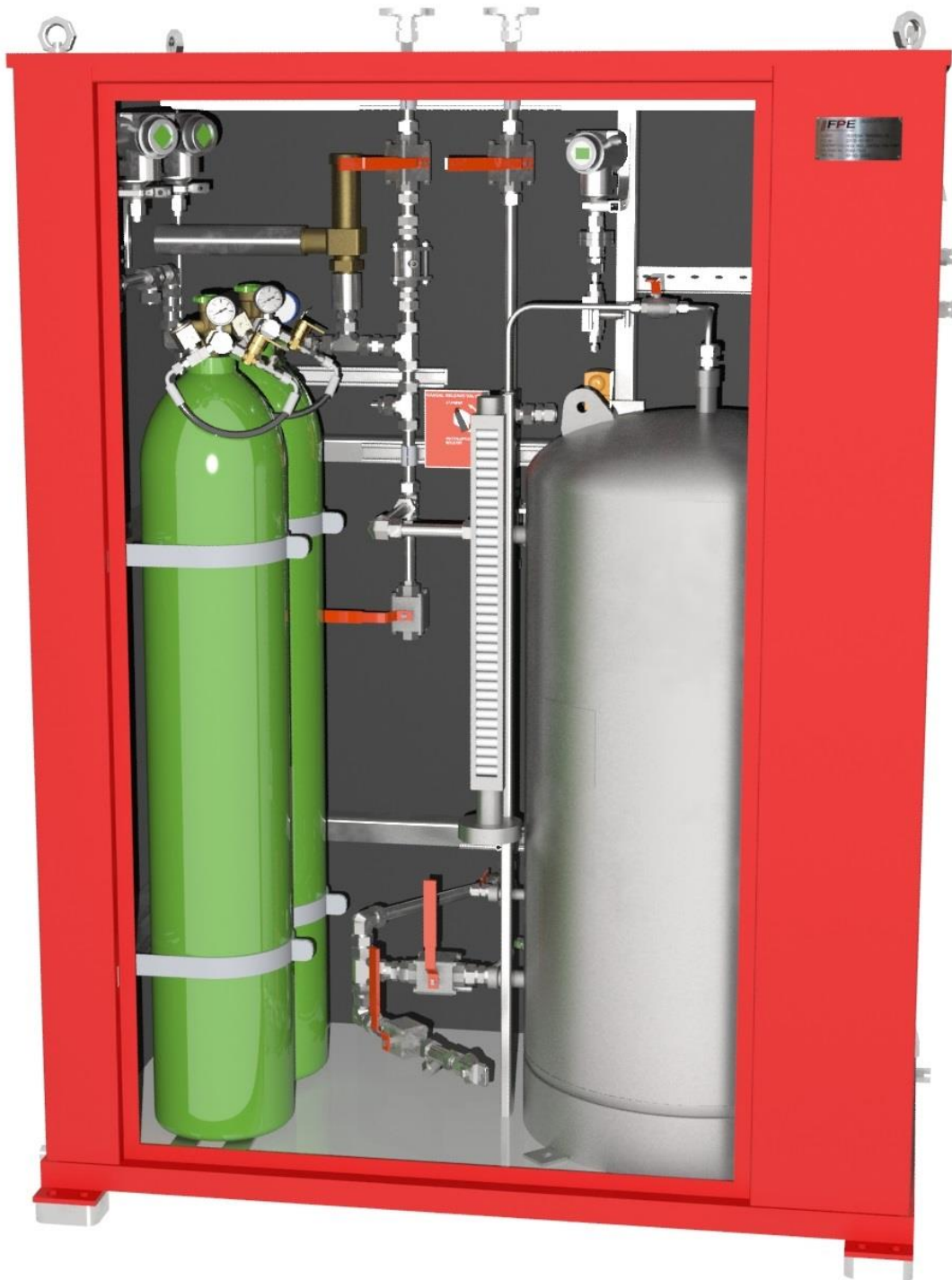


Fine Water Spray Systems – Single or Multi Zone – FWS 01



Twin fluid low pressure fine water spray system

FPE AS
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QA Certificate no: 2001-OSL-AQ-7140



Fine Water Spray Systems – Single or Multi Zone – FWS 01

DESCRIPTION

These systems are twin fluid / low pressure type of Fine Water Spray system designed in accordance with NFPA 750 "Standard on Water Mist Fire Protection Systems" as an Engineered System.

The system design is based on a comprehensive system test program at the Fire Laboratory at SINTEF, which is an institution under the Technical University in Trondheim, Norway.

The design criteria's for our Fine Water Spray system is based on the results from these tests.

FPE's Fine Water Spray systems can be tailored to meet various fire protection applications, in offshore, and oil and gas industry, such as:

- Gas turbine enclosures
- Diesel engines / diesel generators
- Machine enclosures
- Process plant areas (gaseous and liquid flammable materials)
- Process pumps/mixers

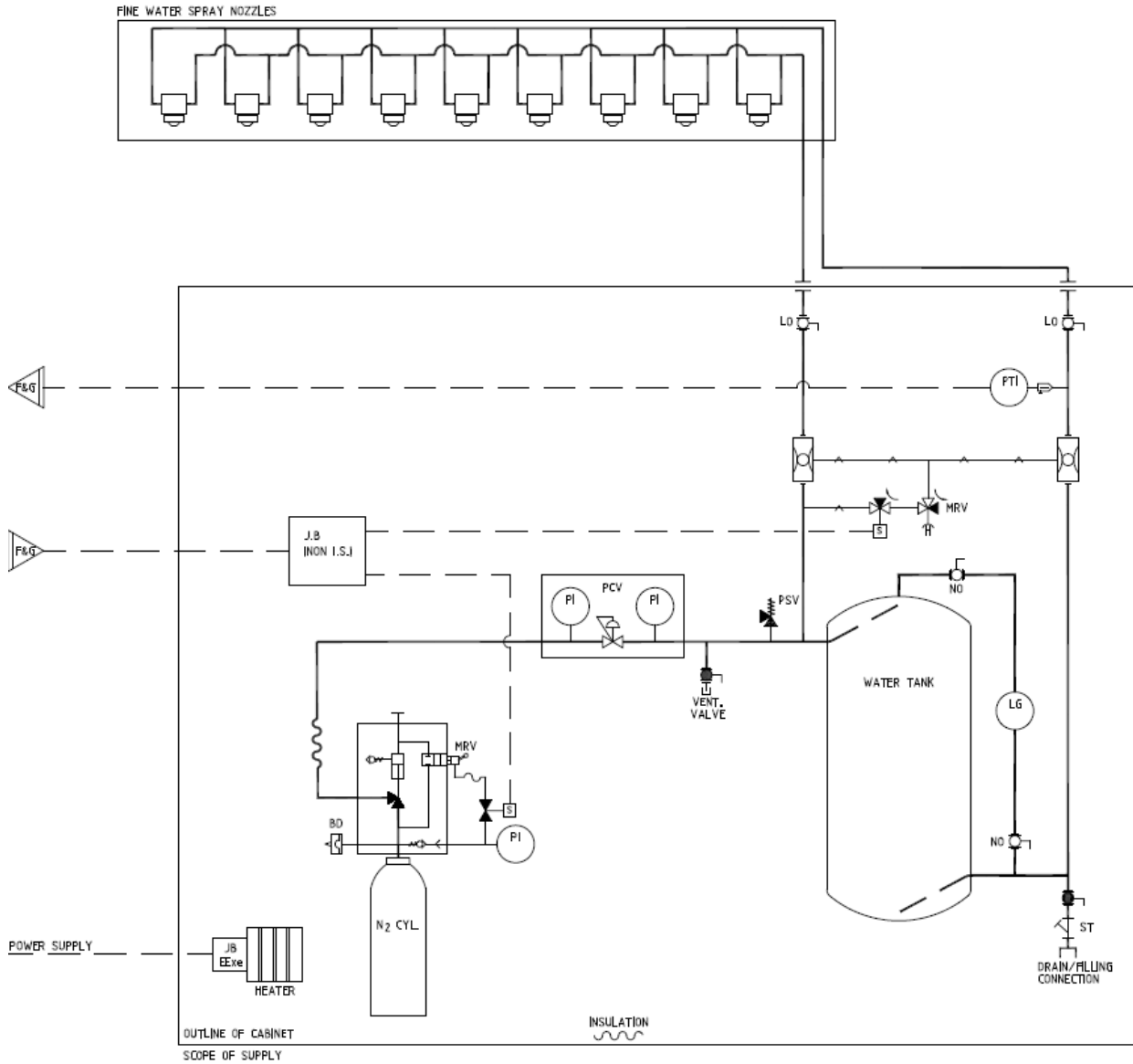
Since 1992 FPE's a large number of Fine Water Spray systems have been delivered to the Norwegian Offshore Industry, British Offshore Industry, and other oil and gas installations around the world.

These Fine water spray systems can be designed as single zone, or multi-zone protection systems. The water tank, nitrogen battery, piping size and valves, will be sized for the largest single zone.

See system logic drawings below.

Fine Water Spray Systems – Single or Multi Zone – FWS 01

System Logic Drawing Single zone system



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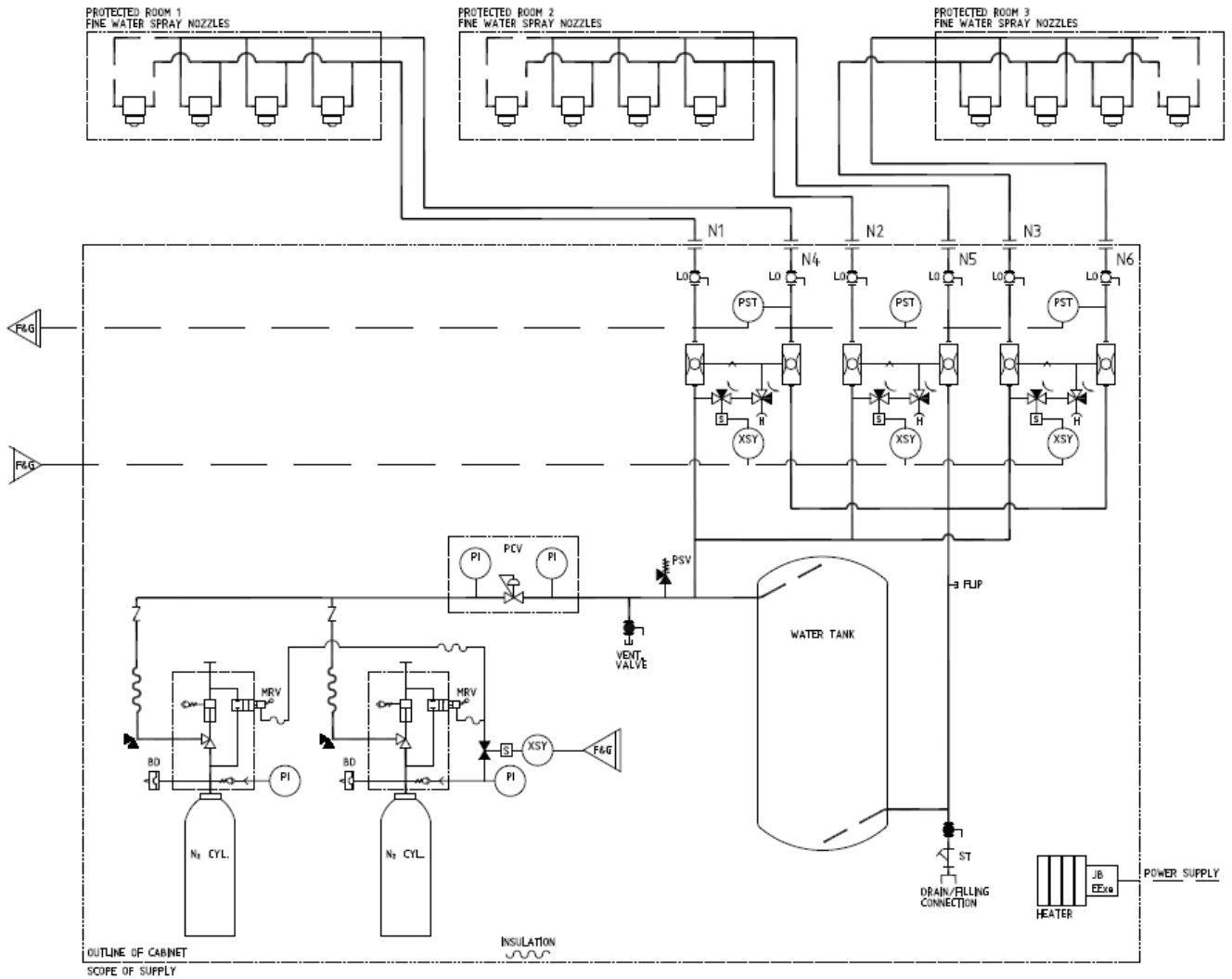
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Fine Water Spray Systems – Single or Multi Zone – FWS 01

System Logic Drawing Multizone system



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Fine Water Spray Systems – Single or Multi Zone – FWS 01

PRODUCT DESCRIPTION:

Standard material

Cabinet:	SST AISI 316, painted externally
Tank:	SST AISI 316
Piping:	SST AISI 316
Instrumentation:	SST AISI 316
Pressure control valve:	Brass
Pressure safety valve:	Gunmetal

Max. working pressure

Cylinder pressure:	200 barg
Tank pressure:	10 barg
Nozzle pressure:	5 Bar nominal

Type	Cabinet Length (mm)	Cabinet Height (mm)	Cabinet Depth (mm)	Dry Weight (kg)
200 ltr.	1600	2070	900	Approx 500
400 ltr.	1600	2070	900	Approx 800
600 ltr.	1950	2200	1000	Approx 1000

* Weight includes charged N2 cylinders.

1 Design philosophy

These Fine Water Spray Systems are designed as Total Flooding Systems according to guidelines from comprehensive testing carried out at the Norwegian Fire laboratory under SINTEF in Trondheim.

A total flooding system will be designed with a water density of min. 0,67 lit / m³ room volume pr. shot. This water quantity will be sufficient to extinguish a small fire, which is the most challenging scenario for a Fine Water Spray system. A large fire will be extinguished by 6 - 9 times less water than a small fire in the same room.

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Fine Water Spray Systems – Single or Multi Zone – FWS 01

A standard FPE Fine Water Spray system will be designed with:

- Initial shot of 0,67 lit / m³ room volume discharged over a period of 2 minutes
- 1 minute pause.
- Second shot of 0,67 lit / m³ room volume discharged over a period of 2 minutes.

One Fine Water Spray skid may serve several rooms; directional valves will then be installed to allow control of the Fine Water Spray to the relevant room.

2 Technical description

FPE is manufacturing a twin fluid low pressure Fine Water Spray (FWS) system. The Fine Water Spray is produced in each separate nozzle; the nozzle relies on the internal atomisation of water by nitrogen to deliver spray of fine, controlled-size droplets.

FWS works by differing combinations of heat absorption, steam generation, oxygen reduction in the base of the flames, flame destabilisation, liquid and surface cooling. It is the interaction of the heat from the fire, the water droplets and the ventilation which create the conditions under which the fires will be extinguished.

The FPE Fine Water Spray system uses nozzles with large orifices, and no moving parts, which gives improved reliability and minimal maintenance requirements. Our system operates at low pressure (nozzle pressure of approx. 5 barg), and produces droplets in the range of 80 to 200 microns.

Fine Water Spray has several advantages when compared with other agents. The advantages are:

- it is environmentally benign
- it is safe for personnel
- it is cheap to run
- it is easy to maintain
- it is reliable
- it is clean
- it will cause very limited damage

A standard FPE Fine Water Spray system will incorporate the following main components:

- Skid, made of stainless steel AISI 316L
- Water pressure vessel w/filling arrangement
- Level gauge, for water pressure vessel

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Fine Water Spray Systems – Single or Multi Zone – FWS 01

- N2 cylinder w/accessories
- Control valves
- Valves (other)
- Instrumentation / Electrical
- Piping / fittings
- Nozzles



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