the high-quality components in customer solutions, adding value to the end product.

Building strong partnerships is of great importance to us, because it is purely by understanding our customers' needs that we can meet the expectations of tomorrow.

Danfoss High Pressure Pumps brings decades of hydraulic experience to the design and manufacture of energy-saving pumps.

The Division designs and markets a broad range of high-performance pumps, including the groundbreaking PAHT pumps for ultra-pure water, as well as dedicated solutions for reverse osmosis and oil and gas applications.

### **Danfoss A/S, High Pressure Pumps**

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