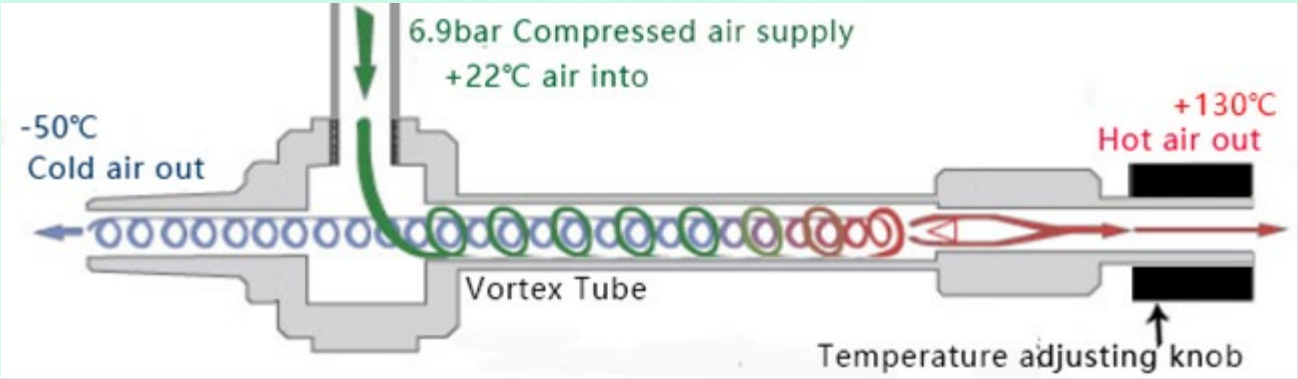
NANOSTONE PTE. LTD.

VAIR Vortex Tube

What is Vortex Tubes?

Vortex tube is a tool that can take normal compressed air and convert into two air streams. One stream is hot air and the other stream is cold air. The cold air can be adjusted down to -50 degrees Celsius, and the hot side can be adjusted up to a temperature of 130 degrees Celsius. Vortex Tubes have an adjustable valve at the "hot" end controls the volume of the air flow, and the temperature exiting at the cold end. By adjusting the valve, you control the "cold fraction" which is the percentage of total input compressed air the exits the cold end of the vortex tube.

How a Vortex Tube works ? A Vortex Tube creates cold air and hot air by forcing compressed air. Compressed air, typically at 80 to 100 Psig (5.5 - 6.9 BAR), is injected into the vortex tube at extremely high speeds and that creates a spin chamber. At up to 1,000,000 RPM, this air stream revolves toward the hot end where some escapes through the control valve. The remaining air, still spinning, is forced back through the center of this outer vortex. The inner stream gives off kinetic energy in the form of heat to the outer stream and exits the vortex tube as cold air. The outer stream exits the opposite end as hot air. The air flow and temperature are totally controllable. And since there are no moving parts there is little need for maintenance.



NANOSTONE PTE. LTD.

Setting Flow and Temperature in Vortex Tubes

Adjusting the slotted valve at the hot air outlet sets the flow rate and temperature at the cold end. The more air let out at the hot end reduces the cold air flowing and the cold air temperature at the cold end. Close the valve at the hot end and you increase the cold air flow at the cold end as well as the air temperature at the cold end. The percentage of total input air to the vortex tube that is directed to the cold end is the "cold fraction". A cold fraction of 60% to 80% produces the optimum refrigeration.

Most industrial applications, such as electrical control panel cooling, parts cooling, and tool cooling require maximum refrigeration and utilize the Maximum Cooling series vortex tubes. Applications which require extreme cold temperatures such as lab sample cooling, circuit board testing, would utilize the Maximum Cold Temperature series vortex tubes.

Compressed Air pressure	Cold fraction%						
	Temperature drop of cold air, ºC in **blue** Temperature rise of hot air, ºC in **red**						
BAR(PSIG)	20%	30%	40%	50%	60%	70%	80%
1.4(20)	34ºC	33ºC	31ºC	28ºC	24ºC	20ºC	16ºC
	8ºC	14ºC	20 ºC	28ºC	36ºC	46ºC	59ºC
2.8(40)	48ºC	46ºC	42ºC	39ºC	34ºC	28ºC	20ºC
	11ºC	18ºC	28ºC	38ºC	50ºC	62ºC	80ºC
4.2(60)	57ºC	55ºC	51ºC	46ºC	40ºC	33ºC	25ºC
	12ºC	22ºC	33ºC	44ºC	57ºC	74ºC	91ºC
5.5(80)	63ºC	62ºC	56ºC	51ºC	45ºC	36ºC	28ºC
	13ºC	24ºC	35ºC	47ºC	63ºC	80ºC	100ºC
6.9(100)	68ºC	65ºC	62ºC	55ºC	48ºC	39ºC	30ºC
	14ºC	25ºC	37ºC	50ºC	66ºC	84ºC	106ºC
8.4(120)	72ºC	69ºC	64ºC	58ºC	50ºC	41ºC	31ºC
	14ºC	26ºC	38ºC	52ºC	68ºC	86ºC	108ºC

The above table is for the (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.

NANOSTONE PTE. LTD.

Vortex Tubes Specifications - S style vortex tube (Standard style)
(3-1)

MODEL	Size	Hot end Muffler	Cold end Muffler	Inlet Pressure	Air Consumption		Capacity	
				Psi/Bar	scfm	slpm	BTU/H	Kcal/H
VC52004S	small	Yes	↓-45°C~50°C	100/6.9	04	120	270	68
VC52008S	small	Yes	↓-45°C~50°C	100/6.9	08	230	540	136
VC52010S	small	Yes	↓-45°C~50°C	100/6.9	10	280	650	164
VC52015S	medium	Yes	↓-45°C~50°C	100/6.9	15	430	1000	252
VC52020S	medium	Yes	↓-45°C~50°C	100/6.9	20	580	1350	340
VC52025S	medium	Yes	↓-45°C~50°C	100/6.9	25	710	1700	428
VC52030S	medium	Yes	↓-45°C~50°C	100/6.9	30	850	2000	504
VC52035S	medium	Yes	↓-45°C~50°C	100/6.9	35	990	2400	605
VC52040S	medium	Yes	↓-45°C~50°C	100/6.9	40	1130	2800	706
VC52050S	large	Yes	↓-45°C~50°C	100/6.9	50	1400	3400	856
VC52060S	large	Yes	↓-45°C~50°C	100/6.9	60	1700	4000	1008
VC52075S	large	Yes	↓-45°C~50°C	100/6.9	75	2100	5100	1285
VC52100S	large	Yes	↓-45°C~50°C	100/6.9	100	2800	6600	1663

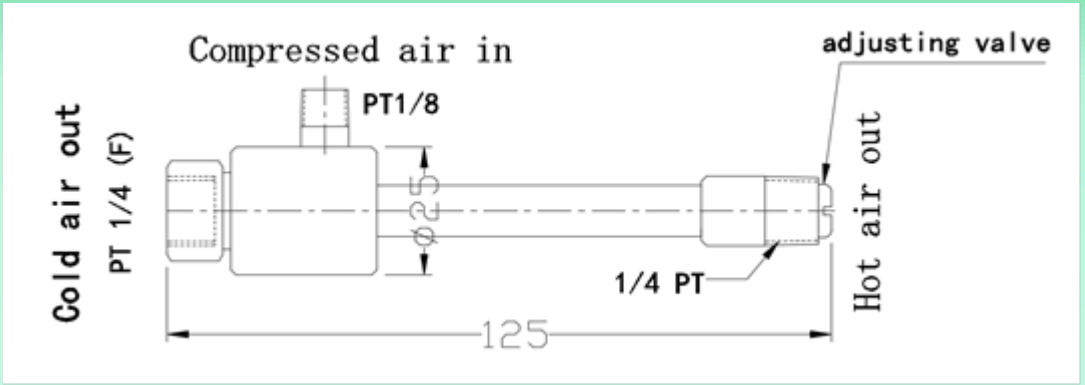
NANOSTONE PTE. LTD.

Vortex Tubes Specifications - S style vortex tube (Standard style)

(3-2)

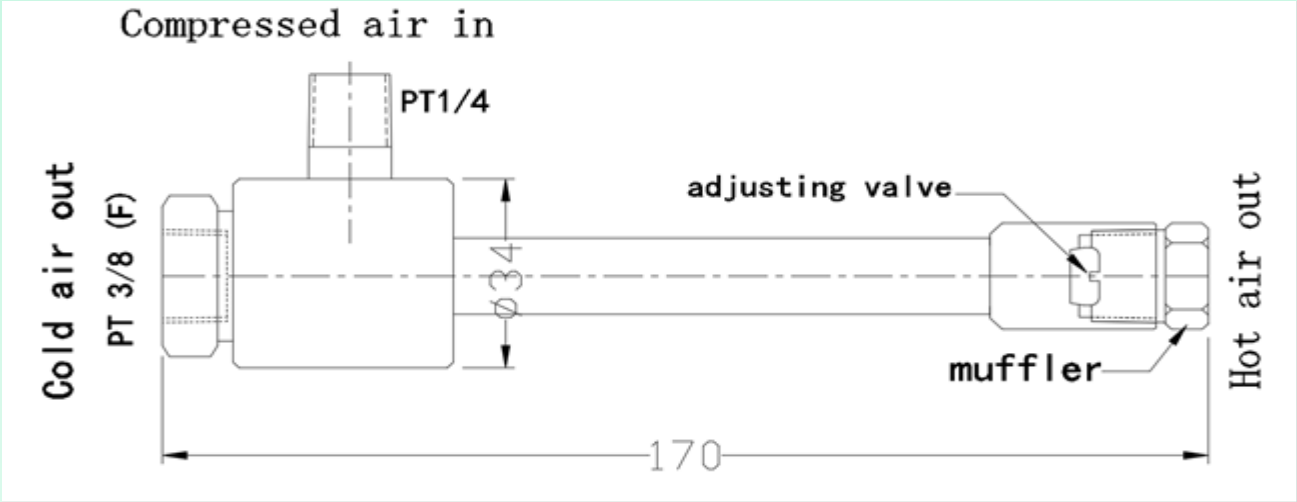
VC52004S,VC52008S and VC52010S:

Small stainless steel vortex tube size:



VC52015S,VC52020S,VC52025S,VC52030S,VC52035S and VC52040S:

Medium stainless steel vortex tube size:



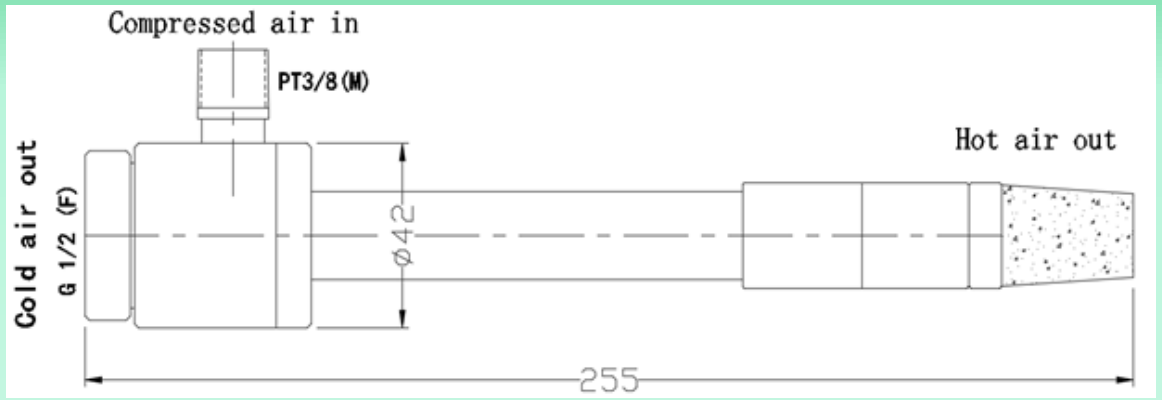
NANOSTONE PTE. LTD.

Vortex Tubes Specifications - S style vortex tube (Standard style)

(3-3)

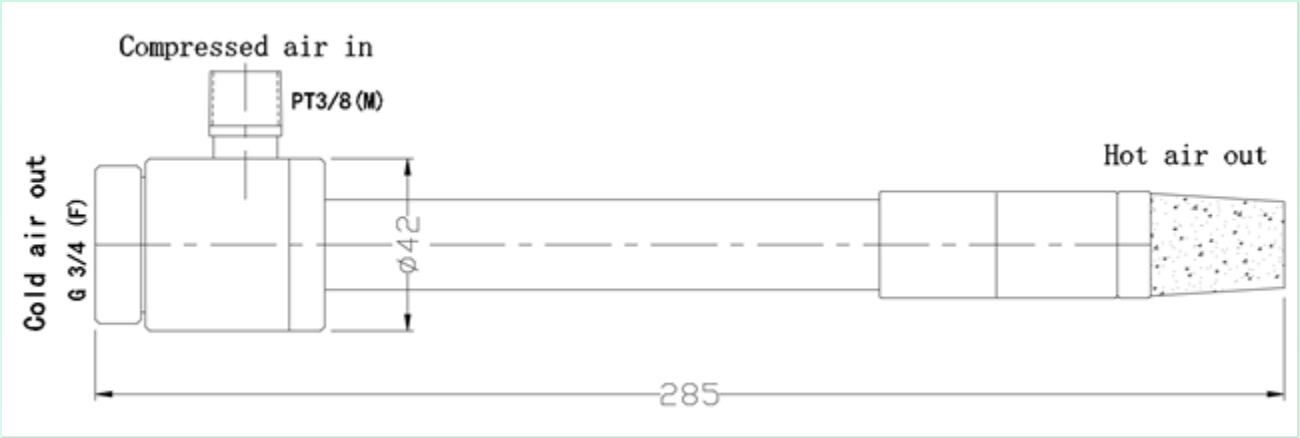
VC52050S and VC52060S:

Large stainless steel vortex tube size:



VC52075S and VC52100S:

Large stainless steel vortex tube size:



NANOSTONE PTE. LTD.

Vortex Tubes Specifications - C style vortex tube (Colder style)
(4-1)

MODEL	Size	Hot end Muffler	Maximum Temperature Drop	Inlet Pressure	Air Consumption		Capacity	
				Psi/Bar	scfm	slpm	BTU/H	Kcal/H
VC62004C	small	Yes	↓-50°C~65°C	100/6.9	4	120	280	70
VC62008C	small	Yes	↓-50°C~65°C	100/6.9	8	230	560	141
VC62010C	medium	Yes	↓-50°C~65°C	100/6.9	10	283	700	176
VC62015C	medium	Yes	↓-50°C~65°C	100/6.9	15	430	1100	277
VC62025C	medium	Yes	↓-50°C~65°C	100/6.9	25	710	1750	441
VC62030C	medium	Yes	↓-50°C~65°C	100/6.9	30	850	2100	529
VC62040C	medium	Yes	↓-50°C~65°C	100/6.9	40	1130	2850	718
VC62050C	Large	Yes	↓-50°C~65°C	100/6.9	50	1410	3650	920
VC62060C	Large	Yes	↓-50°C~65°C	100/6.9	60	1700	4200	1058
VC62075C	super	Yes	↓-50°C~65°C	100/6.9	75	2120	5500	1386
VC62100C	super	Yes	↓-50°C~65°C	100/6.9	100	2830	7200	1814

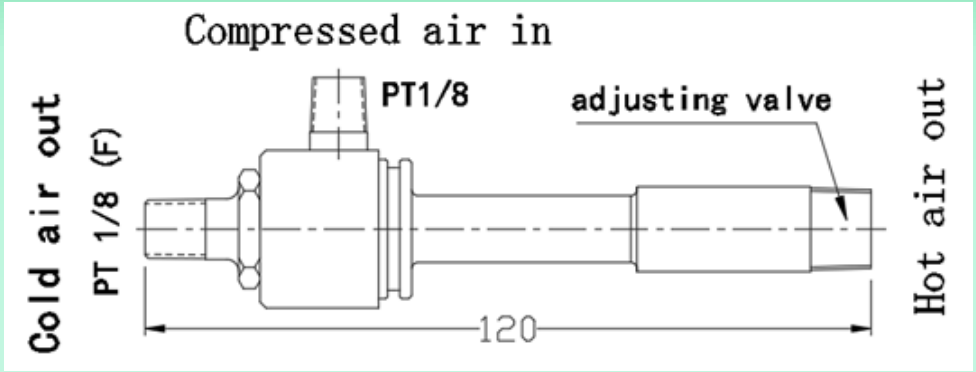
NANOSTONE PTE. LTD.

Vortex Tubes Specifications - C style vortex tube (Colder style)

(4-2)

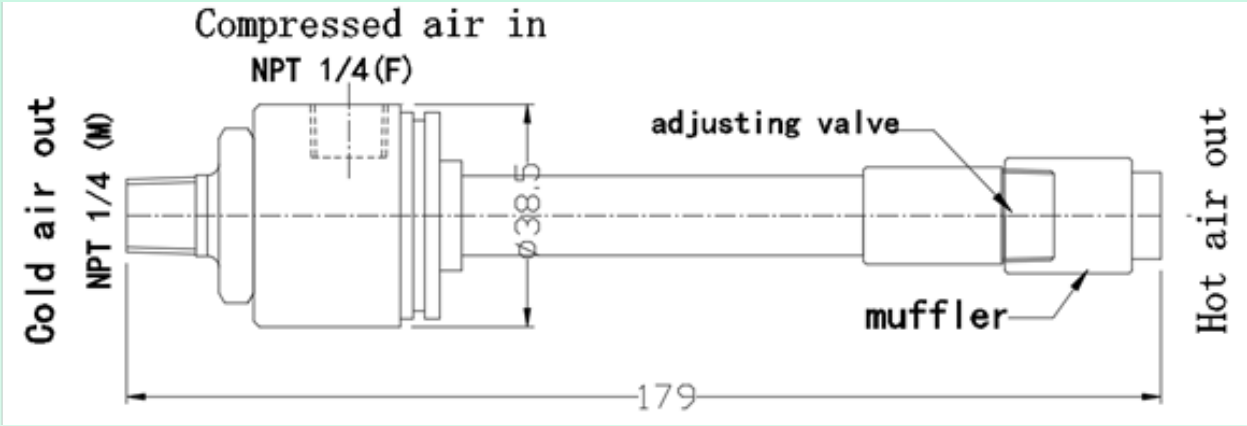
VC62004C，VC62006C and VC62008C:

Small Vortex Tube size:



VC62010C,VC62015C,VC62025C,VC62030C and VC62040C:

Medium Vortex Tube size:



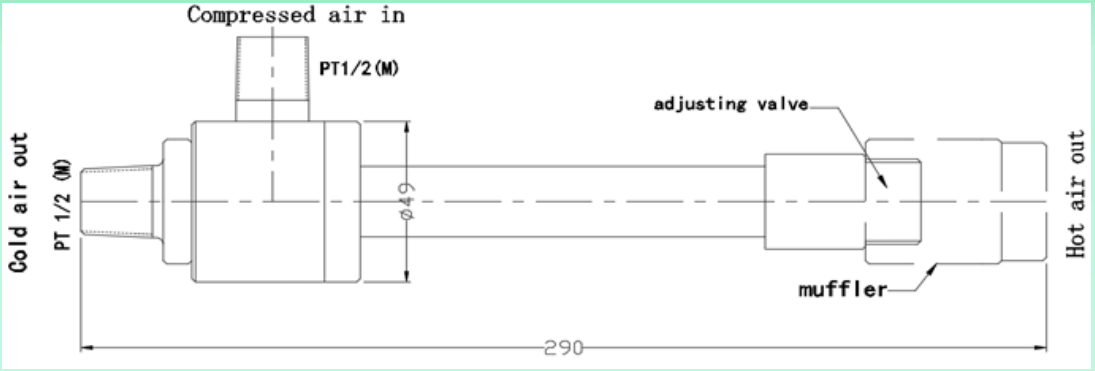
NANOSTONE PTE. LTD.

Vortex Tubes Specifications - C style vortex tube (Colder style)

(4-3)

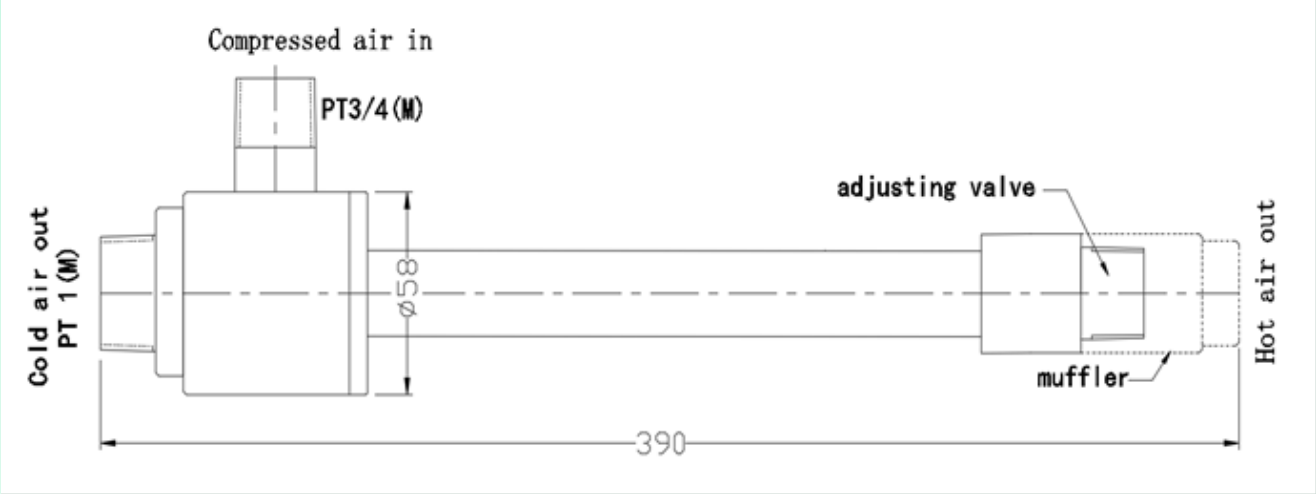
VC62050C and VC62060C:

Large Vortex Tube size:



VC62075C and VC62100C:

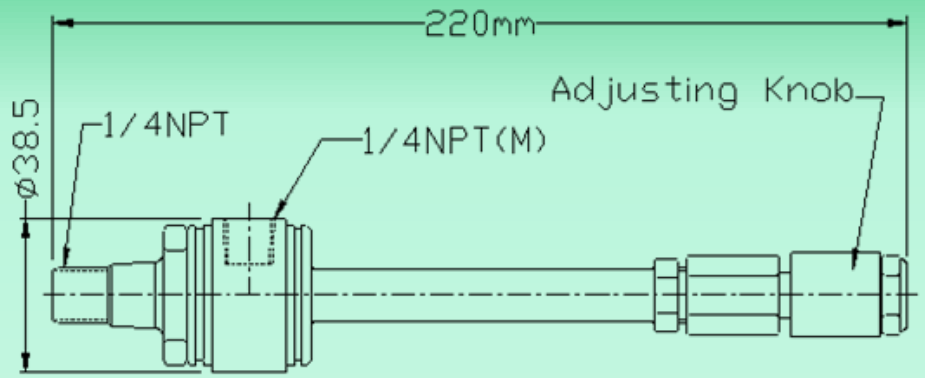
Super Vortex Tube size:



NANOSTONE PTE. LTD.

Vortex Tubes Specifications - C style vortex tube (Colder style)
(4-4)

VC60010C，VC60015C，VC60020C，VC60025C
VC60030C，VC60035C，VC60040C:
Medium Vortex Tube size



MODEL	Size	Hot end Muffler	Maximum Temperature Drop	Inlet Pressure	Air Consumption		Capacity	
				Psi/Bar	scfm	slpm	BTU/H	Kcal/H
VC60010C	medium	Yes	↓-50°C~65°C	100/6.9	10	283	700	176
VC60015C	medium	Yes	↓-50°C~65°C	100/6.9	15	430	1100	277
VC60020C	medium	Yes	↓-50°C~65°C	100/6.9	20	580	1400	352
VC60025C	medium	Yes	↓-50°C~65°C	100/6.9	25	710	1750	441
VC60030C	medium	Yes	↓-50°C~65°C	100/6.9	30	850	2100	529
VC60035C	medium	Yes	↓-50°C~65°C	100/6.9	35	990	2450	617
VC60040C	medium	Yes	↓-50°C~65°C	100/6.9	40	1130	2850	718

NANOSTONE PTE. LTD.

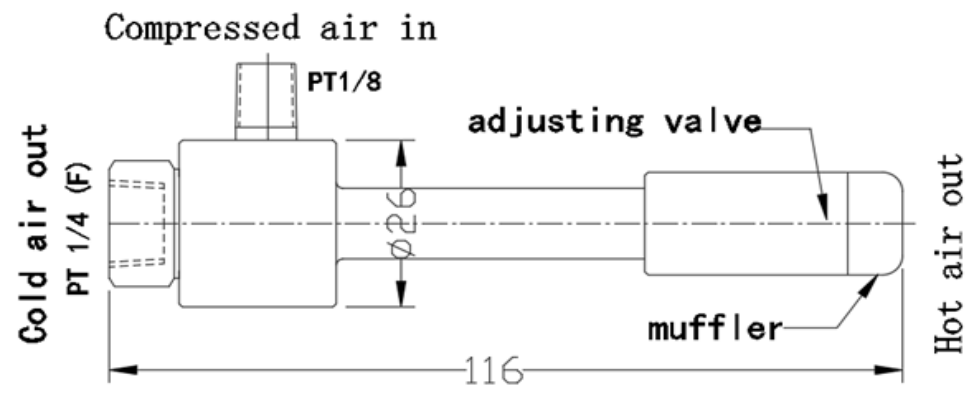
Vortex Tubes Specifications - G style vortex tube (Super cold style)
(3-1)

MODEL	Style	Hot end Muffler	Maximum Temperature Drop	Inlet Pressure	Air Consumption		Capacity	
				Psi/Bar	scfm	slpm	BTU/H	Kcal/H
VC62008G	small	Yes	↓-60°C~70°C	100/6.9	8	230	580	146
VC62010G	medium	Yes	↓-65°C~75°C	100/6.9	10	283	700	176
VC62015G	medium	Yes	↓-65°C~75°C	100/6.9	15	430	1150	290
VC62020G	medium	Yes	↓-65°C~75°C	100/6.9	20	580	1500	378
VC62025G	medium	Yes	↓-65°C~75°C	100/6.9	25	710	1850	466
VC62030G	medium	Yes	↓-65°C~75°C	100/6.9	30	850	2200	555
VC62035G	large	Yes	↓-65°C~75°C	100/6.9	35	990	2600	655
VC62040G	large	Yes	↓-65°C~75°C	100/6.9	40	1130	3000	756
VC62050G	super	Yes	↓-65°C~75°C	100/6.9	50	1420	3800	957
VC62060G	super	Yes	↓-65°C~75°C	100/6.9	60	1700	4400	1108
VC62075G	super	Yes	↓-65°C~75°C	100/6.9	75	2.12	5700	1436
VC62100G	super	Yes	↓-65°C~75°C	100/6.9	100	2.83	7400	1864
VC62125G	super	Yes	↓-65°C~75°C	100/6.9	125	3.54	9100	2293
VC62150G	super	Yes	↓-65°C~75°C	100/6.9	150	4.25	10700	2696
VC62200G	super	Yes	↓-65°C~75°C	100/6.9	200	5.65	14200	3578
VC62250G	super	Yes	↓-65°C~75°C	100/6.9	250	7.08	17800	4485
VC62500G	super	Yes	↓-65°C~75°C	100/6.9	500	14.2	35600	8972

NANOSTONE PTE. LTD.

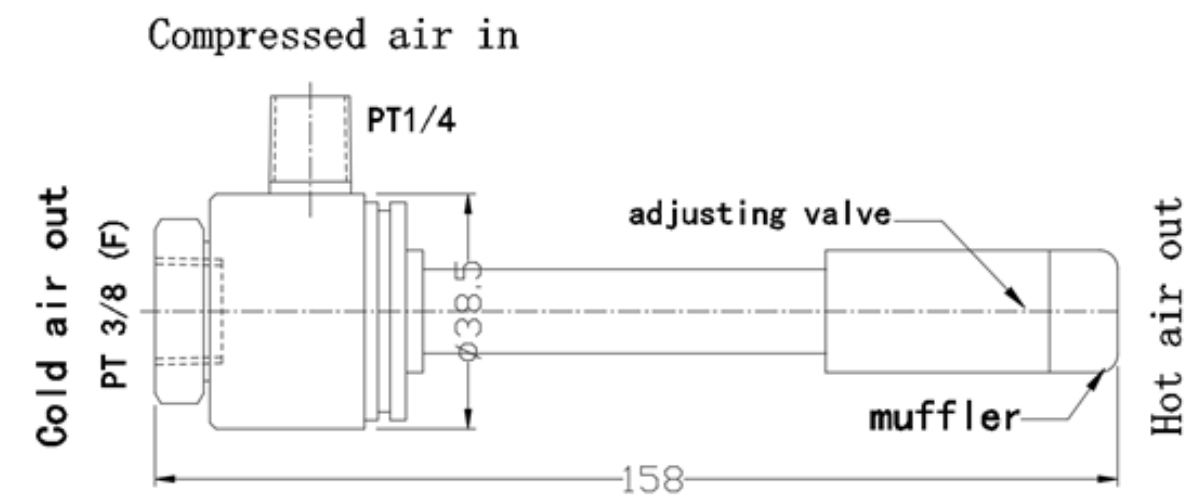
Vortex Tubes Specifications - G style vortex tube (Super cold style)
(3-2)

VC62008G Vortex Tube size



VC62010G,VC62015G, VC62025G and VC62030G:

Vortex Tube size:

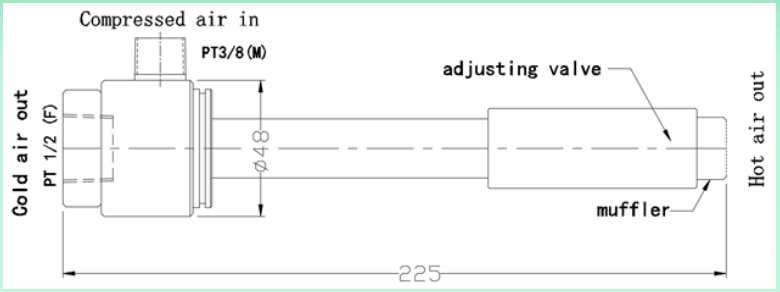


NANOSTONE PTE. LTD.

Vortex Tubes Specifications - G style vortex tube (Super cold style)
(3-3)

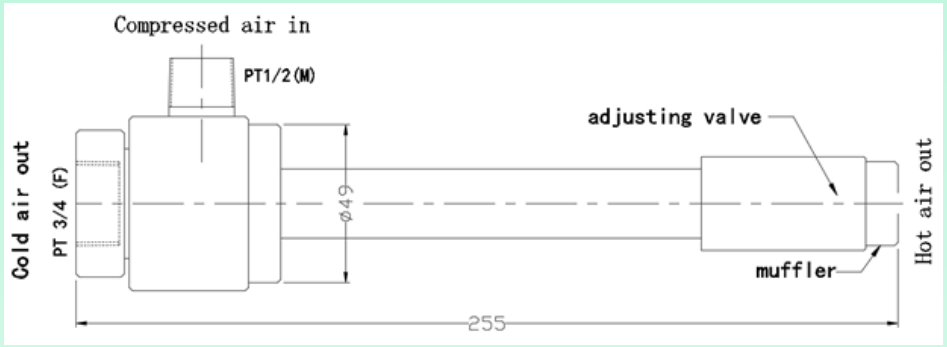
VC62035G and VC62040G:

Vortex Tube size



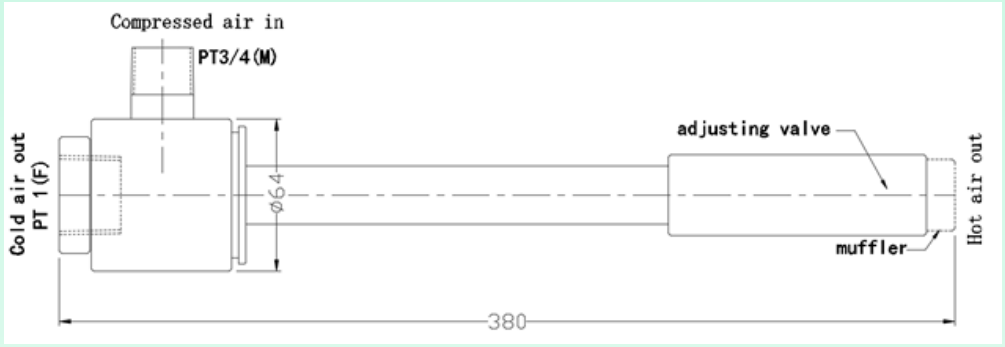
VC62050G and VC62060G:

Vortex Tube size:



VC62075G and VC62100G:

Vortex Tube size:



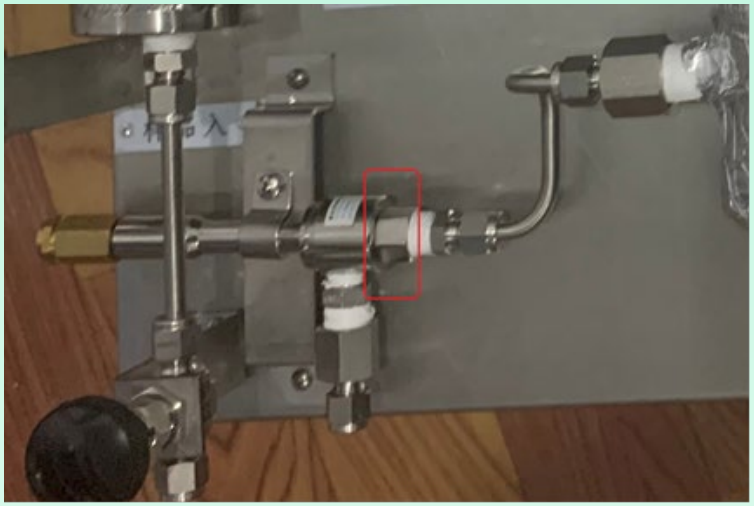
NANOSTONE PTE. LTD.

Vortex Tubes Features & Advantages

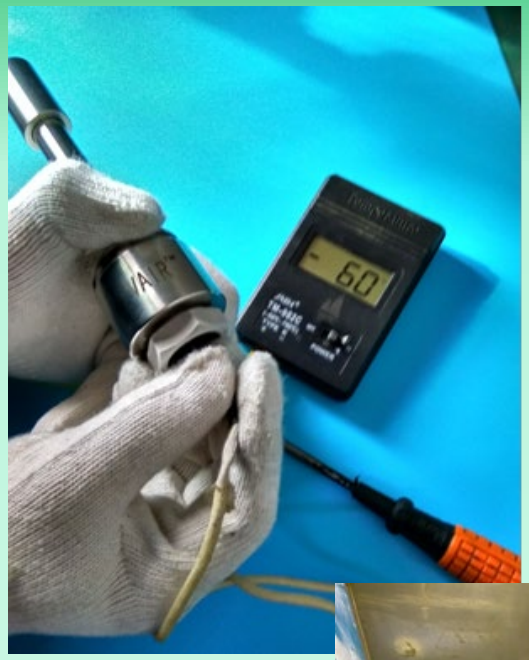
* No moving parts, reliable, maintenance free, lightweight, Low cost application
* Up to 6000 Btu/H (1510 Kcal/H) refrigeration
* Air flow rates up 1 to 1000 SCFM (28300 SLPM)
* Temperatures from -50℃ to +130℃
* use compressed air for spot cooling- no electricity or refrigerants are required
* No spark or explosion hazard, RF/EMI interference
* Instant on/off, easy to control, cools without waste
* No residue to clean up, no part washing needed
* Reliable, maintenance-free, durable stainless steel construction

Vortex Tubes Applications:

* Cool manufacturing processes: Machining plastics or metals, woodworking, soldering, adhesive application, heat sealing, sewing needles, mold tooling and many others
* In the laboratory, cool and dehumidify gas samples, cool environmental chambers
* Temperature cycle electronic and electrical controls, instruments, switches, thermostats
* Air condition electronic control enclosures: CNC cabinets, industrial PCs, PLCs, motor controls, CCTV cameras
* Generate hot air to +130℃, without a spark or explosion hazard to soften plastic, melt adhesives, seal packaging Cool workers wearing protective gear, soldered parts.



NANOSTONE PTE. LTD.



Contact Information:

Block 31, How Sun Road, #02-04 The Lilium, Singapore 538500
Tel: 0065-98267050 (WhatsApp and wechat), 83990076
Fax: 0065-66115562
Email: danial@nanostone.sg