



**Operations Manual
Applies to Waterous Model**

**FireTroll
Rev 1**

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WATEROUS ARIZONA

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Warnings, Cautions, and Notes

Warning A warning alerts you to a procedure, practice or condition that may result in death or long term injury to personnel or destruction of equipment.

Caution A caution alerts you to a procedure or condition that may result in serious damage to equipment or its failure to operate as expected

Note: A note points out important information. Failure to read the note may not result in physical harm to personnel or equipment. It may waste time and money.

Revision History

Revision	Date Issued	Comments
---	6/21/2010	Original Release
1	8/22/11	Added new kit pic and corrected spelling

Disclaimer: These instructions are guidelines only and in no way meant to be definitive. During installation, standard safety precautions and equipment should be used where appropriate. Because the tools used and the skill/experience of the installer can vary widely, it is impossible to anticipate all conditions under which this installation is made, or to provide cautions for all possible hazards. Proper installation is the responsibility of the purchaser. All bolts, setscrews, and belts must be checked prior to start-up AND after the initial operation. Damages due to poor installation are the responsibility of the installer.

Waterous reserves the right to make modifications to the system without notice

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Advantages of the FT Foam Proportioning System (FPS)

- Maintains continuous foam flow under varying water pressures and volumes, and needs no physical adjustment to the FPS.
- Does not exceed 1.0% foam concentrate use under normal operating conditions.
- To obtain concentrate percentages less than 1.0%, simply adjust the metering valve.
- Easy to operate, and has no moving part.
- Does not require electrical power to operate.
- Can be inserted in the plumbing between the pump outlet and the live reel or other discharge points on the fire engine, or can be inserted in a hose lay at any location.
- Has low maintenance, requiring only flushing with fresh water after each operation.
- Is usable with a wide range of different nozzles from 6 to 125+ gpm.
- Light weight and small, for use with a portable pump.

The FT Foam Proportioning System Waterous is offering is available in two models:

- Model FT-100 (1" plumbing with pipe threads; dimensions: 10" x 6" x 3", weight: 11lbs.)
- Model FT-150 (1 1/2" plumbing with pipe threads; dimensions: 13" x 7" x 3 1/4", weight: 17 lbs.)



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The FT Foam Proportioning System (FPS) is being sold as a kit to assure immediate performance. Each FPS kit includes:

- Foam Proportioning System (FPS)
- Positive connect hose assembly with foam concentrate graduated-metering valve.
- Capper kit designed to transfer concentrates from five-gallon foam pails and to prevent spills.
- Appropriate air aspirating nozzle for size of unit.

The Model FT- 100 can be easily installed on Type 6 engines between the pump outlet and the live reel. This provides these smaller engines with the advantage of having foam at the live reel, without adding the concentrate to the tank running foam mixture through the pump. The Model FT-150 with its 1 ½" pipe system is more adaptable to type 3 engines and portable pumps in long hose lays.

The FT-100 and FT-150 FPS have been successfully used in hose lays of 1,000 feet or more, and on moderate to steep slopes. The Model FT-100 has been very successfully operated at pressure's ranging from 80 to 150 psi at the pump while the Model FT-150 unit has been operated very successfully at pressures from 50 to over 180 psi at the pump.

The design of the Foam Proportioning System and the graduated-metering valve in the concentrate supply hose permit either a wet or dry foam to be produced by the FPS.

CAUTION

If this unit is to use water that comes from a source that may contain debris, the unit must be protected so the debris does not enter the unit. Debris can cause the internal mechanisms of this unit to malfunction.

The easiest way to determine if the unit is malfunctioning is to place your thumb over the foam concentrate inlet on the foam proportioning system (red box). If there is no or very slight suction, the unit may be fouled. The easiest way to test for fouling is to pour water slowly in to the inlet. If it flows straight through the unit, the internal backpressure control valve is likely lodged open with debris.

To remove lodged debris from the seat of the back pressure control valve, insert any sufficiently long device into the 1 ½" inlet and push very hard to open the backpressure control valve. (A broomstick or similar device will work). Any debris should fall out. Retest as details above. If water still flows straight through the unit repeat above procedure. If water does not flow through the unit reinstall. It should now perform correctly

CAUTION

TO PROTECT THIS UNIT FROM FREEZING, BE SURE ALL WATER HAS BEEN REMOVED FROM THE PROPORTIONER PRIOR TO COLD WEATHER.

TO REMOVE WATER, ALL PIPING MUST BE DISCONNECTED TO ALLOW ALL WATER TO DRAIN FROM THE UNIT. AS AN ALTERNATE HIGH PRESSURE AIR, FLOWING IN THE SAME DIRECTION AS THE WATER CAN BE USED TO DISPLACE WATER FROM THE PIPING AND PROPORTIONER.

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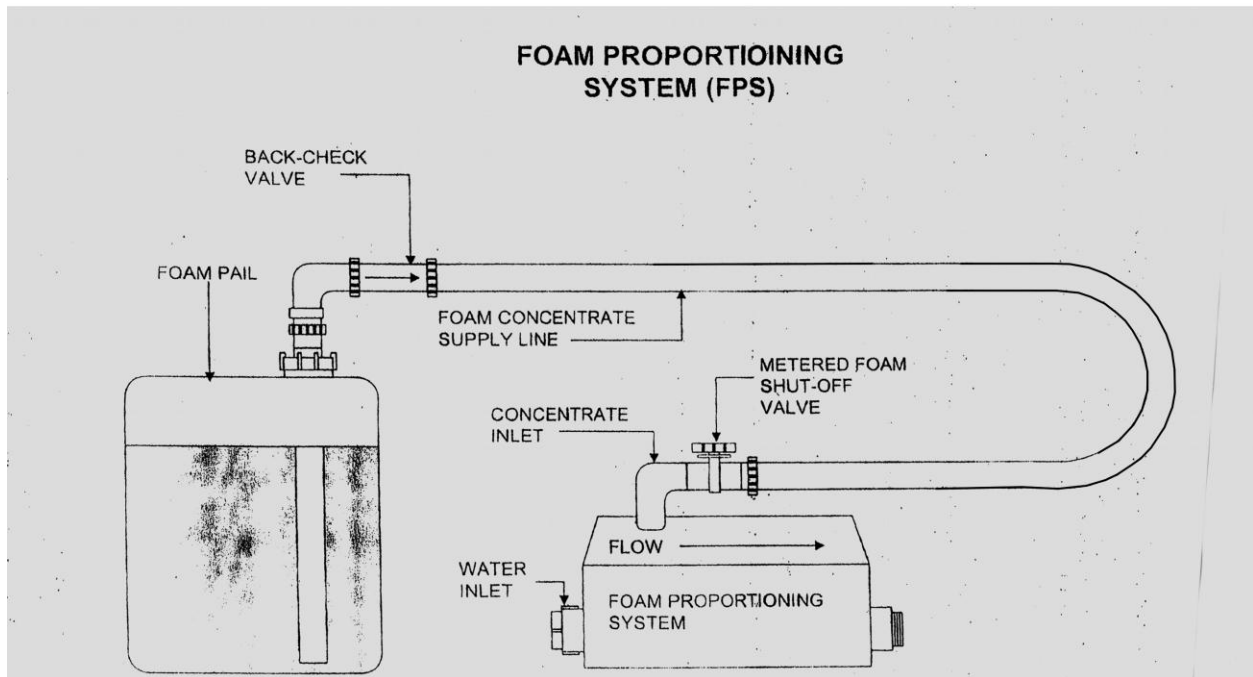
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INSTALLATION / OPERATING INSTRUCTIONS



INSTALLATION:

1. Install the FPS in the discharge water line after the pump and:
 - a. Prior to the live reel or hose basket
 - b. Prior to any other overboard outlet
 - c. To an overboard outlet, and attach the hose line to the outlet of the FPS
 - d. At any desired location in a hose line.

THE UNIT IS DIRECTIONAL AND MUST BE INSTALLED ACCORDING TO THE INLET-OUTLET DESIGNATIONS ON THE FPS.

2. If holes are needed to mount or install the FPS, see the following (Figure 1 Mounting holes).

CAUTION:

DO NOT DRILL HOLES IN ANY OTHER LOCATION. ONE-QUARTER INCH HOLES (1/4") MUST BE DRILLED PERPENDICULAR TO THE FPS UNIT, WHICH MUST BE MOUNTED ON A FIRM BACKING. DO NOT MOUNT THE UNIT NEXT TO ANY EXCESSIVE HEAT SOURCE.

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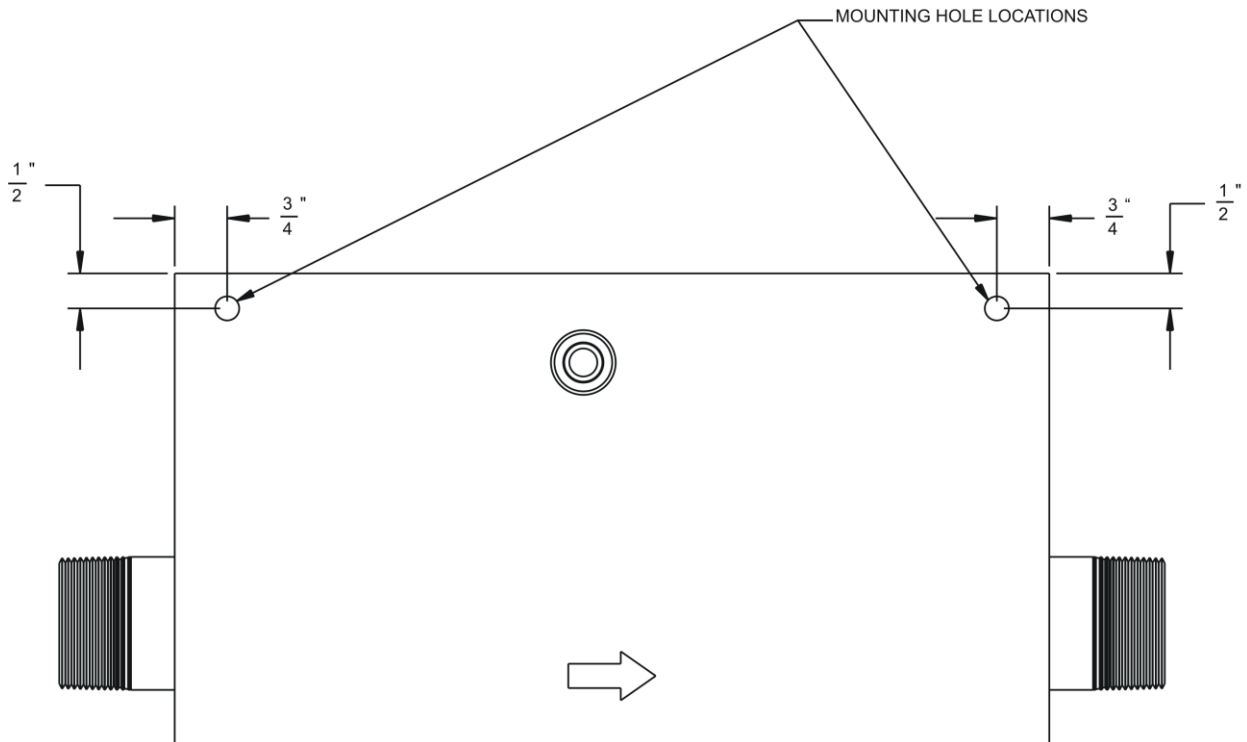


Figure 1 Mounting holes

OPERATION:

1. Attach the desired nozzle or air aspirating foam tube to the hose line to be used.
2. Attach the foam concentrate supply line to the FPS and foam pail, then open the concentrate metering valve in the supply line.
3. Start the pump and set at desired pressure (approximately 125psi).
4. Water and foam concentrate will now exit the FPS into the hose line. Foam concentrate will be less than 1.0% under normal operating conditions.
5. If the foam produced is too dry, slowly close the metering valve towards 0 (0 equals fully closed and 5 equals fully open).
6. Following any use of the FPS with foam concentrate, and prior to shutdown for any extended period, the foam concentrate metering valve should be closed, and clean water should be allowed to flow through the FPS to clean itself. The check valve in the foam concentrate supply line should be periodically removed and rinsed to insure proper foam concentrate flow.

FPS TESTING

Testing performed on Flow Proportioning System (FPS) model FT-150 (1 1/2)

1. Discharge side of FPS contained 1 50ft length of cloth hase and a FT-MF nozzle (rated at 34-37 GPM)
2. FPS adjusted to maximum suction of concentrate flow
3. Pumping unit was a:
Mallory (M-90) Slip on unit for a small pickup truck, 200gal. tank capacity, 20 HP Koeler gasoline engine, # 14280 Valley pump rated at approximately 100 PSI and 100 GPM

INLET	OUTLET	PRESS	Max GPM at disch	Max GPM	GPM thru	GPM at	Nozzle	Loss of	Cono.	Cono.	% Foam	Meter
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PSI	PSI	DROP PSI	of pump w/20' of suct. Hose from a remote tank	at disch of pump w/suct. from the built in tank	FPS, hose & nozzle	disch of pump w/o FPS but w/hose & nozzle	Throw Distance	GPM due to FPS	Flow GPH	Flow GPH		valve setting
A	B	A-B	C	D	E	F		F-E	G	H	H/E	
100	55	45	75	95	35	50	80'	15	17.80 17.80 11.00 5.20	0.30 0.30 0.18 0.09	0.85 0.85 0.52 0.25	2.50 2.00 1.50 1.00
125	75	50	80	90	40	55	80'	15	17.80 17.80 11.00 5.20	0.30 0.30 0.18 0.09	0.74 0.74 0.45 0.23	2.50 2.00 1.50 1.00
150	105	45	80	85	50	60	80'	10	17.80 17.80 11.00 5.20	0.30 0.30 0.18 0.09	0.59 0.59 0.36 0.18	2.50 2.00 1.50 1.00
175	120	55	80	80	52	70	94'	18	17.80 17.80 11.00 5.20	0.30 0.30 0.18 0.09	0.57 0.57 0.35 0.17	2.50 2.00 1.50 1.00
200			65	65								
225			40	40								

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CONDITIONAL 1-YEAR WARRANTY POLICY

WATEROUS warrants, to the original Buyer only, that products and parts manufactured by WATEROUS will be free from defects in material and workmanship under normal use and service for a period of one (1) year from the date the product is first placed in service, or one and one-half (1-1/2) years from the date of shipment by WATEROUS, whichever period shall be the first to expire; provided the Buyer notifies WATEROUS, in writing, of the defect in said product within the warranty period, and said product is found by WATEROUS to be nonconforming with the aforesaid warranty. When required in writing by WATEROUS, defective products must be promptly returned by Buyer to WATEROUS at WATEROUS plant at Glendale, Arizona, or at such other place as may be specified by WATEROUS, with transportation and other charges prepaid. A Returned Material Authorization (RMA) is required for all products and parts and may be requested by phone, fax or mail. The aforesaid warranty excludes any responsibility or liability of WATEROUS for:

- a) damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes, or improper maintenance, or attributable to written specifications or instructions furnished by Buyer;
- b) defects in products manufactured by others and furnished by WATEROUS hereunder, it being understood and agreed by the parties that the only warranty provided for such products shall be the warranty provided by the manufacturer thereof which, if assignable, WATEROUS will assign to Buyer, if requested by Buyer;
- c) any product or part, altered, modified, serviced or repaired other than by WATEROUS, without its prior written consent; and
- d) the cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation.
- e) normal wear items (including, but not limited to belts, hoses, check valves, packing, strainers, filters, light bulbs, anodes, intake screens, mechanical seals, etc.).

This warranty is subject to WATEROUS Conditions of Sale (detailed on WATEROUS Invoice) as currently in effect all of which are herein incorporated and by this reference made a part hereof

All other warranties are excluded, whether express or implied by operation of law or otherwise, including all implied warranties of merchantability or fitness for purpose. WATEROUS shall not be liable for consequential or incidental damages directly or indirectly arising or resulting from the breach of any of the terms of this limited warranty or from the sale, handling, or used of any WATEROUS product or part. WATEROUS liability hereunder, either for breach of warranty or for negligence, is expressly limited at WATEROUS option:

- a) to the replacement at the agreed point of delivery of any product or part, which upon inspection by WATEROUS or its duly authorized representative, is found not to conform to the limited warranty set forth above, or
- b) to the repair of such product or part, or
- c) to the refund or crediting to buyer of the net sales price of the defective product or part. Buyers remedies contained herein are exclusive of any other remedy otherwise available to Buyer.

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Compressed Air Foam Systems