



## ***Installation manual for Holy Smokes Smoke System***

### INTRODUCTION

Thank You for purchasing the Holy Smokes Smoke System! Nothing adds more excitement to an aerobatic flight routine than a trail of thick, white smoke.

This product is the result of a three year collaborative development and testing effort with Danhaki Designs. At a weight of only 1.9 oz, it is designed to provide superior performance above anything available in the market today. It provides a variable & programmable flow rate via the brushless motor ensuring maximum smoke fluid vaporization. We've realized our ultimate goal: Eliminate the guess work of achieving remarkable smoke system performance. Every effort has been made to minimize the known variables providing repeatable results.

By adhering to these setup instructions, billows of lingering white smoke are the flip of a switch away. This setup has extensive field tested with years of modeling experience behind it.

### SMOKE SYSTEM SPECIFICATIONS

Brushless Motor, Adjustable Flow Rate  
Throttle to Smoke Mixing  
Length- 2.5 inches  
Diameter- 1.25 inches  
Weight- 1.94 ounces  
Input Voltage – 2-3 cell Lipo, 12.6v max  
Current draw 300-600mAh  
Pump requires no auxiliary battery & Plugs directly into your 2.4 GHz receiver for power



### INSTALLATION

Starting with the smoke tank, we highly recommend a 3 line configuration: a line for the pickup (clunk), a vent line and a fill line. A fill line that is bent toward the tank floor facilitates filling as well as draining the tank.

PAU Recommends the use of the PAU Clear Fuel Tanks for your smoke fluid





Hint: Drain your smoke tank at the end of your flying session and you might prevent an accidental slip & fall in that smoke fluid, slippery wet spot.



Caution: Do not use a filtered clunk on the smoke tank. The higher viscosity smoke oils have difficulty flowing past the filter.

## TANK PLACEMENT

It's ideal to install your smoke & gas tank(s) on the aircraft's center of gravity (CG). As fluid is consumed the CG remains stable throughout a flight. In reality, most ARF airframes today position the tank(s) in front of the wing tube to accommodate the canister muffler/tuned pipe tunnel below the wing tube.



## Pump Mounting & Placement

**\*\*Important \*\* Simple Gravity Physics to maintain pump prime\*\***

- Mount the pump behind the smoke tank.
- Position it at or below the same horizontal plane as your tank mount with the pump fittings vertically positioned.

Following these mounting instructions guarantees the pump will maintain its prime throughout the entire flight. It also ensures the pump remains properly lubed.

**The mounting kit provided with the Holy Smokes Smoke System includes:**

- (2) grommets
- (2) wood screws.

The two mounting tabs on either end of the pump housing are designed to accommodate a single grommet/mounting screw.

The mounting procedure is simple: Drill two 1/16" pilot holes centered on the mounting tab holes, apply a drop or two of thin CA to the pilot holes and mount the pump with the provided screws. Take care to allow a slight amount of movement. Vibration isolation is lost if the screws are fastened too tight compressing the grommet.

## **Ideal Smoke Pump Mounting Location**

## PLUMBING

The Holy Smokes Smoke System includes the following plumbing kit.

**It includes:**

- (1) Tee Fitting
- (2) Check valve(s) w/Viton Diaphragm
- (1) In-line filter w/ stainless steel screen
- (1) 12" length of Viton tubing.



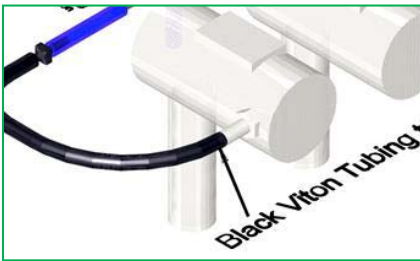
The top corners of the carbon fiber pump frame end cap are engraved with an "I" (upper left hand corner) and an "O" (upper right hand corner). The "I" input (left side barb of the gear pump) side is attached to the clunk line pickup tubing. The "O" output (right side barb of the gear pump) is attached to tubing headed to deliver smoke fluid the muffler(s).



**Install the provided in line Filter w/ Stainless Steel Screen on the tank's clunk line.** Please do not eliminate this critical installation step as the fluid must be filtered prior to entering the gear pump. Please be particularly careful to keep the smoke fluid as clean as possible. It is highly recommended that an additional inline filter be used on your smoke fluid storage can. As the gears of the smoke pump have tight tolerance even the smallest amount of contamination can jam the mechanism. **A CLEAN PUMP IS A HAPPY PUMP AND WILL PROVIDE MANY HOURS OF TROUBLE FREE OPERATION!**

**Install the provided in line Smoke Check Valve(s) on the smoke fluid delivery line to the mufflers.** The check valve(s) are critical components. They ensure instant smoke on/off smoke response without loss of pump prime. Assuming a twin muffler installation, use the two one way check valve(s) to transition between the provided high temp Viton tubing and the Tygon fluid delivery line (client sourced). You can verify the direction of flow with a blow test. Air will only move through the funnel shaped valve in one direction. The funnel shaped end should point toward the muffler.

Hint: high temperature tolerant tubing (Viton) is provided/required as low temp tubing such as Tygon will melt at the smoke muffler pressure fittings. Viton is provided/recommended over Neoprene as it has a much longer useful life. Neoprene eventually hardens and cracks. To ensure the high temp stays attached to the muffler, place a small piece of heat shrink tubing over the end of Viton at the muffler fitting to secure the connection. Small zip ties are also effective.



**Secure and route all tubing connections.** Take care to ensure the high temp. tubing is routed away from and will not chafe/rub the hot mufflers. Secure all tubing connections with a small zip tie. Hint:

**Caution:** Should you need to remove relieve undue stress on the reinforced plastic, undue force will pump barbs or fittings are not covered



any tubing, slice the end so as to component. The gear pump is fiber break the plastic fittings. Broken under warranty.

## WIRING

The Holy Smokes pump ESC has two leads (signal – black/white wires & power – red/black wires). The signal lead is plugged directly into the active port (e.g. Aux1) on your 2.4 GHz Receiver. The power lead can be plugged directly into any unused port on your 2.4 GHz Receiver (exception: bind port). It requires no auxiliary battery or external on/off switch. If desired an external 2-3S LiPo battery can be used to power the unit



**Caution:** If running a serial bus protocol setup (JR XBus or Futaba S.Bus) select a Pulse Width Modulation (PWM) vacant port or use a PWM conversion harness. The ESC relies on pulse width modulation (PWM) to determine its desired position.

## ESC PROGRAMMING

### INITIAL CALIBRATION

The Electronic Speed Control (ESC) is preprogrammed. However the throttle range must be calibrated initially as different transmitters have different throttle ranges. The procedure is simple.

**Throttle Range Setting: (Throttle range should be reset when a new transmitter is being used)**

- Turn on the transmitter, move the throttle stick to full throttle position.
- Turn on receiver/ESC power and wait for about 2 seconds.
- Two beeps "Beep-Beep" should be emitted indicating the full throttle range position has been correctly confirmed.
- Immediately move the throttle stick and trim tab to the lowest position. A single "Beep" tone should be emitted, indicating the lowest throttle range is correctly confirmed.

## TRANSMITTER PROGRAMMING

Detailed program sequences are beyond the scope of this document. Specific transmitter mfg. programming sequence instructions are added to the Holy Smokes Website (holysmokesrc.com) as they become available.

### MIXING THROTTLE WITH YOUR SMOKE CHANNEL.

The pump has an adjustable flow rate set via the transmitter through a program mix. By mixing the designated Aux channel (slave) to the Throttle channel (master), the throttle position determines the fluid flow rate. In this example the throttle is used to control the pump output volume and the gear switch is used to turn the pump on/off.

With the gear switch in the on position the smoke system is activated. Once activated, the smoke system turns on once the throttle stick is advanced beyond a set point (In Value). Fluid flow is regulated via an exponential output curve to smooth the response. Fluid flow will increase as the throttle is advanced and decrease as throttle is lowered. Depending on the sophistication of your radio the optimal flow rate can be set to achieve the optimal fluid vaporization throughout the full range of throttle positions.

Initial Radio Settings: Subtrim set to Zero. Servo Reverse set to Normal. ATV set to 100%. Program Mix - Throttle (master)/Aux1 (slave – Any channel you designate for smoke).

- Assign switch to PMix function.
- In “off” position Mix should be set to -100 across input from 0 (throttle stick at low) to 100 (throttle stick at high).
- In “on” position Mix should be set to -100 from 0 (throttle stick at low) to first point1 set at +15 (ensures pump will not run at idle)
- Point2 (throttle stick at high) set at +50 (decrease this number to decrease the pump output and inversely increase output up to +100 to increase pump output).
  - To fine tune the delivery of fluid based upon the throttle setting, any number of additional points can be set between the initial Point1 (pump start) and Point2 (pump full output).

TIP: It is best to start at a very low pump output value e.g. +30. The key to complete fluid vaporization is to only deliver what the heat of the muffler(s) can vaporize. Too much fluid; you end up with an oily mess on your airframe.

### NORMAL STARTUP PROCEDURE

- Turn on the transmitter, move the throttle stick to bottom throttle position.
- Turn on receiver power and a single beep should be emitted indicating the power input is OK.
- The pump is now ready for use.



## **Smoke System Warranty**

***Up in Smoke Enterprises, LLC - St. Louis, MO USA***  
holysmokesrc.com

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### LIABILITY EXCLUSION

**We expressly deny liability for damages which are caused by the device or arise through the use of the device.** Due to the variability of installations, Radio Control System maintenance and all other factors beyond our control, Up In Smoke Enterprises, Fourtitude R/C, or our Dealers assume no liability for loss, damages or costs which result from the use of this smoke system.

### WARRANTY INFO

- WARRANTY PERIOD - 1 year from the original purchase date.
- Coverage - defects of material or production faults.

### WARRANTY EXCLUSIONS

- Inappropriate handling e.g. to remove Tygon tubing from the pump fittings, slice the tubing first prior to removal. The gear pump is fiber reinforced plastic, undue force will break the fittings.
- Seized pumps caused by foreign material – Proper care to filter smoke fluid will eliminate this potential issue.
- Only use smoke fluid that is specifically used for Radio Control such as Aero Cumulous or Superdry.
- Modification or disassembly of the pump will void the warranty.
- Crash Damage
- Operator mistakes will not be covered under warranty.

Again, as R/C modelers we share your addiction to the hobby and want to count you as one of our raving fans. In the spirit of "Always Looking Forward", please do not hesitate to contact us with feedback of your user experience. Your suggested improvements will only make the product better. If you have any questions or concerns, please contact us via email at: [ktseiter@icloud.com](mailto:ktseiter@icloud.com)

**For all warranty claims or crash damage repair please send your damaged smoke pump with proof of purchase to:**

**Up In Smoke Enterprises**  
**c/o Kurt Seiter**  
145 Crescent Bluff Drive  
Eureka, MO 63025-1626 USA  
(636) 399-7764

We will respond at our earliest possible convenience with notification of warranty coverage/costs to repair the device. For non-warranty related effort, client acknowledgement is required prior to repair execution.

Thank You! We wish you many flying seasons of success with your new Holy Smokes Smoke System.