

# **KNIGHT<sup>®</sup>**



***Fast Foam!*** <sup>TM</sup>  
*Detergent Foaming System*

## **Instruction Manual**



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## Introduction










The Fast Foam™ system is designed to automate the conversion of instrument detergent into foam and enable the application of detergent foam to medical devices in a safe and efficient manner for instrument reprocessing. This innovative new system includes operator friendly wand applicators to quickly and easily coat all external and internal instrument surfaces with detergent foam before bio burden has a chance to harden when the detergent foam is used as directed by chemical manufacturer's Instruction for Use (IFU). Fast Foam includes 2 wand applicators for use with instrument trays and instrument channels. The unique channel wand delivers foam into hard-to-reach instrument channels to start the pre-cleaning process before manual cleaning.

## Indication for Use

Fast Foam is intended to automate the conversion of liquid enzymatic and non enzymatic instrument detergents to foam. Foaming treatment chemistries are used for pre-cleaning and soaking of medical devices prior to manual cleaning. Foam treatments provide a great visual indication of instrument contact and can offer 360 degree coverage.

## Safety Symbols

Listed below are explanations of the safety symbols that appear either on the unit, in the instruction manual, or both. Please familiarize yourself with the meaning of each symbol.






	"ON" (power)
	"OFF" (power)
	Class II Equipment
	Operating Instructions
	Follow operating instructions
	Refer to instruction manual/ booklet
	General warning sign
	This device contains electrical and/or electronic equipment that must be recycled per EU Directive 2012/19/EU – Waste Electrical and Electronic Equipment (WEEE)
	Caution risk of electric shock or Attention Dangerous Voltage



## Safety Precautions

- Wear protective clothing and eye protection whenever operating this system.
- Wear protective clothing and eye wear when dispensing chemicals. Observe safe handling instructions (SDS) provided on chemical container or as supplied by chemical manufacturer.
- To avoid severe or fatal shock, physical injury, always disconnect main power when servicing the unit.
- When installing any equipment, ensure that all national and local safety, electrical and plumbing codes are met.
  - System is for indoor use only
  - Do not submerge or place in direct path of spray/moisture
  - System operates with safe 24 Volt DC power

## Specifications

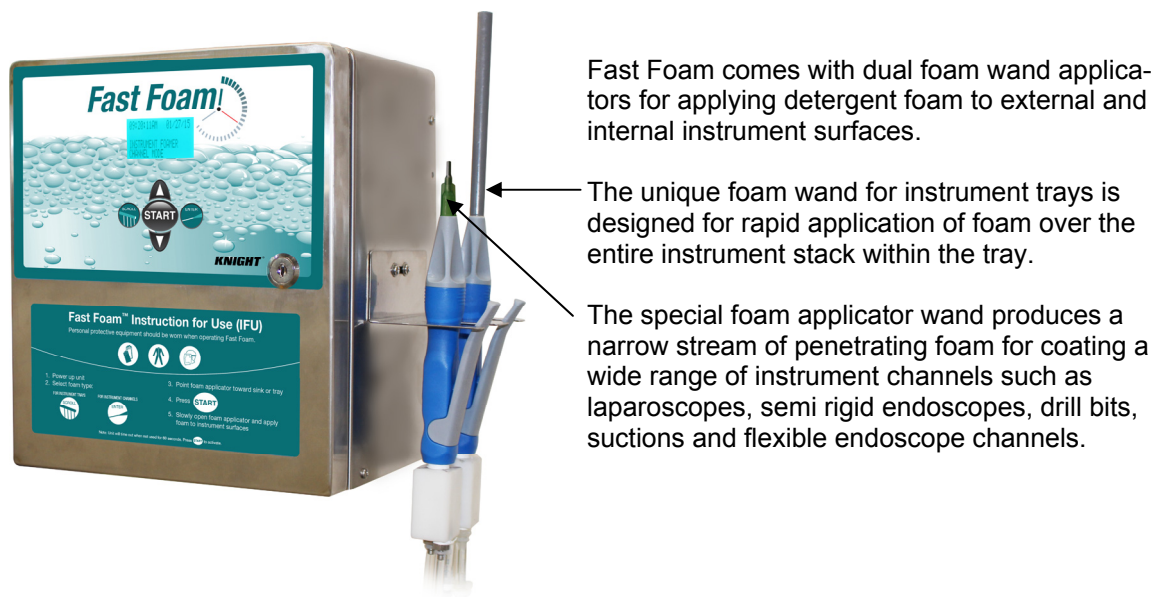
Dimensions	11 in (H) x 9.5 in (W) x 7 in (D) 28 cm x 24 cm x 18 cm
Dosing Pump Flow Rate	10-250 ml/min.
AC Power Supply/Voltage	Wall Mount Type: In: 100-240 Volts AC, 1.4-0.7A, 50-60 Hz Out: 24 Volts DC 2.5A  
Lithium Ion Battery	Chemistry: Lithium Polymer Out: 19 Volts 
Chemical Compatibility— Dose Pump	Industry standard detergents
Unit Weight	14 lbs, 6.4 kg with foam wands
Foam Wand Length/ Material	13 in (33 cm), ABS, PP, POM
Suction/Discharge Tube Length	8ft (243.84 cm) single lobe tube (suction) (2) 8ft (243.84 cm) dual lobe tube (discharge)
Electrical Safety	CAN/CSA-C22.2 No. 61010-1-04 UL Std. No. 61010-1 (2nd Edition)  

## Site Survey

- Before installing Fast Foam confirm with hospital staff where the best location for the system will be. Most often, a central collection point outside the operating rooms or in the sub-sterile area are best suited for surgical technicians or nursing staff to apply pre-treatment detergent foam. An optional IV stand mounting clamp can be purchased for users that prefer a mobile system.
- For facilities without convenient power or where a single system is shared between departments we offer an optional lithium ion battery pack and power supply for recharging the battery. Contact Knight or your supplier for more information.

## Fast Foam—What's Included

### The System



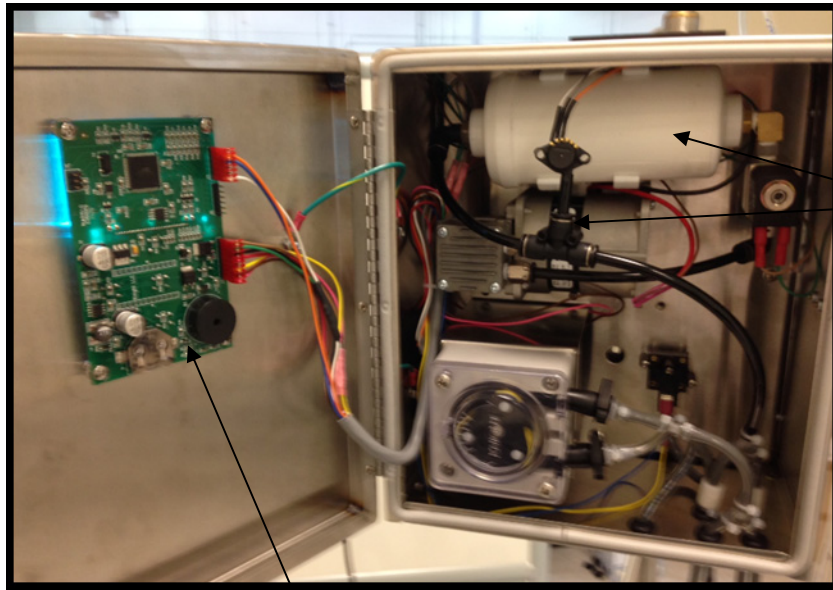
Fast Foam comes with dual foam wand applicators for applying detergent foam to external and internal instrument surfaces.

The unique foam wand for instrument trays is designed for rapid application of foam over the entire instrument stack within the tray.

The special foam applicator wand produces a narrow stream of penetrating foam for coating a wide range of instrument channels such as laparoscopes, semi rigid endoscopes, drill bits, suction and flexible endoscope channels.

### How it Works

At the press of the foaming wand trigger, Fast Foam pumps the detergent foam at the desired speed for channel or tray coverage to the wand applicator. The detergent foam meets with the desired air flow in the mixing chamber mounted on the bottom of the wand. Detergent and air then mix and agitate to the desired foam texture and exit the wand through one or the other tip applicator.



Compressor, air tank and air solenoid valve supply the detergent foam with the appropriate mixture of air to create the foam quality/consistency needed for your instruments

Advanced microcontroller manages the entire foam generation process including pump speeds, air compressor operation, air tank fill/refill cycles and pump on/off intervals

## **Foaming Wand**

For rapid tray coverage and dispensing of detergent foam into instrument channels



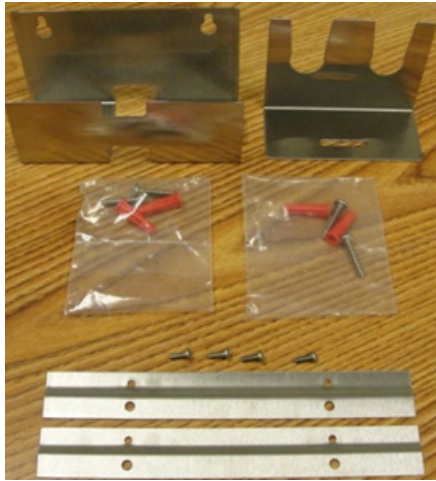
Tray Wand



Channel Wand

## Accessory Kit

The Fast Foam accessory kit includes power supply, power supply wall bracket, cabinet wall mounting bracket, foam wand bracket, extra wand channel tips, mounting screws and anchors.



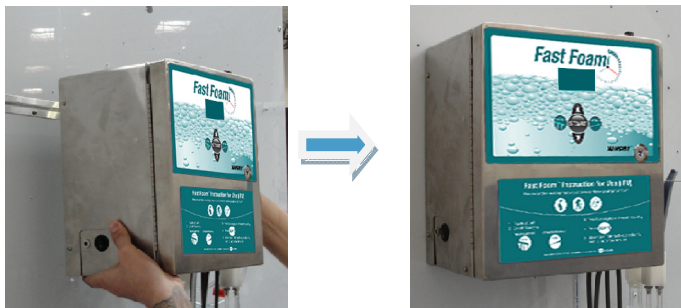
## Installation

### Wall Mount

1. Locate a flat wall surface within 10 feet of the foam application point and within reach of the power outlet to be used.
  - A. Install the wall bracket on the wall where the unit will go and place the corresponding bracket on the back of the case.



- B. Slide the system down to engage the joggle brackets and secure in place from the inside through hole with a sheet metal screw.





2. Install the power supply beneath or alongside the unit. Be sure the power lead that plugs into the power jack is not under constant tension.



3. The chemical suction tube is pre-assembled and tested with the system at the factory. This tubing can be shortened by removing the foot valve strainer and ceramic weight then cutting the excess tubing off or simply coil the excess tubing inside the cabinet.
4. Foam detergent supply containers should be located within 15 feet of the system for best response and fast priming.
5. Place the suction tube/weight/filter into the chemical container as shown. Make certain it sinks to the bottom of the container.



6. To assure the suction tube goes to the bottom of the container each time the bottle is changed cut a hole in chemical container cap, insert the suction tube and slide the tube to the bottom of the container.





7. Connect the power supply to the power port located on the left side of the cabinet and plug into a suitable wall socket.



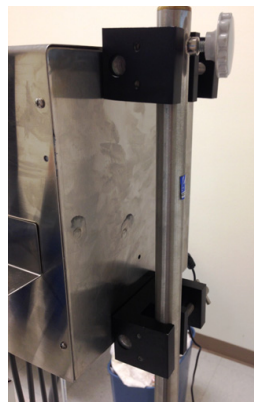
8. Install foaming wand bracket on side of the case as shown using the hardware provided.



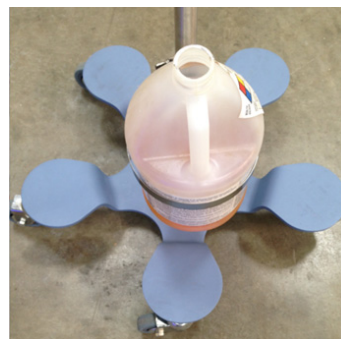
9. Place the foam wands in holder pointing upwards as shown.

## IV Stand Mounting

For complete mobility the Fast Foam can be mounted on an IV stand. Most facilities have extra IV stands that you can use. Knight offers an optional universal clevis clamp for mounting the unit on the stand. An optional one gallon bottle holder can be installed on the stand to provide a mobile source of foam detergent.



Specify part # 0300226  
for IV stand mounting  
clamp



## Programming Fast Foam

1. Turn power on to Fast Foam.  
The default screen should appear.
2. The ENTER key is the menu navigation key. Press and hold the ENTER key to move forward in the programming sequence. The screen will change to violet once you have programming access.
3. **Passcode** – the user code protects the system settings against tampering or accidental changes. Always program a unique user code in the system. From the factory the user code will be 0000. Press ENTER to gain access to program settings.
4. **Change Passcode** – use the SCROLL and UP/DOWN keys to program a new passcode. Press ENTER when finished.
5. **Set Time/Date** - use the SCROLL and UP/DOWN keys to program local time and date. Press ENTER when finished.
6. **Select Language** – use the SCROLL key to select English, German or French. Press ENTER to proceed.

01:33:29PM 02/07/15

INSTRUMENT FOAMER  
CHANNEL MODE



PRESS SCROLL TO  
ENTER PASSCODE

0000

PRESS SCROLL TO  
CHANGE PASSCODE

0000

PRESS SCROLL TO  
CHANGE DATE/TIME  
TIME 04:56:46 PM  
DATE 02-07-15

PRESS SCROLL TO  
SELECT WHICH  
LANGUAGE TO USE

ENGLISH

## Foam Quality

The density and durability of the foam and consumption of the detergent are controlled by the speed of the metering pump and the foam mixing/aeration process. Only trained technicians should attempt to adjust this setting.

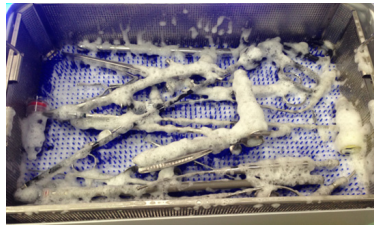
The foam settings should be programmed to achieve the desired foam density and durability (dry/liquid state) required to effectively pre-treat (or pre-soak) the range of instruments coming from the operating room. When foam detergent is used as directed by the chemical manufacturer's IFU, the instrument outer surfaces and channels can be coated completely to prevent hardening of blood and other biological contaminants that irreparably damage instruments or make them impossible to clean. Effective coverage of all surfaces prior to manual cleaning will reduce reprocessing time while preserving the condition of the instruments.

As a general rule the higher the pump dosing speed the more foam will be produced. More air pressure in the mix will produce larger foam membranes that collapse more quickly. Fast Foam is designed to produce high quality foams with any foaming instrument detergent over a wide range of use cost scenarios. Your chemical supplier is trained in the operation of the system and is most knowledgeable about the effectiveness of these chemistries and the settings required to treat your instruments.

Foam provides a great visual marker for where the detergent has been applied on the instrument surfaces. Care must be taken by users to avoid using too much foam that can lead to excessive chemical costs and wasted resource. The foam quality images below provide a visual guideline for proper foam application.



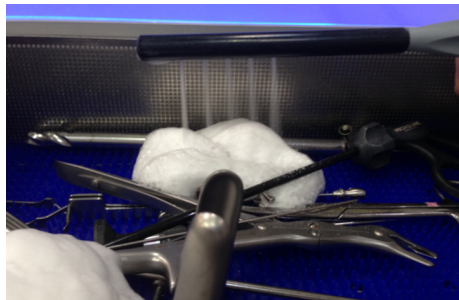
**Too Much**



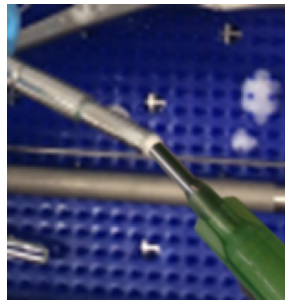
**Too Little**



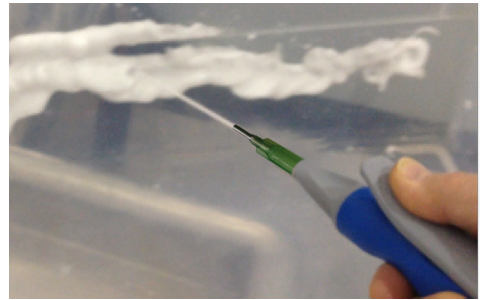
**Just Right**



**Tray Wand Foam Output**



**Channel Foam Output**



## 7. Set Foam Detergent Dosing Speed for Channel and Tray Modes

Factory settings will be 10% for Channel Speed and 50% for Tray Speed. Use the SCROLL and UP/DOWN keys to set the desired detergent dosing volume necessary to produce the foam quality desired. Higher pump speeds will produce wetter foams that are longer lasting. More detergent will produce more foam volume with dense foam membranes that cover instruments more effectively.

To achieve higher foam production for rapid tray coverage more detergent is needed to completely fill the tray wand applicator tube. Channel mode should run slower as the instrument surfaces are smaller and require lower volumes.



*Note: depending on your chemical makeup, channel speeds should be set no higher than 35-40% of full speed to avoid excess foam velocity and over usage. Some trial and error is required until you dial in just the right speeds.*

PRESS SCROLL TO  
ENTER PUMP SPEEDS

CHANNEL SPEED 010%  
TRAY SPEED 050%



## 8. Setting Min-Max Air Pressure

Use the SCROLL and UP/DOWN keys to set the minimum/maximum air pressure. Higher minimum/maximum air pressure settings will produce dryer foam with smaller bubble diameters and thinner membranes. Too much air pressure will cause “sputtering” of the foam stream coming out of the foam wand. Not enough air pressure will leave foams too wet and cause excess usage. A careful balance of the right pump concentrate speed along with the right air mixture will produce the foam durability and quality for your customer. For lean foam mixtures dial down the pump speeds and increase air pressure.

*Note: always maintain a maximum of 3 psi between Min Pressure and Max Pressure*



PRESS SCROLL TO  
ENTER CHAN.  
PRESSURE

MIN PRES 010PSI  
MAX PRES 012PSI

PRESS SCROLL TO  
ENTER TRAY  
PRESSURE

MIN PRES 020PSI  
MAX PRES 023PSI

FOAMING ACTIVE!

## Operating Fast Foam

In order to produce foam that safely and efficiently coat the exterior and interior channels of a surgical instrument, Fast Foam is designed to operate at two different speeds.

**Tray Mode** produces a higher flow of foam required to fill the tray foaming wand with sufficient foam flow for the five outlet holes in the wand.

To apply foam, hold the tray wand 3-5 inches above the instruments and move the wand over the instruments at a steady slow rate like using a spray can.

The further away you hold the wand the more air penetrates the foam and a drier condition results. The closer you hold the wand the more dense/rich the foam will be. Speed of movement over the tray will also determine final foam consistency.

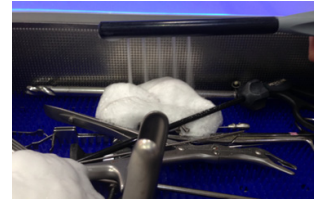
**Channel Mode** provides a lower flow of foam to coat the interior area of an instrument channel or passageway. Dosing foam into instrument channels will start the cleaning process upon contact and dramatically reduce the time to manually remove bio burden. Any blockages of the channel must be removed using a suitable brush in order for foam to penetrate the entire channel.

1. Select foam type.
2. Point the foam applicator toward the sink or tray.
3. Press START
4. Slowly open foam applicator and apply foam to instrument surfaces

NOTE: Unit will time out when not used for 60 seconds. Press START to activate.

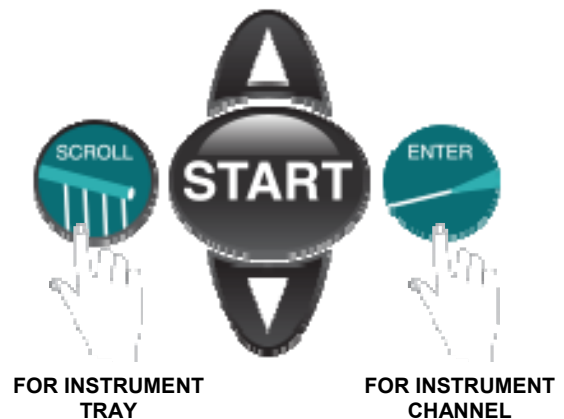
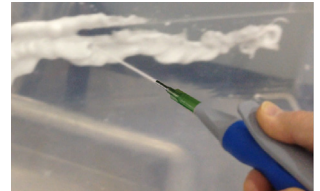
02:59:10PM 02/17/15

INSTRUMENT FOAMER  
TRAY MODE



02:59:10PM 02/17/15

INSTRUMENT FOAMER  
CHANNEL MODE



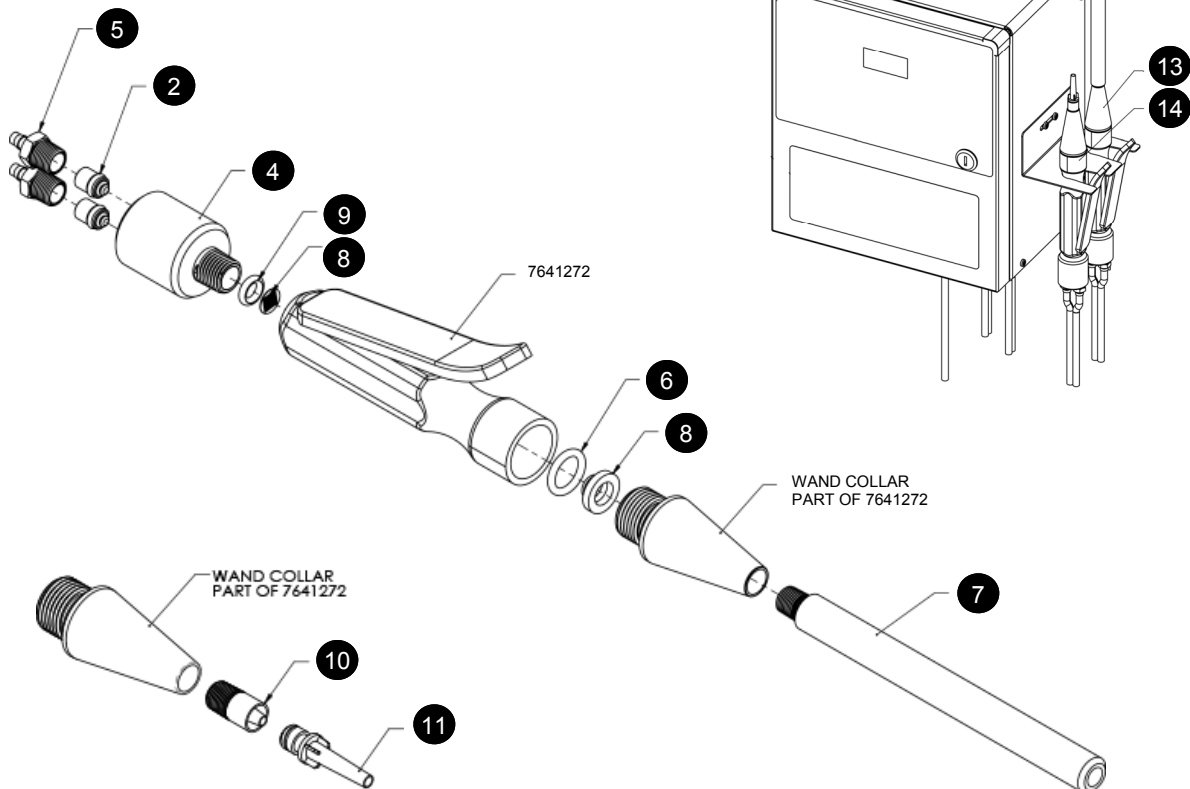
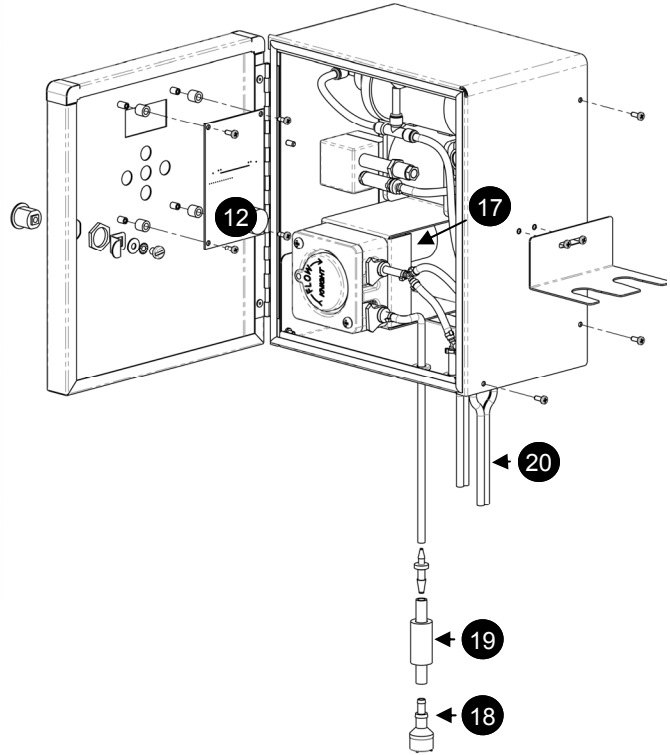
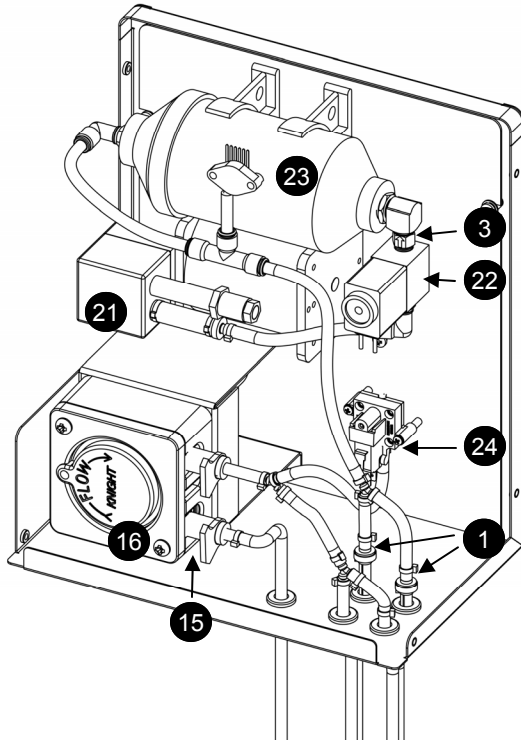


## Fast Foam Maintenance and Repairs

Fast Foam is designed to provide months of operation before maintenance is required. The only wear part in the system is the peristaltic pump tube and air/chemical check valves. The spare parts table below provides a complete listing of the spare parts needed for routine or emergency service.

	Item	Part Number	Wear Part (Y/N)	Recommended Replacement Interval
1	Check Valve, 1/8" x 1/8" barb (air lines)	7901253	Y	12 Months
2	Check valve, foam mixer, press fit	7901252	Y	12 Months
3	Check Valve, 1/8" NPTM, PVDF, Viton, air valve	7901254	Y	12 Months
4	Foam mixer body, 1/4" BSP, Acetal	6455016	N	
5	1/8 NPT x 1/8" barb fitting, foam mixer, PVDF	0600793	N	
6	O-Ring, Viton, foam gun nozzle	1500504	Y	12 Months
7	Tray wand foam tube	6455025	N	
8	Washer/screen, stainless steel, gun nozzle	7902228	Y	12 Months
9	O-Ring, Viton, foam mixer	1500505	Y	12 Months
10	Male Luer fitting, 1/8" MNPT x 7/16" Hex	0600788	N	
11	Channel applicator tip, Luer type	2201220	Y	2 Months
12	Microcontroller PCB, Fast Foam	7140842	N	
13	Foam Gun, Tray, complete assembly	7641273	N	
14	Foam Gun, Channel, complete assembly	7641274	N	
15	Pump Tube, T-50 E, EPDM	7018050-11	Y	
16	Pump Face Plate, 500 series	7502312	N	
17	Pump Motor, 24 VDC, 100 RPM	7010211-LC	N	
18	Foot valve, suction, EPDM	2201225-EP	Y	12 Months
19	Ceramic tube weight	0300519	N	
20	Dual lumen hose, air/chemical, 1/8" I.D. PVC	7026862	N	
21	Air Compressor, 24 VDC	1601061	N	
22	Valve, Solenoid 3-Way 24VDC, Air Flow	0200233	N	
23	Air Tank Assembly	1800979	N	
24	Pressure Switch, 20 PSI Cal	7407131	N	
25	Power Supply, 24V 2.5A 60W	2000526	N	
26	Power Cord, Australia, 1.8m	0300104-AU	N	
27	Power Cord, Europe CEE 7/7 8Ft	0300104-EU	N	
28	Power Cord, UK, BS1363 8 Ft	0300104-UK	N	
29	Power Cord, North America	0300104-US	N	







## Replacing Broken Applicators

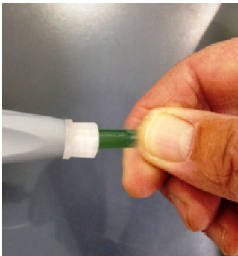
If your tray or channel wand applicators are damaged or worn follow these simple procedures to replace the damaged parts:

**Tray Wand** – should a foam tray wand break or become plugged during normal use, remove the upper section of the gray foam tube as shown. Be sure the system is powered down and that you have opened the gun to relieve any residual fluid pressure. Unwind the foam tube by hand and replace with the new foam tube being careful not to cross thread the two parts. Hand tighten with the wand openings pointing 180 degrees from the gun trigger (away from operator).



**Channel Tip** - should a channel tip break or become plugged during normal use, unscrew the pink tip by turning it counter

clockwise. Replace the tip as needed. Be sure the system is powered down and that you have opened the gun to relieve any residual fluid pressure.



## Replacing Foam

### Agitator Screen

Should the foam agitator screen become clogged, unscrew the upper section of the wand and remove the screen. Flush out the screen or replace as needed.

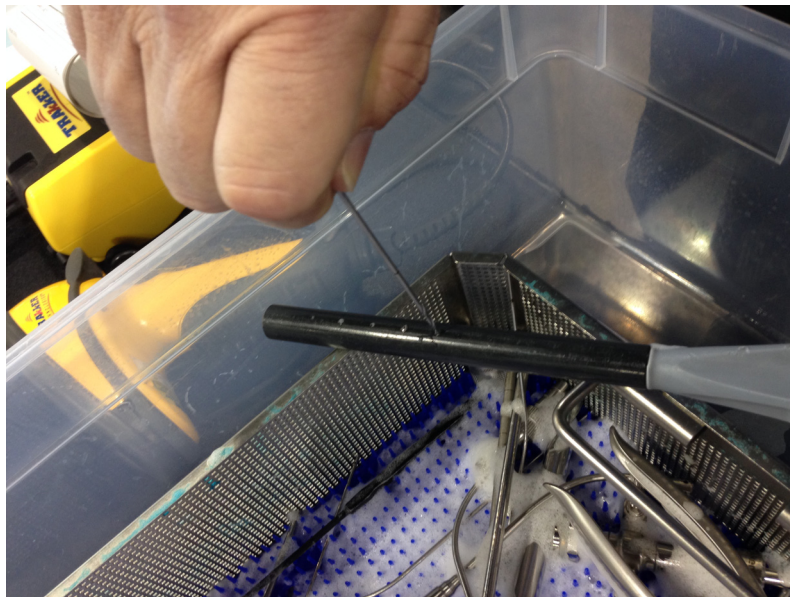


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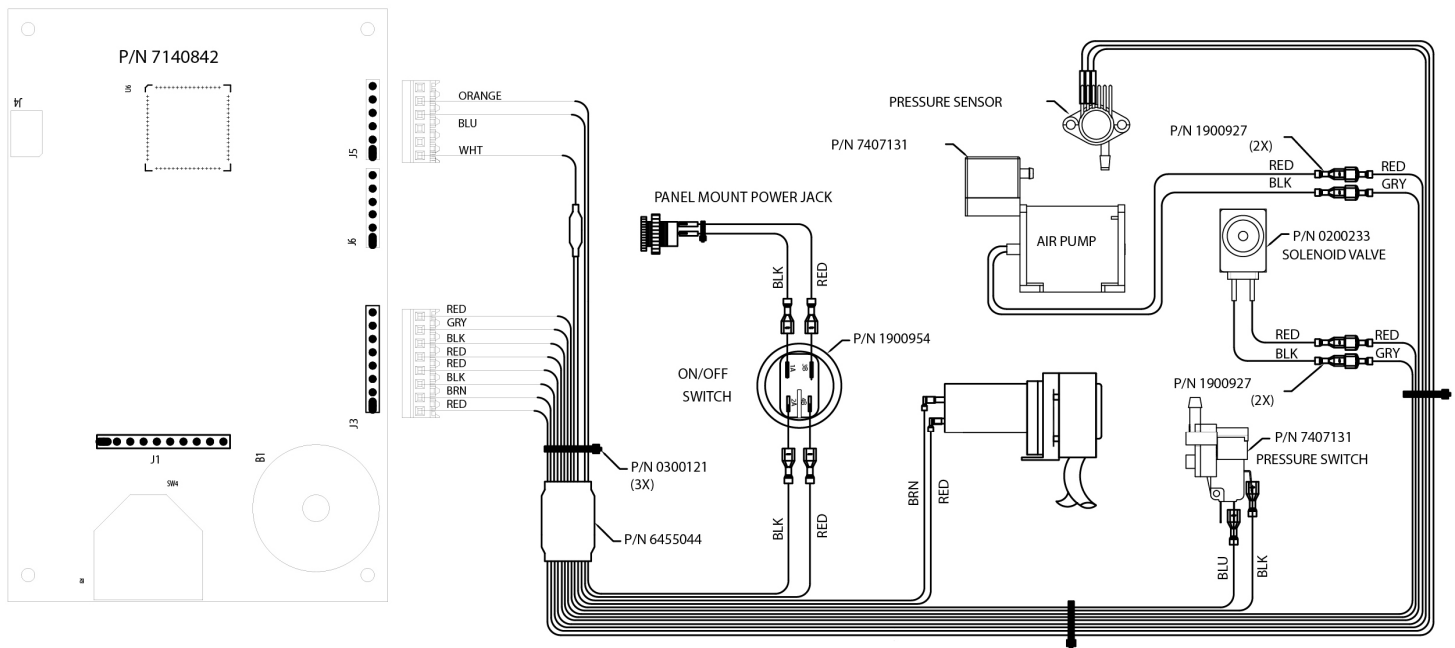
## Clearing the Spray Channel

If your foam wand should fail to spray through all five channels follow this procedure:

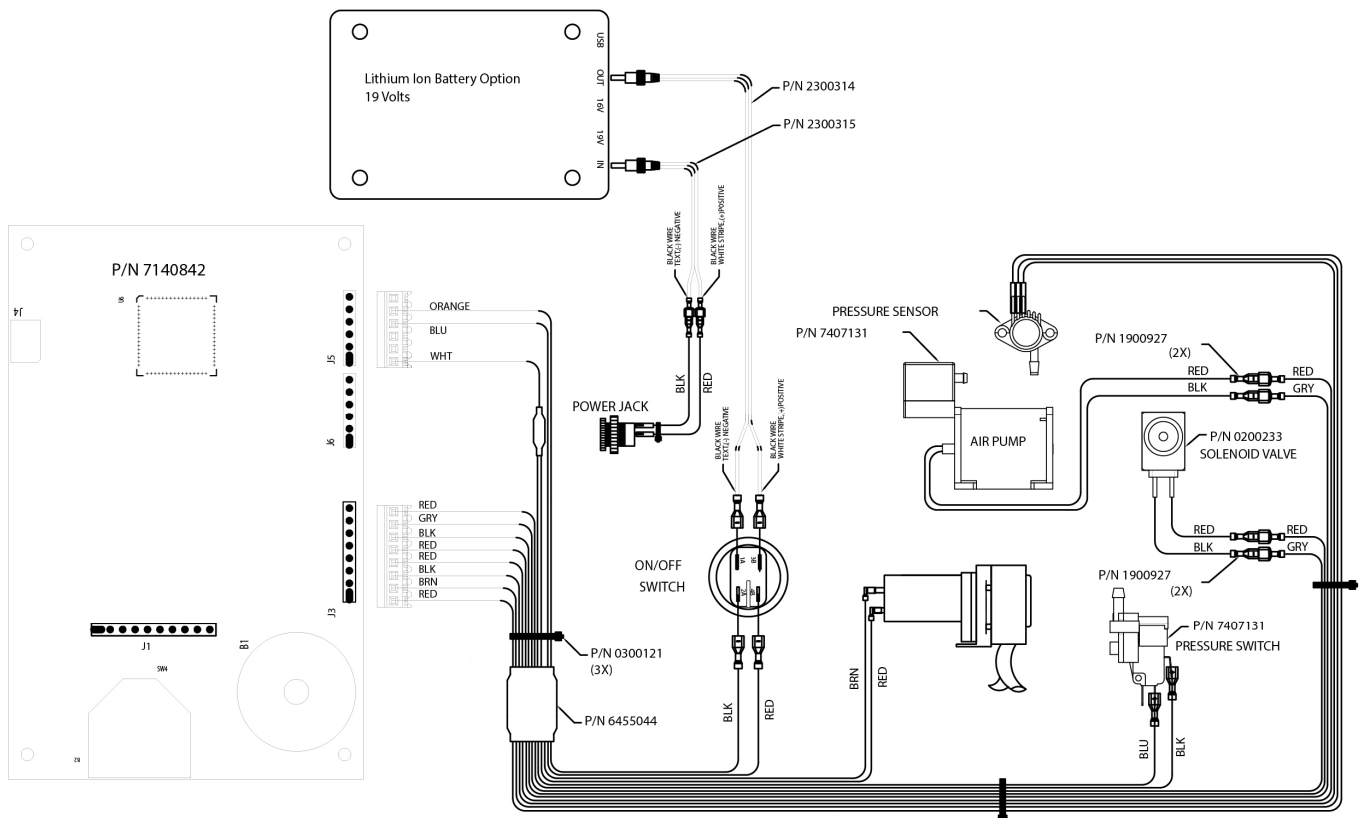
1. De-pressurize the unit by turning off the power to the unit.
2. Open the foam gun to release any retained foam into a sink or instrument tray .
3. Use a paper clip or small pointed instrument to clear the plugged channel by inserting the pointed end into the channel and rotating it a few times. Test the foam spray and repeat if necessary.



## System Wiring (AC Operation)



## System Wiring (Battery Operation)



## Troubleshooting

Problem	Solution
Foam is too wet	Increase min/max air pressure Reduce Channel/Tray speed Consult chemical supplier <u>Air pressure check valves faulty</u>
Foam is too dry	Decrease min/max air pressure Increase Channel/Tray speed Out of chemical Consult chemical supplier
Foam concentrate will not prime	Suction foot valve plugged Pump tube worn out Pump motor failure Circuit board failure <u>Foam mixer check valve plugged</u>
Foam tray wand will not produce consistent stream	Decrease min/max air pressure Increase Channel/Tray speed Out of chemical Replace foam tube Consult chemical supplier
Foam channel tip will produce consistent stream	Decrease min/max air pressure Increase Channel/Tray speed Out of chemical Replace channel tip Consult chemical supplier
Pump will not stop running	Out of chemical Leak in foam delivery line <u>Faulty pressure switch</u>
System will not produce foam	Faulty compressor Check compressor wiring Foam mixer screen plugged Foam mixer check valves plugged

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## **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.

## **FOOTNOTE**

The information and specifications included in this publication were in effect at the time of approval for printing. Knight, LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.

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