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# FIREMIKS<sup>®</sup>, technical advantages –

(aluminium water motor, hard-anodized and PTFE-coated)

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## History

- 1.1. FIREMIKS is a state of the art system based on more than 35 years of experience of developing water motor driven foam pump system. The first system was produced 1979 by Harry Aredal, grand-father of the current owners.

Therefor we name our product ***The Swedish original.***

## Specific technical advantages

- 1.2. Our main specific advantages are described in our brochure, see below copy of page 9:



**THE USER-FRIENDLY DOSING SYSTEM**  
**SPECIFIC ADVANTAGES**

The basic concept of FIREMIKS® is two interconnected volumetric devices; a water motor and a dosing pump. This gives great advantages since this principle creates a practically flow and pressure independent admixture, within the min and max limits for the unit. Importantly, only the water flow is needed to operate the unit, no other additional energy is required.

**9 Specific advantages with FIREMIKS®**

1) The water motor rotor has 8/10 working vanes. This provides a more stable rotation at low rotation speed compared with earlier 4 vane version, i.e. you have an earlier volumetric function of the water motor.

2) FIREMIKS and the water motor with its connections, is constructed and built using a flexible modular system. We can modify - even for a single unit - the water motor size in lpm and/or make the unit in another material, for example bronze, duplex or titanium, based on a special customer request.

3) FIREMIKS can be delivered with almost any type of connections, for example BSP-threads, NPT-threads, Cut groove adaptors, Flanges etc. For the end-user it is therefore easy, for example, to convert a fixed unit into a mobile unit or vice-versa.

4) We can offer both a rugged industrial gear pump for high viscosity extinguishing media and a powerful piston pump for high pressure and low viscosity liquids. Both are made of durable and corrosion resistant materials.

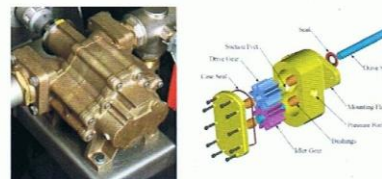
5) An industrial Gear pump is a rugged and reliable solution to achieve the correct admixture within the approved tolerances. The pictures below to the right shows the basic design of a gear pump. Apart from high viscous liquids, it is very suitable for a high-flow system. It can be placed in both vertical and horizontal positions.

6) A piston pump is a pump that suits low starting flows, e.g. sprinkler systems and it gives a very precise dosing, even at high pressures.

7) The water motor is manufactured from standard rolls and bars. Manufactured parts are considered to be stronger than moulded materials, this gives us the flexibility to easily manufacture single units for any specific customer needs.

8) FIREMIKS is designed to be easy to use and understand. Marked arrows clearly show the flow direction of the water, concentrate media and flushing water. Only brief training and handover is required to ensure a safe and secure handling of the FIREMIKS unit.

9) FIREMIKS has, through its precise and accurate interior design of the water motor, a lower noise level than other systems. This is important for a good and safe working environment, it also increases the potential for many years of reliable operation.



## Important factors.

- 1.3. Apart from the advantages described in the previous page we can add the following:
- 1.4. The main working force in a water motor driven foam pump system is the displacement water motor. To make it fully volumetric and tight in a wide flow range there needs to be close contact between vanes and housing of water motor. This volumetric function is one of the two critical factors to achieve the correct dosing rate, the other factor is the pump curve of the dosing pump.
- 1.5. A large part of the development of our FIREMIKS in the last years has been around the function inside the water motor, in order to improve further the function/capacity and to minimize any side-effects.
- 1.6. Lower friction – extended life of vanes.
  - 1.6.1. The whole body is made in solid corrosion resistant aluminum machined to a high smoothness, further strengthened by hard anodizing with a PTFE coating. This makes the water motor more strong against wear on the housing. A smooth and resistant water motor minimize also the wear on the vanes.
  - 1.6.2. Vane material is high grade PET-LF (Low friction) that has very good wear properties.
  - 1.6.3. Different kind but matched materials in body and vane are a recipe that the right part wears – the vanes, which are easy to exchange.
  - 1.6.4. We constantly have improved the internal design of the water motor for better flow, smoother vane transitions, and close tolerances with less slip. This reduces the back and forth movement on the vanes and improves substantially the life of the vanes.
  - 1.6.5. Design of vanes - optimized for the specific rotation - also creates long-life vanes. Furthermore, the strong vane design itself and the fact that we use 8 (or 10, up to 4000 lpm sizes) vanes creates a higher resistance against breakages caused by over-speed and sudden water hammers, as these forces are divided on 3-4 vanes.
- 1.7. Lower noise

The above improvements in point 1.6 also substantially reduces the noise from the water motor and the whole unit runs relatively quiet (60-80 dBA depending on size). This is a benefit by itself but also indicates how well the unit functions for its intended use, especially in the long run. It is also an important factor for good working environment for the personnel.

1.8. Low pressure-drop over unit.

The development of the internal water motor design has also improved the water flow passage through the water motor and by that lowered the pressure-drop and our units have good headroom to fulfill their specification.

1.9. Improved volumetric function on water motor at start up-flow.

1.9.1. The development of internal design described above and the standard function of 8 (or 10) working wings has made our water motor becoming volumetric even earlier and by that giving a more secure start up flow.

1.9.2. Our water motor becomes *fully volumetric* at around 10% of stated max flow, for example 400 at our 4.000 lpm unit.

1.9.3. The fully volumetric and thus smooth function is one of the essential factors for creating a correct admixture and also for avoiding flow oscillations in the piping which can either be caused or amplified by a not fully volumetric water motor.

1.10. Two pump solutions.

Our units equipped with gear pump (-GP) are especially well-suited for medium and high- viscosity admixing fluids (50 cSt and above). They have large foam inlets, smooth continuous operation and no problems with valves or cavitation. For low viscosity concentrates (below 50 cSt) we normally provide plunger pump (-PP) solutions. (See also our "A Guide to choose FIREMIKS" below)

1.11. Lower weight - compact

Our fixed units with gear pump has generally a considerably lower weight and are more compact on larger sizes, compared with similar type of systems from other producers.

1.12. Guide for choosing the most appropriate FIREMIKS-solution.

Please see below Guide on the following pages!

The following list is a guide which will assist you defining your specifications. Please fill in the appropriate answers/comments to the extent possible. If such information is not available, please leave the field blank. Based on the information provided, we will offer the optimum FIREMIKS model for your particular needs.

Unit configuration points	Factors to consider	Answers/Comments
1. Freshwater or saltwater as driving medium of the water motor. Note! Clean water is imperative.	<i>Freshwater:</i> Water motor in hard-anodized aluminium with PTFE coating. <i>Saltwater:</i> Water motor in Bronze.	
2. System flow range	Provide max. and min. flow in litres per minute (lpm). Or provide target flow, e.g deluge system with only one steady flow. State also if it is a dry pipe or wet pipe installation. Note! Parallel installation of several FIREMIKS-units is possible.	
3. Working pressure range	State max. and min. working pressure in bar, or provide target pressure, e.g deluge system, at the inlet of the FIREMIKS. Also please state if the pressure drop over the unit is a crucial factor. In such cases, a larger size of the water motor can be chosen to decrease the pressure drop. (For normal pressure drop please consult corresponding data sheet.)	
4. System pressure	State in bar the maximum system pressure.	
5. Type of concentrate	State type of concentrate, viscosity, Newtonian/Non-Newtonian. If possible please provide the data sheet from the supplier.	
6. Dosing of concentrate	State dosing rate in % and if there is a need for selectable dosing rate. We recommend concentrates with dosing rate of 3% and below. Also state if it is gravity feed or if suction of concentrate is needed. Generally speaking, gravity feed is recommended on Gear pumps units and is a requirement on Piston pump units.	
7. Selection of Gear pump (-GP) or Piston pump (-PP)	<b>From the information above in section 2-6 we can recommend the most suitable type of pump.</b>	

<p>8. Optional – Dosing return valve</p>	<p>The FIREMIKS unit can be supplied with a dosing return valve when there is a need for testing the system without consuming extinguishing media. Return the concentrate back to the extinguishing media tank during a test. This gives 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.</p>	
<p>9. Optional – Installation/ Mobility</p>	<p>Possible options: Vertical installation, different kinds of couplings/flanges, bottom bracket, carrying handle, protective frame, wheels, automatic air relief valve (manual air relief valve is standard), separate suction pipe, hand pulled cart, trailer.</p>	
<p>10. Optional – Spare parts</p>	<p>Packages of Recommended spare parts are available for all models.</p>	
<p>11. Optional – Other</p>	<p>E.g. Reverse flow direction, extra selector valve and/or clap valve for the suction pipe, unit adapted to high ambient temperatures, stainless-steel couplings, water filter to be placed before FIREMIKS, etc.</p>	
<p>12. Documentation – Delivery</p>	<p>Test protocol, CE-certificate. Optional: material specification EN 10204</p>	
<p>13. Documentation – Third party certification</p>	<p>Each unit can be inspected by third parties such as DNV, BV, etc.</p>	