WhisperKOOL®

Air Duct Splitting

The following information is meant to be used as a general guideline for splitting ducts on WhisperKOOL systems. Often when designing a duct setup for a wine cellar, there is a need to run multiple supply and return ducts to ensure adequate air mixture and cooling based on the unique shape of the space. When splitting ducting from one main duct into two ducts, it is recommended that the total area of the ducts after the splitting not be less than the original duct area. Let's explore an example and explain what that means:

- An 8-inch diameter round supply duct is to be split into two ducts. First, determine the area of the duct. In this case we are using a round duct. If square duct is being used, then area must be calculated using A= L x W.

Round duct: $A= \pi r^2$

Where: A = Area, r = radius, radius = ½ diameter

$A= \pi (4 in)^2$

$A = 50.27in^2$

Let's say you want to split this 8-inch duct into two separate ducts of 4-inch diameter. Let's see if that would work:

$A= \pi (2 in)^2$

$A = 12.57 in^2$ (per duct)

To calculate for two ducts, multiply the area of one duct by 2:

$12.57 in^2 \times 2 =$ **$25.14in^2$**

The total area of the two 4-inch ducts after splitting is about half than that of the original 8-inch diameter duct area. This will result in increased static pressure which can lead to several problems. Therefore, 4-inch duct is not recommended in this case. Let's look at the correct duct split size for this application:

- An 8-inch diameter round supply duct is to be split into two 6-inch diameter round ducts.

$A= \pi (3 in)^2$

$A = 28.27in^2$ (per duct)

To calculate for two ducts, multiply the are of one duct by 2:

$28.27in^2 \times 2 =$ **$56.54in^2$**

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The total area of the two 6-inch ducts after splitting is slightly above the original 8-inch diameter duct area, which is acceptable. Therefore, the 6-inch diameter round duct should be selected for this duct splitting. Using this guideline, the following chart has been generated to provide customers who are seeking to split ducts an idea on what size to use. See Chart below for system requirement examples:

Summary: *It is acceptable to split any ducted system as long as the area of the split ducts area combined is as large or larger than the original line. Example 8-inch duct area is 50.27 sq. in. and splitting to two 6-inch is 56.54 sq. in. creating acceptable results.*

	Original Duct Size		**Minimum Recommended Duct Size After Split**	
Model	Supply	Return	Supply	Return
Platinum Split 4000 FD	8-inch	10-inch	6-inch	8-inch
Platinum Split 8000 FD				
Platinum Split Twin				
Phantom 3500				
Phantom 5000				
Phantom 8000				

	Original Duct Size		**Minimum Recommended Duct Size After Split**	
Model	Supply	Return	Supply	Return
Quantum 9000	14-inch	14-inch	10-inch	10-inch
Quantum 12000				

End