



## AXW vortex tube

Material: Stainless steel.



### Features

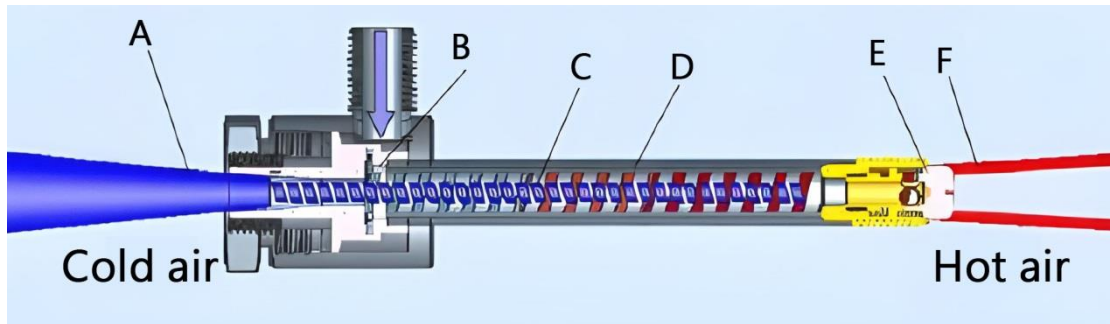
- **Rapid Cooling:** Instantly cools to sub-zero temperatures, providing high refrigeration capacity.
- **Stainless Steel Material:** Long lifespan, effortless adjustment, and reliable operation.
- **Lightweight and Low Noise:** No moving parts, maintenance-free, and easy to install.
- **Environmentally Friendly:** Does not require electricity, fluorocarbons, or chemical refrigerants, ensuring eco-friendly refrigeration without harmful substances.
- **Applications:** Suitable for machine tool cooling, cooling various cutting tools and plastic components, cooling electronic components, and welding cooling.

### Introduction to Vortex Tube

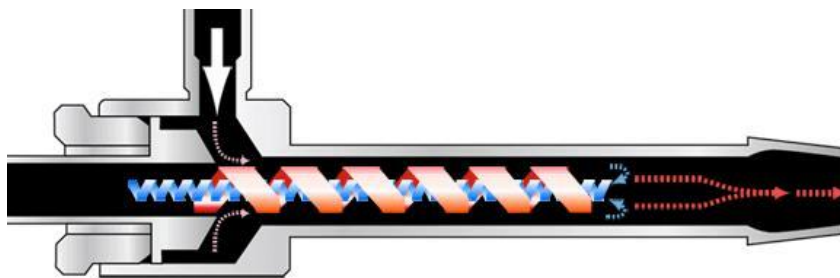
The vortex tube cooler is a low-cost, reliable, and maintenance-free solution for various industrial localized cooling challenges. It is characterized by excellent design, high-quality materials, precision machining, and rigorous testing. The vortex tube cooler is also known as a localized cooler, mold cooler, spot cooler, and more. It is manufactured using high-quality stainless steel, ensuring its reliability and quality.



The refrigeration principle of the vortex tube



When dry compressed air enters the high-pressure chamber, it passes through the vortex generator B, generating a rapidly rotating airflow with speeds of up to 1,000,000 RPM, moving toward the hot end. Some of this airflow is discharged through the control valve E, while the remaining portion of the rotating airflow is forced back towards the center of the vortex tube, where it exits at a lower rotational speed towards the cold end. Within the tube, the airflow undergoes vortex exchange, leading to energy separation, resulting in two flows: one is the hot airflow (F), and the other is the cold airflow (C). This cold airflow, forming as ultra-low temperature cold air (A) at the center of the generator, is collected and discharged at the cold air outlet.





Technical parameters

Model	Air intake volume		Cooling capacity		Cold end outlet
	CFM	L/MIN	BTU/Hr	W	
AXW8	8	220	530	150	1/4 inch
AXW10	10	260	650	195	3/8 inch
AXW15	15	410	980	303	3/8 inch
AXW20	20	530	1300	380	3/8 inch
AXW25	25	660	1600	476	3/8 inch
AXW30	30	790	1950	575	3/8 inch
AXW35	35	920	2280	660	3/8 inch
AXW40	40	1050	2600	758	1/2 inch
AXW50	50	1320	3250	950	1 inch
AXW60	60	1580	3790	1080	1 inch
AXW75	75	2000	4870	1245	1 inch
AXW99	99	2630	6500	1895	1 inch

The above parameter values are approximate values measured at an intake pressure of 6.5 kg.

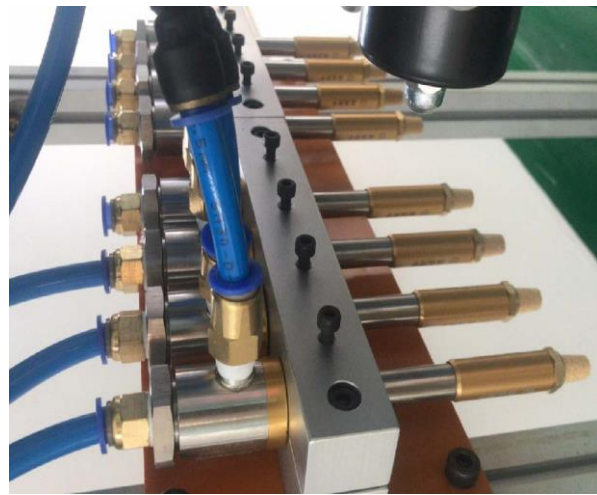


# Applications and Examples of Vortex Tubes

Welding Operation Cooling/High-Temperature Camera Cooling/Hydraulic Oil Cooling/Injection Molding Cooling/Packaging Sealing Cooling  
Machining for Dry Cutting/Cooling of Heat-Generating Components in Machinery/High-Speed Bearing Cooling  
Cooling for Electric Soldering Machine Nozzles/Cooling for Electronic Controllers



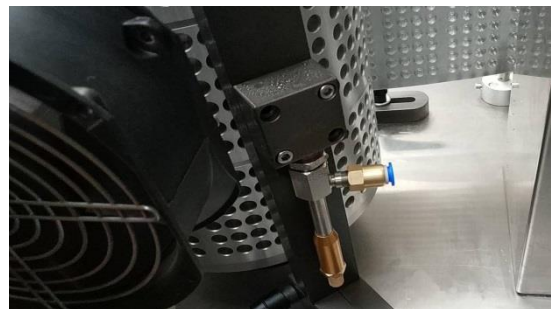
Refrigeration for mining refrigerators.



Simultaneous cooling with multiple vortex tubes



Temperature controller for cooling.



Pharmaceutical plant cooling.



Tool cooling



Cooling and reducing the temperature of a dispensing machine.



## Temperature Variation in Vortex Tube Cooler

The following parameters are for reference only.

By adjusting the control valve at the hot air outlet, you can easily regulate the airflow and temperature of the cold air. Loosening the control valve reduces the cold air flow and lowers the cold air temperature, while tightening the control valve does the opposite. The percentage of airflow directed towards the cold air outlet is referred to as the "cold fraction." In most cases, the best overall performance for cold air flow and temperature drop is achieved when the "cold fraction" is set at 80%, providing the maximum cooling capacity in Btu/hr (kcal/h). Setting the "cold fraction" below 50% can yield lower temperatures but significantly reduces the airflow. Adjusting a vortex tube cooler is a straightforward process. Place a thermometer at the cold air outlet and then adjust the control valve at the hot air outlet. The maximum cooling capacity is typically obtained when the temperature of the cold air is 50°F (28°C) lower than the inlet compressed air temperature.

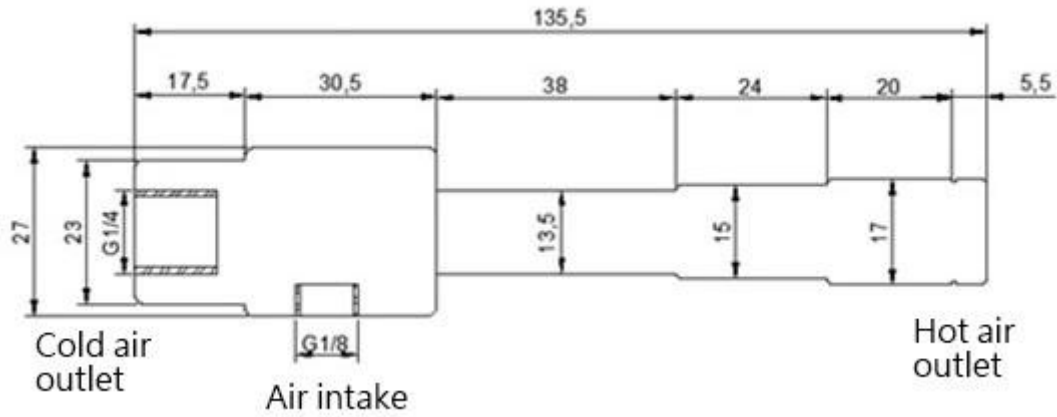
## Considerations

- **Back Pressure:** The back pressure at the cold air outlet can affect the cooling efficiency of the vortex tube cooler. Back pressures below 2 pounds per square inch (0.1 bar) have no significant impact, while a back pressure of 5 pounds per square inch (0.3 bar) can lower the temperature by approximately 5°F (2.8°C).
- **Filtration:** Using clean, dry, and oil-free compressed air is crucial. It is recommended to use a filtration rating of 5 microns or finer. Filters with a 5-micron filter element are available in various flow rates.
- **Inlet Air Temperature:** The temperature drop generated by the vortex tube cooler is based on the temperature of the incoming air (refer to the chart above). Increasing the inlet air temperature will correspondingly increase the cold air temperature.



Exterior Diagram

■ AXW8

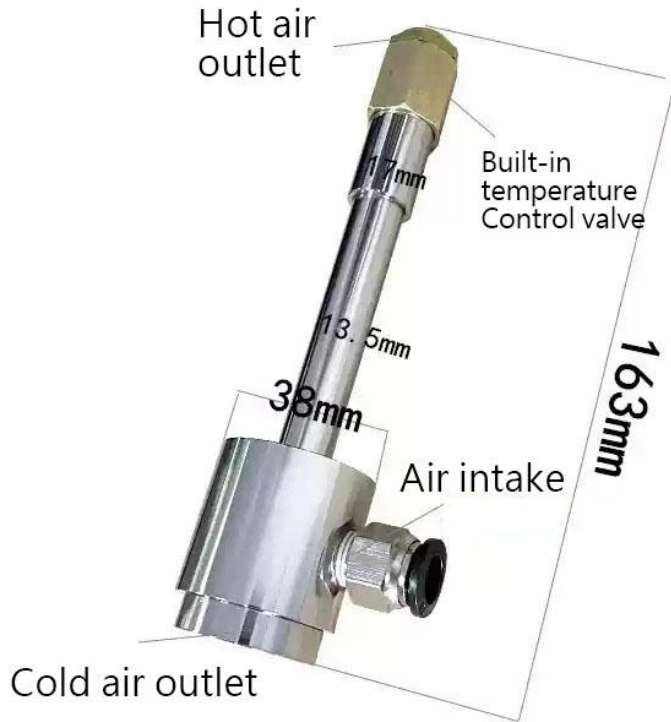


Air intake: 1/8 inch	Cold end outlet: 1/4 inch	Recommended air intake pipe (mm): 8
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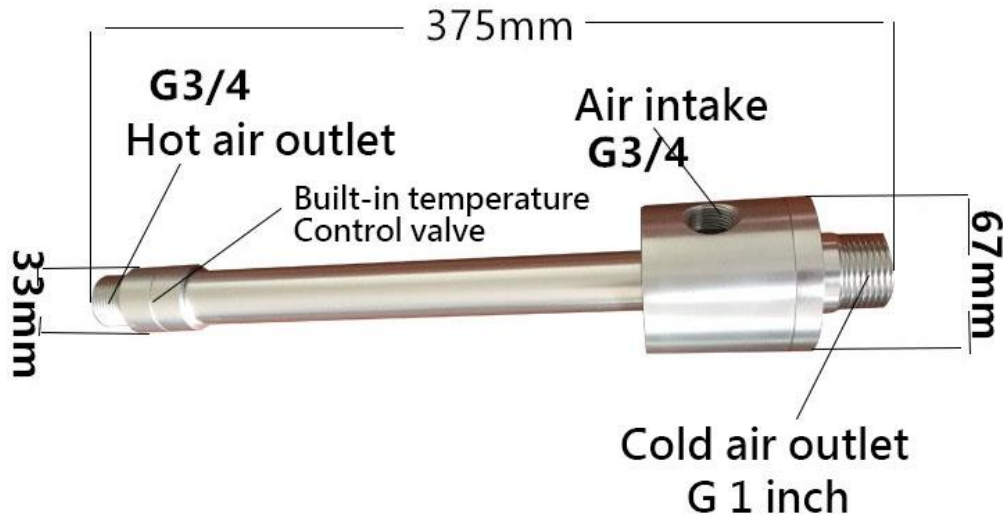
■ AXW10~40



Model	Air intake	Cold end outlet	Recommended air intake pipe (mm)
AXW10	1/4 inch female thread	3/8 inch female thread	10
AXW15	1/4 inch female thread	3/8 inch female thread	10
AXW20	1/4 inch female thread	3/8 inch female thread	12
AXW25	1/4 inch female thread	3/8 inch female thread	12
AXW30	1/4 inch female thread	3/8 inch female thread	12
AXW35	1/4 inch female thread	3/8 inch female thread	12
AXW40	1/4 inch female thread	1/2 female thread	12



■ AXW50~99



Usage Instructions

- Connect the dry compressed air to the Air intake. You can adjust the air supply pressure using the ball valve, with the air source pressure set at 6.9 bar.
- The cold air outlet can be connected to a swivel joint for flexible positioning.
- The hot end of the vortex tube has an adjustment screw. You can use a flathead screwdriver to rotate it clockwise to increase the cooling capacity and counterclockwise to decrease it. Be sure not to overtighten the adjustment screw.





Product Accessories

### Swivel Joint

A swivel joint allows for 360° rotation, directing the cold air to the desired location.



### Powerful Magnetic Base

Convenient for securing on the machine

- ※ A hand slide valve switch is also available for purchase: used to control air intake to serve as an on/off switch.
- ※ If you need to purchase accessories, please contact our sales representatives.