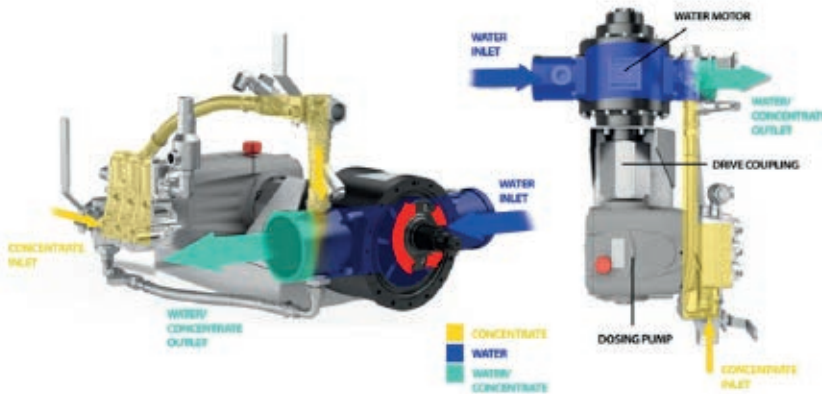


WATER DRIVEN PUMP PROPORTIONER

A VERSATILE DOSING SYSTEM FOR MANY DIFFERENT APPLICATIONS AND CONCENTRATE VISCOSITIES



FUNCTION PRINCIPLE

A water driven pump system is a mechanical way of dosing firefighting additives into the water, without the need of external power, as electricity or diesel driven engines. Furthermore, the water driven pump system does not need any pressure balancing or calibration.

FIREMIKS is such a system and it consists of two volumetric parts, one water motor and one concentrate pump, connected to each other through a direct drive coupling (some models equipped with a belt drive). Extinguishing water drives the volumetric water motor, which in its turn drives the positive displacement concentrate pump that doses the correct amount of foam concentrate in the extinguishing water exiting the water motor.. With this solution the water motor acts like a combined flow meter/drive for the foam pump, so automatically achieving the correct ratio between water motor and foam pump (= dosing rate within approved tolerances) without use of any external flow meters, valve regulating systems or orifices.

A water motor may either be a positive displacement (volumetric) type motor or an open turbine. The difference between these two options is that, with a turbine as drive, the flow and pressure range will be limited as a turbine motor is only partly volumetric. FIREMIKS is on the other hand a fully volumetric system with a positive displacement water motor instead of a turbine. The water motor rotor has 8-10 protruding vanes. This

multi-vane water motor design gives an early volumetric function without using moving elastomer sealings, making it possible to maintain the mathematical ratio (=correct dosing rate) between water motor and concentrate pump in a wide pressure and flow range.

THE IMPORTANCE OF KNOWING THE VISCOSITY OF CONCENTRATE TO CHOOSE THE RIGHT TYPE OF FOAM PUMP.

Today the different brand and types of foam concentrate comes in a wide range of viscosities, especially the new Fluorine free foams can be highly viscous. To be able to select an appropriate proportioner one needs to know the viscosity of the concentrate and if it is Newtonian or non-Newtonian.

Water motor driven foam pump systems equipped with Gear pump are particularly suited for use in systems with higher flow rates, such as deluge systems and large fire monitors. Gear pumps are also very suited for high viscosity concentrates. We have with excellent result tested one of our Gear pumps models with a Fluorine-free foam with 8,040 cP (Brookfield Viscometer Spindle #4 at 30 rpm). The reason Gear pumps work well with these very high viscous concentrates is that they are equipped with counter rotating gears that creates an even flow that does not agitate the concentrate, furthermore the gears seal even better with high viscosity additives. Water motor driven foam pump systems equipped with Piston (plunger) pumps

are particularly suited for use in systems with low start flows, for example sprinkler systems. Piston pumps are also very suited for low and medium viscosity concentrates. Important to know is that Piston pumps have a limit upwards to high viscosity concentrates, normally around 4,000-4,500 cP (Brookfield Viscometer Spindle #4 at 30 rpm) due to the Piston pump reciprocating principle; for each revolution, the plunger sucks concentrate and then presses it out and the concentrate goes from zero to full speed twice per revolution. If the static viscosity is too high with non-Newtonian concentrates, the concentrate will not flow smoothly and therefore the correct dosing rate might not be achieved.



FIREMIKS with Piston pump (-PP)



FIREMIKS with Gear pump (-GP)

FIREMIKS proportioners are offered with both types of pumps, Gear and Piston (plunger). Among several important factors, by them flow and pressure, we always collect info of the concentrate, incl. viscosity, before we propose which type of pump we will offer our unit with. Important for all systems is that one should ensure that diameter on the foam supply piping is big enough for the concentrate delivery and to avoid longer

concentrate lines. Recommendations are specified in our Data sheet for each model. We are always available to guide you with more specific recommendations for your specific project.

SUITABLE FOR MANY DIFFERENT APPLICATIONS

FIREMIKS can be installed anywhere between a water source (hydrant or main water pump) and one or several nozzle(s), e.g. monitors, spray pipes, foam chambers, sprinkler heads, low-ex, medium-ex or high-ex nozzles. No need of a pressure tank; only connects it to an atmospheric foam tank which can be refilled, or replaced also under operation if necessary, using a simple valve switch. Because of this and without the need of an external energy source to power FIREMIKS, the resulting freedom of placement also makes it possible to design for the fastest possible reaction time – the closer to the discharge, the sooner the foam reaches the hazard.

Examples of Industrial Applications: Tank farms, Petrochemical industry, Harbour Jetties, Pump rooms, Warehouses, Waste incineration, Tunnel protection, Heli-deck protection, etc.



FM-approved FIREMIKS 1800-3-PP-F for Heli-deck protection at Hospital - Germany



Foam trailer with FIREMIKS 2400-1-PP-F, Dow Chemical - Netherlands

Others example of applications are Fire trucks, Foam trailers and Marine-Offshore.

Both pump types can be supplied in Mobile versions. With a Mobile unit (or installed

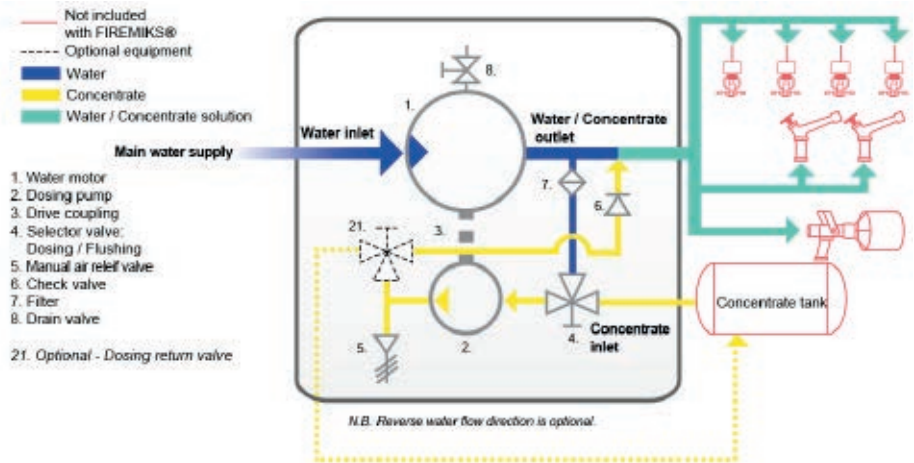
FOAM FEATURE



in a Fire truck) a fire brigade can lay out a system consisting of one FIREMIKS proportioner and e.g. three, four or five nozzles working independently of each other, at different heights and lengths from main water pump. Firefighters are free to open or close their nozzle, even in rapid succession, "pulsing" as there is no delay in reaching the correct dosing FIREMIKS is available in different flow sizes, from max capacity of 180 lpm up to 10,000 lpm, (Installed in parallel on a skid we offer up to 20,000 lpm) and with fixed dosing alternatives of 0,5%, 1%, 2%, 3%, and selectable 0,3-0,6-1%, 1-2-3% or 0,5%-1%-3%. Other dosing options are available on request.

TESTING WITHOUT CONSUMING THE CONCENTRATE

With the option Dosing return valve (DRV) - see point 21. below on Flow chart - one can test the function of the unit without consuming the concentrate. This allows for an easy, quick and regular testing of the unit's functional capacity and for a possible checking of the admixture rate with an added flow meter and pressure valve, without generating the concentrate solution. This may give a substantial saving of costs during many years. Apart from no need of concentrate there is no cost for cleaning up and destruction of the solution after the test, which is an important environmental benefit if choosing this option.

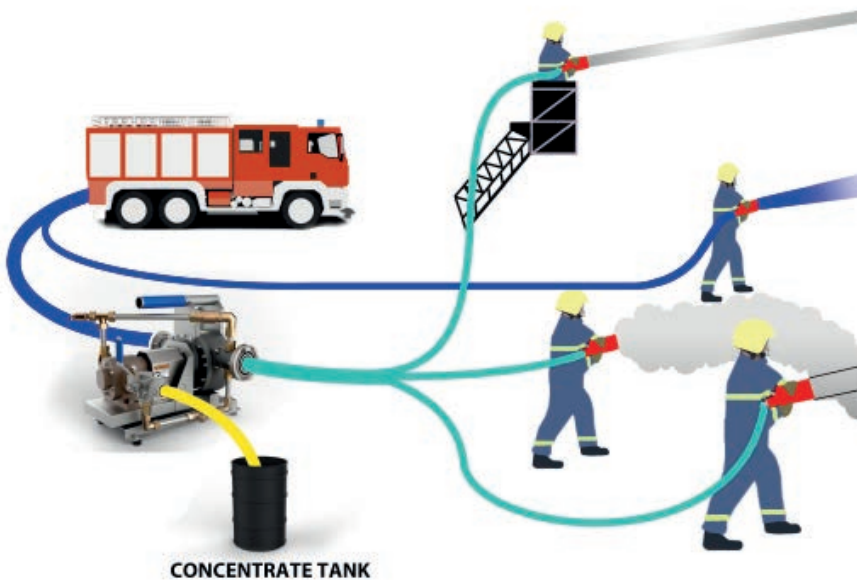
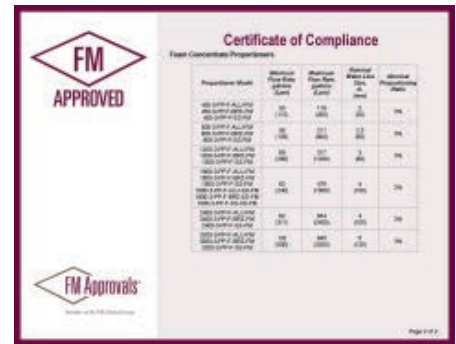


Above a flow chart showing Option with Dosing return valve.

One example: an 8,000 lpm unit with 3% dosing rate. 4 tests/year at max speed for one minute. $8,000 \text{ lpm} \times 3\% = 240 \text{ litre of foam concentrate} \times 4 \text{ times} = 960 \text{ litre}$ at an average cost of 3 euro/lit = 2,880 Euro.- in saved cost/year.

SELECTED LINE OF FIREMIKS FM-APPROVED

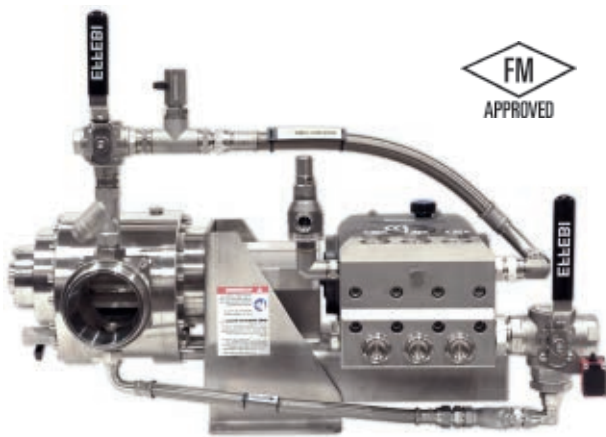
A selected line of six sizes with 3% dosing rate is FM-approved, incl. different water motor material: Hard anodized and PTFE-coated ALU, Ni-Al Bronze or Stainless steel 316 L.



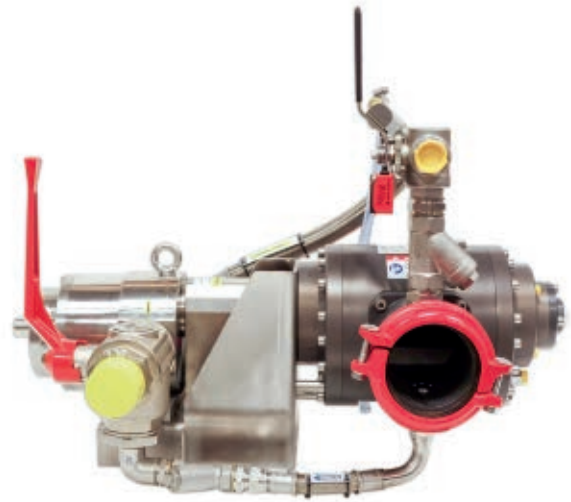
Flow chart showing Option with Dosing return valve.

FIREMIKS meets applicable parts of NFPA 11 and NFPA 1901 and production is made according to European directive 2006/42/EC = CE marked. We offer also Third-party inspection certificates from for ex. DNV-GL, towards NFPA 11 and/or EN 13565 for the whole range. For more information, go to www.firemiks.com

WATER DRIVEN PUMP PROPORTIONERS FOR FIRE FIGHTING



FIREMIKS equipped with Piston pump, suitable for low and medium viscosity concentrates and large flow range. Selected range with FM-approval Class 5130 inkl. water motors in Ni-Al Bronze and SS 316L.



FIREMIKS equipped with SS 316L Gear pump, suitable for high to very high viscosity concentrates and deluge systems.

EASY TO INSTALL

**COMPACT ONE-PIECE
DOSING SYSTEM, EASY TO
INSTALL**

EASY TO USE

**RELIABLE FOAM
PROPORTIONER, DRIVEN BY
THE WATER FLOW ONLY**

EASY TO TEST

**ECONOMICAL AND
ENVIRONMENTALLY
ACCEPTABLE TESTING WITH
A DOSING RETURN VALVE**

www.firemiks.com



INDUSTRIAL



FIRE TRUCKS



TRAILERS



MOBILE



MARINE