



VARIABLE AIR VOLUME TERMINAL UNIT



**Single and Dual Duct Type
VAV compact - CAV**



**Model
SVAV**



WE

SALE

SUPEIORITY

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STARDUCT CERTIFIED MANUFACTURER

With nearly 20 years of experience in manufacturing supplement and supporting systems for M.E.P and HVAC, Star Asia Jsc. has been supplying many major heavy industrial, commercial and residential projects with its Starduct products and service.

Starduct VAV terminal units of Star Asia are results of carefully researching, testing and manufacturing in a long period of time. With complex requirements in terms of technical standards and accuracy in operation, these products require a close combination of professional design engineers, technical staff and experienced workers. . Therefore, VAV boxes are not only products but also the pride of our company.

PRODUCTION SYSTEM AND PROCESS OF STAR ASIA

In order to meet the high technical requirements of products, Star Asia has focused on long-term investment in research and development (R&D), design engineers are directly involved in manufacturing product, quality inspection and testing.

Towards the international market, our VAV terminal units are processed, manufactured, assembled and quality controlled on the most modern machine tools and testing equipment

To ensure reliability and accuracy according to specifications, all batches of VAV products are tested prior to shipment.

APPLICABLE STANDARDS

Meeting technical requirements of national and international standards is a direction throughout Star Asia's activities. In designing, manufacturing and testing, Star Asia references and bases on the highest standards in the industry as a basis such as AMCA, ASTM, ASHRAE, ISO, AHRI, TCVN...

Star Asia Jsc. is the member of AMCA (Air Movement and Control Association), ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers), AHRI (Air-Conditioning, Heating, and Refrigeration Institute), so we are usually receiving relevant updates from these organizations, so that it can be professionally applied to our products.

Star Asia is international member of AMCA





Certificate of Approval

Quality Management System

This is to certify that the Quality Management System of:

STARDUCT MECHANICAL FACTORY

(belongs to STAR ASIA TECHNOLOGICAL INVESTMENT JOINT STOCK COMPANY)

Phung Town industrial park, Dan Phuong district, Hanoi City, Vietnam

has been assessed and found to meet the requirements of:

ISO 9001:2015

The certificate is valid for the following scope of operation:

Manufacture and supply of air grilles, air dampers, air ducts, cable tray, cable trunking, cable ladder and HVAC accessories, solar battery brackets.

The Original Approval Date: 01st February 2018
Date of Certificate Issue: 10th January 2023
Certificate Valid until: 31st January 2024
Certificate Number: NVQV17299-Q
Nace/ EA: 25.99

Authorized:



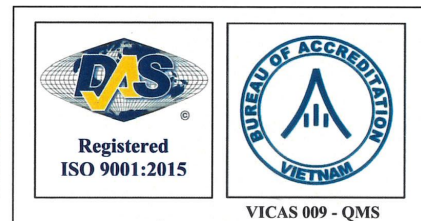
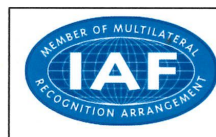
GIÁM ĐỐC

Nguyễn Hương Giang

Date: 10th January 2023

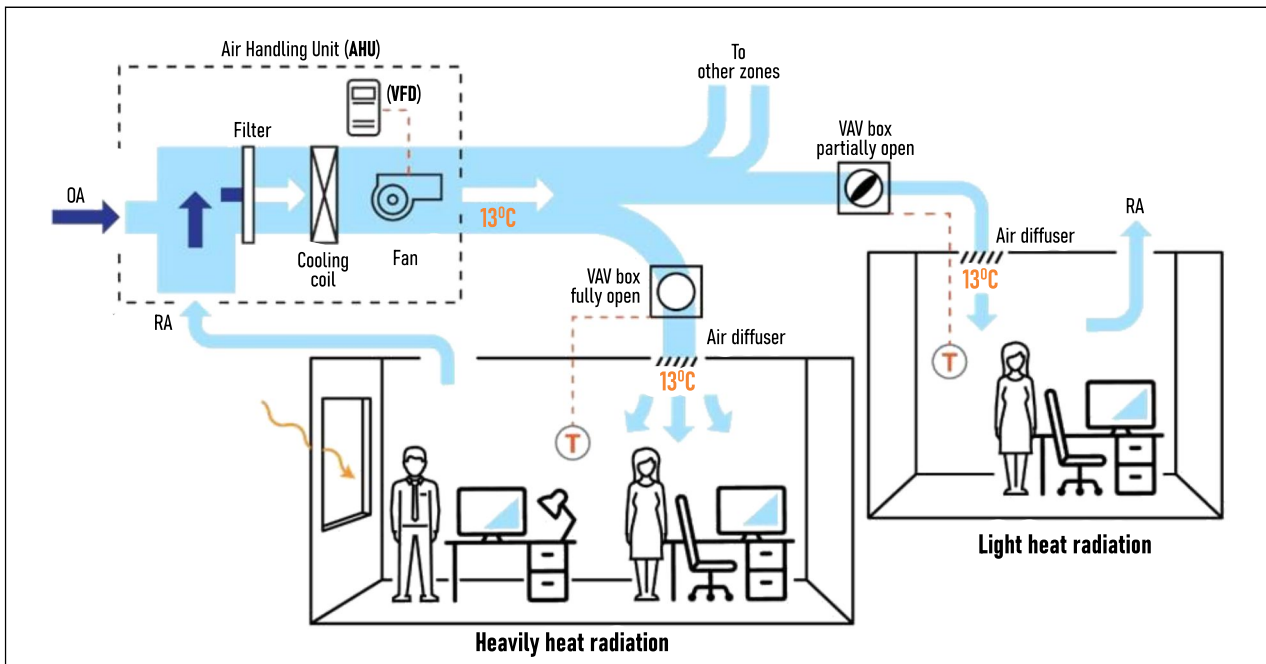
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VICAS 009 - QMS

VAV and CAV SYSTEMS



CAV vs VAV HVAC systems

Twenty to thirty years ago it was common practice to install a CAV (constant air volume) system in commercial buildings for ventilation and air-conditioning. These type of HVAC systems require high airflow rates and higher amounts of energy for heating and cooling. Thus, increasing utility costs. Therefore, the theory is, that you will achieve considerable energy savings by installing a VAV (variable air volume) system. However, the change is effective only if entire system is adapted. So, let's compare CAV and VAV HVAC systems.

CAV system

- CAV systems are small and serve a single thermal zone. However, variations such as CAV with reheat, CAV multi-zone and CAV primary-secondary systems have the ability to serve multiple zones and larger building.
- There are two types of CAV systems commonly used: the terminal reheat system and the mixed air system.
- The terminal reheat system cools the air in the air handling unit (AHU) down within its zone of spaces. While it cools the air, it is inefficient and costly.
- The mixed air system has two air streams. One for the coldest and one for the hottest needed air temperature in the zone. The two air streams are strategically combined to offset the space's load. It works well to cool the air. However, it does not control humidity.

VAV systems

- VAV systems were developed to meet the varying heating and cooling needs of different building zones. For example, a zone can be either a single room or a cluster of rooms all sharing the same heat gain and heat loss characteristics.
- The system is efficient at dehumidifying the space.
- Also available in multi-zone system.
- The VAV system is one of the most energy efficient ways for building air-handling system.
- Offer more precise temperature control as the fan speed varies depending on the temperature in the space. The compressor regulates the refrigerant flow to maintain a constant air temperature.
- The HVAC industry regards pressure independent VAV systems as the best HVAC system design available. This is a result of improvements in the terminal unit.

So, you might be wondering, what is the biggest difference between CAV vs VAV systems? Savings. You can save as much as 30% in energy costs with a VAV system. In addition, VAV systems are economical to install and operate. If you have any questions about what type of system your building currently uses, or are interested in converting your old CAV system to a VAV system, contact us. We can help you save money today.

STARDUCT VAV BOX QUALITY AND STANDARD

GENERAL

Starduct VAV box is a high-tech product made by Star Asia manufacturer, a manufacturer of ancillary products for HVAC systems with almost 20 years of experience in Vietnam. Star Asia has high-technology facilities to fulfil the manufacture of products, with high quality sources of materials and accessories from industry-leading suppliers such as Belimo (Switzerland) for control systems; Nippon Steel (Japan) for ZAM plated steel; Bitronic (Switzerland) for CNC sheet metal processing technology and a team of R&D engineers, machinery & precision mechanical manufacturing with many years of experience. All of which work together to serve the purpose of delivering the highest quality product.

- The product, VAV box, is manufactured at the Starduct Mechanical Factory and have participated in AHRI's certification program according to the **AHRI standard 880 (I-P) 2017** - VAV Terminals Certification program.
- Starduct VAV box has been tested under the standard **ISO 7244** for rate of leakage from outer casing and damper blade. Certified under standard **AS 1217.2:1985** for noise and tested under **ANSI/ASHRAE 130:1996** of radiated and discharge sound power determination



Pictures are for illustration purpose only
Star Asia hold the right to change its products without prior notice

SPECIAL CONSTRUCTION

- Casing: 0.8mm thick 3-componet plated iron sheet, ZAM[®] K27, 270g/m² - imported from Japan.
- Case material optional : Aluminum. Stainless steel
- Damper blade: 0.8mm thick, Stiffness stamping of ZAM[®] , sealed with EPDM rubber seal for heat resistance.
- Insulation: Closed Cell Foarm, Egg crate type, ASTM 2856
- Bushing: ABS plastic
- Shaft: CT45 Hexagonal steel bar, Black coating
- Pressure sensor: Multi-Quadrant Averaging Signal Sensor by A6061 Aluminum tube
- Control system: Belimo BACnet/Modbus

HIGH QUALITY MATERIALS AND CONTROLLER

SẢN PHẨM CHẤT LƯỢNG CỦA NIPPON


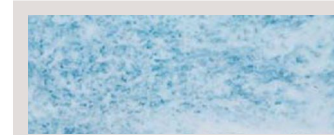
ZAMTM MATERIAL OF THE 21ST CENTURY

Hot-deep coating with alloy of 93% Zn; 6% Al; 3% Mg


Excellent corrosion resistance

Base on the corrosion resistance, ZAM is higher than 10 to 20 times with hot-deep galvanized steel and 5 to 8 times with zinc+5% alluminum coating layer (compared by salt spray test)

Hot-deep galvanized

2,500 hours salt spray test with both of samples 90/90g/m2

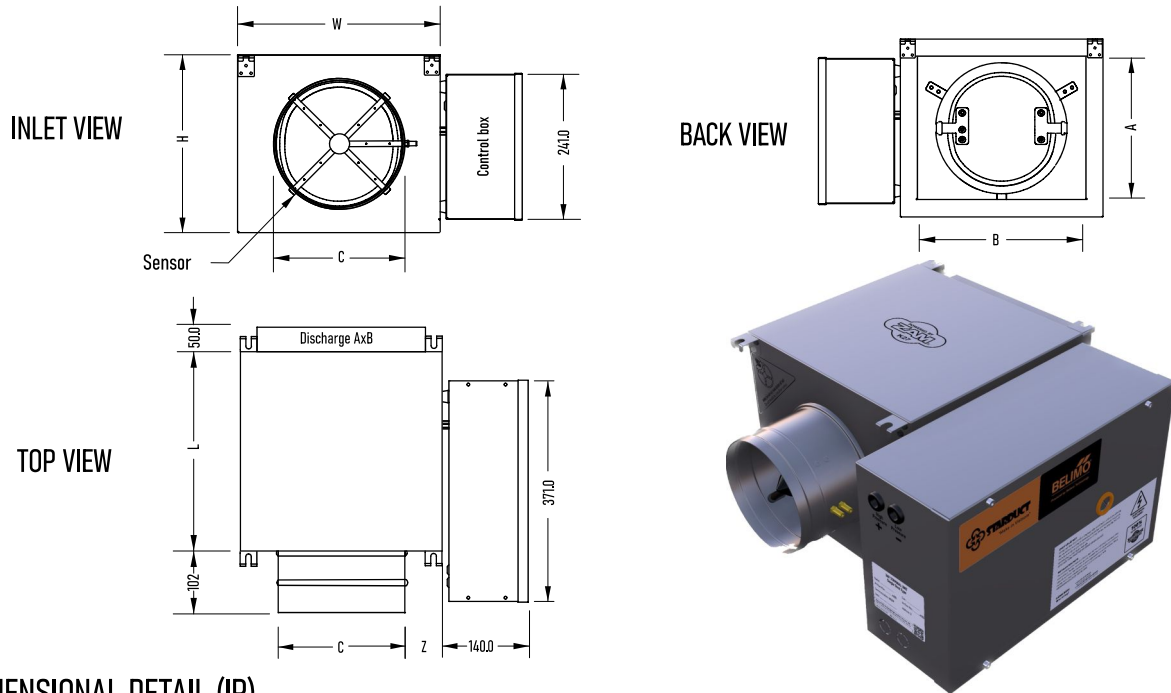


BELIMO

ZoneEaseTM VAV

VAV BOX - SINGLE DUCT

Model: SVAV-S-...


DIMENSIONAL DETAIL (IP)

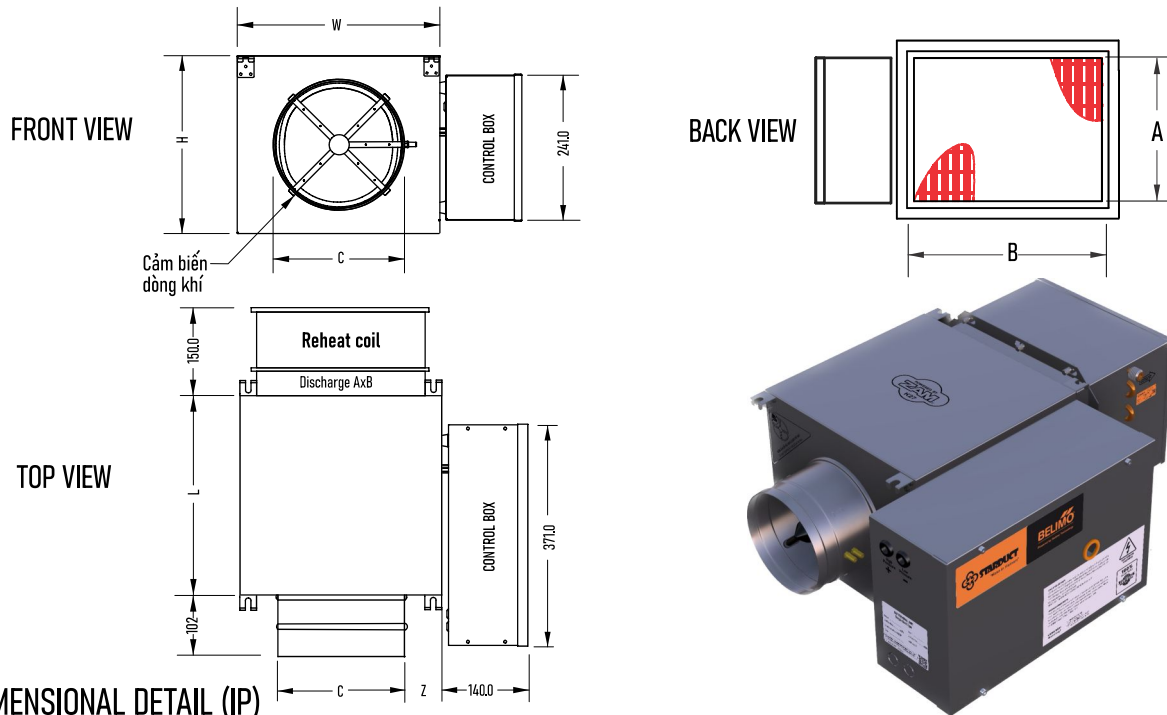
TYPE	Valve	Inlet Dia (C) in.	L in.	H in.	W in.	Z in.	Discharge Dim		Weight lb
							Height (A) in.	Width (B) in.	
SVAV-S-04	4	4	11.5	11	13	3.5	8	10	21
SVAV-S-05	5	5	11.5	11	13	3.5	8	10	21
SVAV-S-06	6	6	11.5	11	13	3.5	8	10	21
SVAV-S-07	7	7	12	13	14	3.5	10	11	22
SVAV-S-08	8	8	12	13	14	3.5	10	11	22
SVAV-S-09	9	9	12	15	17	3.5	12	14	30
SVAV-S-10	10	10	12	15	17	3.5	12	14	30
SVAV-S-12	12	12	13	17	20	3.5	14	17	38
SVAV-S-14	14	14	14	21	22	3.5	18	19	46
SVAV-S-16	16	16	15	21	26	3.5	18	23	51

DIMENSIONAL DETAIL (SI)

TYPE	Valve	Inlet Dia (C) mm	L mm	H mm	W mm	Z mm	Discharge Dim		Weight kg
							Height (A) mm	Width (B) mm	
SVAV-S-04	4	102	292	279	330	89	203	254	9.5
SVAV-S-05	5	127	292	279	330	89	203	254	9.5
SVAV-S-06	6	152	292	279	330	89	203	254	9.5
SVAV-S-07	7	178	305	330	356	89	254	279	10
SVAV-S-08	8	203	305	330	356	89	254	279	10
SVAV-S-09	9	229	305	381	432	89	305	356	13.5
SVAV-S-10	10	254	305	381	432	89	305	356	13.5
SVAV-S-12	12	305	330	432	508	89	356	432	17.5
SVAV-S-14	14	356	356	533	559	89	457	483	21
SVAV-S-16	16	406	381	533	660	89	457	584	23

VAV BOX - SINGLE DUCT (WITH REHEAT COIL)

Model: SVAV-S-...- E/W - ...



DIMENSIONAL DETAIL (IP)

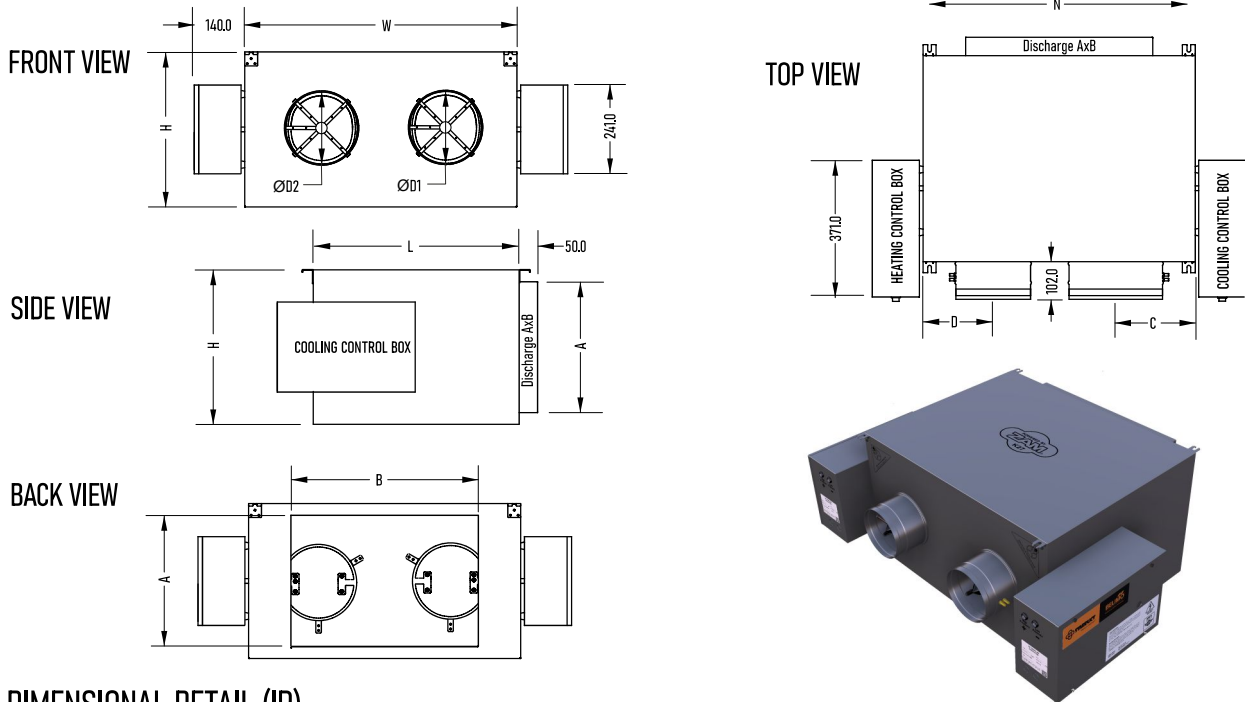
TYPE	Valve	Inlet Dia (C) in.	L in.	H in.	W in.	Z in.	Discharge Dim		Weight lb
							Height (A) in.	Width (B) in.	
SVAV-S-04	4	4	11.5	11	13	3.5	8	10	21
SVAV-S-05	5	5	11.5	11	13	3.5	8	10	21
SVAV-S-06	6	6	11.5	11	13	3.5	8	10	21
SVAV-S-07	7	7	12	13	14	3.5	10	11	22
SVAV-S-08	8	8	12	13	14	3.5	10	11	22
SVAV-S-09	9	9	12	15	17	3.5	12	14	30
SVAV-S-10	10	10	12	15	17	3.5	12	14	30
SVAV-S-12	12	12	13	17	20	3.5	14	17	38
SVAV-S-14	14	14	14	21	22	3.5	18	19	46
SVAV-S-16	16	16	15	21	26	3.5	18	23	51

DIMENSIONAL DETAIL (SI)

TYPE	Valve	Inlet Dia (C) mm	L mm	H mm	W mm	Z mm	Discharge Dim		Weight kg
							Height (A) mm	Width (B) mm	
SVAV-S-04	4	102	292	279	330	89	203	254	9.5
SVAV-S-05	5	127	292	279	330	89	203	254	9.5
SVAV-S-06	6	152	292	279	330	89	203	254	9.5
SVAV-S-07	7	178	305	330	356	89	254	279	10
SVAV-S-08	8	203	305	330	356	89	254	279	10
SVAV-S-09	9	229	305	381	432	89	305	356	13.5
SVAV-S-10	10	254	305	381	432	89	305	356	13.5
SVAV-S-12	12	305	330	432	508	89	356	432	17.5
SVAV-S-14	14	356	356	533	559	89	457	483	21
SVAV-S-16	16	406	381	533	660	89	457	584	23

VAV BOX - DUAL DUCT (COOLING/HEATING AIR)

Model: SVAV-D-...E/W-...



DIMENSIONAL DETAIL (IP)

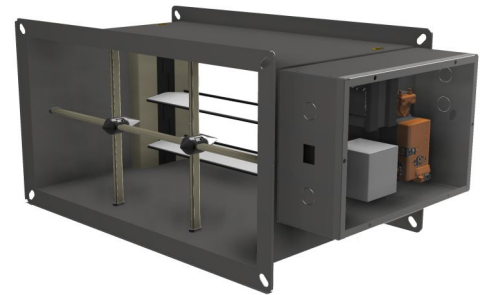
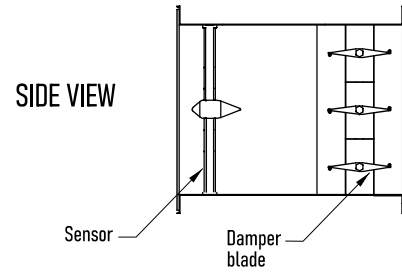
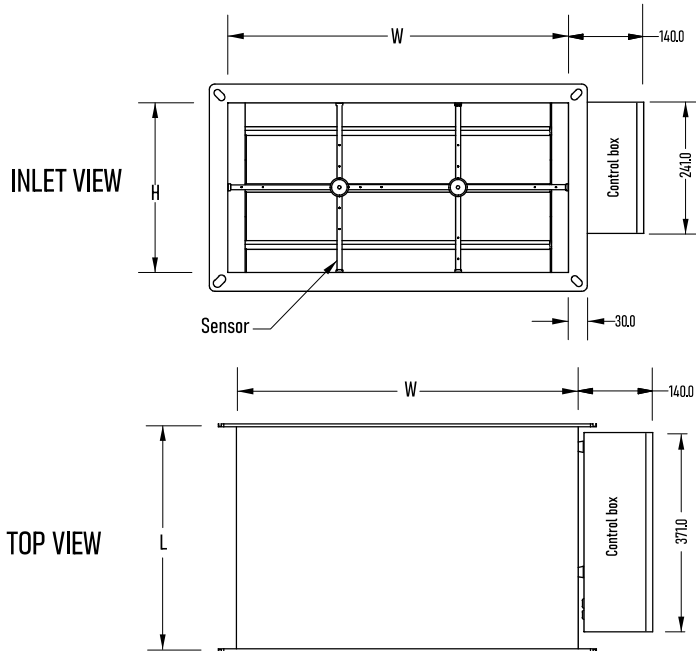
MODEL	Cooling			Heating			Discharge dim.		C (in.)	D (in.)	L (in.)	W (in.)	H (in.)	Weight (lb.)
	Size (in.)	Airflow (cfm)	Inlet dia. D1 - (in.)	Size (in.)	Airflow (cfm)	Inlet dia. D2 - (in.)	A (in.)	B (in.)						
SVAV-D-0505	05	350	5	05	350	5	14	14	6.0	6.0	22	29	16.5	54
SVAV-D-0605	06	500	6	05	350	5	14	14	6.5	6.0	22	29	16.5	54
SVAV-D-0606	06	500	6	06	500	6	14	14	6.5	6.5	22	29	16.5	54
SVAV-D-0806	08	900	8	06	500	6	14	14	7.5	6.5	22	29	16.5	55
SVAV-D-0808	08	900	8	08	900	8	14	14	7.5	7.5	22	29	16.5	56
SVAV-D-0907	09	1200	9	07	700	7	14	14	8.0	7.0	22	29	16.5	57
SVAV-D-1008	10	1400	10	08	900	8	14	14	8.5	7.5	22	29	16.5	57
SVAV-D-1010	10	1400	10	10	1400	10	14	14	8.5	8.5	22	29	16.5	61
SVAV-D-1208	12	2000	12	08	900	8	20	20	9.5	7.5	24	41	22.5	58
SVAV-D-1210	12	2000	12	10	1400	10	20	20	9.5	8.5	24	41	22.5	59
SVAV-D-1212	12	2000	12	12	2000	12	20	20	9.5	9.5	24	41	22.5	60
SVAV-D-1414	14	3000	14	14	3000	14	20	20	10.5	10.5	24	41	22.5	81
SVAV-D-1612	16	4000	16	12	2000	12	20	20	11.5	9.5	24	41	22.5	81
SVAV-D-1616	16	4000	16	16	4000	16	20	20	11.5	11.5	24	41	22.5	83

DIMENSIONAL DETAIL (SI)

MODEL	Cooling			Heating			Discharge dim.		C (mm)	D (mm)	L (mm)	W (mm)	H (mm)	Weight (kg)
	Size (in.)	Airflow (CMH)	Inlet dia. D1 - (mm)	Size (in.)	Airflow (CMH)	Inlet dia. D2 - (mm)	A (mm)	B (mm)						
SVAV-D-0505	05	594	127	05	594	127	356	508	152	152	559	737	419	25
SVAV-D-0605	06	850	152	05	850	127	356	508	165	152	559	737	419	25
SVAV-D-0606	06	850	152	06	850	152	356	508	165	165	559	737	419	25
SVAV-D-0806	08	1530	203	06	1530	152	356	508	191	165	559	737	419	25
SVAV-D-0808	08	1530	203	08	1530	203	356	508	191	191	559	737	419	25
SVAV-D-0907	09	2038	229	07	2038	178	356	508	203	178	559	737	419	26
SVAV-D-1008	10	2380	254	08	2380	203	356	508	216	191	559	737	419	26
SVAV-D-1010	10	2380	254	10	2380	254	356	508	216	216	559	737	419	28
SVAV-D-1208	12	3398	305	08	3398	203	508	508	241	191	610	1041	572	26
SVAV-D-1210	12	3398	305	10	3398	254	508	508	241	216	610	1041	572	27
SVAV-D-1212	12	3398	305	12	3398	305	508	508	241	241	610	1041	572	27
SVAV-D-1414	14	5098	356	14	5098	356	508	508	267	267	610	1041	572	37
SVAV-D-1612	16	6797	406	12	6797	305	508	508	292	241	610	1041	572	37
SVAV-D-1616	16	6797	406	16	6797	406	508	508	292	292	610	1041	572	38

VAV BOX - RECTANGULAR

Model: SVAV-SR-...


AIR VOLUME - TABLE 1
V = 2 m/s

Width W (mm)	Height - H (mm)											
	200	250	300	350	400	450	500	600	700	800	900	1000
200	288											
250	360	450										
300	432	540	648									
350	504	630	756	882								
400	576	720	864	1008	1152							
450	648	810	972	1134	1296	1458						
500	720	900	1080	1260	1440	1620	1800					
550		990	1088	1386	1584	1782	1980					
600			1296	1512	1728	1944	2160	2592				
650			1404	1638	1872	2106	2340	2808				
700			1512	1764	2016	2268	2520	3024	3528			
800				2016	2304	2592	2880	3546	4032	4608		
900					2592	2916	3240	3888	4536	5184	5832	
1000					2880	3240	3600	4320	5040	5760	6480	7200

AIR VOLUME - TABLE 2
V = 4 m/s

Width W (mm)	Height - H (mm)											
	200	250	300	350	400	450	500	600	700	800	900	1000
200	576											
250	720	900										
300	864	1080	1296									
350	1080	1260	1512	1764								
400	1152	1440	1728	2016	2304							
450	1296	1620	1944	2268	2592	2916						
500	1440	1800	2160	2520	2880	3240	3600					
550		1980	2376	2772	3168	3564	3960					
600			2592	3024	3456	3888	4320	5184				
650			2808	3276	3744	4212	4680	5616				
700			3024	3528	4032	4536	5040	6048	7056			
800				4032	4608	5184	5760	6912	8064	9216		
900					5184	5832	6480	7776	9072	10368	11664	
1000					5760	6480	7200	8640	10080	11500	12960	14400

AIR VOLUME - TABLE 3
V = 6 m/s

Width W (mm)	Height - H (mm)											
	200	250	300	350	400	450	500	600	700	800	900	1000
200	864											
250	1080	1350										
300	1296	1620	1944									
350	1512	1890	2268	2646								
400	1728	2160	2592	3024	3456							
450	1944	2430	2916	3402	3888	4374						
500	2160	2700	3240	3780	4320	4860	5400					
550		2970	3564	4158	4752	5346	5940					
600			3888	4536	5184	5832	6480	8208				
650			4212	4914	5616	6318	7560	8640				
700			4536	5292	6048	6804	7776	9072	10574			
800				6048	6912	7776	8640	10368	12096	13824		
900					7760	8748	9720	11664	13608	15552	17496	
1000					8640	9720	10800	12960	15120	17280	19440	21600

AIR VOLUME - TABLE 4
V = 8 m/s

Width W (mm)	Height - H (mm)											
	200	250	300	350	400	450	500	600	700	800	900	1000
200	1152											
250	1440	1800										
300	1728	2160	2592									
350	2016	2520	3024	3528								
400	2304	2880	3456	4032	4508							
450	2592	3240	3888	4536	5184	5832						
500	2880	3600	4320	5040	5760	6480	7200					
550		3960	4752	5544	6336	6968	7920					
600			5184	6048	6904	7776	8640	10368				
650			5616	6552	7488	8424	9360	11232				
700			6048	7056	8064	9072	10080	12096	14112			
800				8064	9216	10368	11520	13824	16128	18432		
900					10368	11664	12960	15552	18144	20736	23328	
1000					11520	12960	14400	17280	20160	23040	25920	28800

AIR VOLUME - TABLE 5
V = 10 m/s

Width W (mm)	Height - H (mm)											
	200	250	300	350	400	450	500	600	700	800	900	1000
200	1440											
250	1800	2250										
300	2160	2700	3240									
350	2520	3150	3780	4410								
400	2880	3600	4320	5040	5760							
450	3240	4050	4860	5670	6480	7290						
500	3600	4500	5400	6300	7200	8100	9000					
550		4950	5940	6930	7920	8710	9900					
600			6480	7560	8630	9720	10800	12960				
650			7020	8190	9360	10530	11700	14040				
700			7560	8820	10080	11340	12600	15120	17640			
800				10080	11520	12960	14400	17280	20160	23040		
900					12960	14580	16200	19440	22680	25920	29160	
1000					14400	16200	18000	21600	25200	28800	32400	36000

Data Selection Sheet

Unit Size (inch)	Airflow			Unit ΔPs		Discharge NC Across unit				Radiated NC Across unit			
	CFM	CMH	L/s	in w.g	Pa	ΔPs 125pa	ΔPs 250pa	ΔPs 375pa	ΔPs 500pa	ΔPs 125pa	ΔPs 250pa	ΔPs 375pa	ΔPs 500pa
						(0.5" w.g)	(1.0" w.g)	(1.5" w.g)	(2.0" w.g)	(0.5" w.g)	(1.0" w.g)	(1.5" w.g)	(2.0" w.g)
4	100	170	47	0.02	5.00	28	29	30	31	11	15	17	18
	125	212	59	0.03	7.50	30	31	33	34	16	20	25	23
	150	255	71	0.04	10.00	31	34	35	35	20	23	25	27
	175	297	82	0.06	15.00	34	35	36	38	23	27	28	30
	200	340	94	0.08	20.00	35	36	38	39	25	29	31	33
5	150	255	71	0.01	2.50	25	28	30	31	10	16	25	21
	200	340	94	0.02	5.00	29	31	34	35	15	21	28	25
	250	425	118	0.03	7.50	31	34	36	38	20	24	30	30
	300	510	141	0.04	10.00	29	33	34	35	22	28	33	33
	350	595	165	0.06	15.00	31	34	36	38	24	30	34	35
6	300	510	141	0.07	17.50	21	26	30	33	16	22	25	28
	350	595	165	0.10	25.00	22	29	31	34	20	25	28	31
	400	680	188	0.13	32.50	25	30	34	35	21	27	30	33
	450	765	212	0.16	40.00	26	31	35	38	23	29	33	35
	500	850	235	0.20	50.00	28	33	36	39	24	30	34	37
7	450	765	212	0.07	17.50	25	29	30	33	20	23	25	28
	500	850	235	0.09	22.50	25	29	31	34	22	24	27	29
	550	934	259	0.10	25.00	26	30	33	36	22	25	28	31
	600	1,019	282	0.12	30.00	26	30	34	37	23	27	29	33
	650	1,104	306	0.15	37.50	26	32	36	38	24	28	31	34
8	600	1,019	282	0.02	5.00	28	31	34	36	20	24	27	29
	650	1,104	306	0.02	5.00	29	33	34	37	22	25	28	30
	700	1,189	329	0.02	5.00	29	33	35	38	22	25	29	31
	750	1,274	353	0.02	5.00	28	31	34	38	23	27	30	33
	800	1,359	376	0.03	7.50	28	32	36	38	24	28	31	34
9	800	1,359	376	0.04	10.00	25	29	30	31	19	23	26	29
	850	1,444	400	0.04	10.00	26	29	31	33	19	23	27	29
	900	1,529	424	0.05	12.50	26	30	33	34	20	24	27	30
	950	1,614	447	0.06	15.00	28	31	35	36	20	24	28	31
	1000	1,699	471	0.06	15.00	28	31	34	35	22	25	29	31
10	900	1,529	424	0.01	2.50	28	30	31	33	22	27	31	34
	1000	1,699	471	0.01	2.50	29	31	33	34	22	28	31	34
	1100	1,869	518	0.01	2.50	29	33	34	35	23	28	31	35
	1200	2,039	565	0.01	2.50	30	33	35	36	24	28	33	35
	1300	2,209	612	0.01	2.50	31	34	35	36	25	29	33	36
12	1200	2,039	565	0.01	2.50	25	29	31	33	20	26	30	32
	1400	2,379	659	0.01	2.50	26	30	33	36	22	28	31	35
	1600	2,718	753	0.01	2.50	28	31	34	37	23	28	31	36
	1800	3,058	847	0.01	2.50	29	33	36	38	25	30	35	37
	2000	3,398	941	0.01	2.50	29	33	37	39	26	31	36	38

Data Selection Sheet

Unit Size (inch)	Airflow			Unit ΔPs		Discharge NC Across unit				Radiated NC Across unit			
	CFM	CMH	L/s	in w.g	Pa	ΔPs 125pa	ΔPs 250pa	ΔPs 375pa	ΔPs 500pa	ΔPs 125pa	ΔPs 250pa	ΔPs 375pa	ΔPs 500pa
						(0.5" w.g)	(1.0" w.g)	(1.5" w.g)	(2.0" w.g)	(0.5" w.g)	(1.0" w.g)	(1.5" w.g)	(2.0" w.g)
14	1500	2,549	706	0.02	5.00	20	24	26	29	18	24	28	30
	1800	3,058	847	0.03	7.50	21	25	28	30	21	27	29	33
	2100	3,568	988	0.04	10.00	22	26	29	31	22	28	31	34
	2400	4,078	1,129	0.05	12.50	24	28	30	32	23	29	33	35
	2700	4,587	1,271	0.06	15.00	24	29	31	33	24	30	34	36
16	2000	3,398	941	0.02	5.00	19	22	25	26	16	21	24	27
	2400	4,078	1,129	0.02	5.00	21	25	28	29	18	24	28	30
	2800	4,757	1,318	0.03	7.50	22	28	30	31	21	27	30	33
	3200	5,437	1,506	0.04	10.00	25	29	31	33	23	29	31	34
	3600	6,116	1,694	0.05	12.50	26	30	33	35	24	30	34	36
20x16	3900	6,626	1,835	0.03	7.50	29	35	39	42	38	41	42	43
	4600	7,815	2,165	0.04	10.00	30	37	40	44	41	43	46	47
	5300	9,005	2,494	0.06	15.00	33	39	43	45	43	47	48	49
	6000	10,194	2,824	0.07	17.50	34	40	44	47	47	49	48	51
	6700	11,383	3,153	0.09	22.50	35	42	45	48	48	51	52	53

ΔPs = static pressure drop; ΔPt = total pressure drop

Calculations of ΔPs and ΔPt were performed using standard air with a density of 1.225 kg/m³ (0.0765 lb/cu ft)

Unit ΔPs and Unit ΔPt are pressure drops across the air terminal unit while the inlet damper is in the wide-open position

Data applies to air terminal units with hot water coil mounted on the discharge side.

Dashes (-) indicate NC's less than 15

Product specifications are subject to change by NSCA without notice

DISCHARGE SOUND POWER (NC) @ 125pa-250Pa

Unit Size (inch)	CFM	CMH	Min ΔPs		ΔPs = 125pa (0.5" w.g)						NC	ΔPs = 250pa (1.0" w.g)						NC
			in w.g	Pa	Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
					125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
4	100	170	0.02	5.0	70	56	47	42	40	33	28	71	59	51	46	47	41	29
	125	212	0.03	7.5	72	60	50	44	42	35	30	73	63	54	49	49	43	31
	150	255	0.04	10.0	73	63	52	47	44	36	31	75	65	57	51	50	44	34
	175	297	0.06	15.0	75	65	54	48	45	37	34	76	68	59	53	51	45	35
	200	340	0.08	20.0	76	67	56	50	46	38	35	77	70	61	55	53	46	36
5	150	255	0.01	2.5	68	53	47	43	41	34	25	70	58	52	47	47	42	28
	200	340	0.02	5.0	71	57	50	46	43	36	29	73	61	56	51	49	44	31
	250	425	0.03	7.5	73	60	53	49	45	38	31	75	65	58	53	51	45	34
	300	510	0.04	10.0	74	62	55	51	47	39	29	77	67	60	55	53	46	33
	350	595	0.06	15.0	76	64	57	52	48	40	31	78	69	62	57	54	47	34
6	300	510	0.07	17.5	68	60	54	50	45	39	21	72	65	59	54	51	45	26
	350	595	0.10	25.0	69	62	55	52	47	40	22	74	67	61	56	52	47	29
	400	680	0.13	32.5	71	63	57	54	48	41	25	75	69	62	58	53	48	30
	450	765	0.16	40.0	72	65	58	55	49	42	26	76	70	64	59	54	49	31
	500	850	0.20	50.0	73	66	60	56	50	43	28	77	72	65	61	55	50	33
7	450	765	0.07	17.5	71	61	54	51	47	40	25	74	66	59	54	51	46	29
	500	850	0.09	22.5	71	62	55	52	48	40	25	74	68	60	56	52	47	29
	550	934	0.10	25.0	72	64	56	54	49	41	26	75	69	61	57	53	48	30
	600	1,019	0.12	30.0	72	65	57	55	49	42	26	75	70	62	58	54	48	30
	650	1,104	0.15	37.5	72	66	58	56	50	43	26	75	72	63	59	55	49	32
8	600	1,019	0.02	5.0	73	63	56	52	48	40	28	76	69	60	55	52	47	31
	650	1,104	0.02	5.0	74	64	57	53	48	41	29	77	70	61	56	53	47	33
	700	1,189	0.02	5.0	74	65	57	54	49	41	29	77	71	61	56	53	48	33
	750	1,274	0.02	5.0	75	66	58	54	49	42	28	77	72	62	57	54	48	31
	800	1,359	0.03	7.5	75	67	58	55	50	42	28	78	73	63	58	54	49	32
9	800	1,359	0.04	10.0	73	61	57	53	49	43	25	76	66	61	57	54	49	29
	850	1,444	0.04	10.0	74	62	57	53	49	43	26	76	67	61	57	54	50	29
	900	1,529	0.05	12.5	74	63	58	54	50	43	26	77	68	62	57	55	50	30
	950	1,614	0.06	15.0	75	63	58	54	50	44	28	78	68	62	58	55	50	31
	1,000	1,699	0.06	15.0	75	64	59	55	50	44	28	78	69	62	58	55	50	31
10	900	1,529	0.01	2.5	75	62	58	55	50	44	28	77	67	62	59	55	50	30
	1,000	1,699	0.01	2.5	76	63	59	56	50	44	29	78	68	63	60	56	51	31
	1,100	1,869	0.01	2.5	76	63	59	57	51	45	29	79	69	64	61	56	51	33
	1,200	2,039	0.01	2.5	77	64	60	57	52	45	30	79	70	64	61	57	52	33
	1,300	2,209	0.01	2.5	78	65	61	58	52	46	31	80	70	65	62	58	53	34
12	1,200	2,039	0.01	2.5	73	64	60	55	53	46	25	76	69	64	59	57	52	29
	1,400	2,379	0.01	2.5	74	65	62	56	54	47	26	77	71	66	61	59	53	30
	1,600	2,718	0.01	2.5	75	66	63	57	55	48	28	78	72	67	62	59	55	31
	1,800	3,058	0.01	2.5	76	68	64	58	55	49	29	79	73	68	63	60	56	33
	2,000	3,398	0.01	2.5	76	69	65	59	56	50	29	79	74	69	64	61	56	33

DISCHARGE SOUND POWER (NC) @ 125pa-250Pa

Unit Size (inch)	CFM	CMH	Min ΔPs		ΔPs = 125pa (0.5" w.g)						NC	ΔPs = 250pa (1.0" w.g)						NC
			in w.g	Pa	Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
					125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
14	1,500	2,549	0.02	5.0	69	57	56	53	50	44	20	72	63	56	59	57	53	24
	1,800	3,058	0.03	7.5	70	59	58	53	50	44	21	73	65	58	59	58	53	25
	2,100	3,568	0.04	10.0	71	60	59	54	51	44	22	74	66	59	60	58	54	26
	2,400	4,078	0.05	12.5	72	61	60	54	51	44	24	75	67	60	60	59	54	28
	2,700	4,587	0.06	15.0	72	62	61	54	51	45	24	76	68	61	61	59	54	29
16	2,000	3,398	0.02	5.0	68	59	57	54	52	45	19	71	63	57	58	56	51	22
	2,400	4,078	0.02	5.0	70	62	59	55	53	56	21	73	66	59	60	58	52	25
	2,800	4,757	0.03	7.5	71	64	61	57	55	48	22	75	68	61	61	59	54	28
	3,200	5,437	0.04	10.0	76	65	63	58	56	49	25	76	69	63	62	60	55	29
	3,600	6,116	0.05	12.5	74	67	65	59	57	50	26	77	71	65	63	61	56	30
20x16	3,900	6,626	0.03	7.5	76	70	66	62	61	56	29	81	75	66	67	67	62	35
	4,600	7,815	0.04	10.0	77	71	67	63	63	58	30	82	77	67	38	38	34	37
	5,300	9,005	0.06	15.0	79	73	69	65	64	60	33	84	78	69	69	70	65	39
	6,000	10,194	0.07	17.5	80	74	70	66	65	61	34	85	79	70	71	71	67	40
	6,700	11,383	0.09	22.5	81	75	71	67	67	62	35	86	80	71	72	72	68	42

Performance data is obtained from laboratory testing in accordance with AHRI 880-2011 and ANSI/ASHRAE 130-2008.

NC values are calculated using attenuation credits outlined in Appendix E of AHRI 885-2008

Discharge Sound power levels shown with End Reflection Corrections Included in dB (ref: 10⁻¹² watts).

Minimum Ps is the static pressure drop across the air terminal unit while the inlet damper is in the wide-open position at a given airflow rate.

Dashes (-) indicate NC's value less than 15

Product specifications are subject to change by NSCA without notice

DISCHARGE SOUND POWER (NC) @ 375pa-500Pa

Unit Size (inch)	CFM	CMH	Min ΔPs		ΔPs = 375pa (1.5" w.g)						NC	ΔPs = 500pa (2.0" w.g)						NC
			in w.g	Pa	Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
					125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
4	100	170	0.02	5.0	72	61	54	49	50	46	30	73	62	56	51	53	49	31
	125	212	0.03	7.5	74	64	57	52	52	47	33	75	65	59	54	55	51	34
	150	255	0.04	10.0	76	67	60	54	54	49	35	76	68	61	56	57	52	35
	175	297	0.06	15.0	77	69	62	56	55	50	36	78	71	64	58	58	53	38
	200	340	0.08	20.0	78	72	63	58	56	51	38	79	73	65	60	59	54	39
5	150	255	0.01	2.5	72	60	55	50	51	46	30	73	62	58	52	53	49	31
	200	340	0.02	5.0	75	64	59	53	53	48	34	76	66	61	55	55	51	35
	250	425	0.03	7.5	77	67	61	56	55	50	36	78	69	63	58	57	53	38
	300	510	0.04	10.0	78	70	63	58	56	51	34	79	72	66	60	59	54	35
	350	595	0.06	15.0	80	72	65	60	57	52	36	81	74	67	61	60	55	38
6	300	510	0.07	17.5	75	68	62	57	54	50	30	77	70	64	58	56	53	33
	350	595	0.10	25.0	76	70	64	59	55	51	31	78	72	66	60	58	54	34
	400	680	0.13	32.5	78	72	65	60	57	52	34	79	74	67	62	59	55	35
	450	765	0.16	40.0	79	73	67	62	58	53	35	81	76	69	63	60	56	38
	500	850	0.20	50.0	80	75	68	63	59	54	36	82	77	70	65	61	57	39
7	450	765	0.07	17.5	75	70	61	56	54	49	30	77	72	63	58	56	52	33
	500	850	0.09	22.5	76	71	63	58	55	50	31	77	74	64	59	57	53	34
	550	934	0.10	25.0	76	73	64	59	56	51	33	78	75	65	60	58	54	36
	600	1,019	0.12	30.0	77	74	64	60	57	52	34	78	76	66	61	59	55	37
	650	1,104	0.15	37.5	77	75	65	61	58	53	36	79	77	67	62	59	55	38
8	600	1,019	0.02	5.0	78	72	62	56	55	51	34	79	75	64	57	57	54	36
	650	1,104	0.02	5.0	78	73	63	57	55	51	34	79	76	65	58	57	54	37
	700	1,189	0.02	5.0	79	74	64	58	56	52	35	80	77	65	59	58	55	38
	750	1,274	0.02	5.0	79	75	64	58	56	52	34	80	78	66	60	58	55	38
	800	1,359	0.03	7.5	79	76	65	59	57	53	36	81	78	67	60	59	56	38
9	800	1,359	0.04	10.0	77	69	63	59	57	53	30	78	71	65	60	59	56	31
	850	1,444	0.04	10.0	78	70	63	59	57	54	31	79	72	65	61	59	56	33
	900	1,529	0.05	12.5	79	70	64	59	57	54	33	80	72	66	61	59	57	34
	950	1,614	0.06	15.0	81	73	67	64	60	56	35	82	75	69	66	63	59	36
	1,000	1,699	0.06	15.0	80	72	65	60	58	54	34	81	74	66	62	60	57	35
10	900	1,529	0.01	2.5	78	70	65	61	58	54	31	79	73	67	63	61	57	33
	1,000	1,699	0.01	2.5	79	71	66	62	59	55	33	80	74	68	64	61	57	34
	1,100	1,869	0.01	2.5	80	72	66	63	60	55	34	81	74	68	65	62	58	35
	1,200	2,039	0.01	2.5	81	73	67	64	60	56	35	82	75	69	66	63	59	36
	1,300	2,209	0.01	2.5	81	74	68	65	61	56	35	82	76	69	66	63	59	36
12	1,200	2,039	0.01	2.5	78	72	66	62	60	56	31	79	74	68	64	62	59	33
	1,400	2,379	0.01	2.5	79	74	68	63	61	57	33	80	76	70	65	63	60	36
	1,600	2,718	0.01	2.5	80	75	69	64	62	58	34	81	77	71	66	64	61	37
	1,800	3,058	0.01	2.5	80	76	71	65	63	59	36	81	78	72	67	65	62	38
	2,000	3,398	0.01	2.5	81	77	72	66	64	60	37	82	79	73	68	66	63	39

DISCHARGE SOUND POWER (NC) @ 375pa-500Pa

Unit Size (inch)	CFM	CMH	Min ΔPs		ΔPs = 375pa (1.5" w.g)						NC	ΔPs = 500pa (2.0" w.g)						NC
			in w.g	Pa	Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
					125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
14	1,500	2,549	0.02	5.0	74	67	56	62	62	59	26	76	69	56	65	65	62	29
	1,800	3,058	0.03	7.5	75	68	58	63	62	59	28	77	71	58	65	65	63	30
	2,100	3,568	0.04	10.0	76	69	89	63	63	59	29	78	72	59	66	66	63	31
	2,400	4,078	0.05	12.5	77	70	60	64	63	59	30	78	73	60	66	66	63	32
	2,700	4,587	0.06	15.0	78	71	61	64	63	60	31	79	74	61	67	66	63	33
16	2,000	3,398	0.02	5.0	73	66	57	61	59	54	25	74	68	57	63	61	57	26
	2,400	4,078	0.02	5.0	75	68	59	62	61	56	28	76	70	59	64	62	58	29
	2,800	4,757	0.03	7.5	77	70	61	64	62	57	30	78	72	61	66	64	60	31
	3,200	5,437	0.04	10.0	78	72	63	65	63	59	31	79	73	63	67	65	61	33
	3,600	6,116	0.05	12.5	79	73	65	66	64	60	33	81	75	65	68	66	62	35
20x16	3,900	6,626	0.03	7.5	84	78	66	69	70	66	39	86	80	66	71	72	68	42
	4,600	7,815	0.04	10.0	85	50	37	71	71	37	40	88	82	67	73	74	70	44
	5,300	9,005	0.06	15.0	87	81	69	72	73	69	43	89	83	69	74	75	71	45
	6,000	10,194	0.07	17.5	88	82	70	73	74	70	44	90	84	70	75	76	73	47
	6,700	11,383	0.09	22.5	89	83	71	74	75	71	45	91	85	71	76	77	74	48

Performance data is obtained from laboratory testing in accordance with AHRI 880-2011 and ANSI/ASHRAE 130-2008.

NC values are calculated using attenuation credits outlined in Appendix E of AHRI 885-2008

Discharge Sound power levels shown with End Reflection Corrections Included in dB (ref: 10⁻¹² watts).

Minimum Ps is the static pressure drop across the air terminal unit while the inlet damper is in the wide-open position at a given airflow rate.

Dashes (-) indicate NC's value less than 15

Product specifications are subject to change by NSCA without notice

RADIATED SOUND POWER(NC) @ 125pa-250Pa

Unit Size (inch)	AIR FLOW		Min ΔPs		ΔPs = 125pa (0.5" w.g)						NC	ΔPs = 250pa (1.0" w.g)						NC
	CFM	CMH			Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
			in w.g	Pa	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000		
4	100	170	0.02	5.00	49	45	36	33	31	26	11	52	48	39	36	35	31	15
	125	212	0.03	7.50	52	49	39	36	32	27	16	55	52	42	38	36	32	20
	150	255	0.04	10.00	55	52	41	37	34	28	20	58	55	44	40	38	34	23
	175	297	0.06	15.00	58	55	42	39	35	29	23	61	58	46	42	39	34	27
	200	340	0.08	20.00	60	57	44	40	36	30	25	63	60	47	43	40	35	29
5	150	255	0.01	2.50	49	44	36	32	31	25	10	53	49	41	36	35	30	16
	200	340	0.02	5.00	53	48	39	35	34	27	15	56	53	44	38	37	32	21
	250	425	0.03	7.50	55	52	41	37	35	29	20	59	56	46	40	39	34	24
	300	510	0.04	10.00	58	54	43	39	37	30	22	62	59	48	42	41	35	28
	300	510	0.06	15.00	60	56	45	40	38	31	24	63	61	49	43	42	36	30
6	300	510	0.07	17.50	55	49	40	35	32	28	16	59	54	45	39	37	33	22
	350	595	0.1	25.00	57	52	42	37	34	29	20	60	57	47	41	38	34	25
	400	680	0.13	32.50	58	53	44	39	35	30	21	61	58	49	42	39	35	27
	450	765	0.16	40.00	59	55	45	40	36	31	23	62	60	50	44	40	36	29
	500	850	0.2	50.00	59	56	47	42	37	32	24	63	61	51	45	41	37	30
7	450	765	0.07	17.50	59	48	42	38	33	24	20	61	54	48	42	38	30	23
	500	850	0.09	22.50	60	50	43	39	34	24	22	62	55	49	43	39	30	24
	550	934	0.1	25.00	60	51	44	40	35	25	22	63	57	50	45	40	31	25
	600	1,019	0.12	30.00	61	53	45	42	35	25	23	63	58	51	46	41	31	27
	650	1,104	0.15	37.50	62	54	46	43	36	26	24	64	59	52	47	41	32	28
8	600	1,019	0.02	5.00	59	50	44	40	38	32	20	62	55	49	43	43	39	24
	650	1,104	0.02	5.00	60	51	44	41	39	32	22	63	56	50	44	44	40	25
	700	1,189	0.02	5.00	60	52	45	42	40	33	22	63	57	50	45	44	41	25
	750	1,274	0.02	5.00	61	53	46	43	40	34	23	64	58	51	46	45	41	27
	800	1,359	0.03	7.50	62	54	47	43	41	34	24	65	59	52	47	46	42	28
9	800	1,359	0.04	10.00	58	47	43	36	34	30	19	61	53	49	42	40	35	23
	850	1,444	0.04	10.00	58	48	43	37	34	31	19	61	54	49	43	41	35	23
	900	1,529	0.05	12.50	59	49	44	37	35	31	20	62	55	50	43	41	35	24
	950	1,614	0.06	15.00	59	50	44	37	35	31	20	62	56	50	43	42	36	24
	1000	1,699	0.06	15.00	60	50	44	38	36	31	22	63	56	50	44	42	36	25
10	900	1,529	0.01	2.50	60	50	47	45	42	29	22	63	57	53	50	48	37	27
	1000	1,699	0.01	2.50	60	51	48	46	43	30	22	64	58	54	51	49	38	28
	1100	1,869	0.01	2.50	61	52	48	47	44	32	23	65	58	54	52	50	39	28
	1200	2,039	0.01	2.50	62	53	48	47	45	32	24	65	59	54	53	51	40	28
	1300	2,209	0.01	2.50	63	54	49	48	45	33	25	66	60	55	53	52	41	29
12	1200	2,039	0.01	2.50	58	50	47	41	37	30	20	62	56	52	47	43	37	26
	1400	2,379	0.01	2.50	60	52	48	42	38	32	22	63	57	54	48	45	39	28
	1600	2,718	0.01	2.50	61	52	48	47	44	32	23	65	58	54	52	50	39	28
	1800	3,058	0.01	2.50	61	55	51	44	41	35	25	65	60	56	50	48	41	30
	2000	3,398	0.01	2.50	62	56	52	45	43	36	26	66	61	57	51	49	43	31

RADIATED SOUND POWER(NC) @ 125pa-250Pa

Unit Size (inch)	AIR FLOW		Min ΔPs		ΔPs = 125pa (0.5" w.g)						NC	ΔPs = 250pa (1.0" w.g)						NC
	CFM	CMH			Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
			in w.g	Pa	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000		
14	1500	2,549	0.02	5.00	56	51	45	43	40	36	18	60	56	50	48	45	41	24
	1800	3,058	0.03	7.50	58	53	46	44	41	36	21	62	58	51	49	46	42	27
	2100	3,568	0.04	10.00	59	54	47	45	42	37	22	63	59	52	50	47	43	28
	2400	4,078	0.05	12.50	60	55	48	46	43	38	23	64	60	53	51	48	43	29
	2700	4,587	0.06	15.00	62	56	49	47	44	38	24	66	61	54	52	49	44	30
16	2000	3,398	0.02	5.00	55	48	43	41	39	31	16	59	53	47	45	44	38	21
	2400	4,078	0.02	5.00	57	51	45	43	41	33	18	61	56	49	47	46	39	24
	2800	4,757	0.03	7.50	59	53	46	44	42	34	21	63	58	51	48	47	41	27
	3200	5,437	0.04	10.00	61	55	48	46	44	36	23	65	60	52	50	49	42	29
	3600	6,116	0.05	12.50	62	56	49	47	45	37	24	66	61	54	51	50	44	30
20x16	3900	6,626	0.03	7.50	70	65	63	59	57	54	38	72	68	66	62	61	58	41
	4600	7,815	0.04	10.00	73	68	66	62	59	55	41	75	71	68	64	63	60	43
	5300	9,005	0.06	15.00	75	71	68	64	61	56	43	78	73	71	66	65	61	47
	6000	10,194	0.07	17.50	77	73	71	66	63	57	47	80	75	70	68	66	62	49
	6700	11,383	0.09	22.50	79	75	72	67	64	58	48	82	77	75	70	68	63	51

Performance data is obtained from laboratory testing in accordance with AHRI 880-2011 and ANSI/ASHRAE 130-2008.

NC values are calculated using attenuation credits outlined in Appendix E of AHRI 885-2008

Discharge Sound power levels shown with End Reflection Corrections Included in dB (ref: 10–12 watts).

Minimum Ps is the static pressure drop across the air terminal unit while the inlet damper is in the wide-open position at a given airflow rate.

Dashes (-) indicate NC's value less than 15

Product specifications are subject to change by NSCA without notice

RADIATED SOUND POWER(NC) @ 375pa-500Pa

Unit Size (inch)	AIR FLOW		Min ΔPs		ΔPs = 375pa (1.5" w.g)						NC	ΔPs = 500pa (2.0" w.g)						NC
	CFM	CMH			Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
			in w.g	Pa	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000		
4	100	170	0.02	5.00	53	50	41	37	37	34	17	55	51	43	38	39	36	18
	125	212	0.03	7.50	57	54	44	40	39	36	25	58	55	45	41	40	38	23
	150	255	0.04	10.00	60	57	46	41	40	37	25	61	58	47	42	42	39	27
	175	297	0.06	15.00	63	59	48	43	41	38	28	64	61	49	44	43	40	30
	200	340	0.08	20.00	65	62	49	44	42	38	31	66	63	51	45	44	41	33
5	150	255	0.01	2.50	61	57	48	41	39	36	25	57	53	45	39	39	35	21
	200	340	0.02	5.00	62	59	50	43	40	37	28	60	57	48	42	41	37	25
	250	425	0.03	7.50	63	61	52	44	42	38	30	63	61	51	44	43	39	30
	300	510	0.04	10.00	64	63	53	46	43	39	33	65	63	52	45	44	40	33
	300	510	0.06	15.00	65	64	54	47	44	40	34	67	65	54	47	45	41	35
6	300	510	0.07	17.50	61	57	48	41	39	36	25	63	59	50	42	41	38	28
	350	595	0.1	25.00	62	59	50	43	40	37	28	64	62	52	44	42	39	31
	400	680	0.13	32.50	63	61	52	44	42	38	30	65	63	54	46	43	40	33
	450	765	0.16	40.00	64	63	53	46	43	39	33	66	65	55	47	45	41	35
	500	850	0.2	50.00	65	64	54	47	44	40	34	67	67	56	49	46	42	37
7	450	765	0.07	17.50	62	57	51	45	41	33	25	63	59	53	46	43	35	28
	500	850	0.09	22.50	63	58	52	46	42	34	27	64	60	54	48	44	36	29
	550	934	0.1	25.00	64	59	53	47	43	34	28	66	62	55	49	45	37	31
	600	1,019	0.12	30.00	65	61	54	48	44	35	29	66	63	56	50	46	37	33
	650	1,104	0.15	37.50	65	62	55	49	44	35	31	66	64	57	51	46	38	34
8	600	1,019	0.02	5.00	64	58	52	46	45	44	27	65	60	54	47	47	47	29
	650	1,104	0.02	5.00	65	59	53	47	46	45	28	66	61	55	48	48	48	30
	700	1,189	0.02	5.00	65	60	53	47	47	45	29	67	62	56	49	49	48	31
	750	1,274	0.02	5.00	66	61	54	48	48	46	30	67	63	56	50	50	49	33
	800	1,359	0.03	7.50	66	62	55	49	48	47	31	68	64	57	51	50	50	34
9	800	1,359	0.04	10.00	62	57	52	46	44	38	26	63	59	55	48	47	40	29
	850	1,444	0.04	10.00	63	58	53	46	45	38	27	64	60	55	49	47	40	29
	900	1,529	0.05	12.50	64	58	53	47	45	38	27	65	61	56	49	48	40	30
	950	1,614	0.06	15.00	64	59	54	47	45	38	28	65	62	56	49	48	40	31
	1000	1,699	0.06	15.00	65	60	54	47	46	39	29	66	62	57	50	48	40	31
10	900	1,529	0.01	2.50	65	60	57	53	52	41	31	67	63	59	56	54	44	34
	1000	1,699	0.01	2.50	66	61	57	54	53	42	31	67	64	59	56	55	45	34
	1100	1,869	0.01	2.50	67	62	57	55	54	43	31	68	64	60	57	56	46	35
	1200	2,039	0.01	2.50	67	63	58	56	55	44	33	69	65	60	58	57	47	35
	1300	2,209	0.01	2.50	68	63	58	56	55	45	33	69	66	61	58	58	48	36
12	1200	2,039	0.01	2.50	64	59	56	50	46	41	30	66	61	58	53	49	43	32
	1400	2,379	0.01	2.50	65	60	57	52	48	42	31	67	63	60	54	51	45	35
	1600	2,718	0.01	2.50	65	60	57	52	48	42	31	68	64	61	55	52	47	36
	1800	3,058	0.01	2.50	67	63	60	54	51	45	35	69	65	62	56	54	48	37
	2000	3,398	0.01	2.50	68	64	61	55	52	47	36	69	67	63	57	55	49	38

RADIATED SOUND POWER(NC) @ 375pa-500Pa

Unit Size (inch)	AIR FLOW		Min ΔPs		ΔPs = 375pa (1.5" w.g)						NC	ΔPs = 500pa (2.0" w.g)						NC
	CFM	CMH			Octave band sound power, Lw, dB							Octave band sound power, Lw, dB						
			in w.g	Pa	125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
14	1500	2,549	0.02	5.00	62	59	53	51	48	45	28	64	61	55	53	50	47	30
	1800	3,058	0.03	7.50	64	60	54	52	49	45	29	66	63	56	54	51	48	33
	2100	3,568	0.04	10.00	66	62	55	53	50	46	31	67	64	58	55	52	49	34
	2400	4,078	0.05	12.50	67	63	56	54	51	47	33	69	65	58	56	53	49	35
	2700	4,587	0.06	15.00	68	64	57	55	52	47	34	70	66	59	57	54	50	36
16	2000	3,398	0.02	5.00	61	56	50	47	47	41	24	63	58	52	49	49	44	27
	2400	4,078	0.02	5.00	64	59	52	49	49	43	28	65	61	54	51	51	46	30
	2800	4,757	0.03	7.50	66	61	54	50	50	45	30	67	63	55	52	52	48	33
	3200	5,437	0.04	10.00	67	62	55	52	52	46	31	69	64	57	53	54	49	34
	3600	6,116	0.05	12.50	69	64	56	53	53	48	34	71	66	58	55	55	40	36
20x16	3900	6,626	0.03	7.50	74	69	67	63	63	61	42	75	70	68	64	65	63	43
	4600	7,815	0.04	10.00	77	72	70	66	65	63	46	78	73	71	67	67	64	47
	5300	9,005	0.06	15.00	79	74	72	68	67	64	48	80	75	73	69	68	66	49
	6000	10,194	0.07	17.50	79	74	72	68	67	64	48	80	77	75	71	70	67	51
	6700	11,383	0.09	22.50	83	78	76	71	70	66	52	84	79	77	72	71	68	53

Performance data is obtained from laboratory testing in accordance with AHRI 880-2011 and ANSI/ASHRAE 130-2008.

NC values are calculated using attenuation credits outlined in Appendix E of AHRI 885-2008

Discharge Sound power levels shown with End Reflection Corrections Included in dB (ref: 10–12 watts).

Minimum Ps is the static pressure drop across the air terminal unit while the inlet damper is in the wide-open position at a given airflow rate.

Dashes (-) indicate NC's value less than 15

Product specifications are subject to change by NSCA without notice

HEAT WATER COIL DATA (kW)

MODEL	ROW	Coil	HD loss	Airflow (CMH)					
		l/s	kPa	212	299	338	425	594	680
SVAV-S-T100-05 SVAV-S-T100-06	1	0.03	0.39	1.64	1.90	1.99	2.17	2.43	2.52
		0.06	1.16	1.82	2.17	2.29	2.52	2.90	3.05
		0.13	5.56	1.96	2.34	2.49	2.78	3.22	3.40
		0.19	12.22	1.99	2.40	2.58	2.87	3.34	3.55
		Through the coil, ΔPs		4.98	7.47	9.95	12.44	24.88	29.86
	2	0.06	0.36	2.72	3.28	3.52	3.93	4.54	4.78
		0.13	1.40	2.99	3.66	3.99	4.48	5.33	5.69
		0.25	5.35	3.14	3.93	4.25	4.86	5.86	6.30
		0.38	11.72	3.19	4.02	4.37	5.01	6.10	6.54
		Through the coil, ΔPs		9.95	17.42	19.91	29.86	52.26	64.70

MODEL	ROW	Coil	HD loss	Airflow (CMH)					
		l/s	kPa	338	511	680	1019	1188	1361
SVAV-S-T100-07 SVAV-S-T100-08	1	0.03	0.51	2.29	2.67	2.93	3.28	3.43	3.55
		0.06	1.97	2.61	3.14	3.55	4.10	4.31	4.48
		0.13	7.47	2.84	3.46	3.96	4.69	4.95	5.22
		0.19	16.38	2.93	3.60	4.13	4.92	5.25	5.51
		Through the coil, ΔPs		4.98	9.95	17.42	37.33	47.28	59.72
	2	0.06	0.51	3.93	4.78	5.42	6.30	6.62	0.92
		0.13	1.91	4.40	5.54	6.42	7.74	8.62	8.70
		0.25	7.26	4.69	6.04	7.12	8.76	9.44	10.02
		0.38	15.90	4.81	6.21	7.39	9.17	9.94	10.58
		Through the coil, ΔPs		12.44	24.88	39.81	79.63	102.02	126.97

MODEL	ROW	Coil	HD loss	Airflow (CMH)					
		l/s	kPa	511	850	1188	1530	1699	1868
SVAV-S-T100-09 SVAV-S-T100-10	1	0.06	0.33	3.49	4.28	4.78	5.16	5.30	5.45
		0.13	1.26	3.96	4.98	5.71	6.24	6.48	6.68
		0.25	4.81	4.25	5.45	6.33	7.03	7.33	7.59
		0.38	10.52	4.37	5.66	6.59	7.36	7.68	7.97
		Through the coil, ΔPs		4.98	14.93	24.88	37.33	47.28	54.74
	2	0.06	0.69	5.48	6.89	7.80	8.44	8.70	8.94
		0.13	2.63	6.33	8.32	9.73	10.81	11.25	11.66
		0.25	9.98	6.86	9.29	11.14	12.57	13.19	13.77
		0.38	21.82	7.06	9.70	1.89	13.31	14.01	14.65
		Through the coil, ΔPs		12.44	29.96	54.74	82.12	97.05	114.47

MODEL	ROW	Coil	HD loss	Airflow (CMH)					
		l/s	kPa	680	1018	1300	2037	2379	2718
SVAV-S-T100-12	1	0.06	0.45	4.57	5.33	5.86	6.59	6.86	7.09
		0.13	1.67	5.25	6.30	7.06	8.18	8.62	9.00
		0.25	6.34	5.89	6.95	7.91	8.35	9.94	10.43
		0.38	13.84	5.86	7.21	8.24	9.85	10.46	11.02
		Through the coil, ΔPs		4.98	9.95	17.43	37.33	47.28	59.72
	2	0.06	0.93	6.95	8.26	9.14	10.32	10.73	11.08
		0.13	3.47	8.24	10.20	11.66	13.75	14.54	15.21
		0.25	13.06	9.06	11.55	13.48	16.44	17.58	18.58
		0.38	28.48	9.48	12.07	14.24	17.55	18.90	20.08
		Through the coil, ΔPs		12.44	24.88	39.81	79.63	102.02	126.91

HEAT WATER COIL DATA (kW)

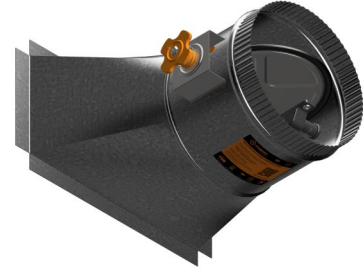
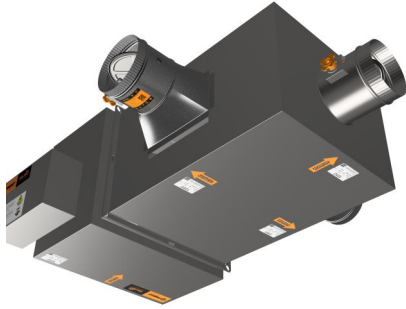
MODEL	ROW	Coil	HD loss	Airflow (CMH)					
		l/s	kPa	1018	1090	2379	3080	3398	3736
SVAV-S-T100-14	1	0.06	0.60	6.30	7.47	8.24	8.76	8.97	9.14
		0.13	2.27	7.47	9.26	10.46	11.37	11.72	12.07
		0.25	8.58	8.24	10.46	12.10	13.36	13.89	14.36
		0.38	18.71	8.56	11.02	12.78	14.18	14.80	15.36
		Through the coil, ΔPs		4.98	14.93	24.88	37.33	47.28	54.74
	2	0.09	0.99	10.35	12.78	14.27	15.33	15.74	16.12
		0.19	3.80	12.25	15.94	18.49	20.40	21.19	21.89
		0.38	14.50	13.48	18.17	21.63	24.35	25.53	26.58
		0.57	31.83	13.95	19.08	22.95	26.02	27.37	28.60
		Through the coil, ΔPs		12.44	29.86	54.74	82.12	97.05	114.47

MODEL	ROW	Coil	HD loss	Airflow (CMH)					
		l/s	kPa	1360	2037	2718	3398	4078	4755
SVAV-S-T100-16	1	0.06	0.69	7.50	8.53	9.20	9.70	10.11	10.40
		0.13	2.57	9.17	10.79	11.93	12.84	13.54	14.16
		0.25	9.71	10.29	12.40	13.98	15.27	16.29	17.20
		0.38	21.16	10.73	13.07	14.86	16.29	17.50	18.52
		Through the coil, ΔPs		7.47	14.93	22.40	34.84	47.28	58.72
	2	0.09	1.11	12.40	14.45	15.80	16.76	17.53	18.08
		0.19	4.18	15.15	18.49	20.93	22.77	24.27	25.50
		0.38	15.99	17.00	21.42	24.79	27.56	29.81	31.74
		0.57	35.12	17.73	22.60	26.44	29.57	32.24	34.55
		Through the coil, ΔPs		14.93	29.86	49.77	72.16	97.05	126.91

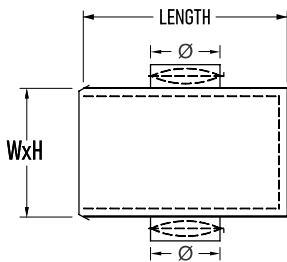
Correction Factors - Hot Water Coil

		Entering Air Temp. °C							
		49	54	60	66	71	77	82	88
Entering Air Temp. °C	10		0.62	0.71	0.79	0.87	0.96	1.04	1.12
	13		0.58	0.67	0.75	0.83	0.92	1.00	1.08
	16		0.55	0.63	0.71	0.79	0.88	0.96	1.04
	18		0.51	0.59	0.67	0.75	0.84	0.92	1.00

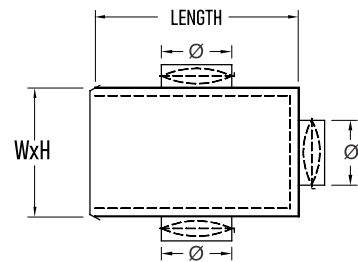
AIR TERMINAL WITH MULTIPLE OUTLET PLENUM ARRANGEMENT



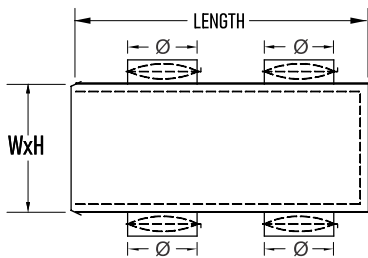
Spigot details



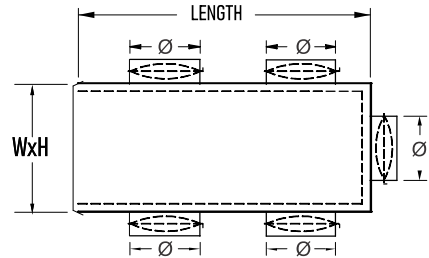
ARRANGEMENT - A



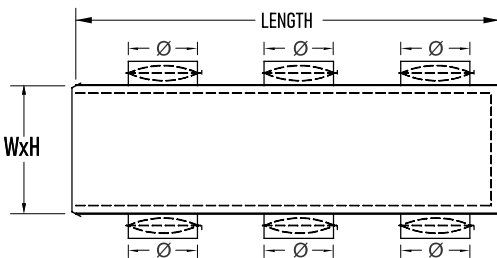
ARRANGEMENT - B



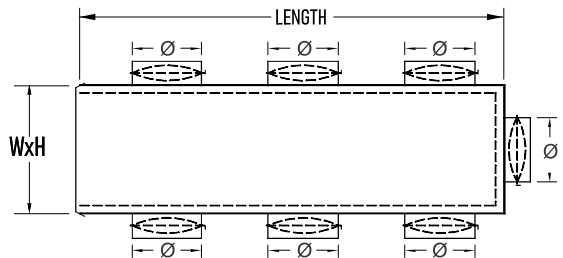
ARRANGEMENT - C



ARRANGEMENT - D

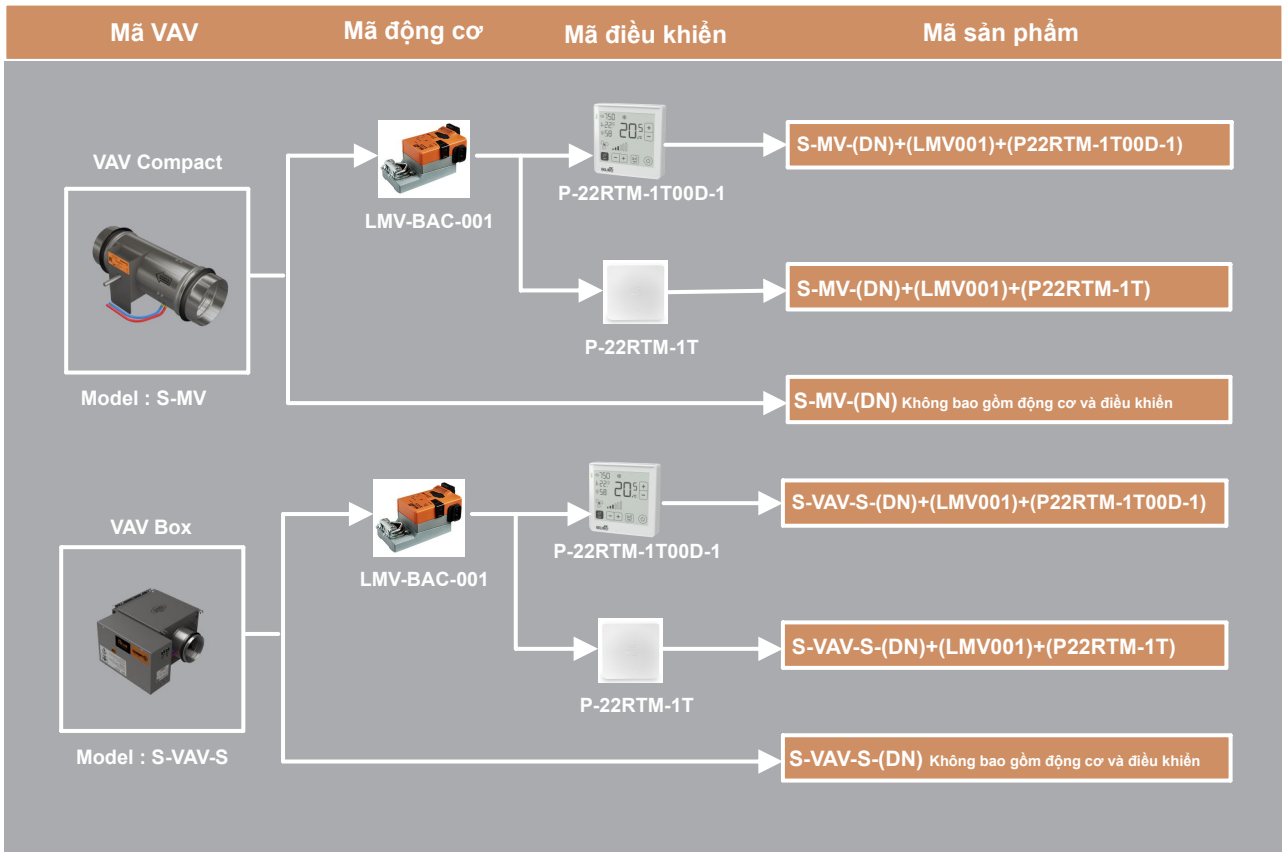
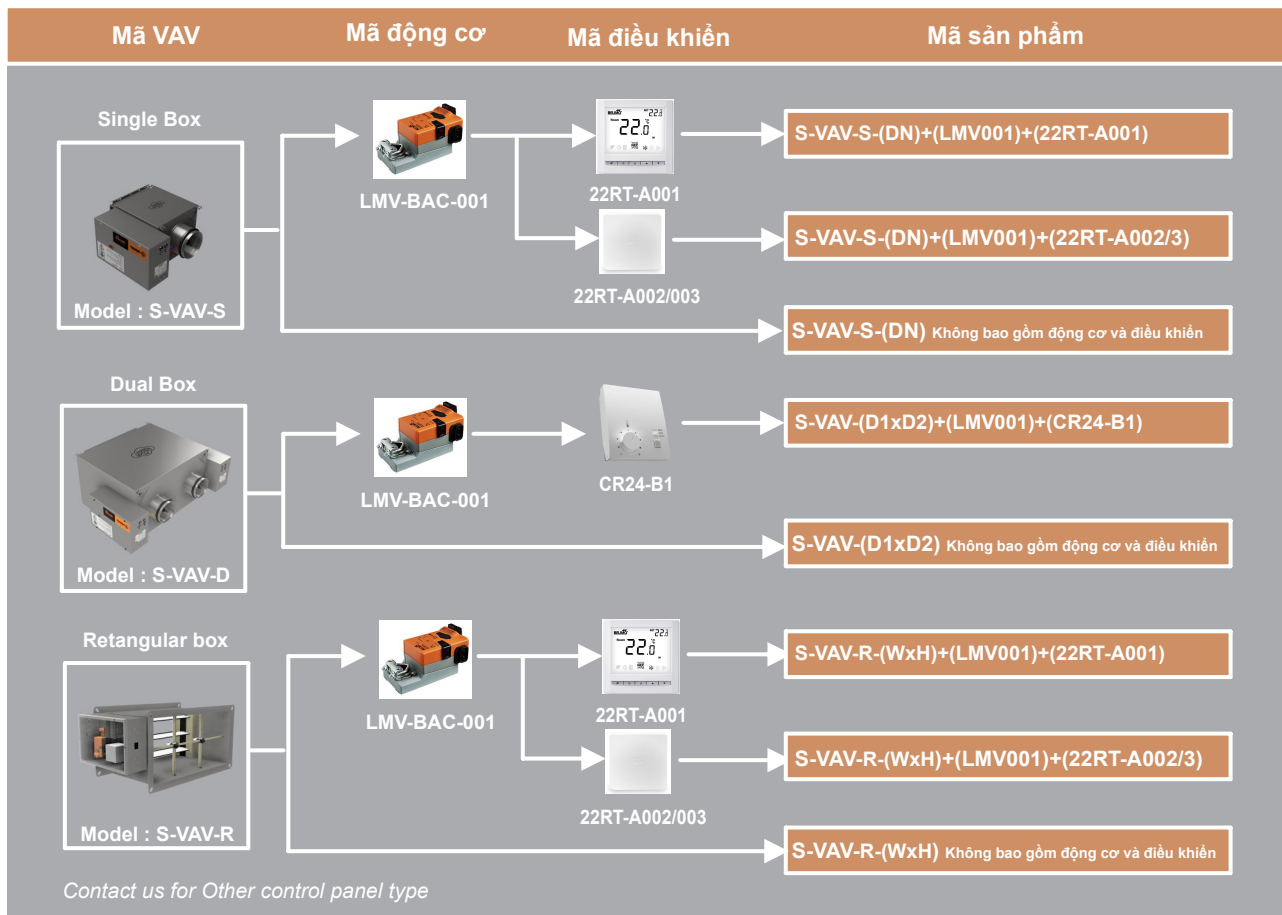


ARRANGEMENT - E



ARRANGEMENT - F

NOTE:
Multiple outlet plenums can be supplied in the upon arrangement and the dimensions will be as per customer's requirement

AIR QUALITY CONTROL

AIR FLOW CONTROL


Closed Cell Foam Acoustic Clean Liner Board insulation



Excellent thermal insulation

Thermal conductivity (λ) of 0.031 (W/m.K) at 25 °C provides excellent thermal performance, reducing heat loss for residential and commercial buildings.



Effective fire protection

Base fibers are non combustible when tested in accordance with BS 476 (part 4), ASTM E136.



Excellent acoustic insulation

Cell foam Acoustic Clean Liner Board Insulation provides optimal acoustic performance for better comfort.



Indoor Air Quality Assure

the material resists mold and mildew growth and is easily cleanable. The material will not wick moisture on exposed edges.

Specification		Standard	Technical data				
Cấu trúc (Cell structure)		ASTM 2856	Closed cell				
Tỉ trọng (Density (kg/m ³))		ISO 854-1998	70-100 kg/m ³				
Hệ số dẫn nhiệt Thermal Conductivity BTU-in/ft ² .h.°F (W/mK)	Mean temperature	Kelvin Temperature	- 4° F	32° F	76° F	90° F	104° F
		Cecius Temperature	- 20° C	0° C	24° C	32° C	40° C
	λ - Value	BTU-in/ft ² .h.°F (W/mK)	0.22 (0.032)	0.23 (0.034)	0.25 (0.037)	0.26 (0.038)	0.27 (0.039)
Service Temperature (Nhiệt độ làm việc)		GB/T8871	-58° F TO 230° F - 50° C TO 110° C				
Coefficient water vapor permeability (Hệ số thấm nước) kg/pa.s.m		ASTM E96	0.16 x 10 ⁻¹²				
Moisture resistance- Chống ẩm (μ Value)		DIN 52615	$\mu \geq 7000$ (15000)				
Water absorption - Hấp thụ nước (by volume)		ASTM D1056	$\leq 0.2\%$				
Dimension stability - Độ ổn định kích thước (%) at 105±3° C in 7 days		ASTM C534	0-7%				
Crack resistance - Chống nứt gãy (N/cm)		ISO 1798:1997	≥ 2.5 N/cm				
Compression resilience ratio - Tỷ lệ khả năng phục hồi nén (Compression 50% V. 72hrs)		ASTM D545	$\geq 70\%$				
Ozone Resistance - Kháng Ozone(Ozone pressure 200mpa 200hrs)		ASTM D1171	No crack				
Flameability & Smoke - Tính dễ cháy và khói		ATSM D635 UL 94 BS476 PART 7 BS476 PART 6	HB (Swan-plan noncombussile) V-0 (Fire self-extinguishing)				
Sound reduction - Giảm âm thanh		AS 1054	Class 2/Class 1/Class 0				
Flexibility - Khả năng co giãn		ISO 178:1993	27Db (20mm)				
Coating with release paper - Độ bám giấy phủ		TCVN 5820:1994	Excelent				
Fungi Resistance - Kháng nấm		ASTM G21	Adhesive test ok under temperature 80° c and 500 hours				
UV & weather resistance - Chống tia cực tím và thời tiết		ASTM G23/G154	Excelent				
Mold resistance - Chống nấm mốc		UL 181	Excelent				
CFC and HCFC			Excelent				
Nitrosamine content - Hàm lượng nitrosamine		US FDABS EN 12956	No detected				
Access the color change - Đổi màu		ISO 105-A02:1993	No color change				
Other tesst certificate (*)							

ORDERING CODE

SVAV-(C/S/D/R)-(Z/A/S)-(DN/D1xD2/WxH)-(C/CH)-(R/L)-(A/B/C/D/E/F)-(120/220)+(LMV/NMV)+(RT/RTM...)

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
1 2 3 4 5 6 7 8 9

1- VAV body type :

- S-MV : Vav compact
- S-VAV-S : Single duct
- S-VAV-D : Dual duct
- S-VAV-R : VAV vuông

2- Body material :

- Z : ZAM K27 steel
- A : Aluminum A5052
- S : Stainless steel Ss304

3- Inlet size :

- DN : Single round diameter
- D1xD2 : Dual round diameter
- (WxH) : Rectangular inlet size

4- Air Flow :

- C : Single duct flow
- CH : Dual duct flow (Hot/Cool)

5- Controller box position:

- R: Right hand
- L: Left hand

6- Outlet option: A/B/C/D/E/F (See page 26)

7- Power input:

- 220 : 220v, 50Hz
- 120: 120v, 60Hz
- Other : Specify

8- Actuator model :

- (See page 27)

9- Control panel model :

- (See page 27)

Order code example:

SVAV-S-Z-04-350-R-220+(LMV001)+(P-22RT-A001)

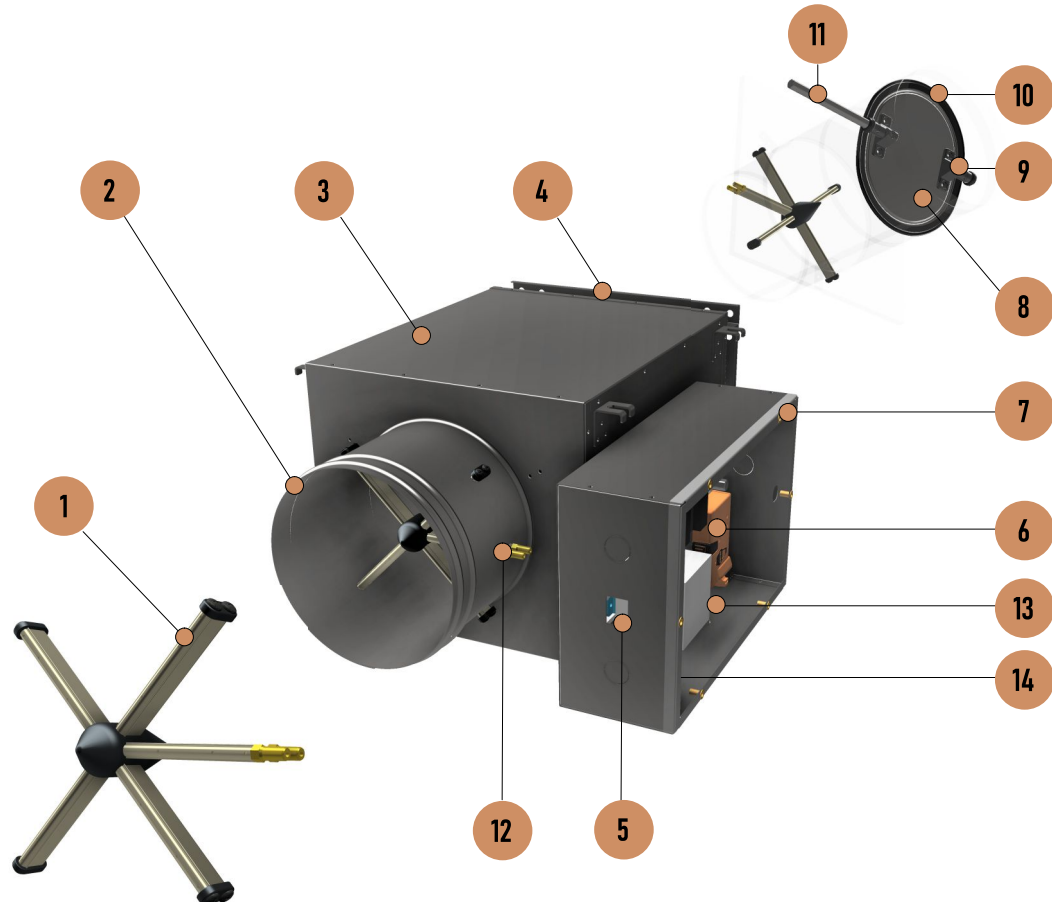
Single duct type, ZAM K27 body material. inlet size 4". Air flow 350 CMH

Controller box in right side. Power input : 220v, 50Hz.

Actuator model LMV-BAC-001VAV

Động cơ LMV-BAC-001, Control panel model P-22RT-A001, LCD display

SPECIAL VAV BOX CONSTRUCTION



- 1 Differential pressure sensor
- 2 Damper casing , ZAM K27 iron sheet
- 3 Casing, ZAM K27 iron sheet
- 4 Connection flange
- 5 On/Off switch
- 6 Belimo BACnet controller
- 7 Control box, ZAM K27 iron sheet

- 8 Oval damper blade, ZAM K27 iron sheet
- 9 Shaft holder, ABS
- 10 EPDM seal
- 11 Shaft, D12 steel bar
- 12 Signal tube P_t/P_s
- 13 Transformer 24v DC
- 14 Wire connector, fuse

Multi-Quadrant Averaging Flow Sensor

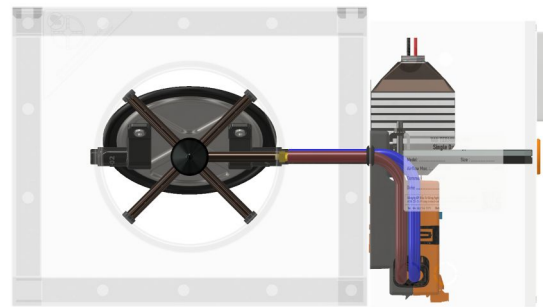
Starduct's standard airflow sensor is a multi-quadrant averaging sensor, suitable for use in most differential pressure feedback air control circuits. The accuracy or minimum-maximum set point is $\pm 5\%$ or less when calibration is accurately performed.



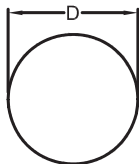
Inlet Flow Sensor Ports

Starduct air terminal units are provided with external piping sensor connections, allowing visual verification of inlet sensor piping connections without having to remove the primary duct or relying solely on tubing color coding.

The units are shipped with Red stripe tubing on the high pressure port and Blue stripe tubing on the low pressure port of the inlet sensor. The tubing are short pieces with barbed fittings. The "HIGH" pressure side of the inlet flow sensor is what the air hits first and the "LOW" pressure side of the inlet flow sensor is farthest away from the airflow. All diagrams display the color of tubing used on the "HIGH" and "LOW" pressure ports of the inlet flow sensor.

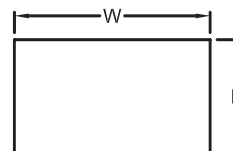


Round Duct Dimensions



Size	D (in .)
04	4
05	5
06	6
08	8
10	10
12	12
14	14
16	16

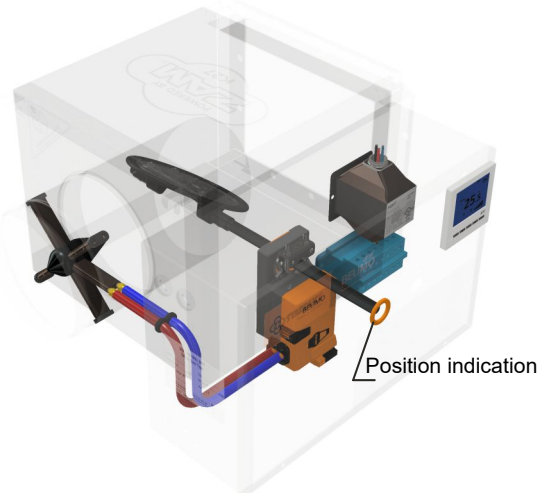
Rectangular Duct Dimensions



Size	W (in .)	H (in .)
14x8	14	8
16x8	16	8
20x16	20	16
24x16	24	16

Indication Damper shaft

Starduct has designed the primary air damper shaft assembly for improved performance. The shaft is a one-piece. The shaft has a straightness tolerance of 0.010"/ft which provides extremely smooth operation. Determining damper position is straightforward since the shaft has a built-in damper position indicator. The indicating arrows provide a high-contrast against the shaft interior for easily visible damper position confirmation.

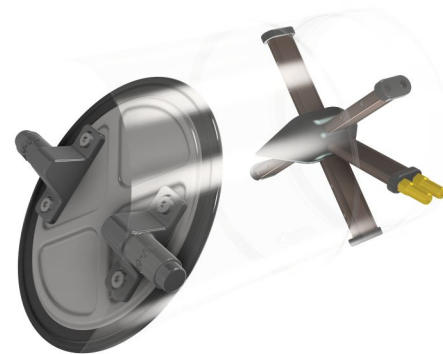


Damper Position Indicator

Stamping Blade with EPDM tube seal

The Starduct damper blade is manufactured with a flexible gasket and mounted without adhesives to provide an excellent close off seal. Included on the damper gasket are slits around the perimeter to prevent damper noise at low turn down. The damper is constructed of double thick 18-gauge equivalent steel. Damper leakage is less than 1% of maximum CFM at 3.0" wg static pressure.

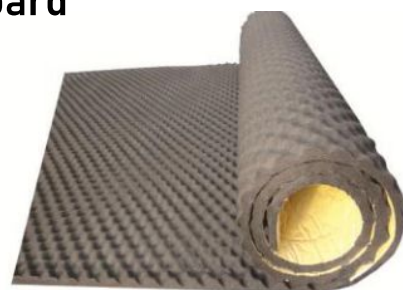
The stiffness stamping blade is much stronger than flat, which rely on a thin damper blade to span the middle part of the damper assembly, thus eliminating the opportunity for flexing and twisting of the damper blade.



Damper Blade Construction

Closed Cell Foam Clean Acoustic Board

the material resists mold and mildew growth and is easily cleanable. The material will not wick moisture on exposed edges.



NBR Rubber Foam Soundproof

(Egg Sheet)

Close Cell Structure

VAV COMPACT - Model: S-MV

Brief description

The VAV-Compact with its PI control characteristic is used for the pressure-independent control of VAV units in the comfort zone.

Product Structure:

- Main body : By ZAM K27 Steel (0.8mm)
- Blade: Stamped blade by ZAM K27 Steel (0.8mm)

Controller:

- Actuator: LMV-BAC-001 (5Nm)
- Thermostat : LCD display Temp. Hum. Co2
- Nominal Voltage: AC/DC 24V. 50/60hz

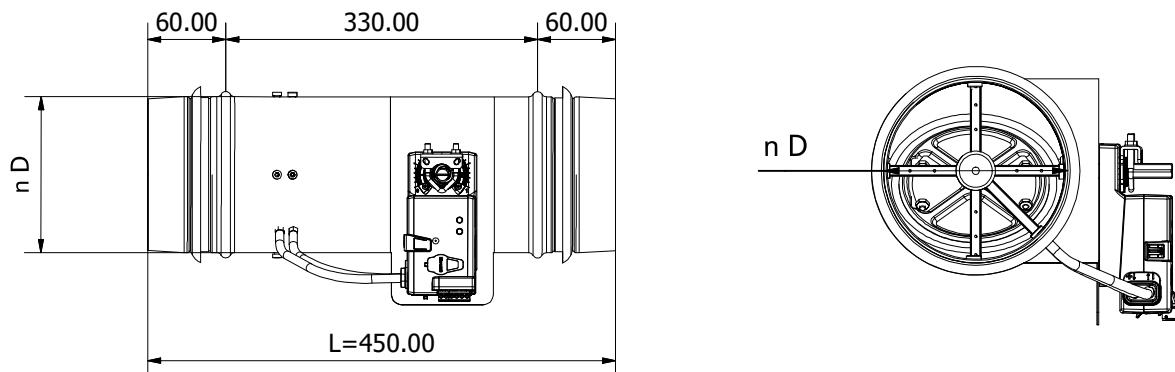
Control function:

Volumetric flow (VAV/CAV) or position control (Open Loop for integration in external VAV control loop).

Application: Fresh air control



Dimension details:



Specification

No.	Model	Diameter (mm)	Length L(mm)	Vmin CMH	Vmax CMH	Actuator	Thermostat	Nominal Voltage	Consumption
1	S-MV80	80	450	40	162	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
2	S-MV100	100	450	79	510	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
3	S-MV125	125	450	102	612	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
4	S-MV150	150	450	153	880	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
5	S-MV200	200	450	272	1560	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
6	S-MV250	250	450	425	2430	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
7	S-MV300	300	450	612	3500	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
8	S-MV350	350	450	816	4760	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W
9	S-MV400	400	450	1071	6232	LMV--BAC-001	P-22RT/22DC11	AC/DC, 24V. 50/60Hz	2W

Working range : AC 19,2....28,8V/DC 21,6....28,8.

P-22RT : Room operation unit (ROU). 22DC11 : CO2 duct sensor

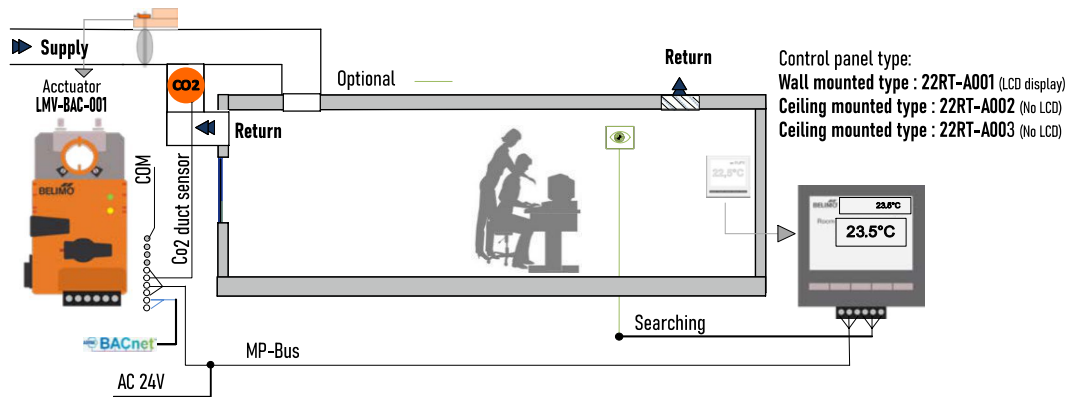
Co2 control by sensor in the return duct

Model : S-MV-22DC11

Application: No 8

Application description

- The supply air volume is controlled by air quality.
- The air quality is measured as Co2 value by a 22DC-11 in the return duct for all VAV in the system



Working principle

Air supply by order

By selecting options on the app, the ZoneEase VAV system will operate according to ventilation control commands depending on the CO2 density from the AHU return line and the desired air quality (according to the CO2 set point).

Off mode

In this mode, the ZoneEase system will only provide a minimum flow into the zone, V_{min} , CO2 control is off. The damper can be configured for a closed state. This may be the case when saving energy or in an unoccupied room, for example on a holiday.

Active mode

In this mode, the system activates all controls for selected applications. That is the opposite of off mode.

Actuator, control panel and duct sensor model :

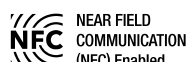
VAV ZoneEase compact:
Model: LMV/NMV-BAC-001

CO2 Duct Sensor
Model : 22DC-11



ZoneEase VAV controller from Belimo

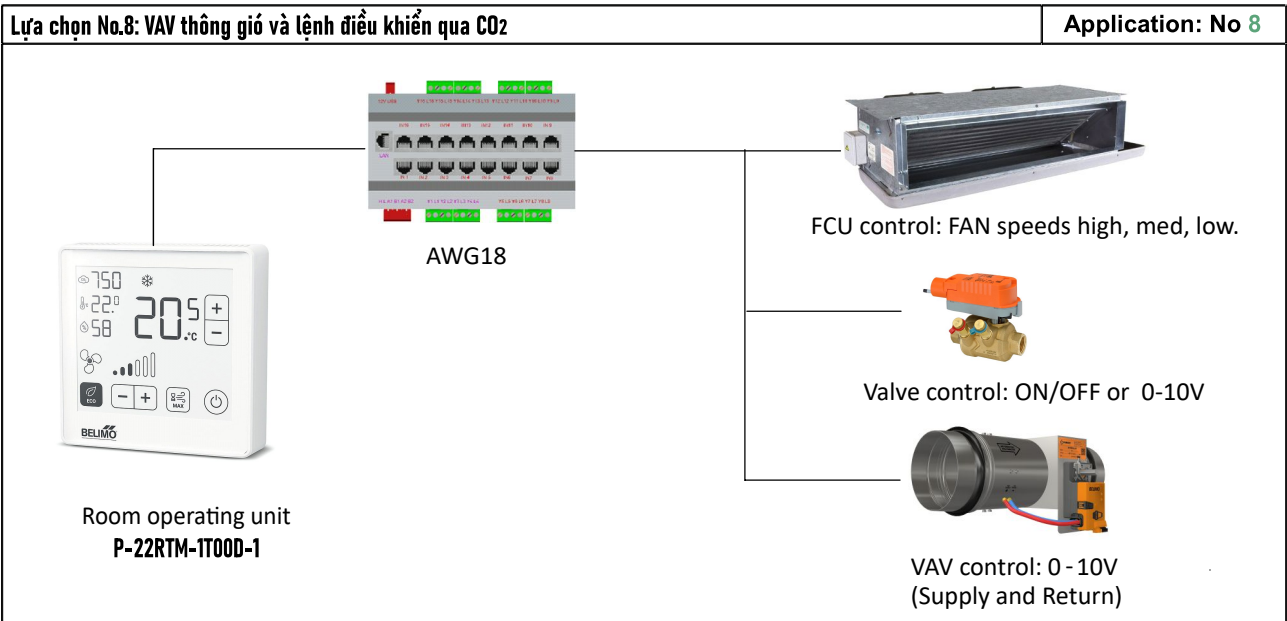
BELIMO
ZoneEase™



Active sensor (0...10v) for measuring Co2
IP65/NEMA 4X rated enclosure

Room air quality control by ROU

Model : S-MV-P-22RTM-1T00D-1



Working principle

Ventilate according to control commands

By installing on the ROU set in each room, VAV will execute ventilation control commands depending on the CO2 density in the room to supply a sufficient amount of fresh air, and at the same time exhaust an appropriate amount of polluted air to ensure quality. Room air reaches desired level (according to Co2 set point and room temperature)






Off mode

In this mode, the ZoneEase system will only provide a minimum flow into the zone, Vmin, CO2 control is off. The damper can be configured for a closed state. This may be the case when saving energy or in an unoccupied room, for example on a holiday.

Active mode

In this mode, the system activates all controls for selected applications. That is the opposite of off mode.

Actuator, control panel and duct sensor model :

<p>VAV ZoneEase compact: Model: LMV/NMV-BAC-001</p> 	<p>Wall mounted LCD type Model : P-22RTM-1T00D-1</p>  
	
	
<p>Active sensor (0...10v) for measuring Co2 IP65/NEMA 4X rated enclosure</p>	

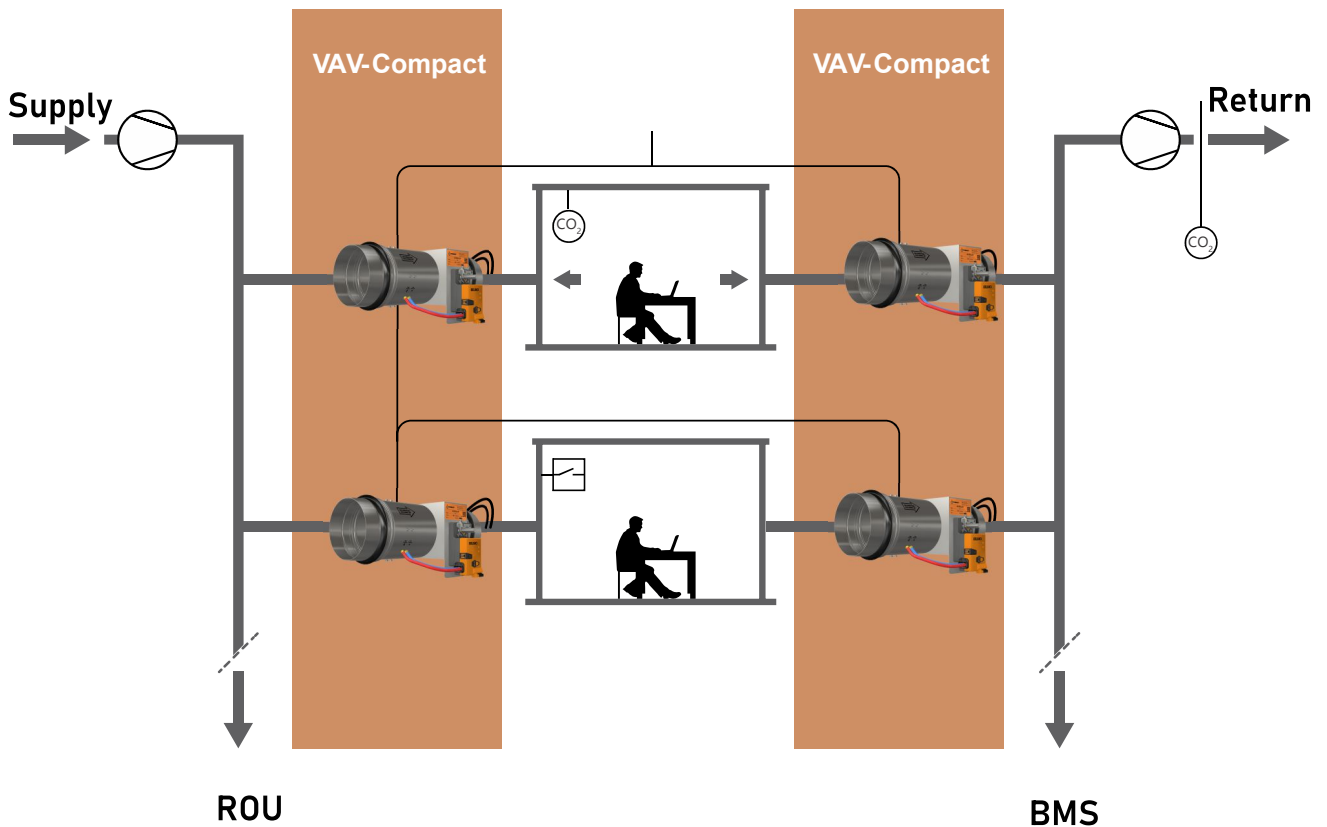
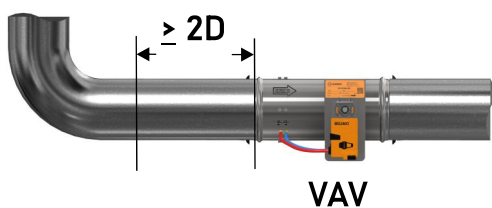
System principle:

Co2 controlled fresh air supply system Uses 2 VAVs, 1 VAV with supply function and 1 VAV with return function. The supply flow is 10 to 15m³/h greater than the return flow

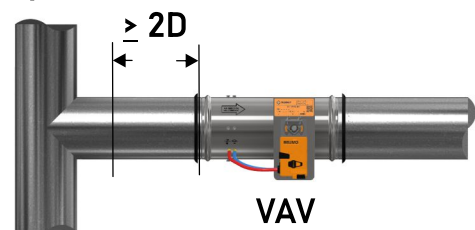
Two VAVs connect to each other via ROU or BMS, CO2 or DDC sensor to receive control signals

The system will automatically provide a minimum flow V_{min} to maintain oxygen conditions in the room and gradually increase when the density of people increases correspondingly to levels up to V_{max} according to the maximum fresh air supply coefficient of the design.

When the system remains at a low level (V_{min}), the pressure sensor in the piping system will transmit a signal to control the fan speed reduction of AHU, PAU... thereby saving energy of the entire system. system.


Installation note:
Elbow 90


Min distance from the end of elbow to VAV = 2D

T piece


Min distance from the end of T to VAV = 2D

Product application:

The S-MV Automatic Flow Modulating Valve is a compact VAV, combining an LMV/NMV controller with a differential pressure sensor/Co2 sensor or temperature sensor to modulate air flow according to different conditions. The design scenario provides air to service spaces as required and is completely automatic, helping to maximize energy savings in operating AHU, PAU systems...

The LMV/NMV controller is capable of receiving control signals from DDC or ROU to control the supply flow according to the VAV Vmin/Vmax method through a modulating reference variable (0/2....10V) such as a sensor. Room temperature sensor/ Co2 concentration sensor, DDC or Bus system. Or CAV type in step mode Close/ Vmin/ Vmid/ Vmax/ Open.

ORDER CODE

S-MV- Z/A/S -DN -120/220 -R/L+ (LMV001)+(P-22RTM-1T00D-1

VAV compac code

Body material code

Inlet size

Power input

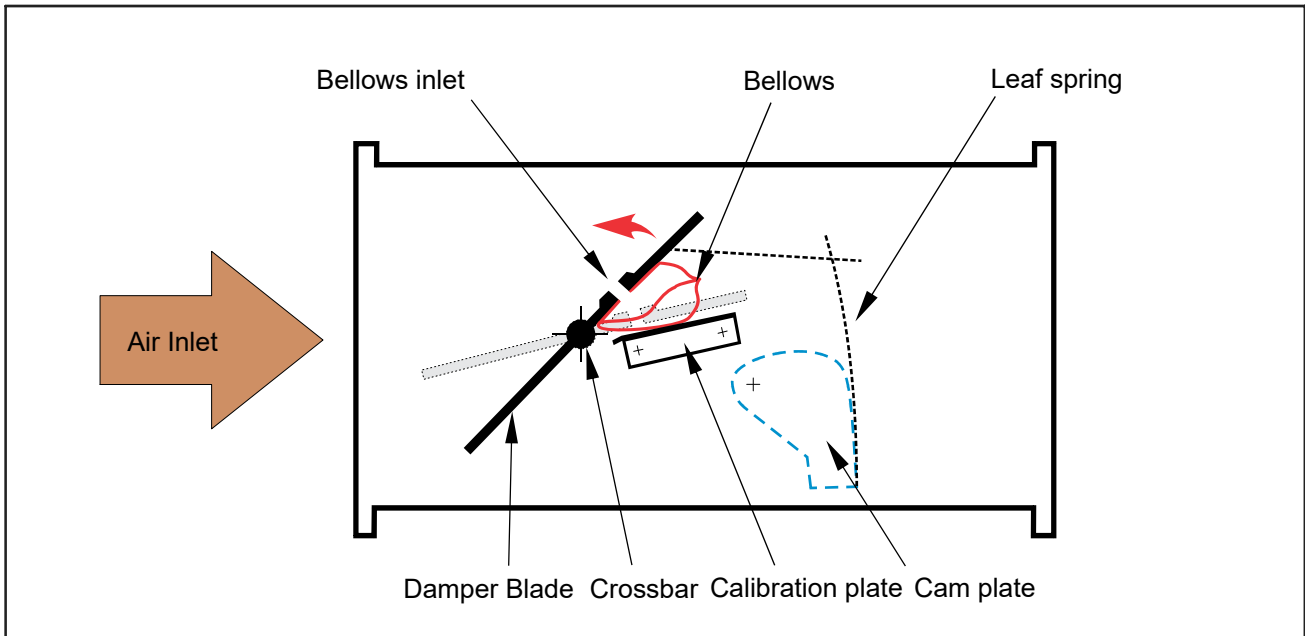
Controller box position

Acctuator model

Control panel model

Constant volume flow control CAV

Round and Retangular



Application :

- CONSTANT FLOW CAV controllers of the precise supply air or extract air flow control in constant air volume systems
- Mechanical self-powered volume flow control without external power supply
- Simplified project handling with orders based on nominal size Volume flow rate setpoint can be set on external scale
- Switching between $q_{v,min}$ and $q_{v,max}$ using optional actuator

Product Features :

CONSTANT FLOW CAV are self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems

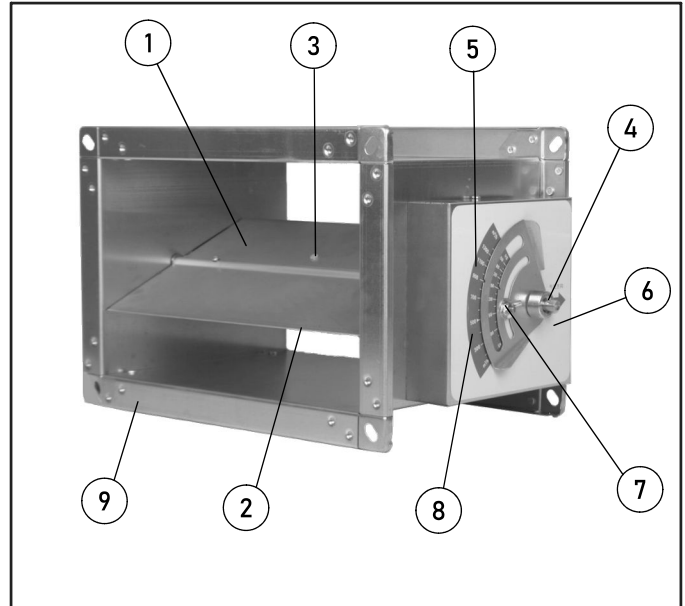
- Volume flow rate can be set using an external scale, no tools required
- High control accuracy
- No on-site test measurements required for commissioning
- Suitable for airflow velocities of up to 12 m/s
- Any installation orientation; maintenance-free
- Casing air leakage to EN 1751, class C

Optional equipment and accessories

- Acoustic cladding for the reduction of case-radiated noise
- Secondary silencer for the reduction of air-regenerated noise
- Hot water heat exchanger and electric air heater for reheating the airflow
- Actuator for switching between setpoint values

RETANGULAR CAV

1. Damper Blade
2. Bellows
3. Bellows inlet
4. CAV Shaft
5. Cam plate and Spring
6. Air Flow scale
7. Scale lock
8. Air flow level
9. Main Body and connector



SPECIFICATIONS

Application

- Rectangular EXCONTROL CONSTANTFLOW CAV controllers of Type EN for supply air / extract air volume flow control in constant air volume systems
- Mechanical self-powered volume flow control without external power supply
- Simplified project handling with orders based on nominal size

Special characteristics

- Volume flow rate set point can be set from outside by rotary Cam plate
- High control accuracy of the set volume flow
- Any installation orientation
- Correct operation even under un-favourable up stream conditions
- Visual display of damper blade position for operating point optimisation

Nominal sizes

- 19 nominal sizes from 200 × 100 – 600 × 600 mm

Construction

- Galvanised sheet steel
- Powder-coated.

Parts and characteristics

- Ready-to-commission controller
- Damper blade with low-friction bearings
- Bellows that acts as an oscillation damper
- Cam plate with leaf spring

- Rotary knob with pointer and scale for setting the volume flow setpoint value
- Aerodynamic functional testing of each unit on a special test rig prior to shipping
- Visual display of damper blade position for operating point optimisation

Galvanised sheet steel construction

- Casing and damper blade made of galvanised sheet steel
- Leaf spring made of stainless steel
- Polyurethane bellows
- Cam plate and adjusting unit made of galvanised sheet steel

Standards and guidelines

- Casing air leakage tested to EN 1751, class C

Maintenance

- Maintenance-free as construction and materials are not subject to wear

Technical data

Nominal sizes	200 × 100 – 600 × 600 mm
Volume flow rate range	39 – 3500 l/s or 140 – 12600 m ³ /h
Volume flow rate control range	Approx. 25 to 100 % of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 to 50 °C

Volume flow rate ranges

The minimum differential pressure of CAV controllers is an important factor in designing the duct work and in rating the fan (including speed control). Sufficient differential pressure must be

Volume flow rate ranges and minimum differential pressure values

NS	qv (l/s)	qv (m ³ /h)	①	②	Δqv (±%)
			ΔP _{st} Min.(Pa)	ΔP _{st} Min.(Pa)	
200 x 100	68	246	50	22	11
200 x 100	164	590	50	125	5
300 x 100	137	492	50	39	8
300 x 100	260	936	50	140	5
300 x 150	152	547	50	17	10
300 x 150	460	1656	50	157	5
300 x 200	197	710	50	16	10
300 x 200	515	1854	50	111	5
400 x 200	337	1213	50	27	8
400 x 200	875	3150	50	179	4
500 x 200	271	977	50	11	11
500 x 200	900	3240	50	122	5
600 x 200	381	1370	50	15	10
600 x 200	1010	3636	50	106	5
400 x 250	333	1198	50	17	10
400 x 250	885	3186	50	117	5

Technical data

Volume flow rate ranges and minimum differential pressure values

NS	qv (l/s)	qv (m ³ /h)	①	②	Δqv (±%)
			ΔP _{st} min.(Pa)	ΔP _{st} min.(Pa)	
500 x 250	235	846	50	5	15
500 x 250	815	2932	50	64	6
600 x 250	300	1080	50	6	14
600 x 250	897	3231	50	54	7
400 x 300	310	1116	50	10	12
400 x 300	902	3249	50	85	6
500 x 300	365	1314	50	9	12
500 x 300	998	3593	50	66	6
600 x 300	350	1260	50	6	14
600 x 300	1137	4094	50	60	6
400 x 400	400	1440	50	9	12
400 x 400	1170	4212	50	80	6
500 x 400	360	1296	50	5	15
500 x 400	1330	4787	50	66	6
600 x 400	450	1620	50	5	15
600 x 400	1595	5741	50	66	6
500 x 500	470	1692	50	5	15
500 x 500	1882	6776	50	85	6
600 x 500	600	2160	50	6	14
600 x 500	2084	7503	50	72	6
600 x 600	700	2520	50	6	14
600 x 600	2921	10517	50	99	5

Installation and commissioning

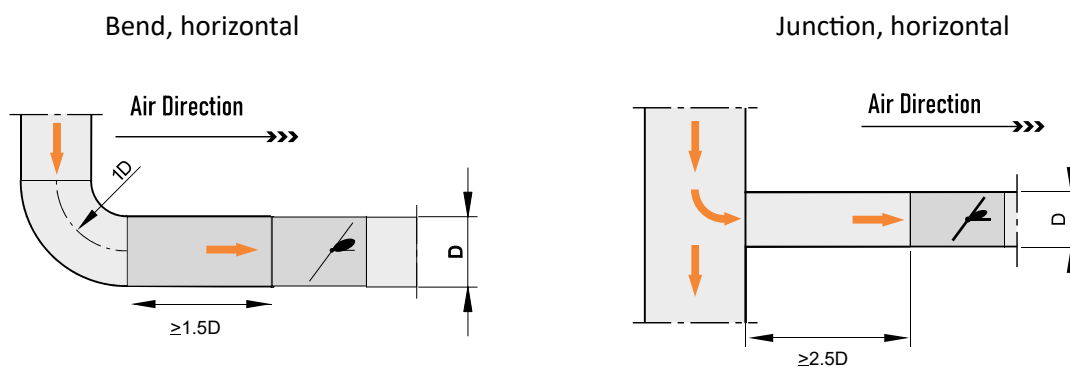
- Any installation orientation (from H = 500 mm, the horizontal air duct must be installed so that the operating side is positioned to the side (right / left) or below)
- Equipotential bonding to be provided by others
- Volume flow rate setpoint can be set from outside by rotary knob
- Loosen and lock the rotary knob with hexagonal socket screw
- No repeat measurements or adjustments required during commissioning
- For constructions with acoustic cladding, ducts on the room side should have cladding up to the acoustic cladding of the controller

Upstream conditions

The volume flow rate accuracy Δq_v applies to straight upstream. Bends, junctions or a narrowing or widening of the duct cause turbulence that may affect measurement. Duct connections, e.g. branches off the main duct, must comply with EN 1505. Free air intake only with a straight duct section of 1.5B or 1.5H upstream.

Space required for commissioning and maintenance

Sufficient space must be clear near to allow for commissioning and maintenance. If necessary, inspection openings of sufficient size are required.



The stated volume flow rate accuracy Δq_v can only be achieved with a straight duct section of at least 1.5D upstream between any bend and the controller.

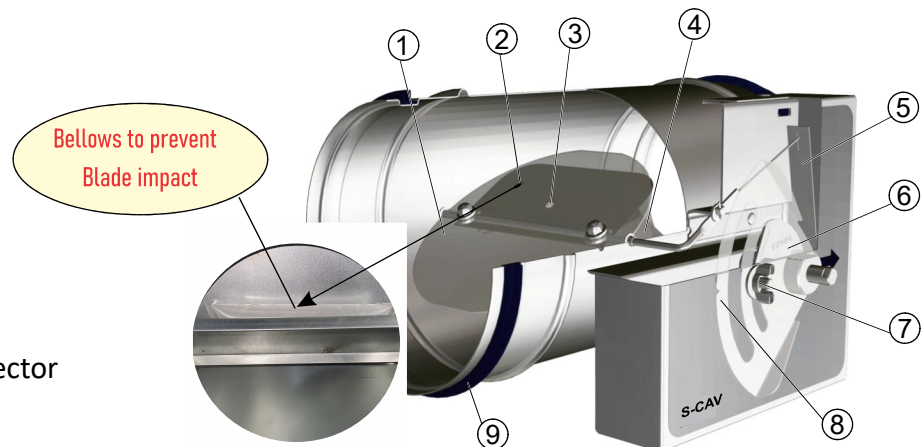
A junction causes strong turbulence. The stated volume flow rate accuracy Δq_v can only be achieved with a straight duct section of at least 2.5D upstream. If there is no straight upstream section at all, the control will not be stable, even with a perforated plate.

■ ORDERING CODE : S-CAV(S) / S-CAV(SS) - (W mm x H mm)

- S-CAV(S) : Rectangular CAV, without insulation cladding
- S-CAV (SS) : Rectangular CAV, with insulation cladding
- W/H : Dimension step min at 50mm

ROUND CAV

1. Damper Blade
2. Bellows
3. Bellows inlet
4. CAV Shaft
5. Cam plate and Spring
6. Air Flow scale
7. Scale lock
8. Air flow level
9. Main Body and connector



SPECIFICATION TEXT

Application

- Round CONTROL CONSTANT FLOW CAV controllers of Type EN for supply air / extract air volume flow control in constant air volume systems
- Mechanical self-powered volume flow control without external power supply
- Simplified project handling with orders based on nominal size

Special characteristics

- Volume flow rate set point can be set from outside by rotary Cam plate
- High control accuracy of the set volume flow
- Any installation orientation
- Correct operation even under un-favourable up stream conditions
- Visual display of damper blade position for operating point optimisation

Nominal sizes

- Ø80 to Ø400 (mm)

Construction

- Galvanised sheet steel
- Powder-coated.

Parts and characteristics

- Ready-to-commission controller
- Damper blade with low-friction bearings
- Bellows that acts as an oscillation damper
- Cam plate with leaf spring

- Rotary knob with pointer and scale for setting the volume flow setpoint value
- Aerodynamic functional testing of each unit on a special test rig prior to shipping
- Visual display of damper blade position for operating point optimisation

Galvanised sheet steel construction

- Casing and damper blade made of galvanised sheet steel
- Leaf spring made of stainless steel
- Polyurethane bellows
- Cam plate and adjusting unit made of galvanised sheet steel

Standards and guidelines

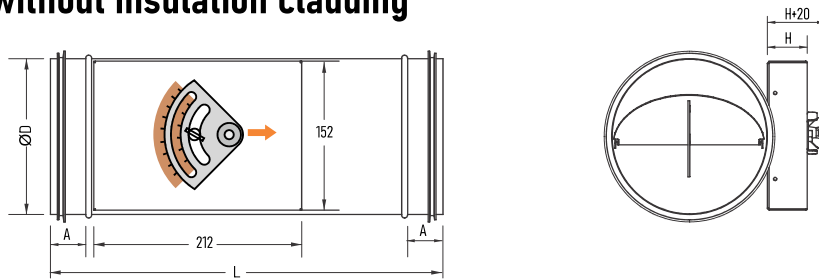
- Casing air leakage tested to EN 1751, class C

Maintenance

- Maintenance-free as construction and materials are not subject to wear

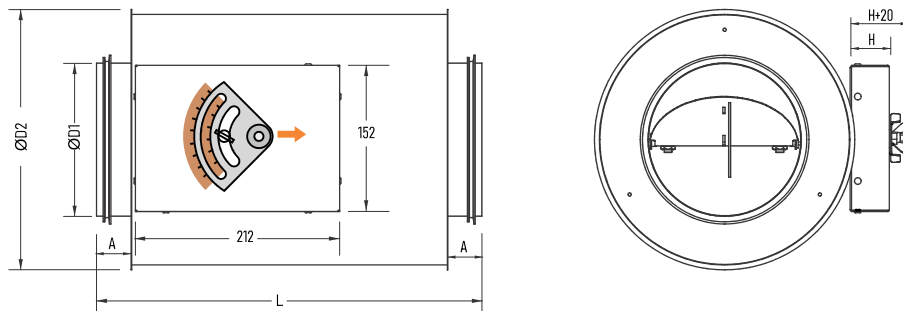
DIMENSION

■ S-CAV - CAV without insulation cladding



Nominal diameter	D		L	A	Weight
	mm		mm	mm	kg
80	79		300	25	1.4
100	99		300	25	1.8
125	124		300	25	2.0
160	159		300	25	2.5
200	199		300	25	3.0
250	249		400	25	3.5
315	314		400	25	4.8
400	399		400	25	5.7

■ S-CAV(S) - CAV with insulation cladding



Nominal diameter	D1	D2	L	A	Weight
	mm	mm	mm	mm	kg
80	79	181	300	25	2.2
100	99	200	300	25	3.6
125	124	220	300	25	4.0
160	159	262	300	25	5.0
200	199	300	300	25	6.0
250	249	356	400	25	7.3
315	314	418	400	25	9.8
400	399	500	400	25	11.8

PRODUCT DATA SHEET
MODEL: S-CAV/S-CAV(S)
Volume flow rate ranges and minimum differential pressures

Size	qv [l/s]	qv [m ³ /h]	1	2	3	4	ΔV [±%]
			Δp _{st} [Pa]				
80	11	40	100	105	105	105	20
80	20	75	100	105	105	105	15
80	40	144	100	110	115	120	10
80	45	162	100	110	120	125	8
100	22	79	50	55	55	55	10
100	40	144	50	55	55	60	8
100	70	252	50	60	65	70	6
100	90	324	50	60	70	80	5
125	35	126	50	55	55	55	10
125	60	216	50	55	55	60	8
125	115	414	50	60	64	70	6
125	140	504	50	60	70	80	5
160	60	216	50	55	55	55	10
160	105	378	50	55	55	55	8
160	190	984	50	55	60	60	6
160	240	864	50	55	65	70	5
200	90	324	50	55	55	55	10
200	160	576	50	55	55	55	8
200	300	1080	50	55	60	65	6
200	360	1296	50	55	60	65	5
250	145	522	50	55	55	55	10
250	255	918	50	55	55	55	8
250	470	1692	50	55	60	60	6
250	580	2088	50	55	60	65	5
315	230	828	50	55	55	55	10
315	400	1440	50	55	55	55	8
315	750	2700	50	55	60	60	6
315	920	3312	50	55	60	65	5
400	350	1260	50	55	55	55	10
400	610	2196	50	55	55	55	8
400	1130	4068	50	55	55	55	6
400	1400	5040	50	55	55	60	5

- Without silencer
- With circular silencer CF, insulation thickness 50 mm, length 500 mm
- With circular silencer CF, insulation thickness 50 mm, length 1000 mm
- With circular silencer CF, insulation thickness 50 mm, length 1500 mm

PRODUCT DATA SHEET
MODEL: S-CAV/S-CAV(S)
Sound pressure level at differential pressure 150 Pa

Size	qv [l/s]	qv [m3/h]	Air-regenerated noise [dB(A)]				Case-radiated noise [dB(A)]	
			1	2	3	4	1	2
			LPA	LPA1			LPA2	LPA3
80	11	40	37	24	17	15	55	<15
80	20	75	39	27	19	17	24	<15
80	40	144	47	34	24	22	31	<15
80	45	162	48	35	25	24	32	<15
100	22	79	37	24	17	15	22	<15
100	40	144	40	29	22	20	21	<15
100	70	252	47	35	27	26	29	<15
100	90	324	50	38	30	29	33	<15
125	35	126	37	27	21	18	15	<15
125	60	216	43	34	27	25	19	<15
125	115	414	50	41	35	33	27	<15
125	140	504	52	44	39	37	30	<15
160	60	216	40	32	26	24	29	<15
160	105	378	45	37	32	29	33	<15
160	190	984	49	41	35	33	39	<15
160	240	864	50	41	36	34	41	<15
200	90	324	40	31	24	22	28	<15
200	160	576	43	35	28	26	32	<15
200	300	1080	48	40	33	32	40	17
200	360	1296	49	41	35	33	42	20
250	145	522	41	32	24	22	29	15
250	255	918	42	34	28	26	33	<15
250	470	1692	46	39	33	31	40	19
250	580	2088	48	41	35	34	43	22
315	230	828	39	33	26	23	30	<15
315	400	1440	42	35	29	27	35	<15
315	750	2700	44	38	32	31	40	19
315	920	3312	46	41	35	34	43	23
400	350	1260	46	39	33	29	45	<15
400	610	2196	48	42	36	32	49	18
400	1130	4068	50	44	38	35	54	24
400	1400	5040	51	45	40	37	56	27

- Without silencer
- With circular silencer CF, insulation thickness 50 mm, length 500 mm
- With circular silencer CF, insulation thickness 50 mm, length 1000 mm
- With circular silencer CF, insulation thickness 50 mm, length 1500 mm
- With acoustic cladding

Installation and commissioning

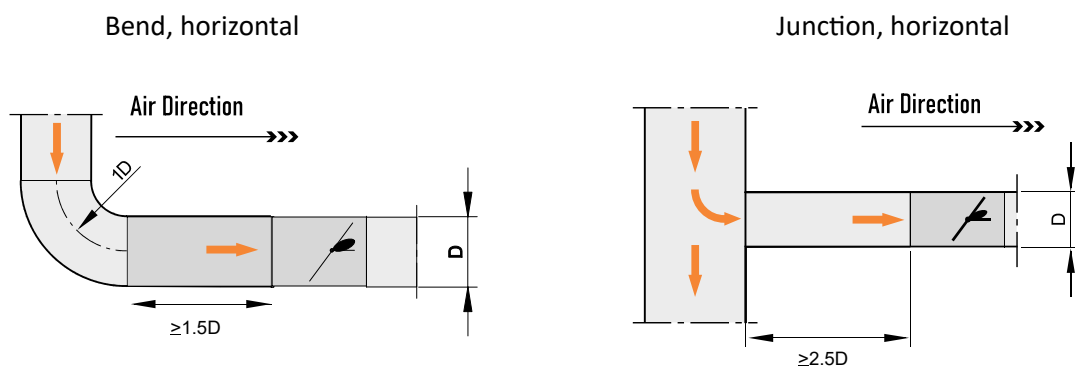
- Any installation orientation (from H = 500 mm, the horizontal air duct must be installed so that the operating side is positioned to the side (right / left) or below)
- Equipotential bonding to be provided by others
- Volume flow rate setpoint can be set from outside by rotary knob
- Loosen and lock the rotary knob with hexagonal socket screw
- No repeat measurements or adjustments required during commissioning
- For constructions with acoustic cladding, ducts on the room side should have cladding up to the acoustic cladding of the controller

Upstream conditions

The volume flow rate accuracy Δq_v applies to straight upstream. Bends, junctions or a narrowing or widening of the duct cause turbulence that may affect measurement. Duct connections, e.g. branches off the main duct, must comply with EN 1505. Free air intake only with a straight duct section of 1.5B or 1.5H upstream.

Space required for commissioning and maintenance

Sufficient space must be clear near to allow for commissioning and maintenance. If necessary, inspection openings of sufficient size are required.



The stated volume flow rate accuracy Δq_v can only be achieved with a straight duct section of at least 1.5D upstream between any bend and the controller.

A junction causes strong turbulence. The stated volume flow rate accuracy Δq_v can only be achieved with a straight duct section of at least 2.5D upstream. If there is no straight upstream section at all, the control will not be stable, even with a perforated plate.

■ ORDERING CODE : S-CAV (R) / S-CAV(RS) - DN

- S-CAV(R): Round CAV, without insulation cladding
- S-CAV(RS) : Round CAV, with insulation cladding
- DN = Diameter : 80/100/125/160/200/250/315/400

Accessories and Reference

Construction

- 20 gauge construction available on all units.
- Hanger brackets available for all units. Metal "L" brackets (4 per unit) which are shipped loose for field installation. Brackets are provided with a 5/8" diameter hole and vibration isolation grommet.
- Inlet attenuators available for fan powered units. The opening is on the side of the box, and the insulation type will match whatever is chosen for the unit. With an induction mounted coil, the filter is on either the top or bottom.

Control Enclosures

- Dust tight control enclosures available for all units. The damper control enclosure is provided sealed to prevent light or dust from entering the enclosure when the cover is in place

Handing

- All single duct units are configured with controls and coil connections on the right as standard (looking in direction of airflow). Optional configurations include controls on left, coil connections on right; controls on right, coil connections on left; and both controls and coil connections on the left.
- All fan powered units are configured with the controls and coil connections on the left as standard (looking in direction of airflow). Optional configurations include controls on left, coil connections on right; controls on right, coil connections on left; and both controls and coil connections on right.

Insulation optional

- All units available with dual density fiberglass insulation. Available thicknesses are 1/2" and 1"
- All units available with foil-faced fiberglass insulation, 1.5 lbs density. Available thicknesses are 1/2", 3/4" and 1"
- All units are available with foil-faced fiberglass insulation, 4 lbs density. Only available in 1" thickness.
- All units available with ThermoPure closed cell foam insulation. Available thicknesses are 1/2" and 1"
- Single duct units are available with solid double-wall/ metal lined insulation. The double wall is available with either 1/2" or 1" fiberglass insulation between the unit and metal liner.

Many insulation types are available for use in air terminal units. Each type and thickness of insulation has different thermal and acoustical characteristics as well as unit cost. It is important when specifying any type of insulation to specify not only the material, but the thickness and density as well -

For instance, a common fiberglass specification is 1" thick, dual density (1.5 lb/ ft3 min.) fiberglass insulation. For all insulations, the thicker the insulation, the greater the acoustical and thermal performance, and the higher the cost.

Generally, insulation erosion resistance is stated with respect to UL 181 erosion test. Insulation meeting this specification will not erode or otherwise contribute particulate to the airstream

at velocities up to 2500 fpm. Also, insulation is regulated regarding the restriction of fire and smoke spread by NFPA 90A, which requires insulation to be tested at a minimum of 250°F. All insulations offered by Starduct meet UL 181 and NFPA 90A requirements.

Fiberglass

The most common type of insulation applied to VAV boxes is fiberglass. Fiberglass insulation is relatively inexpensive, and provides good thermal and acoustical performance. In most cases, some type of binder is applied to the airstream-facing side of the fiberglass to minimize fiber erosion. This is referred to as 'dual density' insulation as the density of the coated material 'skin' is greater than the core material.

Foil-Faced Fiberglass Insulation

In situations where erosion resistance above that of dual density is required, foil-faced insulation may be specified. The material, commonly referred to as FSK (foil scrim kraft) facing is adhered to the face of the fiberglass insulation. Critical to the specification is whether or not the FSK material is to be included in the overall material density. Generally, the density of the underlying insulation should be clearly stated.

Closed-Cell Foam Insulation

Closed-cell foam has acoustical and thermal properties at near parity to dual density fiberglass. In addition to its non-fibrous composition, the material resists mold and mildew growth and is easily cleanable. The material will not wick moisture on exposed edges. The material is more costly than dual density fiberglass and this must be considered when specifying the material.

Double-Wall Insulation

For very stringent specifications where fiber erosion must be completely eliminated as a possibility, solid or double wall metal liners have been specified. These liners are extremely expensive and negatively affect the sound performance of the terminal unit to which it is applied.

Sound Path Attenuation Assumptions

The current AHRI standard for NC calculation is AHRI 885-08

Table 93: AHRI-885-08 Radiated Sound Path Assumptions

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Ceiling/Space Effect*	16	18	20	26	31	36
Total dB Reduction	18	19	20	26	31	36

NOTE: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

Parameters:

1. Mineral fiber ceiling tile, 5/8" thick (35 lb/3 ft density)
2. The plenum space is at least 3 ft. deep and either wide (>30 ft.) or insulated

* Combined effect including absorption of the ceiling tile, plenum absorption and room absorption.

This is new to AHRI-885-08; AHRI-885-90 had separate lines for these absorptions.

AHRI-885-08, Appendix E defines "Small" for applications less than 300 CFM

Table 94: AHRI-885-08 Discharge Sound Path Assumptions, Small

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Duct Lining	2	6	12	25	29	18
End Reflection	9	5	2	0	0	0
Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Power Split	0	0	0	0	0	0
Total dB Reduction	24	28	39	53	59	40

NOTE: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

Parameters:

1. Fiberglass duct lining is 1" thick, 8x8 duct length is 5 feet
2. Flex duct is 8" in diameter and 5 feet in length for run to diffuser
3. Flex duct has vinyl core
4. Room size is 2400 3 ft
5. Unit is located 5 feet from measurement point
6. Sound power split: attenuation credit based on unit feeding one outlet (10 log (# outlets=1))

AHRI-885-08, Appendix E defines "Medium" for applications from 300-700 CFM

Table 95: AHRI-885-08 Discharge Sound Path Assumptions, Medium

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Duct Lining	2	4	10	20	20	14
End Reflection	9	5	2	0	0	0
Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Power Split	3	3	3	3	3	3
Total dB Reduction	27	29	40	51	53	39

NOTE: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

Parameters:

1. Fiberglass duct lining is 1" thick, 12x12 duct length is 5 feet
2. Flex duct is 8" in diameter and 5 feet in length for run to diffuser
3. Flex duct has vinyl core
4. Room size is 2400 3 ft
5. Unit is located 5 feet from measurement point
6. Sound power split: attenuation credit based on unit feeding one outlet (10 log (# outlets=2)).

AHRI-885-08, Appendix E defines “Large” for applications 700 CFM and greater

Table 96: AHRI-885-08 Discharge Sound Path Assumptions, Large

Assumptions	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Duct Lining	2	3	9	18	17	12
End Reflection	9	5	2	0	0	0
Flex Duct	6	10	18	20	21	12
Space Effect	5	6	7	8	9	10
Power Split	5	5	5	5	5	5
Total dB Reduction	29	30	41	51	52	39

NOTE: Attenuation assumptions are based upon factors located in the AHRI Standard AHRI-885-08

Parameters:

1. Fiberglass duct lining is 1" thick, 15×15 duct length is 5 feet
2. Flex duct is 8" in diameter and 5 feet in length for run to diffuser
3. Flex duct has vinyl core
4. Room size is 2400 3 ft
5. Unit is located 5 feet from measurement point
6. Sound power split: attenuation credit based on unit feeding one outlet (10 log (# outlets=3)).

System Design and Noise Generation

The central system equipment and distribution ductwork must be properly designed if the air terminal units are to operate correctly. Noise generated at the central system travels through the duct system to the individual zones and can be objectionable when it is sufficient to ‘break out’ of the duct system or is carried through the duct system to ‘discharge’ into the occupied zone.

The most common source of objectionable noise emanating from VAV systems arises from high static pressure in primary (upstream of the terminal unit) duct systems. These pressures have a two-fold effect of increasing the central system sound levels and of causing the terminal units to operate noisily.

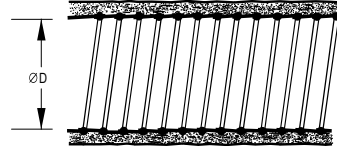
When the pressure is too high, the primary air damper must close to compensate. The air flowing past the damper must do so at a relatively high pressure drop creating objectionable noise levels.

This is seen quite commonly in VAV systems when the highest inlet static pressure in a distribution duct is used as the default condition for all terminal units served by the trunk duct. The result is over sizing of the upstream VAV terminal units. The result is additional system cost, excessive noise, and inefficient operation of the terminal units. To avoid this condition, the designer would be better suited to provide a balancing damper ahead of the upstream branch ducts serving these terminal units, reducing the inlet pressure at each unit.

System noise is also commonly generated by improper duct design or installation. Particular care should be taken in the excessive and improper use of flex duct as it is more susceptible to break out noise and can cause noisy airflow equipment operation when installed in a ‘kinked’ fashion. Avoid using ‘bullhead’ tees and tight elbows before and after terminal units and discharge devices.

In order to ensure proper VAV terminal selection, the system sound pressure levels should be determined. These levels can be used in accordance with AHRI Standard 885 to determine the maximum sound power levels acceptable for each terminal unit. Design engineers should familiarize themselves with the standard and perform an acoustical analysis of each critical path within the system. Standard 885 provides the methodology and data to perform such an analysis for most common applications. Critical applications may require consultation with an acoustical consultant.

INSULATED FLEXIBLE DUCT - STI



DESCRIPTION

Starduct insulated flex. duct is produced from high quality materials and by automatic production line of big capacity.

Materials are environment-frendly, aluminum-polyester & PVC casing, reinforced with spirally wound steel wire. Product is not consist of toxic substance such as chlorine or cadimium.

STI has good thermal and sound insulation properties.

Material

- Casing: Aluminum-polyeser (PET), reinforcement: high grade carbon steel wire 0.8 ~ 1.1 mm.
- Insulation: glass wool, thickness 25mm, 24kg/m3, 32kg/m3

Flexible rate

- Longitudinal rate: 2 / 25

Performance

- High flexibility, durable.
- Thermal conductivity: $R = 0.037 \text{ W/mK}$
- R-value glass wool: $0.65 \text{ m}^2\text{K/W}$
- Working temp. : -30°C to $+140^\circ\text{C}$ (in short time)
- Good anti-corrosion and anti-condensation
- Air tight and low noise

Connection

- Standard GI coupling sleeve, plastic self-lock tie, stainless steel lock tie, adhesive tape ...

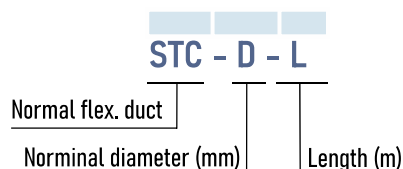
Application

- Commercial, residential HVAC systems. Working as air-supply/Air return duct for AHU, kitchen, bathroom, dryer...
- In case of thermal/sound insulation requested

Reference standard

- EN 13180

ORDERING CODE

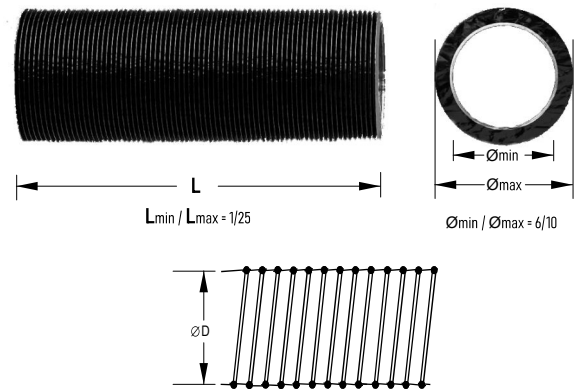


Example: **STC - 200 - 8** = Standard PVC flex duct, D 200, 8m length

Normal diameter	Ø D (mm)	Allowable pressure (Pa)	Tolerance (mm)
100	102	2500	+ 1.5
125	127	2500	+ 1.5
150	152	2500	+ 1.5
200	203	2500	+ 2.0
250	254	2500	+ 3.0
300	305	2500	+ 3.0
350	355	2500	+ 3.0
400	406	2500	+ 3.0
450	457	2500	+ 3.0

Features	
Flexibility rate	Ømin. = Ø D x 60%
Standard length	8.0m
Max. operation vel.	30 m/s
Fire safety	-
Packaging	squizzed to 500mm

PVC FLEXIBLE DUCT - STC



DESCRIPTION

Starduct PVC flex. duct is produced from high quality materials and by automatic production line of big capacity.

Materials are environment-friendly, aluminum-polyester & PVC casing, reinforced with spirally wound steel wire. Product is not consist of toxic substance such as chlorine or cadmium.

STC is thicker, tougher than most competitive products available in the local market.

Material

- Casing: Aluminum-polyester (PET), reinforcement: high grade carbon steel wire 0.8 ~ 1.1 mm.
- Outer PVC cover

Flexible rate

- Longitudinal rate: 1 / 25

Performance

- High flexibility, durable.
- Working temp. : -30°C to +140°C (in short time)
- Good anti-corrosion and anti-condensation
- Air tight and low noise

Connection

- Standard GI coupling sleeve, plastic self-lock tie, stainless steel lock tie, adhesive tape ...

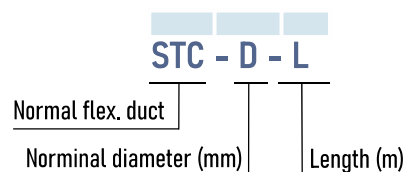
Application

- Commercial, residential HVAC systems. Working as air-supply/Air return duct for AHU, kitchen, bathroom, dryer...
- High humidity, corrosive environments

Normal diameter	Ø D (mm)	Allowable pressure (Pa)	Tolerance (mm)
100	102	2500	+ 1.5
125	127	2500	+ 1.5
150	152	2500	+ 1.5
200	203	2500	+ 2.0
250	254	2500	+ 3.0
300	305	2500	+ 3.0
350	355	2500	+ 3.0
400	406	2500	+ 4.0
450	457	2500	+ 4.0

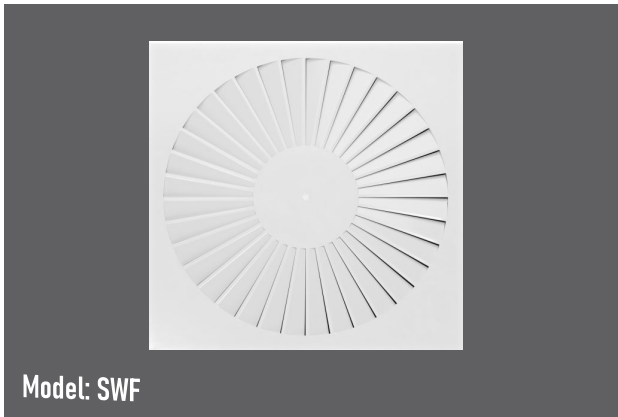
Features	
Flexibility rate	Ømin. = Ø D x 60%
Standard length	8.0m
Max. operation vel.	30 m/s
Fire safety	-
Packaging	squizzed to 500mm

ORDERING CODE



Example: **STC - 200 - 8** = Standard PVC flex duct, D 200, 8m length

CEILING SWIRL DIFFUSER WITH FIXED BLADES



DESCRIPTION

The SWF swirl diffuser with fixed blades is a comfortable air distribution element. The diffuser face is supplied with a radially aligned set of variously shaped blades, which guarantee an even distribution of swirl supply air into the occupied zone. The SWF swirl diffuser can be installed onto an air duct using a plenum box with a horizontal or a vertical connection by a flexible circular ducts. SWF can be used for both, supply or extract air. It can be used for ventilation, as well as supplying cold or warm air. SWS has low sound power level for comfort zones with fixed blades.

MATERIAL

- Powder coated galvanized iron sheet or aluminum

SIZES

- 300-400-500-600-625 (mm)

APPLICATION

- For supply air or exhaust air
- For constant or variable airflow
- For all types of ceiling system
- For room height up to 4m

FINISH

- Standard: white powder coated RAL9010 (optional other RAL codes)

- For supply air to room air temp. difference from -12 to +10 K
- Very high room air change rate due to row arrangement with minimum pitch distance of 0.9m

STANDARD

- Sound power level of the air-generated noise measured according to EN-ISO 5135

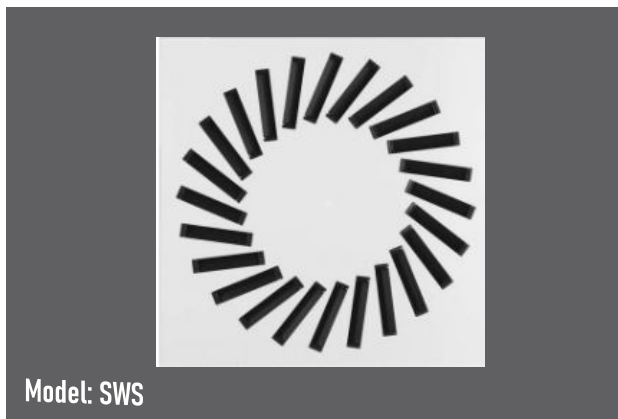
FLOW RATE

- 9 ~ 235 l/s (31 ~ 846 m³/h)

OPTION

- Square/round face
- Square/circular plenum box

CEILING SWIRL DIFFUSER WITH ADJUSTABLE BLADES



DESCRIPTION

The SWS swirl diffuser with individually manually adjustable blades is a comfortable air distribution element. The diffuser is for high room air change rate. The product can be installed onto an air duct using a plenum box with a horizontal or a vertical connection by a flexible circular ducts. It can be used for ventilation, as well as supplying cold or warm air. SWS has low sound power level for comfort zones with adjustable air control blades.

MATERIAL

- Powder coated galvanized iron sheet or aluminum

FINISH

- Powder coated (optional RAL codes)

APPLICATION

- For supply air or exhaust air
- For constant or variable airflow
- For all types of ceiling system
- For room height up to 4m

SIZES

- 300mm x 8 slots - 300mm x 10 slots
- 400mm x 12 slots - 500mm x 16 slots
- 500mm x 24 slots - 500mm x 28 slots
- 600mm x 24 slots - 600mm x 48 slots

- For supply air to room air temp. difference from -12 to +10 K
- Very high room air change rate due to row arrangement with minimum pitch distance of 0.9m

STANDARD

- Sound power level of the air-generated noise measured according to EN-ISO 5135

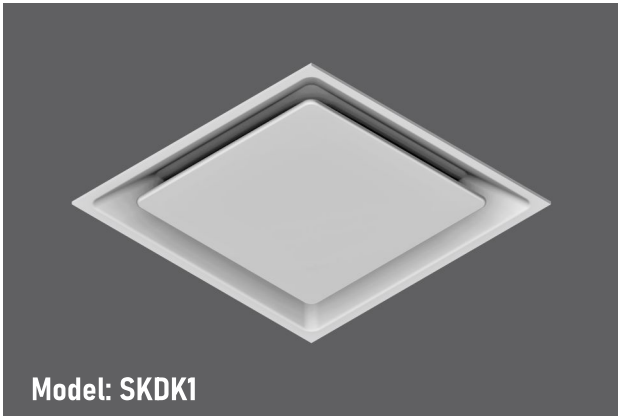
FLOW RATE

- 7 ~ 470 l/s (25 ~ 1692 m³/h)

OPTION

- Square/round face
- Square/circular plenum box

ADJUSTABLE SQUARE CEILING DIFFUSER (1-CONE)



TYPICAL APPLICATION

Adjustable square ceiling diffuser has been specially designed to provide both the unobstructive appearance require for architectural excellence and the 360° diffusion pattern at minimum NC levels.

The one-piece cones eliminate mitered corners and the die-formed curves provide consistent quality and performance. This adjustable product provide stable diffusion and mixing pattern under constant and changing load conditions.

In lay-in application, the diffuser is placed into a T-bar ceiling grid without needs to change T-bar.

MATERIAL

- Frame/cones: one-piece aluminum A6063, thickness 1.0mm.
- Cone control mechanism: Galvanized iron sheet

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guarranteed up to 10 years.

SIZE

- Optional (see table).

CORE AND NECK

- Core set is adjustable in 2 levels. Round neck.

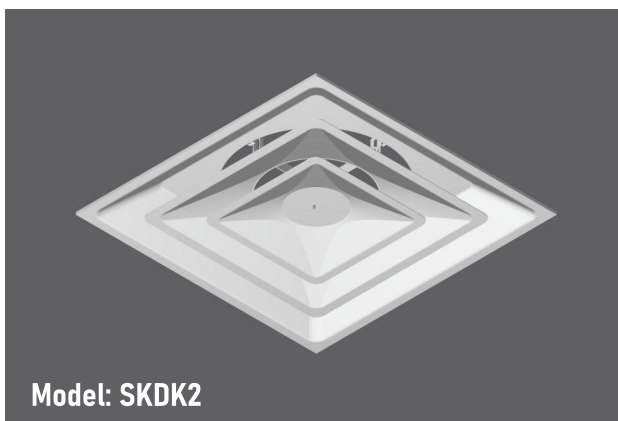
APPLICATION

- For cool and heat air supply
- Flat or suspended ceiling

OPTIONS

- Low plenum
- Radial volume control damper

ADJUSTABLE SQUARE CEILING DIFFUSER (2-CONE)



TYPICAL APPLICATION

Adjustable square ceiling diffuser has been specially designed to provide both the unobstructive appearance require for architectural excellence and the 360° diffusion pattern at minimum NC levels.

The one-piece cones eliminate mitered corners and the die-formed curves provide consistent quality and performance. This adjustable product provide stable diffusion and mixing pattern under constant and changing load conditions.

In lay-in application, the diffuser is placed into a T-bar ceiling grid without needs to change T-bar.

MATERIAL

- Frame/cones: one-piece aluminum A6063, thickness 1.0mm.
- Cone control mechanism: Galvanized iron sheet

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guarranteed up to 10 years.

SIZE

- Optional (see table).

CORE AND NECK

- Core set is adjustable in 2 levels. Round neck.

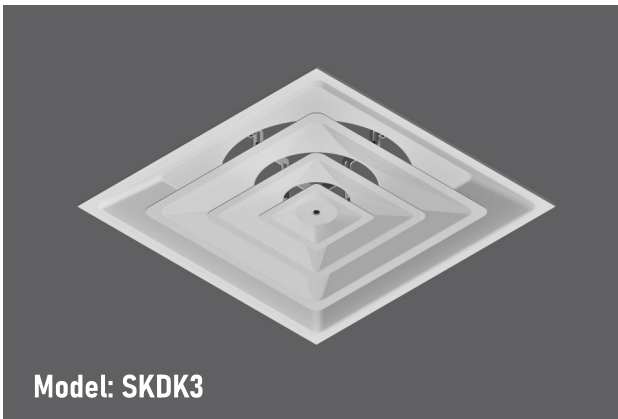
APPLICATION

- For cool and heat air supply
- Flat or suspended ceiling

OPTIONS

- Low plenum
- Radial volume control damper

ADJUSTABLE SQUARE CEILING DIFFUSER (3-CONE)



TYPICAL APPLICATION

Adjustable square ceiling diffuser has been specially designed to provide both the unobstructive appearance require for architectural excellence and the 360° diffusion pattern at minimum NC levels.

The one-piece cones eliminate mitered corners and the die-formed curves provide consistent quality and performance. This adjustable product provide stable diffusion and mixing pattern under constant and changing load conditions.

In lay-in application, the diffuser is placed into a T-bar ceiling grid without needs to change T-bar.

MATERIAL

- Frame/cones: one-piece aluminum A6063, thickness 1.0mm.
- Cone control mechanism: Galvanized iron sheet

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guarranteed up to 10 years.

SIZE

- Optional (see table).

CORE AND NECK

- Core set is adjustable in 2 levels. Round neck.

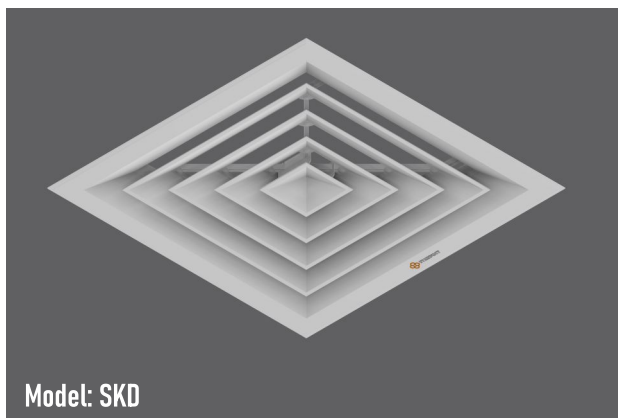
APPLICATION

- For cool and heat air supply
- Flat or suspended ceiling

OPTIONS

- Low plenum
- Radial volume control damper

SQUARE CEILING DIFFUSER



TYPICAL APPLICATION

Square ceiling diffusers are one of the industry standard supply air grilles.

The product is designed to supply large volumes of air in a stable horizontal air pattern that is close to the ceiling and without uncomfortable draft.

In lay-in application, the diffuser is placed into a T-bar ceiling grid without needs to change T-bar.

The frame is also suitable for flat surface mounting.

MATERIAL

- BORDER/FRAME: A6063 extruded aluminum, thickness 1.0~1.2mm.
- CORE: A6063 aluminum thickness 0.35mm

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guarranteed up to 10 years.

DIMENSION

- Optional (see table).

CORE

- Core set is openable with spring latches

OPTIONS

- OBD /filter
- Low plenum

- Plenum & accessories
- Plenum with round inlet

SQUARE BACKPAN ROUND CEILING DIFFUSER (1-CONE)



Model: STR-1R

TYPICAL APPLICATION

The product is designed to supply large volumes of air in a stable horizontal air pattern that is close to the ceiling and without uncomfortable draft.

With high aesthetic appearance, this product is choice of architect for modern and minimalist designs.

STR-1R is specially design for suspended ceiling systems.

MATERIAL

- Frame and cone: spun aluminum A1060, thickness 1.0 mm.
- Blade-joining frame: extruded aluminum A6061

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guarranteed up to 10 years.

DIMENSION

- Optional (see table).

PERFORMANCE

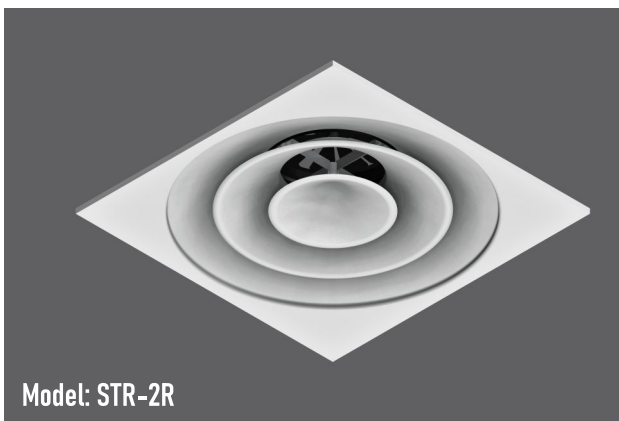
- Cone set is removable with latch
- Suitable for 2.6 - 4m high ceilings

OPTIONS

- Radial damper
- Low round plenum

- Square/round plenum & accessories to create "module" (see next page)

SQUARE BACKPAN ROUND CEILING DIFFUSER (2-CONE)



Model: STR-2R

TYPICAL APPLICATION

The product is designed to supply large volumes of air in a stable horizontal air pattern that is close to the ceiling and without uncomfortable draft.

With high aesthetic appearance, this product is choice of architect for modern and minimalist designs.

STR-2R is specially design for suspended ceiling systems.

MATERIAL

- Frame and cone: spun aluminum A1060, thickness 1.0 mm.
- Blade-joining frame: extruded aluminum A6061

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guarranteed up to 10 years.

DIMENSION

- Optional (see table).

PERFORMANCE

- Cone set is removable with latch
- Suitable for 2.6 - 4m high ceilings

OPTIONS

- Radial damper
- Low round plenum

- Square/round plenum & accessories to create "module" (see next page)

ROUND CEILING DIFFUSER (1-CONE)



TYPICAL APPLICATION

Round ceiling diffusers are one of the industry standard supply air grilles.

The product is designed to supply large volumes of air in a stable horizontal air pattern that is close to the ceiling and without uncomfortable draft.

With high aesthetic appearance, this product is choice of architect for modern and minimalist designs.

MATERIAL

- Frame and cone: spun aluminium A1060, thickness 1.0 mm.
- Blade-joining frame: extruded aluminium A6063

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guaranteed up to 10 years.

DIMENSION

- Optional (see table).

PERFORMANCE

- Cone set is removable with latch
- Suitable for 2.6 - 4m high ceilings

OPTIONS

- Radial damper
- Low round plenum

- Square/round plenum & accessories to create "module" (see next page)

ROUND CEILING DIFFUSER (2-CONE)



TYPICAL APPLICATION

Round ceiling diffusers are one of the industry standard supply air grilles.

The product is designed to supply large volumes of air in a stable horizontal air pattern that is close to the ceiling and without uncomfortable draft.

This product can be used for flat surface ceiling. Especially, it is suitable for direct mount in flexible duct and round duct in applications with open ceiling (without suspended boards).

MATERIAL

- Frame and cone: spun aluminum A6063 thickness 1.0 mm.
- Blade-joining frame: extruded aluminum A6063

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guaranteed up to 10 years.

DIMENSION

- Optional (see table).

PERFORMANCE

- Cone set is removable with latch
- Throw: 0.9 - 6 m

OPTIONS

- Radial damper
- Low round plenum

- Square/round plenum & accessories to create "module" (see next page)

LINEAR SLOT DIFFUSER



TYPICAL APPLICATION

linear slot diffuser is applied increasingly popular in both commercial and residential buildings.

Ability to handle large air volumes makes this product suitable for requirements of large air changes. Also, it can be used in any application requiring long continuous lengths of air supply and is excellent for providing air curtains.

Normally installed in walls and ceilings, the product is a popular choice of architect due to its unobstructive appearance.

MATERIAL

- Frame : Extruded aluminum A6063-T5, thickness 1.0-1.2mm .
- Blade mechanism: Black coated extruded aluminum

FINISH

- Standard: white powder coating RAL 9010 (Optional: RAL code)

DIMENSIONS

- Optional (see table)
- Stiffener for W>600mm

OUTSTANDING PERFORMANCE

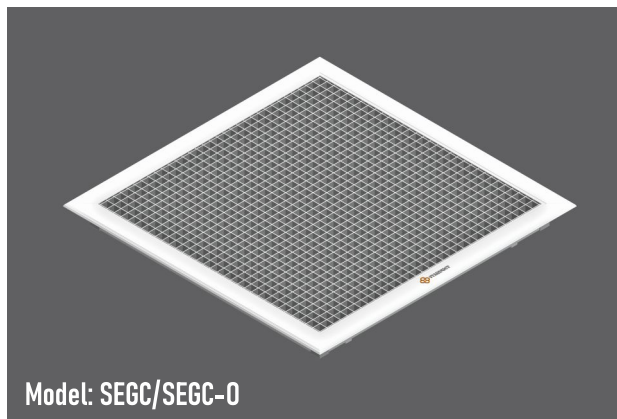
- Free area (depending on angles and number of slot) up to 38%.

OPTIONS

- X-axle curved
- Unobstructive assembly

- Plenum, hanger, bolts & nut, etc. to create "module" (see next page)

EGG CRATE AIR GRILLE



TYPICAL APPLICATION

Egg crate grilles are the largest free area of any grille, this product is well suited to high capacity return/exhaust application that require low sound and pressure drop.

Model SEGC with fixed core and SEGC-0 with openable core of Starduct is to meet variable needs. The sturdy construction and high quality powder coat finish are able to satisfy any requirement of performance and aesthetic appearance.

MATERIAL

- BORDER/FRAME: A6063 extruded aluminum, thickness 1.0~1.2mm.
- CORE: aluminum sheet, thickness 0.35mm

FINISH

- Standard: matt white RAL 9010 (optional RAL code). Guaranteed up to 10 years.

DIMENSION

- Optional (see table). A stiffening bar should be added with frames of larger than 600mm

CORE


- Standard: 0° angled core, 1/2" x 1/2" (12.7mm x 12.7 mm) grid.
- Optional: 45° angled core obstructs line of sight through
- Free area: up to 90%.

OPTIONS

- Removable core
- Hinged core
- OBD (for supply or register)


- Filter
- Plenum & accessories
- Plenum with round inlet





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Single Duct Type
Model : S-VAV-S


SIZE IN BOX

04 <input checked="" type="checkbox"/>	08 <input type="checkbox"/>	12 <input type="checkbox"/>
05 <input type="checkbox"/>	09 <input type="checkbox"/>	13 <input type="checkbox"/>
06 <input type="checkbox"/>	10 <input type="checkbox"/>	14 <input type="checkbox"/>
07 <input type="checkbox"/>	11 <input type="checkbox"/>	16 <input type="checkbox"/>


Sản xuất tại: NHÀ MÁY CƠ KHÍ STARDUCT
Địa chỉ: Cụm công nghiệp Thị trấn Phùng
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Web site: www.starduct.vn



Handle With Care
Hãy tay lái
địch chuyên



Do Nhiệt Độ
ở Ngoài Da
Thấp/Ghi
lạnh, hãy
lưu ý
lưu ý

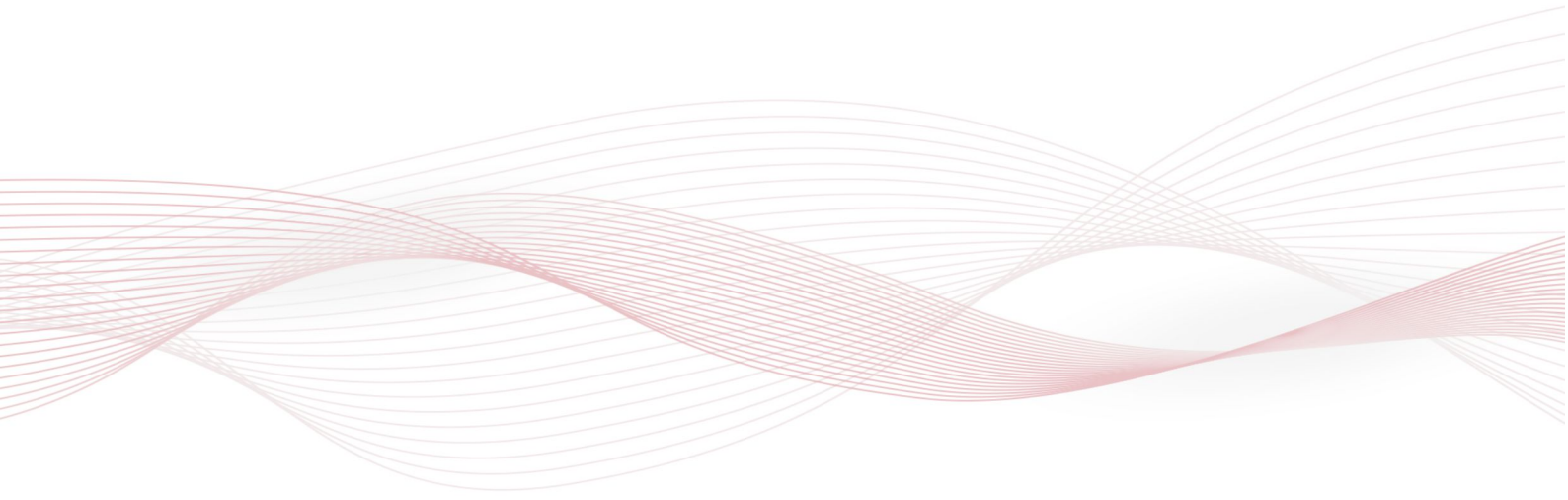


Store in Warehouse
Lưu trữ trong kho

Size in box



Standard packaging



STAR ASIA JSC.

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