SINGLE DUCT VAV TERMINALS

TSS/TSL

AHRI CERTIFIED™
www.ahridirectory.org
VAV Terminals
AHRI Standard 880

Johnson Controls

Table of Content

Features and Benefits

Precise Zone Control

Model TSS/TSL terminals provide variable air volume (VAV) control beyond the typical single duct box. They are specifically designed for precise air delivery throughout the entire operating range, regardless of the installed inlet conditions. They also offer improved space comfort and flexibility for a wide variety of HVAC applications.

TSS/TSL terminals take advantage of typical benefits provided by single duct units, while performing at extremely low sound levels. This is critical in today's buildings, where occupants are placing more emphasis on indoor acoustics.

The ability to provide comfort to the occupant is the measurement of quality for any VAV terminal. Comfort is achieved through quiet and precise control of airflow to the occupied space.

The TSS/TSL terminal provides the ultimate in airflow control with the patented FlowStar™ airflow sensor. No other sensor in the industry can match the FlowStar's ability to quietly and precisely measure airflow. Accurate airflow measurement is the basis for airflow control.

Design Flexibility

Selection and Layout. The TSS/TSL provides flexibility in system design. The compact cabinet design and quiet operation give the system designer the versatility to place units directly above occupied spaces.

It is not necessary to locate the unit in the crowded space above a hall or corridor. This will reduce lengthy and cost of discharge duct runs.

The FlowStarTM sensor ensures accurate control, even when space constraints do not permit long straight inlet duct runs to the terminal.

Sizes. Model TSS terminals are available in 12 unit sizes to handle airflow capacities between 30-8000 CFM [51-13600 CMH]. Model TSL terminalsare available in 4 unit sizes to handle airflowcapacities between 165-4100 CFM [280-6970 CMH].

Convenience Installation

Quality. All TSS/TSL terminals are thoroughly inspected during each step of the manufacturing process, including a comprehensive "preship" inspection, to assure the highest quality product available. All TSS/TSL terminals are packaged to minimize damage during shipment.

Quick Installation. A standard single point electrical main power connection is provided with all electronic controls and electrical components located on the same side of the casing, for quick access, adjustment, and troubleshooting. Installation time is minimized with the availability of factory calibrated controls and a low profile compact design.

The FlowStar™ sensor ensures accurate airflow measurement, regardless of the field installation conditions. A calibration label and wiring diagram is located on the terminal for quick reference during start-up. The terminal is constructed to allow installation with standard metal hanging straps. Optional hanger brackets for use with all-thread support rods or wire hangers are also available.

Lasting Components and Low Cost Operation

Quality. All metal components are fabricated from galvanized steel.

Energy Efficiency. In addition to quiet and accurate temperature control, the building owner will benefit from lower operating costs. The highly amplified velocity pressure signal from the FlowStarTM inlet sensor allows precise airflow control at low air velocities.

The FlowStar™ sensor's airfoil shape provides minimal pressure drop across the terminal. This allows the central fan to run at a lower pressure and with less brake horsepower.

Agency Certification. TSS/TSL terminals and accessories are wired in compliance with all applicable requirements and tested in accordance with AHRI Standard 880.

Maintenance and Service. TSS/TSL terminals require no periodic maintenance and provide trouble-free operation. Controls are located on the outside of the unit casing for easy access by maintenance personnel.

A Variety of Controls

Model TSS/TSL terminals are available with DDC, controls specifically designed for using with TSS/TSL terminals. These controls are designed to accommodate a multitude of control schemes.

From the most basic to the most sophisticated sequence of operation, the controls are designed by experts in VAV single duct terminal operation.

Available Control Types:

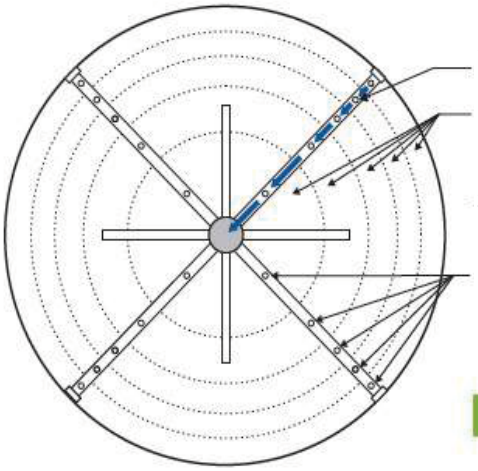
- Johnson Controls DDC for BACnet
- Factory mounted consignment DDC

Standard Control Features:

- Patented FlowStar™ Airflow Sensor
- Standard Electric Control Box
- 24 Volt Control Transformer

Features and Benefits

Patented FlowStar™ Sensor Control

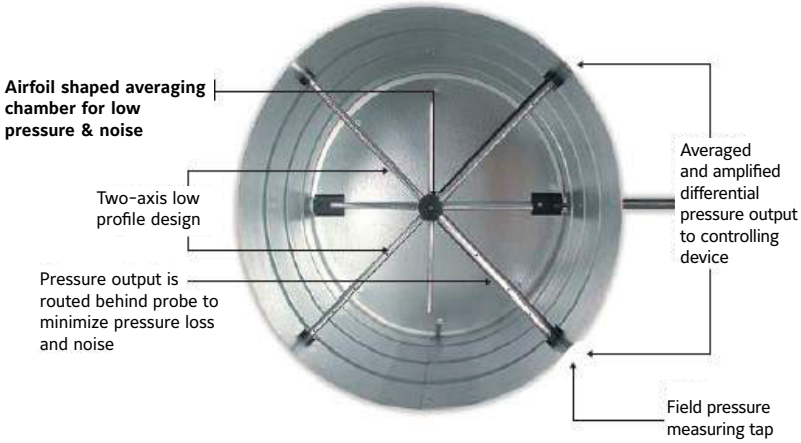


Each pressure input signal is routed to the center averaging chamber

Equal concentric circular areas
Sizes 6 & 7 & 8: 3 Circles
Sizes 9 & 10 & 12: 4 Circles
Sizes 14 & 16: 5 Circles (shown)

Total pressure measured at the center of each concentric circle for maximum accuracy, as outlined in ASHRAE Fundamentals Handbook.
Sizes 6 & 7 & 8: 12 Sensing Points
Sizes 9 & 10 & 12: 16 Sensing Points
Sizes 14 & 16: 20 Sensing Points

FlowStar™ Airflow Sensor
Patent #5,481,925



The air valve features the FlowStar™ airflow sensor which has brought new meaning to airflow control accuracy. The multi-axis design utilizes between 12 and 20 sensing points that sample total pressure at center points within equal concentric crosssectional areas, effectively traversing the air stream in two planes. Each distinct pressure reading is averaged within the center chamber before exiting the sensor to the controlling device.

This sensor adds a new dimension to signal amplification. Most differential pressure sensors provide a signal equal to 1.5 times the equivalent velocity pressure signal. The FlowStar™ provides a differential pressure signal that is 2.5 to 3 times the equivalent velocity pressure signal. This amplified signal allows more accurate and stable airflow control at low airflow capacities. Low airflow control is critical for indoor air quality, reheat minimization, and preventing over cooling during light loads.

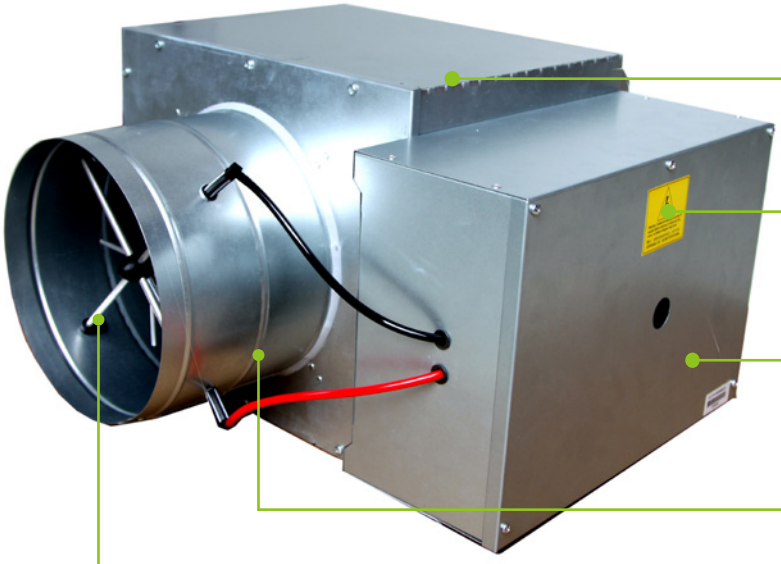
Unlike other sensors which use a large probe surface area to achieve signal amplification, the Flow-Star™ utilizes an unprecedented streamline design which generates amplified signals unrivaled in the industry. The streamlined design also generates less pressure drop and noise. The VAV schedule should specify the minimum and maximum airflow setpoints, maximum sound power levels, and maximum air pressure loss for each terminal. The specification for the VAV terminal must detail the required performance of the airflow sensor. For maximum building occupant satisfaction, the VAV system designer should specify the airflow sensor as suggested in the Guide Specifications of this catalog.

Using FlowStar™ sensing to amplify the airflow signal allows you to use lower minimum airflow setpoints Many VAV controllers require a minimum differential pressure signal of 7.5Pa. The airflow sensor should be able to generate this signal with only 2.0-2.25 m/s air velocity through the inlet collar.

Conventional airflow sensors without amplification capabilities require approximately 3.5 m/s to generate a 7.5Pa signal. If 3.5 m/s represents a 20% minimum condition, the inlet velocity would be 17.8 m/s at the maximum airflow setpoint. This results in extremely noisy conditions. In addition, the airflow sensor should generate a differential pressure range of at least 250Pa over the operating range of the terminal unit.

Standard Construction

Model TSS



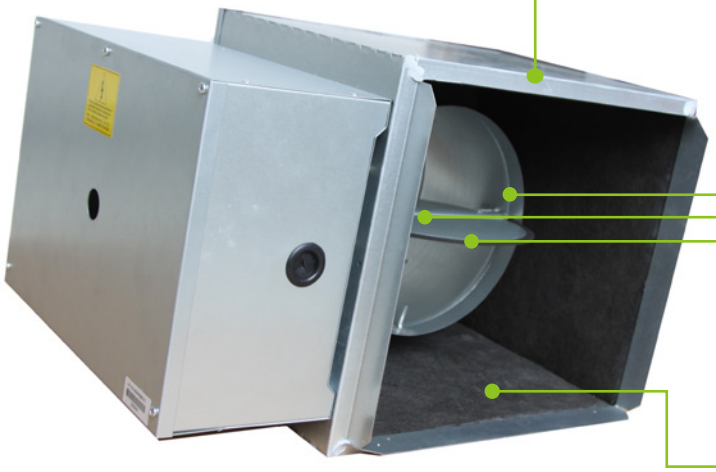
One piece casing design ensure low leakage rate

Product label includes tagging, airflow and electrical information

Electrical devices installed within a electric, control box enclosure, with single point power connection

Roll formed inlet collar with integral stiffening, ribs adds strength and rigidity

Patented FlowStar™ airflow sensor (Patent #5,481,925)



Insulation edge covered by metal – no raw edges of insulation exposed to airstream

Self-lubricating bearing to reduce friction and air leakage

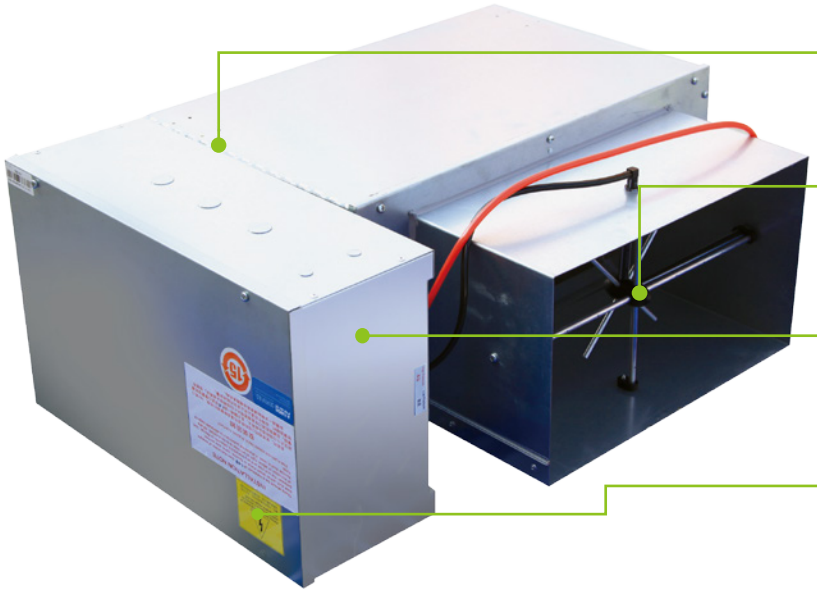
Solid composite damper shaft prevents condensation and breakage

Low leakage damper incorporates closed cell foam gasket

13 or 25mm thick fiberglass insulation

Standard Construction

Model TSL



One piece casing design ensure low leakage rate

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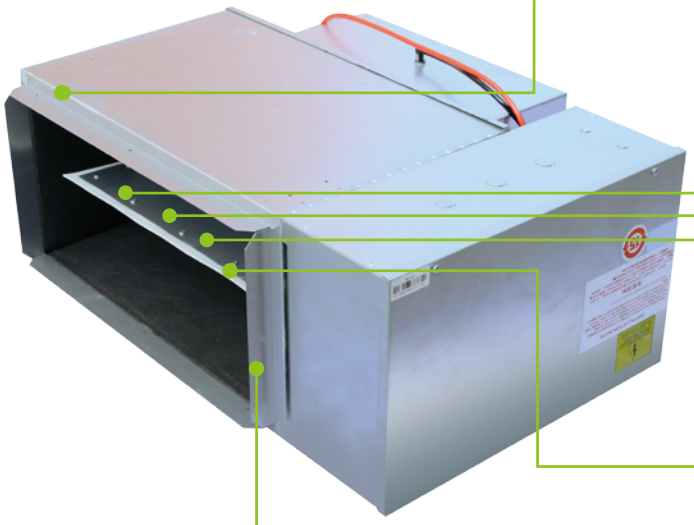
Electrical devices installed within a electric, control box enclosure, with single point power connection

Product label includes tagging, airflow and electrical information



Insulation edge covered by metal – no raw edges of insulation exposed to airstream

Self-lubricating bearing to reduce friction and air leakage

Solid composite damper shaft prevents condensation and breakage

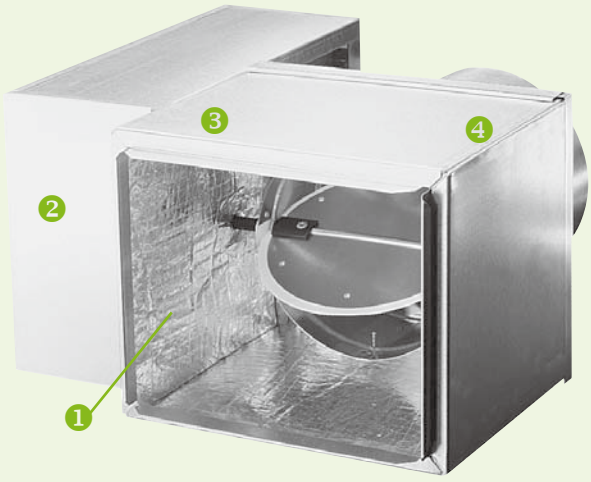
Low leakage damper incorporates closed cell foam gasket

13 or 25mm thick fiberglass insulation

Slip and drive discharge collar for quick field installation

Note: Model TCL's primary air pipe is square.

Optional Construction



Model TSS/TSL

The TSS single duct terminal is available with many optional features to meet any project requirement.

1) Scrim reinforced foil faced insulation meeting ASTM C1136 for mold, mildew and humidity resistance
2) Factory control options:
   - DDC Electronic
   For more information, see corresponding Control Selection Guides
3) Double wall construction (not shown)
4) Mounting brackets (not shown) to accept all-thread hanging rods or wire hangers

Standard & Optional Features

Standard Features

Construction

- AHRI 880 certified and labeled
- 22 gauge galvanized steel casing and valve
- 13mm thick fiberglass insulation, mechanically fastened for added security

Primary Air Valve

- Embossed rigidity rings
- Low thermal conductance damper shaft
- Position indicator on end of damper shaft
- Mechanical stops for open and closed position
- FlowStar™ center averaging airflow sensor
- Plenum-rated sensor tubing

Hot Water Coil

- Designed, manufactured, and tested
- Aluminum fin construction with dieformed spacer collars for uniform spacing
- Mechanically expanded copper tubes leak tested to 2.8MPa air pressure and rated at 1.6MPa working pressure.
- Male sweat type water connections
- 1, 2row configurations

Electrical

- Electric control box

Electrical Heater

- Primary automatic reset thermal protection
- Secondary thermal fuse protection
- Wiring diagram

Optional Features

Construction

- 25mm insulation
- Foil faced scrim backed insulation
- Double wall construction with 22 gauge liner

Hot Water Coil

- Multi-circuit coils for reduced water pressure drop
- Opposite hand water connections
- Bottom and top access plates for cleaning

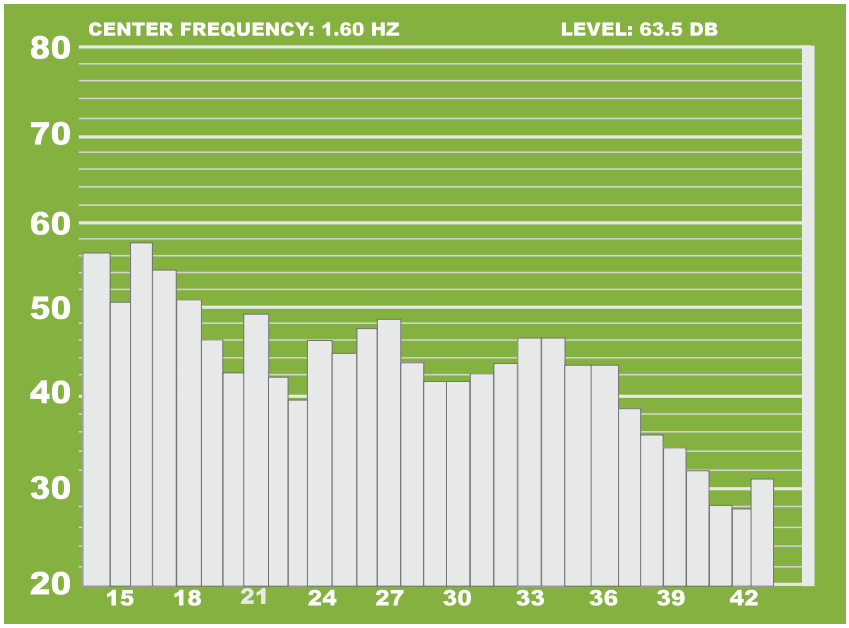
Electrical

- Primary transformer fusing

Controls

- Factory provided controls include
- Johnson controls DDC

Application and Selection



Acoustical Concepts

The focus on indoor air quality is also having an effect on proper selection of air terminal equipment with respect to acoustics.

Sound. At the zone level, the terminal unit generates acoustical energy that can enter the zone along two primary paths. First, sound from the primary air valve can propagate through the downstream duct and diffusers before entering the zone (referred to as Discharge or Airborne Sound). Acoustical energy is also radiated from the terminal casing and travels through the ceiling cavity and ceiling system before entering the zone (referred to as Radiated Sound).

To properly quantify the amount of acoustical energy emanating from a terminal unit at a specific operating condition (i.e.CFM and static pressure), manufacturers must measure and publish sound power levels.

The units of measurement, decibels, actually represent units of power (watts). The terminal equipment sound power ratings provide a consistent measure of the generated sound independent of the environment in which the unit is installed. This allows a straight forward comparison of sound performance between equipment manufacturers and unit models.

Noise Criteria (NC). The bottom line acoustical criteria for most projects is the NC (Noise Criteria) level. This NC level is derived from resulting sound pressure levels in the zone. These sound pressure levels are the effect of acoustical energy (sound power levels) entering the zone caused by the terminal unit and other sound generating sources (central fan system, office equipment, environment, etc.).

The units of measurement is once again decibels; however, in this case decibels represent units of pressure (Pascals), since the human ear and microphones react to pressure variations. There is no direct relationship between sound power levels and sound pressure levels. Therefore, we must predict the resulting sound pressure levels (NC levels) in the zone based in part by the published sound power levels of the terminal equipment. The NC levels are totally dependent on the project specific design, architecturally and mechanically. For a constant operating condition (fixed sound power levels), the resulting NC level in the zone will vary from one project to another.

AHRI 885. A useful tool to aid in predicting space sound pressure levels is an application standard referred to as ARI Standard 885. This standard provides information (tables, formulas, etc.) required to calculate the attenuation of the ductwork, ceiling cavity, ceiling system, and conditioned space below a terminal unit. These attenuation values are referred to as the "transfer function" since they are used to transfer from the manufacturer's sound power levels to the estimated sound pressure levels resulting in the space below, and / or served by the terminal unit. The standard does not provide all of the necessary information to accommodate every conceivable design; however, it does provide enough information to approximate the transfer function for most applications. Manufacturers use different assumptions with respect to a "typical" project design; therefore, it is impossible to compare product performance simply by looking at the published NC values.

General Design Recommendations for A Quiet System

The AHU. Sound levels in the zone are frequently impacted by central fan discharge noise that either breaks out (radiates) from the ductwork or travels through the distribution ductwork and enters the zone as airborne (discharge) sound. Achieving acceptable sound levels in the zone begins with a properly designed central fan system which delivers relatively quiet air to each zone.

Supply Duct Pressure. The primary factor contributing to noisy systems (including single duct applications) is high static pressure in the primary air duct. This condition causes higher sound levels from the central fan and also higher sound levels from the terminal unit, as the primary air valve closes to reduce the pressure. This condition is compounded when flexible duct is utilized at the terminal inlet, which allows the central fan noise and air valve noise to break out into the ceiling cavity and then enter the zone located below the terminal. Ideally, the system static pressure should be reduced to the point where the terminal unit installed on the duct run

associated with the highest pressure drop has the minimum required inlet pressure to deliver the design airflow to the zone. Many of today's HVAC systems experience 0.5''w.g. [125Pa] pressure drop or less in the main trunk. For systems that will have substantially higher pressure variances from one zone to another, special attention should be paid to the proper selection of air terminal equipment.

To date, the most common approach has been to select (size) all of the terminals based on the worst case (highest inlet static pressure) condition. Typically, this results in 80% (or higher) of the terminal units being oversized for their application. This in turn results in much higher equipment costs, but more importantly, drastically reduced operating efficiency of each unit. This consequently decreases the ability to provide comfort control in the zone. In addition, the oversized terminals cannot adequately control the minimum ventilation capacity required in the heating mode.

A more prudent approach is to utilize a pressure reducing device upstream of the terminal unit on those few zones closest to the central fan. This device could simply be a manual quadrant type damper if located well upstream of the terminal inlet. In tight quarters, perforated metal can be utilized as a quiet means of reducing system pressure. This approach allows all of the terminal units to experience a similar (lower) inlet pressure. They can be selected in a consistent manner at lower inlet pressure conditions that will allow more optimally sized units.

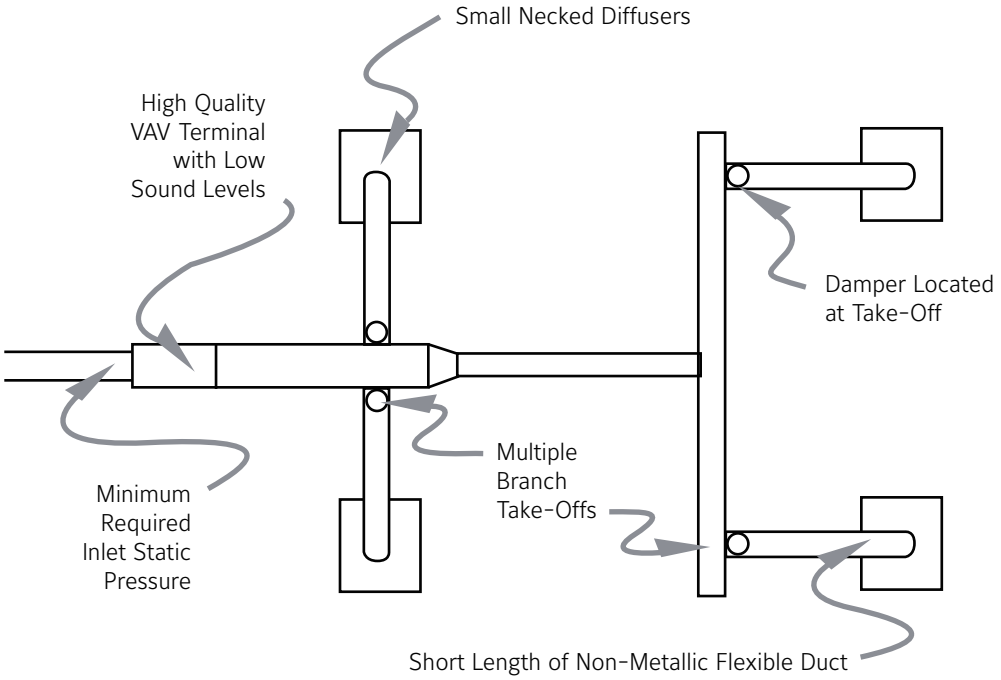
Inlet duct that is the same size as the inlet collar and as straight as possible will achieve the best acoustical performance. For critical applications, flexible duct should not be utilized at the terminal inlet.

Zoning. On projects where internal lining of the downstream duct is not permitted, special considerations should be made to assure acceptable noise levels will be obtained. In these cases, a greater number of smaller zones will help in reducing sound levels. Where possible, the first diffuser takeoff should be located after an elbow or tee and a greater number of small necked diffusers should be utilized, rather than fewer large necked diffusers.

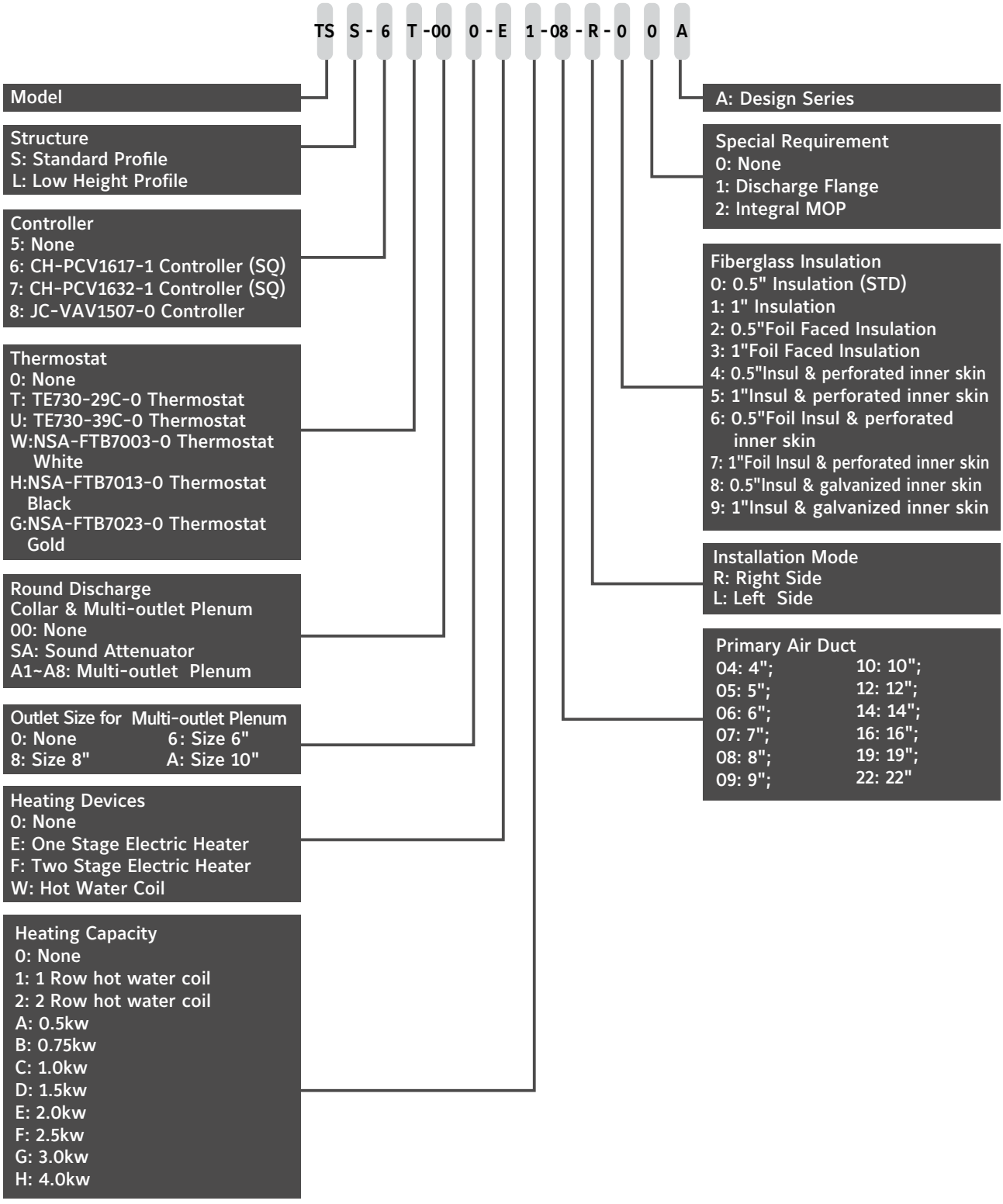
The downstream ductwork should be carefully designed and installed to avoid noise regeneration. Bull head tee arrangements should be located sufficiently downstream of the terminal discharge to provide an established flow pattern downstream of the fan. Place diffusers downstream of the terminal after the airflow has completely developed.

Downstream splitter dampers can cause noise problems if placed too close to the terminal, or when excessive air velocities exist. If tee arrangements are employed, volume dampers should be used in each branch of the tee, and balancing dampers should be provided at each diffuser tap. This arrangement provides maximum flexibility in quiet balancing of the system.

Ideal Duct Design

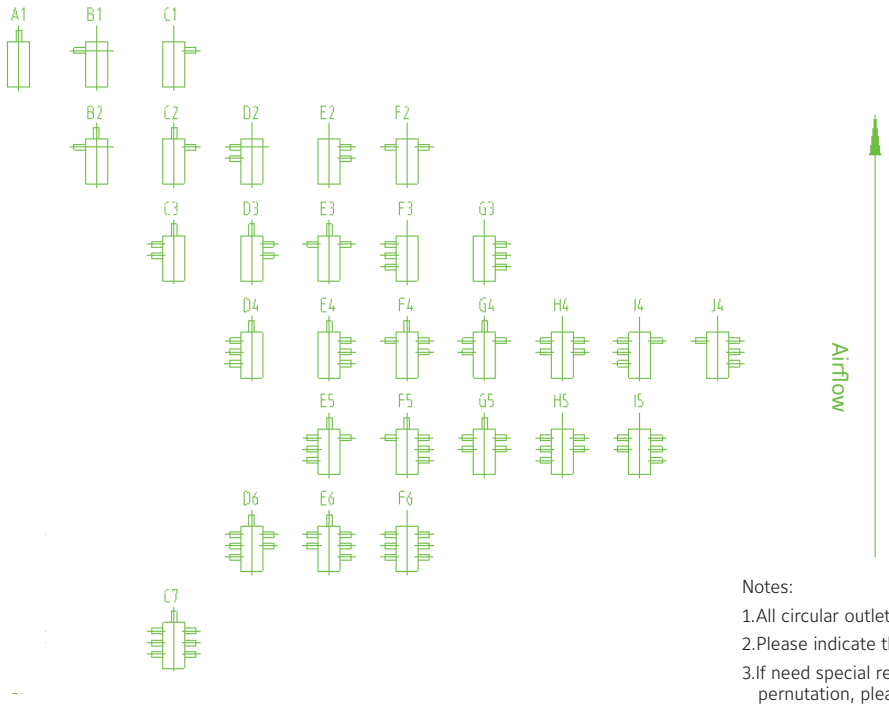


Nomenclature of Single Duct



Notes:
Along the direction of air stream, it is the right hand if control box locates at the right side of unit; vice versa.

TSS Layout of Multi-outlet Plenum(MOP)



Notes:

1.All circular outlet collar with manual valve.

2.Please indicate the direction of airflow.

3.If need special request of air outlet collar dimension or pernutation, please feel free to contact Johnson Controls

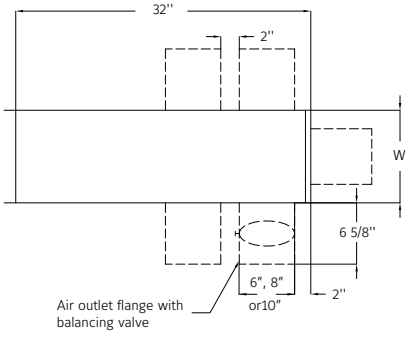
Model TSS
Mop Selection Table

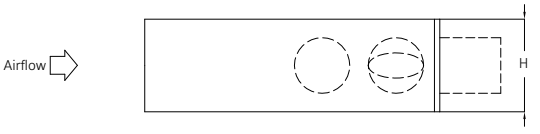
Dimension of MOP	No. of MOP		Unit Size							
				7,8	9,10	12	14	16	19	22
6"	End Face		1	1	1	-	-	-	-	-
	Single Size	813mm	3	3	3					
	Total	813mm	7	7	7					
8"	Face Size		1	1	1	1	-	-	-	-
	Single Size	813mm	2	2	2	2				
	Total	813mm	5	5	5	5				
10"	Face Size		-	-	1	1	1	1	SQ	SQ
	Single Size	813mm			2	2	2	2		
	Total	813mm			5	5	5	5		

Specification

Unit Size	W(mm)	H(mm)	W(mm)*	H(mm)*
04 “,05” ,06 “	254	260	254	280
07 “	305	260	305	280
08"	305	260	305	280
09”	356	324	356	324
10"	356	324	356	324
12"	406	387	406	387
14"	508	451	508	451
16"	610	451	610	465
19"	762	451	782	451
22"	864	451	884	465

Notes: * For the MOP with 25mm insulation

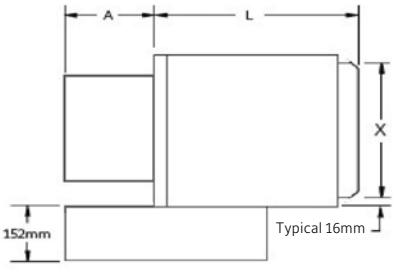




TSS Dimensional Data

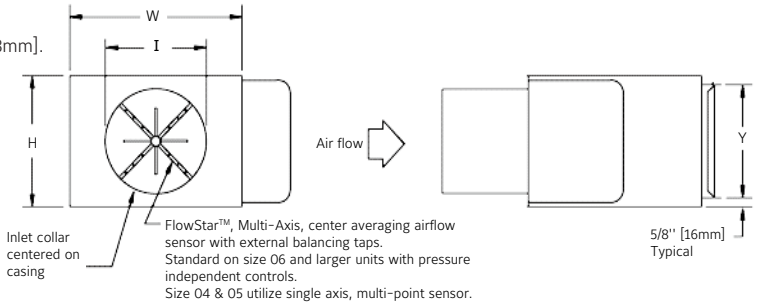
Model TSS

Unit	Unit Size	Dimensions inches [mm]						
		W	H	L	A	I	X	Y
TSS	04"	10 [254]	10 1/4 [260]	11 [279]	10 1/2 [267]	3 7/8 [98]	8 3/4 [222]	9 [228]
	05"	10 [254]	10 1/4 [260]	11 [279]	10 1/2 [267]	4 7/8 [124]	8 3/4 [222]	9 [228]
	06"	10 [254]	10 1/4 [260]	11 [279]	6 1/2 [165]	5 7/8 [149]	8 3/4 [222]	9 [228]
	07"	12 [305]	10 1/4 [260]	11 [279]	6 1/2 [165]	6 7/8 [175]	10 3/4 [273]	9 [228]
	08"	12 [305]	10 1/4 [260]	11 [279]	6 1/2 [165]	7 7/8 [200]	10 3/4 [273]	9 [228]
	09"	14 [356]	12 3/4 [324]	13 [330]	6 1/2 [165]	8 7/8 [225]	12 3/4 [324]	11 1/2 [292]
	10"	14 [356]	12 3/4 [324]	13 [330]	6 1/2 [165]	9 7/8 [251]	12 3/4 [324]	11 1/2 [292]
	12"	16 [406]	15 1/4 [387]	13 [330]	6 1/2 [165]	11 7/8 [302]	14 3/4 [375]	14 [355]
	14"	20 [508]	17 3/4 [451]	17 1/2 [445]	6 1/2 [165]	13 7/8 [352]	18 3/4 [476]	16 1/2 [419]
	16"	24 [610]	17 3/4 [451]	17 1/2 [445]	6 1/2 [165]	15 7/8 [403]	22 3/4 [578]	16 1/2 [419]
	19"	30 [762]	17 3/4 [451]	11 [279]	8 [203]	28 1/4 [718] x 13 7/8 [352]	28 3/4 [730]	16 1/2 [419]
	22"	34 [864]	17 3/4 [451]	11 [279]	8[203]	32 1/4 [819] x 15 7/8 [403]	32 3/4 [832]	16 1/2 [419]



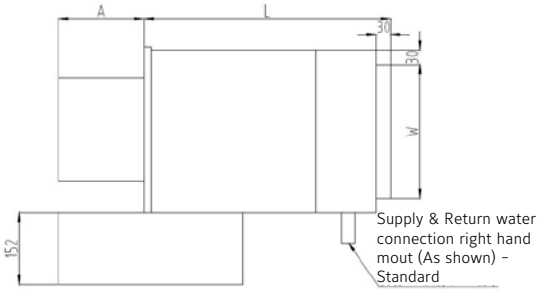
Notes:

1. All dimensions are in inches [mm] with a tolerance of ±1/8"[3mm].
2. Sizes 19 and 22 have rectangular inlet collar.



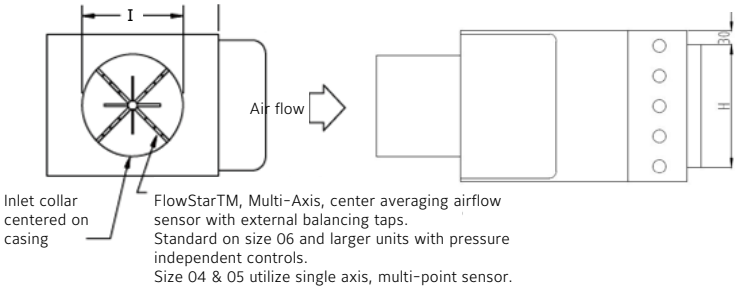
Model TSS-W

Unit	Unit Size	Dimensions inches [mm]				
		W	H	L	A	I
TSS-W	04"	194	200	17 [434]	10 1/2[267]	3 7/8 [98]
	05"	194	200	17 [434]	10 1/2[267]	4 7/8 [124]
	06"	194	200	17 [434]	6 1/2[165]	5 7/8 [149]
	07"	245	200	17 [434]	6 1/2[165]	6 7/8 [175]
	08"	245	200	17 [434]	6 1/2[165]	7 7/8 [200]
	09"	296	264	19 [485]	6 1/2[165]	8 7/8 [225]
	10"	296	264	19 [485]	6 1/2[165]	9 7/8 [251]
	12"	346	327	19 [485]	6 1/2[165]	11 7/8 [302]
	14"	448	391	23 5/8 [600]	6 1/2[165]	13 7/8 [352]
	16"	550	391	23 5/8 [600]	6 1/2[165]	15 7/8 [403]
	19"	702	391	17 [434]	8[203]	28 1/4 [718] x 13 7/8 [352]
	22"	804	391	17 [434]	8[203]	32 1/4 [819] x 15 7/8 [403]



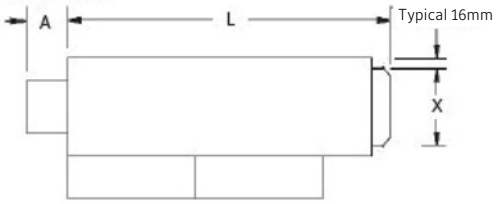
Notes:

1. All dimensions are in inches [mm] with a tolerance of ±1/8"[3mm].
2. Sizes 19 and 22 have rectangular inlet collar.



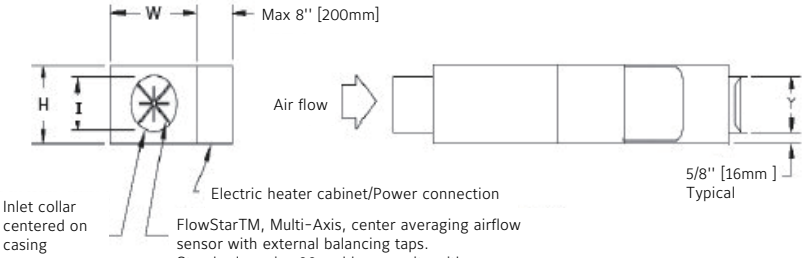
Model TSS-E

Unit	Unit Size	Dimensions inches [mm]						
		W	H	L	A	I	X	Y
TSS-EH	04"	10 [254]	10 1/4 [260]	41 7/8 [1216]	10 1/2 [267]	3 7/8 [98]	8 3/4 [222]	9 [228]
	05"	10 [254]	10 1/4 [260]	41 7/8 [1216]	10 1/2 [267]	4 7/8 [124]	8 3/4 [222]	9 [228]
	06"	10 [254]	10 1/4 [260]	41 7/8 [1216]	6 1/2 [165]	5 7/8 [149]	8 3/4 [222]	9 [228]
	07"	12 [305]	10 1/4 [260]	41 7/8 [1216]	6 1/2 [165]	6 7/8 [175]	10 3/4 [273]	9 [228]
	08"	12 [305]	10 1/4 [260]	41 7/8 [1216]	6 1/2 [165]	7 7/8 [200]	10 3/4 [273]	9 [228]
	09"	14 [356]	12 3/4 [324]	41 7/8 [1216]	6 1/2 [165]	8 7/8 [225]	12 3/4 [324]	11 1/2 [292]
	10"	14 [356]	12 3/4 [324]	41 7/8 [1216]	6 1/2 [165]	9 7/8 [251]	12 3/4 [324]	11 1/2 [292]
	12"	16 [406]	15 1/4 [387]	41 7/8 [1216]	6 1/2 [165]	11 7/8 [302]	14 3/4 [375]	14 [355]
	14"	20 [508]	17 3/4 [451]	41 7/8 [1216]	6 1/2 [165]	13 7/8 [352]	18 3/4 [476]	16 1/2 [419]
	16"	24 [610]	17 3/4 [451]	41 7/8 [1216]	6 1/2 [165]	15 7/8 [403]	22 3/4 [578]	16 1/2 [419]



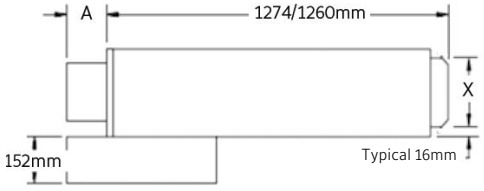
Notes:

1. All dimensions are in inches [mm] with a tolerance of ±1/8" [3mm].



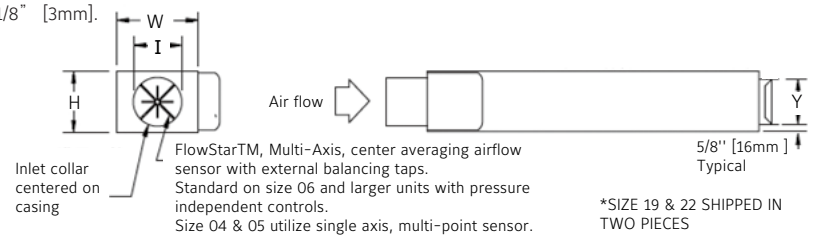
Model TSS-SA

Unit	Unit Size	Dimensions inches [mm]						
		W	H	L	A	I	X	Y
TSS-SA	04"	10 [254]	10 1/4 [260]	50 [1274]	10 1/2 [267]	3 7/8 [98]	8 3/4 [222]	9 [228]
	05"	10 [254]	10 1/4 [260]	50 [1274]	10 1/2 [267]	4 7/8 [124]	8 3/4 [222]	9 [228]
	06"	10 [254]	10 1/4 [260]	50 [1274]	6 1/2 [165]	5 7/8 [149]	8 3/4 [222]	9 [228]
	07"	12 [305]	10 1/4 [260]	50 [1274]	6 1/2 [165]	6 7/8 [175]	10 3/4 [273]	9 [228]
	08"	12 [305]	10 1/4 [260]	50 [1274]	6 1/2 [165]	7 7/8 [200]	10 3/4 [273]	9 [228]
	09"	14 [356]	12 3/4 [324]	50 [1274]	6 1/2 [165]	8 7/8 [225]	12 3/4 [324]	11 1/2 [292]
	10"	14 [356]	12 3/4 [324]	50 [1274]	6 1/2 [165]	9 7/8 [251]	12 3/4 [324]	11 1/2 [292]
	12"	16 [406]	15 1/4 [387]	50 [1274]	6 1/2 [165]	11 7/8 [302]	14 3/4 [375]	14 [355]
	14"	20 [508]	17 3/4 [451]	50 [1274]	6 1/2 [165]	13 7/8 [352]	18 3/4 [476]	16 1/2 [419]
	16"	24 [610]	17 3/4 [451]	50 [1274]	6 1/2 [165]	15 7/8 [403]	22 3/4 [578]	16 1/2 [419]
	19"	30 [762]	17 3/4 [451]	49 1/2 [1260]	8 [203]	28 1/4 [718] x 13 7/8 [352]	28 3/4 [730]	16 1/2 [419]
	22"	34 [864]	17 3/4 [451]	49 1/2 [1260]	8 [203]	32 1/4 [819] x 15 7/8 [403]	32 3/4 [832]	16 1/2 [419]



Notes:

1. All dimensions are in inches [mm] with a tolerance of ±1/8" [3mm].
2. Sizes 19 and 22 have rectangular inlet collar.

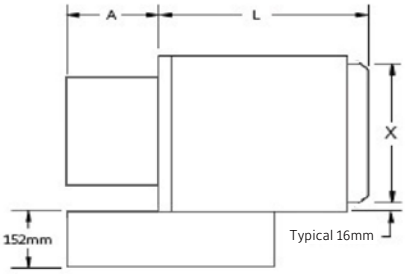


*SIZE 19 & 22 SHIPPED IN TWO PIECES

TSS Dimensional Data

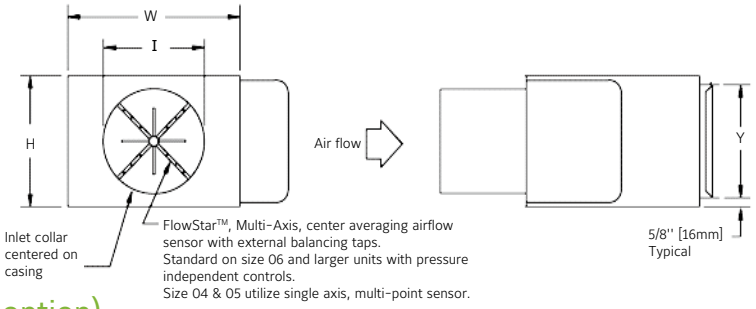
Model TSS (with 25mm insulation option)

Unit	Unit Size	Dimensions (mm)						
		W	H	L	A	I	X	Y
TSS	04"	254	280	279	267	98	197	223
	05"	254	280	279	267	124	197	223
	06"	254	280	279	165	149	197	223
	07"	305	280	279	165	175	248	223
	08"	305	280	279	165	200	248	223
	09"	356	324	330	165	225	299	267
	10"	356	324	330	165	251	299	267
	12"	406	387	330	165	302	350	330
	14"	508	451	445	165	352	451	394
	16"	610	465	445	165	403	553	408
	19"	782	451	279	203	718x352	725	394
	22"	884	465	279	203	819x403	827	408



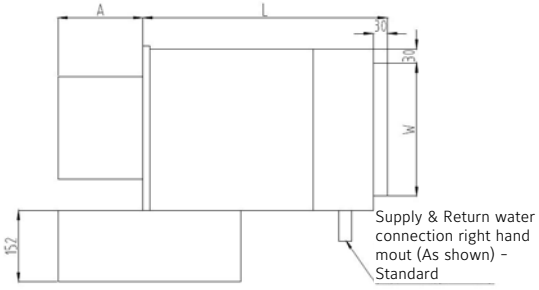
Notes:

1. All dimensions are in mm with a tolerance of ±3mm.
2. Sizes 19 and 22 have rectangular inlet collar.



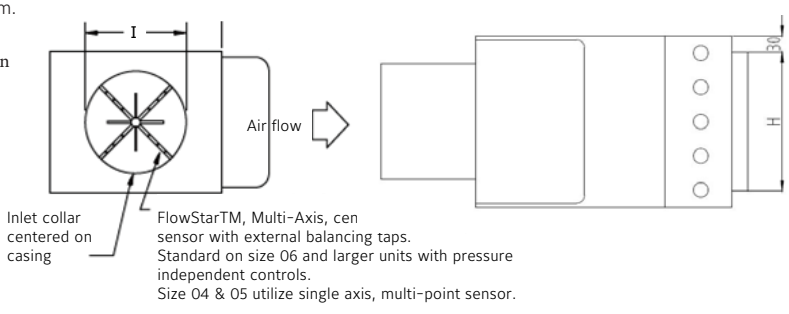
Model TSS-W(with 25mm insulation option)

Unit	Unit Size	Dimensions (mm)				
		W	H	L @3	A	I
TSS-W	04"	194	220	434 + 150	267	98
	05"	194	220	434 + 150	267	124
	06"	194	220	434 + 150	165	149
	07"	245	220	434 + 150	165	200
	08"	245	220	434 + 150	165	200
	09"	296	264	485 + 150	165	251
	10"	296	264	485 + 150	165	251
	12"	346	327	485 + 150	165	302
	14"	448	391	600 + 150	165	352
	16"	550	405	600 + 150	165	403
	19"	722	391	434	203	718x352
	22"	824	405	434	203	819x403



Notes:

1. All dimensions are in mm with a tolerance of ±3mm.
2. Sizes 19 and 22 have rectangular inlet collar.
3. Add 150mm in Length for an inspection window option

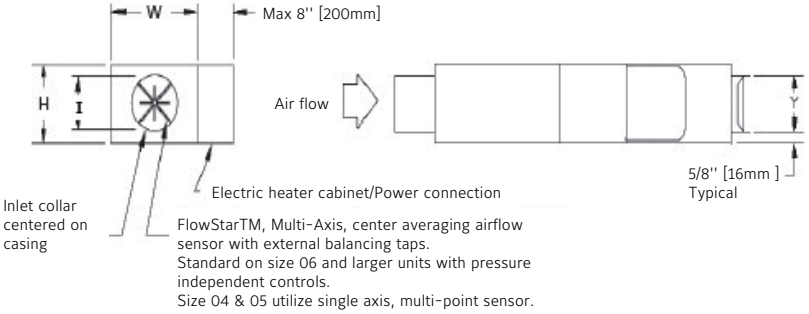


Model TSS-E(with 25mm insulation option)

Unit	Unit Size	Dimensions mm)						
		W	H	L	A	I	X	Y
TSS-EH	04"	254	280	1216	267	98	197	223
	05"	254	280	1216	267	124	197	223
	06"	254	280	1216	165	149	197	223
	07"	305	280	1216	165	200	248	223
	08"	305	280	1216	165	200	248	223
	09"	356	324	1216	165	251	299	267
	10"	356	324	1216	165	251	299	267
	12"	406	387	1216	165	302	350	330
	14"	508	451	1216	165	352	451	394
	16"	610	465	1216	165	403	553	408

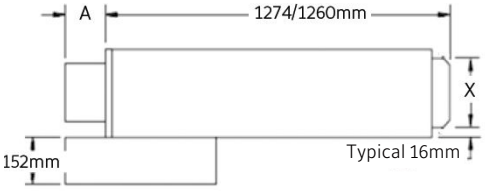
Notes:

1. All dimensions are in mm with a tolerance of ±3mm.



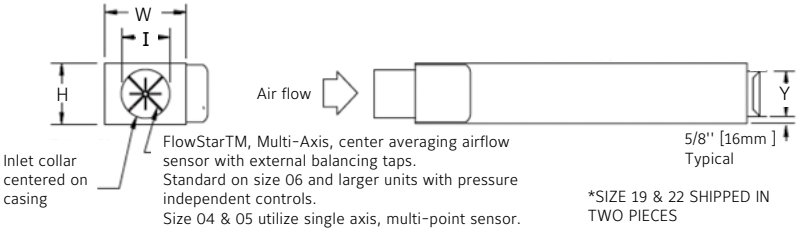
Model TSS-SA(with 25mm insulation option)

Unit	Unit Size	Dimensions mm						
		W	H	L	A	I	X	Y
TSS-SA	04"	254	280	1274	267	98	197	223
	05"	254	280	1274	267	124	197	223
	06"	254	280	1274	165	149	197	223
	07"	305	280	1274	165	200	248	223
	08"	305	280	1274	165	200	248	223
	09"	356	324	1274	165	251	299	267
	10"	356	324	1274	165	251	299	267
	12"	406	387	1274	165	302	350	330
	14"	508	451	1274	165	352	451	394
	16"	610	465	1274	165	403	553	408
	19"	782	451	1260	203	718x352	725	394
	22"	884	465	1260	203	819x403	827	408



Notes:

1. All dimensions are in mm with a tolerance of ±3mm.
2. Sizes 19 and 22 have rectangular inlet collar.



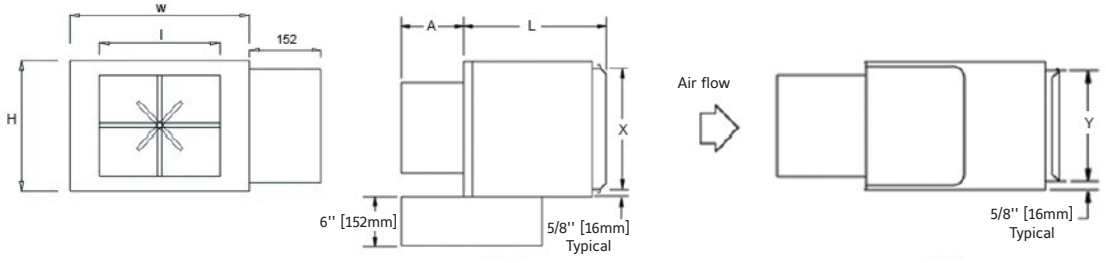
TSL Dimensional Data

Model TSL

Unit	Unit Size	Dimensions inches [mm]						
		W	H	L	A	I	X	Y
TSL	10"	15 [381]	10 1/4 [260]	13 1/5 [335]	6 1/2 [165]	8 [203] x 10 [254]	13 3/4 [349]	9 [228]
	12"	19 [483]	10 1/4 [260]	13 1/5 [335]	6 1/2 [165]	8 [203] x 14 [356]	17 3/4 [451]	9 [228]
	14"	25 [635]	10 1/4 [260]	17 1/8 [435]	6 1/2 [165]	8 [203] x 20 [508]	23 3/4 [603]	9 [228]
	16"	31 [787]	10 1/4 [260]	17 1/8 [435]	6 1/2 [165]	8 [203] x 26 [660]	29 3/4 [756]	9 [228]

Model TSL with 25mm Insultaion

Unit	Unit Size	Dimensions mm						
		W	H	L	A	I	X	Y
TSL	10"	401	280	335	165	203 x 254	349	228
	12"	503	280	335	165	203 x 356	451	228
	14"	655	280	435	165	203 x 508	603	228
	16"	807	280	435	165	203 x 660	756	228



TSS/TSL Airflow Calibration

Airflow Ranges

Model TSS

Model	Airflow Ranges		
	CMH	CFM	L/s
04"	51~425	30~250	15~118
05"	85~600	48~350	23~165
06"	100~935	53~550	25~260
07"	180~1224	105~720	50~340
08"	180~1670	105~1000	50~470
09"	280~2125	165~1250	78~590
10"	280~2720	165~1600	78~752
12"	410~3900	240~2300	113~1081
14"	570~5270	335~3100	158~1457
16"	750~6970	440~4100	207~1927
19 "	1435~11050	845~6500	398~3055
22"	2145~13600	1260~8000	593~3760

Model TSL

Model	Airflow Ranges		
	CMH	CFM	L/s
10"	280~2720	165~1600	78~752
12"	410~3900	240~2300	113~1081
14"	570~5270	335~3100	158~1457
16"	750~6970	440~4100	207~1927

NOTES:

1. Minimum and maximum airflow limits are dependent on the specific DDC controller supplied. Contact the control vendor to obtain the minimum and maximum differential pressure limits (inches W.G.) of the transducer utilized with the DDC controller.

2. Maximum CFM is limited to value shown in General Selection Data.

TSS General Selection Data

Model TSS

UNIT SIZE	Air Flow			MINIMUM △Ps						DISCHARGE NOISE CRITERIA (NC)						RADIATED NOISE CRITERIA (NC)		
				Model TSS/ TSS-SA		Model TSS-WC 1 Row		Model TSS-WC 2 Row		Air Inlet Static Pressure 0.5''in.w.g. [125Pa]		Air Inlet Static Pressure 1.0''in.w.g. [250Pa]"		Air Inlet Static Pressure 3.0''in.w.g. [750Pa]		Air Inlet Static Pressure 0.5''in.w.g. [125Pa]	Air Inlet Static Pressure 1.0''in.w.g. [250Pa]	Air Inlet Static Pressure 3.0''in.w.g. [750Pa]
	CFM	CMH	L/S	in.w.g.	Pa	in.w.g.	Pa	in.w.g.	Pa	Model TSS	Model TSS-SA	Model TSS	Model TSS-SA	Model TSS	Model TSS-SA	Model TSS&TSS-SA	Model TSS&TSS-SA	Model TSS&TSS-SA
04"	100	170	47	0.01	2.5	0.01	2	0.02	4.7	--	--	--	--	20	--	--	--	20
	150	255	71	0.01	2.5	0.02	3.8	0.04	9.2	--	--	24	--	29	21	--	--	24
	200	340	94	0.01	2.5	0.03	6.3	0.06	15.1	23	--	29	23	34	28	--	22	29
	250	425	118	0.01	2.5	0.04	9.2	0.09	22	26	20	31	28	38	33	23	25	33
05 "	100	170	47	0.01	2.5	0.01	2	0.02	4.7	--	--	--	--	--	--	--	--	--
	200	340	94	0.01	2.5	0.03	6.3	0.06	15.1	--	--	24	--	28	--	--	--	24
	300	510	142	0.01	2.5	0.05	12.5	0.12	29.9	23	--	28	--	31	21	--	23	31
	353	600	167	0.01	2.5	0.07	16.2	0.16	38.9	24	--	30	21	33	24	21	25	33
06"	200	340	94	0.02	5	0.03	6.3	0.06	15.1	--	--	--	--	25	--	--	--	29
	250	425	118	0.03	7.5	0.04	9.2	0.09	22	--	--	--	--	28	--	--	--	31
	300	510	142	0.04	10	0.05	12.5	0.12	29.9	--	--	--	--	28	20	--	20	33
	350	595	165	0.06	14.9	0.07	16.5	0.16	39.5	--	--	21	--	30	23	--	21	35
	450	765	213	0.10	24.9	0.10	24.8	0.24	59.6	--	--	24	--	33	25	--	24	36
	550	935	260	0.14	34.8	0.14	34.9	0.34	83.8	20	--	28	24	35	30	23	28	37
07 "	300	510	142	0.01	2	0.04	9	0.09	21.7	--	--	--	--	24	22	--	--	25
	350	595	165	0.01	2.5	0.05	11.7	0.11	28.1	--	--	--	--	27	24	--	--	27
	400	680	189	0.01	2.5	0.06	14.7	0.14	35.3	--	--	--	--	29	27	--	20	28
	450	765	213	0.01	3.5	0.07	18	0.17	43.1	--	--	--	--	31	29	20	22	30
	500	850	236	0.01	3.5	0.09	21.5	0.21	51.5	--	--	21	--	33	30	22	23	33
	600	1020	283	0.02	5	0.12	29.3	0.28	70.2	20	--	23	21	36	34	23	24	35
08"	300	510	142	0.01	2.5	0.04	9	0.09	21.7	--	--	--	--	24	--	--	--	26
	400	680	189	0.01	2.5	0.06	14.7	0.14	35.3	--	--	--	--	26	--	--	--	29
	500	850	236	0.01	2.5	0.09	21.5	0.21	51.5	--	--	--	--	29	--	--	20	30
	600	1020	283	0.01	2.5	0.12	29.3	0.28	70.2	--	--	--	--	30	20	--	21	32
	918	1560	433	0.03	7.5	0.24	60.3	0.58	144.6	--	--	21	--	33	24	20	24	34
	982	1670	464	0.04	10	0.27	67.7	0.65	162.4	21	--	25	21	35	28	23	26	37
09 "	500	850	236	0.01	2	0.05	12.3	0.12	29.4	--	--	--	--	24	23	--	--	29
	600	1020	283	0.01	2.5	0.07	16.7	0.16	40	--	--	--	--	27	25	--	--	30
	700	1190	331	0.01	2.5	0.09	21.7	0.21	52	--	--	--	--	29	28	--	--	31
	800	1360	378	0.01	2.5	0.11	27.2	0.26	65.2	--	--	--	--	29	28	--	20	32
	1000	1700	472	0.02	5	0.16	39.7	0.38	95.3	--	--	22	21	33	31	22	24	35
	1100	1870	519	0.02	5	0.19	46.7	0.45	112.1	20	--	23	22	34	33	22	24	36
10"	600	1020	283	0.01	2.5	0.07	16.7	0.16	40	--	--	--	--	30	--	--	--	32
	800	1360	378	0.01	2.5	0.11	27.2	0.26	65.2	--	--	--	--	30	20	--	--	32
	1000	1700	472	0.02	5	0.16	39.7	0.38	95.3	--	--	20	--	31	24	--	21	32
	1200	2040	567	0.02	5	0.22	54.1	0.52	129.9	--	--	23	--	34	28	--	23	34
	1400	2380	661	0.03	7.5	0.28	70.3	0.68	168.8	--	--	25	20	35	29	20	24	35
	1600	2720	756	0.04	10	0.35	88.3	0.85	211.8	20	--	28	24	36	31	24	26	37
12 "	800	1360	378	0.01	2.5	0.07	16.7	0.16	40.1	--	--	--	--	26	--	--	21	33
	1100	1870	519	0.01	2.5	0.12	28.7	0.28	68.9	--	--	--	--	28	--	--	22	34
	1400	2380	661	0.02	5	0.17	43.3	0.42	103.8	--	--	20	--	30	24	--	24	35
	1700	2890	803	0.02	5	0.24	60.2	0.58	144.4	--	--	21	--	33	28	--	25	36
	2000	3400	944	0.03	7.5	0.32	79.3	0.76	190.3	--	--	23	--	35	30	20	26	37
	2294	3900	1083	0.04	10	0.40	100.1	0.96	240.2	20	--	25	20	36	31	22	28	38
14"	1100	1870	519	0.01	2.5	0.06	15.6	0.15	37.5	--	--	--	--	26	--	--	--	30
	1500	2550	708	0.02	5	0.11	26.4	0.25	63.4	--	--	--	--	29	23	--	--	31
	1900	3230	897	0.03	7.5	0.16	39.5	0.38	94.8	--	--	--	--	30	25	--	21	33
	2300	3910	1086	0.05	12.4	0.22	54.7	0.53	131.2	--	--	21	--	33	28	--	23	34
	2700	4590	1275	0.07	17.4	0.29	71.8	0.69	172.3	--	--	24	20	34	29	20	25	35
	3100	5270	1464	0.09	22.4	0.36	90.8	0.87	217.8	21	--	26	21	35	31	22	28	37
16 "	1600	2720	756	0.01	2.5	0.09	21.6	0.21	51.8	--	--	--	--	24	--	--	--	33
	2100	3570	992	0.02	5	0.14	34.3	0.33	82.3	--	--	--	--	29	23	--	20	35
	2600	4420	1228	0.03	7.5	0.20	49.3	0.47	118.2	--	--	20	--	34	29	--	21	35
	3100	5270	1464	0.04	10	0.27	66.4	0.64	159.4	--	--	23	20	35	30	--	24	36
	3600	6120	1700	0.05	12.4	0.34	85.7	0.83	205.6	20	--	25	21	37	34	21	26	37
	4100	6970	1936	0.06	14.9	0.43	106.8	1.03	256.4	23	--	28	23	39	36	24	29	38
19"	2500	4250	1181	0.06	14.9	0.13	31.5	0.30	75.7	23	20	29	21	38	26	29	35	43
	3000	5100	1417	0.09	22.4	0.17	43	0.41	103.2	24	21	30	25	39	30	30	36	44
	3500	5950	1653	0.13	32.3	0.22	55.9	0.54	134.1	26	24	31	26	40	33	31	37	45
	4500	7650	2125	0.21	52.3	0.34	85.7	0.83	205.6	26	24	31	28	40	36	34	40	48
	5497	9345	2596	0.32	79.6	0.48	120.4	1.16	288.9	29	25	33	29	43	39	38	44	53
	6500	11050	3069	0.44	109.5	0.64	160	1.54	384.1	31	28	33	29	45	41	41	48	56
22 "	4000	6800	1889	0.06	14.9	0.23	56.6	0.55	135.9	28	24	33	26	41	33	31	37	48
	4997	8495	2360	0.09	22.4	0.33	82.6	0.80	198.3	28	24	34	29	41	36	34	39	50
	5997	10195	2832	0.14	34.8	0.45	112.7	1.09	270.4	29	26	34	31	43	38	36	41	53
	6997	11895	3304	0.18	44.8	0.59	146.4	1.41	351.4	30	28	36	33	44	40	39	45	56
	8000	13600	3778	0.24	59.7	0.74	183.9	1.77	441.3	33	29	37	34	45	41	41	47	58

TSL General Selection Data

Model TSL

UNIT SIZE	Air Flow			MINIMUM △Ps Model TSL		DISCHARGE NOISE CRITERIA (NC)			RADIATED NOISE CRITERIA (NC)		
	CFM	CMH	L/S	in.w.g.	Pa	Air Inlet Static Pressure 0.5''in.w.g. [125Pa]	Air Inlet Static Pressure 1.0''in.w.g. [250Pa]	Air Inlet Static Pressure 3.0''in.w.g. [750Pa]	Air Inlet Static Pressure 0.5''in.w.g. [125Pa]	Air Inlet Static Pressure 1.0''in.w.g. [250Pa]	Air Inlet Static Pressure 3.0''in.w.g. [750Pa]
10"	600	1020	283	0.01	2.5	--	--	26	--	20	30
	800	1360	378	0.01	2.5	--	--	28	--	22	32
	1000	1700	472	0.01	2.5	--	21	30	21	25	34
	1200	2040	567	0.01	2.5	--	23	32	23	26	36
	1400	2380	661	0.01	2.5	--	25	35	25	29	38
	1600	2720	756	0.02	5.0	21	26	36	26	31	39
12 "	800	1360	378	0.01	2.5	--	--	26	--	--	29
	1100	1870	519	0.01	2.5	--	--	28	--	20	33
	1400	2380	661	0.01	2.5	--	22	31	20	23	34
	1700	2890	803	0.01	2.5	--	24	33	23	26	36
	2000	3400	944	0.01	2.5	22	26	34	25	29	38
	2294	3900	1083	0.02	5.0	24	28	36	27	31	39
14"	1100	1870	519	0.01	2.5	--	--	26	--	--	28
	1500	2550	708	0.01	2.5	--	20	29	--	20	31
	1900	3230	897	0.01	2.5	--	22	33	20	23	35
	2300	3910	1086	0.01	2.5	--	24	35	22	25	36
	2700	4590	1275	0.02	5.0	23	27	37	24	28	38
	3100	5270	1464	0.02	5.0	25	29	38	27	30	39
16 "	1600	2720	756	0.01	2.5	--	--	26	--	20	32
	2100	3570	992	0.01	2.5	--	--	29	--	23	34
	2600	4420	1228	0.02	5.0	--	22	33	21	25	36
	3100	5270	1464	0.02	5.0	20	25	35	24	28	38
	3600	6120	1700	0.03	7.5	22	27	37	25	30	39
	4100	6970	1936	0.04	10.0	24	29	38	29	31	41

NOTES:

- Min. △Ps is the static pressure difference between the terminal inlet and discharge with the damper wide open."
- when select the coil, please add the coil pressure drop to Min. △Ps.
- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Dash (-) indicates NC level less than 20.
- NC values calculated based upon to AHRI Standard 885 Appendix E
  Typical Sound Attenuation Values (shown at right) using Ceiling Type 2 for calculating Radiated NC.
- NC (sound pressure) levels predicted by subtracting appropriate values at right from published sound power levels (following pages).

DISCHARGE ATTENUATION VALUES	OCTAVE BAND					
	2	3	4	5	6	7
Small Box(<300 CFM)	24	28	39	53	59	40
Medium Box(300-700CFM)	27	29	40	51	53	39
Large Box(>700CFM)	29	30	41	51	52	39

RADIATED ATTENUATION VALUES	OCTAVE BAND					
	2	3	4	5	6	7
Type 2-Mineral Fiber Ceiling	17	18	21	25	29	35

TSS Sound Power Data

Model TSS Radiated Sound Power Data

Unit Size	CFM	[CMH]	[L/S]	Octave Band																							
				0.5"in.w.g. [125Pa]						1.0"in.w.g. [250Pa]						1.5"in.w.g. [375Pa]						3.0"in.w.g. [750Pa]					
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
04"	100	170	47	46	43	35	29	26	27	49	44	39	32	27	24	49	46	42	34	29	26	48	50	46	38	33	31
	150	255	71	49	47	40	33	29	28	52	48	44	36	31	28	53	53	46	38	33	30	53	55	50	43	37	34
	200	340	94	52	51	44	37	32	29	56	52	48	40	35	31	56	54	50	42	37	33	58	59	54	47	41	38
	250	425	118	54	54	47	40	36	32	58	55	51	43	38	34	59	57	53	45	40	37	61	62	58	50	45	41
05 "	100	170	47	42	36	33	27	23	20	45	40	37	29	25	22	46	42	40	32	27	24	47	47	44	36	32	30
	200	340	94	46	44	40	33	28	28	49	48	44	36	31	28	50	49	46	38	33	29	52	53	50	43	37	34
	250	425	118	49	47	43	36	31	28	51	51	47	39	33	29	53	52	49	41	35	32	54	54	53	45	40	36
	300	510	142	51	49	45	38	34	30	54	53	49	41	36	32	55	55	51	43	38	34	56	57	56	48	42	39
	353	600	167	54	52	47	40	36	32	57	55	51	43	38	35	57	57	54	45	40	37	58	59	58	50	45	41
06"	200	340	94	43	38	38	37	33	23	47	44	45	44	40	29	48	46	49	47	43	32	51	52	54	51	47	37
	250	425	118	46	41	39	36	32	23	48	46	45	44	41	30	49	49	51	49	46	34	53	54	56	55	51	40
	300	510	142	48	43	40	36	31	24	50	48	46	44	41	30	51	51	51	49	46	35	55	56	58	57	54	42
	350	595	165	50	46	42	37	31	26	53	50	47	43	40	30	52	52	51	49	46	36	57	58	60	58	55	43
	400	680	189	52	47	43	37	32	27	55	52	48	44	40	31	56	54	52	49	46	36	58	59	61	59	56	44
	450	765	213	54	48	45	38	32	28	57	53	50	45	40	32	58	55	53	49	46	36	60	60	61	59	56	45
	550	935	260	60	53	49	43	36	30	64	58	53	46	41	34	58	56	56	50	46	38	63	63	62	57	55	46
07 "	300	510	142	48	40	39	35	25	17	50	49	44	40	30	22	51	50	47	43	35	21	53	55	55	50	42	24
	350	595	165	50	42	40	36	26	17	52	50	45	41	31	23	53	51	48	44	36	22	56	57	56	51	43	25
	400	680	189	51	43	41	37	27	17	53	50	46	41	32	23	55	51	49	45	36	23	58	58	57	52	43	26
	450	765	213	52	44	42	38	28	18	54	51	47	42	33	24	55	52	50	46	37	24	58	59	58	53	44	28
	500	850	236	52	45	42	38	29	18	54	51	48	43	34	24	55	52	51	46	38	24	57	59	58	54	45	29
	550	935	260	54	46	43	39	30	19	56	52	49	44	35	24	57	53	52	47	39	25	59	60	59	55	46	30
	600	1020	283	55	47	44	40	30	19	57	53	49	44	35	24	58	54	52	48	39	25	60	60	60	55	46	30
08"	300	510	142	46	37	38	33	28	24	49	46	42	38	33	29	50	48	45	41	37	30	53	53	52	47	43	35
	400	680	189	49	40	40	35	30	24	52	47	44	39	35	30	54	49	47	43	38	32	58	56	54	49	44	37
	500	850	236	50	42	41	36	32	25	53	48	46	41	37	31	54	50	49	44	40	33	57	57	55	51	46	40
	600	1020	283	53	44	43	38	33	26	56	50	47	42	38	31	57	52	50	46	41	34	60	58	57	52	47	41
	700	1190	331	56	45	44	39	34	27	58	52	48	44	39	32	58	56	52	47	42	35	62	60	58	53	48	42
	800	1360	378	58	47	45	40	35	28	60	53	50	45	40	33	61	56	53	48	43	36	64	61	59	54	50	43
	1000	1700	472	60	52	48	42	37	30	62	56	52	46	42	35	63	58	55	50	45	38	67	63	62	56	51	45
09 "	500	850	236	47	38	34	23	20	29	51	45	39	29	23	28	52	48	42	32	25	28	56	57	55	43	35	29
	600	1020	283	48	39	35	24	20	29	52	46	40	29	24	28	53	49	43	33	26	28	57	57	55	43	35	30
	700	1190	331	49	40	36	25	21	30	53	47	41	30	25	29	54	50	44	34	28	29	58	58	55	44	36	31
	800	1360	378	50	41	37	26	21	30	54	48	42	30	26	29	55	51	45	35	29	29	59	58	55	44	36	32
	900	1530	425	51	42	39	27	22	30	55	49	43	31	27	29	56	52	46	36	30	30	60	59	55	44	37	33
	1000	1700	472	52	43	40	28	23	30	55	50	44	32	28	29	57	52	47	37	30	30	61	59	55	44	38	34
	1100	1870	519	53	44	41	29	24	30	55	51	45	33	29	30	58	54	50	37	31	31	62	59	56	45	38	34
10"	600	1020	283	49	40	38	32	27	28	53	47	43	37	31	29	54	50	46	40	34	31	58	58	57	49	42	36
	800	1360	378	51	42	40	34	28	29	55	49	45	38	33	30	56	52	48	42	37	32	60	59	57	50	43	38
	1000	1700	472	53	44	43	36	30	29	56	51	47	40	35	30	58	53	50	44	38	33	62	60	57	50	45	40
	1100	1870	519	54	45	44	37	31	29	56	52	48	41	36	31	59	55	53	44	39	34	63	60	58	51	45	40
	1200	2040	567	55	46	45	37	32	29	57	53	49	42	37	31	59	55	53	45	40	35	64	61	59	52	46	41
	1400	2380	661	57	48	46	39	33	29	59	54	50	43	38	33	60	56	54	47	42	36	65	62	60	53	48	43
	1600	2720	756	61	51	48	40	34	29	63	56	52	45	40	34	64	58	55	48	43	38	67	63	62	54	49	44
12 "	800	1360	378	47	41	39	33	30	29	51	49	47	40	37	33	52	52	50	43	40	36	54	60	58	52	47	43
	1100	1870	519	49	44	41	34	31	29	54	51	48	42	38	33	55	54	51	45	40	36	58	61	59	53	48	45
	1400	2380	661	51	46	42	35	32	29	56	52	50	43	39	34	57	54	52	46	42	37	60	62	60	54	49	46
	1600	2720	756	52	47	44	37	33	29	56	53	51	44	39	34	59	56	53	44	40	35	62	63	61	55	49	46
	1700	2890	803	53	48	44	37	33	29	56	53	51	44	39	34	59	56	54	47	42	37	63	63	61	55	49	46
	2000	3400	944	54	49	46	39	33	29	58	54	52	45	40	34	60	56	54	48	42	37	64	64	62	56	50	46
	2300	3910	1086	55	50	48	40	35	30	59	55	53	46	41	35	62	58	56	49	44	39	66	65	63	57	51	47
14"	1100	1870	519	47	42	36	34	34	30	53	49	42	39	40	36	55	52	45	42	42	38	60	60	54	50	47	45
	1500	2550	708	49	44	39	36	34	30	54	51	45	40	41	36	56	54	48	43	43	39	62	61	55	52	48	47
	1900	3230	897	51	46	42	37	34	30	56	53	47	43	43	37	58	55	49	46	45	40	63	62	56	53	51	48
	2100	3570	992	52	47	43	38	34	30	56	54	48	43	43	37	60	58	51	46	46	41	64	62	57	54	52	49
	2300	3910	1086	53	48	44	38	34	30	57	54	48	43	43	37	60	58	52	46	46	41	65	63	58	54	53	50
	2700	4590	1275	55	50	46	40	35	31	59	56	50	45	43	37	61	58	54	48	46	41	66	64	60	55	54	50
	3100	5270	1464	56	53	48	42	37	32	61	58	52	46	43	38	63	60	55	49	46	41	67	65	62	57	55	50
16 "	1600	2720	756	48	44	37	35	30	30	53	49	43	40	36	33	55	52	46	42	38	35	60	62	56	50	46	41
	2100	3570	992	50	46	40	36	33	30	55	52	46	41	39	34	57	55	48	44	41	37	61	64	56	52	47	44
	2600	4420	1228	53	48	43	39	35	31	57	53	47	43	40	36	59	56	50	46	43	39	63	64	58	53	49	46
	2800	4760	1322	54	48	44	39	36	31	58	54	48	44	41	37	60	59	52	47	44	40	64	64	58	54	50	46
	3100	5270	1464	55	49	45	41	37	32	59	55	49	45	42	38	61	59	52	48	45	41	65	65	59	55	51	47
	3600	6120	1700	56	51	47	42	38	34	61	57	51	47	43	39	63	59	54	50	47	43	67	66	61	56	53	49
	4100	6970	1936	58	53	50	44	40	35	62	59	53	48	45	40	65	61	56	51	48	44	69	67	63	58	54	50
19"	2500	4250	1181	59	57	54	47	41	33	65	60	60	52	46	39	66	63	63	55	50	42	70	67	67	63	57	50
	3000	5100	1417	59	58	55	47	41	34	65	61	61	52	46	39	66	63	64	56	50	43	70	68	68	64	58	50
	3500	5950	1653	60	59	56	48	42	35	66	62	62	53	47	40	67	64	65	57	51	44	71	68	69	64	59	51
	4500	7650	2125	60	61	59	50	45	37	66	64	65	55	50	43	68	66	68	59	53	46	72	70	72	67	61	54
	5400	9180	2550	62	62	62	52	48	40	67	66	68	57	52	45	68	68	71	61	56	49	73	72	75	69	64	57
	5500	9350	2597	62	63	63	53	48	40	67	66	68	58	53	46	68	68	71	62	56	49	73	72	76	70	64	57
	6500	11050	3069	66	65	66	56	51	44	67	68	72	61	56	49	69	70	75	65	60	53	75	75	79	73	67	60
22 "	4000	6800	1889	59	60	56	48	42	36	65	63	62	53	47	41	66	66	65	57	51	46	70	71	72	67	60	54
	5000	8500	2361	60	61	59	50	44	38	65	64	64	55	48	43	67	67	67	59	53	48	72	72	74	68	62	56
	6000	10200	2833	62	62	61	51	46	40	65	65	66	56	50	45	67	68	70	61	54	49	72	73	76	70	64	58
	7000	11900	3306	64	63	64	53	48	41	66	66	69	58	52	47	68	69	72	63	56	51	74	74	79	72	66	59
	7100	12070	3353	64	63	64	54	48	41	66	66	69	59	53	47	69	69	73	63	57	51	74	74	79	72	66	59
	8000	13600	3778	66	64	66	55	50	43	67	67	71	60	54	48	70	70	75	65	58	53	75	75	81	74	68	61

- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10-12 watts.
- Certified AHRI data is highlighted blue. Application data (not highlighted blue) is outside the scope of the certification program.

Model TSS-SA Radiated Sound Power Data

Unit Size	CFM	[CMH]	[L/S]	Octave Band																	
				0.5''in.w.g. [125Pa]						1.0''in.w.g. [250Pa]						3.0''in.w.g. [750Pa]					
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
04"	100	170	47	46	43	35	29	26	27	49	44	39	32	27	24	48	50	46	38	33	31
	150	255	71	49	47	40	33	29	28	52	48	44	36	31	28	53	55	50	43	37	34
	200	340	94	52	51	44	37	32	29	56	52	48	40	35	31	58	59	54	47	41	38
	250	425	118	54	54	47	40	36	32	58	55	51	43	38	34	61	62	58	50	45	41
05"	100	170	47	42	36	33	27	23	20	45	40	37	29	25	22	47	47	44	36	32	30
	200	340	94	46	44	40	33	28	28	49	48	44	36	31	28	52	53	50	43	37	34
	300	510	142	51	49	45	38	34	30	54	53	49	41	36	32	56	57	56	48	42	39
	352.94	600	167	54	52	47	40	36	32	57	55	51	43	38	35	58	59	58	50	45	41
06"	200	340	94	43	38	38	37	33	23	47	44	45	44	40	29	51	52	54	51	47	37
	250	425	118	46	41	39	36	32	23	48	46	45	44	41	30	53	54	56	55	51	40
	300	510	142	48	43	40	36	31	24	50	48	46	44	41	30	55	56	58	57	54	42
	350	595	165	50	46	42	37	31	26	53	50	47	43	40	30	57	58	60	58	55	43
	450	765	213	54	48	45	38	32	28	57	53	50	45	40	32	60	60	61	59	56	45
	550	935	260	60	53	49	43	36	30	64	58	53	46	41	34	63	63	62	57	55	46
07"	300	510	142	48	40	39	35	25	17	50	49	44	40	30	22	53	55	55	50	42	24
	350	595	165	49.5	41.5	40	36	26	17	51.5	49.5	45	40.5	31	22.5	55.5	56.5	56	51	42.5	25
	400	680	189	51	43	41	37	27	17	53	50	46	41	32	23	58	58	57	52	43	26
	450	765	213	51.5	44	41.5	37.5	28	17.5	53.5	50.5	47	42	33	23.5	57.5	58.5	57.5	53	44	27.5
	500	850	236	52	45	42	38	29	18	54	51	48	43	34	24	57	59	58	54	45	29
	600	1020	283	55	47	44	40	30	19	57	53	49	44	35	24	60	60	60	55	46	30
08"	300	510	142	46	37	38	33	28	24	49	46	42	38	33	29	53	53	52	47	43	35
	400	680	189	49	40	40	35	30	24	52	47	44	39	35	30	58	56	54	49	44	37
	500	850	236	50	42	41	36	32	25	53	48	46	41	37	31	57	57	55	51	46	40
	600	1020	283	53	44	43	38	33	26	56	50	47	42	38	31	60	58	57	52	47	41
	800	1360	378	58	47	45	40	35	28	60	53	50	45	40	33	64	61	59	54	50	43
	1000	1700	472	60	52	48	42	37	30	62	56	52	46	42	35	67	63	62	56	51	45
09"	500	850	236	47	38	34	23	19.5	28.5	51	45	39	28.5	23	27.5	56	56.5	55	42.5	34.5	29
	600	1020	283	48	39	35	24	20	29	52	46	40	29	24	28	57	57	55	43	35	30
	700	1190	331	49	40	36	25	20.5	29.5	53	47	41	29.5	25	28.5	58	57.5	55	43.5	35.5	31
	800	1360	378	50	41	37	26	21	30	54	48	42	30	26	29	59	58	55	44	36	32
	1000	1700	472	52	43	40	28	23	30	55	50	44	32	28	29	61	59	55	44	38	34
	1100	1870	519	53	44	41	29	24	30	55	51	45	33	29	30	62	59	56	45	38	34
10"	600	1020	283	49	40	38	32	27	28	53	47	43	37	31	29	58	58	57	49	42	36
	800	1360	378	51	42	40	34	28	29	55	49	45	38	33	30	60	59	57	50	43	38
	1000	1700	472	53	44	43	36	30	29	56	51	47	40	35	30	62	60	57	50	45	40
	1200	2040	567	55	46	45	37	32	29	57	53	49	42	37	31	64	61	59	52	46	41
	1400	2380	661	57	48	46	39	33	29	59	54	50	43	38	33	65	62	60	53	48	43
	1600	2720	756	61	51	48	40	34	29	63	56	52	45	40	34	67	63	62	54	49	44
12'	800	1360	378	47	41	39	33	30	29	51	49	47	40	37	33	54	60	58	52	47	43
	1100	1870	519	49	44	41	34	31	29	54	51	48	42	38	33	58	61	59	53	48	45
	1400	2380	661	51	46	42	35	32	29	56	52	50	43	39	34	60	62	60	54	49	46
	1700	2890	803	53	48	44	37	33	29	56	53	51	44	39	34	63	63	61	55	49	46
	2000	3400	944	54	49	46	39	33	29	58	54	52	45	40	34	64	64	62	56	50	46
	2300	3910	1086	55	50	48	40	35	30	59	55	53	46	41	35	66	65	63	57	51	47
14"	1100	1870	519	47	42	36	34	34	30	53	49	42	39	40	36	60	60	54	50	47	45
	1500	2550	708	49	44	39	36	34	30	54	51	45	40	41	36	62	61	55	52	48	47
	1900	3230	897	51	46	42	37	34	30	56	53	47	43	43	37	63	62	56	53	51	48
	2300	3910	1086	53	48	44	38	34	30	57	54	48	43	43	37	65	63	58	54	53	50
	2700	4590	1275	55	50	46	40	35	31	59	56	50	45	43	37	66	64	60	55	54	50
	3100	5270	1464	56	53	48	42	37	32	61	58	52	46	43	38	67	65	62	57	55	50
16"	1600	2720	756	48	44	37	35	30	30	53	49	43	40	36	33	60	62	56	50	46	41
	2100	3570	992	50	46	40	36	33	30	55	52	46	41	39	34	61	64	56	52	47	44
	2600	4420	1228	53	48	43	39	35	31	57	53	47	43	40	36	63	64	58	53	49	46
	3100	5270	1464	55	49	45	41	37	32	59	55	49	45	42	38	65	65	59	55	51	47
	3600	6120	1700	56	51	47	42	38	34	61	57	51	47	43	39	67	66	61	56	53	49
	4100	6970	1936	58	53	50	44	40	35	62	59	53	48	45	40	69	67	63	58	54	50
19"	2500	4250	1181	59	57	54	47	41	33	65	60	60	52	46	39	70	67	67	63	57	50
	3000	5100	1417	59	58	55	47	41	34	65	61	61	52	46	39	70	68	68	64	58	50
	3500	5950	1653	60	59	56	48	42	35	66	62	62	53	47	40	71	68	69	64	59	51
	4500	7650	2125	60	61	59	50	45	37	66	64	65	55	50	43	72	70	72	67	61	54
	5500	9350	2597	62	63	63	53	48	40	67	66	68	58	53	46	73	72	76	70	64	57
	6500	11050	3069	66	65	66	56	51	44	67	68	72	61	56	49	75	75	79	73	67	60
22"	4000	6800	1889	59	60	56	48	42	36	65	63	62	53	47	41	70	71	72	67	60	54
	5000	8500	2361	60	61	59	50	44	38	65	64	64	55	48	43	72	72	74	68	62	56
	6000	10200	2833	62	62	61	51	46	40	65	65	66	56	50	45	72	73	76	70	64	58
	7000	11900	3306	64	63	64	53	48	41	66	66	69	58	52	47	74	74	79	72	66	59
	8000	13600	3778	66	64	66	55	50	43	67	67	71	60	54	48	75	75	81	74	68	61

- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10-12 watts.

Model TSS - Discharge Sound Power Data

Unit Size	CFM	[CMH]	[L/S]	Octave Band																							
				0.5''in.w.g. [125Pa]						1.0''in.w.g. [250Pa]						1.5''in.w.g. [375Pa]						3.0''in.w.g. [750Pa]					
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
04"	100	170	47	57	55	46	42	36	35	61	59	50	46	43	43	61	61	52	48	45	45	62	61	56	53	52	52
	150	255	71	62	60	50	46	41	39	66	64	54	50	46	45	68	67	58	54	49	48	68	68	60	57	56	56
	200	340	94	66	63	53	49	44	42	71	67	57	53	48	48	72	69	59	55	50	50	73	72	64	60	58	58
	250	425	118	69	65	55	53	46	45	73	70	59	55	51	49	74	71	61	57	53	52	77	76	67	62	60	59
05 "	100	170	47	55	53	44	40	35	33	58	57	48	43	42	43	59	58	50	46	44	45	59	59	54	50	50	51
	200	340	94	63	60	51	46	41	39	66	64	54	50	45	44	67	66	57	52	47	47	66	67	61	57	55	55
	250	425	118	65	62	53	48	43	41	69	67	56	52	47	45	70	68	59	55	51	50	69	69	63	59	56	56
	300	510	142	68	64	54	50	45	43	71	68	58	54	49	47	72	70	60	56	51	50	71	71	64	60	58	56
	353	600	167	69	65	55	51	47	45	73	70	59	55	50	49	74	71	62	57	53	51	73	72	66	62	60	57
06"	200	340	94	54	51	48	44	39	36	59	56	52	48	44	42	60	59	55	51	47	45	65	65	62	57	54	53
	250	425	118	59	53	49	46	40	37	63	58	53	49	45	43	64	61	56	52	48	47	66	67	63	59	56	55
	300	510	142	61	55	51	47	41	39	64	60	54	51	46	44	65	63	57	54	50	48	68	68	64	60	57	55
	350	595	165	62	57	52	48	42	40	65	63	55	52	47	46	66	64	58	55	51	50	70	70	65	62	58	57
	400	680	189	63	58	53	50	43	41	66	64	57	53	48	48	69	67	60	57	52	52	71	71	66	63	59	58
	450	765	213	64	59	54	51	44	42	68	65	58	54	49	48	70	68	60	57	52	52	73	72	67	64	59	60
	550	935	260	67	62	55	53	46	45	70	68	61	56	50	50	72	70	63	59	54	53	76	74	69	66	61	63
07 "	300	510	142	55	52	48	47	43	38	56	56	54	49	48	46	59	59	57	53	52	49	64	67	68	64	62	60
	350	595	165	56.5	53.5	49	48	44	39	57.5	57.5	54.5	50.5	48.5	46.5	60.5	60.5	57.5	54.5	52.5	49.5	65	68	68.5	64	62	60
	400	680	189	58	55	50	49	45	40	59	59	55	52	49	47	62	62	58	56	53	50	66	69	69	64	62	60
	450	765	213	59	56	51	50	45.5	41	60.5	60	55.5	53	49.5	47.5	63	63	58.5	57	54	50.5	67	70	69.5	64.5	62.5	60.5
	500	850	236	60	57	52	51	46	42	62	61	56	54	50	48	64	64	59	58	55	51	68	71	70	65	63	61
	550	935	260	61	58	52.5	52	47	42.5	63	61.5	57	54.5	50.5	48.5	65	65	60	58.5	55.5	52	69	71.5	70.5	66	63	61
	600	1020	283	62	59	53	53	48	43	64	62	58	55	51	49	66	66	61	59	56	53	70	72	71	67	63	61
08"	300	510	142	55	50	47	44	41	37	58	55	52	47	47	45	60	58	55	50	50	48	65	65	65	60	60	59
	400	680	189	58	53	49	46	43	39	61	58	53	50	48	46	63	61	56	53	51	49	67	67	66	60	60	59
	500	850	236	60	55	51	48	44	41	64	60	54	52	49	47	65	63	57	55	53	50	69	69	67	61	61	60
	600	1020	283	62	57	52	50	46	42	66	61	56	53	50	48	67	65	59	56	54	52	71	70	68	63	61	60
	700	1190	331	64	58	54	51	47	43	68	63	57	55	52	49	69	67	62	60	57	55	73	72	68	64	62	60
	800	1360	378	66	60	55	52	48	44	69	64	59	56	53	50	71	67	63	60	57	55	74	73	68	65	63	61
	1000	1700	472	70	63	57	54	50	46	72	67	62	58	55	52	74	70	64	61	58	56	78	75	70	67	65	62
09 "	500	850	236	55.5	54	47.5	43.5	42	38	63.5	60	54.5	47	47	45	63.5	62.5	57.5	50	48.5	49	69	69.5	66.5	60.5	56	55
	600	1020	283	57	55	49	45	43	39	64	61	55	48	48	46	65	63	58	51	50	50	70	70	67	61	57	56
	700	1190	331	58.5	56	50.5	46.5	44	40	64.5	62	55.5	49	49	47	66.5	63.5	58.5	52	51.5	51	71	70.5	67.5	61.5	58	57
	800	1360	378	60	57	52	48	45	41	65	63	56	50	50	48	68	64	59	53	53	52	72	71	68	62	59	58
	900	1530	425	61.5	58.5	53	49	46	42	66.5	64	57	51	50.5	49	69	65	59.5	54	54	52.5	73.5	71.5	68	62	60	58.5
	1000	1700	472	63	60	54	50	47	43	68	65	58	52	51	50	70	66	60	55	55	53	75	72	68	62	61	59
	1100	1870	519	64	60	55	51	47	44	69	66	58	53	52	50	71	68	62	58	56	54	75	73	68	63	62	60
10"	600	1020	283	57	53	49	46	44	40	63	59	56	50	49	46	64	62	59	53	51	50	69	70	68	63	59	57
	800	1360	378	60	55	52	49	46	42	64	61	57	52	51	48	67	63	60	55	54	52	71	71	69	64	61	59
	1000	1700	472	63	58	54	51	48	44	67	63	59	54	52	50	69	65	61	57	56	53	74	72	69	64	63	60
	1100	1870	519	64	58	55	52	48	45	68	64	59	55	53	50	70	67	63	60	57	54	74	73	69	65	64	61
	1200	2040	567	65	59	55	53	49	45	69	65	60	56	54	51	71	67	63	61	57	55	75	74	70	66	64	62
	1400	2380	661	67	61	57	54	50	47	70	67	62	58	55	52	73	69	64	61	58	56	77	75	71	67	65	63
	1600	2720	756	69	63	59	56	51	48	74	69	65	60	56	53	76	71	67	62	60	57	80	76	73	69	67	64
12 "	800	1360	378	57	52	49	45	43	40	61	59	58	54	52	50	63	61	61	56	54	52	68	68	68	63	60	59
	1100	1870	519	61	55	52	48	46	42	65	61	60	55	53	52	67	63	62	58	56	54	71	69	68	65	63	61
	1400	2380	661	63	57	54	51	48	44	67	63	61	56	54	52	70	65	63	59	56	54	74	71	71	67	64	62
	1600	2720	756	65	58	56	52	49	45	69	64	62	57	55	52	71	67	64	61	59	57	75	72	72	68	65	63
	1700	2890	803	66	59	56	53	49	46	69	64	62	58	55	52	72	67	65	61	59	57	76	73	72	69	66	64
	2000	3400	944	68	61	58	54	51	47	71	65	64	60	57	53	74	68	66	62	60	57	78	75	73	70	67	66
	2300	3910	1086	69	63	61	56	52	49	73	67	65	61	58	55	75	70	67	63	60	58	80	76	75	70	68	67
14"	1100	1870	519	58	51	49	46	43	40	63	58	54	53	52	52	64	61	57	56	54	54	69	68	67	64	62	62
	1500	2550	708	61	54	52	48	46	42	65	59	56	54	53	52	67	62	59	57	56	55	72	70	68	65	63	63
	1900	3230	897	64	57	55	51	47	44	68	62	58	55	54	53	70	64	61	58	56	56	74	71	69	66	64	63
	2100	3570	992	65	58	56	52	48	45	69	63	59	56	54	54	71	67	64	60	58	57	76	72	69	67	65	64
	2300	3910	1086	66	59	57	53	49	46	70	63	60	56	55	54	73	67	65	60	58	57	77	73	70	68	66	64
	2700	4590	1275	68	60	59	54	50	47	72	65	62	58	56	55	74	68	65	61	59	58	79	74	72	69	67	65
	3100	5270	1464	70	62	61	56	52	48	74	66	64	60	57	56	76	69	67	62	60	59	80	75	74	70	68	67
16 "	1600	2720	756	60	52	51	46	43	41	63	57	54	54	52	51	66	59	57	56	54	53	70	65	64	62	62	60
	2100	3570	992	63	55	54	49	46	43	67	60	57	55	54	51	69	63	60	58	56	54	73	70	67	65	64	62
	2600	4420	1228	65	57	56	51	47	45	69	63	59	56	54	53	71	66	62	59	57	56	76	74	69	68	67	65
	2800	4760	1322	66	58	57	52	48	45	70	64	60	56	54	53	74	68	65	60	58	57	76	74	70	68	67	65
	3100	5270	1464	67	59	58	53	49	46	71	65	61	57	55	54	75	69	65	60	58	57	78	75	71	69	67	66
	3600	6120	1700	69	61	59	54	50	47	73	67	63	58	56	54	75	69	66	61	59	57	80	77	73	70	68	67
	4100	6970	1936	71	63	62	56	51	49	75	68	67	60	57	55	77	71	69	62	60	58	81	79	74	70	68	68
19"	2500	4250	1181	69	65	59	57	57	51	72	70	67	63	63	59	73	73	71	68	65	62	77	78	77	76	74	71
	3000	5100	1417	70	66	60	59	58	52	73	71	69	65	64	60	74	74	73	69	66	62	78	79	78	77	74	71
	3500	5950	1653	71	68	61	61	60	55	74	72	70	66	66	61	75	75	74	70	68	63	79	80	79	78	75	72
	4500	7650	2125	72	68	63	63	62	58	75	72	72	69	68	64	77	76	76	72	70	66	82	80	81	80	78	74
	5400	9180	2550	73	70	66	65	65	61	76	73	73	71	70	67	77	78	79	75	70	68	84	82	83	83	79	76
	5500	9350	2597	73	70	66	65	65	61	76	73	73	71	70	67	78	78	79	75	72	69	84	82	83	83	79	76
	6500	11050	3069	75	72	71	68	67	63	78	73	74	72	71	69	80	79	80	77	73	71	87	84	85	85	80	78
22"	4000	6800	1889	71	69	64	60	56	54	75	73	70	66	62	60	77	76	74	70	65	63	82	81	81	79	75	72
	5000	8500	2361	72	69	66	63	59	57	77	74	74	68	64	62	79	76	76	72	67	65	84	81	83	80	76	73
	6000	10200	2833	74	70	69	66	62	60	79	74	76	71	67	65	81	77	78	74	70	68	85	82	85	82	77	75
	7000	11900	3306	77	71	71	68	64	63	80	76	77	73	69	67	81	78	79	75	71	69	86	83	86	83	79	76
	7100	12070	3353	77	71	71	68	64	63	80	76	77	73	69	67	82	80	82	76	71	69	86	83	86	83	79	76
	8000	13600	3778	79	72	74	70	66	65	81	77	78	75	71	69	83	80	82	77	73	71	87	84	88	84	80	77

- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10-12 watts.
- Certified AHRI data is highlighted blue. Application data (not highlighted blue) is outside the scope of the certification program.

Model TSS-SA - Discharge Sound Power Data

Unit Size	CFM	[CMH]	[L/S]	Octave Band																	
				0.5''in.w.g. [125Pa]						1.0''in.w.g. [250Pa]						3.0''in.w.g. [750Pa]					
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
04"	100	170	47	52	47	35	29	21	22	55	51	42	34	24	24	55	54	48	41	30	28
	150	255	71	55	52	39	32	23	22	61	57	45	37	27	23	63	62	54	45	35	32
	200	340	94	60	56	43	35	24	25	66	61	48	40	29	26	68	67	58	48	37	34
	250	425	118	64	59	46	41	28	26	70	63	51	43	32	27	73	71	62	50	39	34
05"	100	170	47	49	43	35	29	20	20	50	44	39	30	23	24	53	51	45	37	28	27
	200	340	94	53	49	39	30	20	21	56	51	44	35	24	23	60	60	54	44	34	31
	300	510	142	60	53	43	34	21	22	65	57	48	39	26	24	66	63	58	48	37	32
	353	600	167	62	55	45	36	24	21	68	60	50	42	29	25	68	65	60	51	39	32
06"	200	340	94	49	45	35	28	19	22	54	50	43	32	22	23	59	58	51	43	32	29
	250	425	118	56	49	38	30	22	23	59	54	46	35	23	23	61	59	53	45	33	31
	300	510	142	59	52	41	32	22	23	61	57	48	37	25	23	64	62	57	46	35	31
	350	595	165	59	54	44	35	23	24	62	60	51	40	27	24	65	64	59	48	37	33
	450	765	213	60	55	46	37	23	24	65	61	54	42	28	24	69	66	61	50	38	36
	550	935	260	64	59	50	42	26	26	67	65	57	46	32	29	73	70	65	52	39	38
07"	300	510	142	52	47	40	32	24	23	51	51	49	38	29	28	58	58	60	51	40	37
	350	595	165	53.5	47.5	40.5	32.5	24.5	23.5	53	51.5	48.5	38.5	29	28.5	58.5	58.5	60.5	51	40	37
	400	680	189	55	48	41	33	25	24	55	52	48	39	29	29	59	59	61	51	40	37
	450	765	213	56	50	42.5	35	25.5	24.5	57	53.5	49.5	40	30	29	60.5	60.5	62	52.5	41.5	38
	500	850	236	57	52	44	37	26	25	59	55	51	41	31	29	62	62	63	54	43	39
	600	1020	283	58	54	46	39	28	25	61	57	51	44	31	29	64	64	65	56	43	39
08"	300	510	142	52	45	39	29	22	22	53	50	47	36	28	27	59	56	57	47	38	36
	400	680	189	55	46	40	30	23	23	57	51	46	37	28	28	60	57	58	47	38	36
	500	850	236	57	50	43	34	24	24	61	54	49	39	30	28	63	60	60	50	41	38
	600	1020	283	58	52	45	36	26	24	63	56	49	42	30	28	65	62	62	52	41	38
	800	1360	378	62	55	49	39	29	26	66	60	53	45	34	30	71	66	62	53	43	39
	1000	1700	472	66	60	53	44	33	29	69	64	57	49	40	32	75	69	65	55	44	40
09"	500	850	236	53	50	41.5	32.5	21	21.5	57.5	54.5	49.5	37	28.5	28.5	64	57	54.5	45	33.5	35
	600	1020	283	54	51	42	33	22	22	59	56	50	38	29	29	65	59	56	47	35	36
	700	1190	331	55	52	42.5	33.5	23	22.5	60.5	57.5	50.5	39	29.5	29.5	66	61	57.5	49	36.5	37
	800	1360	378	56	53	43	34	24	23	62	59	51	40	30	30	67	63	59	51	38	38
	1000	1700	472	59	56	47	37	27	25	64	61	53	42	33	32	71	66	61	53	41	39
	1100	1870	519	60	56	48	38	27	26	65	62	53	43	34	32	71	67	61	54	42	40
10"	600	1020	283	54	49	42	34	23	23	58	54	51	40	30	29	64	59	57	49	37	37
	800	1360	378	56	51	43	35	25	24	61	57	52	42	31	30	66	63	60	53	40	39
	1000	1700	472	59	54	47	38	28	26	63	59	54	44	34	32	70	66	62	55	43	40
	1200	2040	567	60	57	49	40	29	27	65	61	56	45	37	33	72	69	64	56	44	42
	1400	2380	661	62	59	51	43	32	29	67	63	58	48	40	35	74	70	66	58	46	44
	1600	2720	756	65	61	56	47	35	32	71	66	62	51	43	37	77	72	68	61	48	46
12'	800	1360	378	52	49	44	35	28	26	55	55	54	45	36	33	61	59	58	51	42	40
	1100	1870	519	54	52	47	37	29	28	59	58	56	46	38	38	65	62	61	55	47	43
	1400	2380	661	56	54	50	40	32	28	62	60	57	47	40	38	66	66	66	58	49	45
	1700	2890	803	58	55	52	42	34	31	64	61	58	49	42	38	70	69	67	60	52	48
	2000	3400	944	61	59	54	45	37	33	66	62	60	51	45	40	74	71	69	61	53	51
	2300	3910	1086	65	61	57	48	40	37	69	63	61	52	47	42	76	72	70	61	55	52
14"	1100	1870	519	53	47	42	38	32	26	60	55	50	44	39	35	65	62	59	53	48	45
	1500	2550	708	57	50	45	39	34	28	62	57	52	45	41	38	67	65	62	57	51	48
	1900	3230	897	57	52	48	42	35	29	65	60	54	46	43	41	70	67	65	58	53	49
	2300	3910	1086	60	56	51	45	38	32	66	61	56	47	45	43	72	69	65	60	56	51
	2700	4590	1275	62	57	54	47	40	36	68	63	58	49	47	45	75	70	67	61	57	53
	3100	5270	1464	64	59	56	49	42	37	67	64	60	51	48	46	77	72	68	61	58	56
16"	1600	2720	756	54	48	43	36	32	27	58	54	50	47	39	34	64	59	53	51	48	43
	2100	3570	992	58	52	47	40	34	29	63	58	52	48	42	37	66	65	59	57	52	47
	2600	4420	1228	59	53	50	43	36	30	66	61	54	49	43	41	70	70	63	62	56	51
	3100	5270	1464	61	57	52	46	39	33	67	63	57	49	45	43	74	71	66	61	57	53
	3600	6120	1700	62	59	56	47	41	36	68	64	60	50	47	44	77	74	68	62	58	55
	4100	6970	1936	64	61	59	50	42	38	68	65	63	52	49	45	79	76	70	62	59	57
19"	2500	4250	1181	66	63	54	50	47	38	70	64	60	56	50	42	72	68	65	62	58	51
	3000	5100	1417	67	64	56	53	49	41	71	67	63	58	52	46	74	71	68	66	61	54
	3500	5950	1653	68	66	57	54	50	46	72	68	65	59	55	49	75	73	70	69	63	56
	4500	7650	2125	69	66	59	56	52	49	73	69	68	61	58	53	79	76	75	71	68	61
	5500	9350	2597	70	67	62	58	56	51	74	70	69	63	61	57	82	79	78	75	69	64
	6500	11050	3069	72	69	67	60	58	53	75	70	69	64	63	59	85	81	80	77	71	67
22"	4000	6800	1889	68	66	60	53	46	41	73	68	66	58	50	46	78	73	74	69	63	57
	5000	8500	2361	68	66	62	57	49	45	75	70	70	61	53	50	80	76	77	73	65	59
	6000	10200	2833	71	68	65	60	53	49	77	72	73	63	57	54	82	78	79	73	67	62
	7000	11900	3306	74	69	68	62	55	53	78	73	74	65	60	57	84	80	81	74	68	63
	8000	13600	3778	76	70	71	64	57	55	78	74	74	67	63	59	85	81	82	75	70	65

- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10-12 watts.

TSL Sound Power Data

Model TSL – Radiated Sound Power Data

Unit Size	CFM	[CMH]	[L/S]	Octave Band																							
				0.5''in.w.g. [125Pa]						1.0''in.w.g. [250Pa]						1.5''in.w.g. [375Pa]						3.0''in.w.g. [750Pa]					
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
10	600	1020	283	41	43	42	36	32	26	46	48	46	40	37	32	49	50	49	44	40	34	54	55	55	52	48	42
	800	1360	378	45	45	45	38	33	27	49	50	48	42	38	33	52	52	51	46	41	36	58	58	57	53	49	43
	1000	1700	472	47	47	47	39	34	28	52	52	51	44	39	34	55	55	53	47	43	36	60	60	59	55	50	44
	1100	1870	519	48	48	48	40	35	29	53	53	52	44	39	34	56	56	54	48	43	38	61	61	60	56	51	44
	1200	2040	567	49	48	49	41	35	29	54	54	52	45	40	34	57	57	55	49	44	38	62	62	61	56	51	45
	1400	2380	661	51	50	51	42	36	30	56	55	54	46	41	34	58	58	57	50	45	38	64	63	63	57	52	45
	1600	2720	756	52	51	52	44	37	31	57	56	56	47	42	35	60	59	58	51	46	39	65	64	64	58	53	46
12	800	1360	378	43	42	40	35	33	26	48	49	44	40	37	31	51	52	47	43	41	34	56	59	54	52	48	42
	1100	1870	519	47	45	43	37	34	28	51	52	46	42	39	32	54	54	49	46	42	36	60	62	57	54	51	43
	1400	2380	661	49	49	46	39	35	29	54	54	49	44	40	33	57	56	52	47	44	37	62	63	59	56	51	44
	1600	2720	756	50	50	48	40	36	30	55	55	51	45	41	34	58	58	54	49	46	39	63	64	60	57	52	45
	1700	2890	803	51	50	49	41	37	30	56	56	52	45	42	35	59	59	54	49	46	39	64	65	61	57	53	46
	2000	3400	944	53	52	51	43	38	31	57	57	54	46	43	36	60	60	57	50	47	39	66	66	63	58	54	47
	2300	3910	1086	54	53	52	44	39	33	59	58	56	48	44	37	62	61	58	52	48	41	67	67	64	59	55	48
14	1100	1870	519	47	45	40	36	32	25	52	50	44	39	36	30	55	52	47	43	39	34	60	58	53	50	47	41
	1500	2550	708	50	46	43	37	34	27	55	52	46	41	38	32	58	55	49	45	41	36	63	61	56	53	49	42
	1900	3230	897	53	49	46	40	36	28	57	54	49	43	39	34	60	56	52	47	43	37	65	64	58	55	51	44
	2100	3570	992	54	50	47	41	36	29	58	55	50	44	40	34	61	59	54	49	45	38	66	64	59	55	52	44
	2300	3910	1086	55	51	48	41	37	30	59	56	51	45	41	35	62	59	54	49	45	39	67	65	60	56	52	45
	2700	4590	1275	56	52	50	43	39	31	61	57	53	46	44	36	64	60	56	50	46	40	69	67	62	57	54	46
	3100	5270	1464	58	53	53	44	40	32	62	59	55	47	45	38	65	61	58	51	48	41	70	67	64	59	55	48
16	1600	2720	756	51	45	42	36	30	24	57	52	45	39	35	29	60	54	48	43	38	33	65	61	55	52	45	40
	2100	3570	992	54	47	45	38	32	26	60	53	48	41	37	31	63	56	51	45	40	35	68	63	57	53	47	42
	2600	4420	1228	56	50	47	39	34	27	62	55	51	43	38	33	65	58	54	47	42	36	70	65	60	54	49	43
	2800	4760	1322	59	51	49	40	35	28	61	54	52	44	39	33	66	59	55	48	43	37	71	65	61	55	50	43
	3100	5270	1464	59	52	50	40	36	29	63	56	53	45	40	34	67	59	56	48	43	38	72	66	62	56	51	44
	3600	6120	1700	61	53	51	42	37	30	65	58	55	46	41	36	68	60	58	50	45	39	74	67	64	57	52	45
	4100	6970	1936	62	54	54	44	39	32	67	59	56	47	43	37	70	61	59	51	46	40	75	67	65	58	54	47

- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10-12 watts.
- Certified AHRI data is highlighted blue. Application data (not highlighted blue) is outside the scope of the certification program.

Model TSL - Discharge Sound Power Data

Unit Size	CFM	[CMH]	[L/S]	Octave Band																							
				0.5''in.w.g. [125Pa]						1.0''in.w.g. [250Pa]						1.5''in.w.g. [375Pa]						3.0''in.w.g. [750Pa]					
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
10	600	1020	283	58	55	50	49	46	42	62	59	55	54	52	48	63	62	58	58	56	52	67	67	65	67	65	61
	800	1360	378	61	57	52	50	48	43	65	61	56	55	54	50	66	64	60	59	58	54	70	69	67	67	66	62
	1000	1700	472	63	59	54	52	49	45	67	63	58	57	55	51	69	66	61	60	59	55	73	71	68	68	68	64
	1100	1870	519	64	60	55	52	50	45	68	64	59	57	56	52	70	67	63	61	61	56	75	72	69	69	68	64
	1200	2040	567	65	61	56	53	51	46	69	65	60	58	57	53	71	68	63	62	61	57	76	73	70	70	69	65
	1400	2380	661	68	63	58	54	52	47	71	67	62	59	58	54	73	69	64	63	62	58	77	75	71	71	70	66
	1600	2720	756	69	64	59	56	53	48	73	68	64	60	59	55	75	71	66	64	63	59	79	76	72	72	71	67
12	800	1360	378	57	55	51	49	47	44	62	60	56	54	53	50	64	62	59	58	57	54	68	66	65	67	65	62
	1100	1870	519	61	57	53	51	49	46	65	62	59	56	55	52	68	64	62	60	59	56	72	69	68	69	67	64
	1400	2380	661	64	59	56	53	51	47	68	64	60	58	57	54	70	66	63	62	61	58	74	71	70	70	68	65
	1600	2720	756	65	60	57	55	52	49	69	65	62	60	58	55	72	69	66	63	62	59	75	72	72	71	70	66
	1700	2890	803	66	61	58	55	53	49	70	66	63	60	59	56	73	69	66	64	63	60	76	73	72	72	70	67
	2000	3400	944	68	64	60	57	54	50	71	67	64	62	60	57	73	69	67	66	64	61	78	74	74	74	72	68
	2300	3910	1086	70	66	63	58	56	52	73	69	66	63	62	58	75	71	69	67	66	62	80	76	75	75	73	70
14	1100	1870	519	58	54	50	48	45	42	63	60	55	53	51	49	65	62	59	57	55	53	68	67	65	65	63	61
	1500	2550	708	60	57	53	50	47	44	66	63	58	55	54	51	68	65	61	59	57	55	73	71	68	68	66	63
	1900	3230	897	63	59	56	52	50	46	68	64	60	57	56	53	70	67	63	61	60	57	77	73	71	70	67	64
	2100	3570	992	65	60	57	54	51	47	69	65	62	58	57	54	73	69	66	63	62	59	78	74	72	71	68	65
	2300	3910	1086	66	62	58	55	52	48	71	66	63	59	58	55	74	69	67	64	62	59	79	75	73	71	69	66
	2700	4590	1275	69	65	62	56	53	50	72	68	65	61	59	56	75	70	68	65	63	60	81	77	74	73	71	68
	3100	5270	1464	71	67	64	59	55	51	74	70	67	63	61	58	76	72	70	67	65	62	83	78	76	75	72	69
16	1600	2720	756	59	55	51	46	43	40	65	59	55	51	49	47	67	62	58	55	53	50	73	67	64	63	60	58
	2100	3570	992	62	58	54	49	46	42	67	62	58	54	52	49	69	65	61	58	56	52	76	70	67	66	63	60
	2600	4420	1228	65	60	57	52	48	44	69	65	61	56	54	50	72	67	64	60	58	54	79	73	70	68	65	62
	2800	4760	1322	66	61	58	53	49	44	70	66	62	57	55	51	76	68	65	61	59	56	79	73	71	69	66	63
	3100	5270	1464	67	63	59	54	50	45	71	67	64	59	56	52	76	70	67	62	60	56	80	75	73	70	67	64
	3600	6120	1700	69	65	62	56	52	47	73	69	65	61	58	53	76	71	69	64	62	58	82	77	75	72	69	65
	4100	6970	1936	70	66	64	58	53	49	74	70	67	62	59	55	77	72	70	66	63	59	83	78	76	73	71	66

- Performance data obtained from tests conducted in accordance with AHRI Standard 880.
- Sound levels are expressed in decibels, dB re: 1 x 10-12 watts.
- Certified AHRI data is highlighted blue. Application data (not highlighted blue) is outside the scope of the certification program.

AHRI Standard Ratings

Model TSS

Unit Size	Rated Airflow CFM	Minimum Operating Pressure	Standard Ratings – Sound Power Level, dB Re: 1 x 10-12 WATTS 1.5" Water Static Pressure											
			Radiated						Discharge					
			Hz Octave Band Center Frequency						Hz Octave Band Center Frequency					
	CFM	(IN.W.G.)	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
4	150	0.01	53	53	46	38	33	30	68	67	58	54	49	48
5	250	0.02	53	52	49	41	35	32	70	68	59	55	51	50
6	400	0.10	56	54	52	49	46	36	69	67	60	57	52	52
7	550	0.02	57	53	52	47	39	25	65	65	60	59	56	52
8	700	0.03	58	56	52	47	42	35	69	67	62	60	57	55
9	900	0.03	56	52	46	36	30	30	69	65	60	54	54	53
10	1100	0.03	59	55	53	44	39	34	70	67	63	60	57	54
12	1600	0.04	59	56	53	44	40	35	71	67	64	61	59	57
14	2100	0.06	60	58	51	46	46	41	71	67	64	60	58	57
16	2800	0.04	60	59	52	47	44	40	74	68	65	60	58	57
19	5400	0.38	68	68	71	61	56	49	77	78	79	75	70	68
22	7100	0.20	69	69	73	63	57	51	82	80	82	76	71	69

Model TSL

Unit Size	Rated Airflow CFM	Minimum Operating Pressure	Standard Ratings – Sound Power Level, dB Re: 1 x 10-12 WATTS 1.5" Water Static Pressure											
			Radiated						Discharge					
			Hz Octave Band Center Frequency						Hz Octave Band Center Frequency					
	CFM	(IN.W.G.)	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
10"	1100	0.01	0.01	56	54	48	43	38	70	67	63	61	61	56
12"	1600	0.01	0.01	58	54	49	46	39	72	69	66	63	62	59
14"	2100	0.01	0.01	59	54	49	45	38	73	69	66	63	62	59
16"	2800	0.02	0.02	59	55	48	43	37	76	68	65	61	59	56

Rated in accordance with AHRI Standard 880.

TSS Electric Heater Data

Model TSS-E

Standard Features

- Primary automatic reset thermal protection
- Secondary thermal fuse protection
- Wiring diagram
- Power supplier: 220V/1/50Hz
- Available kW increments are as follows:
  0.5 kW increments from 0.5 to 2 kW
  1 kW increments from 2 to 6 kW
  2 kW increments from 6 to 8 kW

Selection Procedure

With standard heater elements, the maximum capacity (kW) is obtained by dividing the heating (fan) CMH by 120.In other words, the terminal must have at least 120 CMH per kW.In addition, each size terminal has a maximum allowable kW based upon the specific heater element configuration (i.e. voltage, phase, number of steps, etc.).Contact your Johnson Controls representative for design assistance.

Heaters require a minimum of 28Pa downstream static pressure to ensure proper operation.For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 11° C of the desired space temperature. This typically requires a higher air capacity which provides higher air motion in the space increasing thermal comfort. The electric heater should be selected with this in mind, keeping the LAT as low as possible.

Selection Equations

$$kW = \frac{CMH \times \Delta T \times \rho \times c}{3600}$$

* Air density at sea level - reduce by 0.036 for each 1000 feet(304.8 meter) of altitude above sea level.

Electric Heater	Heater Elements	Electric heating tube						
	Unit Size	TSS04~06	TSS07~08	TSS09	TSS10	TSS12	TSS14	TSS16
	Available kW	0.5-4kW	0.5-6kW	0.5-8kW	0.5-8kW	0.5-8kW	0.5-8kW	0.5-8kW
	Stage of Heating	1 or 2 Stages	1 or 2 Stages	1 or 2 Stages	1 or 2 Stages	1 or 2 Stages	1 or 2 Stages	1 or 2 Stages

TSS Hot Water Coil Data

Model TSS-W

Standard Features

- Designed, manufactured, and tested by Johnson Controls
- Aluminum fin construction with die-formed spacer collars for uniform spacing
- Mechanically expanded copper tubes leak tested to 406 PSIG [2.8MPa] air pressure and rated at 232 PSIG [1.6MPa] working pressure
- 1, 2 row configurations

Selection Procedure

TSS-WC Hot Water Coil Performance Tables are based upon a temperature difference of 105.8°F[41°C] between the entering water and the entering air. If this ΔT is suitable, proceed directly to the tables for selection. All pertinent performance data is tabulated. For Variable Air Volume Applications, the static pressure drop must be based on the maximum air volume.

Entering Water - Air Temperature Different (ΔT) Correction Factors °F[°C]															
ΔT(°F[°C])	20[11]	25[14]	30[17]	35[19]	40[22]	45[25]	50[28]	55[31]	60[33]	65[36]	70[39]	75[41]	80[44]	85[47]	90[50]
Factor	0.26	0.33	0.40	0.47	0.53	0.60	0.67	0.74	0.81	0.88	0.95	1.00	1.09	1.16	1.22
ΔT(°F[°C])	95[53]	100[56]	105[58]	110[61]	115[64]	120[67]	125[69]	130[72]	135[75]	140[78]	145[81]	150[83]	155[86]	160[89]	165[92]
Factor	1.29	1.36	1.43	1.52	1.59	1.66	1.72	1.79	1.86	1.95	2.02	2.09	2.16	2.22	2.29

The table above gives correction factors for various entering ΔT's (difference between EWT and EAT). Multiply MBH values obtained from selection tables by the appropriate correction factor above to obtain the actual MBH value. Air and water pressure drop can be read directly from the selection tables. The LAT and LWT can be calculated from the following fundamental formulas:

$$LAT = EAT + \frac{BTUH}{1.085 \times CFM} \qquad LWT = EWT - \frac{BTUH}{500 \times GPM}$$

EAT	Entering Air Temperature (°F)[°C]
LAT	Leaving Air Temperature (°F)[°C]
EWT	Entering Water Temperature (°F)[°C]
LWT	Leaving Water Temperature (°F)[°C]

TSS Hot Water Coil Data

Model TSS-W · Sizes 4, 5, 6

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]		(IN.W.G.)	[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[℃]	°F	[℃]	°F	[℃]	°F	[℃]	MBH	[kW]	MBH	[kW]
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14
50	85	24	1Row	0.01	1	0.5	[0.03]	0.08	0.24	0.15	0.45	102.5	39.2	117.2	47.3	131.6	55.3	128.2	53.4	1.96	0.57	2.76	0.81
						1	[0.06]	0.29	0.86	0.55	1.63	112.8	44.9	131.7	55.4	134.6	57.0	132.4	55.8	2.52	0.74	3.54	1.04
						2	[0.13]	1.22	3.65	2.32	6.93	115.6	46.4	135.6	57.5	137.4	58.5	136.3	57.9	2.67	0.78	3.75	1.10
			2Row	0.01	1.5	3	[0.19]	2.51	7.51	4.76	14.21	116.4	46.9	136.7	58.2	138.2	59.0	137.4	58.6	2.71	0.79	3.81	1.12
						4	[0.25]	4.24	12.68	8.02	23.97	117.0	47.2	137.6	58.7	138.6	59.2	138.0	58.9	2.74	0.80	3.86	1.13
						5	[0.32]	6.82	20.37	12.87	38.45	117.4	47.5	138.2	59.0	138.9	59.4	138.4	59.1	2.77	0.81	3.89	1.14

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Model TSS-W · Size 7， 8

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]		(IN.W.G.)	[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[℃]	°F	[℃]	°F	[℃]	°F	[℃]	MBH	[kW]	MBH	[kW]
175	298	83	1Row	0.01	3.6	0.5	0.03	0.09	0.26	0.17	0.51	84.7	29.3	94.1	34.5	125.0	51.7	117.3	47.4	3.50	1.02	5.28	1.55
						1	0.06	0.32	0.95	0.61	1.81	90.7	32.6	103.2	39.6	130.1	54.5	125.0	51.7	4.63	1.36	6.99	2.05
						2	0.13	1.34	4.01	2.56	7.64	94.5	34.7	108.9	42.7	134.7	57.1	132.0	55.6	5.34	1.57	8.08	2.37
			2Row	0.03	8.7	3	0.19	2.75	8.21	5.22	15.60	95.8	35.5	111.0	43.9	136.2	57.9	134.3	56.8	5.60	1.64	8.47	2.48
						4	0.25	4.63	13.83	8.79	26.25	96.4	35.8	111.9	44.4	137.1	58.4	135.6	57.5	5.71	1.67	8.63	2.53
						5	0.32	7.42	22.16	14.07	42.03	97.2	36.2	113.0	45.0	137.6	58.7	136.4	58.0	5.85	1.72	8.85	2.59
250	425	118	1Row	0.03	6.6	0.5	0.03	0.09	0.26	0.17	0.51	79.8	26.5	87.2	30.7	124.3	51.3	115.6	46.5	3.67	1.08	5.68	1.66
						1	0.06	0.32	0.95	0.61	1.81	84.8	29.3	95.0	35.0	129.2	54.0	123.3	50.7	5.02	1.47	7.77	2.28
						2	0.13	1.34	4.01	2.56	7.64	88.5	31.4	100.7	38.2	134.0	56.7	130.8	54.9	6.02	1.76	9.32	2.73
			2Row	0.06	15.9	3	0.19	2.75	8.21	5.22	15.60	90.1	32.3	103.2	39.5	135.6	57.6	133.2	56.2	6.45	1.89	9.99	2.93
						4	0.25	4.63	13.83	8.79	26.25	90.8	32.6	104.2	40.1	136.6	58.1	134.7	57.1	6.63	1.94	10.27	3.01
						5	0.32	7.42	22.16	14.07	42.03	91.6	33.1	105.5	40.8	137.2	58.5	135.7	57.6	6.85	2.01	10.60	3.11
325	553	153	1Row	0.04	10.3	0.5	0.03	0.09	0.26	0.17	0.51	77.0	25.0	83.3	28.5	123.7	50.9	114.3	45.7	3.80	1.11	5.99	1.76
						1	0.06	0.32	0.95	0.61	1.81	81.5	27.5	90.4	32.4	128.5	53.6	121.8	49.9	5.38	1.58	8.48	2.49
						2	0.13	1.34	4.01	2.56	7.64	85.3	29.6	96.3	35.7	133.4	56.3	129.5	54.2	6.71	1.96	10.57	3.10
			2Row	0.10	24.8	3	0.19	2.75	8.21	5.22	15.60	86.5	30.3	98.2	36.8	135.2	57.3	132.4	55.8	7.14	2.09	11.25	3.30
						4	0.25	4.63	13.83	8.79	26.25	87.4	30.8	99.6	37.6	136.2	57.9	134.0	56.6	7.44	2.18	11.72	3.43
						5	0.32	7.42	22.16	14.07	42.03	88.1	31.2	100.7	38.2	136.9	58.3	135.1	57.3	7.69	2.25	12.12	3.55
400	680	189	1Row	0.06	14.7	0.5	0.03	0.09	0.26	0.17	0.51	75.3	24.1	80.8	27.1	123.1	50.6	112.9	45.0	3.95	1.16	6.31	1.85
						1	0.06	0.32	0.95	0.61	1.81	79.3	26.3	87.2	30.7	127.8	53.2	120.5	49.2	5.68	1.66	9.08	2.66
						2	0.13	1.34	4.01	2.56	7.64	82.9	28.3	92.9	33.8	132.9	56.0	128.6	53.7	7.22	2.12	11.54	3.38
			2Row	0.14	35.3	3	0.19	2.75	8.21	5.22	15.60	84.2	29.0	95.0	35.0	134.7	57.1	131.6	55.3	7.78	2.28	12.43	3.64
						4	0.25	4.63	13.83	8.79	26.25	84.9	29.4	96.1	35.6	135.8	57.7	133.3	56.3	8.09	2.37	12.94	3.79
						5	0.32	7.42	22.16	14.07	42.03	85.7	29.8	97.4	36.3	136.6	58.1	134.6	57.0	8.42	2.47	13.46	3.94
475	808	224	1Row	0.08	19.7	0.5	0.03	0.09	0.26	0.17	0.51	74.0	23.3	78.8	26.0	122.8	50.4	112.2	44.5	4.01	1.18	6.49	1.90
						1	0.06	0.32	0.95	0.61	1.81	77.8	25.4	84.9	29.4	127.3	52.9	119.4	48.5	5.94	1.74	9.61	2.82
						2	0.13	1.34	4.01	2.56	7.64	81.2	27.3	90.5	32.5	132.4	55.8	127.7	53.2	7.69	2.25	12.44	3.65
			2Row	0.19	47.3	3	0.19	2.75	8.21	5.22	15.60	82.5	28.0	92.5	33.6	134.3	56.9	130.9	54.9	8.35	2.45	13.51	3.96
						4	0.25	4.63	13.83	8.79	26.25	83.2	28.4	93.7	34.3	135.5	57.5	132.7	56.0	8.72	2.55	14.10	4.13
						5	0.32	7.42	22.16	14.07	42.03	83.9	28.8	94.9	34.9	136.3	58.0	134.1	56.7	9.09	2.66	14.70	4.31
550	935	260	1Row	0.10	25.3	0.5	0.03	0.09	0.26	0.17	0.51	73.0	22.8	77.3	25.2	122.7	50.4	111.7	44.3	4.03	1.18	6.59	1.93
						1	0.06	0.32	0.95	0.61	1.81	76.4	24.7	82.9	28.3	126.9	52.7	118.7	48.2	6.09	1.78	9.94	2.91
						2	0.13	1.34	4.01	2.56	7.64	79.8	26.5	88.3	31.3	132.0	55.6	127.0	52.8	8.05	2.36	13.15	3.85
			2Row	0.24	60.6	3	0.19	2.75	8.21	5.22	15.60	81.0	27.2	90.4	32.5	134.0	56.7	130.2	54.6	8.81	2.58	14.40	4.22
						4	0.25	4.63	13.83	8.79	26.25	81.8	27.7	91.7	33.2	135.2	57.4	132.2	55.7	9.27	2.72	15.14	4.44
						5	0.32	7.42	22.16	14.07	42.03	82.5	28.1	92.9	33.8	136.1	57.8	133.6	56.5	9.69	2.84	15.83	4.64
625	1063	295	1Row	0.13	31.4	0.5	0.03	0.09	0.26	0.17	0.51	72.3	22.4	76.2	24.5	122.4	50.2	111.1	43.9	4.09	1.20	6.74	1.98
						1	0.06	0.32	0.95	0.61	1.81	75.4	24.1	81.4	27.5	126.6	52.6	118.0	47.8	6.23	1.83	10.28	3.01
						2	0.13	1.34	4.01	2.56	7.64	78.6	25.9	86.7	30.4	131.7	55.4	126.3	52.4	8.40	2.46	13.84	4.06
			2Row	0.30	75.4	3	0.19	2.75	8.21	5.22	15.60	79.9	26.6	88.8	31.6	133.7	56.5	129.7	54.3	9.26	2.71	15.26	4.47
						4	0.25	4.63	13.83	8.79	26.25	80.6	27.0	90.0	32.2	135.0	57.2	131.7	55.4	9.74	2.85	16.05	4.70
						5	0.32	7.42	22.16	14.07	42.03	81.4	27.4	91.2	32.9	135.9	57.7	133.2	56.2	10.25	3.00	16.90	4.95
700	1190	331	1Row	0.15	38	0.5	0.03	0.09	0.26	0.17	0.51	71.7	22.1	75.4	24.1	122.1	50.1	110.3	43.5	4.17	1.22	6.93	2.03
						1	0.06	0.32	0.95	0.61	1.81	74.9	23.8	80.6	27.0	125.9	52.2	116.6	47.0	6.57	1.93	10.92	3.20
						2	0.13	1.34	4.01	2.56	7.64	77.8	25.4	85.4	29.7	131.3	55.2	125.6	52.0	8.76	2.57	14.55	4.26
			2Row	0.37	91.3	3	0.19	2.75	8.21	5.22	15.60	79.0	26.1	87.5	30.8	133.4	56.4	129.1	53.9	9.69	2.84	16.09	4.71
						4	0.25	4.63	13.83	8.79	26.25	79.8	26.5	88.7	31.5	134.7	57.1	131.2	55.1	10.25	3.00	17.02	4.99
						5	0.32	7.42	22.16	14.07	42.03	80.5	26.9	89.9	32.2	135.7	57.6	132.8	56.0	10.78	3.16	17.90	5.24

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Model TSS-W · Size 9, 10

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]	(IN.W.G.)		[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[℃]	°F	[℃]	°F	[℃]	°F	[℃]	MBH	[kW]	MBH	[kW]
300	510	142	1Row	0.01	5.2	0.5	[0.03]	0.14	0.43	0.09	0.27	81.6	27.6	89.9	32.1	118.5	48.1	107.1	41.7	5.00	1.47	7.66	2.25
						1	[0.06]	0.51	1.52	0.32	0.95	87.1	30.6	98.2	36.8	125.5	51.9	117.8	47.6	6.77	1.98	10.37	3.04
						2	[0.13]	2.13	6.35	1.32	3.93	90.9	32.7	104.0	40.0	132.1	55.6	127.9	53.3	7.99	2.34	12.25	3.59
			2Row	0.05	12.4	3	[0.19]	4.33	12.95	2.66	7.95	92.4	33.6	106.3	41.3	134.3	56.8	131.2	55.1	8.49	2.49	13.00	3.81
						4	[0.25]	7.28	21.75	4.44	13.28	93.1	33.9	107.3	41.9	135.5	57.5	133.1	56.2	8.70	2.55	13.33	3.91
						5	[0.32]	11.64	34.78	7.07	21.14	93.8	34.4	108.6	42.5	136.4	58.0	134.5	56.9	8.96	2.62	13.72	4.02
400	680	189	1Row	0.03	8.4	0.5	[0.03]	0.14	0.43	0.09	0.27	78.4	25.8	85.2	29.6	117.4	47.4	104.7	40.4	5.27	1.54	8.23	2.41
						1	[0.06]	0.51	1.52	0.32	0.95	83.1	28.4	92.7	33.7	124.3	51.3	115.5	46.4	7.32	2.14	11.43	3.35
						2	[0.13]	2.13	6.35	1.32	3.93	86.9	30.5	98.5	36.9	131.2	55.1	126.2	52.3	8.92	2.61	13.94	4.08
			2Row	0.08	20.1	3	[0.19]	4.33	12.95	2.66	7.95	88.2	31.2	100.6	38.1	133.6	56.4	129.9	54.4	9.52	2.79	14.87	4.36
						4	[0.25]	7.28	21.75	4.44	13.28	89.0	31.7	101.8	38.8	134.9	57.2	132.1	55.6	9.85	2.89	15.39	4.51
						5	[0.32]	11.64	34.78	7.07	21.14	89.7	32.1	103.0	39.4	135.9	57.7	133.6	56.5	10.17	2.98	15.89	4.65
500	850	236	1Row	0.05	12.3	0.5	[0.03]	0.14	0.43	0.09	0.27	76.3	24.6	82.3	27.9	116.5	46.9	102.7	39.3	5.48	1.61	8.69	2.55
						1	[0.06]	0.51	1.52	0.32	0.95	80.6	27.0	89.1	31.7	123.3	50.7	113.5	45.3	7.79	2.28	12.35	3.62
						2	[0.13]	2.13	6.35	1.32	3.93	84.2	29.0	94.8	34.9	130.4	54.6	124.7	51.5	9.74	2.85	15.46	4.53
			2Row	0.12	29.4	3	[0.19]	4.33	12.95	2.66	7.95	85.4	29.7	96.7	36.0	133.0	56.1	128.8	53.8	10.39	3.05	16.49	4.83
						4	[0.25]	7.28	21.75	4.44	13.28	86.3	30.1	98.0	36.7	134.4	56.9	131.2	55.1	10.83	3.17	17.18	5.03
						5	[0.32]	11.64	34.78	7.07	21.14	87.0	30.5	99.2	37.3	135.5	57.5	132.8	56.0	11.22	3.29	17.80	5.21
600	1020	283	1Row	0.07	16.7	0.5	[0.03]	0.14	0.43	0.09	0.27	74.8	23.8	80.1	26.7	116.0	46.7	101.4	38.6	5.60	1.64	8.99	2.63
						1	[0.06]	0.51	1.52	0.32	0.95	78.7	26.0	86.3	30.2	122.6	50.3	112.1	44.5	8.11	2.38	13.02	3.82
						2	[0.13]	2.13	6.35	1.32	3.93	82.2	27.9	91.9	33.3	129.7	54.3	123.5	50.8	10.38	3.04	16.67	4.88
			2Row	0.16	40	3	[0.19]	4.33	12.95	2.66	7.95	83.5	28.6	94.0	34.5	132.4	55.8	127.8	53.2	11.23	3.29	18.04	5.29
						4	[0.25]	7.28	21.75	4.44	13.28	84.2	29.0	95.1	35.1	134.0	56.7	130.4	54.6	11.67	3.42	18.74	5.49
						5	[0.32]	11.64	34.78	7.07	21.14	85.0	29.4	96.3	35.7	135.1	57.3	132.1	55.6	12.16	3.56	19.53	5.72
700	1190	331	1Row	0.09	21.7	0.5	[0.03]	0.14	0.43	0.09	0.27	73.6	23.1	78.2	25.6	116.1	46.7	101.2	38.5	5.57	1.63	9.04	2.65
						1	[0.06]	0.51	1.52	0.32	0.95	77.3	25.2	84.2	29.0	122.0	50.0	110.7	43.7	8.41	2.46	13.64	4.00
						2	[0.13]	2.13	6.35	1.32	3.93	80.7	27.1	89.7	32.1	129.2	54.0	122.4	50.2	10.96	3.21	17.78	5.21
			2Row	0.21	52	3	[0.19]	4.33	12.95	2.66	7.95	81.9	27.7	91.7	33.2	131.9	55.5	126.9	52.7	11.89	3.48	19.30	5.66
						4	[0.25]	7.28	21.75	4.44	13.28	82.7	28.2	93.0	33.9	133.6	56.4	129.6	54.2	12.49	3.66	20.28	5.94
						5	[0.32]	11.64	34.78	7.07	21.14	83.4	28.6	94.1	34.5	134.8	57.1	131.5	55.3	13.01	3.81	21.12	6.19
800	1360	378	1Row	0.11	27.2	0.5	[0.03]	0.14	0.43	0.09	0.27	72.8	22.7	77.0	25.0	115.6	46.5	100.1	37.8	5.69	1.67	9.31	2.73
						1	[0.06]	0.51	1.52	0.32	0.95	76.1	24.5	82.5	28.0	121.6	49.8	109.8	43.2	8.58	2.52	14.06	4.12
						2	[0.13]	2.13	6.35	1.32	3.93	79.4	26.3	87.8	31.0	128.7	53.7	121.5	49.7	11.41	3.34	18.69	5.48
			2Row	0.26	65.2	3	[0.19]	4.33	12.95	2.66	7.95	80.7	27.1	90.0	32.2	131.5	55.3	126.1	52.3	12.53	3.67	20.53	6.01
						4	[0.25]	7.28	21.75	4.44	13.28	81.5	27.5	91.2	32.9	133.2	56.2	128.9	53.8	13.18	3.86	21.59	6.33
						5	[0.32]	11.64	34.78	7.07	21.14	82.2	27.9	92.4	33.5	134.5	56.9	130.9	54.9	13.80	4.04	22.60	6.62
900	1530	425	1Row	0.13	33.2	0.5	[0.03]	0.14	0.43	0.09	0.27	72.2	22.3	76.1	24.5	115.1	46.2	98.9	37.2	5.80	1.70	9.58	2.81
						1	[0.06]	0.51	1.52	0.32	0.95	75.3	24.1	81.2	27.3	121.0	49.5	108.7	42.6	8.84	2.59	14.59	4.28
						2	[0.13]	2.13	6.35	1.32	3.93	78.4	25.8	86.4	30.2	128.2	53.5	120.5	49.2	11.90	3.49	19.66	5.76
			2Row	0.32	79.7	3	[0.19]	4.33	12.95	2.66	7.95	79.7	26.5	88.5	31.4	131.1	55.1	125.3	51.8	13.13	3.85	21.67	6.35
						4	[0.25]	7.28	21.75	4.44	13.28	80.4	26.9	89.7	32.0	132.9	56.1	128.3	53.5	13.81	4.05	22.80	6.68
						5	[0.32]	11.64	34.78	7.07	21.14	81.2	27.3	90.9	32.7	134.2	56.8	130.3	54.6	14.54	4.26	24.00	7.03
1000	1700	472	1Row	0.16	39.7	0.5	[0.03]	0.14	0.43	0.09	0.27	71.7	22.0	75.3	24.0	114.7	46.0	98.0	36.6	5.89	1.73	9.80	2.87
						1	[0.06]	0.51	1.52	0.32	0.95	74.8	23.8	80.5	26.9	120.1	48.9	106.9	41.6	9.29	2.72	15.45	4.53
						2	[0.13]	2.13	6.35	1.32	3.93	77.7	25.4	85.3	29.6	127.7	53.2	119.6	48.7	12.38	3.63	20.59	6.03
			2Row	0.38	95.3	3	[0.19]	4.33	12.95	2.66	7.95	78.9	26.0	87.3	30.7	130.7	54.8	124.6	51.4	13.69	4.01	22.77	6.67
						4	[0.25]	7.28	21.75	4.44	13.28	79.6	26.4	88.5	31.4	132.5	55.9	127.6	53.1	14.48	4.24	24.08	7.06
						5	[0.32]	11.64	34.78	7.07	21.14	80.3	26.8	89.6	32.0	133.9	56.6	129.8	54.3	15.23	4.46	25.32	7.42

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Model TSS-W · Size 12

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]	(IN.W.G.)		[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[℃]	°F	[℃]	°F	[℃]	°F	[℃]	MBH	[kW]	MBH	[kW]
400	680	189	1Row	0.01	5.2	0.5	[0.03]	0.13	0.40	0.10	0.30	82.2	27.9	90.8	32.7	110.3	43.5	94.4	34.7	6.93	2.03	10.62	3.11
						1	[0.06]	0.55	1.65	0.35	1.04	87.7	30.9	99.1	37.3	120.1	48.9	109.5	43.1	9.28	2.72	14.22	4.17
						2	[0.13]	2.30	6.87	1.43	4.27	91.2	32.9	104.5	40.3	129.3	54.1	123.6	50.9	10.81	3.17	16.56	4.85
			2Row	0.05	12.4	3	[0.19]	4.68	13.97	2.88	8.61	92.5	33.6	106.5	41.4	132.3	55.7	128.2	53.4	11.37	3.33	17.42	5.10
						4	[0.25]	7.84	23.43	4.81	14.36	93.1	33.9	107.4	41.9	134.0	56.7	130.8	54.9	11.62	3.40	17.80	5.22
						5	[0.32]	12.52	37.40	7.64	22.82	93.8	34.3	108.5	42.5	135.2	57.3	132.6	55.9	11.93	3.50	18.28	5.36
550	935	260	1Row	0.04	8.8	0.5	[0.03]	0.13	0.40	0.10	0.30	78.5	25.8	85.4	29.7	108.7	42.6	91.0	32.8	7.30	2.14	11.42	3.35
						1	[0.06]	0.55	1.65	0.35	1.04	83.1	28.4	92.6	33.7	118.5	48.1	106.4	41.3	10.02	2.93	15.68	4.60
						2	[0.13]	2.30	6.87	1.43	4.27	86.5	30.3	98.0	36.7	128.1	53.4	121.3	49.6	12.06	3.53	18.89	5.53
			2Row	0.09	21.2	3	[0.19]	4.68	13.97	2.88	8.61	87.9	31.1	100.2	37.9	131.3	55.1	126.3	52.4	12.91	3.78	20.22	5.92
						4	[0.25]	7.84	23.43	4.81	14.36	88.6	31.4	101.3	38.5	133.2	56.2	129.3	54.0	13.30	3.90	20.83	6.10
						5	[0.32]	12.52	37.40	7.64	22.82	89.3	31.8	102.4	39.1	134.5	56.9	131.4	55.2	13.73	4.02	21.49	6.30
700	1190	331	1Row	0.05	13.3	0.5	[0.03]	0.13	0.40	0.10	0.30	76.1	24.5	82.0	27.8	107.8	42.1	88.8	31.5	7.50	2.20	11.94	3.50
						1	[0.06]	0.55	1.65	0.35	1.04	80.3	26.8	88.6	31.4	117.2	47.3	103.7	39.8	10.64	3.12	16.94	4.96
						2	[0.13]	2.30	6.87	1.43	4.27	83.8	28.8	94.2	34.5	126.8	52.7	119.1	48.4	13.29	3.89	21.15	6.20
			2Row	0.13	32	3	[0.19]	4.68	13.97	2.88	8.61	84.9	29.4	96.0	35.6	130.4	54.7	124.7	51.5	14.16	4.15	22.54	6.60
						4	[0.25]	7.84	23.43	4.81	14.36	85.7	29.8	97.3	36.3	132.4	55.8	127.9	53.3	14.75	4.32	23.48	6.88
						5	[0.32]	12.52	37.40	7.64	22.82	86.4	30.2	98.3	36.9	133.9	56.6	130.2	54.6	15.27	4.47	24.30	7.12
850	1445	401	1Row	0.07	18.5	0.5	[0.03]	0.13	0.40	0.10	0.30	74.6	23.7	79.8	26.6	106.8	41.5	86.4	30.2	7.75	2.27	12.50	3.66
						1	[0.06]	0.55	1.65	0.35	1.04	78.4	25.8	85.8	29.9	116.0	46.7	101.3	38.5	11.17	3.27	18.03	5.28
						2	[0.13]	2.30	6.87	1.43	4.27	81.7	27.6	91.2	32.9	125.9	52.2	117.3	47.4	14.23	4.17	22.96	6.73
			2Row	0.18	44.5	3	[0.19]	4.68	13.97	2.88	8.61	82.9	28.3	93.2	34.0	129.6	54.2	123.2	50.7	15.36	4.50	24.77	7.26
						4	[0.25]	7.84	23.43	4.81	14.36	83.6	28.7	94.3	34.6	131.8	55.4	126.7	52.6	15.97	4.68	25.76	7.55
						5	[0.32]	12.52	37.40	7.64	22.82	84.3	29.1	95.4	35.2	133.3	56.3	129.2	54.0	16.63	4.87	26.82	7.86
1000	1700	472	1Row	0.10	24.4	0.5	[0.03]	0.13	0.40	0.10	0.30	73.5	23.1	78.1	25.6	106.2	41.2	84.8	29.3	7.89	2.31	12.86	3.77
						1	[0.06]	0.55	1.65	0.35	1.04	77.0	25.0	83.8	28.8	114.9	46.1	99.1	37.3	11.68	3.42	19.05	5.58
						2	[0.13]	2.30	6.87	1.43	4.27	80.2	26.8	89.0	31.7	125.0	51.7	115.6	46.4	15.12	4.43	24.66	7.23
			2Row	0.24	58.6	3	[0.19]	4.68	13.97	2.88	8.61	81.4	27.4	91.0	32.8	128.9	53.8	121.9	49.9	16.42	4.81	26.78	7.85
						4	[0.25]	7.84	23.43	4.81	14.36	82.1	27.8	92.1	33.4	131.2	55.1	125.6	52.0	17.14	5.02	27.96	8.19
						5	[0.32]	12.52	37.40	7.64	22.82	82.7	28.2	93.2	34.0	132.8	56.0	128.3	53.5	17.86	5.23	29.14	8.54
1150	1955	543	1Row	0.12	31	0.5	[0.03]	0.13	0.40	0.10	0.30	72.6	22.5	76.7	24.8	106.1	41.2	84.2	29.0	7.90	2.32	13.01	3.81
						1	[0.06]	0.55	1.65	0.35	1.04	75.8	24.3	82.0	27.8	114.4	45.8	97.9	36.6	11.93	3.50	19.65	5.76
						2	[0.13]	2.30	6.87	1.43	4.27	78.9	26.1	87.1	30.6	124.4	51.3	114.3	45.7	15.78	4.62	25.99	7.61
			2Row	0.30	74.3	3	[0.19]	4.68	13.97	2.88	8.61	80.1	26.7	89.1	31.7	128.3	53.5	120.7	49.3	17.28	5.06	28.45	8.34
						4	[0.25]	7.84	23.43	4.81	14.36	80.8	27.1	90.3	32.4	130.6	54.8	124.6	51.4	18.17	5.32	29.91	8.77
						5	[0.32]	12.52	37.40	7.64	22.82	81.5	27.5	91.4	33.0	132.4	55.8	127.4	53.0	19.00	5.57	31.28	9.17
1300	2210	614	1Row	0.15	38.1	0.5	[0.03]	0.13	0.40	0.10	0.30	71.9	22.2	75.7	24.3	105.7	40.9	83.0	28.3	8.00	2.34	13.29	3.89
						1	[0.06]	0.55	1.65	0.35	1.04	74.9	23.8	80.6	27.0	113.8	45.5	96.6	35.9	12.19	3.57	20.24	5.93
						2	[0.13]	2.30	6.87	1.43	4.27	77.9	25.5	85.6	29.8	123.7	51.0	113.0	45.0	16.42	4.81	27.27	7.99
			2Row	0.37	91.5	3	[0.19]	4.68	13.97	2.88	8.61	79.1	26.2	87.6	30.9	127.7	53.2	119.6	48.7	18.11	5.31	30.07	8.81
						4	[0.25]	7.84	23.43	4.81	14.36	79.8	26.5	88.7	31.5	130.2	54.6	123.7	51.0	19.05	5.58	31.63	9.27
						5	[0.32]	12.52	37.40	7.64	22.82	80.5	26.9	89.9	32.2	131.9	55.5	126.6	52.6	20.05	5.88	33.30	9.76
1450	2465	685	1Row	0.18	45.9	0.5	[0.03]	0.13	0.40	0.10	0.30	71.4	21.9	74.9	23.8	105.1	40.6	81.6	27.5	8.14	2.39	13.62	3.99
						1	[0.06]	0.55	1.65	0.35	1.04	74.4	23.6	79.9	26.6	112.5	44.7	93.9	34.4	12.84	3.76	21.47	6.29
						2	[0.13]	2.30	6.87	1.43	4.27	77.1	25.1	84.5	29.2	123.1	50.6	111.7	44.3	17.11	5.01	28.62	8.38
			2Row	0.44	110.2	3	[0.19]	4.68	13.97	2.88	8.61	78.3	25.7	86.4	30.2	127.2	52.9	118.6	48.1	18.92	5.54	31.64	9.27
						4	[0.25]	7.84	23.43	4.81	14.36	79.0	26.1	87.6	30.9	129.7	54.3	122.8	50.4	20.01	5.86	33.47	9.81
						5	[0.32]	12.52	37.40	7.64	22.82	79.6	26.5	88.7	31.5	131.5	55.3	125.8	52.1	21.04	6.17	35.20	10.31

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Model TSS-W · Size 14

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]	(IN.W.G.)		[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[℃]	°F	[℃]	°F	[℃]	°F	[℃]	MBH	[kW]	MBH	[kW]
700	1190	331	1Row	0.01	7.3	0.5	[0.03]	0.09	0.27	0.17	0.52	77.3	25.1	83.4	28.6	104.1	40.1	84.2	29.0	8.37	2.45	13.00	3.81
						1	[0.06]	0.31	0.92	0.61	1.81	84.2	29.0	94.1	34.5	110.8	43.8	94.7	34.8	13.60	3.98	21.13	6.19
						2	[0.13]	1.26	3.76	2.46	7.35	88.0	31.1	100.1	37.9	123.7	50.9	114.6	45.9	16.52	4.84	25.66	7.52
			2Row	0.07	17.4	3	[0.19]	2.53	7.56	4.94	14.76	89.5	31.9	102.4	39.1	128.1	53.4	121.5	49.7	17.62	5.16	27.37	8.02
						4	[0.25]	4.21	12.58	8.21	24.54	90.1	32.3	103.4	39.7	130.7	54.8	125.5	52.0	18.09	5.30	28.11	8.24
						5	[0.32]	6.67	19.94	13.01	38.86	90.9	32.7	104.5	40.3	132.5	55.8	128.4	53.5	18.65	5.46	28.97	8.49
900	1530	425	1Row	0.04	11.1	0.5	[0.03]	0.09	0.27	0.17	0.52	75.1	24.0	80.3	26.9	102.7	39.3	81.1	27.3	8.69	2.55	13.74	4.03
						1	[0.06]	0.31	0.92	0.61	1.81	81.3	27.4	90.1	32.3	108.5	42.5	90.2	32.3	14.70	4.31	23.23	6.81
						2	[0.13]	1.26	3.76	2.46	7.35	85.0	29.4	95.9	35.5	121.9	50.0	111.4	44.1	18.26	5.35	28.86	8.46
			2Row	0.11	26.7	3	[0.19]	2.53	7.56	4.94	14.76	86.2	30.1	97.8	36.6	126.8	52.7	119.2	48.4	19.43	5.69	30.71	9.00
						4	[0.25]	4.21	12.58	8.21	24.54	87.0	30.5	99.0	37.2	129.6	54.2	123.6	50.9	20.18	5.91	31.90	9.35
						5	[0.32]	6.67	19.94	13.01	38.86	87.6	30.9	100.1	37.8	131.6	55.3	126.8	52.6	20.83	6.10	32.92	9.65
1100	1870	519	1Row	0.06	15.6	0.5	[0.03]	0.09	0.27	0.17	0.52	73.6	23.1	78.1	25.6	102.3	39.1	79.6	26.4	8.79	2.57	14.08	4.13
						1	[0.06]	0.31	0.92	0.61	1.81	79.1	26.2	86.9	30.5	107.1	41.7	87.3	30.7	15.34	4.50	24.58	7.20
						2	[0.13]	1.26	3.76	2.46	7.35	82.8	28.2	92.7	33.7	120.5	49.2	108.8	42.7	19.68	5.77	31.53	9.24
			2Row	0.15	37.5	3	[0.19]	2.53	7.56	4.94	14.76	83.9	28.8	94.6	34.8	125.7	52.1	117.2	47.3	21.04	6.17	33.71	9.88
						4	[0.25]	4.21	12.58	8.21	24.54	84.7	29.3	95.8	35.4	128.7	53.7	121.9	50.0	21.93	6.43	35.14	10.29
						5	[0.32]	6.67	19.94	13.01	38.86	85.4	29.6	96.9	36.0	130.8	54.9	125.3	51.9	22.76	6.67	36.46	10.68
1300	2210	614	1Row	0.08	20.8	0.5	[0.03]	0.09	0.27	0.17	0.52	72.6	22.6	76.6	24.8	101.3	38.5	77.3	25.2	9.02	2.64	14.62	4.28
						1	[0.06]	0.31	0.92	0.61	1.81	77.5	25.3	84.5	29.2	106.0	41.1	84.9	29.4	15.85	4.64	25.68	7.52
						2	[0.13]	1.26	3.76	2.46	7.35	81.1	27.3	90.3	32.4	119.3	48.5	106.5	41.4	20.91	6.13	33.88	9.93
			2Row	0.20	49.8	3	[0.19]	2.53	7.56	4.94	14.76	82.3	28.0	92.3	33.5	124.7	51.5	115.2	46.2	22.63	6.63	36.67	10.74
						4	[0.25]	4.21	12.58	8.21	24.54	82.9	28.3	93.3	34.1	127.9	53.3	120.4	49.1	23.51	6.89	38.09	11.16
						5	[0.32]	6.67	19.94	13.01	38.86	83.6	28.7	94.5	34.7	130.1	54.5	124.0	51.1	24.49	7.18	39.69	11.63
1500	2550	708	1Row	0.11	26.4	0.5	[0.03]	0.09	0.27	0.17	0.52	71.7	22.1	75.2	24.0	101.7	38.7	77.3	25.2	8.93	2.62	14.62	4.28
						1	[0.06]	0.31	0.92	0.61	1.81	76.1	24.5	82.4	28.0	105.7	40.9	83.8	28.8	16.01	4.69	26.20	7.68
						2	[0.13]	1.26	3.76	2.46	7.35	79.8	26.5	88.4	31.3	118.3	47.9	104.4	40.2	21.97	6.44	35.94	10.53
			2Row	0.25	63.4	3	[0.19]	2.53	7.56	4.94	14.76	80.9	27.2	90.3	32.4	123.8	51.0	113.6	45.3	23.85	6.99	39.02	11.43
						4	[0.25]	4.21	12.58	8.21	24.54	81.7	27.6	91.5	33.1	127.1	52.8	118.9	48.3	25.05	7.34	40.98	12.01
						5	[0.32]	6.67	19.94	13.01	38.86	82.3	27.9	92.5	33.6	129.5	54.2	122.8	50.5	26.09	7.64	42.69	12.51
1700	2890	803	1Row	0.13	32.7	0.5	[0.03]	0.09	0.27	0.17	0.52	71.1	21.7	74.4	23.5	101.0	38.3	75.7	24.3	9.09	2.66	15.00	4.39
						1	[0.06]	0.31	0.92	0.61	1.81	75.2	24.0	81.0	27.2	104.7	40.4	81.7	27.6	16.46	4.82	27.17	7.96
						2	[0.13]	1.26	3.76	2.46	7.35	78.6	25.9	86.7	30.4	117.4	47.5	102.8	39.3	22.80	6.68	37.63	11.02
			2Row	0.32	78.5	3	[0.19]	2.53	7.56	4.94	14.76	79.8	26.6	88.7	31.5	123.0	50.6	112.0	44.5	25.03	7.33	41.31	12.10
						4	[0.25]	4.21	12.58	8.21	24.54	80.5	27.0	89.9	32.1	126.4	52.5	117.6	47.6	26.33	7.71	43.45	12.73
						5	[0.32]	6.67	19.94	13.01	38.86	81.2	27.3	91.0	32.8	128.9	53.8	121.7	49.8	27.57	8.08	45.50	13.33
1900	3230	897	1Row	0.16	39.5	0.5	[0.03]	0.09	0.27	0.17	0.52	70.7	21.5	73.7	23.2	100.4	38.0	74.1	23.4	9.24	2.71	15.37	4.50
						1	[0.06]	0.31	0.92	0.61	1.81	74.3	23.5	79.8	26.5	104.1	40.1	80.4	26.9	16.72	4.90	27.81	8.15
						2	[0.13]	1.26	3.76	2.46	7.35	77.8	25.4	85.4	29.7	116.5	47.0	101.0	38.3	23.71	6.95	39.43	11.55
			2Row	0.38	94.8	3	[0.19]	2.53	7.56	4.94	14.76	78.9	26.1	87.4	30.8	122.3	50.2	110.6	43.6	26.14	7.66	43.48	12.74
						4	[0.25]	4.21	12.58	8.21	24.54	79.6	26.4	88.5	31.4	125.8	52.1	116.5	46.9	27.51	8.06	45.74	13.40
						5	[0.32]	6.67	19.94	13.01	38.86	80.3	26.8	89.7	32.0	128.4	53.5	120.6	49.2	28.95	8.48	48.15	14.11
2100	3570	992	1Row	0.19	46.8	0.5	[0.03]	0.09	0.27	0.17	0.52	70.3	21.3	73.0	22.8	100.3	38.0	73.6	23.1	9.25	2.71	15.49	4.54
						1	[0.06]	0.31	0.92	0.61	1.81	73.7	23.2	78.7	26.0	103.6	39.8	79.0	26.1	16.98	4.98	28.43	8.33
						2	[0.13]	1.26	3.76	2.46	7.35	77.0	25.0	84.4	29.1	115.6	46.5	99.2	37.3	24.60	7.21	41.19	12.07
			2Row	0.45	112.4	3	[0.19]	2.53	7.56	4.94	14.76	78.2	25.7	86.3	30.2	121.6	49.8	109.2	42.9	27.20	7.97	45.54	13.34
						4	[0.25]	4.21	12.58	8.21	24.54	78.9	26.0	87.4	30.8	125.2	51.8	115.2	46.2	28.78	8.43	48.18	14.12
						5	[0.32]	6.67	19.94	13.01	38.86	79.5	26.4	88.5	31.4	127.8	53.2	119.6	48.7	30.26	8.87	50.66	14.84

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Model TSS-W · Size 16

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]	(IN.W.G.)		[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[℃]	°F	[℃]	°F	[℃]	°F	[℃]	MBH	[kW]	MBH	[kW]
1600	2720	756	1Row	0.01	21.6	0.5	[0.03]	0.10	0.31	0.20	0.60	71.6	22.0	74.9	23.8	100.2	37.9	75.4	24.1	9.27	2.72	15.05	4.41
						1	[0.06]	0.35	1.06	0.70	2.08	75.7	24.3	81.7	27.6	104.6	40.3	82.6	28.1	16.50	4.83	26.78	7.85
						2	[0.13]	1.43	4.28	2.81	8.39	81.0	27.2	90.3	32.4	114.6	45.9	98.8	37.1	25.66	7.52	41.65	12.20
			2Row	0.21	51.8	3	[0.19]	2.87	8.57	5.62	16.79	82.1	27.8	92.0	33.3	121.4	49.7	109.8	43.2	27.47	8.05	44.59	13.06
						4	[0.25]	4.76	14.23	9.32	27.84	82.8	28.2	93.1	33.9	125.3	51.8	116.1	46.7	28.63	8.39	46.47	13.62
						5	[0.32]	7.53	22.51	14.73	44.01	83.4	28.6	94.1	34.5	128.0	53.4	120.6	49.2	29.73	8.71	48.26	14.14
1800	3060	850	1Row	0.11	26.4	0.5	[0.03]	0.10	0.31	0.20	0.60	71.0	21.7	74.0	23.3	100.2	37.9	74.8	23.8	9.29	2.72	15.19	4.45
						1	[0.06]	0.35	1.06	0.70	2.08	74.8	23.8	80.3	26.8	104.0	40.0	81.1	27.3	16.77	4.91	27.45	8.04
						2	[0.13]	1.43	4.28	2.81	8.39	80.0	26.6	88.7	31.5	113.5	45.3	96.6	35.9	26.77	7.84	43.80	12.83
			2Row	0.25	63.3	3	[0.19]	2.87	8.57	5.62	16.79	81.1	27.3	90.5	32.5	120.4	49.1	107.9	42.2	28.93	8.48	47.33	13.87
						4	[0.25]	4.76	14.23	9.32	27.84	81.7	27.6	91.5	33.1	124.5	51.4	114.7	45.9	30.07	8.81	49.20	14.42
						5	[0.32]	7.53	22.51	14.73	44.01	82.3	27.9	92.6	33.6	127.4	53.0	119.4	48.6	31.32	9.18	51.24	15.01
2000	3400	944	1Row	0.13	31.5	0.5	[0.03]	0.10	0.31	0.20	0.60	70.5	21.4	73.3	23.0	99.9	37.7	74.0	23.3	9.34	2.74	15.39	4.51
						1	[0.06]	0.35	1.06	0.70	2.08	74.1	23.4	79.2	26.2	103.5	39.7	79.9	26.6	17.00	4.98	28.02	8.21
						2	[0.13]	1.43	4.28	2.81	8.39	79.1	26.2	87.4	30.8	112.5	44.7	94.6	34.8	27.81	8.15	45.83	13.43
			2Row	0.30	75.7	3	[0.19]	2.87	8.57	5.62	16.79	80.2	26.8	89.2	31.8	119.6	48.6	106.3	41.3	30.19	8.85	49.75	14.58
						4	[0.25]	4.76	14.23	9.32	27.84	80.8	27.1	90.2	32.3	123.8	51.0	113.3	45.2	31.47	9.22	51.87	15.20
						5	[0.32]	7.53	22.51	14.73	44.01	81.4	27.4	91.2	32.9	126.8	52.7	118.3	47.9	32.81	9.61	54.07	15.84
2200	3740	1039	1Row	0.15	37.1	0.5	[0.03]	0.10	0.31	0.20	0.60	70.1	21.2	72.7	22.6	100.0	37.8	73.6	23.1	9.33	2.73	15.47	4.53
						1	[0.06]	0.35	1.06	0.70	2.08	73.4	23.0	78.2	25.7	103.2	39.6	79.0	26.1	17.16	5.03	28.46	8.34
						2	[0.13]	1.43	4.28	2.81	8.39	78.3	25.7	86.3	30.1	111.5	44.2	92.8	33.8	28.74	8.42	47.68	13.97
			2Row	0.36	89	3	[0.19]	2.87	8.57	5.62	16.79	79.3	26.3	88.0	31.1	118.8	48.2	104.9	40.5	31.25	9.16	51.83	15.19
						4	[0.25]	4.76	14.23	9.32	27.84	80.0	26.7	89.1	31.7	123.1	50.6	112.0	44.4	32.82	9.62	54.45	15.95
						5	[0.32]	7.53	22.51	14.73	44.01	80.6	27.0	90.1	32.3	126.2	52.4	117.2	47.3	34.21	10.02	56.75	16.63
2400	4080	1133	1Row	0.17	43	0.5	[0.03]	0.10	0.31	0.20	0.60	69.8	21.0	72.2	22.3	100.2	37.9	73.6	23.1	9.27	2.72	15.47	4.53
						1	[0.06]	0.35	1.06	0.70	2.08	72.9	22.7	77.4	25.2	102.8	39.3	78.0	25.5	17.33	5.08	28.92	8.47
						2	[0.13]	1.43	4.28	2.81	8.39	77.6	25.3	85.2	29.5	110.8	43.8	91.3	33.0	29.47	8.63	49.17	14.41
			2Row	0.41	103.2	3	[0.19]	2.87	8.57	5.62	16.79	78.7	25.9	87.0	30.6	118.1	47.8	103.5	39.7	32.31	9.47	53.91	15.80
						4	[0.25]	4.76	14.23	9.32	27.84	79.3	26.3	88.1	31.1	122.5	50.3	110.8	43.8	33.97	9.95	56.69	16.61
						5	[0.32]	7.53	22.51	14.73	44.01	79.9	26.6	89.1	31.7	125.7	52.1	116.1	46.7	35.55	10.42	59.32	17.38
2600	4420	1228	1Row	0.20	49.3	0.5	[0.03]	0.10	0.31	0.20	0.60	69.6	20.9	71.8	22.1	99.6	37.6	72.3	22.4	9.41	2.76	15.78	4.62
						1	[0.06]	0.35	1.06	0.70	2.08	72.4	22.5	76.6	24.8	102.6	39.2	77.2	25.1	17.44	5.11	29.26	8.57
						2	[0.13]	1.43	4.28	2.81	8.39	77.0	25.0	84.3	29.1	110.0	43.3	89.7	32.0	30.31	8.88	50.85	14.90
			2Row	0.47	118.2	3	[0.19]	2.87	8.57	5.62	16.79	78.1	25.6	86.1	30.1	117.4	47.5	102.1	38.9	33.35	9.77	55.95	16.39
						4	[0.25]	4.76	14.23	9.32	27.84	78.7	25.9	87.2	30.6	121.9	50.0	109.7	43.2	35.08	10.28	58.85	17.24
						5	[0.32]	7.53	22.51	14.73	44.01	79.3	26.3	88.2	31.2	125.2	51.8	115.2	46.2	36.83	10.79	61.79	18.10
2800	4760	1322	1Row	0.22	55.9	0.5	[0.03]	0.10	0.31	0.20	0.60	69.3	20.7	71.4	21.9	99.9	37.7	72.4	22.5	9.34	2.74	15.75	4.62
						1	[0.06]	0.35	1.06	0.70	2.08	72.0	22.2	76.0	24.5	102.3	39.0	76.4	24.6	17.60	5.16	29.67	8.69
						2	[0.13]	1.43	4.28	2.81	8.39	76.5	24.7	83.5	28.6	109.2	42.9	88.1	31.2	31.11	9.11	52.45	15.37
			2Row	0.54	134.1	3	[0.19]	2.87	8.57	5.62	16.79	77.5	25.3	85.3	29.6	116.8	47.1	100.8	38.2	34.32	10.06	57.87	16.96
						4	[0.25]	4.76	14.23	9.32	27.84	78.2	25.6	86.4	30.2	121.4	49.7	108.6	42.6	36.16	10.59	60.97	17.86
						5	[0.32]	7.53	22.51	14.73	44.01	78.8	26.0	87.4	30.8	124.7	51.5	114.2	45.7	38.05	11.15	64.16	18.80
3000	5100	1417	1Row	0.25	62.8	0.5	[0.03]	0.10	0.31	0.20	0.60	69.1	20.6	71.1	21.7	99.6	37.6	71.6	22.0	9.41	2.76	15.94	4.67
						1	[0.06]	0.35	1.06	0.70	2.08	71.7	22.0	75.5	24.1	102.0	38.9	75.7	24.3	17.71	5.19	30.00	8.79
						2	[0.13]	1.43	4.28	2.81	8.39	76.0	24.5	82.9	28.3	108.4	42.5	86.5	30.3	31.89	9.34	54.03	15.83
			2Row	0.61	150.8	3	[0.19]	2.87	8.57	5.62	16.79	77.1	25.0	84.6	29.2	116.1	46.7	99.5	37.5	35.26	10.33	59.74	17.50
						4	[0.25]	4.76	14.23	9.32	27.84	77.7	25.4	85.7	29.8	120.8	49.3	107.5	41.9	37.30	10.93	63.20	18.52
						5	[0.32]	7.53	22.51	14.73	44.01	78.3	25.7	86.7	30.4	124.2	51.2	113.3	45.2	39.23	11.49	66.45	19.47

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Model TSS-W • Size 19

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]	(IN.W.G.)		[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]	MBH	[kW]	MBH	[kW]
2300	3910	1086	1Row	0.01	27.4	0.5	[0.03]	0.12	0.37	0.10	0.29	70.0	21.1	72.5	22.5	99.1	37.3	73.0	22.8	9.54	2.79	15.63	4.58
						1	[0.06]	0.42	1.26	0.33	1.00	73.3	23.0	77.9	25.5	102.1	38.9	77.9	25.5	17.67	5.18	28.96	8.48
						2	[0.13]	1.69	5.05	1.33	3.97	79.1	26.2	87.4	30.8	108.2	42.3	87.9	31.1	32.12	9.41	52.64	15.42
			2Row	0.26	65.7	3	[0.19]	3.37	10.08	2.64	7.89	80.9	27.2	90.3	32.4	115.3	46.3	99.4	37.5	36.54	10.71	59.88	17.55
						4	[0.25]	5.59	16.69	4.35	13.01	81.5	27.5	91.3	33.0	120.4	49.1	107.9	42.2	38.08	11.16	62.41	18.29
						5	[0.32]	8.82	26.34	6.84	20.45	82.1	27.8	92.3	33.5	124.1	51.2	114.0	45.5	39.51	11.58	64.75	18.97
2600	4420	1228	1Row	0.14	33.7	0.5	[0.03]	0.12	0.37	0.10	0.29	69.6	20.9	71.8	22.1	99.1	37.3	72.5	22.5	9.52	2.79	15.74	4.61
						1	[0.06]	0.42	1.26	0.33	1.00	72.5	22.5	76.6	24.8	102.1	39.0	77.4	25.2	17.66	5.17	29.18	8.55
						2	[0.13]	1.69	5.05	1.33	3.97	77.9	25.5	85.5	29.7	107.5	41.9	86.3	30.2	32.85	9.62	54.28	15.90
			2Row	0.32	80.9	3	[0.19]	3.37	10.08	2.64	7.89	79.9	26.6	88.9	31.6	113.9	45.5	96.9	36.1	38.52	11.29	63.65	18.65
						4	[0.25]	5.59	16.69	4.35	13.01	80.5	26.9	89.8	32.1	119.4	48.5	105.9	41.1	40.06	11.74	66.20	19.40
						5	[0.32]	8.82	26.34	6.84	20.45	81.1	27.3	90.7	32.6	123.2	50.7	112.3	44.6	41.71	12.22	68.92	20.19
2900	4930	1369	1Row	0.16	40.6	0.5	[0.03]	0.12	0.37	0.10	0.29	69.3	20.7	71.3	21.8	98.8	37.1	71.4	21.9	9.61	2.82	16.00	4.69
						1	[0.06]	0.42	1.26	0.33	1.00	71.9	22.2	75.7	24.3	101.7	38.7	76.2	24.6	17.85	5.23	29.72	8.71
						2	[0.13]	1.69	5.05	1.33	3.97	77.0	25.0	84.2	29.0	106.5	41.4	84.3	29.1	33.80	9.90	56.27	16.49
			2Row	0.39	97.4	3	[0.19]	3.37	10.08	2.64	7.89	79.1	26.2	87.6	30.9	112.7	44.8	94.5	34.7	40.33	11.82	67.14	19.67
						4	[0.25]	5.59	16.69	4.35	13.01	79.6	26.4	88.5	31.4	118.4	48.0	104.0	40.0	41.98	12.30	69.89	20.48
						5	[0.32]	8.82	26.34	6.84	20.45	80.2	26.8	89.5	31.9	122.4	50.2	110.7	43.7	43.76	12.82	72.86	21.35
3200	5440	1511	1Row	0.19	48	0.5	[0.03]	0.12	0.37	0.10	0.29	69.0	20.5	70.8	21.6	98.9	37.2	71.1	21.7	9.59	2.81	16.07	4.71
						1	[0.06]	0.42	1.26	0.33	1.00	71.4	21.9	74.9	23.9	101.4	38.5	75.3	24.0	18.01	5.28	30.19	8.84
						2	[0.13]	1.69	5.05	1.33	3.97	76.1	24.5	82.8	28.2	106.1	41.2	83.2	28.4	34.25	10.04	57.40	16.82
			2Row	0.46	115.2	3	[0.19]	3.37	10.08	2.64	7.89	78.3	25.7	86.5	30.3	111.7	44.3	92.6	33.7	41.77	12.24	70.01	20.51
						4	[0.25]	5.59	16.69	4.35	13.01	78.9	26.1	87.5	30.8	117.4	47.5	102.1	39.0	43.88	12.86	73.54	21.55
						5	[0.32]	8.82	26.34	6.84	20.45	79.4	26.3	88.4	31.3	121.6	49.8	109.2	42.9	45.70	13.39	76.60	22.44
3500	5950	1653	1Row	0.22	55.9	0.5	[0.03]	0.12	0.37	0.10	0.29	68.7	20.4	70.4	21.4	99.3	37.4	71.3	21.8	9.49	2.78	16.01	4.69
						1	[0.06]	0.42	1.26	0.33	1.00	70.9	21.6	74.2	23.4	101.6	38.7	75.2	24.0	17.92	5.25	30.21	8.85
						2	[0.13]	1.69	5.05	1.33	3.97	75.4	24.1	81.7	27.6	105.6	40.9	82.0	27.8	34.76	10.18	58.61	17.17
			2Row	0.54	134.1	3	[0.19]	3.37	10.08	2.64	7.89	77.6	25.4	85.5	29.7	110.7	43.7	90.6	32.6	43.24	12.67	72.92	21.37
						4	[0.25]	5.59	16.69	4.35	13.01	78.2	25.7	86.5	30.3	116.6	47.0	100.5	38.1	45.47	13.32	76.67	22.46
						5	[0.32]	8.82	26.34	6.84	20.45	78.8	26.0	87.4	30.8	120.9	49.4	107.8	42.1	47.55	13.93	80.18	23.49
3800	6460	1794	1Row	0.26	64.3	0.5	[0.03]	0.12	0.37	0.10	0.29	68.5	20.3	70.2	21.2	98.8	37.1	70.2	21.2	9.60	2.81	16.27	4.77
						1	[0.06]	0.42	1.26	0.33	1.00	70.6	21.5	73.7	23.2	101.0	38.3	73.8	23.2	18.19	5.33	30.85	9.04
						2	[0.13]	1.69	5.05	1.33	3.97	74.7	23.7	80.6	27.0	105.5	40.8	81.4	27.5	34.89	10.22	59.17	17.34
			2Row	0.62	154.2	3	[0.19]	3.37	10.08	2.64	7.89	77.1	25.0	84.6	29.2	109.8	43.2	88.7	31.5	44.64	13.08	75.70	22.18
						4	[0.25]	5.59	16.69	4.35	13.01	77.6	25.4	85.6	29.8	115.8	46.6	99.0	37.2	46.96	13.76	79.63	23.33
						5	[0.32]	8.82	26.34	6.84	20.45	78.2	25.7	86.6	30.3	120.2	49.0	106.4	41.3	49.30	14.45	83.60	24.50
4100	6970	1936	1Row	0.29	73.1	0.5	[0.03]	0.12	0.37	0.10	0.29	68.3	20.2	69.9	21.0	99.3	37.4	70.6	21.5	9.49	2.78	16.17	4.74
						1	[0.06]	0.42	1.26	0.33	1.00	70.3	21.3	73.1	22.8	101.4	38.6	74.2	23.5	17.99	5.27	30.67	8.99
						2	[0.13]	1.69	5.05	1.33	3.97	74.2	23.4	79.8	26.6	104.9	40.5	80.2	26.8	35.42	10.38	60.38	17.69
			2Row	0.70	175.5	3	[0.19]	3.37	10.08	2.64	7.89	76.6	24.8	83.9	28.8	108.9	42.7	86.9	30.5	45.98	13.47	78.38	22.97
						4	[0.25]	5.59	16.69	4.35	13.01	77.1	25.1	84.8	29.4	115.1	46.1	97.5	36.4	48.44	14.19	82.57	24.19
						5	[0.32]	8.82	26.34	6.84	20.45	77.7	25.4	85.8	29.9	119.5	48.6	105.1	40.6	50.98	14.94	86.90	25.46
4400	7480	2078	1Row	0.33	82.5	0.5	[0.03]	0.12	0.37	0.10	0.29	68.2	20.1	69.6	20.9	99.0	37.2	69.7	21.0	9.57	2.80	16.38	4.80
						1	[0.06]	0.42	1.26	0.33	1.00	70.0	21.1	72.8	22.7	100.8	38.2	72.8	22.7	18.29	5.36	31.32	9.18
						2	[0.13]	1.69	5.05	1.33	3.97	73.7	23.1	79.0	26.1	104.9	40.5	79.8	26.6	35.49	10.40	60.78	17.81
			2Row	0.79	197.9	3	[0.19]	3.37	10.08	2.64	7.89	76.1	24.5	83.2	28.5	108.0	42.2	85.2	29.5	47.28	13.85	80.98	23.73
						4	[0.25]	5.59	16.69	4.35	13.01	76.7	24.8	84.2	29.0	114.3	45.7	95.9	35.5	50.01	14.65	85.66	25.10
						5	[0.32]	8.82	26.34	6.84	20.45	77.3	25.1	85.2	29.5	118.9	48.3	103.8	39.9	52.59	15.41	90.08	26.39

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

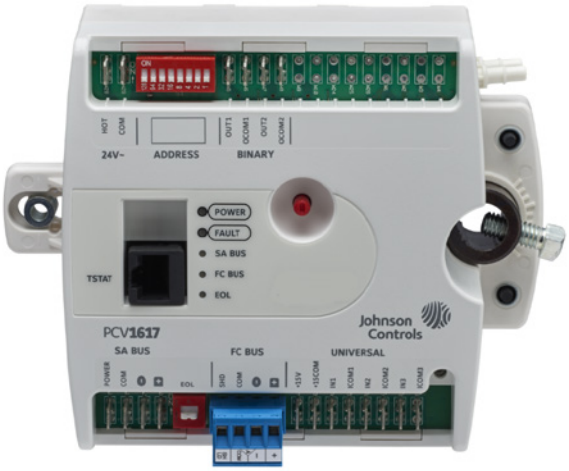
Model TSS-W • Size 22

Airflow			Air PD			Water Flow		Water PD				LAT				LWT				Capacity			
CFM	[CMH]	[L/S]	(IN.W.G.)		[Pa]	GPM	[L/s]	1 Row		2 Row		1 Row		2 Row		1 Row		2 Row		1 Row		2 Row	
								(FT.W.G.)	[kPa]	(FT.W.G.)	[kPa]	°F	[°C]	°F	[°C]	°F	[°C]	°F	[°C]	MBH	[kW]	MBH	[kW]
3100	5270	1464	1Row	0.01	36.7	0.5	[0.03]	0.14	0.41	0.11	0.33	69.0	20.5	70.8	21.6	100.0	37.8	73.6	23.1	9.34	2.74	15.48	4.54
						1	[0.06]	0.47	1.39	0.37	1.11	71.6	22.0	75.1	23.9	101.5	38.6	76.1	24.5	17.96	5.26	29.79	8.73
						2	[0.13]	1.86	5.57	1.47	4.39	76.4	24.7	83.2	28.4	106.1	41.1	83.7	28.7	34.28	10.05	56.85	16.66
			2Row	0.35	88.1	3	[0.19]	3.71	11.10	2.91	8.70	79.6	26.4	88.3	31.3	109.7	43.2	89.8	32.1	44.71	13.10	74.14	21.72
						4	[0.25]	6.14	18.34	4.80	14.33	80.1	26.7	89.3	31.8	116.0	46.7	100.2	37.9	46.60	13.65	77.27	22.64
						5	[0.32]	9.68	28.92	7.53	22.50	80.6	27.0	90.1	32.3	120.6	49.2	107.8	42.1	48.35	14.17	80.17	23.49
3500	5950	1653	1Row	0.18	45.1	0.5	[0.03]	0.14	0.41	0.11	0.33	68.7	20.4	70.4	21.3	99.2	37.3	71.8	22.1	9.51	2.79	15.90	4.66
						1	[0.06]	0.47	1.39	0.37	1.11	71.0	21.7	74.2	23.5	101.0	38.4	74.9	23.8	18.17	5.32	30.37	8.90
						2	[0.13]	1.86	5.57	1.47	4.39	75.4	24.1	81.6	27.6	105.4	40.8	82.2	27.9	34.93	10.23	58.40	17.11
			2Row	0.43	108.3	3	[0.19]	3.71	11.10	2.91	8.70	78.5	25.9	86.8	30.5	108.4	42.5	87.2	30.7	46.63	13.66	77.97	22.84
						4	[0.25]	6.14	18.34	4.80	14.33	79.2	26.2	87.9	31.0	114.8	46.0	97.8	36.6	48.99	14.35	81.91	24.00
						5	[0.32]	9.68	28.92	7.53	22.50	79.7	26.5	88.8	31.5	119.5	48.6	105.7	40.9	51.01	14.94	85.28	24.99
3900	6630	1842	1Row	0.22	54.2	0.5	[0.03]	0.14	0.41	0.11	0.33	68.5	20.3	70.0	21.1	99.0	37.2	71.0	21.6	9.56	2.80	16.10	4.72
						1	[0.06]	0.47	1.39	0.37	1.11	70.5	21.4	73.5	23.1	100.8	38.2	74.0	23.3	18.28	5.36	30.78	9.02
						2	[0.13]	1.86	5.57	1.47	4.39	74.6	23.7	80.4	26.9	105.0	40.5	81.0	27.2	35.39	10.37	59.61	17.47
			2Row	0.52	130.1	3	[0.19]	3.71	11.10	2.91	8.70	77.5	25.3	85.3	29.6	107.6	42.0	85.5	29.7	47.79	14.00	80.49	23.58
						4	[0.25]	6.14	18.34	4.80	14.33	78.4	25.8	86.7	30.4	113.6	45.3	95.5	35.3	51.32	15.04	86.44	25.33
						5	[0.32]	9.68	28.92	7.53	22.50	78.9	26.1	87.6	30.9	118.5	48.0	103.8	39.9	53.50	15.67	90.11	26.40
4300	7310	2031	1Row	0.26	64	0.5	[0.03]	0.14	0.41	0.11	0.33	68.3	20.1	69.7	20.9	99.0	37.2	70.5	21.4	9.56	2.80	16.21	4.75
						1	[0.06]	0.47	1.39	0.37	1.11	70.2	21.2	72.9	22.7	100.5	38.1	73.1	22.8	18.40	5.39	31.20	9.14
						2	[0.13]	1.86	5.57	1.47	4.39	73.9	23.3	79.2	26.2	104.6	40.3	80.0	26.7	35.74	10.47	60.60	17.76
			2Row	0.62	153.6	3	[0.19]	3.71	11.10	2.91	8.70	76.6	24.8	83.9	28.8	107.2	41.8	84.3	29.1	48.49	14.21	82.22	24.09
						4	[0.25]	6.14	18.34	4.80	14.33	77.7	25.4	85.8	29.9	112.4	44.7	93.2	34.0	53.62	15.71	90.91	26.64
						5	[0.32]	9.68	28.92	7.53	22.50	78.2	25.7	86.6	30.3	117.5	47.5	101.9	38.8	55.85	16.36	94.70	27.75
4700	7990	2219	1Row	0.30	74.5	0.5	[0.03]	0.14	0.41	0.11	0.33	68.1	20.0	69.4	20.8	99.6	37.5	71.0	21.7	9.42	2.76	16.07	4.71
						1	[0.06]	0.47	1.39	0.37	1.11	69.8	21.0	72.3	22.4	100.9	38.3	73.3	22.9	18.24	5.34	31.11	9.12
						2	[0.13]	1.86	5.57	1.47	4.39	73.3	23.0	78.4	25.8	104.2	40.1	78.9	26.1	36.19	10.60	61.73	18.09
			2Row	0.72	178.7	3	[0.19]	3.71	11.10	2.91	8.70	75.9	24.4	82.7	28.2	106.7	41.5	83.2	28.5	49.13	14.39	83.81	24.55
						4	[0.25]	6.14	18.34	4.80	14.33	77.1	25.1	84.9	29.4	111.4	44.1	91.2	32.9	55.54	16.27	94.75	27.76
						5	[0.32]	9.68	28.92	7.53	22.50	77.6	25.4	85.7	29.8	116.6	47.0	100.2	37.9	58.08	17.02	99.08	29.03
5100	8670	2408	1Row	0.34	85.5	0.5	[0.03]	0.14	0.41	0.11	0.33	67.9	20.0	69.2	20.6	99.2	37.3	69.9	21.1	9.52	2.79	16.33	4.79
						1	[0.06]	0.47	1.39	0.37	1.11	69.5	20.8	71.9	22.1	101.1	38.4	73.2	22.9	18.14	5.32	31.12	9.12
						2	[0.13]	1.86	5.57	1.47	4.39	72.9	22.7	77.6	25.3	103.7	39.8	77.7	25.4	36.67	10.74	62.90	18.43
			2Row	0.82	205.3	3	[0.19]	3.71	11.10	2.91	8.70	75.2	24.0	81.7	27.6	106.4	41.3	82.4	28.0	49.61	14.54	85.11	24.94
						4	[0.25]	6.14	18.34	4.80	14.33	76.6	24.8	84.1	28.9	110.5	43.6	89.4	31.9	57.35	16.80	98.38	28.82
						5	[0.32]	9.68	28.92	7.53	22.50	77.1	25.1	85.0	29.4	115.8	46.5	98.5	36.9	60.21	17.64	103.28	30.26
5500	9350	2597	1Row	0.39	97.3	0.5	[0.03]	0.14	0.41	0.11	0.33	67.8	19.9	68.9	20.5	99.8	37.7	70.7	21.5	9.37	2.74	16.15	4.73
						1	[0.06]	0.47	1.39	0.37	1.11	69.3	20.7	71.5	21.9	101.0	38.3	72.8	22.6	18.18	5.33	31.35	9.19
						2	[0.13]	1.86	5.57	1.47	4.39	72.4	22.4	76.8	24.9	103.7	39.9	77.5	25.3	36.64	10.74	63.17	18.51
			2Row	0.94	233.4	3	[0.19]	3.71	11.10	2.91	8.70	74.7	23.7	80.9	27.1	105.8	41.0	81.0	27.2	50.53	14.81	87.13	25.53
						4	[0.25]	6.14	18.34	4.80	14.33	76.2	24.5	83.4	28.5	109.6	43.1	87.5	30.8	59.15	17.33	101.99	29.88
						5	[0.32]	9.68	28.92	7.53	22.50	76.7	24.8	84.3	29.0	115.0	46.1	96.8	36.0	62.25	18.24	107.33	31.45
5900	10030	2786	1Row	0.44	109.6	0.5	[0.03]	0.14	0.41	0.11	0.33	67.6	19.8	68.7	20.4	100.6	38.1	71.7	22.0	9.19	2.69	15.93	4.67
						1	[0.06]	0.47	1.39	0.37	1.11	69.1	20.6	71.2	21.8	100.5	38.1	71.6	22.0	18.41	5.39	31.89	9.34
						2	[0.13]	1.86	5.57	1.47	4.39	72.0	22.2	76.3	24.6	103.3	39.6	76.4	24.7	37.06	10.86	64.21	18.81
			2Row	1.06	263	3	[0.19]	3.71	11.10	2.91	8.70	74.2	23.4	80.0	26.7	105.6	40.9	80.4	26.9	50.79	14.88	88.00	25.78
						4	[0.25]	6.14	18.34	4.80	14.33	75.8	24.3	82.8	28.2	108.6	42.5	85.5	29.7	61.06	17.89	105.78	30.99
						5	[0.32]	9.68	28.92	7.53	22.50	76.3	24.6	83.7	28.7	114.2	45.7	95.3	35.1	64.21	18.81	111.23	32.59

Data is based on 140°F[60°C] entering water and 66.2°F[19°C] entering air temperature at sea level. Please contact your Johnson Controls representative for other conditions data.

Johnson Controls DDC

PCV1617/1632 Series Controllers



DESCRIPTION

PCV16s are programmable digital controllers tailored for VAV applications that communicate via the BACnet Master-Slave/Token-Passing (MS/TP) protocol. The PCV16s controllers feature an integral digital pressure sensor, an integral damper actuator, and a 32-bit microprocessor. The controllers' small package size facilitates quick field installation and efficient use of space, while not compromising high-tech control performance. The PCV16s controllers connect easily to the NS Series Network Sensors for zone and discharge air temperature sensing.

These features make the PCV16s the product of choice for VAV systems. The wide variety of network sensor models provides options for measuring and displaying zone temperature, occupancy detection, duct temperature, zone humidity and dewpoint determination, carbon dioxide (CO2) level, setpoint adjustments, VAV box fan speed control, and discharge air temperatures.

FEATURES

- Standard BACnet® Protocol - Provides interoperability with other Building Automation System (BAS) products that use the widely accepted BACnet standard.
- Standard Hardware and Software Platform - Uses a common hardware design throughout the family line to support standardized wiring practices and installation workflows. Also uses a common software design to support use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.
- Mobile Access Portal (MAP) Interface - Provides an easy-to-use connection to the configuration and commissioning tool.
- Auto Tuned Control Loops - Reduce commissioning time, eliminate change-of-season re-commissioning, and reduce wear and tear on mechanical devices.
- Universal Inputs, Configurable Outputs, and Point Expansion Modules - Allow multiple signal options to provide input/output flexibility.
- Optional Local User Interface Display - Allows convenient monitoring and adjusting capabilities at the local device.
- BACnet Testing Laboratories™ (BTL) Listing - Ensures interoperability with other BTL-listed devices. BTL is a third-party agency which validates that BAS vendor products meet the BACnet industry-standard protocol.
- 32-bit microprocessor ensures optimum performance and meets industry specifications.
- BACnet Automatic Discovery support enables easy controller integration into BAS.
- Integral End-of-Line (EOL) switch enables field controller as a terminating device on the communications bus.
- Pluggable communications bus and supply power terminal blocks expedite installation and troubleshooting.
- Patented proportional adaptive control (P-Adaptive) and Pattern Recognition Adaptive Control (PRAC) technologies provide continuous loop tuning.
- Writable flash memory allows standard or customized applications to be downloaded from the Controller Configuration Tool (CCT) and enables persistent application data.
- Large product family provides a wide range of point mix to meet application requirements and allows the addition of one or more Input/Output Module (IOM)s and/or Network Sensors to provide even more I/O capacity.
- a state-of-the-art digital non-flow pressure sensor to provide 14-bit resolution with bidirectional flow operation that supports automatic correction for polarity on high- and low-pressure DP tube connections; this pressure sensor eliminates high- and low- pressure connection mistakes
- Universal Inputs that provide more low-cost sensor options
- a fast response actuator that drives the damper from full open to full closed (90˚) in 60 seconds to reduce commissioning time

Johnson Controls DDC

PCV16 (32-bit) Series Point Type Counts per Model

Point Types	Signals Accepted	PCV1617	PCV1632
Modular Jacks		8-pin SA Bus supports analog non-communicating sensor	
Universal Input (UI)	Analog Input, Voltage Mode, 3 3 3 3 0–10 VDC	3	3
	Analog Input, Resistive Mode, 0–2k ohm, RTD (1k NI [Johnson Controls], 1k PT, A998 SI), NTC (10k Type L, 2.252k Type 2)		
	Binary Input, Dry Contact Maintained Mode		
Binary Output (BO)	24 VAC Triac	2	3
Configurable Output (CO)	Analog Output, Voltage Mode, 2 2 0–10 VDC		2
	Binary Output Mode, 24 VAC Triac		
Integrated Actuator	Internal	1	1
Integrated Flow Sensor	Internal	1	1
Zone Sensor Input	On SA Bus1	Up to 4 NS Series Network Zone Sensors	

PCV16s Series Ordering Information

Product Code Number	Description
CH-PCV1617-1	32-bit, Integrated VAV Controller/Actuator/Pressure Sensor,
	3 UI and 2 BO; 24 VAC;
	Field Controller (FC) Bus, and Sensor/Actuator (SA) Bus
	8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors
CH-PCV1632-1	32-bit, Integrated VAV Controller/Actuator/Pressure Sensor,
	3 UI, 3 BO, and 2 CO; 24 VAC;
	Field Controller (FC) Bus, and Sensor/Actuator (SA) Bus
	8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors

1.This model is currently available only in Asia; contact your local Johnson Controls representative for more information.

Technical Specifications

Product Code Numbers	CH-PCV1617-1: 32-bit, Integrated VAV Controller/Actuator/Pressure Sensor,
	3 UI and 2 BO; 24 VAC;
	FC and SA Bus;
	8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors
	CH-PCV1632-1: 32-bit, Integrated VAV Controller/Actuator/Pressure Sensor,
	3UI,3BO，2CO；24VAC；
	FC and SA Bus;
	8-pin TSTAT Port for use with TE-7xx Series Non-Communicating Sensors
Supply Voltage	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety Extra-Low Voltage (SELV) (Europe)
Power Consumption	10 VA typical, 14 VA maximum
Ambient Conditions	Operating: 0 to 50°C (32 to 122°F)
	Storage: -40 to 70°C (-40 to 158°F)
Terminations	Inputs/Outputs, SA Bus, and Supply Power: 6.3 mm (1/4 in.) Spade Lugs
	FC Bus Pluggable Screw Terminal Block
	TSTAT Modular Port: RJ-45 8-Pin Modular Jack
Controller Addressing	DIP switch set; valid field controller device addresses 4–127
	(Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.)
Communications Bus2	BACnet MS/TP, RS-485:
	3-wire FC Bus between the supervisory controller and field controllers
	4-wire SA Bus from the PCV controller, network sensors, and other sensor/actuator devices, includes a terminal to source 15 VDC supply power from PCV to SA Bus devices.
Processor	RX630 32-bit Renesas® microcontroller
Memory	1 MB Flash Memory and 512 KB Random Access Memory (RAM)
Actuator Rating	4 N•m (35 lb•in.)
Dimensions	(Height x Width x Depth): 165 x 125 x 73 mm (6.5 x 4.92 x 2.9 in.)
Weight	0.65kg（1.45lb）

Johnson Controls DDC

VAV1507 Series Controllers

VAV1507 INTRODUCTION

The VAV1507 configurable digital controller is designed for Variable Air Volume (VAV) applications that communicate through the BACnet® MS/TP protocol.

This VAV controller features a combination of an integral digital differential pressure transducer (DPT), a damper actuator, and a 32-bit microprocessor.

The controller's small package size facilitates quick field installation and an efficient use of space without any compromise on performance. The controller connects easily to sensors for zone air temperature sensing.

The controller comes with a configurable software application that supports single-duct, cooling-only control scenarios. The software application features the following items:

- The controller can automatically detect the connected sensors, including TE730 analog sensors and NSA and NS series network sensors.
- You can configure the controller to use a local or remote zone temperature setpoint. The local setpoint comes from a sensor, and the remote setpoint comes from the BAS.
- You can view the airflow readings in cubic feet per minute (CFM), liters per second (L/s), or cubic meters per hour (CMH).
- You can configure the zone temperature offset of the connected sensors.
- Warm-up and cooldown mode supports the central system warm-up or cooldown. You can specify the minimum flow setpoint independently for warm-up and cooldown.

VAV1507 FEATURES AND BENEFITS

The following features and benefits apply to the VAV1507:

Standard hardware and software platform

Uses a common hardware design with other similar Johnson Controls® products to support standardized wiring practices and installation workflows. Uses a common software design to support the use of a single tool for control applications, commissioning, and troubleshooting to minimize technical training.

32-bit microprocessor and 8 MB SDRAM

Ensures optimum performance and meets industry specifications.

Integrated DPT

Features a state-of-the-art digital DPT that uses flow-through technology to provide accurate readings in the range of -500 Pa to +500 Pa with no offset drift, also at the bottom end of the measuring range.

Integrated fast-response actuator

You can reduce commissioning time because the actuator drives the damper from full open to full closed (90°) in 60 seconds.

Modular ports

Supports quick connection to the Mobile Access Portal (MAP) Gateway, network sensors, or TE730 sensors.

Automatic detection of NS, NSA, and TE730 sensors

Expedites installation and troubleshooting.

SI units

Eases configuration tasks with points that can display airflow in different units, including SI units: CFM, L/s, or CMH.

User interface

Provides convenient monitoring and adjusting capabilities through the MAP Gateway.

Pre-loaded, configurable application

Features a single-duct, cooling-only application loaded at the factory that provides several points for configuration and data display.

Auto-tuned control loops

Reduces commissioning time, eliminates changeof- season re-commissioning, and reduces wear and tear on mechanical devices.

Patented technologies

Includes Proportional Varying Deadzone Control (PVDC) and Pattern Recognition Adaptive Control (PRAC+) to provide continuous loop tuning.

Simple installation

Minimizes installation efforts with no input and output connections, no programming needed, and a simple configuration workflow.

BACnet automatic discovery

Supports easy controller integration into a BAS.

BACnet Testing Laboratories (BTL) listed and certified

Ensures interoperability with other BTL-listed devices.

Johnson Controls DDC

Table 1: VAV1507 controller ordering information

Product code number	Description
JC-VAV1507-0	32-bit, integrated VAV controller/actuator/pressure sensor – DPT for cooling application, 24 VAC, FC and SA bus, includes 8-pin TSTAT port for use with TE-7xx series non-communicating sensors

TECHNICAL SEPCIFICATIONS
VAV1507 controller

Specification	Description
Product code number	JC-VAV1507-0: 32-bit, integrated VAV controller/actuator/pressure sensor – DPT for cooling application, 24 VAC, FC and SA bus, includes 8-pin TSTAT port for use with TE-7xx series non-communicating sensors
Communications protocol	BACnet MS/TP
Supply voltage	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety Extra-Low Voltage (SELV) (Europe)
Power consumption	14 VA maximum
Ambient conditions	Operating: 0° C to 50° C (32° F to 122° F), 10% to 90% RH noncondensing Storage: -40° C to 70° C (-40° F to 158° F), 5% to 95% RH noncondensing
Terminations	SA bus and supply power: 6.3 mm (1/4 in.) spade lugs FC bus: pluggable screw terminal block TSTAT modular port: RJ-45 8-pin modular jack SA bus modular port: RJ-12 6-pin modular jack
Controller addressing for BACnet MS/TP	DIP switch set; valid field controller device addresses 4 to 127 (Device addresses 0 to 3 and 128 to 255 are reserved and not valid field controller addresses.)
Communications bus	RS-485: FC bus: 0.6 mm (22 AWG) standard 3-wire, twisted, shielded cable recommended between the supervisory controller and the VAV controller SA bus: 0.6 mm (22 AWG) stranded, 4-wire (2-twisted pairs) shielded cable recommended from the VAV controller to network sensors and other sensor and actuator devices; includes a terminal to source 15 VDC supply power from the controller to SA bus devices TSTAT port: 8-pin RJ-45 connector, 1 SA, 2 UI SA bus port: 6-pin RJ-12 connector ⓘ ***Note:*** *For more information, refer to the MS/TP Communications Bus Technical Bulletin (LIT-12011034).*
Processor	RX651 32-bit Renesas® microcontroller
Memory	4 MB flash memory and 8 MB SDRAM
Universal input resolution	UI analog input: 15-bit resolution on UIs at TSTAT port
Air pressure differential sensor	Range: -500 Pa to 500 Pa (-2.0 in. H2O to 2.0 in. H2O) Performance characteristics: Zero point accuracy: 0.1 Pa Span accuracy: 3% of reading
Actuator rating	4 N·m (35 lb·in) minimum shaft length = 44 mm (1-3/4 in.)
Mounting	Mounts to damper shaft using single set screw and to duct with single mounting screw
Dimensions (height x width x depth)	165 mm x 125 mm x 73 mm (6.5 in. x 4.92 in. x 2.9 in.) Center of output hub to center of captive spacer: 135 mm (5-5/16 in.)
Weight	0.66 kg (1.46 lb)

Johnson Controls DDC

TE730 Series Temperature Sensors

DESCRIPTION

The TE730 Series Temperature Sensors provide temperature sensing in room wall-mount applications. This arrangement allows local temperature setpoint adjustment and temporary occupancy override.

A setpoint dial is included on all models to adjust the temperature setpoint. A manual occupancy override push button is available on one model to allow the user to request a time-of-day scheduling override, when the space is occupied outside of the normal occupied hours schedule.

The wires connecting the temperature sensor to the controller are terminated with a modular jack connection. All models include a Sensor Actuator (SA) Bus access port (6-pin modular jack) for connecting accessories. This feature allows a technician to commission or service the controller via the temperature sensor.

FEATURES

- large setpoint dial — provides ease of temperature setpoint adjustments by the user
- occupancy override push button (TE730-39C-0 model) — allows the user to request a time-of-day scheduling override when the space is occupied outside of the normal occupied hours schedule
- compact and easy to install design — interfaces directly with the field controller via modular jack connections
- 6-pin modular jack SA Bus access port — allows a technician to commission or service the field controller via the TE730 Series Temperature Sensor

SELECTION CHART

Product Code Number	Temperature Sensor Type	Temperature Setpoint Adjustment Dial	Integral Manual Occupancy Override Push Button	Connection	Enclosure Dimensions (Height x Width x Depth)
TE730-29C-0	Platinum 1k ohm Thin Film Resistive	Yes	No	Modular Jack	3-1/4 x 3-1/4 x 1-7/16 in.[80*80*36mm]
TE730-39C-0	Platinum 1k ohm Thin Film Resistive	Yes	Yes	Modular Jack	3-1/4 x 3-1/4 x 1-7/16 in.[80*80*36mm]

TECHNICAL SEPCIFICATIONS

Temperature Sensor Type	Platinum 1k ohm Thin Film Resistive
Temperature Sensor Coefficient	Approximately 3.9 ohms per C° (2 ohms per °F)
Temperature Sensor	1k ohms at 0°C (32°F)
Temperature Sensor Accuracy	±0.56C°/±1.0F° at 21°C (70°F)
Temperature Setpoint Range	Adjustable 15 to 29°C (59 to 84°F)
Temperature Sensor Response Time	8-Pin Modular Jack Connector
SA Bus Access	6-Pin Modular Jack Connector with Bottom Access for a Wireless Commissioning Converter or VAV Balancing Tool
Ambient Operating Conditions	0 to 40°C (32 to 104°F); 10 to 90% RH, Noncondensing; 30°C (86°F) Maximum Dew Point
Ambient Storage Conditions	'-40 to 60°C (-40 to 140°F); 5 to 95% RH, Noncondensing; 30°C (86°F) Maximum Dew Point
Materials	White Thermoplastic Enclosure
Shipping Weight	0.1 kg (0.3 lb)

Johnson Controls DDC

NSA SERIES NETWORK SENSORS

The flush-mounted NSA7000 series network sensor with LCD is an electronic zone sensor designed to function directly with Johnson Controls® BACnet® MS/TP digital controllers in heating, ventilating and air conditioning (HVAC) systems. Models in this series monitor the temperature set point, zone temperature and humidity, and transmit this data to a field controller on the sensor actuator (SA) bus.

NSA-FHR71X3-0 can toggle between temperature and RH on the display, and has the capability to set the desired default display to either temperature or RH. A fan mode push button is included in NSA-FTD70X3-0 to set the desired fan speed (OFF-LOW-MED-HIGH-AUTO). Besides NSA-FHN70X1-0, all other models have occupancy override button which allows user to signal the controller that the zone is occupied to override the scheduled mode.

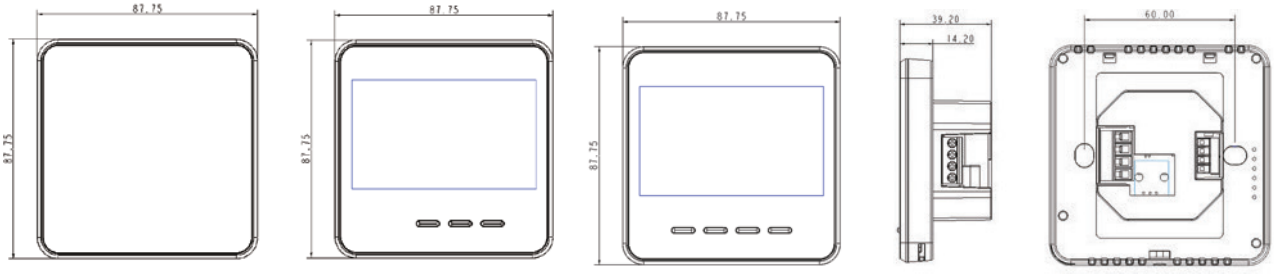
For communication wiring flexibility, all models equipped with both a modular jack and screw terminals, connecting the NSA7000 network sensor to controllers.

Features and Benefits

Features	Benefits
BACnet® MS/TP protocol communication	Provides compatibility with Metasys system field controllers and Facility Explorer programmable controllers in a proven communication network.
Field-changeable address on some models	Allows user to change address of NSA7000
Backlit LCD available on some models	Provides real time status of the environment with backlighting activated during user interaction
Simple temperature set point adjustment available on some models	Enables user to change the set point by pushing buttons
Temporary occupancy available on some models	Provides a push button for user to override the scheduled mode
Field-selectable default display setting on some models	Allows user to toggle between temperature and RH on the display.
Field-selectable Fahrenheit/Celsius (F/C) unit display on some models	Toggles the display temperature between degrees Celsius and degrees Fahrenheit

IMPORTANT:
Use this NSA7000 sensor only as an operating control. Where failure of malfunction of the NSA7000 sensor could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the system. Incorporate and maintain other devices such as supervisory or alarm systems or safety or limit controls intended to warn of, or protect against, failure or malfunction of the NSA7000 sensor.

Product dimensions



Johnson Controls DDC

NSA7000 series network sensor product code number

Product code number	Color1	LCD	Fan control	Humidity 2	Temp. adjustment 3	F/C scale toggle	Occupancy override	Screw terminal 4	Address selection 5
NSA-FHN7001-0	White	No	No	Yes (±3%)	N/A	No	No	ST/MJ	No
NSA-FTD7003-0	White	Yes	Yes	No	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FTB7003-0	White	Yes	No	No	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FHR7103-0	White	Yes	No	Yes (±3%)	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FHN7011-0	Black	No	No	Yes (±3%)	N/A	No	No	ST/MJ	No
NSA-FTD7013-0	Black	Yes	Yes	No	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FTB7013-0	Black	Yes	No	No	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FHR7113-0	Black	Yes	No	Yes (±3%)	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FHN7021-0	Gold	No	No	Yes (±3%)	N/A	No	No	ST/MJ	No
NSA-FTD7023-0	Gold	Yes	Yes	No	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FTB7023-0	Gold	Yes	No	No	Set/WC	Yes	Yes	ST/MJ	Yes
NSA-FHR7123-0	Gold	Yes	No	Yes (±3%)	Set/WC	Yes	Yes	ST/MJ	Yes

Note

1. There is MOQ (Minimum Order Quantity) requirement for black and gold color.
2. For models with humidity sensor, the humidity value also can be displayed in LCD, and the measurement accuracy is 3%RH.
3. Set/WC means this model can work under set or W/C mode, selected in setting.
4. All models equipped with both ST and MJ, can be selected by user in the field.
5. The address can be selected in setting (199-215), and default address is 199. User need to calculate the current consumption, to decide max. NSA7000 connected in one SA Bus.

Technical specifications

NSA7000 series network sensor

Supply Voltage	9.8 to 16.5 VDC; 15VDC norminal (From SA Bus)
Current consumption	30mA maximum
Terminations	Modular jack or screw terminal block
Sensor addressing	All models with factory set address 199. NSA-FTD70X3-0, NSA-FTB70X3-0 and NSA-FHR71X3-0 can set address from 199 to 215 in setting page
Wire size	Modular jack: 24 AWG or 26 AWG (0.5 or 0.4 mm diameter) recommended; Three twisted pair (six conductors)
Wire size	Screw terminal block: 18 to 22 AWG (1.0 to 0.6 mm diameter); 22AWG (0.6 mm diameter) recommended
Communication rate	Auto-detect: 9.6k, 19.2k, 38.4k or 76.8k bps
Mounting	Flush-mounted
Temperature measurement range	0 to 40°C (32 to 104°F)
Humidity measurement range	Full range: 0 to 100% RH
Temperature accuracy	0.5℃ (1°F)
Humidity accuracy	3%RH
Default temperature set point adjustment range	10.0℃ to 30.0℃ (50.0 to 86.0) in 0.5℃ increments
Ambient conditions	Operating: 0 to 40°C (32 to 104°F), 10 to 90% RH, noncondensing, 29°C (85°F) maximum dew point
	Storage: -20 to 60℃ (-4 to 140°F), 5 to 95% RH, noncondensing
Shipping weight	Approx. 300g
Compliance	CE mark
	RCM mark, Australia/NZ emissions compliance

Guide Specifications

General

Furnish and install TSS/TSL Single Duct Variable Air Volume Terminal Units of the sizes and capacities as scheduled. Terminals shall be certified by AHRI and bear the AHRI 880 seal.

Construction

Terminals shall be constructed of not less than 20''[0.8mm] gauge galvanized steel, able to withstand a salt spray test. The terminal casing shall be mechanically assembled (spot-welded casings are not acceptable).

Casing shall be internally lined with 64kg/m3 fiberglass insulation, rated for a maximum air velocity of 5000 f.p.m.[25m/s]. Maximum thermal conductivity shall be 0.24 (BTU · in) / (hr· ft2 · °F) [0.031Wm. K]. Raw insulation edges on the discharge of the unit must be covered with metalliner to eliminate flaking of insulation during field duct connections. Simple "buttering" of raw edges with an approved sealant is not acceptable.

All appurtenances including control assemblies, control enclosures, hot water heating coils, and electric heating coils shall not extend beyond the top and bottom of the unit casing. At an inlet velocity of 2000 f.p.m.[10m/s], the static pressure drop across the basic terminal or basic terminal with a sound attenuator shall not exceed 0.08" W.G. [20Pa] for all unit sizes.

The casing leakage shall not exceed 1% of maximum inlet rated airflow at 3" W.G.[750Pa] inlet pressure.

Primary Air Valve

Rectangular shaped primary air valves shall consist of galvanized steel. The damper blade shall be connected to a solid shaft by means of an integral molded sleeve which does not require screw or bolt fasteners. The shaft shall be manufactured of a low thermal conducting composite material, and include a molded damper position indicator visible from the exterior of the unit. The damper shall pivot in self lubricating bearings. The damper actuator shall be mounted on the exterior of the terminal for ease of service. The valve assembly shall include internal mechanical stops for both full open and closed positions. The damper blade seal shall be secured without use of adhesives.

The TSS air valve leakage shall not exceed 0.5% of maximum inlet rated airflow at 4" W.G.[1000Pa] inlet pressure.

The TSL air valve leakage shall not exceed 0.5% of maximum inlet rated airflow at 3" W.G.[750Pa] inlet pressure.

Primary Airflow Sensor

Differential pressure airflow sensor shall traverse the duct along two perpendicular diameters. Single axis sensor shall not be acceptable for duct diameters 6"[152mm] or larger. A minimum of 12 total pressure sensing points shall be utilized. The total pressure inputs shall be averaged using a pressure chamber located at the center of the sensor. A sensor that delivers the differential pressure signal from one end of the sensor is not acceptable. The sensor shall output an amplified differential pressure signal that is at least 2.5 times the equivalent velocity pressure signal obtained from a conventional pitot tube.

Hot Water Coil

Single duct terminal shall include an integral hot water coil where indicated on the plans. The coil shall have a galvanized sheet metal casing. Coil to be constructed of pure aluminum fins with full fin collars to assure accurate fin spacing and maximum tube contact. Fins shall be spaced with a minimum of 10 per inch and mechanically fixed to seamless copper tubes for maximum heat transfer. Each coil shall be hydrostatically tested at a minimum of 406 PSIG [2.8MPa] under water, and rated for a maximum 232 PSIG [1.6MPa] working pressure.

Sound Attenuator

Sound attenuator shall be provided where scheduled to meet acoustical performance requirements. Attenuator casing shall be constructed as specified for the base terminal.

Electric Heater

Terminal shall include an integral electric heater where indicated on the plans. The heater cabinet shall be constructed of not less than 20 gauge galvanized steel.Stainless steel cabinets, or galvannealed steel casing swith a baked enamel paint finish, may be used as an alternative. Heater shall have a hinged access panel for entry to the controls. A power disconnect shall be furnished to render the heater non-operational. Heater shall have a single point electrical connection.It shall include a primary disc-type automatic reset high temperature limit, secondary high limit(s), Ni-Chrome elements, and fusing. Heater shall have complete wiring diagram with label indicating power requirement and KW output. Heater shall be interlocked with fan terminal so as to preclude operation of the heater when the fan is not running.

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