OPERATION & SAFETY INSTRUCTIONS

VORTEC COOLING VEST AND COOLING TUBE

IMPORTANT

Please read all instructions BEFORE attempting to use this product

VORTEC
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GENERAL SAFETY CONSIDERATIONS

WARNING: COMPRESSED AIR COULD CAUSE DEATH, BLINDNESS OR INJURY

1. Do not operate a Cooling Vest or Cooling Tube at air pressures above 150 psig (10.3 Bar).
2. Do not operate a Cooling Vest or Cooling Tube at compressed air temperatures above 90°F (32°C).
3. Avoid direct contact with compressed air.
4. Do not direct compressed air from a nozzle or orifice at any person.
5. When using compressed air, wear safety glasses with side shields.

Introduction

Vortec Cooling Tubes are designed to be used with Vortec Cooling Vests to provide worker comfort in extreme temperature environments. The vortex tube technology utilized in the Cooling Tube uses filtered compressed air to focus chilled air on the user's torso through the Cooling Vest. With no moving parts, and under reasonable care, the Cooling Tubes and Cooling Vests will provide years of trouble-free operation.

Compressed Air Supply

The compressed air supply must be filtered (5 micron maximum) to remove water and dirt. If oil is present in the compressed air supply, remove the oil using a 0.01 micron (maximum) coalescing filter. 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 (fixed to a wall or rigid piping) so that they remain in an upright position with the bowl drain pointing downward. All recommended filters have an automatic drain feature, so all condensation will automatically be expelled from the bottom of the filter when the bowl reaches capacity. The filter should be located as close as possible to the Cooling Tube, so use the shortest hose possible to prevent excessive pressure drop.

The appropriate size of compressed air hose should be selected to ensure optimal performance of the Cooling Tube. Please refer to Table 2 to determine the proper compressed air hose size for your application. Contact Vortec at 1-800-441-7475 for further assistance. If the Cooling Tube is used to provide cool respirable air to a hood or helmet, then the compressed air supply must meet stringent conditions for oxygen content and other factors. (Refer to the respirator manufacturer's instructions.)

All of Vortec's Cooling Tubes utilize a standard ¼" Industrial Interchange quick connect nipple to allow for easy attachment to and detachment from compressed air hoses.

Operation

Cooling Tube

The Cooling Tube can be used to provide a chilled air supply to the user. The temperature and flow rate of the cold air stream can be adjusted over a wide range by turning the black muffler on the end of the Cooling Tube: turning the muffler counterclockwise reduces the temperature and flow of the cold air. Turning the

muffler clockwise will increase the temperature and flow of the cold air. The black muffler may become warm. An optional heat shield is available to protect the user's body from the hot exhaust air, if desired. (See Table 1).

The Cooling Tube can supply chilled air to the Vortec Cooling Vest or to a hood or helmet. When purchased with the vest, the cooling tube is inserted into a sleeve on the vest; when purchased separately, the Cooling Tube is supplied with a belt, with the Cooling Tube in a horizontal orientation on the user's waist. If it is desired to reposition the Cooling Tube so that it is vertical on the waist (for connection to a hood or helmet), first remove the white plastic button at the end of the belt by pulling the two halves apart. Remove the belt assembly from the metal belt bracket and then reattach it to the bracket through the alternate slots. Loop the end of the belt through the male side of the buckle and reattach the white button in the belt hole by pushing the two halves together. See Figures 1 and 2.

Cooling Vests

Upon receipt, inspect the vest and contact your Vortec representative immediately if you suspect damage of any kind to the vest. Once the vest is placed into service, it may not be returned under any circumstances. The Cooling Vest comes with the Cooling Tube already inserted into the sleeve on the vest. Put the Vest on, and secure the front of the vest with the four Velcro fasteners. Be sure to leave enough room to comfortably move in the vest. Connect the Cooling Tube to the air supply for cooling to begin.

The Cooling Vest may be used under welding leathers, coveralls or other protective garments, but the warm exhaust air from the Cooling Tube must be vented outside of the garment.

Maintenance

The Cooling Tube may be disassembled for cleaning by removing the cold outlet fitting. Remove the O-ring and the red, blue or brown nylon generator. Inspect the parts and clean or replace as needed (see Table 1 for replacement items). When reinstalling the components, it is important to torque the cold outlet fitting to 100 inch-pounds (11 newton meters) to ensure proper sealing. Check the filter elements in the compressed air filter(s) and change if necessary.

Troubleshooting

Insufficient airflow may be caused by the following:

1. Undersized compressed air line size (See Table 2).
2. Compressed air hose too long (excessive pressure drop through hose).
3. Compressed air pressure too low.
4. Insufficient compressed air volume.
5. Partial or complete blockage of internal compressed air path, due to dirt or moisture freezing in the cold air stream.
6. Loose cold outlet fitting (if 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 manufacturing within ten years of the date of invoice. Cooling Vests are not covered under by this warranty if the vest has been removed from the packaging and placed into service.

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.

Figure 1: Vortec Cooling Tube with belt installed for horizontal orientation

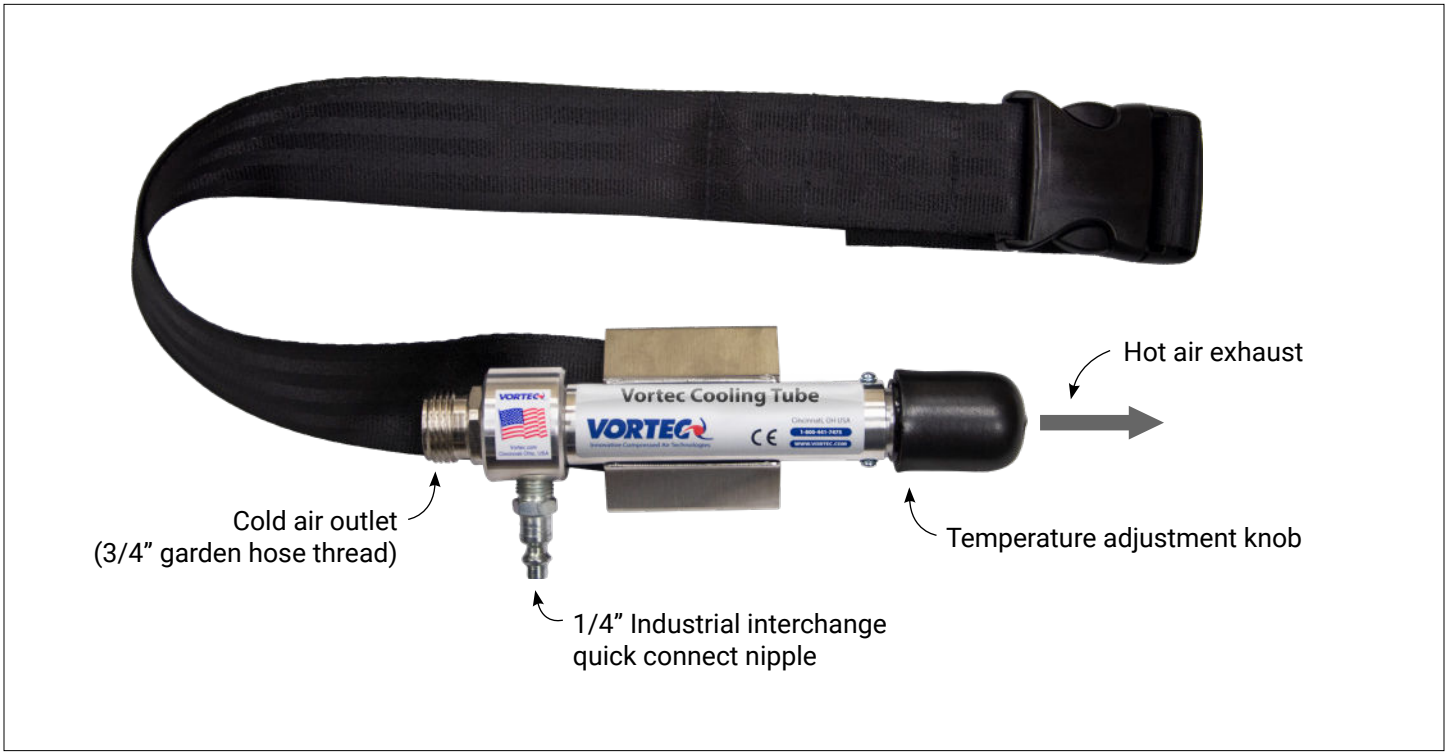

Figure 2: Vortec Cooling Tube with belt installed for vertical orientation

Table 1: Cooling Tube / Cooling Vest Model Number Matrix

VEST MODEL NUMBER MATRIX	Cooling Vest (L)	Cooling Vest (XL)	Cooling Vest (2XL)
Cooling Tube with Belt Model Number	22825	22835	22835
Replacement Vest Model Number	Vest-L	Vest-XL	Vest-2XL
Cooling Capacity	1500 BTUH (378 kCal/hr)	2500 BTUH (630 kCal/hr)	2500 BTUH (630 kCal/hr)
Air Consumption	25 scfm (708 slpm)	35 scfm (990 slpm)	35 scfm (990 slpm)
Recommended Air Filters:			
5 Micron Air Filter Part Number	701S-24A	701S-24A	701S-24A
Oil Removal Part Number	701S-48	701S-48	701S-48
Replacement Parts and Accessories:			
Heat Shield Part Number	228-80	228-80	228-80
Replacement Generator Kit Part Number*	208GK-25H	208GK-35H	208GK-35H

All specifications at 100 psig and 70°F (6.9 bar and 21°C) compressed air.
* A generator kit consists of five generators of the same specification.

Table 2: Determining Compressed Air Hose Size

1. Determine the product's compressed air consumption from the information given in Table 1.
2. Determine the length of compressed air hose required for the application.
3. Locate the hose length in the left column and read to the right to find the compressed air consumption.
4. Locate the recommended hose size at the top of the column.

MAXIMUM AIRFLOW (SCFM) THROUGH SMOOTH BORE HOSE at a 5 psig pressure drop (100 psig and 70°F)			
Hose Length (feet)	3/8" id hose	1/2" id hose	3/4" id hose
10	29	65	120
20	21	46	85
30	17	37	70
40	15	32	60
50	13	29	54
60	12	26	49
70	11	25	46
80	10	23	43
90	10	22	40
100	9	21	38

MAXIMUM AIRFLOW (SLFM) THROUGH SMOOTH BORE HOSE at a 0.3 bar pressure drop (6.9 bar and 21°C)			
Hose Length (meters)	10 mm id hose	13 mm id hose	20 mm id hose
3	821	1840	3396
6	594	1302	2406
9	481	1047	1981
12	425	906	1698
15	368	821	1528
18	340	736	1387
21	311	708	1302
24	283	651	1217
27	269	623	1132
31	255	594	1075

Example:
A model 22825 Cooling Tube uses 25 scfm (708 slpm) of air. If a 50 foot (15 m) long hose is needed to supply air to the 22825, then the inside diameter of the hose should be 1/2" (13mm).