



### INTRODUCTION

The Knight FoamGuard II Doorway Sanitizer is designed to lay down a blanket of sanitizing foam in doorways at periodic timed intervals. The unit draws concentrated chemical from a local source, dilutes it with water at a pre-determined rate, and produces a rich thick foam blanket on the floor that clings to the bottom of shoes or in forklift treads. Features include:

#### ***Sophisticated timer – “Smart” timer allows sanitation levels to be set by traffic load***

- A menu walks you through the programming steps in simple English. So easy, first time users understand right away and have no difficulties.
- Spray intervals and durations are set by the plant's shift times. Shifts can vary from day-to-day, or even schedule a shutdown on weekends.
- All the timing information from one day can be copied to another, making setup a snap.
- The optional audible/visual alarm activates five seconds *before* the unit sprays, allowing people to step away before their shoes get sprayed.

#### ***Two versions available***

- ▶ Foam Tube Version – Simple design for maximum reliability. The mixing and foaming chamber has no moving parts to wear out or break.
- ▶ Pump Driven Version – If low water pressure is a concern at the installation site, this version is for you. Because a pump is used to push the liquids, low factory water pressure should never be a concern. Standard with Santoprene elastomers, it is also available with Viton elastomers for aggressive chemicals.
- Dilute on-the-fly – Both versions utilize concentrated sanitizer chemicals and dilute with water as needed. No need to premix water and chemical in a bulky day tank that constantly needs to be refilled.
- Secure – Once you set it, forget it. The Knight FoamGuard II cannot get tampered with. The programming menu is password protected. All air and water adjustments are secure in a stainless steel enclosure under (user supplied) lock and key to prevent tampering.
- Sanitary and durable – The enclosures are constructed of powder coated stainless steel that won't collect dirt and debris and will look beautiful for years to come.
- Flexible – One FoamGuard II unit will spray one double-door (one nozzle on each side), or two single doors (one nozzle each), or one double-door *and* one adjacent single door (under many circumstances).
- Modular – If you primarily need Foam Tube versions, you may wish to have a Pump Driven version on hand, in case you run into an application where the water pressure is low. Because the units are modular, you only need to stock a Pump Module to make the swap.



**CAUTION: Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.**



**CAUTION: To avoid severe or fatal shock, always disconnect main power when servicing the unit.**



**CAUTION: When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.**



**CAUTION: Backflow preventer not supplied with FoamGuard II system. Please check with local plumbing codes and install appropriate backflow preventer as needed to prevent chemicals from contaminating water supply.**

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## Standard components

- One wall-mounted unit – either the pump-driven version or the foam tube version. Each wall units consists of a control module on the left, a hydraulic module on the right, both mounted on a common back plate.
- Single chemical draw kit – check valve, metering tip kit, 6 foot pickup tube, ceramic weight, and foot valve.
- Two discharge manifolds – foam nozzle mounted in an elbow attached to a 12 inch length of PVC pipe.

## Optional components

- Second chemical draw kit – allows for a second chemical to be educted simultaneously.
- Alarm – Visual and audible signal the doorway is about to be foamed in 5 seconds.

## INSTALLATION

- (1) Mount the FoamGuard II doorway sanitizer to a wall near the doorway. The unit will supply sufficient foam for one or two discharge nozzles (two supplied) under most conditions. This means you can cover one or two single doors; or one double-door with a nozzle on each side. Each nozzle should be no more than 40 feet of line length from the wall unit. See the installation diagram. on page 7
- (2) Optionally, a third discharge nozzle can employed, if all three nozzles are within 20 feet of the wall unit. This is useful where a people door is adjacent to a forklift door.
- (3) Mount the supplied foam discharge ell(s) at the doorway about 1" – 2" off the floor, pointing the nozzle(s) in a flat pattern to cover the distance across the floor.
- (4) Connect the ¾" NPT foam outlet to the discharge ell(s) with ¾" pipe or tubing (user supplied). Pay attention to line length to keep the foam spray balanced at each nozzle. Making an arch over a double door and placing a tee in the middle of the arch will keep the spray from becoming uneven across a double-door. If a third nozzle is used, a valve in the foam line (not supplied) may be needed to balance the foam delivery.
- (5) If the optional strobe alarm is used, mount it where it can easily be seen by people standing in the path of the foam spray.
- (6) Connect electricity, water, and compressed air to unit (see wiring diagram and system specifications, pages 7 and 8). Follow all electric and plumbing codes, paying particular attention to backflow prevention requirements.
- (7) If two chemicals are to be used at one time (for example, a non-foaming sanitizer and a foaming agent), then install the appropriate optional dual chemical draw kit.
- (8) Place the chemical concentrate(s) immediately beneath the wall unit. Using the metering tip chart below, install the appropriate color tip(s) in the check valve(s). Remember, the chart will only give an *estimate* of dilution rates. If exact dilutions are critical, measure the PPM of the foam and adjust the metering tip accordingly.
- (9) Measure the chemical pickup tube and cut to length so that the bottom of the pickup tube is at the bottom of the chemical container and not curling up. Attach to the barb of the check valve and secure with a zip tie.

### Metering tip dilution chart

Measured with water thin chemical. Results will vary with chemical viscosity and ambient temperature, so be sure to measure actual dilutions and adjust accordingly.

Tip Color	Chemical Flow, oz/gal	Chemical to Water Ratio
White	22.10	1:5.8
Yellow	21.52	1:6.0
Pink	19.84	1:6.5
Dk Green	15.92	1:8.1
Black	13.27	1:9.6
Brown	9.15	1:14.2
Gray	6.72	1:19.3
Blue	5.71	1:22.9
Red	4.36	1:30.0
Peach	3.36	1:39.6
Lt Blue	2.56	1:54.1
Purple	1.97	1:70.1
Lt Green	1.38	1:99.6
Orange	0.57	1:228
Lt Brown	0.55	1:220

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## OPERATION

The cycle of operation begins when the unit is powered up, or when exiting the programming mode. The display will show the current time and date on the top line, and the bottom line will show a 2 minute countdown until the unit begins foaming. When the 2 minute countdown expires, the unit will begin foaming for the foam time set for the current day and shift.

When the foam time is finished, the display will then show the time remaining (referred to as interval time) till the next foaming activation. The system will continue in this manner throughout the shift. As soon as the next shift starts, the system will count down for 5 seconds, and then will begin foaming for the foam time set for that shift.

### ***Foam consistency is based on...***

- Type of Chemical – Some chemicals are naturally more foamy than others. Chemicals that don't foam at all will require the addition of a separate foaming agent (surfactant). The dual chemical draw kit is used in this case.
- Chemical Dilution – Lightly dosed water may not foam well. Heavier concentrations of chemical-to-water may be needed in order to create a thicker foam.
- Air – This is adjusted with both the air pressure and air volume. The air pressure regulator is factory set at 40 psi. You may need to increase or decrease this, depending upon your water pressure. [Not necessary with the Pump Version.] The air volume is adjusted with the needle valve adjacent to the foam tube or foam tee. Opening the valve lets in more air, tending to make drier foam. Closing the valve creates wetter foam.
- Water Pressure – The air pressure needs to be lower than the water pressure to make foam. If the water pressure is too low (under 35 psi) in the Foam Tube version, no amount of adjustments will make the foam dry and thick. You need to install a Pump Version, or convert to Pump Version with a Pump Module.

Adjust the foam discharge ell(s) at the doorway to spray in a flat pattern to cover the distance across the floor(s).

## BUTTON FUNCTIONS

ENTER: Allows access into programming mode, logs data from programming menus.

SCROLL: Exits programming mode, exits the current menu item, moves the cursor on the display.

UP: Acts as a "yes" response to menu prompts. Increases the selected number or day.

DOWN: Acts as "no" response to menu prompts. Decreases the selected number or day.

**Important note:** While programming, the scroll button is used to revert back to the previous selection. For example, when you are making changes in a programming menu, press and hold the SCROLL button to go back to the original menu prompt. From any menu prompt, you can press and hold the SCROLL button to exit the programming mode and return to normal operation.

## DEFAULT SETTINGS

The system will have the following default settings when shipped new from the factory, or after loading default settings in the programming menus.

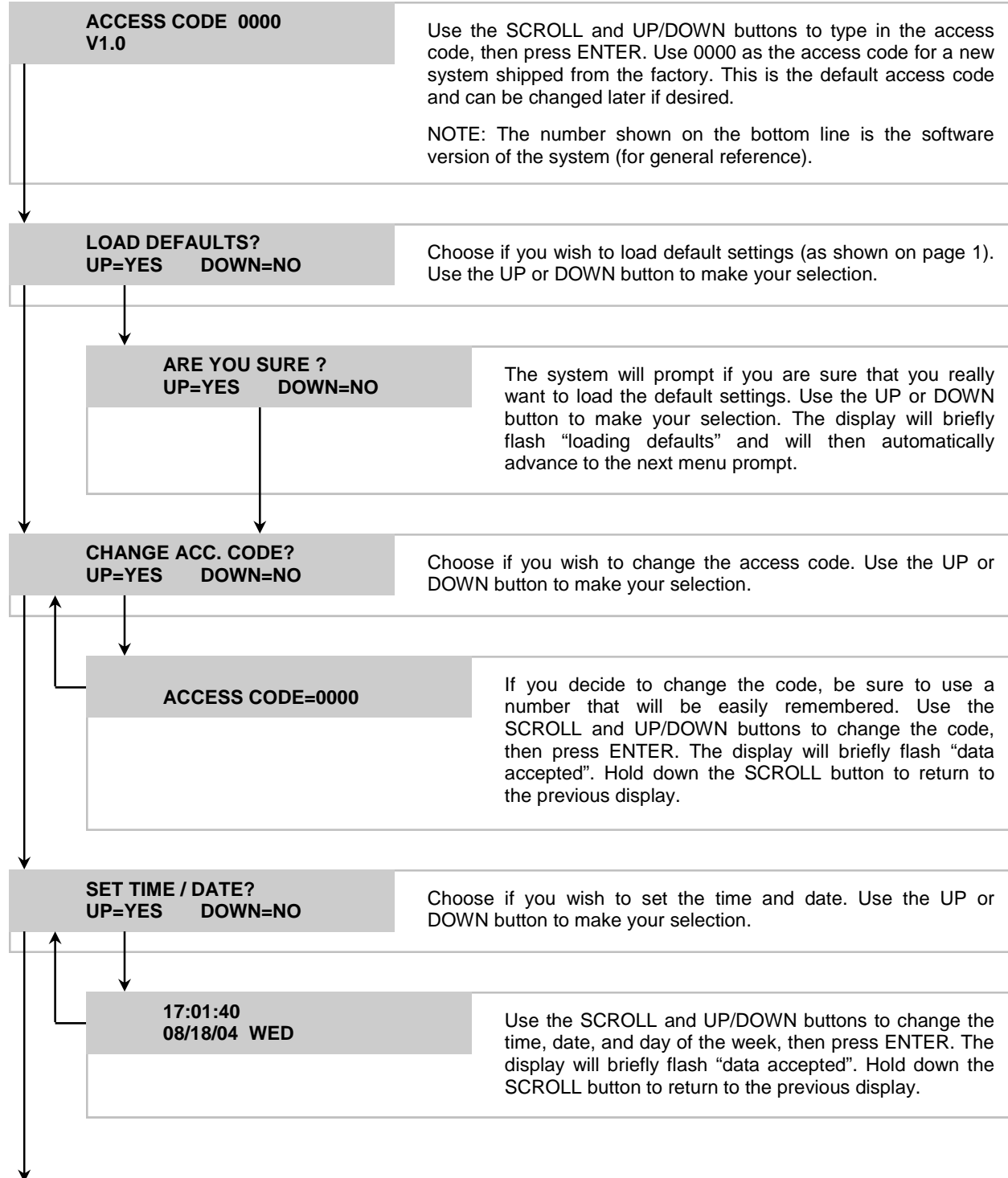
Shift times:	1 = 06:00	2 = 14:00	3 = 22:00
Foam times:	Monday - Friday (all shifts)	On for 30 seconds	Off (interval time) for 30 minutes
	Saturday & Sunday (all shifts)	Zero on time	Off (interval time) for 4 hours

**Important note:** Set the "on time" to zero for all days and shifts where you want the unit to be off.

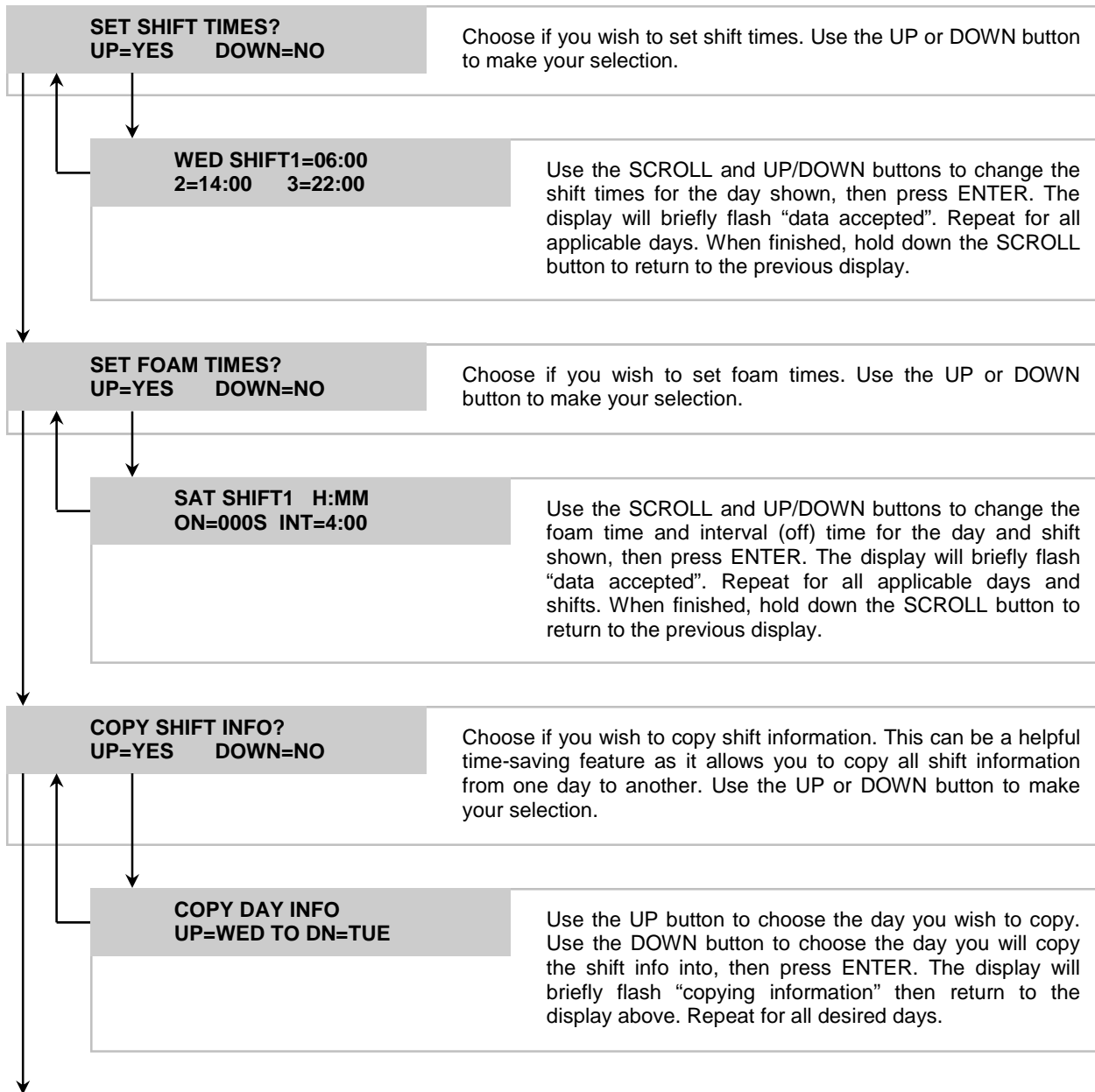
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## PROGRAMMING

To begin programming, hold down the ENTER button until you see the following display...



Continue on next page



When finished programming, you will return (wrap-around) to the very first menu prompt. From there, you can go back through all programming menu prompts as many times as you wish. To exit the programming mode, hold the SCROLL button until you see the normal operating display.

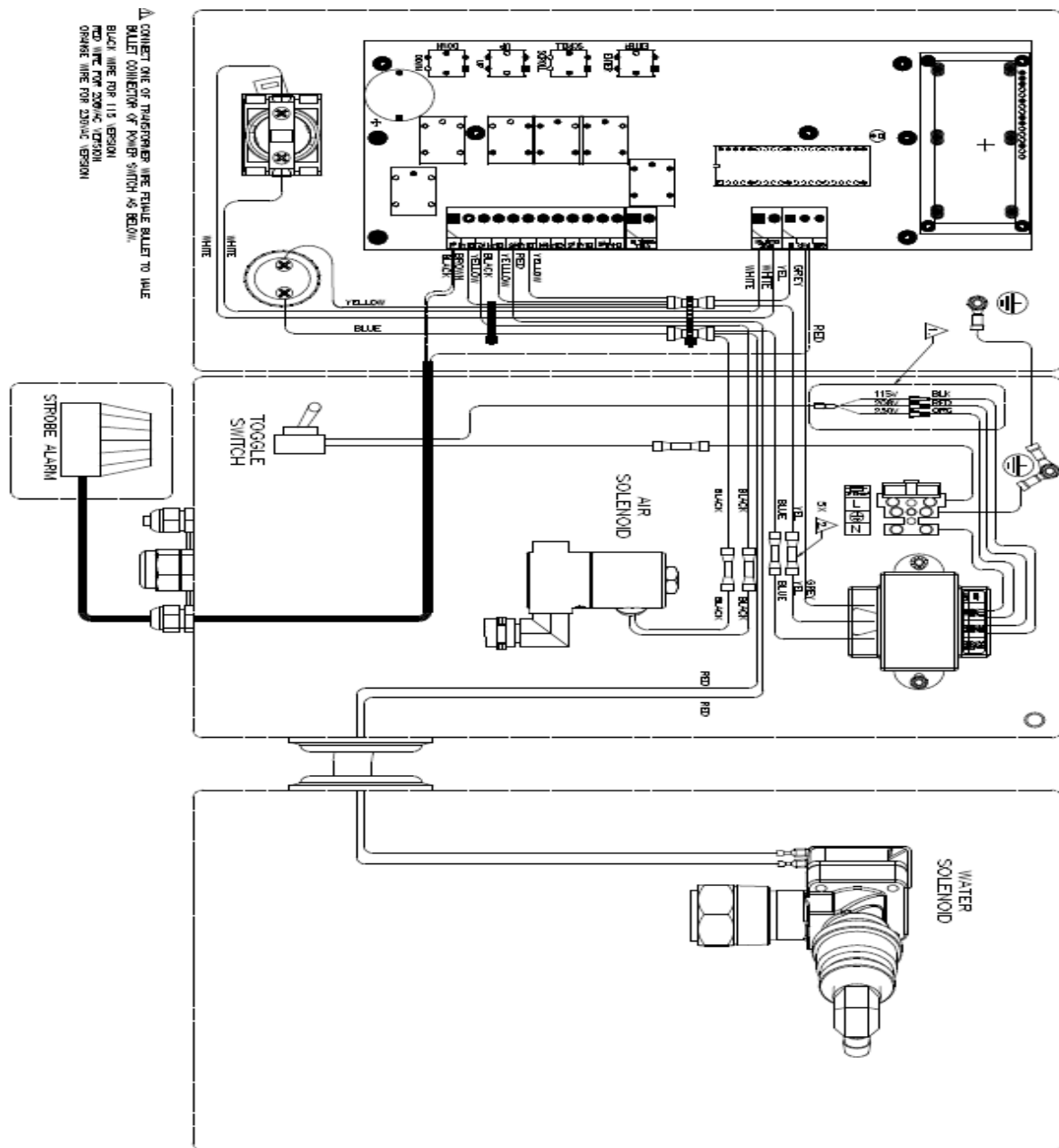
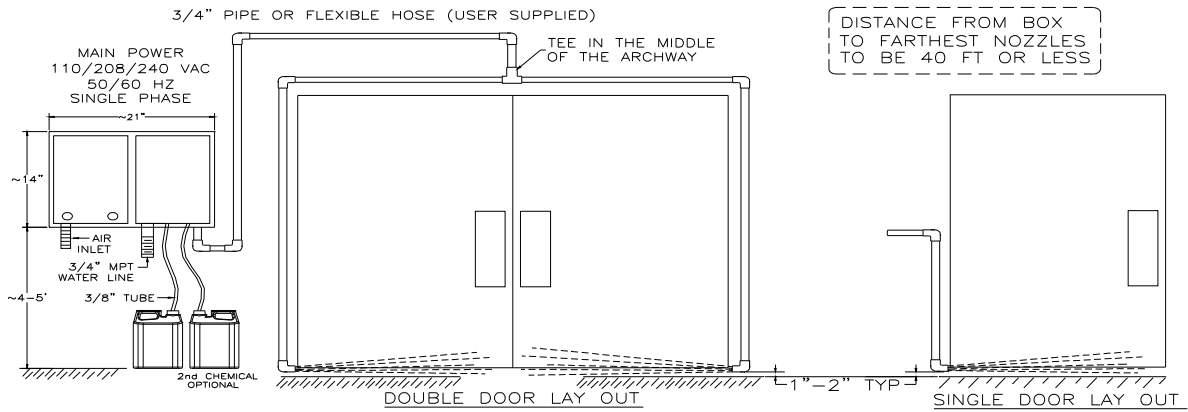
## TROUBLESHOOTING

Problem	Solution
Pump version will not stroke.	<ul style="list-style-type: none"> <li>• Check for 40 psi or more air pressure.</li> <li>• Check air regulator filter for obstruction such as water, oil, or debris.</li> <li>• Needle valve is opened too far. Close valve and reopen in a gradual manner.</li> <li>• Air passes through the pump without cycling. Repair or replace pump.</li> </ul>
Unit will not make foam	<ul style="list-style-type: none"> <li>• Check if out of chemical or pickup tube not immersed in chemical.</li> <li>• Pickup tube not tight or cracked (sucking air).</li> <li>• Make sure the correct foaming chemicals and concentrations are being used.</li> <li>• Adjust air ratio with needle valve and/or air regulator.</li> <li>• Metering tip is clogged. Rinse.</li> <li>• Check valve is clogged. Rinse.</li> <li>• Foot valve screen is clogged. Rinse.</li> <li>• Pump version foam tee packing is contaminated or degraded. Service the packing. See below.</li> <li>• Water pressure under 35 psi (Foam Tube version only). Increase water pressure or replace with Pump version.</li> </ul>
System doesn't start when supposed to.	<ul style="list-style-type: none"> <li>• Check to see if wired correctly.</li> </ul>
Foam tee packing is contaminated or degraded. Service the packing.	<ol style="list-style-type: none"> <li>(1) Be sure to turn off air to unit and open the cut-off valve on the discharge hose to remove backpressure on the unit.</li> <li>(2) Remove the hose barb from the discharge tee.</li> <li>(3) Remove screen retainer and packing from inside tee.</li> <li>(4) Clean any particles from the packing and the screen retainer.</li> <li>(5) Replace the packing and screen retainer into the tee and replace the hose barb fitting. Use a pipe thread</li> </ol>

## REPAIR PARTS

<u>Description</u>	<u>Qty</u>	<u>Part Number</u>	<u>Version</u>
Pump, 3 GPM, Santoprene Elastomers	1	1600956	Pump, Santoprene
Pump, 3 GPM, Viton Elastomers	1	1600957	Pump, Viton
Packing, SS	1	1900427	Either Pump Version
Screen, SS	2	1900862	Either Pump Version
Filter Regulator, Self Draining	1	7407014-10	Pump or Foam Tube
Solenoid Valve, Air	1	7640320-04	Pump or Foam Tube
Solenoid Valve, Water	1	7648915	Pump or Foam Tube
Metering Tip Kit, Without Chart	1*	2201200-1	Pump or Foam Tube
Check Valve, Chemical	1*	7901246	Pump or Foam Tube

\*Two are needed if dual chemical draw kit is used.



## SPECIFICATIONS

Parameter	Specification	Minimum	Maximum
Ambient Temperature		Above freezing	120 °F
Air Pressure	Dry and oil free	40 psi	100 psi
Water *Dynamic Pressure	Foam tube version	35 psi	100 psi
Water *Dynamic Pressure	Pump version	15 psi	100 psi
Water Temperature		Above freezing	120 °F
Power – Voltage	110/208/240 VAC		
Power – Frequency	50 or 60 Hz		
Power – Phase	Single phase		
*Dynamic pressure means the pressure when the unit is operating and water is flowing to the wall unit. Often the			

## DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

## WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as “O” rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.

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