OPERATION & SAFETY INSTRUCTIONS

AIR KNIVES & IONIZING AIR KNIVES

Models 921-X and 981-X
(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 Air Knives at compressed air pressures above 150 psig (10.3 Bar).
2. Avoid direct contact with compressed air.
3. Do not direct compressed air at any person.
4. When using compressed air, wear safety glasses with side shields.

Introduction

Air Knives are airflow amplifiers that can reduce compressed air consumption by up to 50% while helping to meet OSHA dead-end pressure and noise specifications. Air Knives produce a high velocity, highly uniform airflow for blow off or surface cooling of moving webs, sheets, strips and large or small objects and wide surfaces.

Ionizing Air Knives are used for static neutralization and blow off of moving webs, sheets, strips and large or small objects and wide surfaces.

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 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 the 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.

Installation and Operation

Air Knives can be cycled on and off to match machine cycle times. In order to vary the volume of airflow from the Air Knife, an appropriately sized pressure regulator can be used to control the compressed air pressure, (less pressure = less airflow). Pressure regulator recommendations are given in Table 1.

Air Knives have no moving parts, and require only filtered compressed air for proper operation. Ionizing Air Knives must be connected to a suitable power supply (Vortec models F167 or D167RY). The power supplies are capable of operating up to two or four separate Ionizing Air Knives respectively. The total effective length of all Ionizing Air Knives connected to one power supply should not exceed 200 inches.

Multiple Air Knives can be installed by connecting to an air manifold or by directly plumbing to the appropriately-sized, hard piped, compressed air source that does not exceed 150 psig (10.3 Bar). Air Knives will be most effective if securely mounted at 18 inches or less from the surface to be blown off.

Maintenance

It is critical to the performance of the Air Knives that the internal air passages remain clean. If performance suddenly drops, carefully disassemble the unit and inspect for debris. If debris is found, it may be necessary to change the filter element. Clean the debris from the unit and reassemble. For detailed instructions on cleaning or reassembly contact your authorized distributor or Vortec.

If uneven airflow is present from the Air Knife, it may be partially clogged with dirt. You may disassemble the Air Knife and clean any debris that may be blocking airflow out of the extremely small air gap. Use a soft brush and/or pure isopropyl alcohol on a clean cloth to remove stubborn deposits. Be careful not to damage the thin aluminum shim(s) inside the unit. When reassembling the Air Knife, use the same thickness shims that were removed from the unit. Red colored shims are 0.002”, green are 0.003” and silver are 0.004”. Tighten the cap screws that secure the two main components together from the center of the unit out to the ends. Replace the end caps and gaskets.

Ionizing Air Knives

In order for the ionizing system to function, the ionizing high voltage cable must be kept at least 1/4” (6 mm) from any grounded surface. Two cable supports are provided to help position the cable and keep it in place away from grounded surfaces. To install the cable supports, push the plastic bushing out of the metal support. Screw the metal support into the desired location; then snap the plastic bushing onto the cable (the bushing is split to allow this) at the desired position. Push the cable onto the metal support and press the bushing back into the support.

Run the green ground wire from the ionizing bar back to the power supply. Attach the ground wire ring terminal to the ground stud on the power supply. Secure the ground wire to the power supply with a locknut. Keep the green ground wire at least 1/4” away from the high voltage cable.

Insert the spring loaded connector on the end of the high voltage cable into one of the high voltage receptacles on the power supply. Finger tighten the knurled knob on the connector into the receptacle. **Be sure that the power to the power supply is disconnected before attempting to connect the high voltage power cable.**

Verify that all electrical connections are securely attached before plugging the power supply into the appropriate 115 VAC receptacle. The receptacle must have a good ground connection for the ground pin on the plug. If it does not, bolt the power supply to a well grounded metal machine frame. The Ionizing Air Knife will not operate unless properly grounded.

If you suspect that your ionizing bar is not functioning properly, you may test it when the unit is operating. Using an insulated handle screwdriver, place the metal shaft of the screwdriver on the metal surface of the ionizing bar. While the metal shaft of the screwdriver is touching one of the metal sides of the ionizing bar, position the tip of the screwdriver near one of the sharp emitter points on the bar. A small spark should jump a 1/16” to 1/8” (1 to 3 mm) gap between the emitter point and the tip of the screwdriver. Continue this test on each emitter point. The emitter points can be cleaned with a soft brush and small amounts of isopropyl alcohol. Disconnect power to the power supply when cleaning the emitter points.

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 air path, due to dirt. See Maintenance section for cleaning instructions; and Compressed Air Supply section for filter recommendations.
4. Insufficient compressed air volume.

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

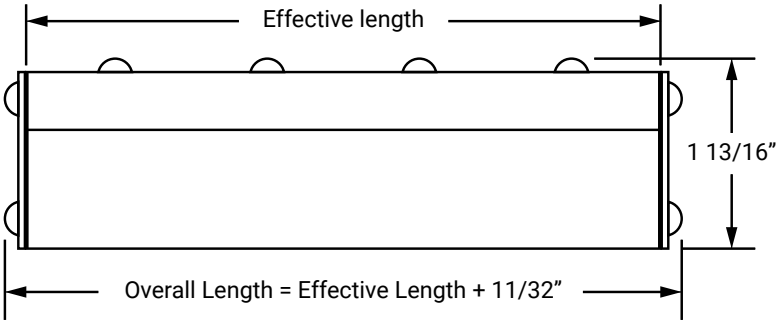
Limited Warranty

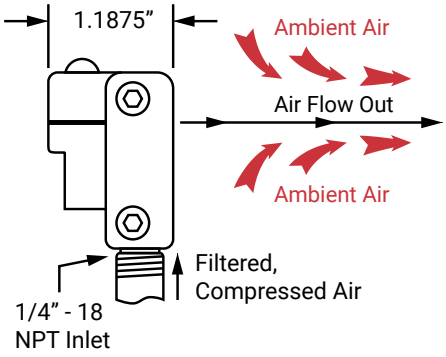
Vortec compressed air products manufactured by ITW Air Management will be replaced or repaired if found to be defective due to manufacture defect within ten years from the date of invoice. Refer to our website **www.vortec.com** for full warranty details and limitations. ITW Air Management makes no specific warranty merchantability or warrant of fitness to a particular purpose.

Dimensions and Functionality

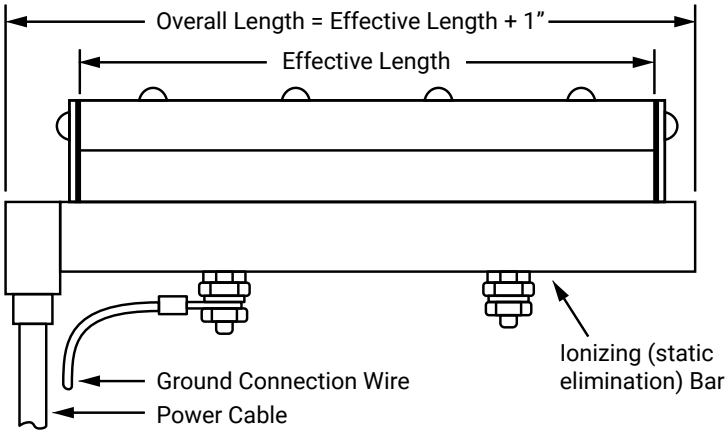
(Drawings shown below are not to scale)

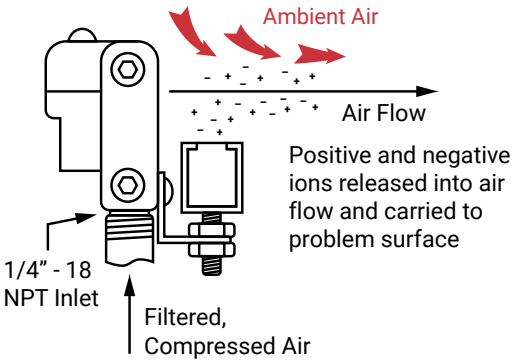
Air Knife





Ionizing Air Knife





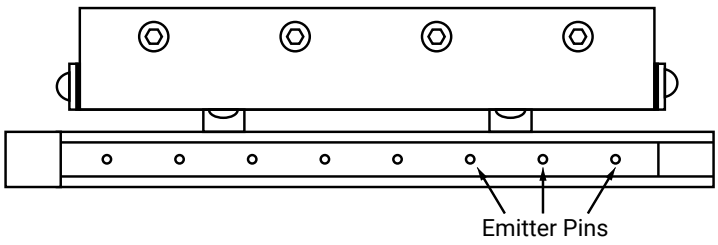


Table 1: Filter Recommendations

FILTER AND REPLACEMENT PART ITEM NUMBERS				
Vortec Model	5 micron Air Filter	Oil Removal Filter	Pressure Regulator	.002", .003" or .004" shims
921-3	701S-24A	701S-48	208R	930-8, 930-9, 930-10
921-6, 981-6	701S-24A	701S-48	208R	930-8, 930-9, 930-10
921-12, 981-12	701S-40A	701S-54	208R	930-8, 930-9, 930-10
921-18, 981-18	701S-40A	-	208RX	930-8, 930-9, 930-10
921-24, 981-24	701S-40A	-	208RX	930-8, 930-9, 930-10

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