OPERATION & SAFETY INSTRUCTIONS

VORTEX TUBES

Models 106, 208, 208SS, 308 and 328 series
(Includes all BSP versions of models listed above)

IMPORTANT

Please read all instructions BEFORE attempting to use this product

VORTEC
ITW Air Management

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GENERAL SAFETY CONSIDERATIONS

WARNING: COMPRESSED AIR COULD CAUSE DEATH, BLINDNESS OR INJURY

1. Do not operate a Vortex Tube at compressed air pressures above 150 psig (10.3 Bar).
2. Do not operate a Vortex Tube at line temperatures above 110°F (43°C).
3. Avoid direct contact with compressed air.
4. Do not direct compressed air at any person.
5. When using compressed air, wear safety glasses with side shields.

Introduction

A Vortex Tube is a device which, when supplied with filtered compressed air at 100 psig (6.9 Bar) and 70°F (21°C), converts the air into two streams. One stream is adjustable up to 250°F (121°C) and the other is adjustable down to -50°F (-48°C). Models ranging in air consumption from 2 SCFM to 100 SCFM are available.

Compressed Air Supply

The compressed air supply must be filtered to remove water and dirt using a 5 micron or smaller filter. Failure to use a filter may cause clogging (and freezing) of the compressed air paths inside the Vortec product. Filter recommendations are given in Table 1.

Filter elements must be changed on a regular basis. Frequency of change is determined by the condition of the compressed air supply. Filters should be installed in the compressed air supply line as close as possible to the Vortec product.

The appropriate size of compressed air supply line should be selected to ensure optimal performance of the Vortec product. Please refer to Table 2 to determine what supply line size is recommended for your application. Contact Vortec at 1-800-441-7475 for further assistance.

When the desired cold air stream temperature is less than 32°F (0°C), a compressed air dryer may be necessary to prevent ice formation on the inside of the Vortec product.

Installation

Vortex Tubes can be installed by directly plumbing to the appropriately-sized, hard piped, compressed air source that does not exceed 150 psig (10.3 Bar).

Operation

Vortex Tubes vary in air consumption from 2 SCFM to 100 SCFM. For help in selecting the appropriate Vortex Tube for your exact need, contact your local distributor or Vortec.

The cold air temperature and volume can be changed by adjusting the valve at the hot end of the Vortex Tube. Turning the valve counterclockwise will decrease the temperature and volume of cold air. Correspondingly, the flow of hot air will increase but its temperature will decrease.

Maximum refrigeration (cooling capacity) is created when the valve is adjusted to produce 60 to 70% cold air flow and 30 to 40% hot air exhaust.

Maintenance

Vortex Tubes have no moving parts and can be disassembled for cleaning. When reassembling the Vortex Tubes, be sure to tighten the cold cap to 100 inch pounds of torque.

Troubleshooting

Insufficient airflow may be caused by the following:

1. Undersized compressed air line size.
2. Compressed air pressure too low.
3. Partial or complete blockage of internal compressed air path, due to dirt. See Maintenance section for cleaning instructions; and Compressed Air Supply section for filter recommendations.

Insufficient cold air temperature may be caused by:

1. Compressed air line temperature too high.
2. Water vapor in the compressed air supply.
3. Loose cold cap. This may occur if not tightened properly after disassembled for cleaning.

If trouble persists, please contact Vortec at 1-800-441-7475.

Limited Warranty

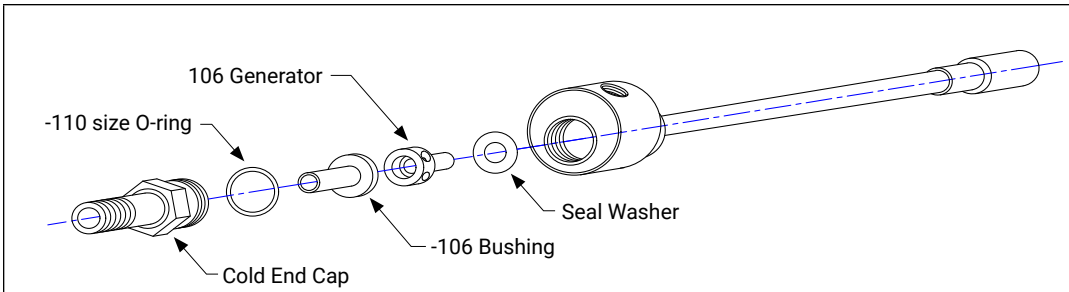
Vortec compressed air products manufactured by ITW Air Management will be replaced or repaired if found to be defective due to manufacture defect within ten years from the date of invoice.

Refer to our website **www.vortec.com** for full warranty details and limitations. ITW Air Management makes no specific warranty merchantability or warrant of fitness to a particular purpose.

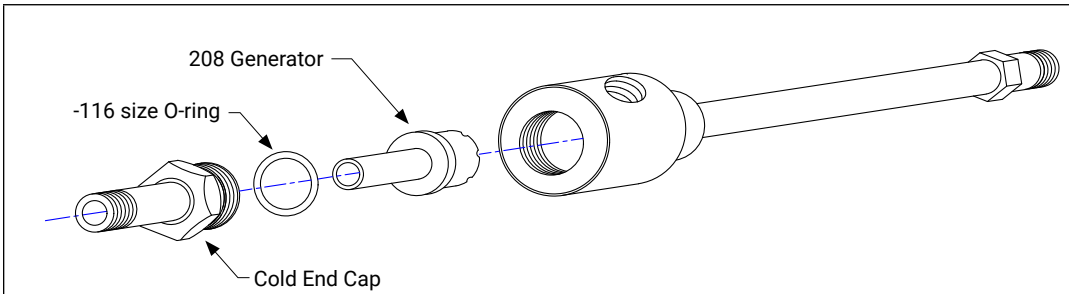
Vortex Tube Assembly

(Drawings shown below are not to scale)

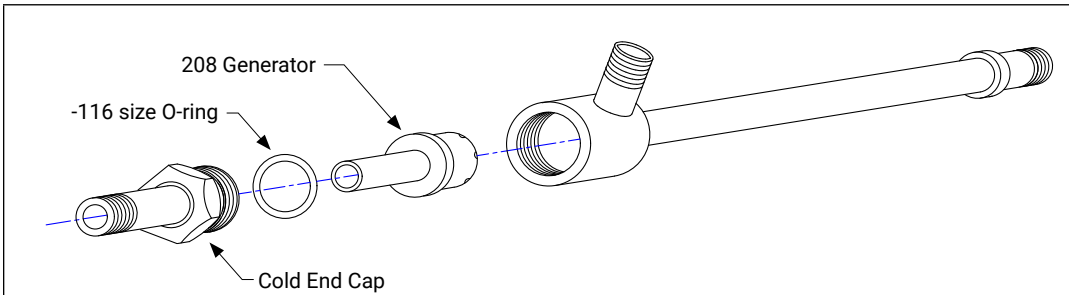
Model 106



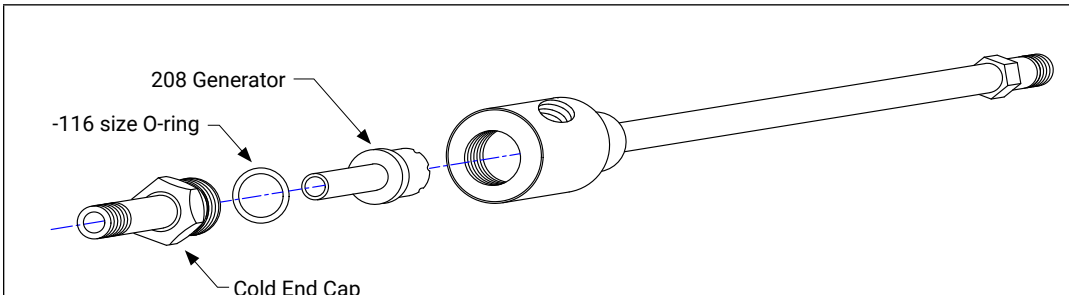
Model 208



Model 208SS



Model 308



Model 328

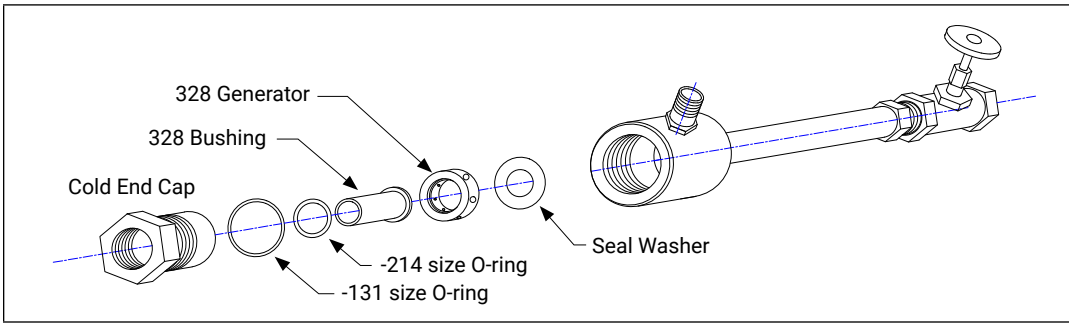


Table 1: Filter Recommendations

FILTER AND REPLACEMENT PART ITEM NUMBERS						
Vortec Model	5 micron Air Filter	Oil Removal Filter	Cold Air Muffler	Hot Exhaust Muffler	Magnetic Mounting Base	Replacement Generator Kits (5 pcs)
106 series	701S-24A	701S-48	106MC	208MH	620-26	106GK-2H, -4H, -8H
208 series	701S-24A	701S-48	208MC	208MH	620-26	208GK-11H, -15H, -25H
208SS	701S-24A	701S-48	208MC	208MH	620-26	208GK-11H, -15H, -25H
308 series	701S-36A	701S-54	208MC	308MH	620-26	208GK-35H
328-50-H	701S-36A	701S-54	328M	328M	-	328GK-50H*
328-75-H	701S-40A	-	328M	328M	-	328GK-75H*
328-100-H	701S-40A	-	328M	328M	-	328GK-100H*

*328 Generator Kits consist of one generator and one bushing of the indicated size.

Table 2: Determining Compressed Air Line Size

1. Calculate total product compressed air consumption (SCFM, SLPM).
2. Determine length of compressed air line required for connection to main supply.
3. Locate pipe length in left column and read to the right to find the compressed air requirements.
4. Locate pipe size at top of column.

MAXIMUM AIRFLOW (SCFM) THROUGH PIPE AT 5 PSIG PRESSURE DROP (100 PSIG AND 70°F)									
Pipe Length (Feet)	Pipe Size (Nominal) - Schedule 40								
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2
10	29	65	120	254	480	978	1483	2863	4536
20	21	46	85	180	340	692	1049	2024	3208
30	17	37	70	147	277	565	856	1653	2619
40	15	32	60	127	240	489	792	1431	2268
50	13	29	54	114	215	437	663	1280	2029
60	12	26	49	104	196	399	606	1169	1852
70	11	25	46	96	181	370	561	1082	1715
80	10	23	43	90	170	346	524	1012	1604
90	10	22	40	85	160	326	494	954	1512
100	9	21	38	80	152	309	469	905	1435

MAXIMUM AIRFLOW (SLPM) THROUGH PIPE AT 0.3 BAR PRESSURE DROP (6.9 BAR AND 21°C)									
Pipe Length (Meters)	Pipe Size (Nominal) - Schedule 40								
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2
3	821	1840	3396	7188	13584	27677	42117	81023	128369
6	594	1302	2406	5094	9622	19584	29687	57279	90786
9	481	1047	1981	4160	7839	15990	24225	46780	74188
12	425	906	1698	3594	6792	13839	20999	40497	64184
15	368	821	1528	3226	6085	12367	18763	36224	57421
18	340	736	1387	2943	5547	11292	17150	33083	52412
21	311	708	1302	2717	5122	10471	15877	30621	48535
24	283	651	1217	2547	4811	9792	14829	28640	45393
27	269	623	1132	2406	4528	9226	13980	26998	42790
31	255	594	1075	2264	4302	8745	13273	25612	40611

Rubber hose maximum airflow rating: 1/2” I.D. rubber hose = 3/8” pipe; 3/4” I.D. rubber hose = 1/2” pipe