



# Fire Protection of Data Centres

With SEM-SAFE® High-Pressure Water Mist System

# Danfoss Semco A/S

Total Solution Provider of Certified Fixed Fire Fighting Systems



Need a fire fighting system that:

- Allows you to keep your data centre running while suppressing a fire?
- Provides instant cooling in the fire zone?
- Allows you to keep ventilation running?
- Has no need for shutting fire dampers?
- Permits you to keep doors to protected space open?
- Doesn't harm people?

**Then SEM-SAFE® is your solution!**



# SEM-SAFE®

## For data centres



### SEM-SAFE® in brief

SEM-SAFE® is a high-pressure water mist fire fighting system that uses micro droplets released through nozzles into protected areas. It comprises a high-pressure modular pump unit, section valves, piping and water mist nozzles.

The system is safe, efficient and environmentally friendly. With small pipe dimensions, large coverage, minimal water consumption, a compact pump unit and simple design, SEM-SAFE® high-pressure water mist is the perfect choice to protect data centres against fire, with reliability and cost-saving in mind.



### Fire protection of data centres

Normally a double knock pre-action system is used for protecting data centres against fires. This provides you with added safety for your data centre in the unlikely event of accidental release. The piping system is dry and nozzles are closed. When a fire is detected and confirmed by the fire alarm system, the section valve of the SEM-SAFE® system opens and water flows into the actual section pipes. Only nozzles with bursted bulbs are activated. This means that only the areas affected by fire will be actively sprayed.

#### Minimal downtime

Due to the minimal water damage to surrounding equipment and the environment, minimal downtime is achieved. Furthermore you can keep your data centre running while extinguishing the fire.

#### Safety

The system can be discharged immediately upon detection of a fire – without any threat to human safety.

#### Scalable

The modular design of the SEM-SAFE® system makes it easy to extend to cover more sections as your data centre gradually expands.

#### Simplicity

No need to shut off ventilation before releasing the water mist system.

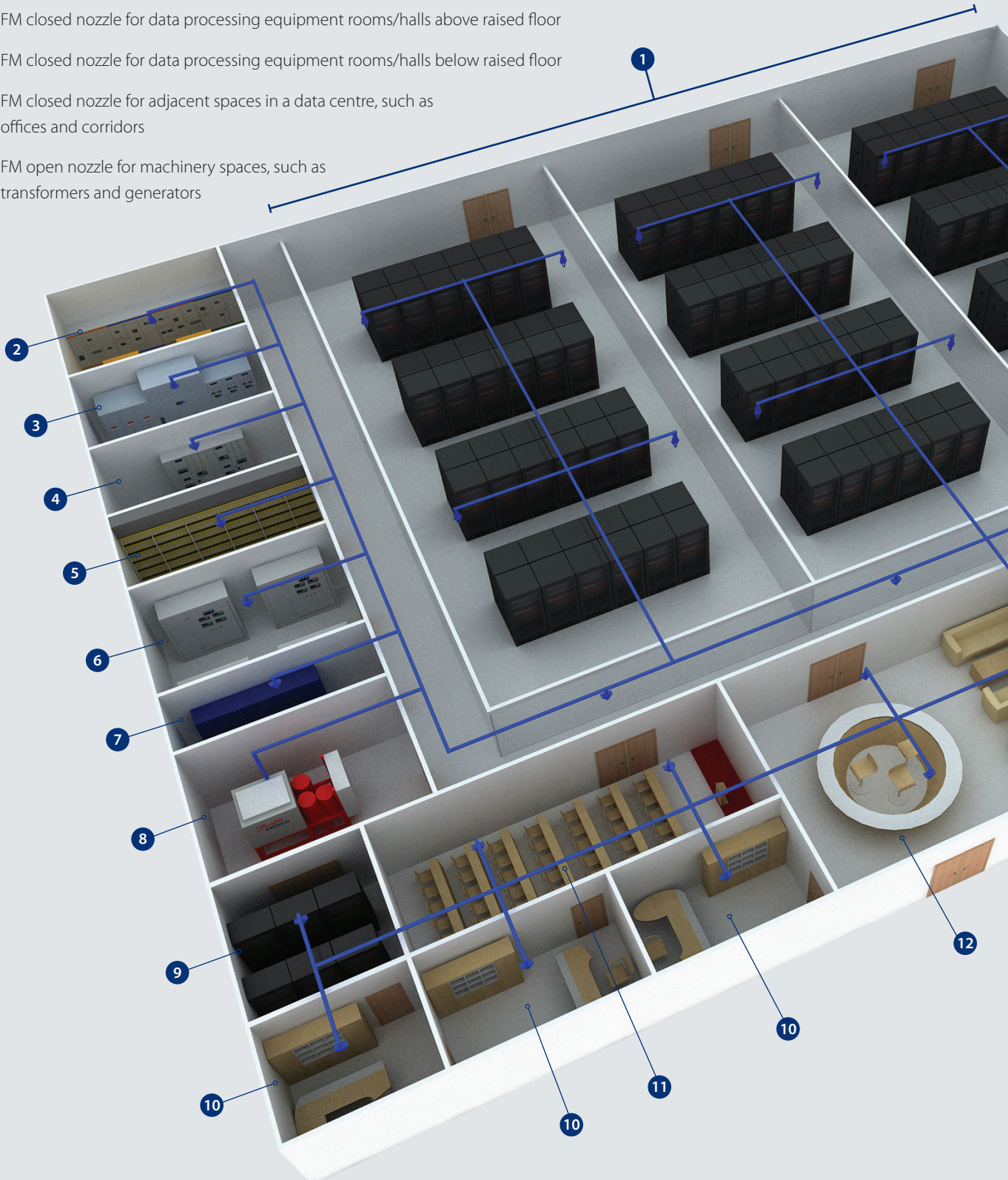
#### Reliability

Danfoss Semco continues to invest in new approvals as well as in R&D to ensure the most efficient and reliable system performance.

## One FM tested system to protect all areas in the data c

Danfoss Semco has a complete portfolio of FM tested nozzles to protect any area in the data centre:

- FM closed nozzle for data processing equipment rooms/halls above raised floor
- FM closed nozzle for data processing equipment rooms/halls below raised floor
- FM closed nozzle for adjacent spaces in a data centre, such as offices and corridors
- FM open nozzle for machinery spaces, such as transformers and generators

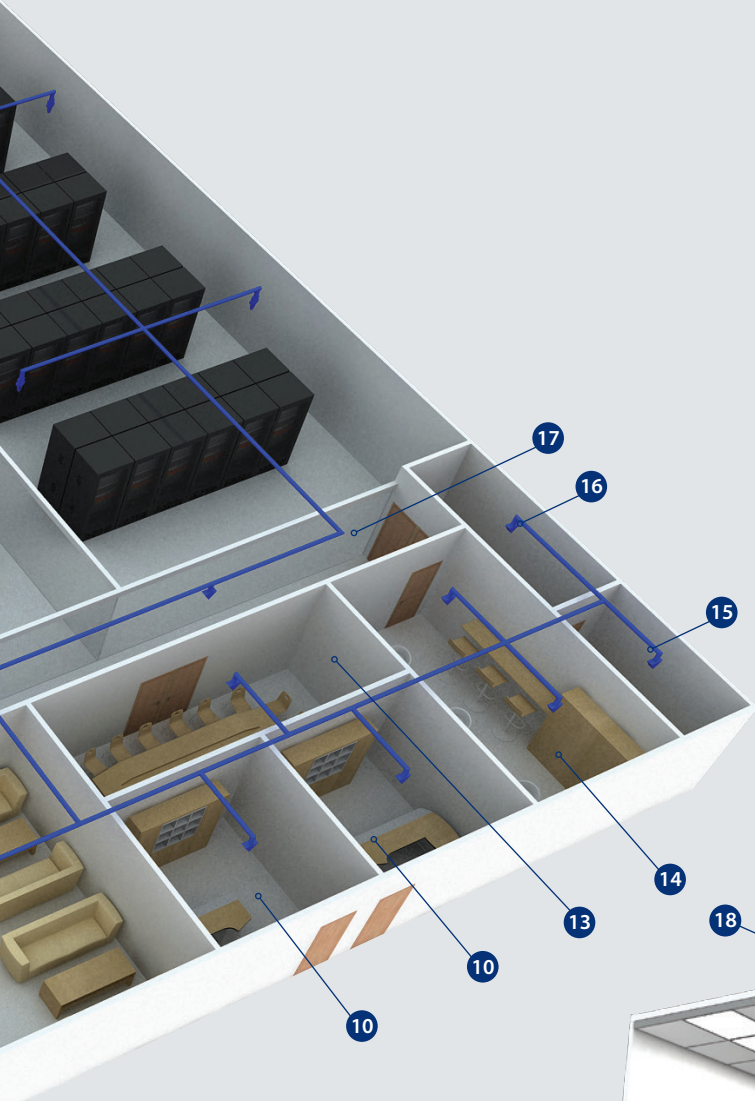




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Danfoss Semco provides fire fighting solutions for areas such as:

- 1 DATA HALL
- 2 TRANSFORMER ROOM
- 3 GENERATOR SPACE
- 4 SWITCHGEAR ROOM
- 5 BATTERY ROOM
- 6 UPS ROOM
- 7 TECHNICAL ROOM
- 8 WATER MIST PUMP ROOM
- 9 DATA CENTRE ROOM
- 10 OFFICES
- 11 AUDITORIUM
- 12 RECEPTION AREA
- 13 CONFERENCE ROOM
- 14 CANTEEN
- 15 KITCHEN
- 16 STORAGE ROOM
- 17 CORRIDOR
- 18 ABOVE FLOOR APPLICATION
- 19 BELOW FLOOR APPLICATION



*Cross section – a zoom on a part of the data hall*



# SEM-SAFE® high-pressure water mist system



## How SEM-SAFE® works

When water is forced through nozzles at high-pressure, a fine mist is formed that has a two-fold extinguishing effect – it rapidly cools down the fire plume and simultaneously starves the fire of oxygen.



## Benefits of SEM-SAFE® high-pressure water mist

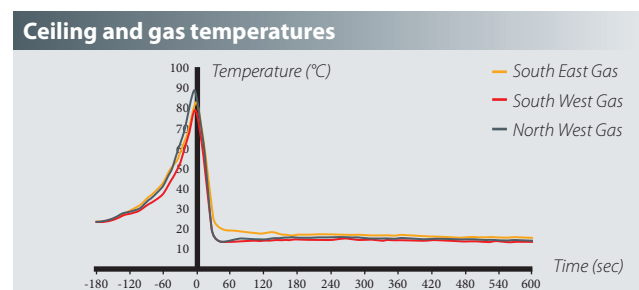
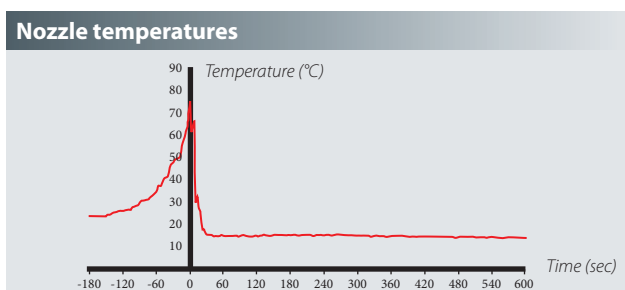
### Tackles fire swiftly and efficiently

- Can be instantly activated without the need to seal off and/or evacuate the area
- Immediately cools the fire, preventing fire growth
- Water mist is documented to be harmless to electrical installations (IP23), which enables you to keep your data centre running even while fighting a fire
- With 30% fewer components compared to most competing systems, the SEM-SAFE® system is lighter and more compact. This allows for easier installation, simplified maintenance and valuable space saving
- No over-pressurisation of the fire-affected area when the SEM-SAFE® system is activated
- Only one SEM-SAFE® water mist unit needed to cover all areas of your entire data centre

### Money-saving solution

- With fewer nozzles required thanks to optimized spacing and the need for only one pump unit for all applications, installation cost and time as well as required service interventions are considerably reduced
- The SEM-SAFE® system is ideal for both new building projects and for installation in existing facilities
- Our high-pressure pumps are water-lubricated and hence virtually maintenance-free
- The small water droplets evaporate immediately during discharge. The result is minimal water damage to surrounding equipment and the environment, reducing operational downtime to a minimum

## Superior cooling properties of the SEM-SAFE® high-pressure water mist system



# Proven experience



## Extensive reference list

For more than 20 years, Danfoss Semco has worked successfully with high-pressure water mist for commercial and industrial applications. Mission-critical fire protection for data centres has been implemented for numerous companies all over the world.

### Selected references

- *Equinix*, Netherlands
- *Equinix (former Digital Realty Trust)*, France
- *Digital Realty Trust*, UK
- *Equinix (former Telecity) Condorcet*, France
- *Equinix (former Telecity)*, Germany
- *Yandex*, Finland

## In-house design

We have the experience and technological knowledge to provide you with the optimal fire fighting solution based on a fire risk analysis made for your data centre.

## Tested and approved

The design of the SEM-SAFE® high-pressure water mist system is based on full scale fire tests. For industrial and commercial applications, approvals are obtained by testing according to specifications from, for example, the European guideline CEN/TS 14972 and approvals from VdS, FM and DIFT.

In addition to being approved for 5 meters ceiling height for temperature of 57°C and 68°C, the Danfoss Semco SEM-SAFE® high-pressure water mist nozzle has successfully passed fire test for below floor application for both single and double-tier cable trays. Also, we are currently (year=2017) the only fire fighting supplier in the market that can protect double-tier cable trays.

Results from test demonstrate the excellent performance of the SEM-SAFE® high-pressure water mist system in comparison with competitors:

- up to 20% less water per nozzle
- significantly less water demand in design area
- only 2 nozzles activated during tests for above floor application

*For data centres in particular, we have carried out our "Above floor and below floor" tests according to FM 5560*



# 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 the world's largest low-pressure CO<sub>2</sub> 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 for a wide range of commercial and industrial applications, including remarkable projects such as:

- *Metro line* in Shanghai, the fastest-growing rapid transit system in the world
- *Equinix* in the Netherlands, a worldwide renowned data centre
- *Alston* in Denmark, a 28,400 m<sup>2</sup> building housing a university, concert hall and a research park
- *Danish University Hospital (DNU)* in Denmark, a 400,000 m<sup>2</sup> super-hospital complex and one of the largest water mist for fire fighting installations in Denmark
- *AB6* in Denmark, a unique office block in the heart of Copenhagen
- *Heinrich-Hertz-Institute* in Germany, a high-rise building for leading-edge research and development of IT



*Equinix Data Centre in the Netherlands, protected with SEM-SAFE® high-pressure water mist system*