

DEGROFF AVIATION TECHNOLOGIES  
PITOTSHIELD V2™ with SMARTCOVER™ TECHNOLOGY

# ***PITOTSHIELD V2™***

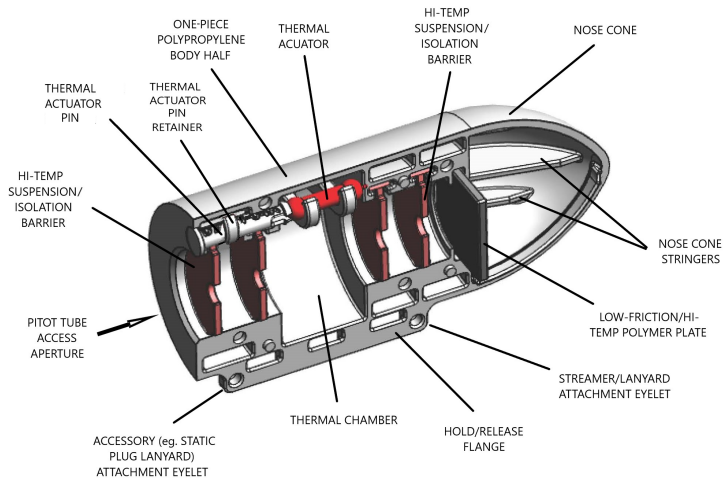
USER'S INSTRUCTION MANUAL

## **ATTENTION**

READ THIS ENTIRE MANUAL PRIOR TO USING  
PITOTSHIELD V2™ SMARTCOVER™



Scan for Digital  
Instruction Manual



## DEVICE DETAIL

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## Section i – DEFINITIONS

**PSV2** - Throughout this manual, PSV2 is synonymous with PITOTSHIELD V2™ SMARTCOVER™.

**WARNING** – Means that failure to follow the described action, or violation of or failure to follow prescribed procedure may result in DEATH or INJURY.

**CAUTION** – Means that failure to follow the described action, or violation of or failure to follow prescribed procedure may result in DAMAGE to equipment or subsequent failure of systems and/or components.

**ADVISORY** – Means DeGross Aviation Technologies has determined that a procedure or action has been deemed to be the most appropriate means of accomplishing a specified result.

## Section ii - WARNINGS - CAUTIONS – ADVISORIES

**WARNING!** PITOTSHIELD V2™ SMARTCOVER™ MUST BE REMOVED FROM THE PITOT TUBE PRIOR TO ANY OPERATION OF THE AIRCRAFT.

**WARNING!** VERIFY THE FIT OF THE PITOTSHIELD V2™ SMARTCOVER™ IS COMPATIBLE WITH THE AIRCRAFT'S PITOT TUBE PRIOR TO UTILIZATION OF THE COVER.

**WARNING!** PITOTSHIELD V2™ SMARTCOVER™ IS DESIGNED FOR USE ON ROUND (CYLINDRICALLY-SHAPED) PITOT TUBES ONLY.

**WARNING!** PITOTSHIELD V2™ SMARTCOVER™ AUTO-RELEASE FEATURE IS INTENDED FOR AIRCRAFT WITH PITOT HEAT SYSTEMS AUTOMATICALLY ACTIVATED (PASSIVELY) WITH NORMAL SYSTEMS OPERATION.

**WARNING!** IN THE UNLIKELY EVENT THE PITOTSHIELD V2™ SMARTCOVER™ DISENGAGEMENT ACTUATOR FAILS TO PROVIDE A TIMELY RELEASE, THE PITOT COVER COULD OVERHEAT RESULTING IN THE POLYMER BODY MELTING AND CONTAMINATING THE PITOT TUBE, RENDERING THE AIRCRAFT UNAIRWORTHY.

**WARNING!** IF THE PITOTSHIELD V2™ SMARTCOVER™ IS COATED IN SIGNIFICANT ICE, THE INTERIOR THERMAL ACTUATOR WILL OPERATE APPROPRIATELY, BUT RELEASE OF THE PITOT COVER CAN BE DELAYED DUE TO THE HEAT REQUIRED TO MELT THE EXTERIOR ICE. THIS DELAY CAN OVERHEAT THE PITOT COVER INTERIOR AND DAMAGE THE PITOT TUBE RENDERING THE AIRCRAFT UNAIRWORTHY.

**WARNING** – DO NOT ATTEMPT REMOVAL OF A SNOW OR ICE-CONTAMINATED PSV2 BY USING PITOT HEAT TO ACTIVATE THE HEAT-RELEASE MECHANISM. DOING SO MAY DAMAGE THE PITOT TUBE AND MAY RENDER THE AIRCRAFT UNAIRWORTHY.

**WARNING!** DO NOT CONSTRICT, BIND OR OTHERWISE ALTER A PSV2 IN ANY MANNER. IF THE SEPARATION OF THE PSV2 BODY HALVES IS IMPAIRED BY NATURAL OR ARTIFICIAL MEANS, THE THERMAL ACTIVATION MAY BE INEFFECTIVE IN REMOVING THE PITOTSHIELD V2 FROM THE PITOT TUBE.

**WARNING!** NO PITOT TUBE COVER CAN BE ABSOLUTE IN ITS PROTECTION OF THE PITOT TUBE. ALWAYS INSPECT THE PITOT TUBE FOR CONTAMINATION PRIOR TO OPERATING THE AIRCRAFT.

**CAUTION!** SERVICING A PITOTSHIELD V2™ SMARTCOVER™ AND ACCESSORIES MUST BE PERFORMED IN COMPLIANCE WITH INSTRUCTION MANUALS AND VIDEOS PUBLISHED BY DeGROFF AVIATION TECHNOLOGIES.

**CAUTION!** DEGROFF AVIATION TECHNOLOGIES RECOMMENDS COVERING THE PITOT TUBES WITH PITOTSHIELD V2™ SMARTCOVER™ PITOT COVERS WHEN THE AIRCRAFT WILL BE ON THE GROUND FOR MORE THAN TWENTY (20) MINUTES, PARTICULARLY IN CONDITIONS CONDUCIVE TO INSECT INFESTATION. IF THE AIRCRAFT WILL NOT BE FLYING FOR AN EXTENDED PERIOD, THE PITOT TUBE COVERS AND THE PITOT TUBES SHOULD BE INSPECTED FOR DAMAGE AND CONTAMINATION EVERY FOURTEEN (14) DAYS (AIRLINE OEM RECOMMENDATION) OR LESS IF STUPULATED IN OPERATIONS OR MAINTENANCE MANUAL. PITOT TUBES AND PITOT TUBE COVERS SHOULD BE INSPECTED FOR SECURITY, DAMAGE AND CONTAMINATION IN AN EVENT OF STEADY WIND OR GUSTS EXCEEDING 50 KNOTS.

**CAUTION!** DO NOT PLACE A PITOTSHIELD V2™ SMARTCOVER™ ON A PITOT TUBE WITH TEMPERATURE EXCEEDING 140 DEG F/60 DEG C.

**NOTE:** Recommendations in this manual regarding use of pitot tube covers are from DeGross Aviation Technologies and are advisory in nature. Always refer to applicable Aircraft Maintenance Manuals, Airplane Flight Manuals, Pilots Operating Handbooks, Aircraft Operating Manuals, and Flight Operations Manuals for guidance relevant to your particular operation.

## **SECTION 1 - ADS PROBE PROTECTION**

Today's commercial, corporate, and military turbine aircraft have complex Air Data Systems (ADS) with numerous sensors providing data to the flight instruments, digital processors, and pilots. Indeed, virtually every manned aircraft flying has at least one pitot tube as part of the ADS. The need for a properly functioning pitot tube is illustrated by the many aircraft incidents and accidents related to ADS malfunctions. Regarding the ADS, a properly functioning pitot tube is paramount and proper function is dependent upon an unobstructed pitot tube.

Contamination can lead to inaccurate ADS input and must be prevented. Pitot tubes have been shown to become contaminated from ice, snow, insect nests, spider nests, in-flight insect and bird impact and various other causes. When an aircraft is on the ground, pitot tube contamination can be avoided with the proper use of pitot tube covers. Always refer to Aircraft Maintenance Manuals, Airplane Flight Manuals, Pilots Operating Handbooks, Aircraft Operating Manuals, and Flight Operations Manuals for guidance.

Previously, there has been little System Safety Engineering technology to mitigate the human error of not removing pitot tube covers. If the pitot tube cover is not removed from the pitot tube, the cover itself now becomes the obstruction. PitotShield V2™ SmartCover™ will mitigate the risk of human error that exists with the use of conventional pitot tube covers.

## **SECTION 2 - REGULATIONS AND STANDARDS**

There are no US Federal Regulations regarding pitot tube covers. Two Defense standards apply to pitot covers. Those are: "SAE AS5778- Covers, Aircraft Components, General Requirements For", and "NAS1756 STREAMER, WARNING. These were formerly two 1970's Milspecs (MIL-5778D and MS 51700 respectively) superseded in the 1990's, and continuing under SAE unchanged for nearly 50 years. Generally, pitot cover design is unchanged for nearly a century. Pitot covers remain basically a fabric covering protecting a critical flight system. DeGross Aviation Technologies does not advocate for increased regulation. But if new technology is available to solve long-standing human-error related issues that affect maintenance, operations and safety, it is incumbent upon industry to adopt this solution as a new standard.

## **SECTION 3 - STRUCTURAL AND FUNCTIONAL OVERVIEW**

NOTE: PITOTSHIELD V2™ SMARTCOVER™ is designed for use on round pitot tubes. The Standard Size PITOTSHIELD V2™ SMARTCOVER™ will fit approximately 90% of all turbine aircraft round pitot tubes. It may be the only size many operators need for accommodating their entire fleet. There are a few pitot tubes with dimensions outside those optimal for the Standard Size. For those we have a Short and a Large size option. Refer to Section 10, page 12 for illustrated Application/Fitting details.

## General Design Aspects

The innovative PITOTSHIELD V2™ SMARTCOVER™ is a thermal-reactive pitot cover designed to self-remove from the pitot tube after inadvertent pitot heat application. The PSV2 utilizes an internal mechanism allowing a smooth, easy application, yet maintains an increased firm grip on the pitot tube. This system also allows for one size to fit most turbine aircraft pitot tubes. Additionally, where most conventional pitot tube covers can be a significant challenge to apply to a pitot tube located high and out of reach on an airframe, the PSV2 Telescopic Installation/Removal Tool makes this process very easy with the PSV2's innovative firm polymer body design and large opening into which the pitot tube tip inserts. Where many pitot tube covers are not heat-resistant and can melt onto a pitot tube when heat is applied, PSV2™ contacts the pitot tube in only four small areas around the pitot tube and at the tip using high-temperature materials that will not melt.

## Structure/Function

(See page two for visual reference)

The PITOTSHIELD V2™ SMARTCOVER™ consists of two major components. First are two, recyclable polymer body halves mated somewhat like a clamshell. The second component is a replaceable proprietary high-visibility reflective Remove Before Flight (RBF) Streamer with a Polyamide nonmetallic attachment. Additionally, a NAS/SAE Standard RBF Streamer is an option.

Within the mated body halves is a patented heat-resistant suspension/isolation system. The suspension/isolation system has five distinct functions: 1. Four isolation barriers suspend the polymer body from the potentially hot pitot tube to prevent melting of the polymer should pitot heat be applied to the pitot tube. 2. The barriers hold the pitot tube tip against a patented flat, protective temperature-resistant fluoropolymer plate to ensure no contamination into the pitot tube tip. Flexing of the isolation barriers during installation results in the need during removal for increased force sufficient to reverse the barriers. This function is maintained even when water-saturated. 3. The physical flexibility of the suspension system facilitates one size pitot cover fitting numerous sizes and shapes of pitot tubes. 4. The isolation barriers form a thermal chamber within the body surrounding the pitot tube. Within this chamber is a release actuator which, upon reaching a specified temperature, will trigger release of the two body halves. 5. Simultaneously with release of the two body halves, the isolation barriers aid their separation and the pitot cover components to fall free from heated but undamaged pitot tube.

Additional features of the PSV2 are the eyelets on either end of the lower hold/release flange. One eyelet is the attachment point for the RBF Streamer while the other can be an attachment point for lanyards from static plugs and/or AOA covers to augment ADS system protection.

An additional feature of the PITOTSHIELD V2™ SMARTCOVER™ is an optional Detaining Bridle available to be used within the maintenance area. The high-temperature, universal-fit bridle suspends a thermally ejected PSV2 from the pitot tube, preventing the separated components from falling into the maintenance environment. **See SECTION 5 - WHEN TO USE PITOTSHIELD V2™ SMARTCOVER™- SPECIAL APPLICATION IN MAINTENANCE**

## SECTION 4 - SAFETY ASPECTS

1. The PITOTSHIELD V2™ SMARTCOVER™ has been developed in response to industry requests for a “fail-safe” turbine aircraft pitot cover available in one size that fits many different pitot tubes. With systems safety engineering in mind, PITOTSHIELD V2™ SMARTCOVER™ has been developed to protect turbine aircraft from pitot tube contamination.\*
2. If the PITOTSHIELD V2™ SMARTCOVER™ is not removed prior to aircraft operation, it will disengage from the pitot tube within minutes of pitot heat activation\*.
3. One size of PITOTSHIELD V2™ SMARTCOVER™ fits nearly all diameters of round pitot tubes, thus assuring availability of pitot tube protection nearly everywhere an airplane flies.
4. PSV2 SmartCover(tm) has a stable, firm fit on the pitot tube, increasing its grip if agitated by wind or jet blast. There is no metal in the PSV2 body to cause a metallic hazard condition.
5. The DeGross Aviation-designed International Orange REMOVE BEFORE FLIGHT Streamer utilizes the highest visibility colors for daytime recognition and is accompanied by a retro-reflective band for night visibility. Optional NAS/SAE STANDARD red streamers are also available.
6. Testing showed the PITOTSHIELD V2™ SMARTCOVER™ will remain in place in direct tailwinds up to 60 kts, owing to its unique gripping concept and the characteristics of a specifically designed RBF streamer. Testing of headwinds showed stability exceeding 90 kts and cross-winds exceeding 80 kts.

\*see limitations in Section 10 – LIMITATIONS OF PITOTSHIELD V2™ SMARTCOVER™

## SECTION 5 - WHEN TO USE PITOTSHIELD V2™ SMARTCOVER™

The PITOTSHIELD V2™ SMARTCOVER™ should be applied to the aircraft in compliance with the Aircraft Maintenance Manual, Airplane Flight Manual, Flight Operations Manual, or other protocol defined for your operation. In general, particularly in conditions conducive to insect infestation or other contamination, pitot tubes should be covered when an aircraft will be on the ground for more than twenty minutes.

**SPECIAL APPLICATION IN MAINTENANCE:** Research and experience shows that the most common setting for damage to pitot tube covers and pitot tubes is from pitot heat activation within the maintenance environment. Some operators and maintenance facilities establish strictly defined FOD tolerances and request a feature to prevent a thermally-activated PSV2 from falling to the maintenance area floor or otherwise becoming a hazard. In response, DeGross Aviation has developed PSV2 versions with a replaceable universal-fit detaining bridle to be used within the maintenance environment. This solution secures the PSV2 components to the pitot tube after a thermal-actuation. Further information is available at [DeGrossAviation.com](http://DeGrossAviation.com).

**CAUTION:** DO NOT PLACE A PSV2 ON A PITOT TUBE WITH TEMPERATURE EXCEEDING 140 DEG F/60 DEG C.



## SECTION 6 - INSPECTION AND MAINTENANCE

**NORMAL SERVICE INSPECTION:** Inspect the PITOTSHIELD V2™ SMARTCOVER™ for any damage or contamination prior to installation and after removal. Examine the exterior for any distortions, cracks, evidence of surface contact with significant oil, grease, and other debris that could affect its function. The interior should be viewed to the extent possible for debris or contamination. Any contamination within the body should be cleared by shaking the cover with the open end down. The assembled body is not 100% waterproof. Some liquids can seep through the body junctions and drain out the bottom. If oil or grease is present internally, the ability of the silicone suspension/isolation barriers to hold the PSV2 in place could be compromised. The interior can be flushed with water/detergent or degreaser, followed by draining and shaking open-end down and/or blowing excess water or solvent out with compressed air. Aircraft De-greasers and most solvents are safe to use for the exterior and interior.

**INSPECTION FOLLOWING THERMAL ACTUATION:** Clean as above and inspect each activated PSV2 (and each Detaining Bridle if attached) for damage. Read **SECTION 9 – ACTIVE DISENGAGEMENT**. If there is any damage to one or both PSV2 body halves, replace the PSV2 with new. If there is thermal degradation\* of the contact areas of the PSV2 Silicone Discs and/or the contact area of the Detaining Bridle, replace Silicone Discs (Kit PN 77-SDRK\_1) and/or Bridle (PN 77-DBU1). If there is no damage to any components of the PSV2, the interior and exterior can be cleaned as described in **NORMAL SERVICE INSPECTION** above. It can then be returned to service following the instructions included with the PITOTSHIELD V2™ Field Service/Recharge Kit (PN 77-TBDRK01) and Universal-Fit Detaining Bridle (PN 77-DBU1) if applicable.

\* Thermal Degradation is characterized by crystallization or powdering and/or cracking of the silicone in areas of contact with the pitot tube, particularly at corners and represents a non-serviceable component.

## SECTION 7 - INSTALLATION/REMOVAL OF PITOTSHIELD V2™SMARTCOVER™

Installation starts with using the correct size PITOTSHIELD V2™ SMARTCOVER™. The PSV2 is intended for protection of conventional round tube-type pitot tubes. As discussed in SECTION 3, the Standard Size fits 90+% of pitot tubes. Unusually short or large diameter pitot tubes can be fit with our Short or Large versions. Typical tapering of a pitot tube and other irregular shapes such as bulges will not affect the functioning of the PSV2. If the cover slides off with between 29 oz (0.8 kg) to six lb (2.7 kg) of force, the PITOTSHIELD V2™ SMARTCOVER™ will function as intended. Above six lb (2.7 kg) or more of removal force indicates a too large pitot tube for the size PSV2 being used. This will result in difficult removal if using the Install/Remove Device fully extended, and may damage the internal silicone suspension barriers of the PSV2.

To install the PITOTSHIELD V2™ SMARTCOVER™, place the cover on the pitot tube in the conventional manner by lining up the cover WITH THE RBF STREAMER ATTACHMENT AT THE BOTTOM, such that the pitot tube will enter the rearmost silicone suspension/isolation barrier. Three more barriers (two with the Short Version) will center and guide the PSV2 in place. Continue sliding the cover until a hard stop is felt. At this point, rotating the PSV2 slightly clockwise/counterclockwise, WITHOUT ADDING FORCE will initiate a stable, firm but gentle seating of the tip of the pitot tube against the high-temperature butt plate and ensure shielding of the pitot tube from contamination. If the unit is agitated by high winds the RBF flag will nudge the PSV2, but this dynamic will actually act to keep the cover well-seated with the pitot opening protected. If applicable, place attached static port plugs and/or AOA covers after seating the PSV2, assuring that the lanyards do not interfere with the seating or functioning of the PSV2.

To remove the PITOTSHIELD V2™ SMARTCOVER™, simply grasp the body and move it forward off the pitot tube. Note that a significant force will be needed for initiating release from its seat against the butt plate, followed by a lesser force as the cover is removed. See **NOTE** below if using optional Detaining Bridle. Follow removal with inspection of the pitot tube and inspection of the PSV2 and address appropriately.

**NOTE:** DO NOT REMOVE PSV2 BY GRASPING THE RBF STREAMER. DAMAGE TO THE PSV2 COULD OCCUR.

**NOTE:** IF USING THE OPTIONAL MAINTENANCE ENVIRONMENT DETAINING BRIDLE (PN 77-TBU1), DO NOT REMOVE THE BRIDLE BY PULLING ON THE PSV2 BODY or RBF STREAMER. DOING SO CAN RESULT IN FAILURE OF THE BRIDLE. FIRST, REMOVE THE PSV2 BODY by hand FROM THE PITOT TUBE, LEAVING THE BRIDLE ATTACHED AND LETTING THE BODY HANG FROM THE BRIDLE. NEXT, REMOVE THE BRIDLE BY GRASPING IT WITH TWO HANDS ON EITHER SIDE OF THE PITOT TUBE AND PULLING STRAIGHT OFF.

**NOTE:** DO NOT ATTEMPT REMOVAL OF PSV2 AND/OR DETAINING BRIDLE BY PULLING ON THE RBF STREAMER. DOING SO CAN RESULT IN FAILURE OF THE BRIDLE.

**ADVISORY:** For pitot tubes not within reach, utilize the PITOTSHIELD V2™ Installation/Removal Device Kit (DeGroff Aviation Technologies P/N 77-7801CK). DO NOT USE IF DETAINING BRIDLE OPTION IS IN USE.

## SECTION 8 - STORAGE OF PITOTSHIELD V2™ SMARTCOVER™

PITOTSHIELD V2™ SMARTCOVER™ while durable, is designed to be low-mass, frangible and with the DeGroff Aviation Proprietary Hi-Vis RBF Streamer, has the highest visual-detection colors to minimize FOD hazard.

The device should be stowed within the protected environment of the aircraft or other suitable area of moderate temperature when not installed on the pitot tube.

## SECTION 9 – ACTIVE DISENGAGEMENT\*\*

Typically, within two to five minutes after activation of pitot heat, a PITOTSHIELD V2™ SMARTCOVER™ left on the pitot tube will activate. The PSV2 will disengage and drop from the pitot tube. If the setting is in maintenance and a Detaining Bridle option is in place, confirm the pitot tube is cool and remove the bridle from the pitot tube using two hands as described in the PitotShield V2™ Detaining Bridle Instructions and/or video. There will be two separate body halves, one with the RBF streamer attached. There will be three drops (0.15ml) of a non-toxic water-miscible liquid liberated inside the cover halves and some tiny gravel-like particles of glass. Safely collect the components and confirm the Thermal Actuator Pin is in place in the left body half (see Device Detail-page 2). Our testing has revealed no damage or contamination to the pitot tube upon activation; however, a visual inspection of the pitot tube must be performed and any contamination or other discrepancy addressed appropriately by a qualified technician. Clean and inspect each activated PSV2 (and each Detaining Bridle if applicable). Refer to **SECTION 6 - INSPECTION AND MAINTENANCE**. If there is any damage to the PSV2 body halves, replace the PSV2 with new. If there is thermal degradation\* of the contact areas of the PSV2 Silicone Discs or the contact area of the Detaining Bridle, replace with new Silicone Discs (PN 77-SDRK\_1) and/or Bridle (PN 77-DBU1). If there is no damage to the PSV2, it can be returned to service following the instructions included in the PITOTSHIELD V2™ Field Service/Recharge Kit (PN 77-TBDRK01).

\* Thermal Degradation is characterized by crystallization or powdering and/or cracking of the silicone in areas of contact with the pitot tube, particularly at corners. This indicates decreased tensile strength and decreased elongation at break and represents a non-serviceable component.

\*\*Activation of a PITOTSHIELD V2™ SMARTCOVER™, while indicative of human factors failure, is a confirmation of overall Safety Management System success, saving your operation, crew, and passengers time, money and possibly lives.

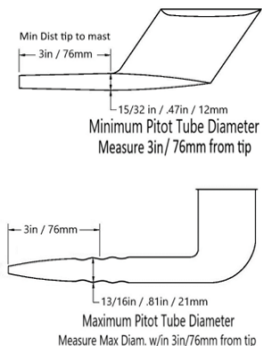
## SECTION 10 – LIMITATIONS OF PITOTSHIELD V2™ SMARTCOVER™

### A. Universal Fit

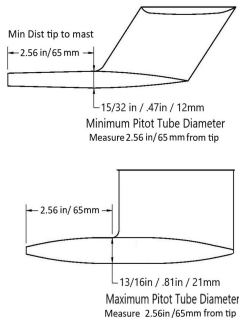
The PSV2 will fit most ROUND pitot tubes. There are a few variations from normal:

1. NON-ROUND and BLADE TYPES of pitot tubes are NOT compatible.
2. Refer to the Application/Fitting Details on page 12 below for proper sizing of PSV2 to your aircraft. Note that some individual aircraft may have pitot tubes of differing sizes.
3. Testing has shown the Standard Size PSV2 to maintain position over ten thousand continuous hours in four season weather on the smallest pitot tube (the lowest grip force) with episodes of up to 60 knot wind from aft. Attachment of accessory (static plugs) lanyard may affect this.

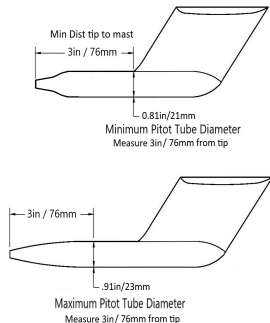
**PitotShield V2™ Standard Size**  
**77TBU\*\*\* Fit Parameters**



**PitotShield V2™ Short Size**  
**77TBS\*\*\* Fit Parameters**



**PitotShield V2™ Large Size**  
**77TBL\*\*\* Fit Parameters**



**APPLICATION/FITTING DETAILS**

This **Standard Size PitotShield V2™ SMARTCOVER™** fits nearly all turbine aircraft round pitot tubes. If the tip of the pitot tube is less than 3in/76mm from the mast or the diameter at 3in/76mm from the tip is less than .47in/12mm, or the pitot tube diameter within three inches from the tip is greater than 13/16in (21mm), the **Standard PitotShield V2™ Smartcover™** will not fit.

**APPLICATION/FITTING DETAILS**

This **Short Size PitotShield V2™ SMARTCOVER™** fits round pitot tubes having a minimum length from the mast of 2.56in/65mm and a maximum diameter of 0.81in/21mm.

**APPLICATION/FITTING DETAILS**

This **Large Size PitotShield V2™ Smartcover™** fits pitot tubes with a minimum length from tip to mast of 3in/76mm and a diameter from .81"/21mm to .91" within 3in (76mm) of the tip.

**B. Protection from Contamination**

The most vulnerable part of a pitot tube regarding contamination is the ram-air tip. PITOTSHIELD V2™ SMARTCOVER™ has been shown to protect the pitot tube tip from obstructions due to typical contaminants that affect a pitot tube. This includes insects, spiders, windblown rainwater, snow, and sleet. After over ten thousand hours continuously in place on a pitot tube in four seasons of Great-Lakes weather, the PSV2 functioned perfectly and had no contamination.

It is known that some airport environments are prone to sandstorms that can contaminate many components of aircraft, covered pitot tubes notwithstanding. PITOTSHIELD V2™ SMARTCOVER™ was tested in a fine media sandblaster to all exterior surfaces. After five minutes of constant bombardment, there were approximately one hundred grains of fine grit found in the pitot tube. As added protection from this possibility, DeGross Aviation Technologies is developing a high-temperature silicone “Sand Boot” to be applied over the PSV2 where needed to minimize any potential ingress of wind-blown sand.

- C. WARNING – USE OF A SAND BOOT WILL ELIMINATE THE PITOT HEAT RELEASING FEATURE AND RENDER THE PITOTSHIELD V2™ SMARTCOVER™ AS A CONVENTIONAL PITOT COVER, POTENTIALLY DAMAGING THE PITOT TUBE COVER AND PITOT TUBE AND RENDERING THE AIRCRAFT UNAIRWORTHY.**

**WARNING – NO PITOT TUBE COVER CAN BE ABSOLUTE IN ITS PROTECTION OF THE PITOT TUBE. ALWAYS REMOVE THE PITOT COVERS AND INSPECT THE PITOT TUBES FOR CONTAMINATION/ OBSTRUCTION PRIOR TO AIRCRAFT AND/OR PITOT HEAT OPERATION.**

**D. Self-Disengagement**

The primary objective of the PITOTSHIELD V2™ SMARTCOVER™ is, like any conventional pitot tube cover, protecting the pitot tube from contamination. However, in the event that the PITOTSHIELD V2™ SMARTCOVER™ is left on at power-up of pitot heat, the PSV2 self-disengages in approximately two to five minutes. The disengagement actuator within a PITOTSHIELD V2™ SMARTCOVER™ is temperature-sensitive. The time to release after pitot heat power-up varies with the initial temperature of the pitot tube and the pitot tube cover as well as variations innate with each pitot tube model. Other factors that can extend the release time beyond five minutes include:

1. Orientation - The PITOTSHIELD V2™ SMARTCOVER™ must be installed with the RBF streamer flange downward to assure timely heat-activated ejection.
2. OAT (Outside Air Temperature) under 0 deg C (32F) and/or a cold wind.
3. Heavy and/or cold precipitation.
4. Icing conditions - If the PITOTSHIELD V2™ SMARTCOVER™ is coated in significant ice, the interior thermal actuator will operate appropriately, but the release of the pitot cover can be delayed due to the heat required to melt the exterior ice. This time delay can overheat the PSV2 interior components and damage the pitot tube rendering the aircraft unairworthy.

**WARNING!** DO NOT REMOVE A SNOW OR ICE-CONTAMINATED PITOT TUBE COVER BY USING PITOT HEAT TO ACTIVATE THE HEAT-RELEASE MECHANISM. THE PITOT TUBE MAY BE DAMAGED AND THE AIRCRAFT RENDERED UNAIRWORTHY.

**WARNING!** LIKE ALL PITOT TUBE COVERS, PITOTSHIELD V2™ SMARTCOVER™ MUST BE REMOVED FROM THE PITOT TUBE PRIOR TO ANY OPERATION OF THE AIRCRAFT.

**CAUTION:** ALWAYS INSPECT THE PITOT TUBE FOR CONTAMINATION PRIOR TO OPERATING THE AIRCRAFT.

#### **D. Aircraft with manual pitot heat**

1. The PitotShield V2™ SMARTCOVER™ will protect the pitot tube of an aircraft with manual pitot heat perfectly well. As with legacy pitot Covers, the PSV2 is intended to be removed before aircraft operation.

**WARNING!** IF PITOTSHIELD V2™ SMARTCOVER™ IS NOT REMOVED PRIOR TO OPERATING AN AIRCRAFT WITH MANUAL PITOT HEAT ACTIVATION AND PITOT HEAT APPLICATION IS DELAYED TO WITHIN APPROXIMATELY SIX MINUTES OF TAKEOFF, THE TAKEOFF MAY COMMENCE WITH THE PITOT COVERS IN PLACE. THIS WILL CAUSE ERRONEOUS AIR DATA INDICATIONS AND POSSIBLE LOSS OF CONTROL OF THE AIRCRAFT.

**NOTE:** ADVERSE AMBIENT CONDITIONS MAY EXTEND DISENGAGEMENT TIME. SEE C. SELF-DISENGAGEMENT ABOVE.

**E. High Outside Air Temperature**

The thermal actuator releases the PITOTSHIELD V2™ SMARTCOVER™ when the heat-sensitive component reaches approximately 60deg C (138 deg F). As of this writing, the highest recorded temperature at an airport is 54deg C (129deg F). Computer modeling indicates that atmospheric thermal dynamics are insufficient to cause an activation even if this record temperature is encountered. However, the possibility should be considered when parked on an extremely hot ramp in direct bright sun-lit and calm wind conditions. If a PSV2 disengages, see Section 9 – ACTIVE DISENGAGEMENT for appropriate actions.

**F. Service Life**

The service life of a PITOTSHIELD V2™ SMARTCOVER™ is five years. See SECTION 6 - INSPECTION AND MAINTENANCE OF PITOTSHIELD V2™ SMARTCOVER™

## **SECTION 11 – WARRANTY**

- A. DeGross Aviation Technologies LLC (DAT) warrants PITOTSHIELD V2™ SMARTCOVER™ TO BE FREE OF MANUFACTURER'S DEFECTS throughout the service life of the product, defined as five years after placing the product into service.
- B. DeGross Aviation Technologies has sole discretion to determine normal use wear-and-tear when evaluating on final disposition of any warranty claims on the PSV2 and accessories.
- C. Any warranty claim is limited to original purchase price less cost of shipping/handling of product return and replacements returned to the customer.
- D. DeGross Aviation Technologies LLC warrants PITOTSHIELD V2™ SMARTCOVER™ to perform as described in the Owner's Instruction Manual, with regard to the statement:
- WARNING! AS WITH ALL CONVENTIONAL PITOT TUBE COVERS, PITOTSHIELD V2™ SMARTCOVER™ MUST BE REMOVED FROM THE PITOT TUBE PRIOR TO OPERATION OF THE AIRCRAFT.**
- DeGross Aviation Technologies is not responsible for any damages that result from operation of an aircraft with a PITOTSHIELD V2™ SMARTCOVER™ in place on the pitot tube.

## SECTION 12 – SPECIFICATIONS-Standard Fit\*

### A. BODY

- Length 5.2in (132cm)
- Diameter 2.25in (5.7cm)
- Weight 4.25 oz (120 g)
- Materials
  - Polypropylene
  - Silicone Elastomer
  - Silica(Glass)
  - Water-miscible substituted hydrocarbon

### B. RBF Streamer Assembly (Standard)

- Length 18.5in (47cm)
- Width 2.25in (5.7cm)
- Weight 0.57oz (16.2g)
- Color International Orange; RBF Printed Black

#### Materials

- Streamer: Vinyl-coated Polyester or Nylon
- Grommet: Brass (Attached Millspec-style-NAS1756)
- Attachment ring: 0.043 in UV-Resistant Nylon Cord/Al crimp sleeve

### C. Total Assembled Weight w/Standard RBF Streamer: 4.75oz (135 g)

### D. Intended Use Operational Temperature: -40 F (-40 C) to 130 F (54 C) Tested Thermal Activation Temperature Effective: -4 F (-20 C) to 130 F (54 C)

### E. Shelf Life: Ten Years

**Scan for current  
complete spec sheets**

