

FOAMPRO®

**System
2000**

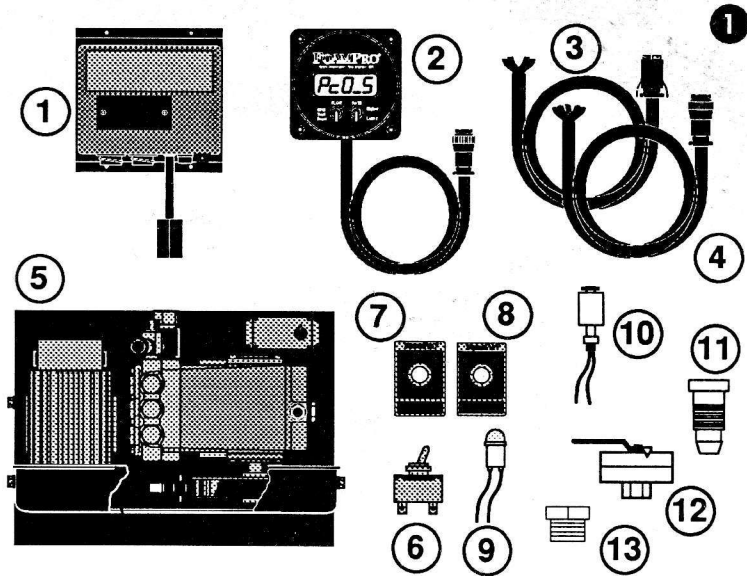
5-92

FORM 600FP

**INSTALLATION
OPERATION
AND PARTS
MANUAL**

1 WHAT YOU GET

1. COMPUTER CONTROL MODULE
2. DIGITAL DISPLAY MODULE
3. POWER HARNESS
4. CONTROL HARNESS
5. FOAM PUMP ASSEMBLY
6. FOAM ON/OFF SWITCH
7. FOAM ON/OFF NAMEPLATE
8. TANK LOW NAMEPLATE
9. TANK LOW INDICATOR LIGHT
10. TANK LOW SWITCH
11. INJECTOR FITTING
12. INJECT/CAL/FLUSH VALVE
13. 1/2" to 3/8" BUSHING
14. ELECTRICAL CONNECTORS (NOT SHOWN)

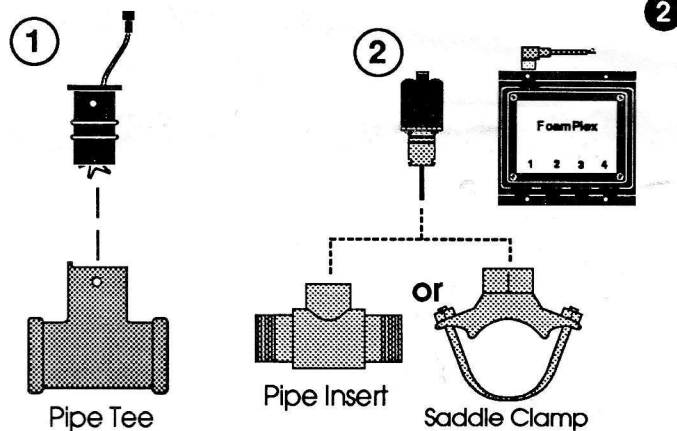


and

1. FOAMPRO PADDLEWHEEL TYPE FLOW METER
2. SPAN SPRING TYPE FLOWMINDER

NOTE: FLOWMINDERS MUST BE USED WITH A FOAMPLEX INTERFACE MODULE.

Each FoamPro system requires at least one flow meter input and can monitor up to 4 simultaneously.



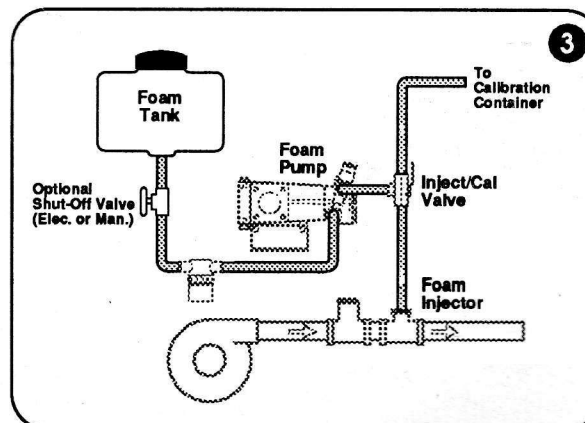
2 WHAT YOU SUPPLY

FOAM TANK TO INTAKE OF FOAM PUMP

Fittings and hoses from the foam tank to the inlet of the foam pump will need to be supplied by the installer. Use 1/2" or 3/4" diameter hose. Use components that are rated to working discharge pressures or greater.

FOAM PUMP TO INJECTOR FITTING

Fittings and hoses from the discharge of the foam pump to the injector fitting will need to be supplied by the installer. Use components that are rated to working discharge pressures or greater.



3 SAFETY

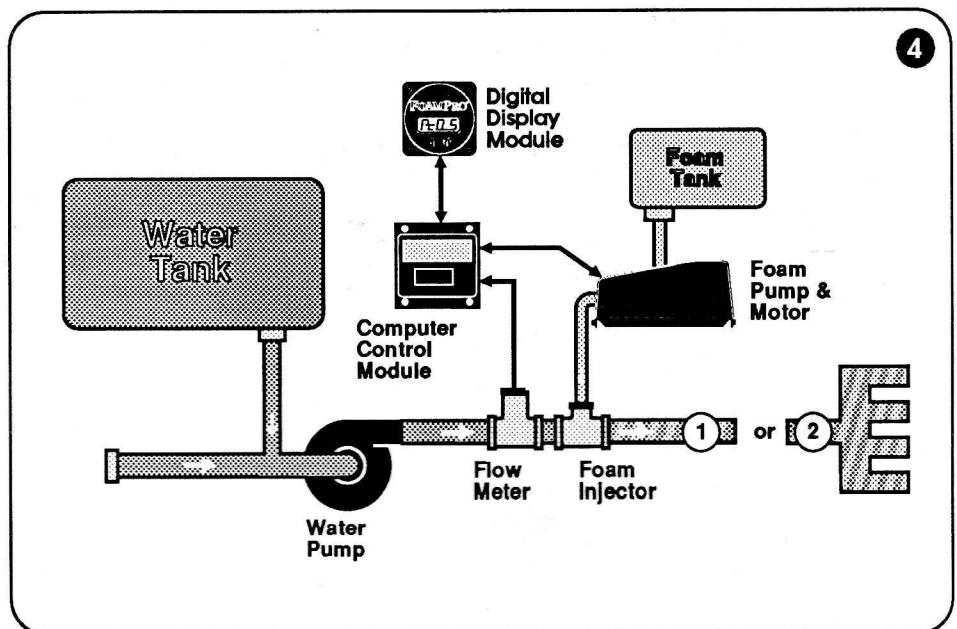
Before attempting to install or operate a FoamPro System 2000, read all of the following safety precautions and follow carefully.

1. Do not pump at pressures higher than the maximum recommended pressure. (400 PSI)
2. Do not attempt to operate the system at or above a temperature of 158° Fahrenheit.
3. Ensure that the electrical source of power for the unit is a 12-Volt, Direct Current system, with a minimum current rating of at least 25 Amps.
4. Do not permanently remove or alter any guarding devices or attempt to operate the system when these guards are temporarily removed.
5. **Always disconnect the power source** before attempting to service any part of the pump.
6. **Release all pressure** within the system before servicing any of its components.
7. **Drain all liquids** from the system before servicing any of its component parts.
8. Check all hoses for weak or worn conditions before each use. Ensure that all connections and fittings are tight and secure.
9. Periodically inspect the pump and the system components. Perform routine preventative maintenance as required. Failure to perform routine maintenance may cause damage to the pump. See the maintenance section of this manual for recommended maintenance procedures and intervals between maintenance work.
10. Use only pipe, hose, and fittings which are rated for the maximum Pounds per Square Inch (400 PSI) rating at which the pump system operates.

4 A QUICK LOOK AT HOW THE SYSTEM WORKS

The FoamPro System 2000 is a flow-based proportioning system that measures water flow and then injects the proper amount of foam concentrate to maintain the pre-set percentage. The flow meter measures the water flow and sends a signal to the computer control module. Another sensing device monitors the foam pump output. These two information signals are constantly compared by the computer to ensure that the desired proportion of concentrate and water is maintained at all times, independent of any variations in intake or discharge pressures. Foam agent is injected directly into the water

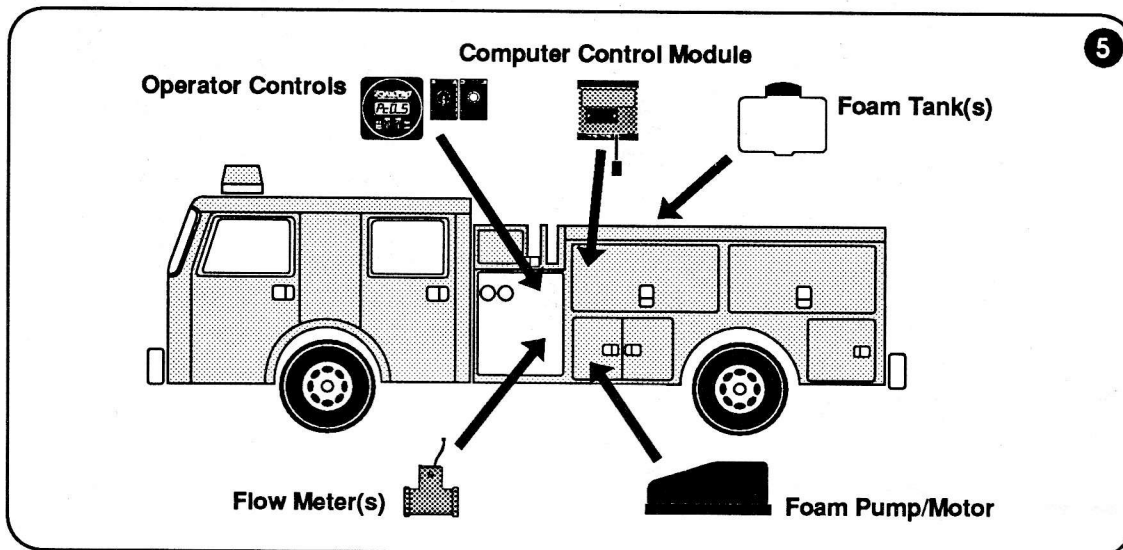
on the discharge side of the water pump. It is then fed as foam solution into a standard fog nozzle, an air aspirated nozzle, or any CAFS equipment.



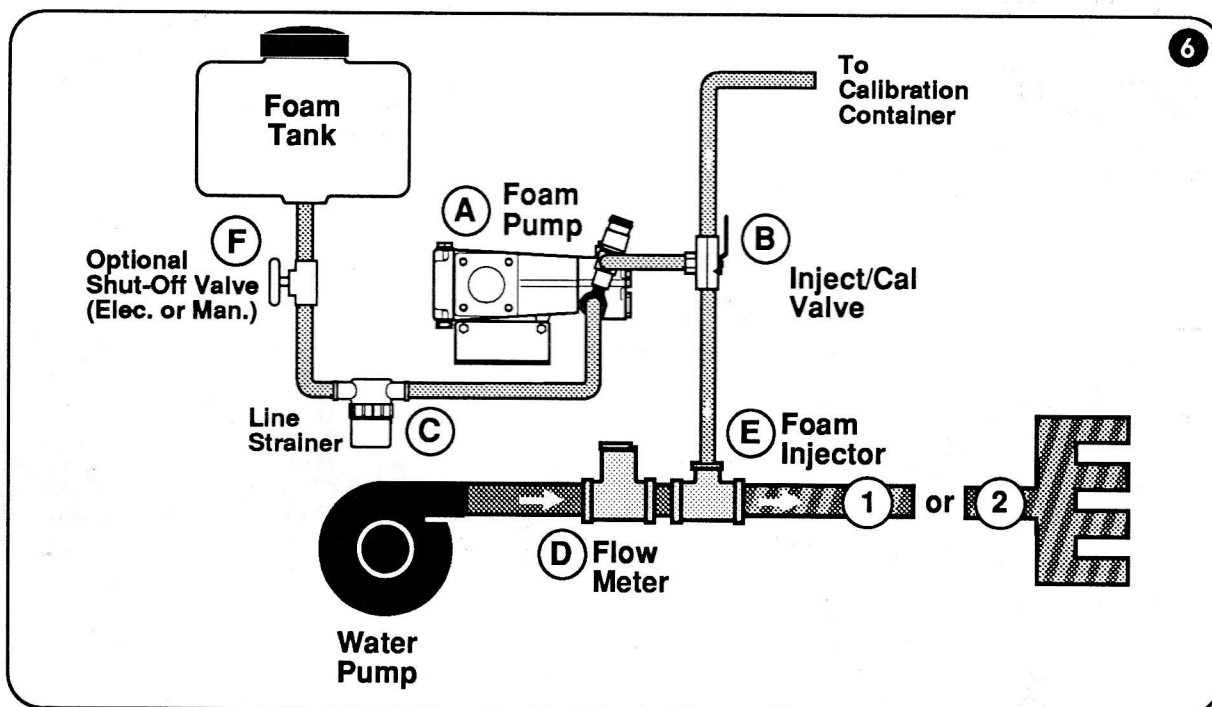
5 PLAN AHEAD

Because of all the potential differences in systems, it is not possible to depict exactly how your unit can best be installed onto your particular apparatus. Much of the information contained in the following sections, however, will apply to any situation. It is recommended that you read it thoroughly. It is also recommended that you

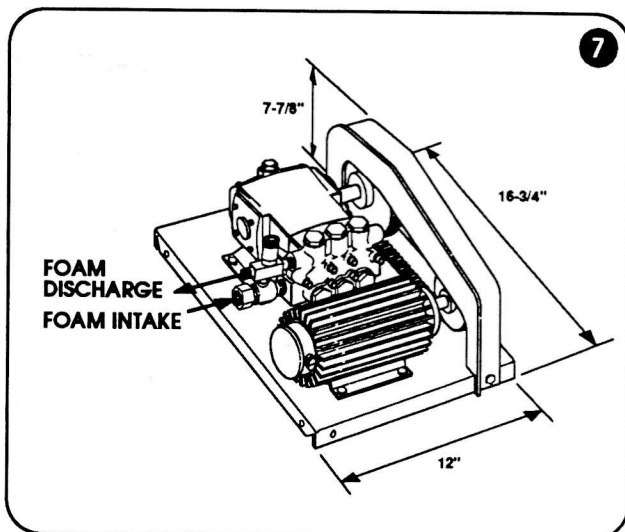
spend time planning and designing where and how you intend to install this unit in your apparatus **before beginning** the actual installation. The below diagram provides guidelines as to where each of the major components should be installed.



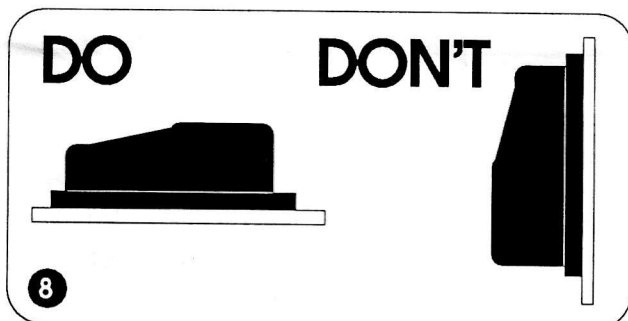
6 PLUMBING COMPONENT INSTALLATION AND HOOK-UP



A. FOAM/PUMP BASE ASSEMBLY



The pump/motor unit is mounted on a rigid base assembly that can be easily mounted on a shelf in compartment or in the pump compartment. It **MUST** be mounted in an upright position (See Fig. 8) since the pump crankcase is vented and the oil tends to leak out if put in a position far from upright. It is a good idea to



mount the assembly somewhere that it can be easily accessed for routine maintenance and service if necessary. If possible, a clean compartment is the recommended installation area. This will keep the belt and pulley drive operating longer.

Keep in mind how the plumbing coming to and going from the unit will be affected by the location of the unit. **IF AT ALL POSSIBLE**, the foam pump intake should be below the tank to aid in priming and supplying the pump. The shorter the distance between the tank and pump, the less the restriction there will be.

There are two ports on the foam pump. The top one is the discharge port and the bottom one is the intake port.

B. INJECT/CAL/FLUSH VALVE

The INJECT/CAL/FLUSH Valve should be mounted on the outlet port of the pump. A 3/8" to 1/2" bushing is supplied for this. The valve is a 3-way directional valve that selects where the output of the pump will go. Check to make sure the valve is installed properly. This is done by visually inspecting the ports as you move the handle (the flow should go from the center port to each of the other ports). The line from the INJECT port should be hose that is rated at or above the operating pressure rating of all the other discharge plumbing on the apparatus since it will be exposed to the same discharge pressures. The hose from the CAL/FLUSH port may have a lower pressure rating since it is plumbed to the atmosphere and will not receive the high discharge pressures. This line is used for calibrating the foam pump or pumping the foam tank into a container to empty the tank.

C. LINE STRAINER

The Line Strainer should be mounted on the inlet side of the foam pump. It has 1/2" NPT male ports and may be installed directly into the inlet port of the pump if desired. Otherwise it may be installed anywhere in the inlet side plumbing. The hose from the foam tank should have adequate wall stiffness to withstand the suction of the foam pump while it is operating.

NOTE: If a pressurized water flush from one of the discharges is incorporated, the plumbing exposed to this pressure must be rated at or above the operating pressure of all other discharge plumbing components.

D. FLOW METER(S)

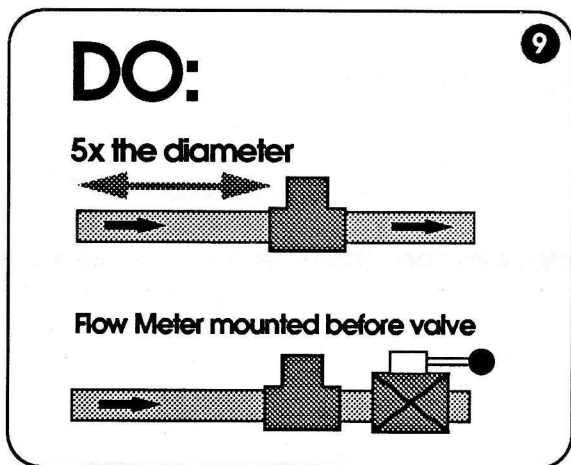
The FoamPro System 2000 can accept flow reading signals from two types of flow meters—the FoamPro Paddlewheel Style Flow Meter and the Span Spring Type FlowMinder. With the use of an interface box, up to 4 flow meters may be monitored simultaneously. Keep in mind that while 4 discharges may possibly be monitored, a common injection point is still required somewhere before the separate discharges are connected.

Each of the Flow meter types require that the amount of turbulence in the pipe before them

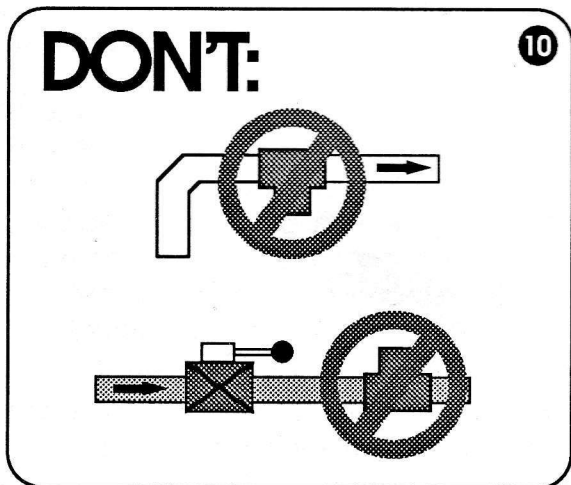
is as low as possible. Excessive turbulence produces unstable and inaccurate flow readings. The following installation guidelines will help you get the best readings, and apply to both the paddle-wheel and the spring type flow meters.

- a. A minimum **5 times the pipe diameter** of straight run pipe without any fittings is necessary before the flow meter. **10 times** is even better—the longer the straight run the lower the turbulence. Here are some examples of required straight run:

Pipe Size	Recommended Straight Run Before
1.5"	7.5" to 15"
2"	10" to 20"
2.5"	12.5" to 25"



Down stream of the flow meter is not as critical, but again, straight runs without fittings helps.

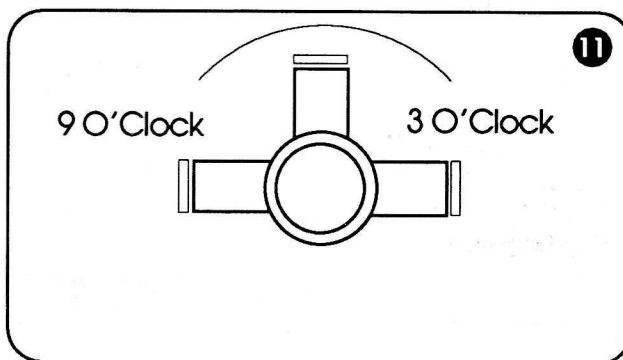


Do not mount a flow meter directly after an elbow or valve. Valves can create a lot of turbulence when they are "gated-down".

Last, try to mount the flow meters in a position that is accessible for routine inspection and maintenance.

FOAMPRO PADDLEWHEEL FLOW METERS

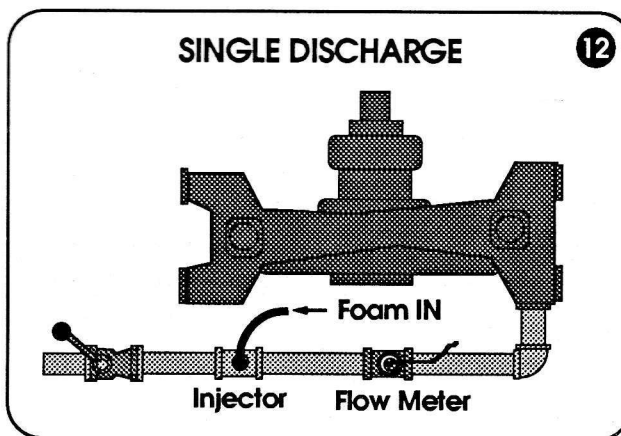
The FoamPro paddlewheel style flow meters fittings are specially designed tees that make inspection and maintenance of the flow sensor easy. The threads of the tees are NPT. In horizontal runs the tees should be mounted as close to upright as possible.

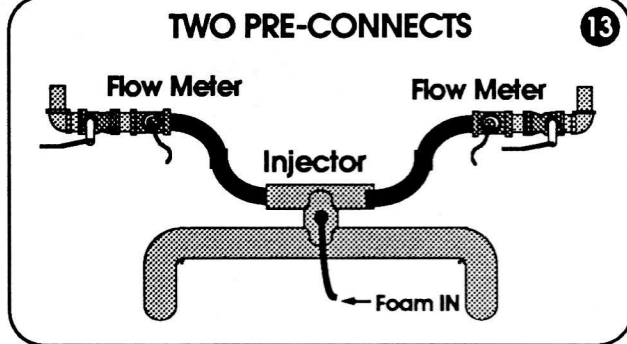


SPAN SPRING FLOWMINDERS

The Span spring style flow meters have two mounting options available—a NPT pipe insert for 1.5" and a saddle clamp for all other sizes. Please refer to the Span FlowMinder installation instructions for proper mounting.

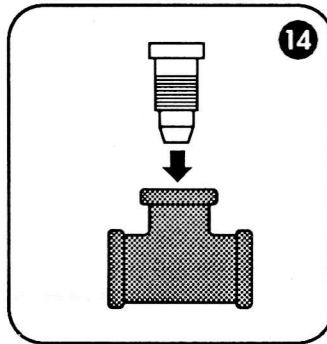
SOME SUGGESTED PLUMBING IDEAS



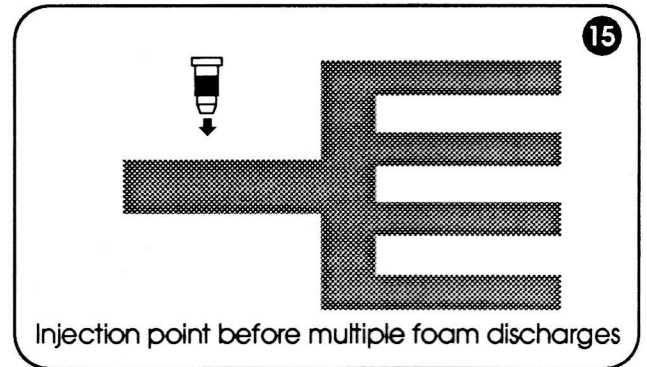


C. INJECTOR FITTING

The brass injector fitting was designed to fit into a pipe tee that is installed in the discharge plumbing where foam is desired. The inlet of the fitting is 3/8" NPT female and the outer threads are 1" NPT. The injector may also be inserted into a weld fitting with 1" NPT



female threads. It MUST be mounted in a water supply pipe that is common to all discharges that foam is desired in. A separate injection point is not possible for each discharge. There is only one, so some manifolding may be in order to supply multiple discharges. Foam concentrates by nature mix with water very quickly, so each discharge from a manifold will receive equal concentrations. The injection point is recommended to be put after the flow meter but it can be put before if necessary. If multiple flow meters are used, the injector will have to be before the flow meters.



7 ELECTRONIC COMPONENT INSTALLATION AND HOOK-UP

ELECTRICAL CONNECTIONS

Follow the system electrical schematic on page 7 for proper hook-up of each of the electrical components. Sealed connectors are provided with each FoamPro system to make all the necessary connections. You can however use any type of connector that you are confident will make a good connection and remain sealed. *The system can only perform when the electrical connections are sound, so make sure each one is tight.*

SOME THINGS TO KEEP IN MIND

- **DO NOT** hook-up the main power cables until all connections are made to each of the electrical components. The last connection should be the big 4-pin power harness connector from the computer control module.
- **CUT ALL LEADS TO LENGTH (Except Motor Leads).** DO NOT coil up excess wire and tie

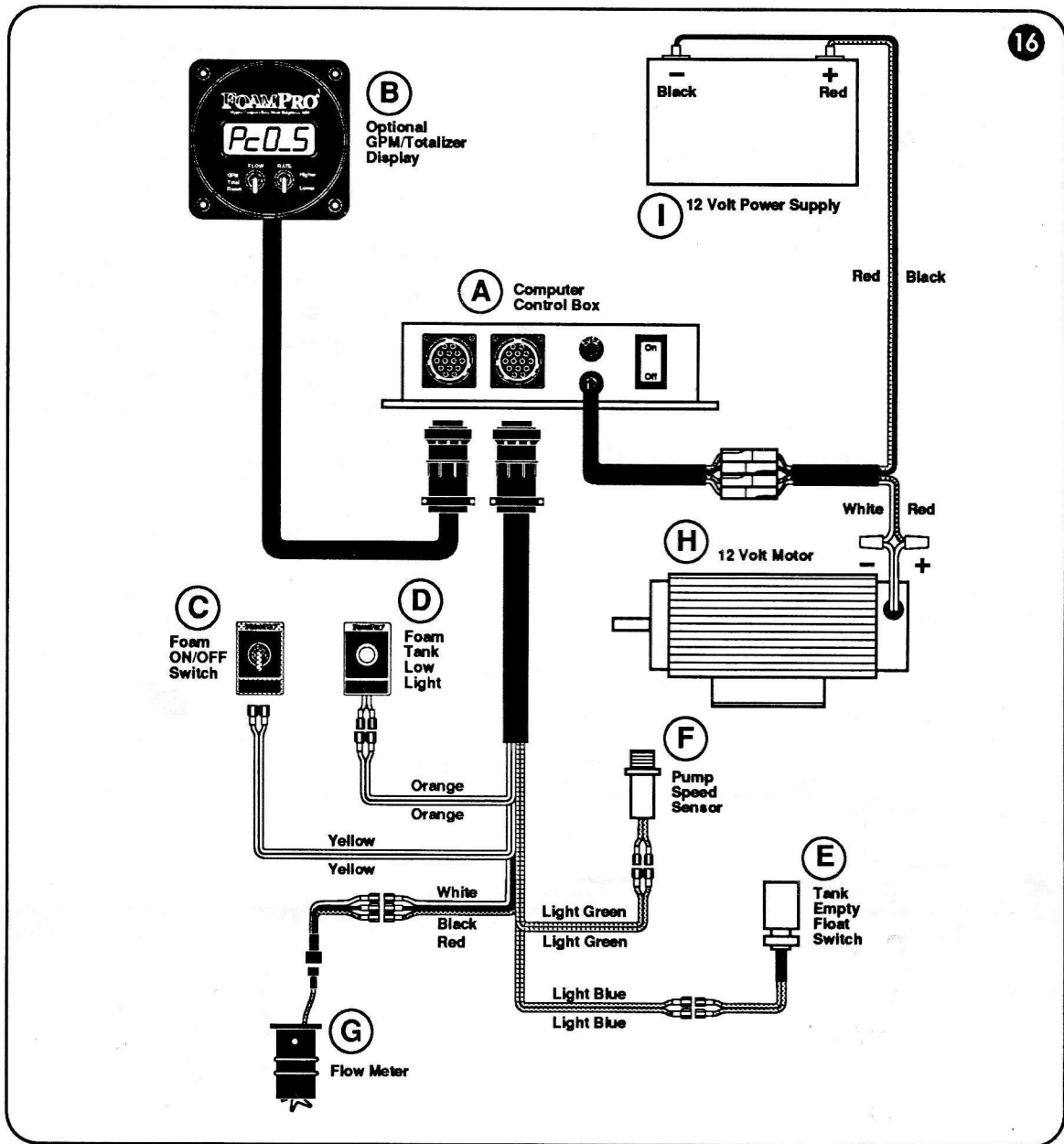
it up. Doing this creates antennas that can pick up outside electrical noise.

A. COMPUTER CONTROL MODULE

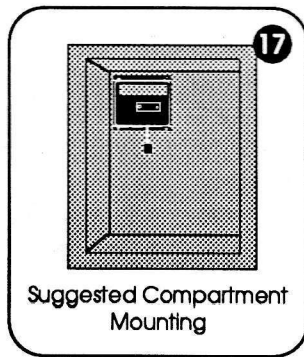
The computer control module should be mounted in a compartment that will be as dry and temperature stable as possible. **DO NOT** mount it where it will be exposed to direct spraying of water. **DO NOT** put the module in an area that will expose it to high temperatures. Mount it in the upper corner of a compartment that is not right next to the engine or exhaust. Another mounting place is under the seat or on the back wall of the cab of the vehicle.

B. DIGITAL DISPLAY MODULE

The digital display module is designed to be mounted in the operator panel of the apparatus. The cutout that will be needed in the operator panel is a 3-7/8" diameter hole (the same as a 3-1/2" pressure gauge). The display



is secured with four bolts in the four holes in the face. The display is 2-3/8" deep from the back of the face-plate, make sure there is enough clearance behind the operators panel for it. Once mounted and secured, connect the display harness to the computer control module with the twist-on connector.

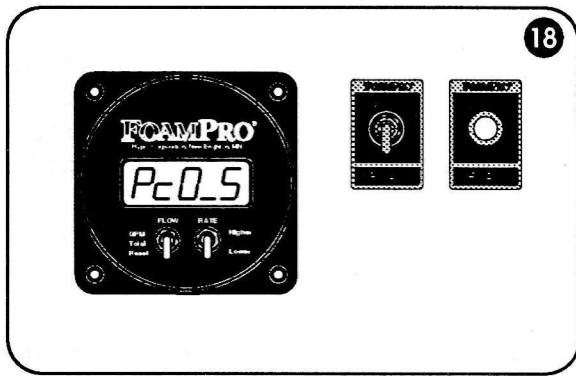


C. FOAM ON/OFF SWITCH

The switch and nameplate should be mounted next to, or close to the digital display module (See Fig. 18). This keeps all the foam system controls in one place on the panel. Locate the pilot hole for the switch in panel by using the nameplate as a template. The hole should be 1/2" in diameter. Once the switch and nameplate are mounted properly connect the yellow leads from the control harness with the provided space connectors.

D. FOAM TANK LOW INDICATOR LIGHT

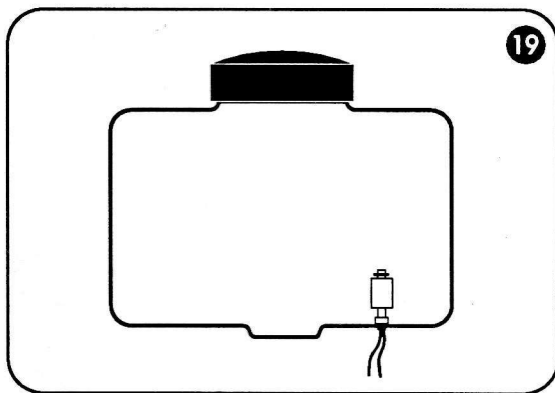
The light and nameplate should be mounted next to the Foam ON/OFF switch and close to



the digital display module (See Fig. 18). This keeps all the foam system controls in one place on the panel. Locate the pilot hole for the indicator light in panel by using the nameplate as a template. The hole should be 1/2" in diameter. Once the light and nameplate are mounted, connect the leads with the orange leads from the control harness.

E. FOAM TANK LOW FLOAT SWITCH

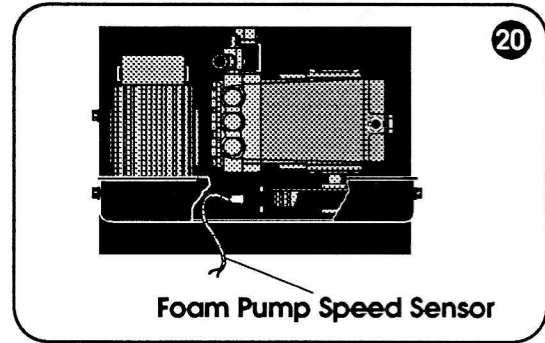
The foam tank float switch must be mounted into the bottom of foam tank to monitor low tank condition. The switch has 1/8" NPT threads. Drill a hole in the bottom of the tank sized to either the 1/8" threads of switch directly or a larger bushing with 1/8" internal threads. There must be room under the tank for the leads to feed back to the computer control module. Connect these leads to the light green leads from the control harness.



- If the tank low switch is not used, seal both leads separately. DO NOT tie them together, since this would make the system think the tank is always empty. If another style of tank low indicator is used as an input to the FoamPro system, make sure the signal output is a contact closure type. A closed circuit indicates a low tank condition.

F. PUMP SPEED SENSOR

The pump speed sensor is located under the belt guard on the pump/motor base unit (See Fig. 20). The two wires have no polarity. The light blue leads from the control harness should be connected to the two wires from the speed sensor.



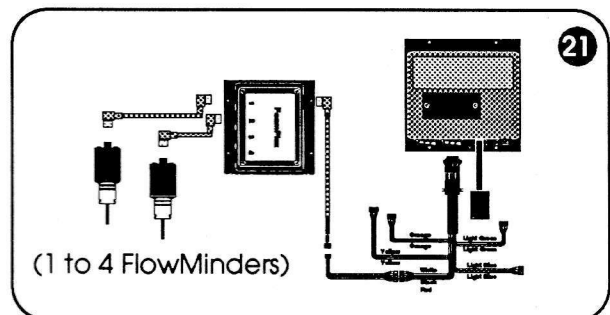
G. FLOW METER(s)

If you are using a single FoamPro paddle wheel type flow meter with the FoamPro system, the RED, BLACK and WHITE leads from the control harness can be connected directly to the flow meter leads. A short pigtail is supplied with a quick connect on one end to mate up to the connector on the leads from the flow meter itself. This provides an easy method of disconnecting the flow sensor and replacing it if necessary.

If you are using multiple paddlewheel flow meters or Span FlowMinders, the output signal leads from the interface modules must be connected to the flow meter leads from the control harness.

FLOW METER INTERFACE MODULES

See the instructions included with the interface module for specific mounting and calibration instructions. The flow signal output lead from the module will be connected to the flow meter leads from the control harness instead of a single flow meter (See Fig. 21).



- No matter what type of flow meter is used, the bare grounding wire (no insulation) in the flow meter lead from the control harness should be run to a good chassis ground. This will aid in shielding the red, black and white leads from other electronic noise.

H. 12 VOLT MOTOR

The leads from the 12 volt motor should NOT be shortened. Shorten the RED and WHITE leads from the power harness to get the proper length. Connect the leads with the wire nuts supplied or other connectors that are capable of 25 AMPS and seal the connections with electrical tape or heat shrink tubing.

I. 12 VOLT POWER SUPPLY

Electrical devices can be easily damaged by a weak or erratic power supply. The FoamPro system is no different—the better the power supply the better the FoamPro will perform and survive. At maximum output the FoamPro system can draw up to 25 AMPS or more.

ALWAYS connect the primary 12 volt positive lead (RED) from the power harness to the master switch terminal or the positive battery terminal. Connect the ground (BLACK) lead to the chassis frame or the negative battery terminal.

DO NOT connect the main power leads to small leads that are supplying some other device such as a light bar or siren unless it is the master switch terminal or the primary battery cable.

8

MAKING SURE EVERYTHING IS WORKING RIGHT

INSTALLATION CHECKLIST

- 1. The wiring on the apparatus matches with the electrical system schematic on page 7.
- 2. The flow meter(s) each have at least 5X the pipe diameter of straight run in front of them.
- 3. The injector (there can be only one) is in a common point to supply foam to all discharges specified to have foam capability.
- 4. The configuration switches are set properly for this installation.
 - A. DIP switches 1, 2 and 3 are set to the proper flow meter size.

NOTE:

When using the flow meter interface modules switches 1, 2 and 3 should be set to the 1.5" settings.

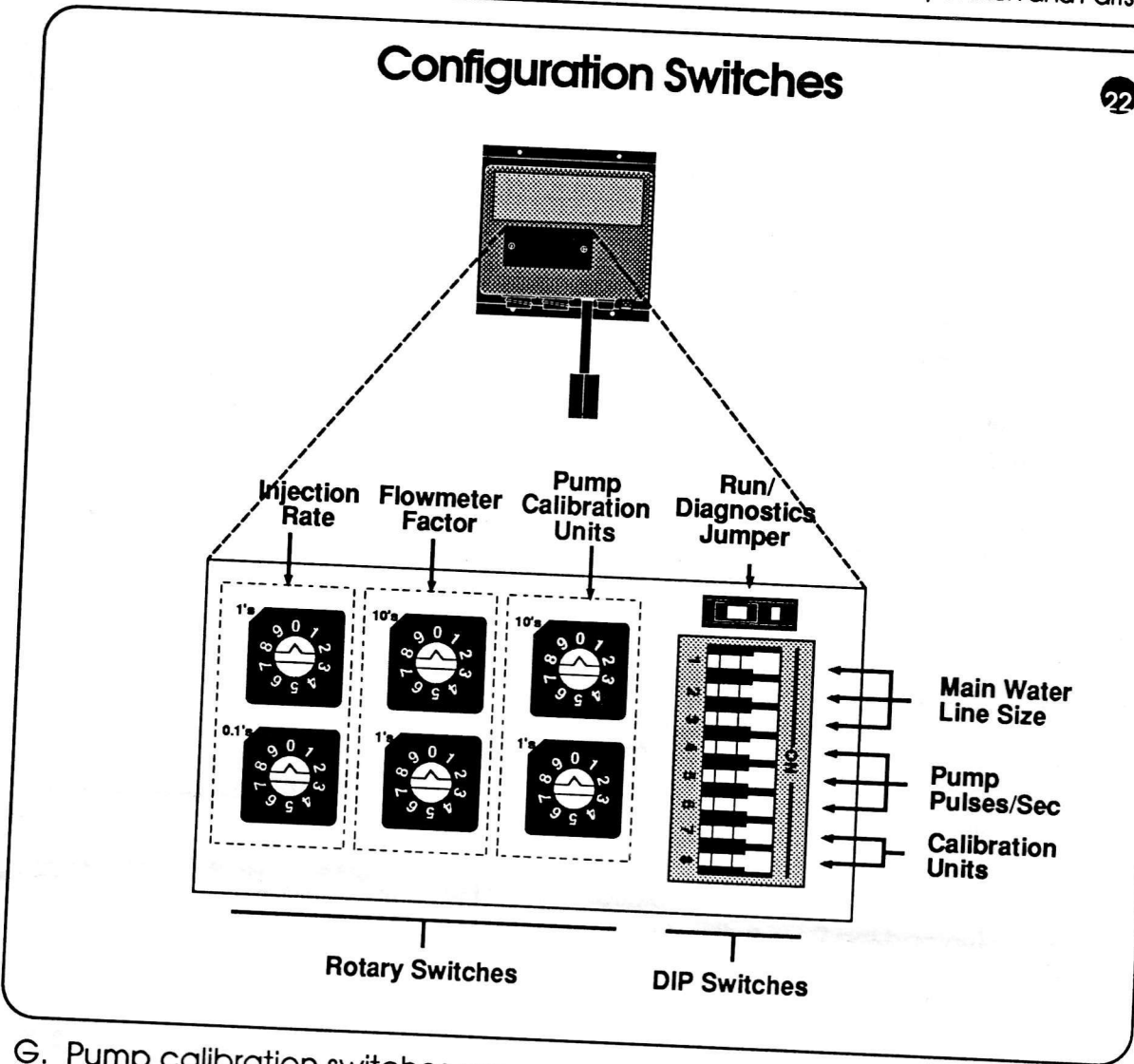
- B. DIP switches 4, 5 and 6 are set for the proper pump configuration
4 = Off 5 = Off 6 = On
- C. DIP switch 7 is set to ON.
- D. DIP switch 8 is set for GPM units or dekaliter units.
Off = GPM units
On = Dekaliter units
- E. The Injection Rate rotary switches are set for the proper default rate (the % the unit starts at each time it is powered up) Examples would be 0.5% or 1.0% etc.
- F. Flow factor rotary switches are set to match the flow factor number on the flow meter.

NOTE:

If a FoamPlex interface is being used set the flow factor rotary switches to 10.

Pipe Size	Switch Setting		
	1	2	3
1.5"	On	Off	Off
2.0"	Off	On	Off
2.5"	On	On	Off

Configuration Switches

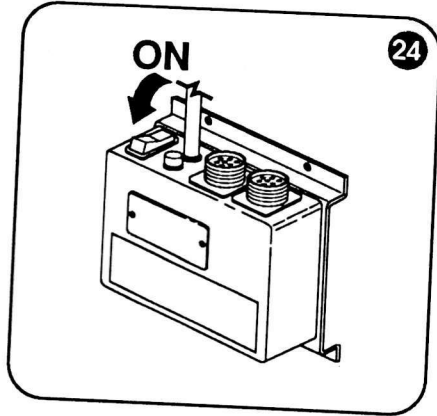
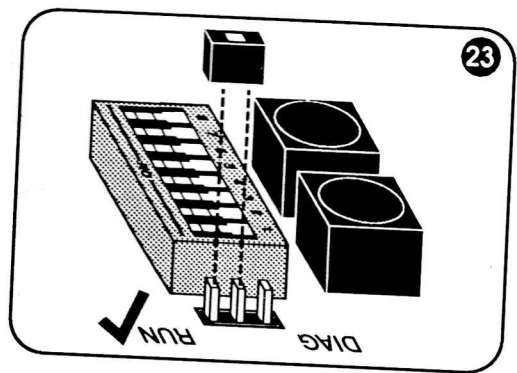


G. Pump calibration switches are set between 50 and 65. If they are not the calibration of the foam pump, they should be checked. See the pump calibration section.

H. RUN/DIAGNOSTIC Jumper is in the RUN position.

SYSTEM POWER CHECK

Turn the main power switch on the computer control module to ON and check the digital display – a zero should appear on the digital readout. If no zero appears, refer to the "If THINGS AREN'T WORKING RIGHT" section for possible causes and solutions.



FLOW METER(S) CHECK

FLOW A SET FLOW RATE THROUGH EACH DISCHARGE AND CHECK THE READING ON THE DISPLAY TO SEE IF THE READING MATCHES THE SET RATE.

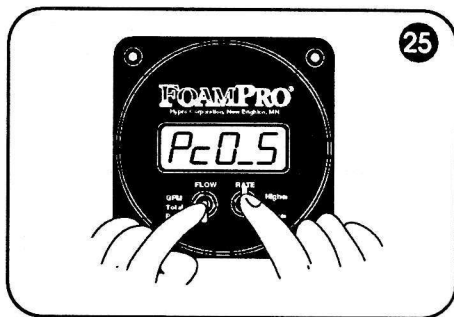
** If there is only one paddlewheel style flow meter used in the system and the reading is not correct, it can be corrected by adjusting the flow factor rotary switches inside the computer control module.*

** If Span FlowMinders are used, each FlowMinder will need to be calibrated individually after installation. Refer to the FoamPlex Installation and Calibration instructions for the proper procedure.*

FOAM PUMP PRIMING CHECK

Turn the INJECT/CAL/FLUSH valve to the CAL/FLUSH position and place a container to collect the output that will be coming from the foam pump (A CALIBRATED CONTAINER IS BEST, UNDER THE OUTLET TUBE).

- Put the system into "simulated flow mode" by holding the FLOW switch on the digital display down and the RATE switch up



(both at the same time). Move the FLOW switch back to GPM and "S_ 75" should be displayed on the digital readout. Next move the rate switch up to increase the rate to "2.0%". This will cause the pump to run faster and prime easier.

- Engage the FoamPro system by putting the "FOAM ON/OFF" switch in the "ON" position.
- Foam concentrate should be flowing into the container. If concentrate is not being pumped, check first to make sure the

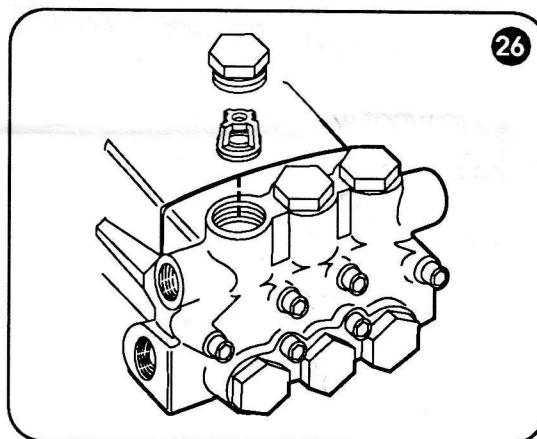
foam pump is running. If the pump is running but still no concentrate, then the pump is most likely not primed completely. If the pump does not prime within 20-30 seconds, disengage the system by putting the "FOAM ON/OFF" switch into the "OFF" position.

- Once foam flow is established, disengage the system.

PRIMING THE "DIFFICULT" FOAM PUMP

If you are having difficulty priming the foam pump in your FoamPro system:

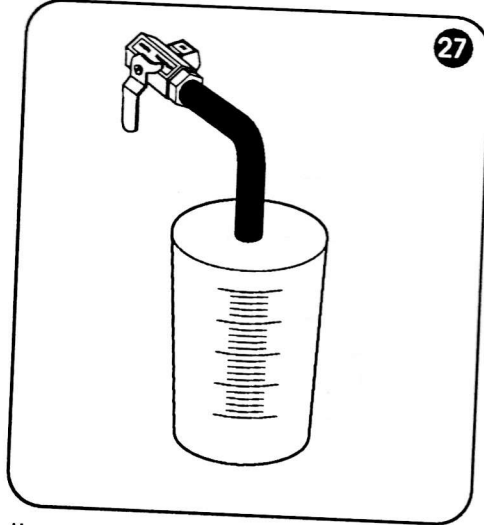
- First check to make sure there are no leaks in your plumbing where the pump can "suck in" air.
- Remove one of the valve caps from the head of the pump and remove the check valve under it.



- Pour a small amount of concentrate into the opening where the valve was to fill up the pumping chamber in the pump head.
- Replace the check & valve caps and tighten securely. Run the pump again and the pump should prime right away.

SYSTEM ACCURACY CHECK

Turn the INJECT/CAL/FLUSH valve to the CAL/FLUSH position and make sure you have a calibrated container to collect and measure the output from the foam pump.



27

Set up the apparatus to flow a known flow rate from one of the foam discharges (i.e., 100 GPM for a 1-1/2" discharge).

Engage the system by putting the "FOAM ON/OFF" switch into the "ON" position. Time a 1-MINUTE period at these conditions and collect the output. Disengage the system when the 1-MINUTE period is complete.

Measure the amount of fluid collected from the foam pump. Compare what you collected to what was expected.

KNOWING WHAT TO EXPECT

To determine what to expect, take the water flow rate times the concentration rate times the time. See the following examples:

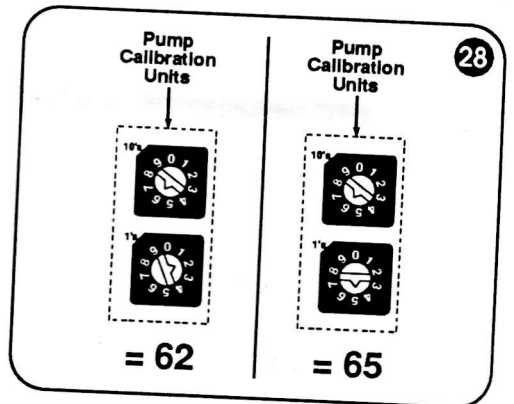
If you don't get what you expect, the pump calibration units in the computer control module will need to be adjusted. Let's say for the 100 GPM @ 0.5% example you measured .7 gallons instead of the expected .5 gallons. This would be a great enough error to warrant correcting the calibration units. But if .55 gallons were collected, no changes should be necessary.

100 GPM @ 0.5%
 $\frac{100 \text{ gallons} \times .005 \times 1 \text{ minute}}{\text{minute}} = .5 \text{ gallons}$

150 GPM @ 1.0%
 $\frac{150 \text{ gallons} \times .01 \times 1 \text{ minute}}{\text{minute}} = 1.5 \text{ gallons}$

200 GPM @ 0.5%
 $\frac{200 \text{ gallons} \times .005 \times 1 \text{ minute}}{\text{minute}} = 1 \text{ gallon}$

To adjust the pump calibration units, remove the access cover from the computer control module. If the volume collected was too much the pump calibration units should be adjusted up by turning the rotary switch(es) to a higher number. (EXAMPLE: To go from 62 to 65 adjust the 1's rotary switch from 2 to 5.)



28

If no adjustment was needed, your FoamPro system is ready for service. If adjustments were made, repeat the 1-minute cycle until you get the correct results.

9 WHAT TO DO IF THINGS AREN'T GOING RIGHT

The FoamPro System 2000 has the ability to run its own diagnostic tests to help identify possible problems. Turn the main power OFF before putting the unit into diagnostic mode. You can signal the system to go into diagnostic mode by moving the RUN/DIAGNOSTIC

jumper to the diagnostic position. Once the unit is in diagnostic mode use the chart to check different conditions. By moving the switches as listed the corresponding information should be displayed for you.

DIAGNOSTIC MODE OPERATION

Foam ON/OFF Switch	Display FLOW Switch	Action and Display
ON	GPM	Show average flow counts per second. The display is updated each second to show the average number of pulses received from the flow meter in each of the four prior seconds. This verifies the operation of the flow meter.
ON	TOT	Show pump feed back pulses per second. The pump will be run at a duty cycle equal to the "Pump calibration units" rotary switches. The motor will operate regardless of the tank level. This verifies the operating of the pump speed sensor.
ON	CLR	The left two digits of the display will show the status of the Run/Standby" switch as "On". The right two digits will display the status of the tank level switch as "Hi" or "Lo", depending on the current tank conditions.
OFF	GPM	The left two digits of the display will show the value of the Pump calibration units switches. The right two digits show the hexadecimal value of the Configuration switches.
OFF	TOT	The left two digits will show the value of the "Injection Percent rotary switches. The right two digits will show the value of the Flow Meter Efficiency" rotary switches.
OFF	CLR	The display will perform a lamp test on every segment in each digit location. If the Display Rate switch is put in the increase position all segments will be illuminated. If the Display Rate switch is put in the decrease position, all segments will be extinguished.

Please refer to the following Troubleshooting Section for actions to take if the diagnostic procedures uncover any problems.

FoamPro Systems Limited Warranty

HYPRO CORPORATION(HYPRO),as manufacturer,warrants to the original purchaser,each new pump,system or other product of its own manufacture, for a period of two years from the date of shipment from the factory, to be free from defects in material and workmanship under normal use and service. "Normal use and service" means not in excess of recommended maximum speeds, pressures, and temperatures, or handling fluids not compatible with components materials, as noted in applicable HYPRO product catalogs, technical literature, and instructions. This warranty shall not apply to any pump, system or other product which shall have been repaired or altered to adversely affect the performance or reliability of the pump, system or other product.

Neither this warranty nor any implied warranty apply to damage or harm caused by any or all of the following: (1) Freight damage; (2) Freezing damage;(3) Damage caused by parts and/or accessories or components not obtained from or approved by HYPRO; (4) ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES, OTHER THAN INJURY TO THE PERSON, ARISING FROM THE USE OF ANY PUMP OR OTHER PRODUCT MANUFACTURED BY HYPRO EXCEPT in states that do not allow the exclusion or limitation of incidental or consequential damages; (5) Damage due to misapplication and/or misuse; (6) Normalwear of moving parts or components affected by moving parts.

The liability of HYPRO under the foregoing warranty is limited to the repair or replacement at HYPRO's option without charge for labor or materials of any parts upon return of the entire pump, system or other product or of the particular part to the HYPRO factory within the warranty period, at the sole expense of the purchaser,which part shall upon examination appear to HYPRO's satisfaction to have been defective in material and workmanship.

The liability of HYPRO under any theory of recovery (except any express warranty where the remedy is set forth in the above paragraph) for loss, harm or damage, shall be limited to the lesser of the actual loss, harm or damage or the purchase price of the involved pump, system or other product when sold by HYPRO to its customer.

HYPRO expressly warrants its pumps and other products as above stated. THERE ARE NO OTHER EXPRESS WARRANTIES. ANY IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO TWO YEARS FROM THE DATE OF PURCHASE BY THE ORIGINAL PURCHASER EXCEPT in states that do not allow time limitations on implied warranties. THERE IS NO IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY WHEN THIS PRODUCT IS PUT TO RENTAL USE.

No person including any dealer or representative of HYPRO is authorized to make any representation or warranty concerning HYPRO products on behalf of HYPRO, or to assume for HYPRO the obligations contained in this warranty. HYPRO reserves the right to make changes in design and other changes and improvements upon its products without imposing any obligations upon itself to install the same, upon its existing products then in process or manufacture.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

TROUBLESHOOTING GUIDE

Symptom	Probable Cause(s)	Corrective Action
Pumps runs but produces no flow	Pump is not primed	See PRIMING DIFFICULT PUMP section.
Pump loses prime, chattering noise, pressure fluctuates.	Air leak in suction hose or inlet fittings.	Remove suction hose and test for leaks by pressurizing hose with water. Make sure thread sealant has been used on all fittings.
	Suction line is blocked, collapsed or too small.	Remove suction line and inspect it for a loose liner or debris lodged in hose. Avoid all unnecessary bends. Do not kink hose.
	Clogged suction strainer	Clean strainer.
Pump runs for 8 to 10 seconds then shuts down.	Broken drive belt.	Replace broken belt.
	Incorrect wiring to speed sensor.	Inspect wiring and connection to speed sensor
	Sensor position incorrect.	Check to ensure that the speed sensor is within the proper sensing distance of 1/32" to 3/32" from the pulley teeth.
	Speed sensor not functioning.	Replace speed sensor.
Pump runs full speed whenever the Foam ON/OFF switch is in "ON".	Computer control module has been damaged.	
No characters are displayed on the digital display.	The main power switch is not "ON".	Turn on the the main power switch on the computer control module.
	Power fuse is blown.	Replace fuse.
	Digital display has been damaged.	Replace the digital display.
	Computer control module has been damaged.	Replace computer control module.
System is powered up and the Foam ON/OFF switch is in on but the foam pump doesn't run.	No water is flowing in any of the foam discharges.	Flow water.
	Flow meter wiring not correct.	Inspect wiring and connection to flow meter.
	Flow meter obstructed.	Clear flow meter of debris.
	Flow meter not functioning.	Replace flow meter.
	Float is on plunger wrong—indicating tank is low.	Remove the snap ring at the top of the plunger and remove the float, turn it over and reinstall.
	Float stuck on plunger—indicating tank is low.	Inspect and clean float switch.

TO PRODUCE FIREFIGHTING FOAM

1. Flip the foam switch to the "on" position and open a discharge valve that is connected to the foam system.
2. If the concentration rate of .5% is not suitable, adjust the percentage up or down with the rate switch toggle.
3. Place the mode switch in the GPM position to read flow of water/foam solution.

