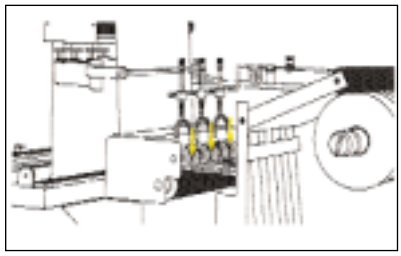


Vortex Tube

Meech Air Technology Stainless Steel Vortex Tubes convert compressed air into two airflows, one extremely cold and the other extremely hot. Vortex Tubes have no moving parts and can produce temperatures from -60°C to +110°C and maintain temperatures at +/-0.6°C.

APPLICATIONS:

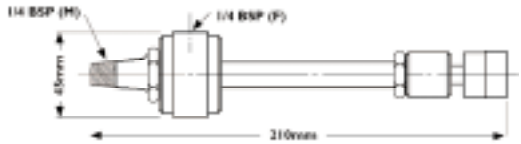
- *Spot cooling*
- *Weld cooling*
- *Plastic slitting*
- *Extrusion cooling*
- *Foodstuffs cooling*



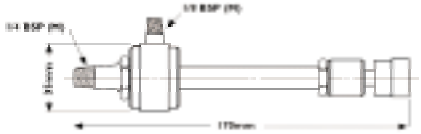
Plastic Slitting
Cutting wheels on this slitter can work at top speed - and stay sharper longer - when cold air from Vortex Tubes eliminates the frictional heat build up. Trim edge is cleaner too.

DIMENSIONS:

Medium Vortex Tube (10 - 35 CFM)



Small Vortex Tube (8 CFM)



FEATURES AND BENEFITS:

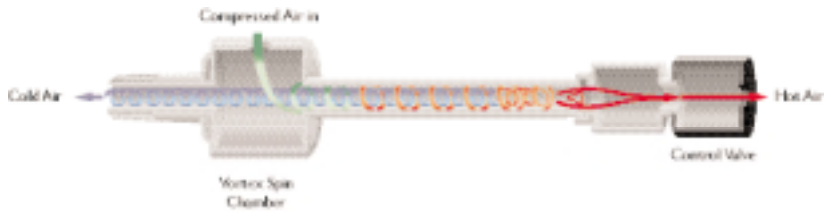
Innovative design	-	Cold air to -60°C
	-	Hot air to +110°C
Stainless Steel	-	Hard wearing
No moving parts	-	Maintenance free
Relief valve	-	Accurate temperature control

High Cold Fraction:		*Low Cold Fraction:*		
A20008	-	A21008	-	8cfm, 550BTUH, Small Vortex Tube
A20010	-	A24011	-	10cfm, 650BTUH, Medium Vortex Tube
A20015	-	A24016	-	15cfm, 1000BTUH, Medium Vortex Tube
A20025	-	A24026	-	25cfm, 1700BTUH, Medium Vortex Tube
A20035	-	A24036	-	35cfm, 2400BTUH, Medium Vortex Tube

Experimental Kits (High and Low Cold Fraction):

A20300	-	8cfm, 550BTUH, Experimental Kit, Small
A20400	-	10-35cfm, 650-2400BTUH, Experimental Kit, Medium

HOW A VORTEX TUBE WORKS:



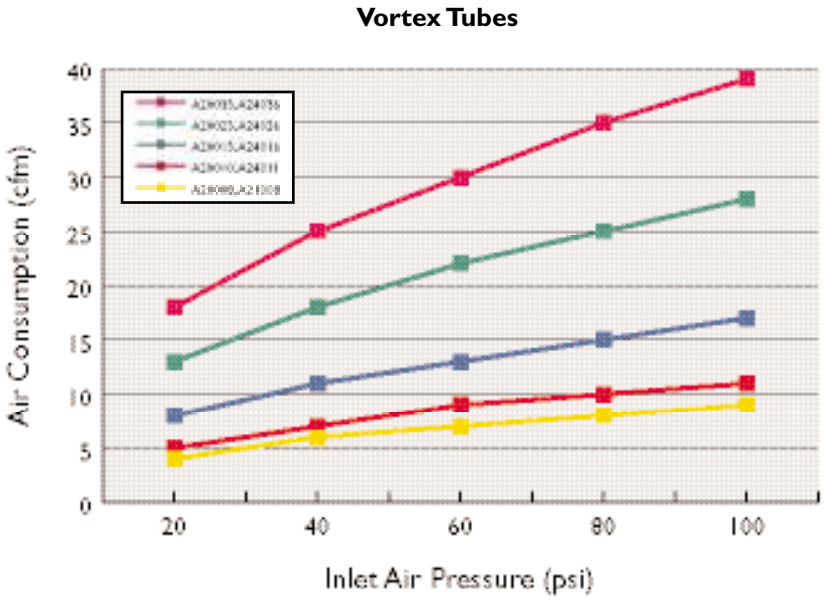
Compressed air enters the spin chamber tangentially. This causes the column of air inside the tube to rotate at a very high speed (up to 1 million rpm). The air at the outside of the column, moving very fast, has a lot of energy and is hot. The air at the centre of the column, moving relatively slowly, has little energy and is cold. The hot outer air, is bled off at one end of the tube and the cold inner air at the other. The percentage of the air exiting the cold end is called the cold fraction and is adjustable by a valve.

Generators:

The generator controls the air consumption of the Vortex Tube and influences the achievable temperatures. Ten generator sizes are available, in total offering five air consumptions - 8, 10, 15, 25 and 35cfm (226, 283, 425, 708 and 991 lpm). For each generator size there is a high and low cold fraction model.



PERFORMANCE GRAPH:



Cold Fraction

The 'cold fraction' is the percentage of input compressed air that is released through the cold end of the Vortex Tube. The cold fraction is adjusted in two ways - by adjusting the control relief valve to exhaust more or less hot air or by changing the generator inside the Vortex Tube to either a 'high' or 'low' cold fraction model.

A 'high' cold fraction is above 50%. This is the setting which best suits most industrial applications as it provides the most efficient cooling, although this is not the coldest possible temperature. A 'low' cold fraction is below 50%. This setting provides a lower cold airflow and allows the coldest temperatures to be achieved. The chart below details the temperature changes that are achievable at various cold fraction settings and inlet compressed air pressures.

VORTEX TUBE PERFORMANCE CHART:

Inlet Air Pressure		Cold Fraction						
psi	bar	20%	30%	40%	50%	60%	70%	80%
14.7	1	25	24	24	20	18	15	11
		6	10	15	20	26	33	43
29.4	2	35	34	32	29	25	21	15
		8	14	21	29	37	47	59
44.1	3	53	51	48	44	38	31	23
		12	21	31	43	55	71	87
58.8	4	56	54	50	45	39	32	24
		13	22	31	43	56	71	90
73.5	5	58	55	51	46	40	33	25
		13	22	32	43	58	72	91
88.2	6	59	57	53	48	41	34	26
		13	22	32	44	58	73	93
102.9	7	69	66	62	56	48	40	30
		14	24	35	49	64	80	105
117.6	8	70	67	63	57	49	41	32
		14	25	37	51	66	84	105

Figures in blue detail the achievable temperature drop in °C
Figures in red detail the achievable temperature rise in °C

Vortex Tubes are factory calibrated to a cold fraction of 70%. This can be achieved by adjusting the control relief valve by approximately 2.5 turns from fully closed.