

General imsubs P. Ltd.

Vortex Tubes, easy to install, compact, quick cooling systems



What is a Vortex Tube?

The Vortex Tube is an effective, low cost solution to a wide variety of industrial spot cooling and process cooling needs. Compressed air is injected into the vortex tube, flows at a rate of up to 1,000,000 RPM towards the 'hot' end of the tube. Once this hot air reaches the end, a small amount is exhausted through a control valve. The rest of the air is forced backwards towards the other end and exits as 'cold' air. The Vortex Tube can decrease temperatures by ~115°F (46°C) and raise temperatures up by ~200°F (93°C) from the initial inlet air temperature.

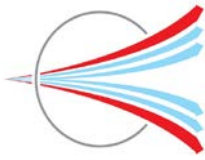
Which Vortex Tube will best suite my needs?

Our Vortex Tubes are available in 2 sizes (Small and Medium). Each Vortex Tube is constructed of stainless steel. The wear resistance of stainless steel, as well as its resistance to corrosion and oxidation, assures that Vortex Tube will provide years of reliable, maintenance free-operation.

3711/A, GIDC, Phase-IV, Vatva, Ahmedabad-382445, India

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Advantage of Vortex tube

Safety, as no electricity at the point of application.
No RF interference.
Low cost of ownership
Lower noise.
SS 304 construction.
Available in two sizes
Enhances reliability and durability of equipment

Applications or Vortex Tube

Panel cooling
Sewing machine needle cooling
Tools and plastic grinding and machining
Ultrasonic Welding
Bearing Cooling
Spot cooling

How Vortex Tubes works:

- (A) Compressed air, normally 80 to 100 PSIG (5.5 - 6.9 BAR) enters the Vortex Tube through a standard NPTM inlet and tangentially through a generator into the vortex spin chamber.
- (B) This air stream spinning at up to 1,000,000 RPM travels in one direction along the small (hot end) tube and then is forced back through the center of this outer vortex.
- (C) The brass control valve on the hot end allows for quick n' easy adjustment of the "cold fraction".
- (D) As the center column travels towards the opposite end, it gives off kinetic energy in the form of heat to the outside stream of air and exits the vortex tube as cold air.

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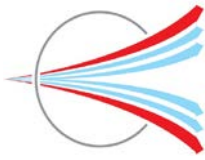
7500 Series Vortex Tube Specifications

The 7500 series Vortex Tube are used in most industrial applications, such as electrical control panel cooling, tool cooling, and parts cooling. These Vortex Tubes optimize airflow and temperature drop to produce maximum cooling power or Btu/hr. (Kcal/hr.)

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7500 Series Vortex Tube Specifications and Performance

Size	Model No.	Air Consumption	BTU/Hr. @ 100 PSIG	Kcal / Hr. @ 6.9 BAR
Small	7502	2 SCFM (57 SLPM)	145 BTU/Hr.	37
Small	7504	4 SCFM (113 SLPM)	275 BTU/Hr.	69
Small	7508	8 SCFM (227 SLPM)	560 BTU/Hr.	141
Medium	7510	10 SCFM (283 SLPM)	700 BTU/Hr.	176
Medium	7515	15 SCFM (425 SLPM)	1100 BTU/Hr.	277
Medium	7525	25 SCFM (708 SLPM)	1800 BTU/Hr.	454
Medium	7530	30 SCFM (850 SLPM)	2060 BTU/Hr.	519
Medium	7540	40 SCFM (1133 SLPM)	2800 BTU/Hr.	706

Factors Affecting Performance of Vortex Tube

Inlet Air Temperature

The Vortex Tube will provide a temperature drop from the temperature of the compressed air supply.

Back Pressure

A low back pressure, up to 2 PSIG (.1 BAR), will not affect the performance of the Vortex Tube. Anything over this will have a performance degradation of ~ 5°F (2.8°C).

Filtration

Filtration to maintain clean air is necessary at a rate of 25 microns or less. filters contain a 5 micron element and are properly sized for airflow.

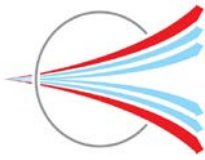
Noise/Muffling

Both Small and Medium Vortex Tubes can be quite noisy if unducted. offers mufflers for both cold and hot air discharge. If the cold air is ducted, muffling is not usually required.

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7500 Series Vortex Tube Performance

PSIG	Cold Fraction																	
	10%	20%	30%	40%	50%	60%	70%	80%	90%									
20	63F 35C	62F 34C	60F 33C	56F 31C	51F 28C	44F 24C	36F 20C	28F 15C	17F 9C									
	7F 4C	15F 8C	25F 14C	36F 20C	50F 28C	64F 36C	83F 46C	107F 59C	148F 82C									
40	91F 51C	88F 49C	85F 47C	80F 44C	73F 41C	63F 35C	52F 28C	38F 21C	26F 14C									
	9F 5C	21F 11C	35F 19C	52F 29C	71F 39C	92F 51C	117F 65C	147F 82C	220F 122C									
60	107F 59C	104F 58C	100F 56C	93F 52C	84F 47C	73F 41C	60F 33C	45F 25C	29F 16C									
	10F 6C	24F 13C	40F 22C	59F 33C	80F 44C	104F 58C	132F 73C	168F 93C	236F 131C									
80	119F 66C	115F 64C	110F 61C	102F 57C	92F 51C	80F 44C	66F 36C	49F 27C	31F 17C									
	11F 7C	25F 14C	43F 24C	63F 35C	86F 48C	113F 63C	143F 79C	181F 101C	249F 138C									
100	127F 71C	123F 68C	118F 66C	110F 61C	99F 55C	86F 48C	71F 39C	53F 29C	33F 18C									
	12F 8C	26F 14C	45F 25C	67F 37C	91F 51C	119F 66C	151F 84C	192F 107C	252F 140C									
120	133F 74C	129F 72C	124F 69C	116F 64C	104F 58C	91F 50C	74F 41C	55F 31C	34F 19C									
	13F 8C	27F 14C	46F 26C	69F 38C	94F 52C	123F 68C	156F 87C	195F 108C	257F 142C									

The percentage of cold air produced versus total filtered compressed air consumed by vortex tube.

Pounds per Square Inch Gauge

Drop in temperature.

Rise in temperature.

Actual Vortex Tube Performance

The cold fraction is the "percentage flow" of the airflow at cold end. So a 60% cold fraction means 60% of airflow comes out cold end and 40% goes out the hot end.

The above table is for the 7500 Series (10-15 SCFM) Medium sized vortex tubes. The performance can significantly change for higher flow designs. With that said, it's not generally important to get such "low" temperatures and in most application the Vortex Tube is "preset" to produce a specific temperature drop.

The cold fraction table above is ONLY for the 7500 Series Generators, or as some competitors like to call ('H' Generators). The 7700 Series Vortex Tube ('C' Generators), produce very cold temperatures but with a lower cold end flow. The 7700 Generators are not designed for high BTU/Hr (or watt) cooling effect.

Temperature drop and Cold end airflow vary inversely between the two as the "cold fraction" changes. The cooling effect is a balance and combination of both outlet flow and temperature drop. Colder temperatures produces do NOT always mean the absolute highest cooling effect will be produced.

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