



# OPERATION & SAFETY INSTRUCTIONS

## DUAL ACTION / COOLING ONLY PERSONAL AIR CONDITIONERS and DIFFUSE AIR VESTS



**IMPORTANT**  
Please read all instructions BEFORE attempting to use this product

**TW Air Management**

**TABLE 1: PERSONAL AIR CONDITIONER / VEST MODEL NUMBER MATRIX**

| PERSONAL AIR CONDITIONER / VEST MODEL NUMBER MATRIX |                            |                              |                               |           |                  |           |                  |           |                 |      |                                 |                                |                                       |  |                                 |
|---|----------------------------|------------------------------|-------------------------------|-----------|------------------|-----------|------------------|-----------|-----------------|------|---------------------------------|--------------------------------|---------------------------------------|--|---------------------------------|
| Integrated PAC/Vest Model Number                    | Cold Only PAC Model Number | Dual Action PAC Model Number | Replacement Vest Model Number | Vest Size | Cooling Capacity |           | Heating Capacity |           | Air Consumption |      | Recommended Air Filters         |                                | PAC Replacement Parts and Accessories |  |                                 |
|   |                            |                              |                               |           | (BTUH)           | (kCal/Hr) | (BTUH)           | (kCal/Hr) | scfm            | slpm | 5 Micron Air Filter Part Number | Oil Removal Filter Part Number | Heat Shield Part Number               | Replacement Generator Kit Part Number* | Replacement Muffler Part Number |
| -   | 22815                      | -                            | -                             |           | 900              | 227       | -                | -         | 15              | 425  | 701S-24A                        | 701S-48                        | 228-80                                | 208GK-15H                              | -                               |
| 22525   | 22825                      | -                            | 865                           | L         | 1500             | 378       | -                | -         | 25              | 708  | 701S-24A                        | 701S-48                        | 228-80                                | 208GK-25H                              | -                               |
| 22735   | 22835                      | -                            | 867                           | XL        | 2500             | 630       | -                | -         | 35              | 990  | 701S-36A                        | 701S-48                        | 228-80                                | 208GK-35H                              | -                               |
| 22935   | 22835                      | -                            | 869                           | XXL       | 2500             | 630       | -                | -         | 35              | 990  | 701S-36A                        | 701S-48                        | 228-80                                | 208GK-35H                              | -                               |
| 29525   | -                          | 29625                        | 865                           | L         | 900              | 227       | 900              | 227       | 25              | 708  | 701S-24A                        | 701S-48                        | -                                     | 208GK-25H                              | 28525-4                         |
| 29735   | -                          | 29635                        | 867                           | XL        | 1140             | 287       | 900              | 227       | 35              | 990  | 701S-36A                        | 701S-48                        | -                                     | 208GK-35H                              | 28525-4                         |
| 29935   | -                          | 29635                        | 869                           | XXL       | 1140             | 287       | 900              | 227       | 35              | 990  | 701S-36A                        | 701S-48                        | -                                     | 208GK-35H                              | 28525-4                         |

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 (SLPM) THROUGH SMOOTH BORE HOSE at a .3 bar pressure drop (6.9 bar and 21°C) |              |              |              |
|--|--------------|--------------|--------------|
| Hose Length (meters)   | 10mm id hose | 13mm id hose | 20mm 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 29525 Dual Action PAC uses 25 scfm (708 slpm) of air. If a 50 foot (15 m) long hose is needed to supply air to the 29625, then the inside diameter of the hose should be 1/2" (13mm).

## GENERAL SAFETY CONSIDERATIONS

### WARNING: COMPRESSED AIR COULD CAUSE DEATH, BLINDNESS OR INJURY.

1. Do not operate a Personal Air Conditioner at air pressures above 150 psig (10.3 bar).
2. Do not operate a Personal Air Conditioner 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's PACs (Personal Air Conditioners) and Dual Action PACs are designed to be used with Vortec's Diffuse Air Vests to provide worker comfort in extreme temperature environments. The vortex tube technology utilized in the PAC uses filtered compressed air to concentrate chilled or heated air on the user's torso through the Diffuse Air Vest. With no moving parts, and under reasonable care, the PACs and Diffuse Air 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 Personal Air Conditioner, 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 PAC. 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 PAC is used to provide cool or warm 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 PACs and Dual Action PACs utilize a standard ¼" Industrial Interchange quick connect nipple to allow for easy attachment to and detachment from compressed air hoses.

## OPERATION

### Dual Action Personal Air Conditioners

The Dual Action PAC can be used to provide a chilled air supply or a heated air supply to the user. Hot air exits from one end of the Dual Action PAC and cold air exits from the opposite end. Both of these connections are ¾" male garden hose threads. The temperature and flow rate of the hot and cold air streams can be adjusted slightly by changing the air pressure to the PAC.

The Dual Action PAC can supply chilled or heated air to one of Vortec's Diffuse Air Vests (models 865, 867 or 869: purchased separately or included if purchased as an integrated unit) or to a hood or helmet. The Dual Action PAC is attached to a belt via a swivel bracket. By pulling out the quick release pin in the swivel bracket and rotating the PAC in 90 degree increments, the hot or cold air outlet can be positioned as needed for the application: for connection to the Diffuse Air Vest or to a hood or helmet. Insert the quick release pin back into the swivel bracket to lock the PAC into position. (See fig. 1)

Rotate the body of the Dual Action PAC so that the compressed air quick connect nipple points in the desired direction (usually downward or rearward). (See fig. 2)

When using the cold air output from the Dual Action PAC, screw the black exhaust muffler onto the hot end of the unit. (see fig. 3) When using the hot air output, move the black exhaust muffler to the cold end. (See fig. 4) (Refer to the labeling on the PAC.) Connect the output end to the vest or hood/helmet (as appropriate) via the ¾" male garden hose thread.

### Cooling Only Personal Air Conditioners

The cooling only PAC 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 adjustment knob on the end of the PAC: turning the knob counterclockwise reduces the temperature and flow of the cold air. Turning the knob clockwise will increase the temperature and flow of the cold air. The temperature adjustment knob may be hot: use gloves when adjusting the knob. An optional heat shield is available to protect the user's body from the hot exhaust air, if desired. (See Table 1)

The PAC can supply chilled air to one of Vortec's Diffuse Air Vests (models 865, 867 or 869: purchased separately or included if purchased as an integrated unit) or to a hood or helmet.

### Diffuse Air 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.* If the vest was purchased as part of an integrated PAC/Vest, put the PAC/Vest on and attach the ends of the belt with the buckle. Pull the end of the belt tight to secure it around your waist. Secure the front of the vest with the four Velcro fasteners. Be sure to leave enough room to comfortably move in the vest.

## FIGURE 1

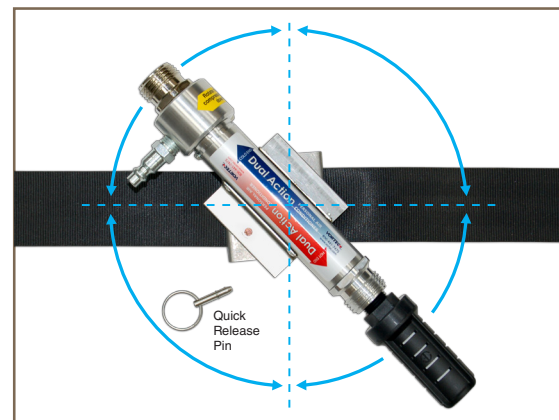


FIGURE 3 (Chilled Air to Vest)



## FIGURE 2

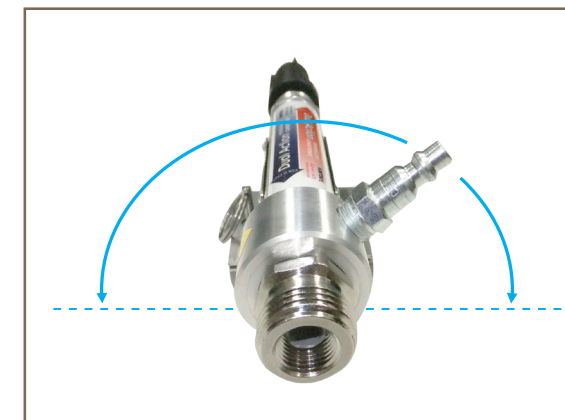


FIGURE 4 (Heated Air to Vest)



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

## TROUBLESHOOTING

Insufficient airflow may be caused by the following:

1. Undersized compressed air pipe or hose diameter.
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.

## MAINTENANCE

The Dual Action PAC or cold only PAC 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.

## 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. Diffuse Air 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](http://www.vortec.com) for full warranty details and limitations. ITW Air Management makes no specific warranty of merchantability or warrant of fitness for a particular purpose.