SKORPION™ Process Air Heater

SKORPION ™ Model
F075615 1.5kW 120V 1PH 12.5A
F075616 3.0kW 240V 1PH 12.5A

SHOCK HAZARD!
Only qualified individuals should install this heater and related controls. Follow all applicable electrical codes and use proper wiring.

BURN HAZARD!
Avoid contact with the heater nozzle during or soon after operation.

EXPLOSION HAZARD!
Heater produces extremely high temperatures. Do not use in hazardous environments, and/or near explosive or reactive gases, or combustible materials.

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Warranty

OSRAM SYLVANIA warrants that all products to be delivered hereunder will be free from defects in material and workmanship at the time of delivery. OSRAM SYLVANIA's obligation under this warranty shall be limited to (at its option) repairing, replacing, or granting a credit at the prices invoiced at the time of shipment for any of said products. This warranty shall not apply to any such products which shall have been repaired or altered, except by OSRAM SYLVANIA, or which shall have been subjected to physical or electrical abuse or misuse. OSRAM SYLVANIA shall be liable under this warranty only if (A) OSRAM SYLVANIA receives notice of the alleged defect within sixty (60) days after the date of shipment; (B) the adjustment procedure hereinafter provided is followed, and (C) such products are, to OSRAM SYLVANIA's satisfaction, determined to be defective.

THE WARRANTY SET FORTH IN THE PRECEDING PARAGRAPH IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY.

The information contained in this manual is based on data considered to be true and accurate. Reasonable precautions for accuracy has been taken in the preparation of this manual, however OSRAM SYLVANIA assumes no responsibility for any omissions or errors, nor assumes any liability for damages that may result from the use of the product in accordance with the information contained in this manual.

Please direct all warranty/repair requests or inquiries to the place of purchase, and provide the following information, in writing:

(A) Order number under which products were shipped
(B) Model/Serial Number of product
(C) Reason for rejection

PRODUCTS CAN NOT BE RETURNED TO OSRAM SYLVANIA WITHOUT AUTHORIZATION.

Replacement, repair, or credit for products found to be defective will be made by the place of purchase. All products found to be not defective will be returned to the Buyer; transportation charges collect or stored at Buyers expense.

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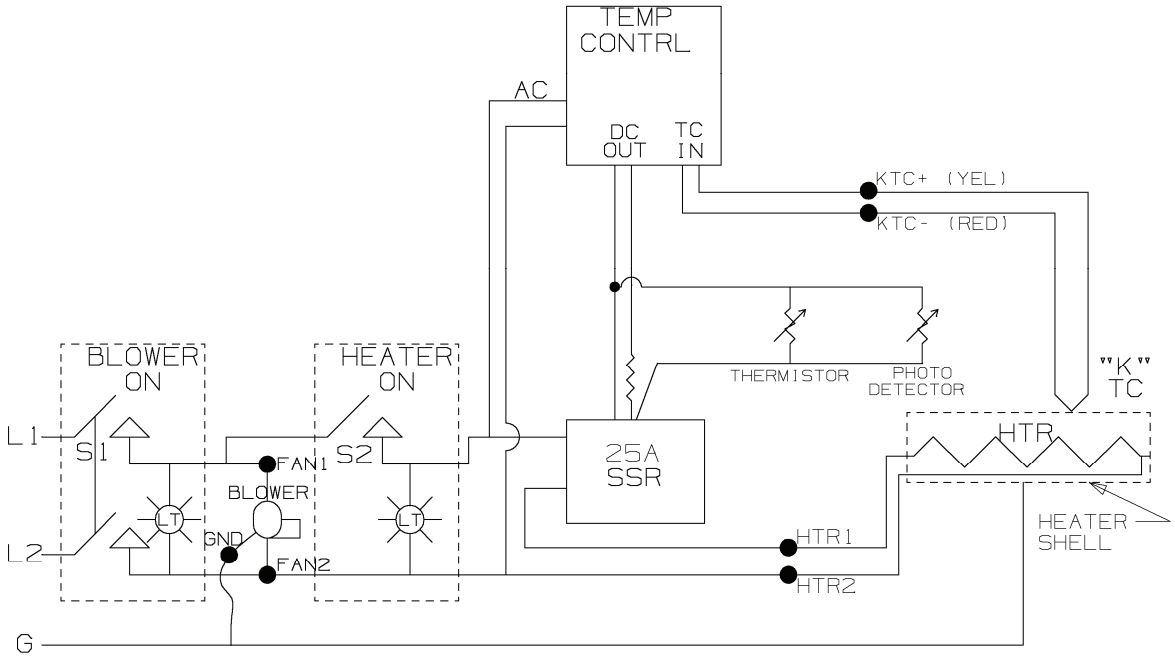
Overview

The SKORPION ™ Process Air Heater from OSRAM SYLVANIA represents the perfect combination of power, size, reliability and control in Air Heating technology.

With a closed-loop PID temperature control system, the SKORPION ™ produces air temperatures from 1200°F (650°C) (120V version) to 1400°F (760°C) (240V version), to ensure precise control of your process.

If used correctly, an element life of 5000 hours or greater can be expected.

Operation



1. **Turn SKORPION air heater ON** using <u>two switches</u>:
   1.1. Switch S1 (blower) sends power to the blower and to heater switch S2.
   1.2. Switch S2 (heater) sends power to the heater control circuit.
   1.3. <u>Note, for heater safety, S2 (heater) cannot turn ON without S1 (blower) ON.</u>

2. **Adjust airflow** via a rotational air damper at the blower inlet.

3. **Adjust set point (SV)** with the UP/DOWN arrows on the temperature controller. Heater will ramp to temperature.
   3.1. The set point temperature (SV) is in GREEN.
   3.2. The process temperature (PV) is in RED.
   3.3. The process temperature is measured with an internal type “K” thermocouple located at the end of an element inside the stainless housing.

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4. When **turning the heater off** the heater power (S2) may be turned off and the blower (S1) left on to cool the heater housing assembly. This is suggested to prevent burn injury of personnel around the heater but is not necessary for safety of the heater element.

NOTES:

- **Heater Voltage** is regulated by a Solid State Relay (SSR), which is turned ON and OFF rapidly according to the temperature controller DC OUT signal. A "zero cross" type SSR is used to minimize electrical noise.
- **Heater Element** is protected with a resistive photo detector and a thermal resistor (thermistor) mounted at the heater inlet. These sensors are connected in parallel with the DC input signal going to the SSR.
    - If the element overheats (bright orange color) the photo detector resistance decreases which reduces the control signal which, in turn, limits power to the heater.
    - If the air temperature in the housing reaches an unsafe level, the thermistor resistance decreases which reduces the control signal, which in turn, limits power to the heater.
    - A small fixed resistor in series with the control signal sets element and air temperature limits.
- The large black dots on the wiring diagram represent connections that are made on the internal terminal strip. The terminal strip allows the customer easy access to remove and replace the heater element and blower if necessary.

Performance

The maximum air temperature (as displayed on the temperature controller) depends on the exit configuration, and the position of the inlet air damper. The chart below shows approximately the maximum air temperature achievable in various heater configurations. Actual performance may vary slightly, particularly at reduced line voltages. A closed damper (reduced flow rate) will allow higher operating temperatures until the optical sensor detects the maximum element temperature is reached. A closed damper (reduced flow rate) will also result in a faster ramp-up time.

MAXIMUM AIR TEMPERATURE vs. HEATER CONFIGURATION

	120V		**240V**	
Heater configuration	*Open damper*	*Closed damper*	*Open damper*	*Closed damper*
Open ended or with flare	1000°F (540°C)	1200°F (650°C)	1400°F (760°C)	1400°F (760°C)
With high-flow nozzle	1300°F (730°C)	1200 °F (650°C)	1400°F (760°C)	1400°F (760°C)

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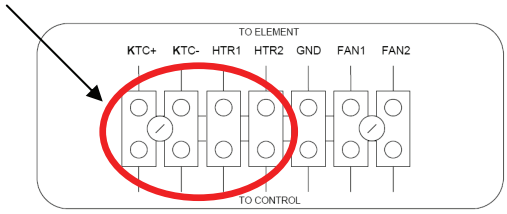
Replacement Parts List and Accessories

SKORPION ™ Model	Replacement part numbers				
	Heating Element	Temp Control	Power Control	Blower	Nozzle Tube
F075615 1.5kW 120V 1PH 12.5A	F205526	F205499	F205486	F205513	F205494
F075616 3.0kW 240V 1PH 12.5A	F205502	F205499	F205486	F205512	F205494
Optional Attachments (all models)					
F075744 High Flow Nozzle 21mm (1") diameter					
F075745 Standard Flare 150mm x 12mm (6"x0.5")					
F075746 Wide Flare 300mm x 4mm (12"x 0.16")					

Replacement Procedures

I. Replacing the Heating Element

1. Turn heater/blower switches OFF, and disconnect from power source.
2. Use a flat screwdriver to remove (pry open) the wiring cover under the stainless nozzle tube.
3. Remove the stainless nozzle by removing the two mounting screws, and the thru-bolt which passes through the plastic support tower and threads into the nozzle flange.
4. Disconnect the KTC+ (Yellow), KTC- (Red), HTR1, HTR2 connections from the wiring terminal as shown. Total of four wires.



5. Remove the old element, pulling the KTC and HTR wires through the plastic support tower.
6. Install new element by reversing steps 2-5.

II. Replacing the Temperature Controller

1. Turn heater/blower switches OFF, and disconnect from power source.
2. Remove the four screws which secure the black plastic top cover plate.
3. Lift the white plastic mounting tab and gently push the temperature controller halfway out of the faceplate.

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4. Using masking tape or other method, mark each wire going to the back of the controller with a number 1-9, corresponding to its terminal location. This is CRITICAL to ensure proper wiring to the new controller.
5. Using a small screwdriver, loosen and remove the wires from the terminals at the rear of the temperature controller.
6. Remove temperature controller completely from the faceplate.
7. Install new temperature controller halfway into faceplate.
8. Reconnect the wires according to the terminal number and ID marking from step #4.
9. Press controller into faceplate while engaging the white mounting tab securely.
10. Replace the black plastic top cover plate and reattach mounting screws.

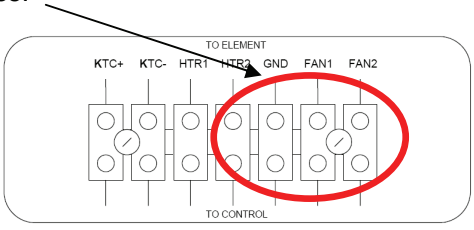
III. Replacing the Power Controller

NOTE: Electrical "heat sink putty" is required to mount new SSR.

1. Turn heater/blower switches OFF, and disconnect from power source.
2. Remove the four screws which secure the black plastic top cover plate.
3. Remove the four wires connecting to the four terminals on the solid state relay. Be sure to mark the wires clearly for re-installation.
4. Remove the two screws holding the Solid State Relay from the aluminum base plate and remove the SSR.
5. Carefully wipe off the old white heat sink putty from the base plate and apply new heat sink putty on the back of the new SSR.
6. Mount SSR onto aluminum base plate with the mounting screws and reconnect wires.
7. Replace the black plastic top cover plate and reattach mounting screws.

IV. Replacing the Blower

1. Turn heater/blower switches OFF, and disconnect from power source.
2. Use a flat screwdriver to remove (pry open) the wiring cover under the stainless nozzle tube.
3. Remove the blower by removing the three mounting bolts. One of these bolts passes through the plastic support tower and threads into the nozzle flange.
4. Disconnect the GND, FAN1, and FAN2 connections from the wiring terminal as shown. Total of three wires.



5. Remove the blower, GND, FAN1, FAN2 wires through the plastic support tower.
6. Install new blower by reversing steps 2-5.

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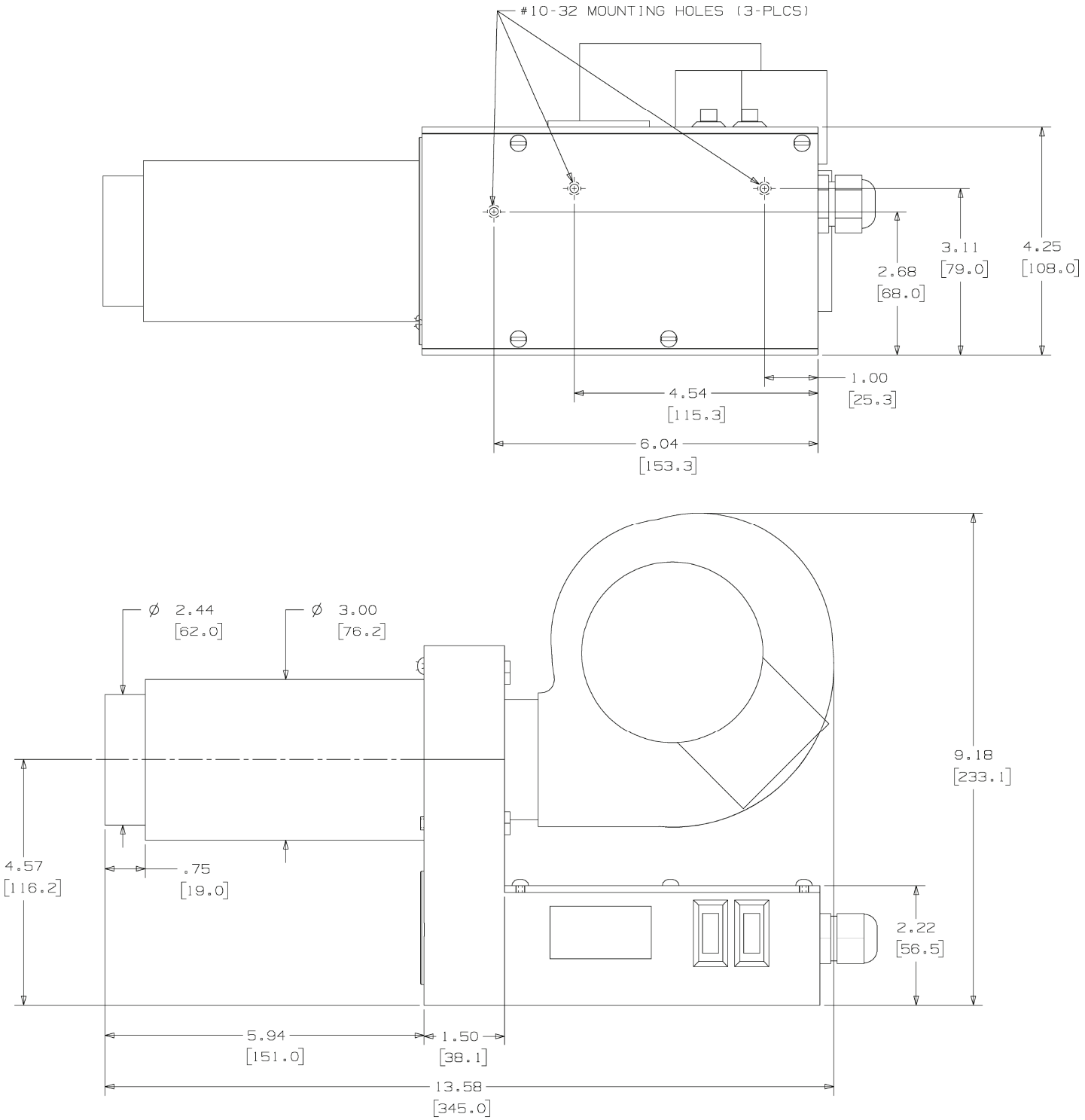
SKORPION ™ 120V/240V Dimensions



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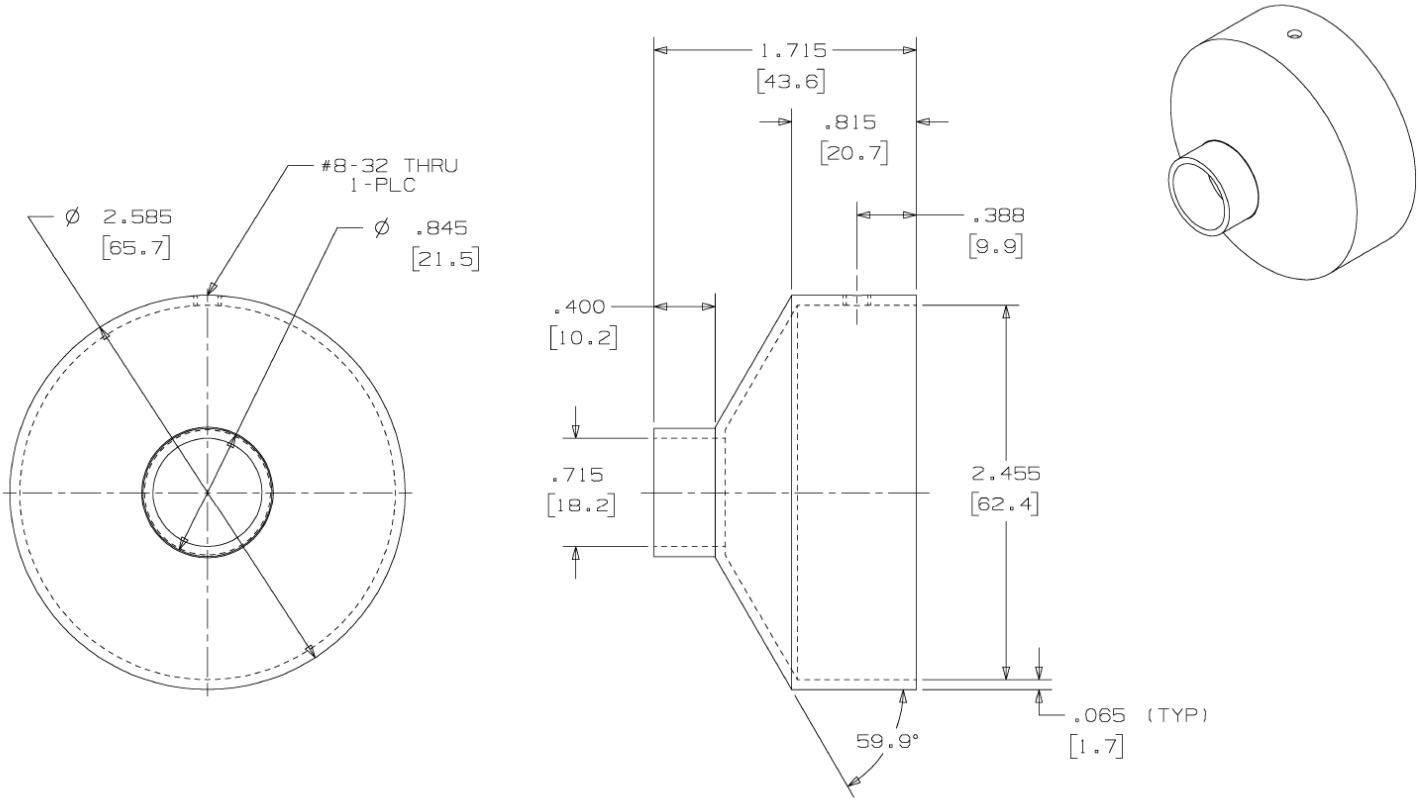
SKORPION ™ High Flow Nozzle P/N F075744
21mm (1” dia.) (includes #8-32 set screw)



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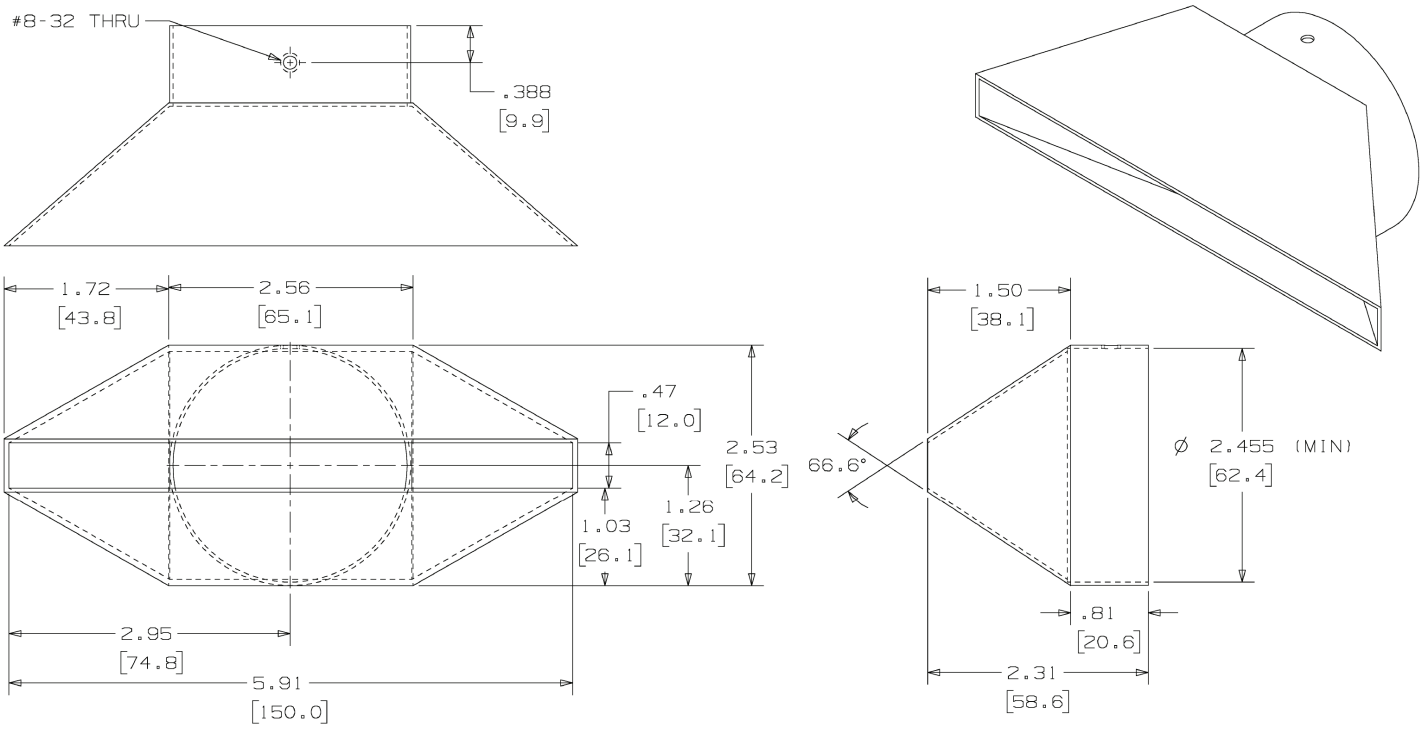
SKORPION ™ Standard Flare P/N F075745
150mm x 12mm (6”x.5”) (includes #8-32 set screw)



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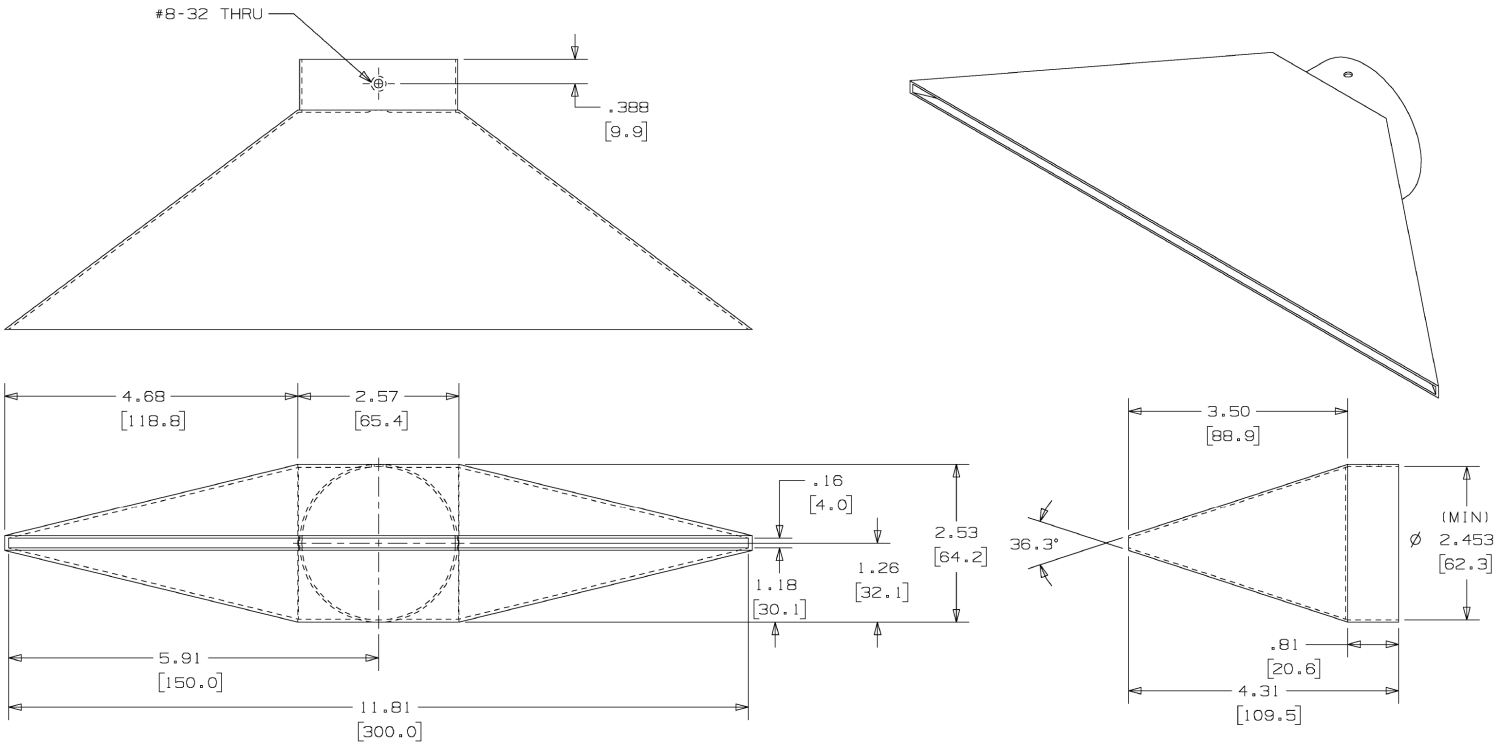
SKORPION ™ Wide Flare P/N F075746
300mm x 4mm (12”x 0.16”) (includes #8-32 set screw)



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