

# Sound Application Guide:

Description and Ratings





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## Overview - AHRI 260 Sound Ratings for Ducted Units

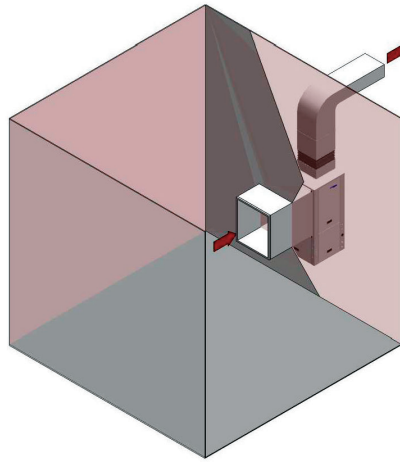
AHRI 260 is a recently adopted standard for rating ducted air moving and conditioning equipment. Prior to AHRI 260 there was no standard for the evaluation of water source heat pump (WSHP) sound performance. Previously, wsHP manufacturers tested per their own internal procedures making comparisons between manufacturers impossible. Now with AHRI 260 and a standardized test procedure and rating system, sound ratings are usable by acousticians to estimate the resulting sound pressure of wsHP equipment in new buildings.

The last two applications, ducted discharge and free inlet casing radiated, are most commonly used as rating points for wsHP manufacturers. Ducted discharge is typically the worst case scenario for airflow noise and represents an office location located under the discharge air noise. Free inlet/casing radiated is also often used because it combines a noisy open air return with cabinet radiated noise from the compressor and represents an office location directly below the unit itself in an open plenum return.

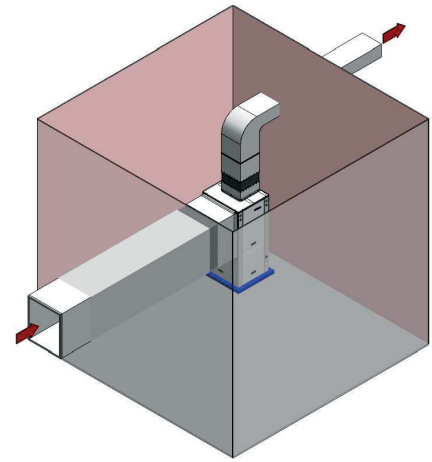
AHRI 260-2001 allows rating of product in 5 common applications:

- Ducted Inlet
- Casing Radiated
- Free Inlet
- Free Inlet/Casing Radiated
- Ducted Discharge

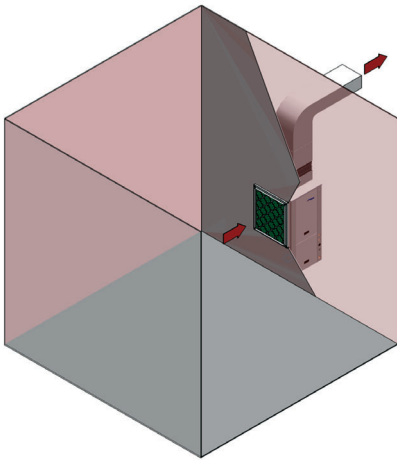
Ducted Inlet



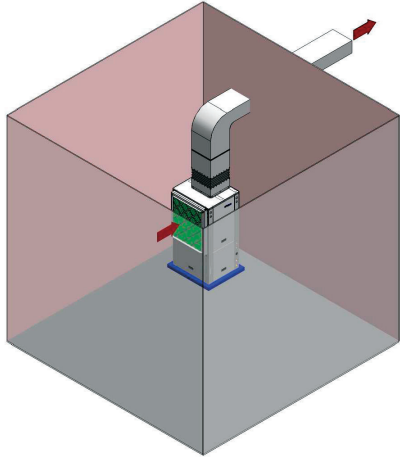
Casing Radiated



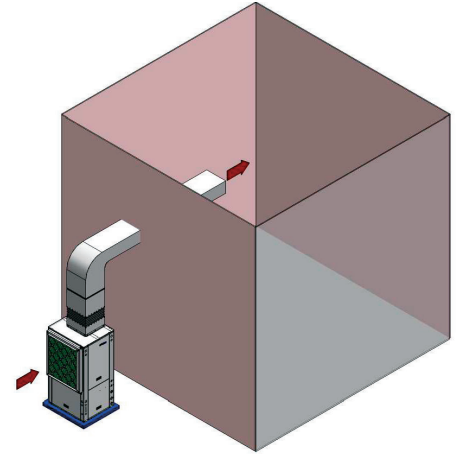
Free Inlet



Free Inlet/Casing Radiated



Ducted Discharge



## Overview - AHRI 350 Sound Ratings for Ducted Units

AHRI 350 sound standard is used to rate non-ducted indoor air-conditioning equipment. This standard is similar in many ways to AHRI 260 with the free inlet/casing radiated condition. The application for this equipment is typically a unit operated at free-delivery conditions without any

ductwork. This is the case for compressor bearing units such as a console that operates directly in the occupied space. Classrooms, hotel rooms, and offices commonly encounter this situation.

## Acoustical Basics

Most of this discussion that follows is described in ASHRAE Fundamentals Chapter 7. Noise is best described as an unwanted or unpleasant sound usually emanating from a vibrating surface or a turbulent fluid (air) stream. Obviously this noise can appear at many different pitches or frequencies. Below is a chart summarizing typical frequency spectrum of HVAC noise and its cause.

The pitch or frequency of the sound is measured in Hertz (Hz) or cycles per second. The frequency band that the human ear can hear is 20 Hz to 20 kHz. This range will vary by person and by age, with younger people hearing typically near the 20 kHz frequency and older people’s hearing dropping off to around 12 kHz. To aid in the description of sound many times this spectrum is divided into octave bands. That is to say an octave is where the second frequency is twice the Hz as the first. In pitch terms, it is exactly as an octave sounding on the piano. The range of HVAC noise is usually limited to the 63 Hz – 8 kHz range with the ultra low 8 – 63 Hz range reserved for larger air moving products like VAV. Some applications require further dividing the spectrum into one-third octave bands. This is accomplished by dividing the octave into three equal frequency parts.

The accepted measurement unit is the dB (decibel) for comparing these sound power or pressure level ratios. By definition the dB is equal to 10 times the base 10 logarithm of the ratio of any two like quantities. Usually differences of 10 dB are described by the listener as twice as loud, and differences of 3 – 4 dB are barely noticeable to the listener. Figure 2 shows typical sound pressure levels for common noise sources.

The most important concept in this primer is illustrated by Figure 3. Sound power will emanate from the sound source. Then the resulting sound pressure level, measured at the occupant of the room, will represent the resulting noise level as it approaches the listener. The sound power is the result of the testing procedure in AHRI 260. Then sound pressure levels for a given room can be predicted using acoustical equations to estimate noise levels for the occupant. This means given the data from AHRI 260, noise performance in a building can be estimated using standard acoustical engineering methods. Now not only can sound levels be compared manufacturer to manufacturer, but also sound performance in the building can be predicted.

Figure 1: Typical HVAC Sound Spectra (reference ASHRAE 2005 Fundamentals 7.15, and HVAC Applications 47.2).

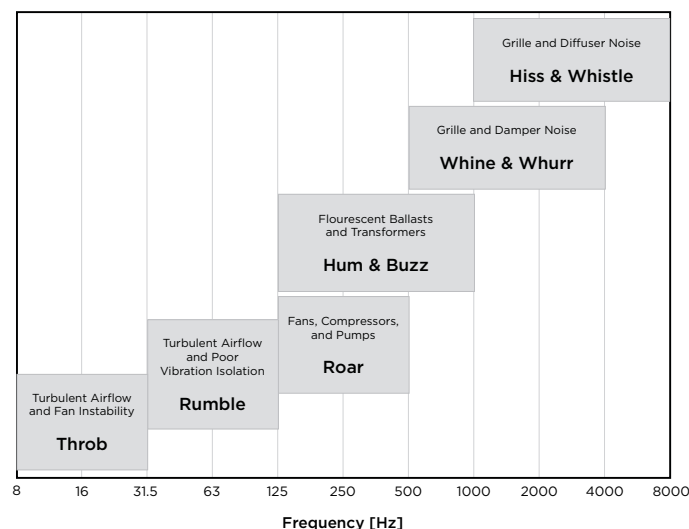
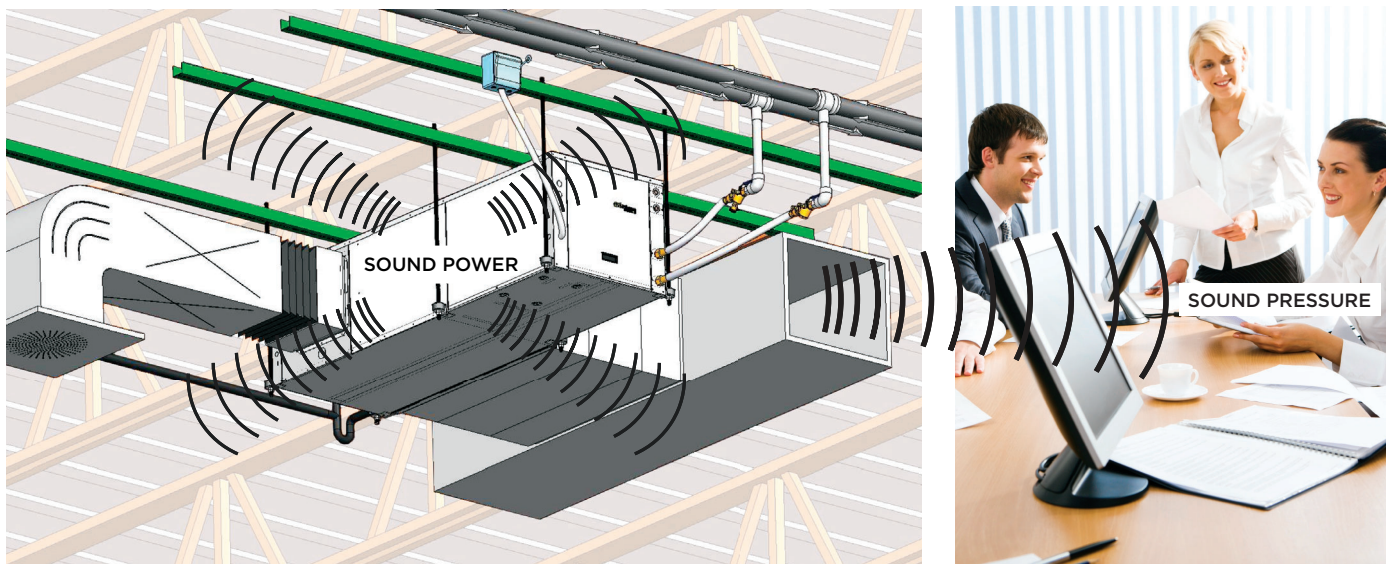


Figure 3: Sound power emanates from WSHP equipment and sound pressure is experienced by occupants of building.



## Acoustical Basics cont.

Figure 2: Typical Sound Pressure Levels  
(reference ASHRAE 2005 Fundamentals 7.2  
Table 1).

Sound Source	Sound Pressure Level (dB re 20 $\mu$ Pa)	Subjective Reaction
Military Jet Takeoff at 100 ft.	140	Extreme Danger
Artillery fire at 10 ft.	130	
Passenger jet Takeoff at 50 ft.	120	Threshold of pain
Loud Rock Band	110	Threshold of discomfort
Automobile Horn at 10 ft.	100	Very Loud
Unmuffled Large Diesel Engine	90	
Accelerating Diesel Truck at 50 ft.	80	
Freight Train at 100 ft.	70	Loud
Conversational speech at 3 ft.	60	
Window air conditioner @ 3 ft.	50	Moderate
Quiet Residential Area	40	Quiet
Whispered conversation @ 6 ft.	30	
Buzzing Insect at 3 ft.	20	Perceptible
Threshold of Good Hearing	10	Faint
Threshold of Youthful Hearing	0	Threshold of hearing

## Rating Methods

### Single Number Ratings

#### A-Weighting

In the past some single number ratings have been used such as dBA. The 'A' represents the A-weighted sound level. This 'weighting' refers to adjusting the loudness measurements to effectively correct for the sensitivity of the human ear to different frequencies. However, the limited frequency range of A-Weighting, 700 – 4000 Hz, is most frequently used in occupational hazard measurement where the human ear is most sensitive. This means annoyance type noises of lower frequency like HVAC rumble are not even measured by dbA ratings.

#### C-Weighting

The C-Weighted sound pressure level ( $L_A$ ) is used when a single number is desired to state the design goal. This weighting scale is most often used with the measurement of wide spectrum (i.e. music) in occupational environment and is sensitive to the wide 50-5000 Hz range. The extended lower frequency range is important with the measurement of rumble and its impact on the measurement method is simple. A single measurement is made on a handheld instrument and the C-weighting is typically a selection on the instrument. (dBC). The C-weighting is most often used when measuring non-hazardous noise in occupational and recreational environments such as offices or music concerts where the sound source is a full spectrum.

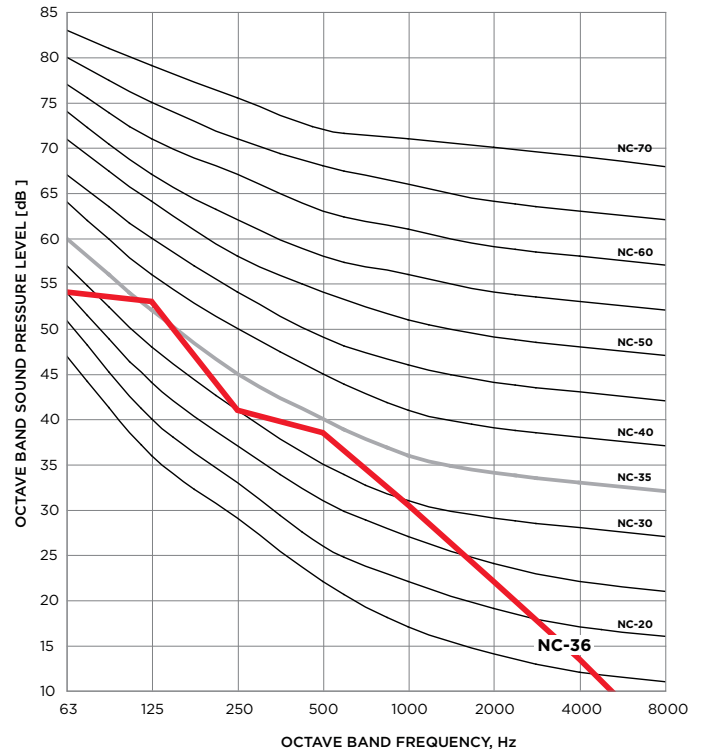
## Rating Methods cont.

### Single Number Ratings cont.

#### Noise Criterion Method - NC Curves

The NC method has been used for more than 40 years. Although it is a single number rating, it is more sensitive to relative loudness and speech interference of a given noise spectrum. It is popular primarily because of its wide use in acoustic design textbooks. A noise curve is corrected for transmission loss through the ceiling ASHRAE 2003 HVAC Applications 47.33. The resulting noise curve is then plotted on a chart of NC curves (every 5 dB). The highest interpolated NC curve (in 1 dB increment) attained is the NC rating. Figure 4 shows an example with an NC-36 rating.

Figure 4: NC Performance results in an NC-36 Rating

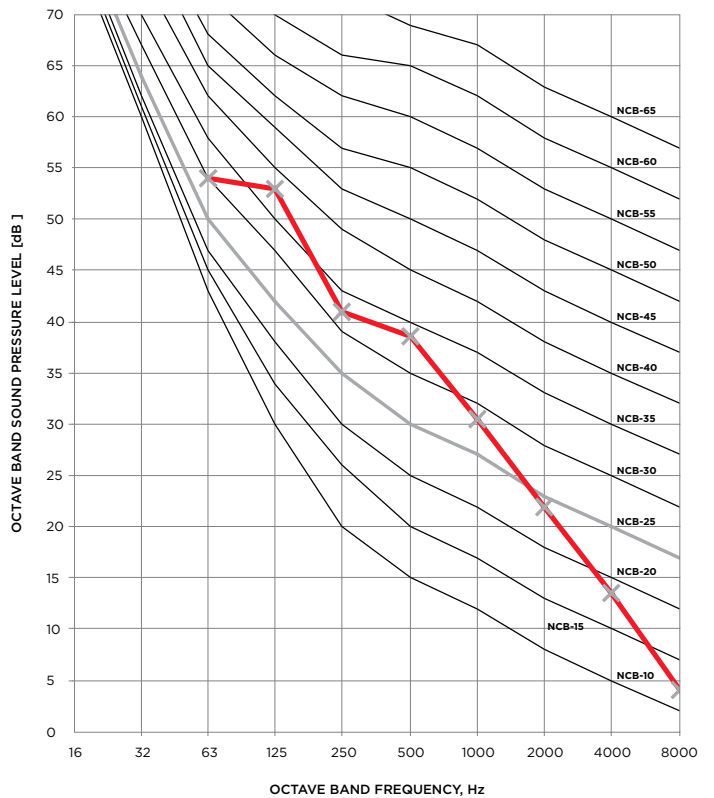


#### Balanced Noise Criteria (NCB)

The NCB method was designed as a successor method to the NC Curve. The NCB features higher permissible upper frequencies, two low frequency octave bands, and an additional test for rumble and hiss compliance. By averaging the NCB levels for frequencies 500, 1k, 2k, and 4k, the overall NCB rating is obtained.

The method also allows for a descriptor for low frequency rumble or high frequency hiss imbalance. If frequencies below 1 kHz are more than 3 dB higher than the NCB rating curve, it is rumble imbalanced. If frequencies above 1 kHz are more than the best fit level of the 125, 250 and 500 Hz NCB rating curve, the NCB rating curve is hiss imbalanced. The figure below results in an NCB 25 with low frequency rumble imbalance.

Figure 5: NCB Performance results in an NCB-25 rating with rumble imbalance.



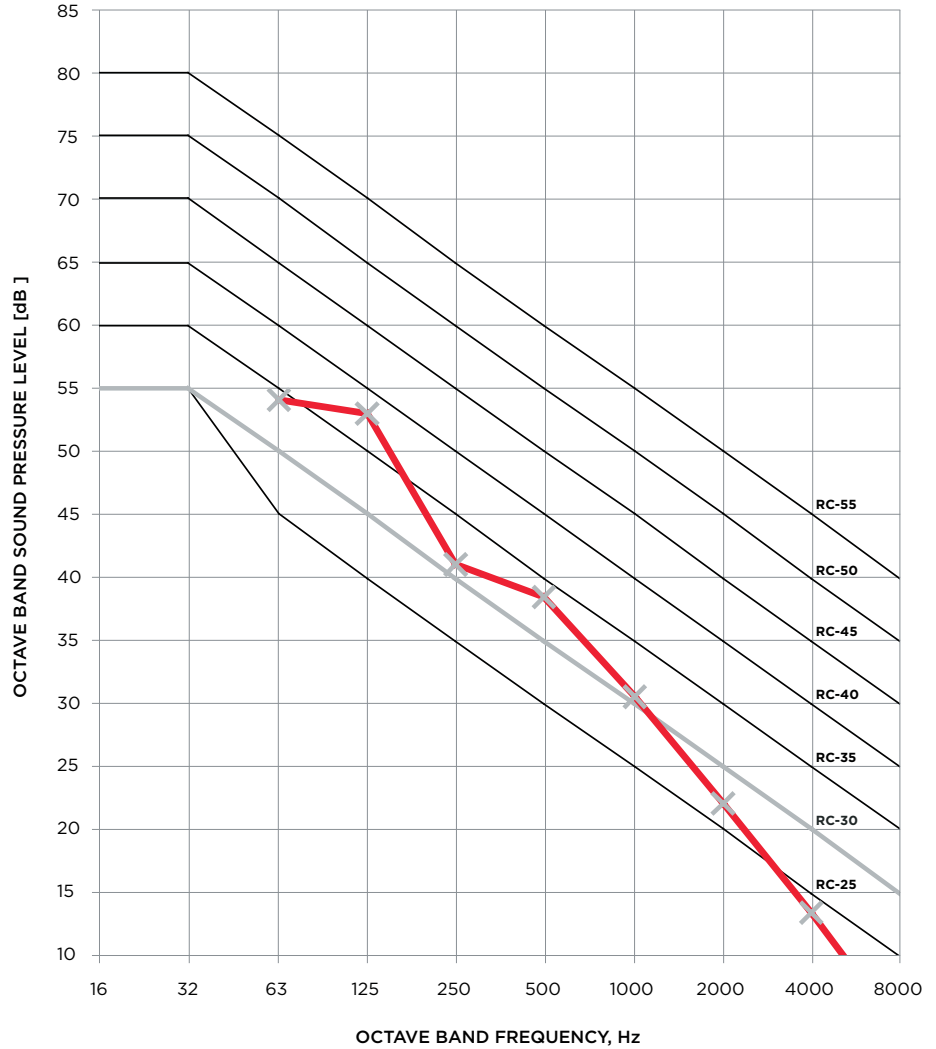
## Rating Methods cont.

### Room Criteria (RC) Mark II Method

The RC Mark II method was designed specifically for HVAC equipment as a whole. This method features a set of rating curves, a procedure for determining the RC rating, and a procedure for rating occupant satisfaction (quality) when the noise shape does not match the RC curves. The RC is the average of 500 Hz - 2 kHz levels and the quality

index when the curve deviates from the RC curve. The quality index adds on a LF (low frequency), MF (medium frequency), HF (high frequency), or N (neutral). The example below is an RC rating of RC30 (Neutral).

Figure 6: RC Mark II Performance results in an RC-30 (N) rating.





## Acoustical Installation Considerations

Our product today employs several technologies to reduce noise. They may include scroll compressors, variable speed fan motor with oversized blower, dual compressor isolation mounting plate, compressor blankets and multi-density base plates, and finally multi-density fiberglass insulation.

The following figure illustrates some of the installation acoustic considerations that should be considered.

### Recommendations for Noise Reduction

#### Horizontal Unit Location

- Specify equipment with quietest sound power ratings
- Do not locate units above areas with a required NC-40 or less
- Space WSHP at least 10 ft. (3m) apart to avoid noise summing of multiple units in a space.
- Maximize the height of the unit above the ceiling (horizontal).
- Suspend unit with isolation grommets that are appropriately rated to reduce vibrations (horizontal).

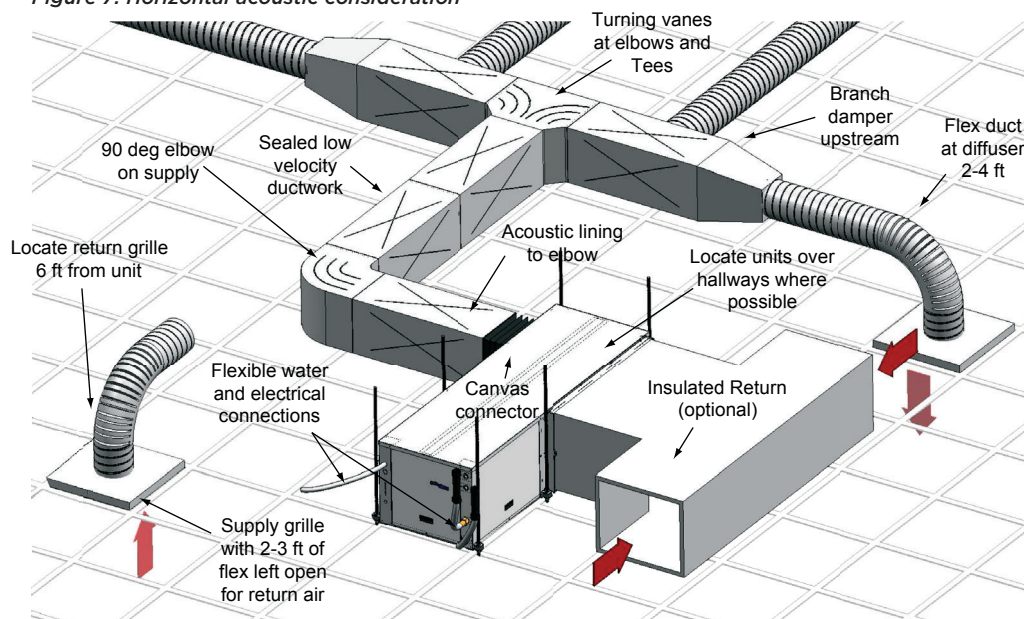
#### Vertical Unit Location

- Specify equipment with quietest sound power ratings
- Space WSHP at least 10 ft. (3m) apart to avoid noise summing of multiple units in a space.
- Acoustic ceiling coatings can greatly reduce noise levels in mechanical rooms.
- Mount unit on a sound absorbing pad, extruded polystyrene, rubber or cork pad.

- Ensure return air grilles will not allow line of site noise to transfer to adjacent space. Use a sound barrier or some other material to isolate the grille from the unit. A supply grille, boot and short piece of flex duct pointed away from the unit can greatly attenuate equipment noise.
- Use a canvas isolation duct connector at the supply and return duct connection of the unit.
- Internally line the discharge and return duct within the first 4-8 feet of unit with acoustic insulation. Install an internally lined 'L' shaped return duct elbow at return grille. Face the elbow away from adjacent units.
- Always install at least one 90° elbow in the discharge duct to eliminate line of sight noise transmission of the blower.
- Use turning vanes at all elbows and tees to reduce turbulence.
- Limit supply duct velocities to less than 1000 fpm
- Design and install ductwork as stiff as possible
- Allow 3 duct diameters both up and down stream of the unit before any fittings or transitions are installed.
- Use duct sealant on all duct joints.
- Install a short (2-4 ft.) of flex duct on all branch ducts just prior to discharge boot or diffuser to reduce vibration and duct sound prior to delivery in the room.
- Locate the branch duct balancing damper as far away from the diffuser as possible.
- In ceiling plenum systems, install an internally lined 'L' shaped return duct elbow at unit. Face the elbow away from adjacent units (horizontal).

### Ductwork

Figure 7: Horizontal acoustic consideration



## Performance Data - 7 Series

### Variable Speed - Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

MODEL	Cabinet	MODE	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			OCTAVE BAND FREQUENCY, Hz								OCTAVE BAND FREQUENCY, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
036	V/H	Fan Only	58	49	47	47	40	33	23	18	67	59	48	45	43	36	27	20
		Cooling: Low Speed	60	55	50	50	45	36	28	35	68	57	47	46	44	37	27	20
		Cooling: High Speed	65	63	57	57	52	46	41	41	73	67	54	53	54	49	45	35
		Heating: Low Speed	61	57	51	53	47	42	36	37	69	60	49	47	47	40	31	20
		Heating: High Speed	67	65	62	58	52	49	47	44	75	68	66	60	59	57	55	49
048	V/H	Fan Only	65	55	51	50	44	36	26	21	68	61	50	46	45	38	29	21
		Cooling: Low Speed	62	56	52	51	46	38	30	37	69	60	48	46	45	38	28	22
		Cooling: High Speed	67	65	59	58	53	48	43	44	73	68	56	54	54	50	46	36
		Heating: Low Speed	63	59	54	56	50	45	40	40	69	62	51	48	48	41	33	22
		Heating: High Speed	68	66	63	60	55	52	49	46	75	70	66	63	60	58	55	51
060	V/H	Fan Only	66	56	53	51	46	37	26	21	72	64	54	49	49	43	33	25
		Cooling: Low Speed	65	56	54	53	50	40	33	40	73	60	52	49	49	42	32	25
		Cooling: High Speed	69	65	62	61	58	51	47	47	76	69	59	58	59	55	50	41
		Heating: Low Speed	66	59	55	59	55	48	43	43	73	63	56	52	54	46	37	25
		Heating: High Speed	72	67	67	63	60	57	55	51	79	71	73	68	67	64	62	56

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001 8/22/17

## Performance Data - 5 Series

### Dual Capacity - Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

MODEL	Cabinet	MODE	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			OCTAVE BAND FREQUENCY, Hz								OCTAVE BAND FREQUENCY, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
024	V/H	Fan Only	56	53	52	49	44	40	37	32	69	59	51	54	49	42	37	32
		Cooling: Low Speed	63	67	58	57	51	47	43	41	72	65	56	60	54	49	46	38
		Cooling: High Speed	65	66	61	60	55	51	49	43	76	69	59	65	59	54	53	46
		Heating: Low Speed	64	66	59	57	51	46	43	41	72	65	55	60	54	48	47	40
		Heating: High Speed	65	67	60	58	51	47	47	43	73	68	60	65	59	54	52	47
030	V/H	Fan Only	59	55	65	51	46	43	40	46	70	60	52	54	49	43	39	33
		Cooling: Low Speed	64	67	69	57	52	48	45	46	72	66	56	60	54	49	46	38
		Cooling: High Speed	66	67	62	60	55	51	49	44	76	69	59	64	59	54	53	46
		Heating: Low Speed	65	67	62	58	52	48	45	42	72	67	56	60	54	49	47	42
		Heating: High Speed	65	68	61	59	53	49	48	44	73	68	60	64	59	55	52	47
036	V/H	Fan Only	62	59	56	53	48	45	42	38	71	61	53	54	50	44	40	33
		Cooling: Low Speed	65	68	60	58	53	49	46	43	72	68	57	59	54	50	47	39
		Cooling: High Speed	67	68	63	60	56	52	50	45	75	70	60	63	59	54	53	46
		Heating: Low Speed	66	67	64	60	53	49	46	43	73	68	57	60	54	50	48	44
		Heating: High Speed	65	68	62	59	54	50	49	45	74	69	60	63	59	55	52	48
042	V/H	Fan Only	66	62	59	55	50	47	45	41	71	62	54	55	51	45	41	34
		Cooling: Low Speed	66	68	61	58	54	50	47	44	72	69	58	59	55	50	48	40
		Cooling: High Speed	68	69	64	60	56	53	51	47	75	71	61	62	59	54	53	46
		Heating: Low Speed	67	68	66	61	55	50	48	45	73	69	58	60	54	50	49	46
		Heating: High Speed	65	68	62	60	56	51	50	46	74	70	60	62	58	55	52	49
048	V/H	Fan Only	69	65	61	56	53	49	47	44	72	63	55	55	52	47	43	35
		Cooling: Low Speed	67	69	62	59	55	51	49	45	73	71	58	59	55	51	49	41
		Cooling: High Speed	69	70	65	61	57	54	52	48	75	71	62	62	59	55	54	47
		Heating: Low Speed	68	69	68	63	56	52	50	46	73	70	59	59	55	51	50	48
		Heating: High Speed	66	69	63	61	57	53	51	47	74	71	60	61	58	56	52	50
060	V/H	Fan Only	70	66	63	58	55	51	48	44	77	66	60	59	57	53	50	42
		Cooling: Low Speed	70	69	65	62	60	55	54	49	77	71	63	63	61	57	56	49
		Cooling: High Speed	71	70	68	64	62	58	57	52	78	72	66	66	65	61	60	54
		Heating: Low Speed	71	69	69	66	61	56	55	50	77	71	65	64	62	58	57	53
		Heating: High Speed	70	70	67	64	62	58	57	52	78	72	66	66	65	62	59	55
072	V/H	Fan Only	71	67	65	61	58	53	50	45	82	69	65	64	62	60	57	49
		Cooling: Low Speed	72	69	69	66	64	60	60	53	81	71	68	68	67	64	63	57
		Cooling: High Speed	74	71	71	68	67	63	63	57	82	73	70	70	71	67	66	61
		Heating: Low Speed	74	70	70	68	66	61	60	55	81	72	70	68	70	65	64	58
		Heating: High Speed	75	71	71	68	67	63	62	58	82	73	72	70	72	67	67	61

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

8/22/17

## Performance Data - 5 Series with OptiHeat

### Standard Construction

Octave Band Sound Pressure Level, dB, re 1 pico Watt

Model	dBA	Octave Band Frequency, Hz							
		63	125	250	500	1000	2000	4000	8000
048	54	76	60	52	49	47	43	42	43
060	54	76	60	52	49	47	43	42	43

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## Performance Data - 5 Series 3D

### Dual Capacity - Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
036	V	Fan Only	61	58	55	53	48	45	42	38	71	61	53	54	50	44	40	33
		Hydronic Mode	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Cooling: Low Speed	65	68	60	58	53	49	46	43	72	68	57	59	54	50	47	39
		Cooling: High Speed	67	68	63	60	56	52	50	45	75	70	60	63	59	54	53	46
		Heating: Low Speed	66	67	64	60	53	49	46	43	73	68	57	60	54	50	48	44
		Heating: High Speed	65	68	62	59	54	50	49	45	74	69	60	63	59	55	52	48
048	V	Fan Only	68	64	60	56	53	49	47	44	72	63	55	55	52	47	43	35
		Hydronic Mode	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Cooling: Low Speed	67	69	62	59	55	51	49	45	73	71	58	59	55	51	49	41
		Cooling: High Speed	69	70	65	61	57	54	52	48	75	71	62	62	59	55	54	47
		Heating: Low Speed	68	69	68	63	56	52	50	46	73	70	59	59	55	51	50	48
		Heating: High Speed	66	69	63	61	57	53	51	47	74	71	60	61	58	56	52	50
060	V	Fan Only	69	65	62	58	55	51	48	44	77	66	60	59	57	53	50	42
		Hydronic Mode	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Cooling: Low Speed	70	69	65	62	60	55	54	49	77	71	63	63	61	57	56	49
		Cooling: High Speed	71	70	68	64	62	58	57	52	78	72	66	66	65	61	60	54
		Heating: Low Speed	71	69	69	66	61	56	55	50	77	71	65	64	62	58	57	53
		Heating: High Speed	70	70	67	64	62	58	57	52	78	72	66	66	65	62	59	55
072	V	Fan Only	70	66	64	61	58	53	50	45	82	69	65	64	62	60	57	49
		Hydronic Mode	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Cooling: Low Speed	72	69	69	66	64	60	60	53	81	71	68	68	67	64	63	57
		Cooling: High Speed	74	71	71	69	67	63	63	57	82	73	70	70	71	67	66	61
		Heating: Low Speed	74	70	70	68	66	61	60	55	81	72	70	68	70	65	64	58
		Heating: High Speed	75	71	71	68	67	63	62	58	82	73	72	70	72	67	67	61

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

8/22/17

# Performance Data - 3 Series

## Dual Capacity - Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

MODEL	Cabinet	MODE	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			OCTAVE BAND FREQUENCY, Hz								OCTAVE BAND FREQUENCY, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
024	V/H	Fan Only	69	67	59	60	57	51	48	41	78	70	59	61	58	55	50	43
		Cooling: Low Speed	70	67	60	61	59	53	50	43	78	70	61	63	61	57	53	47
		Cooling: High Speed	70	68	62	63	62	57	54	48	78	71	62	63	63	59	56	50
		Heating: Low Speed	71	66	60	61	60	53	50	43	78	69	61	64	62	56	53	46
		Heating: High Speed	72	69	62	63	62	57	54	48	79	70	62	64	63	58	55	49
036	V/H	Fan Only	71	69	61	61	59	52	49	42	80	72	61	63	60	56	52	45
		Cooling: Low Speed	72	68	62	63	61	54	51	44	81	72	63	65	62	58	55	48
		Cooling: High Speed	72	70	64	65	64	58	55	50	81	73	64	65	64	60	57	52
		Heating: Low Speed	73	68	62	63	62	55	51	44	81	71	63	66	64	58	54	47
		Heating: High Speed	74	71	64	65	64	59	56	49	81	73	64	66	65	60	57	50
048	V/H	Fan Only	74	71	63	63	61	54	50	43	83	74	63	65	62	58	53	46
		Cooling: Low Speed	74	71	64	65	62	56	53	46	83	74	65	67	64	60	56	50
		Cooling: High Speed	74	72	66	67	66	60	57	51	83	75	66	67	66	62	59	53
		Heating: Low Speed	75	70	64	65	64	56	53	46	83	74	65	68	66	60	56	48
		Heating: High Speed	76	73	66	67	66	60	57	51	84	75	66	67	67	62	58	52
060	V/H	Fan Only	76	74	65	65	63	56	52	45	85	76	65	67	64	60	55	47
		Cooling: Low Speed	76	73	65	67	64	58	54	47	86	76	66	69	66	62	58	51
		Cooling: High Speed	76	74	68	69	68	62	59	53	86	77	68	69	68	64	61	55
		Heating: Low Speed	77	73	66	67	65	58	55	47	86	76	67	70	68	62	57	50
		Heating: High Speed	78	75	68	69	68	62	59	52	86	77	68	69	69	64	60	53
072	V/H	Fan Only	79	80	68	65	61	58	58	52	87	76	70	68	67	63	61	56
		Cooling: Low Speed	80	80	69	70	63	60	60	54	87	77	71	69	69	65	64	60
		Cooling: High Speed	81	82	71	68	67	62	62	57	87	77	72	71	71	66	65	61
		Heating: Low Speed	82	81	70	67	64	60	60	55	88	77	71	70	70	65	63	59
		Heating: High Speed	83	82	72	68	66	62	62	58	90	78	72	72	71	67	65	60

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

4/6/15

# Performance Data - Versatec 300 WSHP

## Single Speed - Standard Construction - PSC

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
006	V/H	Fan Only	54	50	47	46	36	33	30	19	60	52	41	40	34	31	26	21
		Cooling: High Speed	55	52	46	44	35	35	24	20	60	51	43	39	37	32	28	21
		Heating: High Speed	51	49	46	43	36	30	27	17	62	52	44	42	38	34	30	23
009	V/H	Fan Only	57	54	51	48	37	35	33	21	62	55	44	42	39	36	32	27
		Cooling: High Speed	57	52	49	46	39	36	29	19	61	54	45	44	40	36	32	27
		Heating: High Speed	54	53	50	46	38	36	32	20	65	58	49	45	41	38	35	30
012	V/H	Fan Only	58	54	52	48	43	39	35	22	65	58	48	45	43	38	35	30
		Cooling: High Speed	58	54	51	49	42	38	34	21	63	57	50	46	43	37	35	30
		Heating: High Speed	56	55	53	50	44	40	35	23	67	59	57	47	45	39	38	31
015	V/H	Fan Only	56	53	53	49	46	44	36	26	61	56	53	48	46	40	35	27
		Cooling: High Speed	55	53	53	50	45	41	32	24	67	59	54	53	46	43	38	33
		Heating: High Speed	54	53	52	48	46	41	32	23	67	58	58	53	47	44	41	34
018	V/H	Fan Only	58	54	53	51	49	45	38	29	64	57	55	51	47	42	39	31
		Cooling: High Speed	57	55	54	52	47	42	32	26	70	61	59	54	51	45	41	35
		Heating: High Speed	61	55	54	52	48	43	32	25	70	62	60	54	52	45	43	36
024	V/H	Fan Only	59	57	56	52	51	47	42	35	67	64	62	55	53	47	48	39
		Cooling: High Speed	59	59	57	53	53	47	41	33	69	66	61	60	58	53	51	44
		Heating: High Speed	61	60	57	57	53	47	40	31	72	67	62	62	60	53	53	44
030	V/H	Fan Only	60	61	58	53	52	49	45	41	72	67	63	64	60	56	56	49
		Cooling: High Speed	60	61	62	55	52	48	45	40	70	69	62	63	60	56	55	48
		Heating: High Speed	64	63	62	56	54	50	47	44	73	69	63	64	61	57	56	49
036	V/H	Fan Only	62	63	60	54	53	49	46	42	74	69	65	64	63	57	58	52
		Cooling: High Speed	62	63	60	54	53	49	46	42	74	69	65	64	63	57	58	52
		Heating: High Speed	64	65	64	58	55	53	49	45	74	71	64	63	62	57	57	52
042	V/H	Fan Only	62	64	61	57	54	53	48	44	76	70	65	67	64	59	58	55
		Cooling: High Speed	64	63	60	60	55	54	52	45	77	71	66	65	64	61	62	53
		Heating: High Speed	66	67	67	60	59	56	55	50	76	72	65	63	63	59	60	55
048	V/H	Fan Only	64	65	59	59	55	54	52	46	78	71	66	66	66	60	59	55
		Cooling: High Speed	66	69	66	63	60	59	58	52	78	69	67	66	65	61	61	55
		Heating: High Speed	67	69	66	61	60	59	58	53	79	70	68	64	67	61	61	56
060	V/H	Fan Only	61	64	61	58	57	55	50	82	74	68	69	66	64	63	57	
		Cooling: High Speed	67	71	66	61	61	60	59	54	81	73	67	66	66	63	63	57
		Heating: High Speed	66		67	61	62	60	59	54	83	76	69	66	67	63	64	57
070	V/H	Fan Only	64	66	65	62	61	59	57	53	84	77	73	72	68	67	65	51
		Cooling: High Speed	69	70	68	65	66	62	60	56	82	76	71	69	70	66	65	61
		Heating: High Speed	70	71	70	66	64	64	62	56	85	78	72	70	67	67	68	58

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

8/22/17

## Performance Data - Versatec 300 WSHP cont

### Single Speed - Super Quiet Construction - PSC

Octave Band Sound Power Level, dB, re 1 picro Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
006	V/H	Fan Only	Not Available								Not Available							
		Cooling: High Speed	Not Available								Not Available							
		Heating: High Speed	Not Available								Not Available							
009	V/H	Fan Only	Not Available								Not Available							
		Cooling: High Speed	Not Available								Not Available							
		Heating: High Speed	Not Available								Not Available							
012	V/H	Fan Only	Not Available								Not Available							
		Cooling: High Speed	Not Available								Not Available							
		Heating: High Speed	Not Available								Not Available							
015	V/H	Fan Only	56	53	53	49	46	44	36	26	61	56	53	48	46	40	35	27
		Cooling: High Speed	53	51	51	49	44	40	31	23	65	57	52	51	45	42	37	32
		Heating: High Speed	52	51	50	47	45	40	31	22	65	56	56	51	46	43	40	33
018	V/H	Fan Only	58	54	53	51	49	45	38	29	64	57	55	51	47	42	39	31
		Cooling: High Speed	55	54	53	51	46	41	31	25	68	59	57	53	50	44	40	34
		Heating: High Speed	59	54	53	51	47	42	31	24	68	60	58	53	51	44	42	35
024	V/H	Fan Only	59	57	56	52	51	47	42	35	67	64	62	55	53	47	48	39
		Cooling: High Speed	57	57	55	52	52	46	40	32	67	64	59	58	57	52	50	43
		Heating: High Speed	59	58	55	56	52	46	39	30	70	65	60	60	59	52	52	43
030	V/H	Fan Only	60	61	58	53	52	49	45	41	72	67	63	64	60	56	56	49
		Cooling: High Speed	58	59	60	53	51	47	44	39	68	67	60	61	58	55	54	47
		Heating: High Speed	62	61	60	54	53	49	46	43	71	67	61	62	59	55	54	48
036	V/H	Fan Only	62	63	60	54	53	49	46	42	74	69	65	64	63	57	58	52
		Cooling: High Speed	59	60	60	57	52	51	47	42	74	70	63	62	60	58	59	51
		Heating: High Speed	62	63	62	56	54	52	48	44	72	69	62	61	60	56	56	51
042	V/H	Fan Only	62	64	61	57	54	53	48	44	76	70	65	67	64	59	58	55
		Cooling: High Speed	62	61	58	58	54	53	51	44	75	69	64	63	62	59	61	52
		Heating: High Speed	64	65	65	58	58	55	54	49	74	70	63	61	61	57	59	54
048	V/H	Fan Only	64	65	59	59	55	54	52	46	78	71	66	66	66	60	59	55
		Cooling: High Speed	64	67	64	61	58	57	56	51	76	67	65	64	63	59	59	54
		Heating: High Speed	65	67	64	59	58	57	56	52	77	68	66	62	65	59	59	55
060	V/H	Fan Only	61	64	61	58	57	57	55	50	82	74	68	69	66	64	63	57
		Cooling: High Speed	65	69	64	59	59	58	57	53	79	71	65	64	64	61	61	55
		Heating: High Speed	64	69	65	59	60	58	57	53	81	74	67	64	65	61	62	55
070	V/H	Fan Only	64	66	65	62	61	59	57	53	84	77	73	72	68	67	65	61
		Cooling: High Speed	67	68	66	63	64	60	58	55	80	74	69	67	68	64	63	59
		Heating: High Speed	68	69	68	64	62	62	60	55	83	76	70	68	65	65	66	56

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

8/22/17

## Performance Data - Versatec 300 WSHP cont

### Single Speed - Standard Construction - ECM

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
015	V/H	Fan Only	59	56	55	51	48	46	38	27	64	59	56	50	48	42	37	28
		Cooling: High Speed	58	56	56	52	47	43	33	25	70	62	57	55	48	45	40	35
		Heating: High Speed	57	55	54	50	48	43	33	24	70	61	61	55	49	46	43	36
018	V/H	Fan Only	61	57	56	53	51	47	40	30	67	60	57	53	49	44	41	32
		Cooling: High Speed	60	57	56	55	50	44	34	27	73	64	62	56	53	47	43	37
		Heating: High Speed	63	58	56	55	50	45	34	26	73	65	63	56	55	47	45	38
024	V/H	Fan Only	62	60	59	54	53	49	44	37	70	67	65	58	55	49	50	41
		Cooling: High Speed	62	62	60	55	55	49	43	35	72	69	64	63	61	55	53	46
		Heating: High Speed	64	63	60	60	56	49	42	32	75	70	65	65	63	55	56	46
030	V/H	Fan Only	63	64	61	56	54	51	47	43	75	70	66	67	63	59	59	51
		Cooling: High Speed	63	64	65	58	54	50	47	42	74	72	65	66	62	58	58	50
		Heating: High Speed	67	66	65	59	57	52	49	46	77	73	66	67	64	60	59	52
036	V/H	Fan Only	65	66	63	57	55	51	48	44	77	72	68	67	66	60	61	54
		Cooling: High Speed	64	65	65	61	56	54	50	45	80	75	68	67	64	62	63	54
		Heating: High Speed	67	68	67	61	58	55	51	47	78	74	67	66	65	60	60	54
042	V/H	Fan Only	65	67	64	60	57	55	50	46	80	73	68	70	67	62	61	58
		Cooling: High Speed	67	66	63	63	58	57	54	47	81	74	69	68	67	64	65	55
		Heating: High Speed	69	70	70	63	62	59	58	52	80	75	68	66	66	62	63	58
048	V/H	Fan Only	67	68	62	61	58	57	55	48	82	74	69	69	69	63	62	58
		Cooling: High Speed	70	72	69	66	63	62	60	55	82	73	70	70	68	64	64	58
		Heating: High Speed	70	72	69	64	63	62	61	55	83	74	71	67	70	64	64	58
060	V/H	Fan Only	64	67	64	61	60	60	58	52	86	78	71	72	69	67	66	60
		Cooling: High Speed	70	74	69	64	64	63	62	56	85	77	70	70	69	66	66	60
		Heating: High Speed	69	74	70	64	64	63	62	57	87	80	72	70	70	66	67	60
070	V/H	Fan Only	67	69	68	65	64	62	60	55	88	81	76	75	71	70	68	64
		Cooling: High Speed	72	73	71	68	69	65	63	59	86	80	74	72	73	69	68	64
		Heating: High Speed	73	74	73	69	67	67	65	59	89	82	75	73	70	70	71	61

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001 8/22/17



## Performance Data - Versatec 300 WSHP cont

### Single Speed - Super Quiet Construction - ECM

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
015	V/H	Fan Only	59	56	55	51	48	46	38	27	64	59	56	50	48	42	37	28
		Cooling: High Speed	57	54	55	51	46	42	32	24	69	61	56	54	47	44	39	34
		Heating: High Speed	56	53	53	49	47	42	32	23	69	60	60	54	48	45	42	35
018	V/H	Fan Only	61	57	56	53	51	47	40	30	67	60	57	53	49	44	41	32
		Cooling: High Speed	59	56	55	54	49	43	33	26	72	63	61	55	52	46	42	36
		Heating: High Speed	62	57	55	54	49	44	33	25	72	64	62	55	54	46	44	37
024	V/H	Fan Only	62	60	59	54	53	49	44	37	70	67	65	58	55	49	50	41
		Cooling: High Speed	61	60	59	54	54	48	42	34	71	68	63	62	60	54	52	45
		Heating: High Speed	63	61	59	59	55	48	41	31	74	69	64	64	62	54	55	45
030	V/H	Fan Only	63	64	61	56	54	51	47	43	75	70	66	67	63	59	59	51
		Cooling: High Speed	62	63	64	56	53	49	48	41	73	70	64	65	61	57	56	49
		Heating: High Speed	66	65	64	57	56	51	48	45	76	71	65	66	62	59	57	51
036	V/H	Fan Only	65	66	63	57	55	51	48	44	77	72	68	67	66	60	61	54
		Cooling: High Speed	63	64	64	60	55	53	49	44	79	74	67	66	63	61	62	53
		Heating: High Speed	66	67	66	60	57	54	50	46	77	73	66	65	64	59	59	53
042	V/H	Fan Only	65	66	63	57	55	51	48	44	77	72	68	67	66	60	61	54
		Cooling: High Speed	66	64	62	61	57	56	53	46	80	73	68	67	66	63	64	54
		Heating: High Speed	67	68	69	61	61	58	57	51	79	74	67	65	65	61	61	57
048	V/H	Fan Only	67	68	62	61	58	57	55	48	82	74	69	69	69	63	62	58
		Cooling: High Speed	69	71	68	64	62	61	58	54	80	71	69	69	66	62	62	57
		Heating: High Speed	69	71	68	62	62	61	59	54	81	72	70	66	68	62	62	57
060	V/H	Fan Only	64	67	64	61	60	60	58	52	86	78	71	72	69	67	66	60
		Cooling: High Speed	69	73	68	62	63	62	60	55	83	75	69	69	67	64	64	59
		Heating: High Speed	68	73	69	62	63	62	60	56	85	78	71	69	68	64	65	59
070	V/H	Fan Only	67	69	68	65	64	62	60	55	88	81	76	75	71	70	68	64
		Cooling: High Speed	70	72	70	67	67	63	61	57	85	79	72	70	71	67	66	62
		Heating: High Speed	72	73	71	68	65	66	64	57	88	81	73	71	68	69	70	59

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001 8/22/17

# Performance Data - Versatec 500 WSHP

## Single Speed - Standard Construction - PSC

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
009	V/H	Fan Only	62	62	55	50	41	39	36	36	73	68	57	46	55	50	48	47
		Cooling: High Speed	73	62	56	52	42	38	36	36	81	72	62	52	61	56	55	56
		Heating: High Speed	78	60	57	48	43	39	38	38	80	73	63	50	62	56	55	55
012	V/H	Fan Only	61	62	57	52	46	43	39	36	72	71	59	55	56	52	49	44
		Cooling: High Speed	70	64	57	53	46	42	39	35	79	73	61	57	58	54	52	48
		Heating: High Speed	73	65	58	52	47	43	40	37	79	73	62	57	60	55	52	48
015	V/H	Fan Only	61	62	57	53	48	45	41	36	72	72	60	59	56	52	49	42
		Cooling: High Speed	69	64	58	54	48	44	40	35	77	74	61	60	57	53	51	44
		Heating: High Speed	71	67	58	53	49	45	41	36	79	74	62	60	58	54	51	44
018	V/H	Fan Only	61	62	58	55	51	47	42	36	72	74	61	64	57	53	50	41
		Cooling: High Speed	67	65	58	55	50	47	42	35	76	74	61	63	56	53	49	40
		Heating: High Speed	69	70	58	55	51	47	42	36	78	74	62	64	57	53	50	41
024	V/H	Fan Only	51	46	47	43	38	33	30	32	69	59	51	54	49	42	37	32
		Cooling: High Speed	65	66	61	60	55	51	49	43	76	69	59	65	59	54	53	46
		Heating: High Speed	65	67	60	58	51	47	47	43	75	68	60	66	60	55	53	48
030	V/H	Fan Only	57	55	53	52	47	44	41	37	70	61	58	59	55	50	47	44
		Cooling: High Speed	71	63	60	59	56	51	47	42	77	68	65	66	63	59	58	52
		Heating: High Speed	71	70	60	59	56	51	47	41	77	69	66	66	64	59	57	50
036	V/H	Fan Only	61	60	61	60	54	49	47	40	71	63	60	61	59	53	49	45
		Cooling: High Speed	71	66	62	59	58	53	50	44	75	68	66	66	63	59	59	52
		Heating: High Speed	72	70	64	59	57	53	49	44	76	69	66	66	64	61	59	52
042	V/H	Fan Only	66	65	65	61	58	53	50	44	72	64	62	62	61	55	53	46
		Cooling: High Speed	72	68	65	61	59	55	52	46	76	70	67	67	63	60	60	52
		Heating: High Speed	73	68	67	61	59	54	51	46	75	70	67	67	65	61	59	52
048	V/H	Fan Only	71	68	69	63	60	57	54	49	73	66	65	64	63	57	56	48
		Cooling: High Speed	72	69	69	63	61	57	54	49	77	71	68	68	64	61	61	53
		Heating: High Speed	73	69	70	64	61	57	54	49	76	70	68	67	65	60	59	52
060	V/H	Fan Only	72	73	71	65	64	62	61	56	78	73	76	72	74	70	70	65
		Cooling: High Speed	85	75	72	67	66	65	63	58	77	74	75	72	74	70	70	65
		Heating: High Speed	82	73	71	66	64	62	61	56	79	75	75	72	73	69	68	63
070	V/H	Fan Only	72	73	71	65	64	62	61	56	78	73	76	72	74	70	70	65
		Cooling: High Speed	85	75	72	67	66	65	63	58	77	74	75	72	74	70	70	65
		Heating: High Speed	82	73	71	66	64	62	61	56	79	75	75	72	73	69	68	63

7/28/14

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

## Performance Data - Versatec 500 WSHP cont.

### Single Speed Series - Super Quiet Construction - PSC

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
009	V/H	Fan Only	60	61	54	48	39	37	35	34	71	67	55	45	53	49	46	45
		Cooling: High Speed	72	61	55	50	41	36	34	34	80	70	61	51	59	54	54	54
		Heating: High Speed	76	58	56	47	41	37	37	36	79	72	62	49	61	55	53	53
012	V/H	Fan Only	60	61	55	51	44	41	38	34	71	69	57	53	54	50	47	42
		Cooling: High Speed	69	62	56	52	45	41	37	34	77	71	60	56	57	53	51	46
		Heating: High Speed	72	63	56	50	45	41	39	35	78	72	61	55	58	53	51	46
015	V/H	Fan Only	59	61	56	52	47	43	39	34	70	71	58	58	55	51	48	41
		Cooling: High Speed	67	63	56	52	47	43	39	33	76	72	59	58	55	52	49	42
		Heating: High Speed	69	66	56	52	47	43	40	35	77	72	60	59	57	52	49	43
018	V/H	Fan Only	59	61	57	53	49	45	41	34	70	72	60	62	55	52	48	39
		Cooling: High Speed	66	64	57	53	49	45	40	33	75	73	59	61	54	51	48	38
		Heating: High Speed	67	68	57	54	49	45	41	34	77	72	60	62	56	52	48	39
024	V/H	Fan Only	50	45	46	43	38	33	30	32	69	59	51	54	49	42	37	32
		Cooling: High Speed	62	63	59	58	53	50	48	42	74	67	57	64	59	54	53	46
		Heating: High Speed	62	64	58	56	49	46	46	42	73	66	58	65	60	55	53	48
030	V/H	Fan Only	56	54	52	52	47	44	41	37	70	61	58	59	55	50	47	44
		Cooling: High Speed	68	60	58	57	54	50	46	41	75	66	63	65	63	59	58	52
		Heating: High Speed	68	67	58	57	54	50	46	40	75	67	64	65	64	59	57	50
036	V/H	Fan Only	60	59	60	60	54	49	47	40	71	63	60	61	59	53	49	45
		Cooling: High Speed	68	63	60	57	56	52	49	43	73	66	64	65	63	59	59	52
		Heating: High Speed	69	67	62	57	55	52	48	43	74	67	64	65	64	61	59	52
042	V/H	Fan Only	65	64	64	61	58	53	50	44	72	64	62	62	61	55	53	46
		Cooling: High Speed	69	65	63	58	57	54	51	45	74	68	65	66	63	60	60	52
		Heating: High Speed	70	65	65	58	57	53	50	45	73	68	65	66	65	61	59	52
048	V/H	Fan Only	70	67	68	63	60	57	54	49	73	66	65	64	63	57	56	48
		Cooling: High Speed	69	66	67	60	59	56	53	48	75	69	66	67	63	61	61	53
		Heating: High Speed	70	66	68	61	59	56	53	48	74	68	66	66	64	59	59	52
060	V/H	Fan Only	71	72	70	65	64	62	61	56	78	73	76	72	74	70	70	65
		Cooling: High Speed	82	72	70	64	64	64	62	57	75	72	73	71	73	70	70	65
		Heating: High Speed	79	70	69	63	62	61	60	55	77	73	73	71	72	69	68	63
070	V/H	Fan Only	71	72	70	65	64	62	61	56	78	73	76	72	74	70	70	65
		Cooling: High Speed	82	72	70	64	64	64	62	57	75	72	73	71	73	70	70	65
		Heating: High Speed	79	70	69	63	62	61	60	55	77	73	73	71	72	69	68	63

7/28/14

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

# Performance Data - Versatec 500 WSHP

## Single Speed - Standard Construction - ECM

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
015	V/H	Fan Only	58	60	55	51	46	42	38	33	69	70	57	57	54	50	47	40
		Cooling: High Speed	69	64	58	54	48	44	40	35	77	74	61	60	57	53	51	44
		Heating: High Speed	71	67	58	53	49	45	41	36	79	74	62	60	58	54	51	44
018	V/H	Fan Only	58	60	56	52	48	44	40	33	69	71	59	61	54	51	47	38
		Cooling: High Speed	67	65	58	55	50	47	42	35	76	74	61	63	56	53	49	40
		Heating: High Speed	69	70	58	55	51	47	42	36	78	74	62	64	57	53	50	41
022	V/H	Fan Only	49	44	45	42	37	32	29	31	68	58	50	53	48	41	36	31
		Cooling: High Speed	65	66	61	60	55	51	49	43	76	69	59	65	59	54	53	46
		Heating: High Speed	65	67	60	58	51	47	47	43	75	68	60	66	60	55	53	48
030	V/H	Fan Only	55	53	51	51	46	43	40	36	69	60	57	58	54	49	46	43
		Cooling: High Speed	71	63	60	59	56	51	47	42	77	68	65	66	63	59	58	52
		Heating: High Speed	71	70	60	59	56	51	47	41	77	69	66	66	64	59	57	50
036	V/H	Fan Only	60	57	54	52	47	44	41	37	70	60	52	53	49	43	39	32
		Cooling: High Speed	70	65	61	58	57	52	49	43	74	67	65	65	62	58	58	51
		Heating: High Speed	71	69	63	58	56	52	48	43	75	68	65	65	63	60	58	51
042	V/H	Fan Only	62	61	61	58	55	50	47	41	69	61	59	59	58	52	50	43
		Cooling: High Speed	71	67	64	60	58	54	51	45	75	69	66	66	62	59	59	51
		Heating: High Speed	72	67	66	60	58	53	50	45	74	69	66	66	64	60	58	51
048	V/H	Fan Only	67	63	59	55	52	48	46	43	71	62	54	54	51	46	42	34
		Cooling: High Speed	71	68	68	62	60	56	53	48	76	70	67	67	63	60	60	52
		Heating: High Speed	72	68	69	63	60	56	53	48	75	69	67	66	64	59	58	51
060	V/H	Fan Only	69	65	62	58	55	51	48	44	77	66	60	59	57	53	50	42
		Cooling: High Speed	85	75	72	67	66	65	63	58	77	74	75	72	74	70	70	65
		Heating: High Speed	82	73	71	66	64	62	61	56	79	75	75	72	73	69	68	63
070	V/H	Fan Only	70	66	64	61	58	53	50	45	82	69	65	64	62	60	57	49
		Cooling: High Speed	85	75	72	67	66	65	63	58	77	74	75	72	74	70	70	65
		Heating: High Speed	82	73	71	66	64	62	61	56	79	75	75	72	73	69	68	63

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001 8/22/17

## Single Speed Series - Super Quiet Construction - ECM

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
015	V/H	Fan Only	58	60	55	51	46	42	38	33	69	70	57	57	54	50	47	40
		Cooling: High Speed	67	63	56	52	47	43	39	33	76	72	59	58	55	52	49	42
		Heating: High Speed	69	66	56	52	47	43	40	35	77	72	60	59	57	52	49	43
018	V/H	Fan Only	58	60	56	52	48	44	40	33	69	71	59	61	54	51	47	38
		Cooling: High Speed	66	64	57	53	49	45	40	33	75	73	59	61	54	51	48	38
		Heating: High Speed	67	68	57	54	49	45	41	34	77	72	60	62	56	52	48	39
024	V/H	Fan Only	49	44	45	42	37	32	29	31	68	58	50	53	48	41	36	31
		Cooling: High Speed	62	63	59	58	53	50	48	42	74	67	57	64	59	54	53	46
		Heating: High Speed	62	64	58	56	49	46	46	42	73	66	58	65	60	55	53	48
030	V/H	Fan Only	55	53	51	51	46	43	40	36	69	60	57	58	54	49	46	43
		Cooling: High Speed	68	60	58	57	54	50	46	41	75	66	63	65	63	59	58	52
		Heating: High Speed	68	67	58	57	54	50	46	40	75	67	64	65	64	59	57	50
036	V/H	Fan Only	60	57	54	52	47	44	41	37	70	60	52	53	49	43	39	32
		Cooling: High Speed	67	62	59	56	55	51	48	42	72	65	63	64	62	58	58	51
		Heating: High Speed	68	66	61	56	54	51	47	42	73	66	63	64	63	60	58	51
042	V/H	Fan Only	62	61	61	58	55	50	47	41	69	61	59	59	58	52	50	43
		Cooling: High Speed	68	64	62	57	56	53	50	44	73	67	64	65	62	59	59	51
		Heating: High Speed	69	64	64	57	56	52	49	44	72	67	64	65	64	60	58	51
048	V/H	Fan Only	67	63	59	55	52	48	46	43	71	62	54	54	51	46	42	34
		Cooling: High Speed	68	65	66	59	58	55	52	47	74	68	65	66	62	60	60	52
		Heating: High Speed	69	65	67	60	58	55	52	47	73	67	65	65	63	58	58	51
060	V/H	Fan Only	69	65	62	58	55	51	48	44	77	66	60	59	57	53	50	42
		Cooling: High Speed	82	72	70	64	64	64	62	57	75	72	73	71	73	70	70	65
		Heating: High Speed	79	70	69	63	62	61	60	55	77	73	73	71	72	69	68	63
070	V/H	Fan Only	70	66	64	61	58	53	50	45	82	69	65	64	62	60	57	49
		Cooling: High Speed	82	72	70	64	64	64	62	57	75	72	73	71	73	70	70	65
		Heating: High Speed	79	70	69	63	62	61	60	55	77	73	73	71	72	69	68	63

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001 7/28/14

# Performance Data - Versatec 500 WSHP

## Dual Capacity - Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

MODEL	Cabinet	MODE	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			OCTAVE BAND FREQUENCY, Hz								OCTAVE BAND FREQUENCY, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
026	V/H	Fan Only	56	53	52	49	44	40	37	32	69	59	51	54	49	42	37	32
		Cooling: Low Speed	63	67	58	57	51	47	43	41	72	65	56	60	54	49	46	38
		Cooling: High Speed	65	66	61	60	55	51	49	43	76	69	59	65	59	54	53	46
		Heating: Low Speed	64	66	59	57	51	46	43	41	72	65	55	60	54	48	47	40
		Heating: High Speed	65	67	60	58	51	47	47	43	73	68	60	65	59	54	52	47
038	V/H	Fan Only	62	59	56	53	48	45	42	38	71	61	53	54	50	44	40	33
		Cooling: Low Speed	65	68	60	58	53	49	46	43	72	68	57	59	54	50	47	39
		Cooling: High Speed	67	68	63	60	56	52	50	45	75	70	60	63	59	54	53	46
		Heating: Low Speed	66	67	64	60	53	49	46	43	73	68	57	60	54	50	48	44
		Heating: High Speed	65	68	62	59	54	50	49	45	74	69	60	63	59	55	52	48
049	V/H	Fan Only	69	65	61	56	53	49	47	44	72	63	55	55	52	47	43	35
		Cooling: Low Speed	67	69	62	59	55	51	49	45	73	71	58	59	55	51	49	41
		Cooling: High Speed	69	70	65	61	57	54	52	48	75	71	62	62	59	55	54	47
		Heating: Low Speed	68	69	68	63	56	52	50	46	73	70	59	59	55	51	50	48
		Heating: High Speed	66	69	63	61	57	53	51	47	74	71	60	61	58	56	52	50
064	V/H	Fan Only	70	66	63	58	55	51	48	44	77	66	60	59	57	53	50	42
		Cooling: Low Speed	70	69	65	62	60	55	54	49	77	71	63	63	61	57	56	49
		Cooling: High Speed	71	70	68	64	62	58	57	52	78	72	66	66	65	61	60	54
		Heating: Low Speed	71	69	69	66	61	56	55	50	77	71	65	64	62	58	57	53
		Heating: High Speed	70	70	67	64	62	58	57	52	78	72	66	66	65	62	59	55
072	V/H	Fan Only	71	67	65	61	58	53	50	45	82	69	65	64	62	60	57	49
		Cooling: Low Speed	72	69	69	66	64	60	60	53	81	71	68	68	67	64	63	57
		Cooling: High Speed	74	71	71	68	67	63	63	57	82	73	70	70	71	67	66	61
		Heating: Low Speed	74	70	70	68	66	61	60	55	81	72	70	68	70	65	64	58
		Heating: High Speed	75	71	71	68	67	63	62	58	82	73	72	70	72	67	67	61

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

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## Dual Capacity - Super Quiet Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

MODEL	Cabinet	MODE	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			OCTAVE BAND FREQUENCY, Hz								OCTAVE BAND FREQUENCY, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
026	V/H	Fan Only	55	52	51	49	44	40	37	32	69	59	51	54	49	42	37	32
		Cooling: Low Speed	60	64	55	54	49	46	42	40	70	63	54	59	53	49	46	38
		Cooling: High Speed	62	63	59	57	53	50	48	42	74	67	57	64	58	54	53	46
		Heating: Low Speed	61	63	56	54	49	45	42	40	70	63	53	59	53	48	47	40
		Heating: High Speed	62	64	58	55	49	46	46	42	71	66	58	64	58	54	52	47
038	V/H	Fan Only	61	58	55	53	48	45	42	38	71	61	53	54	50	44	40	33
		Cooling: Low Speed	62	65	57	55	51	48	45	42	70	66	55	58	53	50	47	39
		Cooling: High Speed	64	65	61	57	54	51	49	44	73	68	58	62	58	54	53	46
		Heating: Low Speed	63	64	61	57	51	48	45	42	71	66	55	59	53	50	48	44
		Heating: High Speed	62	65	60	56	52	49	48	44	72	67	58	62	58	55	52	48
049	V/H	Fan Only	68	64	60	56	53	49	47	44	72	63	55	55	52	47	43	35
		Cooling: Low Speed	64	66	59	56	53	50	48	44	71	69	56	58	54	51	49	41
		Cooling: High Speed	66	67	63	58	55	53	51	47	73	69	60	61	58	55	54	47
		Heating: Low Speed	65	66	65	60	54	51	49	45	71	68	57	58	54	51	50	48
		Heating: High Speed	63	66	61	58	55	52	50	46	72	69	58	60	57	56	52	50
064	V/H	Fan Only	69	65	62	58	55	51	48	44	77	66	60	59	57	53	50	42
		Cooling: Low Speed	67	66	62	59	58	54	53	48	75	69	61	62	60	57	56	49
		Cooling: High Speed	68	67	66	61	60	57	56	51	76	70	64	65	64	61	60	54
		Heating: Low Speed	68	66	66	63	59	55	54	49	75	69	63	63	61	58	57	53
		Heating: High Speed	67	67	65	61	60	57	56	51	76	70	64	65	64	62	59	55
072	V/H	Fan Only	70	66	64	61	58	53	50	45	82	69	65	64	62	60	57	49
		Cooling: Low Speed	69	66	66	63	62	59	59	52	79	69	66	67	66	64	63	57
		Cooling: High Speed	71	68	69	65	65	62	62	56	80	71	68	69	70	67	66	61
		Heating: Low Speed	71	67	67	65	64	60	59	54	79	70	68	67	69	65	64	58
		Heating: High Speed	72	68	69	65	65	62	61	57	80	71	70	69	71	67	67	61

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 260-2001

7/28/14

## Performance Data - Versatec 500 Large WSHP

Model	Cabinet	Mode	Free Air Inlet Combined with Casing (Cabinet) Radiated								Ducted Discharge							
			Octave Band Frequency, Hz								Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
084	H	Fan Only	74	71	64	63	58	52	50	43	76	72	64	67	60	58	57	50
		Cooling: High Speed	75	69	65	63	57	57	55	50	78	74	69	73	67	65	64	59
		Heating: High Speed	77	71	66	64	58	56	54	51	77	73	68	72	65	63	62	57
096	H	Fan Only	78	72	68	65	60	59	58	53	81	76	72	76	70	68	67	62
		Cooling: High Speed	76	72	67	65	60	57	55	49	79	75	69	72	65	63	63	57
		Heating: High Speed	80	75	68	67	62	57	55	51	79	76	69	73	65	62	62	55
120	H	Fan Only	79	73	69	66	61	60	59	54	82	77	73	77	71	69	68	63
		Cooling: High Speed	79	73	69	67	61	61	59	54	82	78	73	77	71	69	68	63
		Heating: High Speed	80	76	69	67	63	59	57	54	80	76	71	75	68	66	65	60
150	H	Fan Only	80	74	70	67	62	61	60	55	83	78	74	78	72	70	69	64
		Cooling: High Speed	81	75	71	67	63	63	61	56	84	80	75	77	73	71	70	65
		Heating: High Speed	83	77	72	68	64	62	61	57	83	79	74	77	72	69	69	63
180	H	Fan Only	80	74	70	67	62	61	60	55	83	78	74	78	72	70	69	64
		Cooling: High Speed	82	76	72	68	64	64	62	57	85	81	76	78	74	72	71	66
		Heating: High Speed	84	78	73	69	65	63	62	58	84	80	75	78	73	70	70	64
084	V	Fan Only	73	70	63	62	57	51	49	42	75	71	63	66	59	57	56	49
		Cooling: High Speed	74	68	64	62	56	56	54	49	77	73	68	72	66	64	63	58
		Heating: High Speed	76	70	65	63	57	55	53	50	76	72	67	71	64	62	61	56
096	V	Fan Only	77	71	67	64	59	58	57	52	80	75	71	75	69	67	66	61
		Cooling: High Speed	75	71	66	64	59	56	54	48	78	74	68	71	64	62	62	56
		Heating: High Speed	79	74	67	66	61	56	54	50	78	75	68	72	64	61	61	54
120	V	Fan Only	78	72	68	65	60	59	58	53	81	76	72	76	70	68	67	62
		Cooling: High Speed	78	72	68	66	60	60	58	53	81	77	72	76	70	68	67	62
		Heating: High Speed	79	75	68	66	62	58	56	53	79	75	70	74	67	65	64	59
150	V	Fan Only	79	73	69	66	61	60	59	54	82	77	73	77	71	69	68	63
		Cooling: High Speed	80	74	70	66	62	62	60	55	83	79	74	76	72	70	69	64
		Heating: High Speed	82	76	71	67	63	61	60	56	82	78	73	76	71	68	68	62
180	V	Fan Only	79	73	69	66	61	60	59	54	82	77	73	77	71	69	68	63
		Cooling: High Speed	81	75	71	67	63	63	61	56	84	80	75	77	73	71	70	65
		Heating: High Speed	83	77	72	68	64	62	61	57	83	79	74	77	72	69	69	63
240	V	Fan Only	81	77	74	65	65	65	64	57	84	81	78	76	76	73	73	67
		Cooling: High Speed	83	77	74	66	66	65	64	58	87	82	78	76	76	73	73	67
		Heating: High Speed	86	79	75	67	67	65	65	60	86	82	78	75	75	72	73	66
300	V	Fan Only	82	78	76	64	67	66	66	59	85	82	80	75	77	75	75	68
		Cooling: High Speed	85	79	76	65	67	66	65	59	88	83	80	75	77	75	74	68
		Heating: High Speed	88	81	77	66	68	67	67	61	88	83	79	75	76	74	75	67
360	V	Fan Only	83	79	77	65	68	67	67	60	86	83	81	76	78	76	76	69
		Cooling: High Speed	86	80	77	66	68	67	66	60	89	84	81	76	78	76	75	69
		Heating: High Speed	89	82	78	67	69	68	68	62	89	84	80	76	77	75	76	68

## Performance Data - Versatec 300 Console

### Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Mode	dBA	Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000
09	High Fan Only	66	60	66	69	66	65	58	54	49
	Low Fan Only	64	57	63	67	64	62	56	51	46
	Cooling: High Speed	68	91	78	70	67	65	58	53	48
	Heating: High Speed	67	89	76	69	66	65	58	54	49
	Cooling: Low Speed	66	91	79	68	63	62	55	50	44
Heating: Low Speed	65	88	76	68	64	62	55	50	45	
12	High Fan Only	66	61	66	69	67	65	58	54	50
	Low Fan Only	60	58	64	67	64	63	56	51	46
	Cooling: High Speed	66	91	79	70	67	65	58	54	48
	Heating: High Speed	66	89	77	70	67	65	58	54	50
	Cooling: Low Speed	63	92	79	69	64	62	55	50	44
Heating: Low Speed	64	89	76	68	64	62	55	50	45	
15	High Fan Only	64	60	66	69	64	64	57	54	47
	Low Fan Only	61	57	61	64	60	58	51	46	38
	Cooling: High Speed	63	81	73	70	65	65	57	54	48
	Heating: High Speed	66	84	78	71	64	64	56	53	47
	Cooling: Low Speed	62	81	73	66	60	59	52	47	39
Heating: Low Speed	64	84	78	69	60	59	51	46	38	
18	High Fan Only	65	59	65	68	64	64	57	54	47
	Low Fan Only	60	56	61	63	60	58	51	46	38
	Cooling: High Speed	65	80	73	69	64	64	57	54	48
	Heating: High Speed	66	84	78	70	64	64	56	53	47
	Cooling: Low Speed	62	81	72	66	60	59	52	47	39
Heating: Low Speed	62	84	77	68	60	58	51	46	38	

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 350-1986.

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### Super Quiet Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Mode	dBA	Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000
09	High Fan Only	65	57	62	65	63	61	55	51	47
	Low Fan Only	63	54	60	63	60	59	52	48	43
	Cooling: High Speed	67	86	74	66	63	61	54	50	45
	Heating: High Speed	66	84	72	66	62	61	55	51	47
	Cooling: Low Speed	65	86	74	64	60	58	52	47	41
Heating: Low Speed	64	83	71	64	60	58	52	47	43	
12	High Fan Only	65	57	63	65	63	62	55	51	47
	Low Fan Only	59	54	60	63	61	59	53	48	43
	Cooling: High Speed	66	86	74	66	63	61	55	50	45
	Heating: High Speed	65	84	72	66	63	62	55	51	47
	Cooling: Low Speed	62	86	75	65	60	58	52	47	42
Heating: Low Speed	62	84	72	64	60	59	52	48	43	
15	High Fan Only	63	56	62	65	61	60	54	51	45
	Low Fan Only	60	53	58	60	56	55	48	44	36
	Cooling: High Speed	63	76	69	66	61	61	54	51	45
	Heating: High Speed	65	80	74	67	61	60	53	50	44
	Cooling: Low Speed	61	76	68	62	57	56	49	44	37
Heating: Low Speed	63	79	73	65	57	55	48	43	36	
18	High Fan Only	64	56	62	64	60	60	53	51	44
	Low Fan Only	59	53	58	60	56	55	48	43	36
	Cooling: High Speed	65	76	69	65	61	61	54	51	45
	Heating: High Speed	65	79	73	66	60	60	53	50	44
	Cooling: Low Speed	61	76	68	62	57	56	49	44	37
Heating: Low Speed	62	79	73	65	57	55	48	43	35	

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 350-1986.

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## Performance Data - Versatec 500 Console

### Standard Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Mode	dBA	Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000
09	High Fan Only	57	50	54	57	58	51	46	39	33
	Low Fan Only	52	50	49	52	53	45	38	29	28
	Cooling: High Speed	57	60	58	58	58	51	45	37	33
	Heating: High Speed	57	58	59	59	58	52	45	37	33
	Cooling: Low Speed	52	61	53	54	54	44	38	28	28
	Heating: Low Speed	51	58	53	55	54	46	38	28	28
12	High Fan Only	57	52	57	58	57	52	47	40	34
	Low Fan Only	53	51	52	54	53	47	40	32	29
	Cooling: High Speed	58	60	61	60	57	52	46	39	34
	Heating: High Speed	58	58	64	60	58	53	46	39	34
	Cooling: Low Speed	54	60	57	56	54	47	40	32	30
	Heating: Low Speed	54	58	59	56	54	48	40	32	30
15	High Fan Only	58	53	60	59	56	53	47	41	34
	Low Fan Only	54	52	56	55	53	49	43	35	31
	Cooling: High Speed	59	59	65	61	56	54	47	41	35
	Heating: High Speed	60	59	68	61	57	54	47	41	35
	Cooling: Low Speed	55	59	60	57	53	50	43	35	31
	Heating: Low Speed	56	58	64	58	54	50	43	35	31
18	High Fan Only	58	55	63	60	55	54	48	42	35
	Low Fan Only	55	53	59	57	53	51	45	38	32
	Cooling: High Speed	60	59	68	62	55	55	48	43	36
	Heating: High Speed	61	59	73	62	56	55	48	43	36
	Cooling: Low Speed	57	58	64	59	53	52	45	39	33
	Heating: Low Speed	58	58	69	59	54	52	45	39	33

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 350-1986.

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### Super Quiet Construction

Octave Band Sound Power Level, dB, re 1 pico Watt

Model	Mode	dBA	Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000
09	High Fan Only	56	48	53	55	56	49	44	37	32
	Low Fan Only	51	49	47	51	52	43	37	28	27
	Cooling: High Speed	56	58	57	57	57	49	44	36	32
	Heating: High Speed	56	56	57	57	57	50	44	36	32
	Cooling: Low Speed	51	59	51	53	53	43	36	27	27
	Heating: Low Speed	50	57	52	53	53	44	36	27	27
12	High Fan Only	56	50	56	56	55	50	45	38	32
	Low Fan Only	52	50	51	52	52	45	39	31	28
	Cooling: High Speed	57	58	60	58	56	51	45	38	33
	Heating: High Speed	57	57	62	58	56	51	45	38	33
	Cooling: Low Speed	53	58	55	54	52	46	39	30	28
	Heating: Low Speed	53	57	57	55	52	46	39	30	28
15	High Fan Only	57	52	59	57	55	51	46	40	33
	Low Fan Only	53	51	54	54	51	47	41	34	29
	Cooling: High Speed	58	58	63	59	55	52	46	40	33
	Heating: High Speed	59	57	67	59	55	52	46	39	34
	Cooling: Low Speed	54	57	59	56	52	48	41	34	30
	Heating: Low Speed	55	57	62	56	52	48	41	34	30
18	High Fan Only	57	53	62	58	54	52	46	41	33
	Low Fan Only	54	52	58	56	51	49	44	37	30
	Cooling: High Speed	59	57	67	60	54	54	46	41	34
	Heating: High Speed	60	58	72	60	55	53	47	41	35
	Cooling: Low Speed	56	56	63	57	51	51	44	37	31
	Heating: Low Speed	57	56	68	58	52	50	44	37	31

Data based on sound measurements made in a Reverberant room on representative units from each cabinet size in accordance with ARI standard 350-1986.

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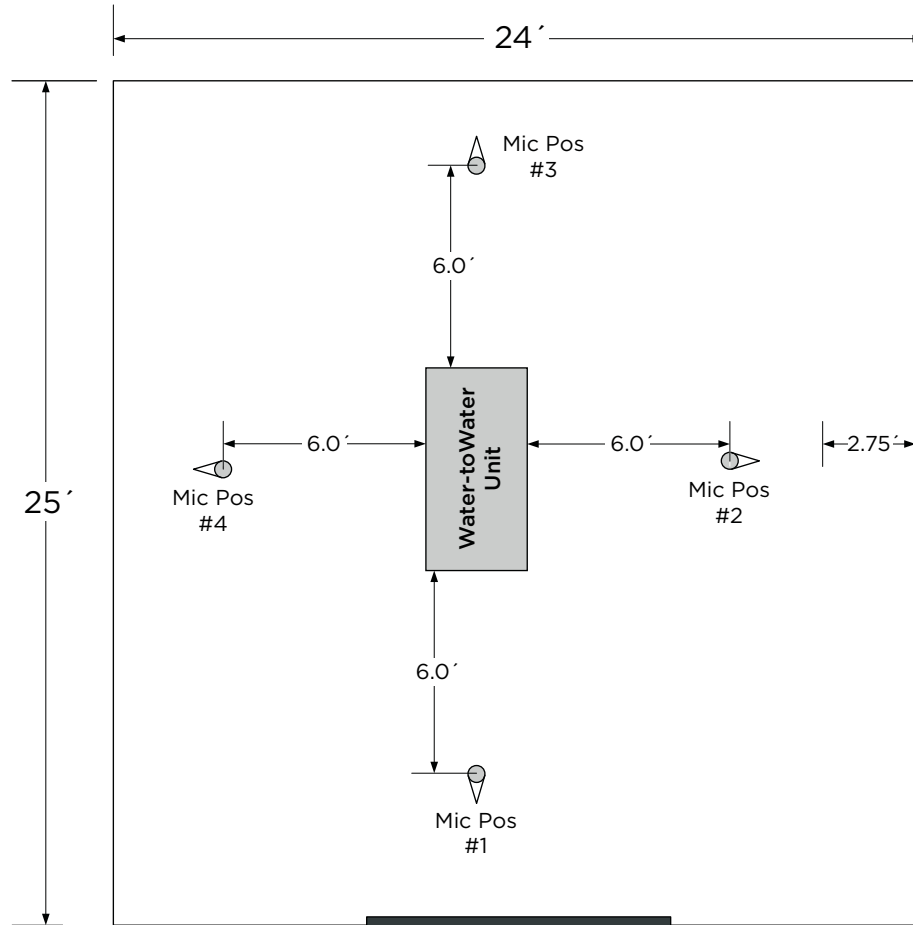
## Performance Data - TruClimate 100 Water-to-Water Heat Pump

Water-source heat pumps categorized by AHRI 13256-2 do not have an applicable sound performance standard. These units were tested by positioning a microphone in the locations shown in the figure. The performance data from each location was used to determine the final data

presented in the tables. The illustration describes the room conditions where the unit was tested.

**NOTE:** Data is presented as Sound Pressure and not Sound Power.

*Test Method Setup*



Ceiling height: 9'7"  
 Room Volume: 5748 cu. ft.  
 Min. Distance from source: 5.4'  
 Min. Distance from walls/ceiling: 1.7'  
 Min. Distance from mic positions: 4.5' (1/2 wavelength 125 Hz)  
 Mic height Pos #1: 2'  
 Mic height Pos #2: 3'  
 Mic height Pos #3: 4'  
 Mic height Pos #4: 5'

## Performance Data - TruClimate 100 Water-to-Water Heat Pump

### 1.5-6 Ton Sound Data

Octave Band Sound Pressure Level, dB, re 1 pico Watt

Model	dBA	Octave Band Frequency, Hz							
		63	125	250	500	1000	2000	4000	8000
018	57	58	56	42	40	32	30	28	26
024	57	58	56	42	40	32	30	28	26
040	61	62	60	44	42	33	31	29	28
048	61	62	60	52	43	38	36	35	28
060	63	64	62	55	53	44	42	41	39
075	64	65	63	56	54	45	43	42	39

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## Performance Data - TruClimate 100 Water-to-Water Heat Pump

### 8-15 Ton Sound Data

Octave Band Sound Pressure Level, dB, re 1 pico Watt

Model	dBA	Octave Band Frequency, Hz							
		63	125	250	500	1000	2000	4000	8000
100	64	65	63	56	55	54	53	43	39
120	65	66	64	57	56	55	54	44	40
150	68	69	67	63	60	57	55	47	43
180	70	71	69	68	64	58	56	49	46

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## Performance Data - TruClimate 100 Water-to-Water Heat Pump

### 20-50 Ton Sound Data

Octave Band Sound Pressure Level, dB, re 1 pico Watt

Model	dBA	Octave Band Frequency, Hz							
		63	125	250	500	1000	2000	4000	8000
100	64	65	63	56	55	54	53	43	39
120	65	66	64	57	56	55	54	44	40
150	68	69	67	63	60	57	55	47	43
180	70	71	69	68	64	58	56	49	46

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## Performance Data - TruClimate 100 Domestic Hot Water Chiller

### DHW Sound Data

Octave Band Sound Pressure Level, dB, re 1 pico Watt

Model	Configuration	dBA	Octave Band Frequency, Hz							
			63	125	250	500	1000	2000	4000	8000
120	with enclosure	62	63	61	60	59	56	50	46	40
	without enclosure	71	72	70	69	68	64	58	53	46
180	with enclosure	64	65	63	62	60	57	51	46	41
	without enclosure	74	76	73	71	69	66	59	53	47
240	with enclosure	64	65	63	62	60	58	52	47	41
	without enclosure	74	76	73	71	69	67	59	53	47
360	with enclosure	66	67	65	63	61	59	52	47	41
	without enclosure	76	78	75	73	70	68	59	53	47
600	with enclosure	69	70	68	65	61	59	52	47	41
	without enclosure	79	81	78	74	70	68	59	53	47

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## Revision Guide

<b>Pages:</b>	<b>Description:</b>	<b>Date:</b>	<b>By:</b>
Misc.	Added Versatec 500 Large data	03 Mar 2024	MA
Misc	Updated branding, added TruClimate 100 DHW	20 Dec 2024	MA
All	New naming convention	21 Aug 2023	MA
Misc.	Updated Versatec Base, 5 Series, Synergy3D	30 Oct. 2017	JM
All	Updated Formatting, added NEW, 3 Series, Low Sill Console, and NHW	09 April 2015	MA
21-15	Corrected Model Number Misprint	22 Mar 2013	DS
10	Added 7 Series Models	12 Nov 2012	DS
11-15	Added 5 Series Models	12 Nov 2012	DS
24-27	Added Versatec Base Models	12 Nov 2012	DS
34	Added Revision Table	12 Nov 2012	DS





Manufactured by  
WaterFurnace International, Inc.  
9000 Conservation Way  
Fort Wayne, IN 46809  
[www.waterfurnace.com](http://www.waterfurnace.com)



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