POLARIS

ANGUS FIRE

Polaris 6000

Water powered fire fighting foam induction motor

- Injects foam into high pressure moving water streams
- Reliable operation
- Accurate proportioning over wide range of flows and pressures
- Compatible with all fire fighting foams and potable or sea water
- Fixed or portable versions available

The Angus Fire Polaris foam induction system comprises a water motor coupled directly to a foam pump. The 8-vane water motor (Fig 1) is fitted into the main water supply pipe and is driven by the water pressure. The motor is a fully sealed unit so no water is lost during this process. The rotation speed of the water motor is directly proportional to the water flow rate.

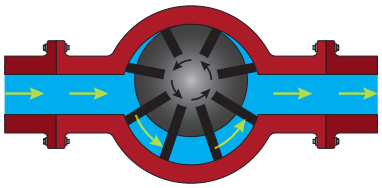

Fig 1: 8-Vane Water Motor

The water motor is coupled via a shaft to either one or two positive displacement foam injection pumps (Fig 2), which draw foam from a storage tank and into the main water pipe downstream of the water motor.

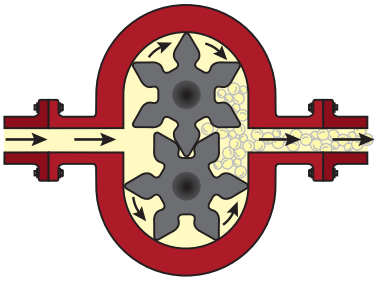

Fig 2: Foam Injection Pump

The water motor speed is directly proportional to the water flow rate, and as the water motor output shaft is connected directly to the foam injection pump(s), the foam induction rate will always be directly related to the water flow over a wide range of flows and pressures.

The energy-efficient design of the 8-vane motor only utlilises the power necessary to drive the foam induction pumps. This minimises the pressure loss in the main water stream.

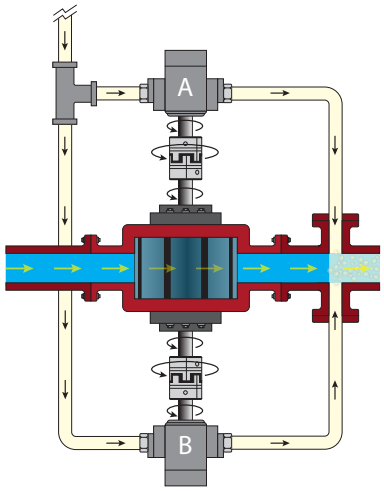

Fig 3: Schematic showing water motor and 2 foam injection pumps

Polaris may use either one foam induction pump 'A' (for single rate induction) whilst dual rate induction models use two foam pumps 'A' and 'B'. One pump is positioned on each end of the rotor shaft (Fig 3). To achieve the lower of the two induction rates, one pump is switched to operate on water only, leaving the other induction pump to supply the foam.

Materials

Water motor body, motor rotor and end plates	Bronze to EN CC491K (LG2)
Copper	85%
Zinc	5%
Lead	5%
Tin	5%
Rotor blades	Polyoxymethylene
End plate seals	Viton "O" rings
Fixings	A4 stainless steel
Frame	SS316 stainless steel
Foam pump body	Bronze
Foam pump fixings	Bronze
Foam pipe work	SS316 stainless steel
Induction rate control and bleed valves	SS316 stainless steel
Bearings	External to waterway, sealed for life, single row ball races

Induction Rate Control

Polaris induction motors are available with either single or dual rate induction. To achieve the required induction rate, Pumps A and B are set as shown below:

	Pump A	Pump B
1% single rate	1%	N/A
3% single rate	3%	N/A
6% single rate	6%	N/A
1%/3% dual rate	1%	2%
3%/6% dual rate	3%	3%

Operation

Maximum water flow rate	6000 l/min (1590 US galls/min)
Minimum water flow rate	1200 l/min* (320 US galls/min)
Maximum operating pressure	12 bar (180 psi)
Factory test pressure	24 bar (360 psi)
Max foam suction height	3m (10 ft)
Operating temperature range	5°C to 50°C (41°F to 122°F)
Water motor connections	150 mm (6") threaded BSP (M) parallel; DIN 150 grooved option
Foam inlet connection (all BSP F)	
1% single rate	2"
3% single rate	2½"
6% single rate	3"
1%/3% dual rate	2"/2½"
3%/6% dual rate	2½"/ 2½"

* *Flow below which the induction rate may not be achieved*

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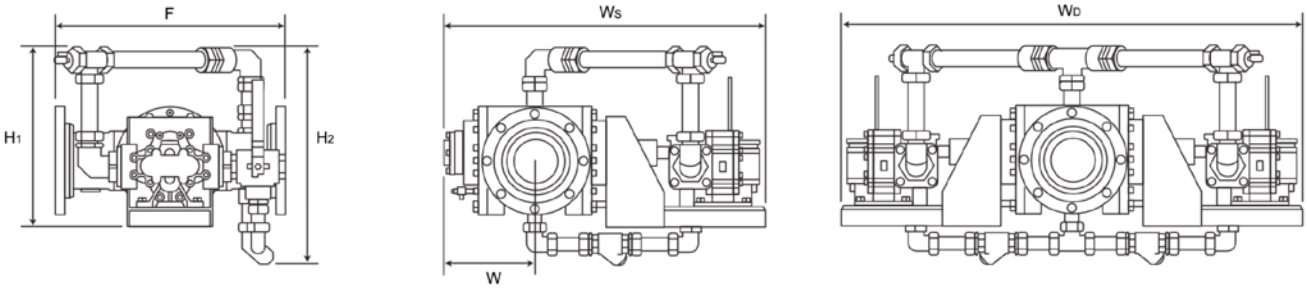
Installation Dimensions and Weights

Dosing rate			1%	3%	6%	1%/3%	3%/6%
			Single rate	Single rate	Single rate	Dual rate	Dual rate
Water motor connection							
between inlet and outlet flanges	F	mm/inch	700/27.6	700/27.6	700/27.6	700/27.6	700/27.6
Height from baseplate	H_1	mm/inch	580/22.8	580/22.8	580/22.8	580/22.8	580/22.8
Overall height	H_2	mm/inch	680/26.8	680/26.8	680/26.8	680/26.8	680/26.8
Motor overhang	W	mm/inch	215/8.5	215/8.5	215/8.5	215/8.5	215/8.5
Overall length	W_S/W_D	mm/inch	730/28.7	800/31.5	970/38.2	1200/47.2	1270/50.0
Weight		kg/lb	202/440	232/510	283/620	283/620	313/690



The Polaris foam induction motor is designed to work with the flow of water at a maximum of 6m/sec through a schedule 40 steel pipe of the same diameter as the water motor inlet and outlet. For the Polaris 6000, the maximum flow rate is 6000 litres/min, with an inlet size of 150mm (6"). The energy required to power the foam pump(s) is provided by the pressure drop between the water motor inlet and outlet.

Pressure Loss

Dosing rate		1%	3%	6%	1%/3%	3%/6%
		Single rate	Single rate	Single rate	Dual rate	Dual rate
1200 lpm	bar	0.4	0.5	0.6	0.9	1.0
2400 lpm	bar	0.6	0.7	0.8	1.3	1.4
3600 lpm	bar	0.9	1.0	1.1	1.9	2.0
4800 lpm	bar	1.3	1.4	1.5	2.7	2.8
6000 lpm	bar	1.8	2.0	2.3	3.8	4.0

Polaris Range

Model	Flow l/min (max)	Inlet size
Polaris 1200	1200	65mm (2½")
Polaris 2400	2400	100mm (4")
Polaris 3200	3200	125mm (5")
Polaris 4000	4000	125mm (5")
Polaris 6000	**6000**	**150mm (6")**
Polaris 8000	8000	200mm (8")

Options

- Portable model with light alloy motor body, hard anodised working surfaces and Cam-Lock foam inlet
- Sprinkler system model

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