



American
ventus
2021





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01
VTS Group

VTS GROUP is a manufacturer of technologically advanced equipment for the HVAC Sector; using innovative technologies in the spheres of project research, production and logistics.

OUR MISSION

AHU#1



MARKET'S
BEST
TIME LEAD **

* Logistics center

** Factory will confirm lead time based on the units selected.





THE 3 ELEMENTS OF SUCCESS

Consistently superior product quality. Unbeatable market prices. The shortest lead time. These three elements of market policy ensure that VTS is always one step ahead, in every region of the world.

Following the proven assembly method of the automotive Industry, VTS created a network of 5 efficiently functioning logistics centers: **Atlanta, Dubai, Moscow, Warsaw and Bangalore**. Thereby guaranteeing the shortest delivery terms in the market, regardless of the region in the world.

Mass scale production of reproducible devices makes it possible for VTS to offer our product at the **most competitive price while retaining the best quality**.

Multilevel quality control systems enables VTS to offer a **2 year optional warranty for each unit**.

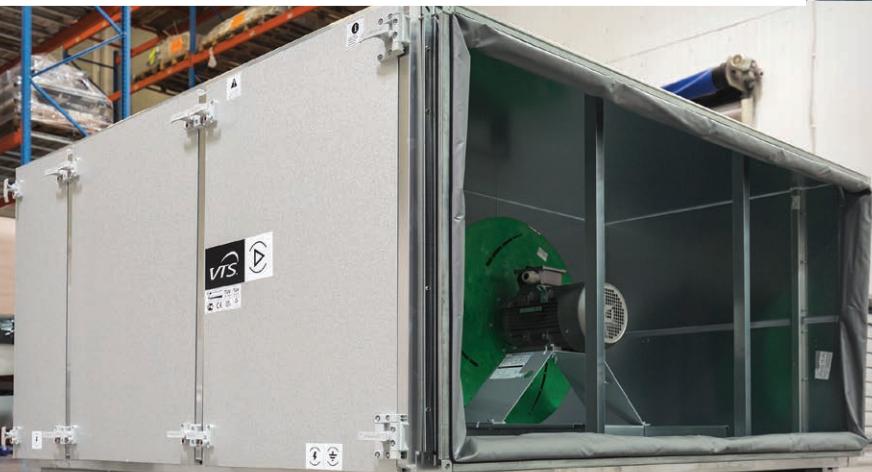
MARKET'S
BEST TIME
LEAD
LOGISTICS
5 CENTERS

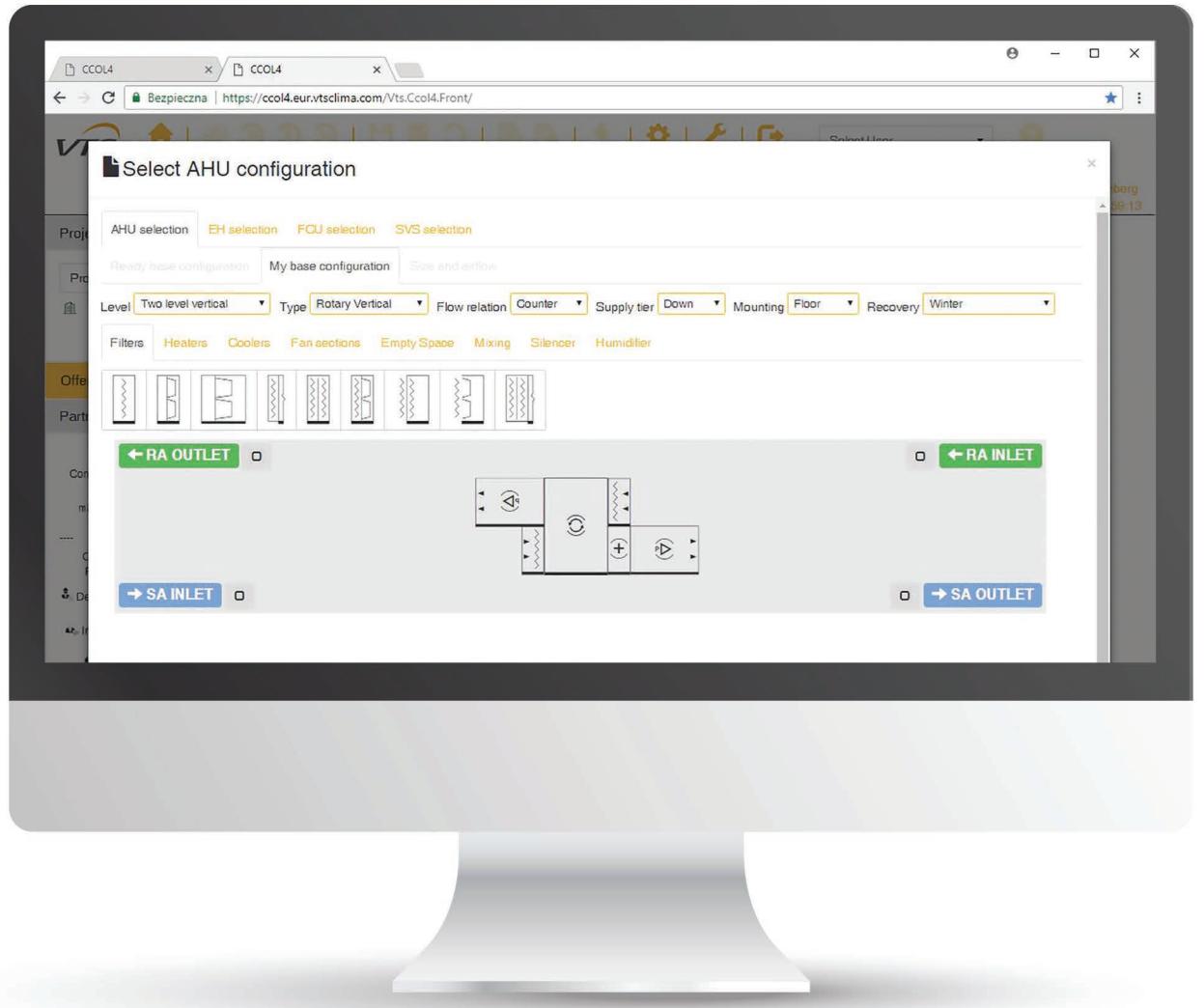
\$ competitive
price

150 000 UNITS SOLD ANNUALLY

Q the highest
quality

2 years optional warranty FOR EACH UNIT



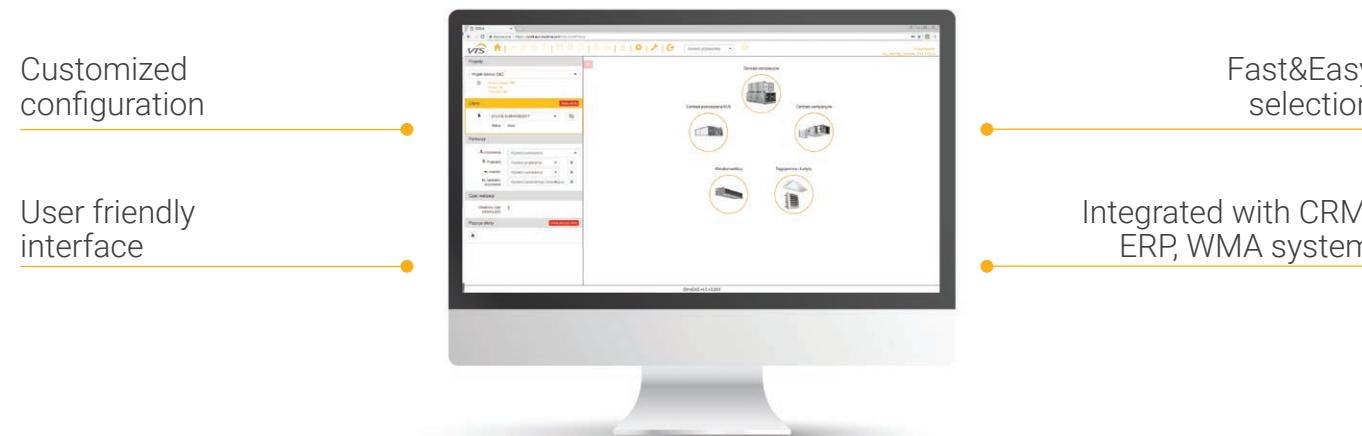


02

Designer support



ClimaCAD Online 4.0 [CCOL 4]



Customized configuration

User friendly interface

Fast&Easy selection

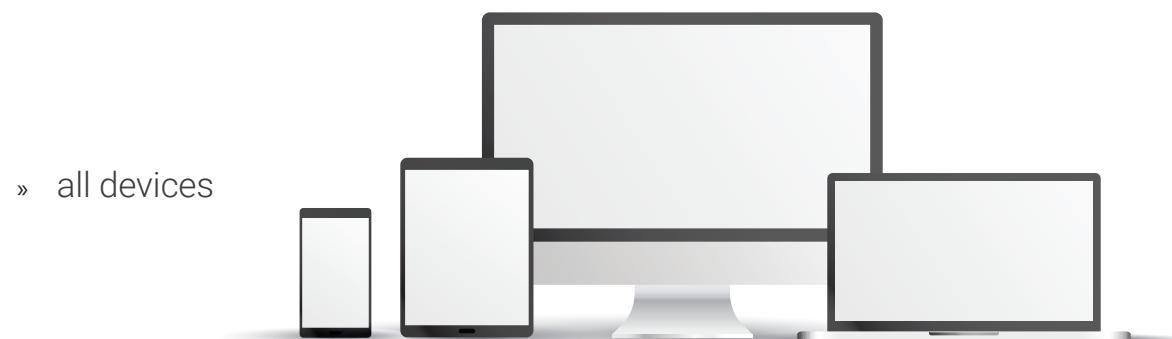
Integrated with CRM,
ERP, WMA system

CCOL 4 IS ADJUST TO

» all browsers



» all operating system



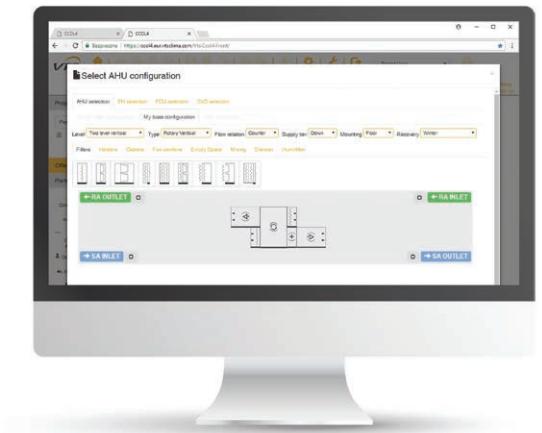
DATA EXPORT TO



CCOL 4 uses the latest technology and development platforms, which will be accessible from anywhere in the world through our software as service models. All you need is a device with a web browser and access to the internet.

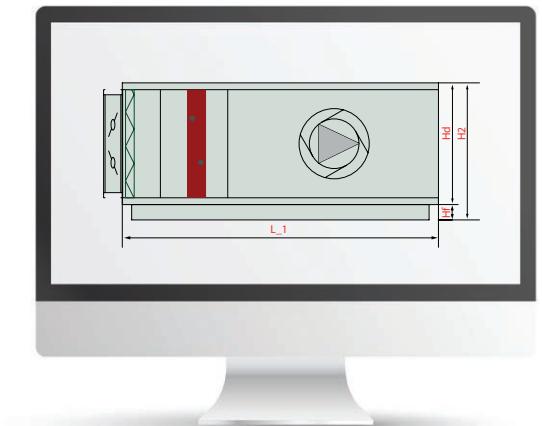
THE VERSATILITY OF DESIGNING

- » unlimited number of device configurations
- » detection of illogical configurations



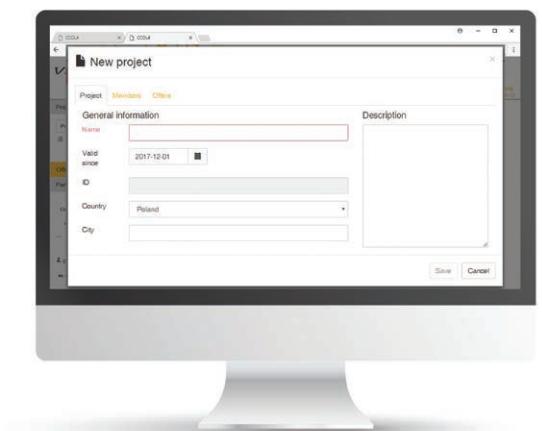
DYNAMIC COUNTING OF DEVICES DIMENSIONS

- » CCOL offers the optimal length of the control panel and the optimal section length adapted to the device functions and device design



MANAGING YOUR OWN DATABASE

- » the possibility of creating your own project database (selection)
- » the possibility of exporting own selections to quotation by VTS technical engineers

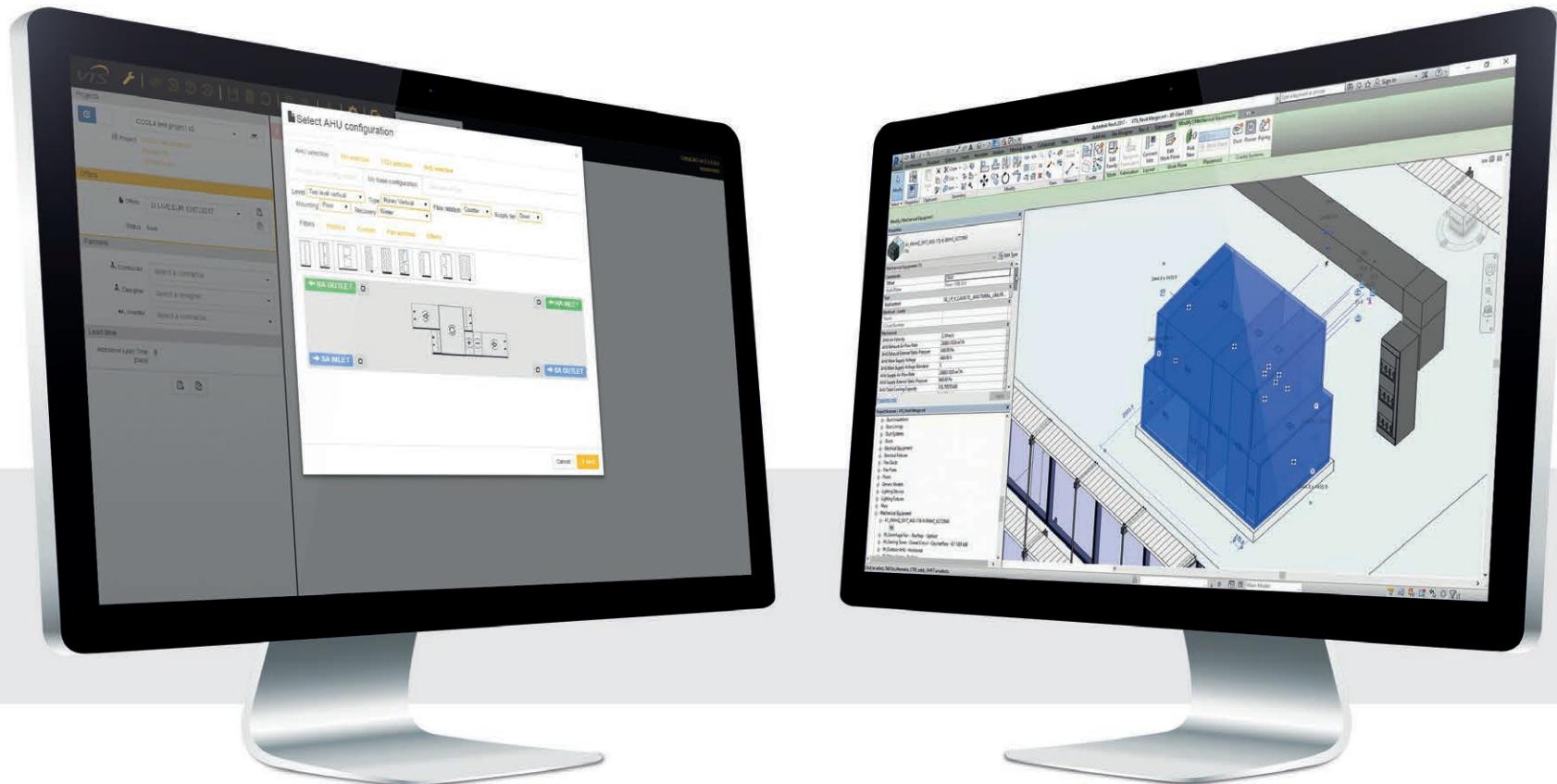


www.ccol4.com



VTS BIM - a new approach to digital models of air-handling units

VTS has created the possibility of generating digital models of VENTUS VS and American VENTUS air-handling models on-line. This is possible thanks to the implementation of a new ClimaCAD OnLine 4.0 selection tool, equipped with .rfa (Revit®) files generator.



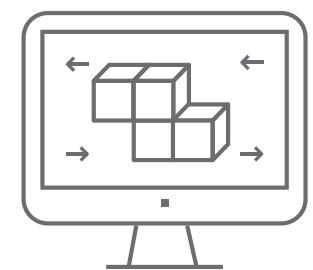
The process of model generation comes down to the following 3 steps:



1 Login to CCOL 4.0 website

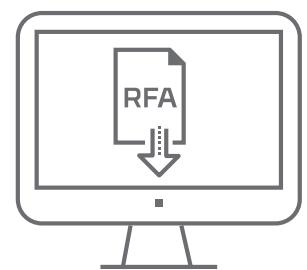
Login to the CCOL 4.0 using the following web address:

www.ccol4.com



2 Unit configuration

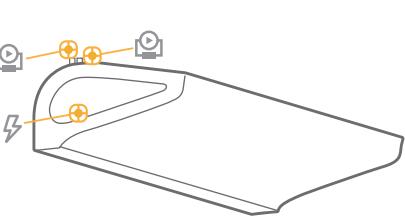
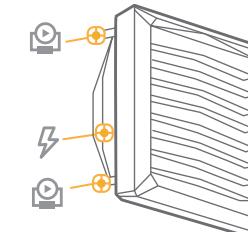
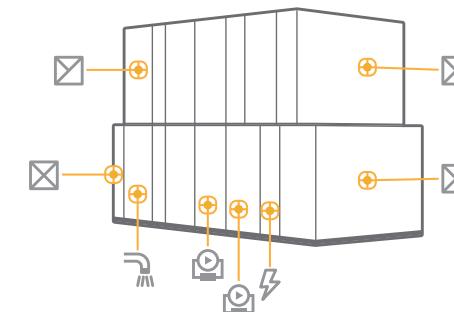
Use the intuitive selection tool to select your Air Handling Unit and set its working parameters to fit the specified project demands.



3 Data export to .rfa file

In order to generate a model in .rfa file, it is enough to enter the name and surname plus the email address of the person dedicated to receive the file. The system will automatically send a link to download the model. The entire process lasts approximately 15 minutes.

As a result, the client receives:



The generated objects contain detailed parameters connectors:

- » **air systems,**
- » **hydraulic systems,**
- » **sanitary systems,**
- » **electric systems,**

as well as the complete dimensional data, the device **maintenance** zone and the service (**repair**) zone.

VTS also provides digital models of WING air curtains and VOLCANO air heaters.

The models contain:

- » **parametrized electric and hydraulic connectors,**
- » **mount options vertically and horizontally,**
- » **presentation of the range of air stream,**
- » **parameter of any inclination angle of an air heater in relation to the horizontal plane.**

Models can be downloaded from: <https://vtsgroup.com/us/vts-bim>



03
Units



AVS



from **800 CFM**
to **38 000 CFM**
in total **capacity**

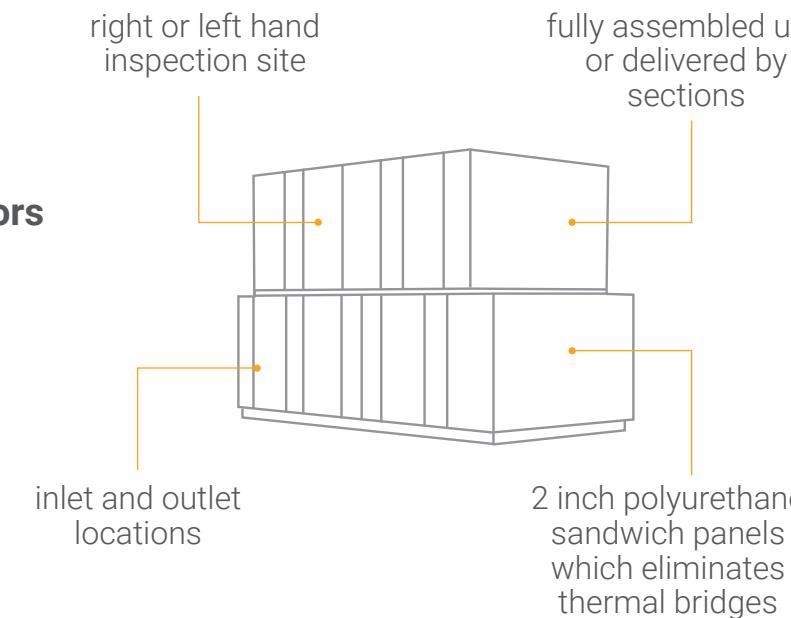


premium efficiency motors energy recovery system:

- cross-flow plate
- energy wheel



2 000 h
salt spray test
resistance
on the external coating



AVS LITE



from **800 CFM**
to **4 000 CFM**
in total **capacity**

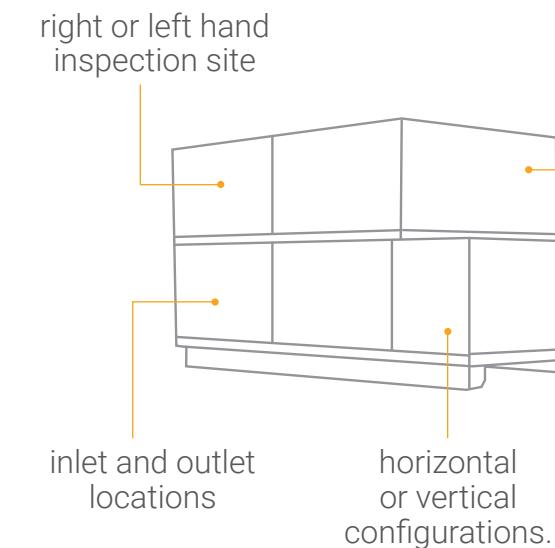


premium efficiency motors energy recovery system:

- cross-flow plate
- energy wheel



2 000 h
salt spray test
resistance
on the external coating



AVS VERTICAL



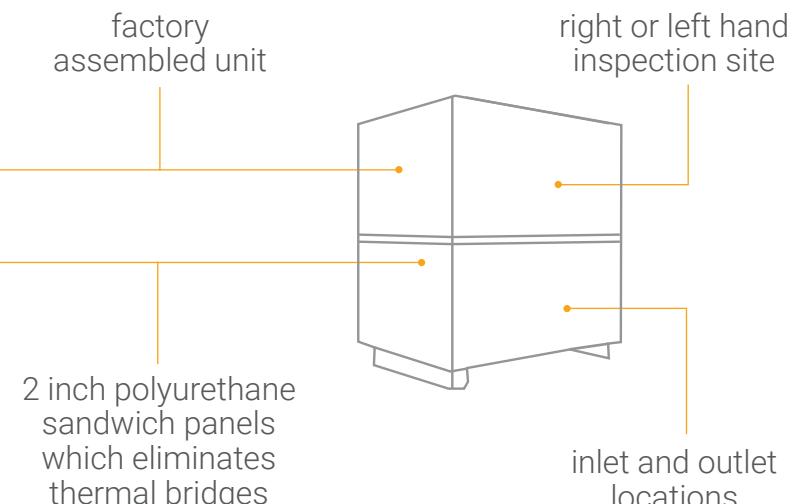
from **800 CFM**
to **4 000 CFM**
in total **capacity**



premium efficiency motors



2 000 h
salt spray test
resistance
on the external coating





Units

American
ventus

Units



RELIABLE
AND TIGHT
CONSTRUCTION



TOP QUALITY
COMPONENTS



INTELLIGENT
CONTROLS
SYSTEMS

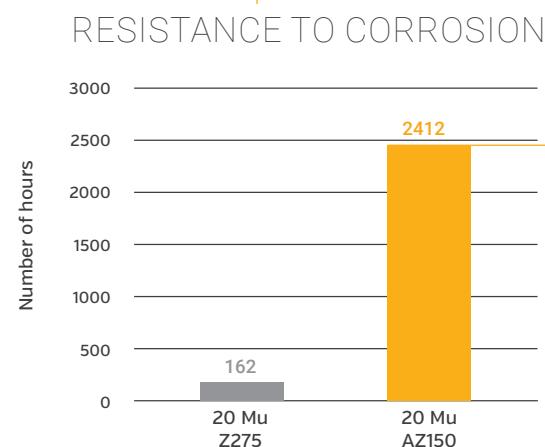


SAFETY
OF USE

DESIGN



MORE THAN 2,000 HOURS SALT SPRAY TEST PROTECTION



CASING SKIN

- » high rigidity and durability of the AHU structure
- » low absorption of heat radiation and UV
- » perfect resistance to weather conditions

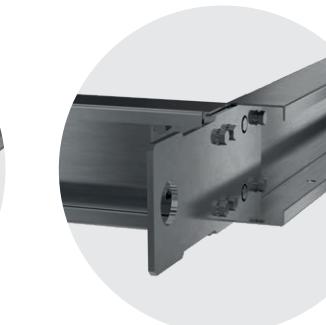


FAN SECTION CAGE

- » high longitudinal stiffness of the structure
- » easy section assembly



Z PROFILE
AVS040-AVS085



C PROFILE
AVS100-AVS380

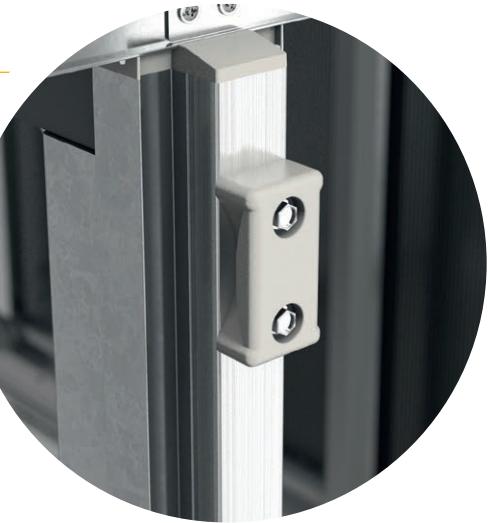


CURB READY RAILS
AVS040-AVS380

GALVANIZED STEEL SUPPORT AS STANDARD FOR ALL TYPES OF UNITS

CONVENIENT

- » easy transport
- » great profile resistance to deflection



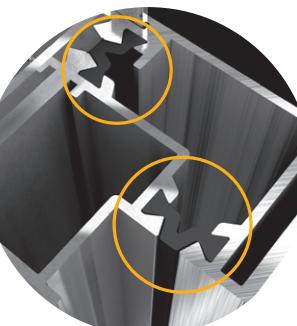
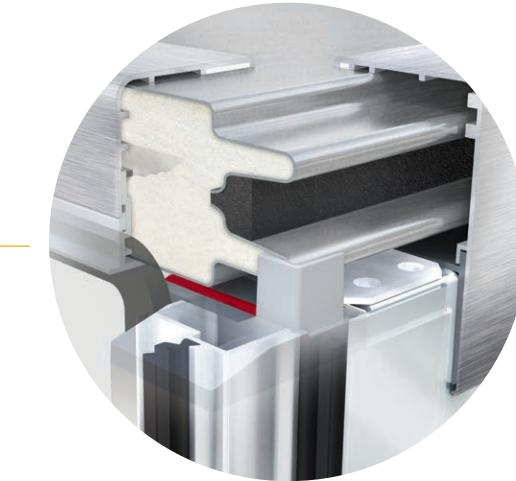
ALUMINUM POSTS AS STANDARD FOR ALL TYPES OF UNITS

AIR TIGHTNESS

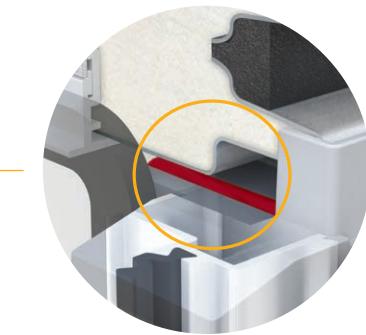


ERGONOMIC INSPECTION PANEL LOCK

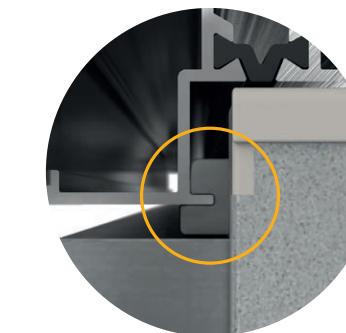
- » Highly aesthetic and ergonomic handles securing perfect tightness of inspection panels.



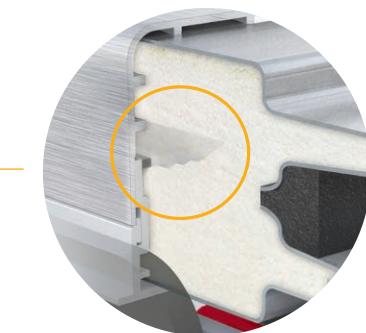
THERMAL
BREAK



ADDITIONAL
POST SEALING



LABYRINTH
SEALING



ADDITIONAL
SEALING EDGE

ALUMINUM STRUCTURAL POSTS WITH AN ADDITIONAL SEALING FIN
AND A THERMAL INSERT

- » thermal break as standard - ensures no condensation outside the AHU
- » the fin ensures labyrinth sealing – currently the most effective solution on the market, mainly used in laboratory equipment
- » original solution consisting in the use of symmetrical channel tension filled with a sealing compound, which provides 100% tightness of the connection between the column and construction structure

* patent pending; information will be published after its formal validation.

ROOFTOP APPLICATIONS



SECTIONAL ROOF

- » prevents water penetration during service
- » additional weather protection

VARIABLE INTAKE CONFIGURATIONS

- » top, bottom and side intake options
- » end – optional full face intake damper available units
- » dampers:
 - gear system for even distribution of the torque
 - extruded aluminum construction
 - low leakage
 - double wall blade construction

CURB READY RAILS

- » design -overhangs the side of the curb to avoid the need of flashing
- » integrated lifting lugs

VARIABLE DISCHARGE CONFIGURATION

- » end, top, bottom and side discharge options
- » optional discharge dampers and full end discharge dampers available



04

Technical
Parameters

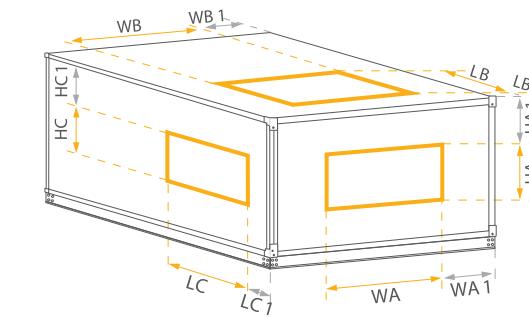
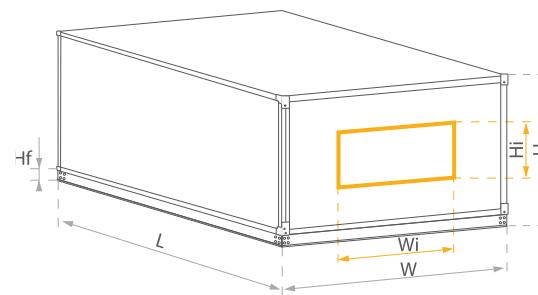


AVS 8-55 - SUPPLY & EXHAUST

Rated parameters		Recommended range of airflow						
Size		AVS 008	AVS 012	AVS 016	AVS 020	AVS 030	AVS 040	AVS 055
15 000	[CFM]	332	427	427	480	618	618	636
10 000		819	819	819	806	1037	1037	1185
5 000		1037	1037	1037	1524	1524	1567	1945
0		1945	1945	1945	2003	2419	2419	2419
Min.		332	427	427	480	618	618	636
Max.		2140	1883	1254	924	3091	2719	1817
H _f		3.54						
H		21.97	21.97	24.02	27.17	32.48	37.20	41.14
W		27.95	38.62	44.21	46.77	53.50	59.06	66.14
W _i		24.02	34.68	40.28	42.83	49.57	55.12	62.20
H _i		14.49	14.49	16.54	19.69	25.00	29.72	33.66
Main configuration	DE*	Basic configurations						
	-	44.26	44.26	44.26	44.26	58.65	58.65	73.05
	-	58.65	58.65	58.65	58.65	73.05	73.05	87.45
	-	73.05	73.05	73.05	73.05	87.45	87.45	101.85
	✓	73.05	73.05	73.05	73.05	87.45	87.45	101.85
	✓	87.45	87.45	87.45	87.45	87.45	87.45	101.85
	✓	87.45	87.45	87.45	87.45	101.85	101.85	116.24
	✓	101.85	101.85	101.85	101.85	101.85	101.85	116.24
	✓	101.85	101.85	101.85	101.85	116.24	116.24	130.64
	✓	116.24	116.24	116.24	116.24	116.24	116.24	130.64
	-	87.45	87.45	87.45	87.45	101.85	101.85	116.24
	-	73.05	73.05	73.05	73.05	87.45	87.45	101.85
	-	101.85	101.85	101.85	101.85	116.24	116.24	130.64
	✓	116.24	116.24	116.24	116.24	116.24	116.24	130.64
Units with external filters instead of internal are shorter by 14.4 inches								
Additional functions								
Empty section	L _{min}	29.86	29.86	29.86	29.86	29.86	29.86	29.86
	L _{max}	29.86	29.86	29.86	29.86	29.86	29.86	29.86
Mixing box	L	29.86	29.86	29.86	29.86	29.86	29.86	29.86

* Include Droplet Eliminator after Cooling Coil

DIMENSIONS - AVS 8-55 - SUPPLY & EXHAUST



AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)			
UNIT	WA	HA	WA1
AVS 008	21.65	12.13	3.15
AVS 012	32.32	12.13	3.15
AVS 016	37.91	14.17	3.15
AVS 020	40.47	17.32	3.15
AVS 030	47.20	22.64	3.15
AVS 040	52.76	27.36	3.15
AVS 055	59.84	31.30	3.15

END (FS)			
UNIT	WA	HA	WA1
AVS 008	17.99	7.99	5.03
AVS 012	25.98	7.99	6.33
AVS 016	34.02	7.99	5.13
AVS 020	25.98	12.01	10.43
AVS 030	34.02	12.01	9.83
AVS 040	40.47	17.32	9.29
AVS 055	47.20	22.64	9.47

Top (US)			
UNIT	WB	LB	WB1
AVS 008	17.99	7.99	5.03
AVS 012	25.98	7.99	6.33
AVS 016	34.02	7.99	5.13
AVS 020	25.98	12.01	10.43
AVS 030	34.02	12.01	9.83
AVS 040	40.47	17.32	9.29
AVS 055	47.20	22.64	9.47

Top (US)			
UNIT	WB	LB	WB1
AVS 008	17.94	7.94	5.00
AVS 012	25.94	7.94	6.34
AVS 016	33.94	7.94	5.16
AVS 020	25.94	11.94	10.43
AVS 030	33.94	11.94	9.80
AVS 040	47.20	22.64	5.93
AVS 055	52.76	27.36	6.69

UNIT CODING

AVS - XXX - R/L - EM / HC / EM

AVS - type of AHU family
XXX - size of unit (equal to the rated air flow in cfm)
R/L - inspection side (R-right, L-left)
EM - symbols of additional functions upstream main functions
HC - symbols of main thermodynamic functions (basic functions)
EM - symbols of additional functions downstream main functions
Length depends on AHU equipment

Side (BS)			
UNIT	HC	LC	HC1
AVS 008	10.94	7.94	4.33
AVS 012	10.94	7.94	4.33
AVS 016	12.94	7.94	4.33
AVS 020	15.94	11.94	4.33
AVS 030	20.94	11.94	4.33
AVS 040	16.26	14.96	6.89
AVS 055	24.13	14.96	6.73

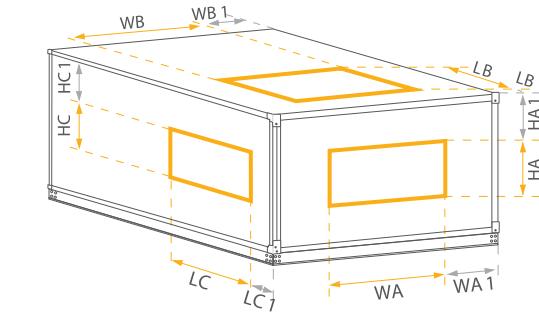
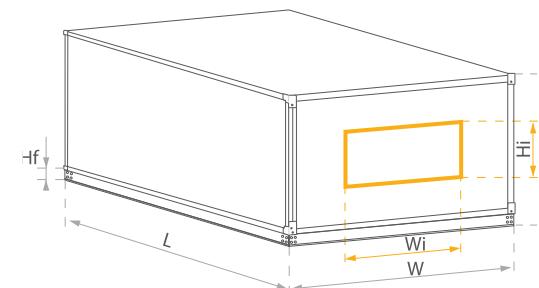


AVS 65-380 - SUPPLY & EXHAUST

Rated parameters		Recommended range of airflow								
Size		AVS065	AVS085	AVS100	AVS130	AVS170	AVS230	AVS300	AVS380	
75 000	[CFM]	12395	3307	3307	2952	4069	4069	3559	4501	4501
50 000		2952	4069	4069	4069	4069	4069	4069	4069	4069
25 000		12395	3307	3307	2952	4069	4069	3559	4501	4501
0		12395	3307	3307	2952	4069	4069	3559	4501	4501
Min.		2395	3307	3307	2952	4069	4069	3559	4501	4501
Max.		15402	14553	10640	7840	18983	17907	13199	9725	22883
H _f		3.54								
H		42.60	46.57	54.21	54.21	65.98	75.16	75.16	93.94	
W		75.24	82.87	82.87	98.94	102.56	122.24	141.93	146.34	
W _i		71.30	78.94	78.94	95.00	98.62	118.31	137.99	142.40	
H _i		35.12	39.09	47.13	47.13	58.90	68.07	68.07	86.85	
Main configuration	DE*	Basic configurations								
	-	73.05	73.05	58.65	58.65	73.05	73.05	73.05	73.05	
	-	87.45	87.45	73.05	73.05	87.45	87.45	87.45	87.45	
	-	101.85	101.85	87.45	87.45	101.85	101.85	101.85	101.85	
	-	101.85	101.85	87.45	87.45	101.85	101.85	101.85	101.85	
	✓	101.85	101.85	87.45	87.45	101.85	101.85	101.85	101.85	
	-	116.24	116.24	101.85	101.85	116.24	116.24	116.24	116.24	
	✓	116.24	116.24	101.85	101.85	116.24	116.24	116.24	116.24	
	-	130.64	130.64	116.24	116.24	130.64	130.64	130.64	130.64	
	✓	130.64	130.64	116.24	116.24	130.64	130.64	130.64	130.64	
	-	116.24	116.24	101.85	101.85	116.24	116.24	116.24	116.24	
	-	101.85	101.85	87.45	87.45	101.85	101.85	101.85	101.85	
	-	130.64	130.64	116.24	116.24	130.64	130.64	130.64	130.64	
	✓	130.64	130.64	116.24	116.24	130.64	130.64	130.64	130.64	
Units with external filters instead of internal are shorter by 14.4 inches										
Additional functions										
Empty section	L _{min}	29.86	29.86	29.86	29.86	29.86	29.86	29.86	29.86	
	L _{max}	29.86	44.26	44.26	44.26	44.26	44.26	44.26	44.26	
Mixing box	L	29.86	44.26	44.26	44.26	44.26	44.26	44.26	44.26	

* Include Droplet Eliminator after Cooling Coil

DIMENSIONS - AVS 65-380 - SUPPLY & EXHAUST



AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)			
UNIT	WA	HA	WA1
AVS 065	68.94	32.76	3.15
AVS 085	76.57	36.73	3.15
AVS 100	76.57	44.76	3.15
AVS 130	92.64	44.76	3.15
AVS 170	96.26	56.54	3.15
AVS 230	115.94	65.71	3.15
AVS 300	135.63	65.71	3.15
AVS 380	140.04	84.49	3.15

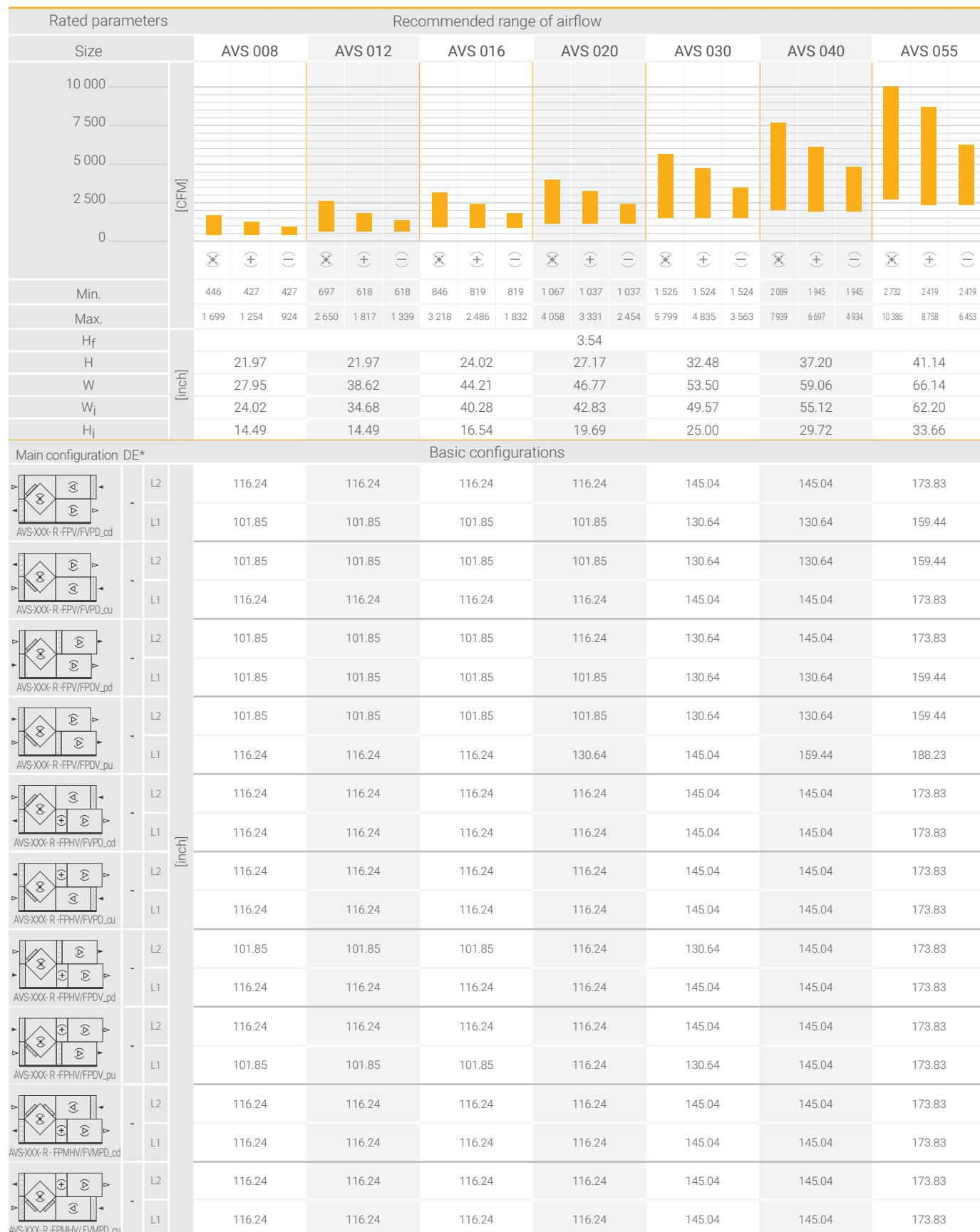
Top (US)			
UNIT	WB	LB	WB1
AVS 065	47.20	22.64	14.02
AVS 085	59.84	31.30	11.52
AVS 100	59.84	31.30	11.52
AVS 130	76.57	36.73	11.18
AVS 170	76.57	36.73	12.99
AVS 230	104.33	36.73	8.96
AVS 300	124.02	36.73	8.96
AVS 380	127.95	36.73	9.19

END (FS)			
UNIT	WA	HA	WA1
AVS 065	47.20	22.64	14.02
AVS 085	59.84	31.30	11.52
AVS 100	59.84	31.30	11.52
AVS 130	76.57	36.73	11.18
AVS 170	76.57	36.73	12.99
AVS 230	104.33	36.73	8.96
AVS 300	124.02	36.73	8.96
AVS 380	127.95	36.73	9.19

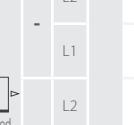
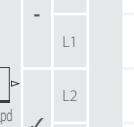
Top (US)			
UNIT	WB	LB	WB1
AVS 065	59.84	31.30	7.70
AVS 085	59.84	31.30	11.52
AVS 100	59.84	31.30	11.52
AVS 130	75.31	29.13	11.81
AVS 170	76.57	36.73	12.99
AVS 230	104.33	36.73	8.96
AVS 300	124.02	36.73	8.66
AVS 380	127.95	36.73	9.19

Side (BS)			
UNIT	HC	LC	HC1
AVS 065	24.13	14.96	6.89
AVS 085	28.07	29.13	6.89
AVS 100	35.94	29.13	6.89
AVS 130	35.94	29.13	6.89
AVS 170	47.76	29.13	6.89
AVS 230	59.57	29.13	6.89
AVS 300	59.57	29.13	6.89
AVS 3			

AVS 8-55 - CROSS-FLOW PLATE

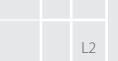




Main configuration	DE*	Basic configurations					
	L2	101.85	101.85	101.85	116.24	130.64	145.04
		130.64	130.64	130.64	130.64	159.44	159.44
	L1	101.85	101.85	101.85	116.24	130.64	145.04
		145.04	145.04	145.04	145.04	159.44	159.44
	L2	130.64	130.64	130.64	130.64	159.44	159.44
		101.85	101.85	101.85	116.24	130.64	145.04
	L1	145.04	145.04	145.04	145.04	159.44	159.44
		101.85	101.85	101.85	116.24	130.64	145.04
	L2	116.24	116.24	116.24	116.24	145.04	145.04
		130.64	130.64	130.64	130.64	159.44	159.44
	L1	116.24	116.24	116.24	116.24	145.04	145.04
		145.04	145.04	145.04	145.04	159.44	159.44
	L2	130.64	130.64	130.64	130.64	159.44	159.44
		116.24	116.24	116.24	116.24	145.04	145.04
	L1	145.04	145.04	145.04	145.04	159.44	159.44
		116.24	116.24	116.24	116.24	145.04	145.04
	L2	101.85	101.85	101.85	116.24	130.64	145.04
		130.64	130.64	130.64	130.64	159.44	159.44
	L1	101.85	101.85	101.85	116.24	130.64	145.04
		145.04	145.04	145.04	145.04	159.44	159.44
	L2	130.64	130.64	130.64	130.64	159.44	159.44
		101.85	101.85	101.85	116.24	130.64	145.04
	L1	145.04	145.04	145.04	145.04	159.44	159.44
		101.85	101.85	101.85	116.24	130.64	145.04
	L2	116.24	116.24	116.24	116.24	145.04	145.04
		130.64	130.64	130.64	130.64	159.44	159.44
	L1	116.24	116.24	116.24	116.24	145.04	145.04
		145.04	145.04	145.04	145.04	159.44	159.44
	L2	130.64	130.64	130.64	130.64	159.44	159.44
		116.24	116.24	116.24	116.24	145.04	145.04
	L1	145.04	145.04	145.04	145.04	159.44	159.44
		116.24	116.24	116.24	116.24	145.04	145.04

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck

Main configuration	DE*	Basic configurations							
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
	AVS-XXX-R-FPMHCV/FVMPD_cd	L1	130.64	130.64	130.64	130.64	159.44	159.44	188.23
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L1	145.04	145.04	145.04	145.04	159.44	159.44	188.23
		L2	130.64	130.64	130.64	130.64	159.44	159.44	188.23
	AVS-XXX-R-FPMHCV/FVMPD_cu	L1	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L2	145.04	145.04	145.04	145.04	159.44	159.44	188.23
		L1	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
	AVS-XXX-R-FPHCVH/FVPD_cu	L1	145.04	145.04	145.04	145.04	173.83	173.83	202.63
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L1	159.44	159.44	159.44	159.44	173.83	173.83	202.63
		L2	145.04	145.04	145.04	145.04	173.83	173.83	202.63
	AVS-XXX-R-FPMHCVH/FVMPD_cu	L1	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L2	159.44	159.44	159.44	159.44	173.83	173.83	202.63
		L1	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L2	145.04	145.04	145.04	145.04	173.83	173.83	202.63
	AVS-XXX-R-FPHCVH/FPDV_pd	L1	116.24	116.24	116.24	116.24	145.04	159.44	188.23
		L2	159.44	159.44	159.44	159.44	173.83	173.83	202.63
		L1	116.24	116.24	116.24	116.24	145.04	159.44	188.23
		L2	159.44	159.44	159.44	159.44	173.83	173.83	202.63
	AVS-XXX-R-FPHCVH/FPDV_pd	L1	116.24	116.24	116.24	116.24	145.04	159.44	188.23
		L2	145.04	145.04	145.04	145.04	173.83	173.83	202.63
		L1	116.24	116.24	116.24	116.24	145.04	159.44	188.23
	AVS-XXX-R-FPHCVH/FVPD_cu	L1	159.44	159.44	159.44	159.44	173.83	173.83	202.63
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L1	145.04	145.04	145.04	145.04	173.83	173.83	202.63
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
	AVS-XXX-R-FPHCVH/FVPD_cu	L1	159.44	159.44	159.44	159.44	173.83	173.83	202.63
		L2	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L1	145.04	145.04	145.04	145.04	173.83	173.83	202.63
	AVS-XXX-R-FPHCVH/FVPD_cu	L1	116.24	116.24	116.24	116.24	145.04	145.04	173.83
		L2	159.44	159.44	159.44	159.44	173.83	173.83	202.63
		L1	116.24	116.24	116.24	116.24	145.04	145.04	173.83

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck



AVS 65-380 - CROSS-FLOW PLATE

Rated parameters		Recommended range of airflow																								
Size		AVS065	AVS085	AVS100	AVS130	AVS170	AVS230	AVS300	AVS380																	
60 000	[CFM]	3 307	3 307	3 307	4 185	4 069	4 069	4 501	4 501	5 070	5 183	5 183	7 630	7 630	10 427	10 427	12 165	12 165	15 526	15 526						
45 000		3 307	3 307	3 307	4 185	4 069	4 069	4 501	4 501	5 070	5 183	5 183	7 630	7 630	10 427	10 427	12 165	12 165	15 526	15 526						
30 000		3 307	3 307	3 307	4 185	4 069	4 069	4 501	4 501	5 070	5 183	5 183	7 630	7 630	10 427	10 427	12 165	12 165	15 526	15 526						
15 000		3 307	3 307	3 307	4 185	4 069	4 069	4 501	4 501	5 070	5 183	5 183	7 630	7 630	10 427	10 427	12 165	12 165	15 526	15 526						
0		3 307	3 307	3 307	4 185	4 069	4 069	4 501	4 501	5 070	5 183	5 183	7 630	7 630	10 427	10 427	12 165	12 165	15 526	15 526						
Min.		3 307	3 307	3 307	4 185	4 069	4 069	4 501	4 501	5 070	5 183	5 183	7 630	7 630	10 427	10 427	12 165	12 165	15 526	15 526						
Max.		11 972	10 640	7 840	15 905	13 199	9 725	15 905	16 026	11 809	19 268	19 697	14 513	28 041	26 348	19 414	33 749	35 609	26 238	39 471	43 761	32 245	47 778	58 255	42 924	
H _{fd}	[inch]	3.54								3.15																
H _{fu}		0.00								2.36								2.36								
H		42.6								54.21								65.98								
W		75.24								82.87								98.94								
W _i		71.3								95.00								98.62								
H _j		35.12								39.09								47.13								
Main configuration DE*		Basic configurations																								
AVSXXX-R-FPV/FVPD_cd	L [inch]	173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPV/FVPD_cu		159.44	173.83	159.44	159.44	202.63	202.63	202.63	217.03																	
AVSXXX-R-FPV/FPDV_cu		159.44	173.83	159.44	159.44	202.63	202.63	202.63	217.03																	
AVSXXX-R-FPV/FPDV_pd		173.83	173.83	159.44	159.44	202.63	202.63	202.63	217.03																	
AVSXXX-R-FPV/FPDV_pu		159.44	173.83	159.44	159.44	202.63	202.63	202.63	217.03																	
AVSXXX-R-FPHV/FVPD_cd		188.23	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPHV/FVPD_cu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPHV/FPDV_cd		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPHV/FPDV_cu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPHV/FPDV_pd		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPHV/FPDV_pu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_cd		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_cu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_pd		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_pu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_cd		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_cu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_pd		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPMHV/FVMPD_pu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPCVH/FVPD_cd		188.23	202.63	188.23	188.23	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPCVH/FVPD_cu		173.83	188.23	173.83	173.83	217.03	217.03	217.03	231.42																	
AVSXXX-R-FPCVH/FVPD_pd		188.23</																								



Main configuration	DE*	Basic configurations						
 AVS-XXX-R-FPCVH/FPDV_pd	-	L2	173.83	173.83	159.44	159.44	202.63	202.63
	-	L1	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L2	173.83	173.83	159.44	159.44	202.63	202.63
	✓	L1	188.23	202.63	188.23	188.23	231.42	231.42
 AVS-XXX-R-FPCVH/FPDV_pu	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	173.83	159.44	159.44	202.63	202.63
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	173.83	159.44	159.44	202.63	202.63
 AVS-XXX-R-FPHCV/FPDV_cd	-	L2	173.83	188.23	173.83	173.83	217.03	217.03
	-	L1	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L2	173.83	188.23	173.83	173.83	217.03	217.03
	✓	L1	188.23	202.63	188.23	188.23	231.42	231.42
 AVS-XXX-R-FPHCV/FVPD_cu	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	188.23	173.83	173.83	217.03	217.03
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	188.23	173.83	173.83	217.03	217.03
 AVS-XXX-R-FPHCV/FPDV_pd	-	L2	173.83	173.83	159.44	159.44	202.63	202.63
	-	L1	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L2	173.83	173.83	159.44	159.44	202.63	202.63
	✓	L1	188.23	202.63	188.23	188.23	231.42	231.42
 AVS-XXX-R-FPHCV/FPDV_pu	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	173.83	159.44	159.44	202.63	202.63
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	173.83	159.44	159.44	202.63	202.63
 AVS-XXX-R-FPMCVH/RVMCD_cd	-	[inch]	173.83	173.83	159.44	159.44	202.63	202.63
	-	L2	173.83	173.83	159.44	159.44	202.63	202.63
	-	L1	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L2	173.83	173.83	159.44	159.44	202.63	202.63
 AVS-XXX-R-FPMCVH/RVMCD_pu	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	173.83	159.44	159.44	202.63	202.63
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	173.83	159.44	159.44	202.63	202.63
 AVS-XXX-R-FPMCVH/RVMCD_cu	-	L2	173.83	188.23	173.83	173.83	217.03	217.03
	-	L1	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L2	173.83	188.23	173.83	173.83	217.03	217.03
	✓	L1	188.23	202.63	188.23	188.23	231.42	231.42
 AVS-XXX-R-FPMCVH/RVMPD_cd	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	188.23	173.83	173.83	217.03	217.03
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	188.23	173.83	173.83	217.03	217.03
 AVS-XXX-R-FPMCVH/RVMPD_pu	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	188.23	173.83	173.83	217.03	217.03
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	188.23	173.83	173.83	217.03	217.03
 AVS-XXX-R-FPMCVH/RVMPD_cu	-	L2	188.23	202.63	188.23	188.23	231.42	231.42
	-	L1	173.83	188.23	173.83	173.83	217.03	217.03
	✓	L2	188.23	202.63	188.23	188.23	231.42	231.42
	✓	L1	173.83	188.23	173.83	173.83	217.03	217.03

* Include Droplet Eliminator after Cooling Coil

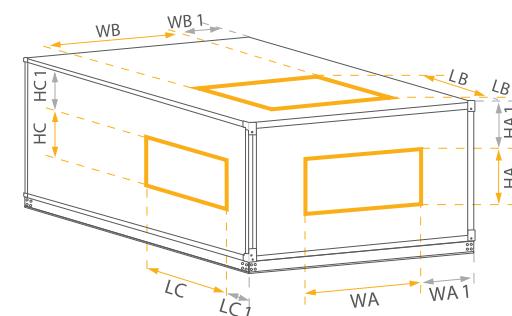
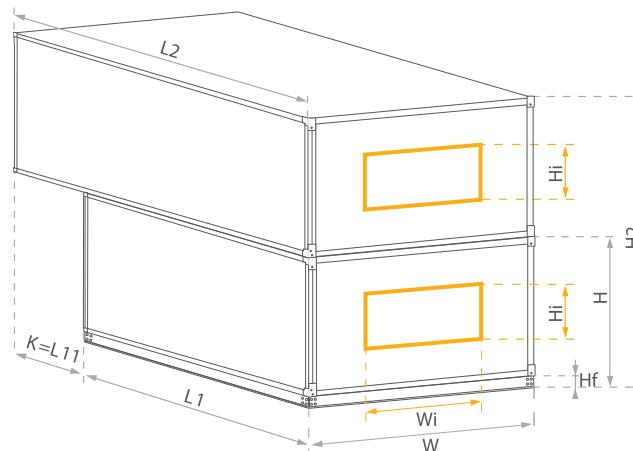
L1- doesn't cover empty space in bottom deck

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck



DIMENSIONS - AVS 8-55 - CROSS-FLOW PLATE



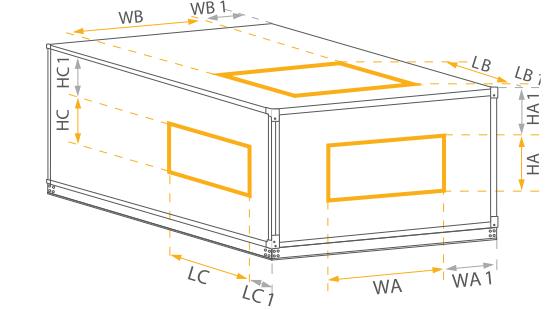
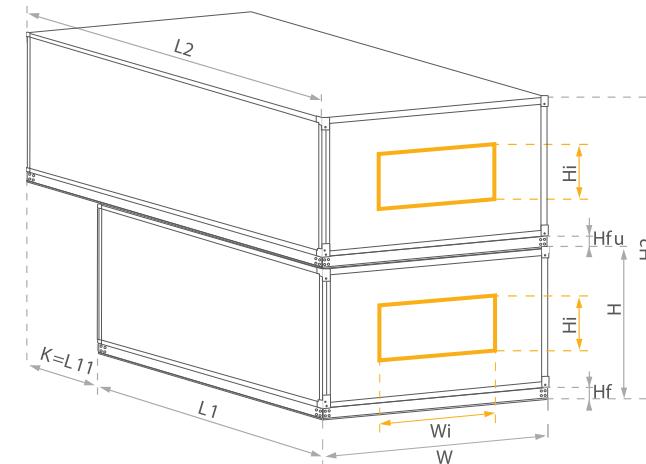
AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)				
UNIT	WA	HA	WA1	HA1
AVS 008	21.65	12.13	3.15	3.15
AVS 012	32.32	12.13	3.15	3.15
AVS 016	37.91	14.17	3.15	3.15
AVS 020	40.47	17.32	3.15	3.15
AVS 030	47.20	22.64	3.15	3.15
AVS 040	52.76	27.36	3.15	3.15
AVS 055	59.84	31.30	3.15	3.15

END (FS)				
UNIT	WA	HA	WA1	HA1
AVS 008	17.97	7.97	5.00	5.24
AVS 012	25.97	7.97	6.34	5.24
AVS 016	33.97	7.97	5.16	6.26
AVS 020	25.97	11.97	10.43	5.83
AVS 030	33.97	11.97	9.80	8.50
AVS 040	40.51	17.36	9.29	8.19
AVS 055	47.24	22.68	9.47	7.48

Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 008	10.94	7.94	4.33	3.74
AVS 012	10.94	7.94	4.33	3.74
AVS 016	12.94	7.94	4.33	3.74
AVS 020	15.94	11.94	4.33	3.82
AVS 030	20.94	11.94	4.33	3.98
AVS 040	16.26	14.96	6.89	8.70
AVS 055	24.13	14.96	6.89	6.73

DIMENSIONS - AVS 65-380 - CROSS-FLOW PLATE



AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)				
UNIT	WA	HA	WA1	HA1
AVS 065	68.94	32.76	3.15	3.15
AVS 085	76.57	36.73	3.15	3.15
AVS 100	76.57	44.76	3.15	3.15
AVS 130	92.64	44.76	3.15	3.15
AVS 170	96.26	56.54	3.15	3.15
AVS 230	115.94	65.71	3.15	3.15
AVS 300	135.63	65.71	3.15	3.15
AVS 300	140.04	84.49	3.15	3.15

END (FS)				
UNIT	WA	HA	WA1	HA1
AVS 065	47.24	22.68	14.02	8.23
AVS 085	59.88	31.34	11.52	5.87
AVS 100	59.88	31.34	11.52	9.88
AVS 130	76.61	36.77	11.18	7.17
AVS 170	76.61	36.77	12.99	13.07
AVS 230	104.37	36.77	8.96	17.64
AVS 300	124.06	36.77	8.96	17.64
AVS 380	127.99	36.77	9.19	27.05

Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 065	24.13	14.96	6.89	7.46
AVS 085	28.07	29.13	6.89	7.48
AVS 100	35.94	29.13	6.89	7.56
AVS 130	35.94	29.13	6.89	7.56
AVS 170	47.76	29.13	6.89	7.54
AVS 230	59.57	29.13	6.89	6.22
AVS 300	59.57	29.13	6.89	6.22
AVS 380	75.31	29.13	6.89	7.74

UNIT CODING

AVS - XX

AVS - type of AHU family

XXX - size of unit (equal to the rated air flow in cfm*0.001)

R/L - inspection side (R-right, L-left)

PHC - symbols of main thermodynamic functions (basic functions)

Length depends on AHU equipment

UNIT CODING

AVS - XX

AVS - type of AHU family

XXX - size of unit (equal to the rated air flow in cfm*0.001)

R/L - inspection side (R-right, L-left)

PHC - symbols of main thermodynamic functions (basic functions)

Length depends on AHU equipment

AVS 12 - 65 WITH ENERGY WHEEL

Rated parameters		Recommended range of airflow													
Size		AVS 012	AVS 016	AVS 020	AVS 030	AVS 040	AVS 055	AVS 065							
12 000	[CFM]	116.24	116.24	116.24	130.64	130.64	145.04	145.04	145.04	130.64	130.64	145.04	145.04	145.04	145.04
8 000		130.64	130.64	130.64	145.04	145.04	159.44	159.44	159.44	130.64	130.64	145.04	145.04	145.04	145.04
4 000		116.24	116.24	116.24	130.64	130.64	145.04	145.04	145.04	130.64	130.64	145.04	145.04	145.04	145.04
0		145.04	145.04	145.04	159.44	159.44	173.83	173.83	173.83	130.64	130.64	145.04	145.04	145.04	145.04
Min.		618	618	618	819	819	1037	1037	1037	1524	1524	1945	1945	2419	2419
Max.		2179	1817	1339	2664	2486	1832	4068	3331	2454	5869	4835	3563	7364	6697
H _f															
H		21.97	24.02	27.17	32.48	37.20	41.14	42.60							
W		38.62	44.21	46.77	53.50	59.06	66.14	75.24							
W _i		34.68	40.28	42.83	49.57	55.12	62.20	71.30							
H _i		14.49	16.54	19.69	25.00	29.72	33.66	35.12							
H ₂		40.39	44.49	50.79	61.42	70.87	78.74	81.65							

Main configuration DE*		Basic configurations					
		87.45	87.45	101.85	101.85	116.24	116.24
		AVS-XXX-R-FRV/FRV_cd	L2	L1	87.45	87.45	116.24
			L11	28.80	28.80	43.19	57.59
				87.45	87.45	101.85	116.24
				L1	87.45	87.45	116.24
			L11	28.80	28.80	43.19	57.59
				87.45	87.45	101.85	116.24
				L1	101.85	101.85	116.24
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	101.85	101.85	116.24
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99
				116.24	116.24	130.64	145.04
				L1	130.64	130.64	145.04
			L11	130.64	130.64	145.04	159.44
				130.64	130.64	145.04	159.44
				L1	116.24	116.24	145.04
			L11	87.45	87.45	101.85	116.24
				101.85	101.85	116.24	130.64
				L1	28.80	28.80	43.19
			L11	87.45	87.45	101.85	116.24
				101.85	101.85	116.24	130.64
				L1	116.24	116.24	130.64
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99

* Include Droplet Eliminator after Cooling Coil

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L1- doesn't cover empty space in bottom deck

Main configuration DE*		Basic configurations					
		116.24	116.24	116.24	130.64	130.64	145.04
		AVS-XXX-R-FRMCV/FVMR_cd	L2	L1	130.64	130.64	145.04
			L11	116.24	116.24	130.64	145.04
				145.04	145.04	145.04	159.44
				L1	130.64	130.64	145.04
			L11	116.24	116.24	130.64	145.04
				101.85	101.85	116.24	130.64
				L1	130.64	130.64	145.04
			L11	116.24	116.24	130.64	145.04
				101.85	101.85	116.24	130.64
				L1	28.80	28.80	43.19
			L11	87.45	87.45	101.85	116.24
				101.85	101.85	116.24	130.64
				L1	116.24	116.24	130.64
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99
				101.85	101.85	116.24	130.64
				L1	116.24	116.24	130.64
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99
				101.85	101.85	116.24	130.64
				L1	116.24	116.24	130.64
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101.85
			L11	43.19	43.19	57.59	71.99
				101.85	101.85	116.24	130.64
				L1	116.24	116.24	130.64
			L11	28.80	28.80	43.19	57.59
				101.85	101.85	116.24	130.64
				L1	87.45	87.45	101

AVS 85-380 WITH ENERGY WHEEL

Rated parameters		Recommended range of airflow													
Size		AVS085	AVS100	AVS130	AVS170	AVS230	AVS300	AVS380							
[CFM]	60 000														
	40 000														
	20 000														
	0	⊖	⊕	⊖	⊖	⊕	⊖	⊖	⊖	⊕	⊖	⊖	⊕	⊖	⊖
	Min.	4069	4069	4069	4501	4501	4501	4979	5183	5183	7630	7630	7630	10427	10427
	Max.	15121	13198	9724	15122	16026	11809	21698	19697	14513	23578	26348	19414	32704	35609
	H _{fd}	3.54													
	H _{fu}	0.00	2.36		2.36		2.36		2.36		2.36		2.36		
	H	46.57	54.21		54.21		65.98		75.16		75.16		93.94		
	W	82.87	82.87	98.94		102.56		122.24		141.93		146.34			
[inch]	W _i	78.94	78.94	95.00		98.62		118.31		137.99		142.4			
	H _i	39.09	47.13	47.13		58.9		68.07		68.07		86.85			
	H ₂	89.61	107.64	107.64		131.18		149.53		149.53		187.09			
Main configuration DE*		Basic configurations													
[inch]	L2	116.24	101.85	101.85	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24
	L1	116.24	101.85	101.85	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24
	L11	57.59	43.19	43.19	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59
	L2	116.24	101.85	101.85	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24
	L1	116.24	101.85	101.85	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24
	L11	57.59	43.19	43.19	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59
	L2	116.24	101.85	101.85	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24
	L1	130.64	116.24	116.24	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64
	L11	57.59	43.19	43.19	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59	57.59
	L2	130.64	116.24	116.24	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64	130.64
[inch]	L1	116.24	101.85	101.85	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24	116.24
	L11	71.99	57.59	57.59	71.99	71.99	71.99	71.99	71.99	71.99	71.99	71.99	71.99	71.99	71.99
	L2	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L1	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
	L11	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L2	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
	L1	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L11	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
	L2	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L1	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
[inch]	L11	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L2	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L1	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
	L11	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L2	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L1	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
	L11	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L2	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44
	L1	173.83	159.44	159.44	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83	173.83
	L11	159.44	145.04	145.04	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44	159.44

* Include Droplet Eliminator after Cooling Coil

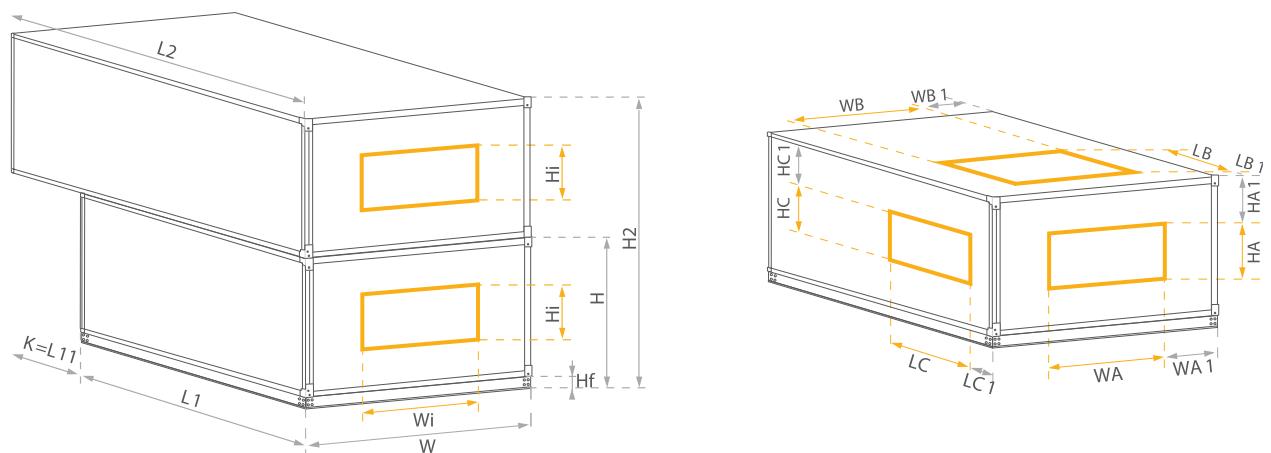
L1- doesn't cover empty space in bottom deck

Main configuration DE*		Basic configurations						

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DIMENSIONS -AVS 12 - 65 WITH ENERGY WHEEL

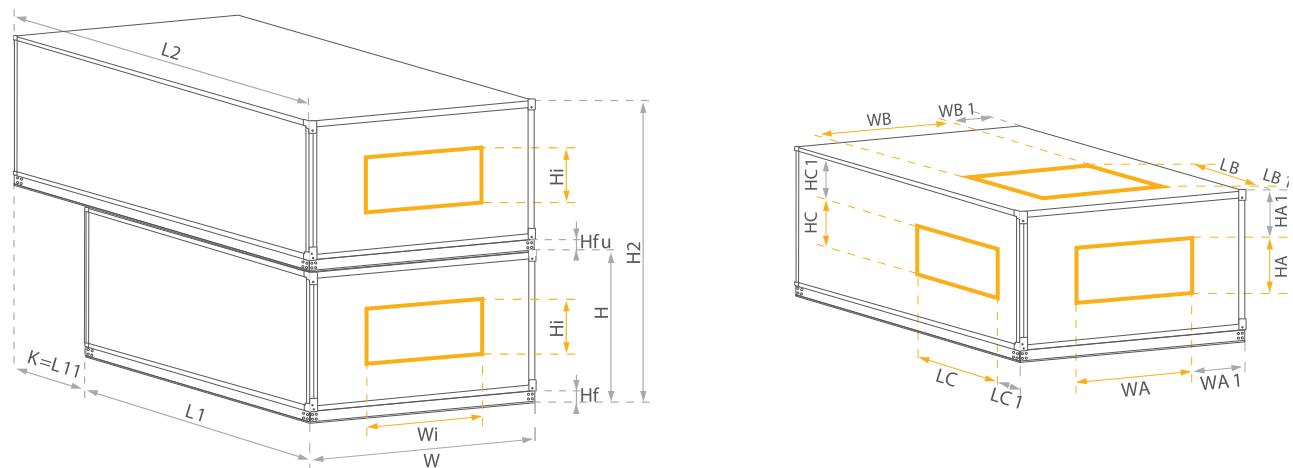


AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)				
UNIT	WA	HA	WA1	HA1
AVS 012	32.32	12.13	3.15	3.15
AVS 016	37.91	14.17	3.15	3.15
AVS 020	40.47	17.32	3.15	3.15
AVS 030	47.20	22.64	3.15	3.15
AVS 040	52.76	27.36	3.15	3.15
AVS 055	59.84	31.30	3.15	3.15
AVS 065	68.94	32.76	3.15	3.15

END (FS)				
UNIT	WA	HA	WA1	HA1
AVS 012	25.97	7.97	6.34	5.24
AVS 016	33.97	7.97	5.16	6.26
AVS 020	25.97	11.97	10.43	5.83
AVS 030	33.97	11.97	9.80	8.50
AVS 040	40.51	17.36	9.29	8.19
AVS 055	47.24	22.68	9.47	7.48
AVS 065	47.24	22.68	14.02	8.23

DIMENSIONS -AVS 85-380 WITH ENERGY WHEEL



AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)				
UNIT	WA	HA	WA1	HA1
AVS 085	76.57	36.73	3.15	3.15
AVS 100	76.57	44.76	3.15	3.15
AVS 130	92.64	44.76	3.15	3.15
AVS 170	96.26	56.54	3.15	3.15
AVS 230	115.94	65.71	3.15	3.15
AVS 300	135.63	65.71	3.15	3.15
AVS 380	140.04	84.49	3.15	3.15

END (FS)				
UNIT	WA	HA	WA1	HA1
AVS 085	59.88	31.34	11.52	5.87
AVS 100	59.88	31.34	11.52	9.88
AVS 130	76.61	36.77	11.18	7.17
AVS 170	76.61	36.77	12.99	13.07
AVS 230	104.37	36.77	8.96	17.64
AVS 300	124.06	36.77	8.96	17.64
AVS 380	127.99	36.77	9.19	27.05

Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 012	10.94	7.94	4.33	3.74
AVS 016	12.94	7.94	4.33	3.74
AVS 020	15.94	11.94	4.33	3.82
AVS 030	20.94	11.94	4.33	3.98
AVS 040	16.26	14.96	6.89	8.70
AVS 055	24.13	14.96	6.89	6.73
AVS 065	24.13	14.96	6.89	7.46

Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 085	28.07	29.13	6.89	7.48
AVS 100	35.94	29.13	6.89	7.56
AVS 130	35.94	29.13	6.89	7.56
AVS 170	47.76	29.13	6.89	7.54
AVS 230	59.57	29.13	6.89	6.22
AVS 300	59.57	29.13	6.89	6.22
AVS 380	75.31	29.13	6.89	7.74

UNIT CODING

AVS - XX

AVS - type of AHU family

XXX - size of unit (equal to the rated air flow in cfm*0.001)

R/L - inspection side (R-right, L-left)

PHC - symbols of main thermodynamic functions (basic functions)

Length depends on AHU equipment

UNIT CODING

AVS - XX

AVS - type of AHU family

XXX - size of unit (equal to the rated air flow in cfm*0.001)

R/L - inspection side (R-right, L-left)

PHC - symbols of main thermodynamic functions (basic functions)

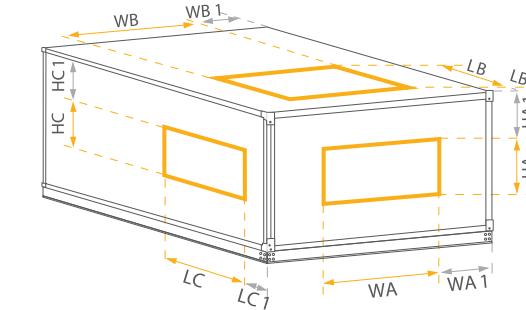
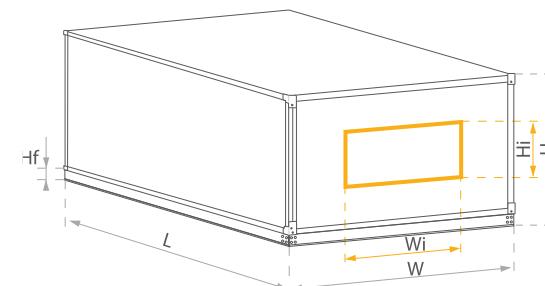
Length depends on AHU equipment



AVS LITE 8-40 - SUPPLY & EXHAUST

Rated parameters		Recommended range of airflow					
Size	AVS 008	AVS 012	AVS 016	AVS 020	AVS 030	AVS 040	
15 000	0	0	0	0	0	0	0
10 000	0	0	0	0	0	0	0
5 000	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
Min.	332	427	427	427	480	618	618
Max.	2140	1883	1254	924	3091	2719	1817
H_f	3.54						
H	21.97	21.97	24.02	27.17	32.48	37.20	
W	27.95	38.62	44.21	46.77	53.50	59.06	
W_i	24.02	34.68	40.28	42.83	49.57	55.12	
H_i	14.49	14.49	16.54	19.69	25.00	29.72	
Main configuration		Basic configurations					
	L1	29,9	29,9	44,3	44,3	44,3	44,3
	L1	44,3	44,3	44,3	44,3	58,69	58,69
	L1	44,3	44,3	58,69	58,69	58,69	58,69
	L1	44,3	58,69	58,69	58,69	58,69	58,69
	L1	44,3	58,69	58,69	58,69	58,69	58,69
	L1	58,69	58,69	58,69	58,69	73,09	73,09
	L1	58,69	58,69	73,09	73,09	73,09	73,09
	L1	58,69	73,09	73,09	73,09	73,09	73,09
	L1	58,69	73,09	73,09	73,09	73,09	73,09
Units with external filters instead of internal are shorter by 14.4 inches							
Additional functions							
Empty section	L_{min}	29.86	29.86	29.86	29.86	29.86	29.86
	L_{max}	29.86	29.86	29.86	29.86	29.86	29.86
Mixing box	L	29.86	29.86	29.86	29.86	29.86	29.86

DIMENSIONS - AVS LITE 8-40 - SUPPLY & EXHAUST



AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)			
UNIT	WA	HA	WA1
AVS 008	21.65	12.13	3.15
AVS 012	32.32	12.13	3.15
AVS 016	37.91	14.17	3.15
AVS 020	40.47	17.32	3.15
AVS 030	47.20	22.64	3.15
AVS 040	52.76	27.36	3.15

END (FS)			
UNIT	WA	HA	WA1
AVS 008	17.99	7.99	5.03
AVS 012	25.98	7.99	6.33
AVS 016	34.02	7.99	5.13
AVS 020	25.98	12.01	10.43
AVS 030	34.02	12.01	9.83
AVS 040	40.47	17.32	9.29

Top (US)			
UNIT	WB	LB	WB1
AVS 008	17.99	7.99	5.03
AVS 012	25.98	7.99	6.33
AVS 016	34.02	7.99	5.13
AVS 020	25.98	12.01	10.43
AVS 030	34.02	12.01	9.83
AVS 040	40.47	17.32	9.29

Top (US)			
UNIT	WB	LB	WB1
AVS 008	17.94	7.94	5.00
AVS 012	25.94	7.94	6.34
AVS 016	33.94	7.94	5.16
AVS 020	25.94	11.94	10.43
AVS 030	33.94	11.94	9.80
AVS 040	47.20	22.64	5.93

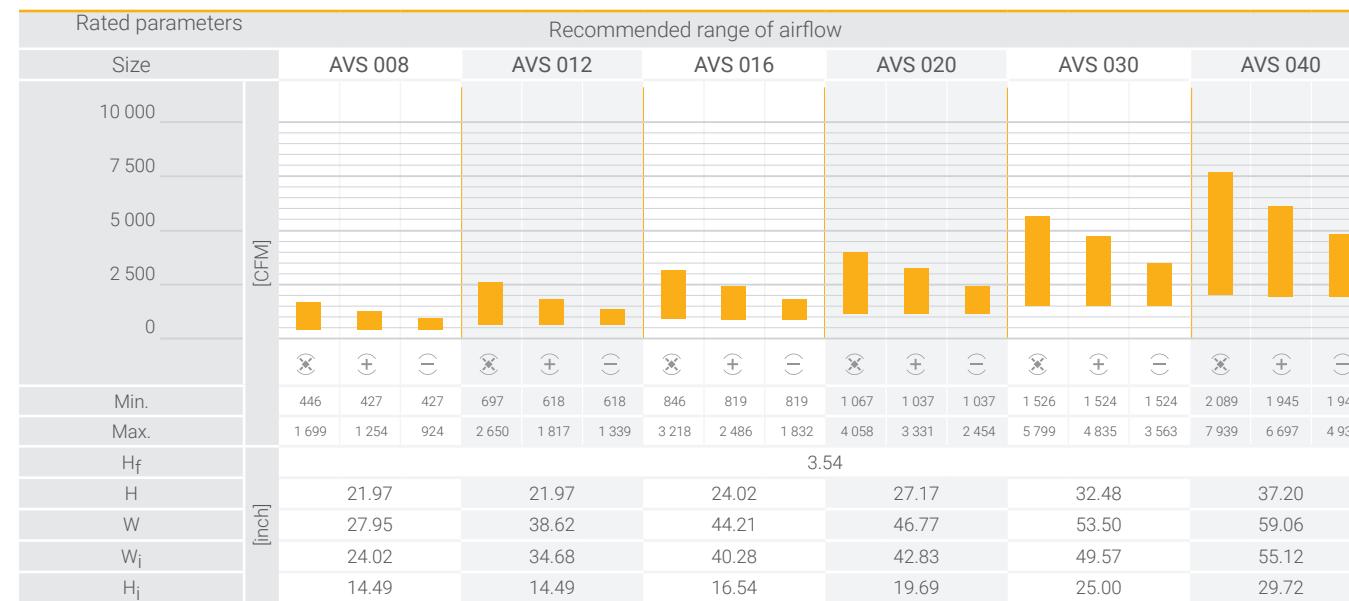
Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 008	10.94	7.94	4.33	3.74
AVS 012	10.94	7.94	4.33	3.74
AVS 016	12.94	7.94	4.33	3.74
AVS 020	15.94	11.94	4.33	3.82
AVS 030	20.94	11.94	4.33	3.98
AVS 040	16.26	14.96	6.89	8.70

UNIT CODING
AVS - XXX - R/L - EM / HC / EM

AVS - type of AHU family
XXX - size of unit (equal to the rated air flow in cfm)
R/L - inspection side (R-right, L-left)
EM - symbols of additional functions upstream main functions
HC - symbols of main thermodynamic functions (basic functions)
EM - symbols of additional functions downstream main functions
Length depends on AHU equipment



AVS LITE 8-40 - CROSS-FLOW PLATE



Main configuration DE*

		Basic configurations					
 AVS XXX-R-FPV/FVPD_cd	L2	58,69	58,69	87,49	87,49	87,49	101,89
	L1	58,69	58,69	73,09	87,49	87,49	101,89
 AVS XXX-R-FPV/FPDV_pd	L2	73,09	73,09	73,09	87,49	101,89	101,89
	L1	58,69	58,69	73,09	87,49	87,49	101,89
 AVS XXX-R-FPHV/FVPD_cd	L2	58,69	58,69	87,49	87,49	87,49	101,89
	L1	73,09	73,09	87,49	87,49	87,49	101,89
 AVS XXX-R-FPHV/FPDV_pd	L2	73,09	73,09	73,09	87,49	101,89	101,89
	L1	58,69	58,69	73,09	87,49	87,49	101,89
 AVS XXX-R-FPCV/FVPD_cd	L2	73,09	73,09	73,09	87,49	101,89	101,89
	L1	58,69	58,69	87,49	87,49	87,49	101,89
 AVS XXX-R-FPCV/FPDV_pd	L2	73,09	73,09	87,49	87,49	101,89	116,28
	L1	73,09	73,09	87,49	87,49	87,49	116,28
 AVS XXX-R-FPHV/FPDV_cd	L2	73,09	73,09	87,49	87,49	101,89	101,89
	L1	73,09	73,09	87,49	87,49	87,49	101,89

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck

Main configuration DE*

		Basic configurations					
 AVS XXX-R-FPHCV/FVPD_cd	L2	58,69	58,69	87,49	87,49	87,49	101,89
	L1	73,09	73,09	87,49	101,89	101,89	116,28
 AVS XXX-R-FPHCV/FPDV_pd	L2	73,09	73,09	73,09	87,49	101,89	101,89
	L1	73,09	73,09	87,49	87,49	87,49	101,89
 AVS XXX-R-FPHV/FVPD_cd	L2	58,69	58,69	87,49	87,49	87,49	101,89
	L1	73,09	73,09	87,49	101,89	101,89	116,28
 AVS XXX-R-FPHV/FPDV_pd	L2	73,09	73,09	73,09	87,49	101,89	101,89
	L1	73,09	73,09	87,49	87,49	87,49	101,89
 AVS XXX-R-FPV/FPDV_cd	L2	58,69	58,69	87,49	87,49	87,49	101,89
	L1	73,09	73,09	73,09	87,49	101,89	101,89
 AVS XXX-R-FPV/FPDV_pd	L2	73,09	73,09	73,09	87,49	101,89	101,89
	L1	73,09	73,09	87,49	87,49	87,49	101,89
 AVS XXX-R-FPHV/FPDV_cd	L2	87,49	87,49	87,49	87,49	87,49	101,89
	L1	87,49	87,49	87,49	87,49	87,49	101,89

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck

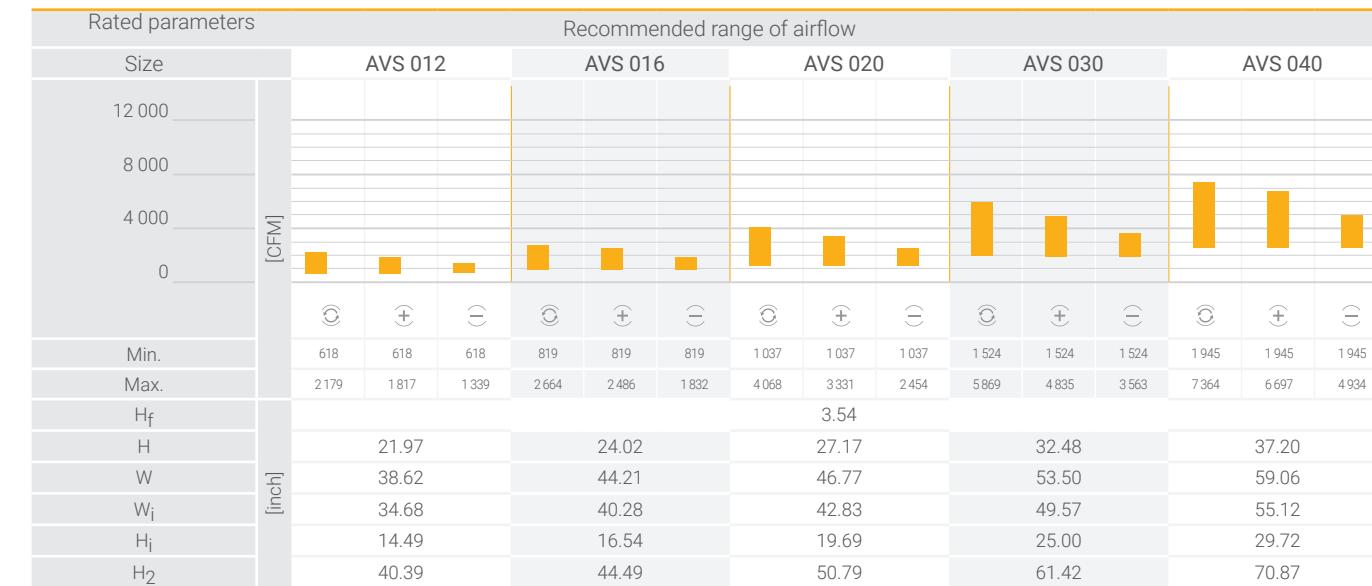


AVS LITE 12 - 40 WITH ENERGY WHEEL

Main configuration DE*		Basic configurations					
		L2	L1	L2	L1	L2	L1
	73,09	73,09	73,09	87,49	101,89	101,89	
	87,49	87,49	87,49	87,49	101,89	101,89	
	58,69	58,69	87,49	87,49	87,49	101,89	
	87,49	87,49	87,49	87,49	116,28	116,28	
	73,09	73,09	73,09	87,49	101,89	101,89	
	87,49	87,49	87,49	87,49	116,28	116,28	
	58,69	58,69	87,49	87,49	87,49	101,89	
	87,49	87,49	87,49	101,89	116,28	116,28	
	73,09	73,09	73,09	87,49	101,89	101,89	
	87,49	87,49	87,49	101,89	116,28	116,28	
	58,69	58,69	87,49	87,49	87,49	101,89	
	87,49	87,49	87,49	101,89	116,28	116,28	
	73,09	73,09	73,09	87,49	101,89	101,89	
	87,49	87,49	87,49	101,89	116,28	116,28	

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck



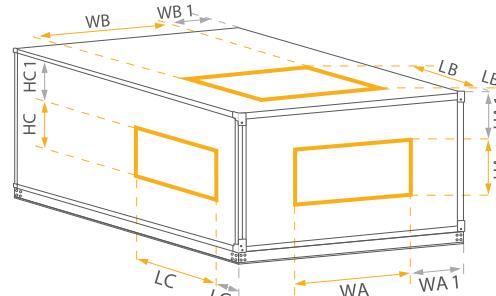
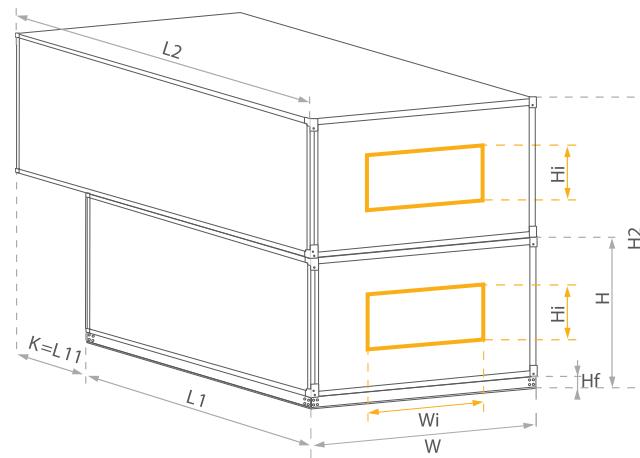
Main configuration DE*		Basic configurations					
		L2	L1	L2	L1	L2	L1
	58,69	73,09	73,09	73,09	73,09	73,09	
	58,69	58,69	73,09	73,09	73,09	73,09	73,09
	58,69	73,09	73,09	73,09	73,09	73,09	
	58,69	58,69	73,09	73,09	73,09	73,09	73,09
	58,69	73,09	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	58,69	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	58,69	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	58,69	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	73,09	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	58,69	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	73,09	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09
	58,69	58,69	73,09	73,09	73,09	73,09	
	73,09	73,09	73,09	73,09	73,09	73,09	73,09

* Include Droplet Eliminator after Cooling Coil

L1- doesn't cover empty space in bottom deck



DIMENSIONS AVS LITE 8-40 - CROSS-FLOW PLATE

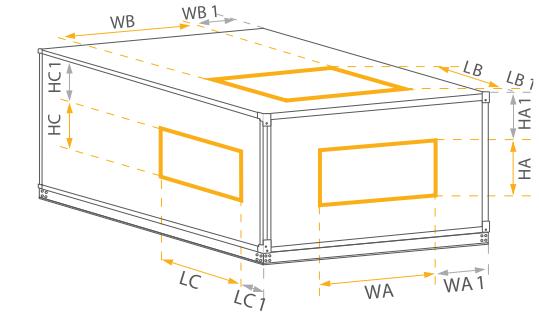
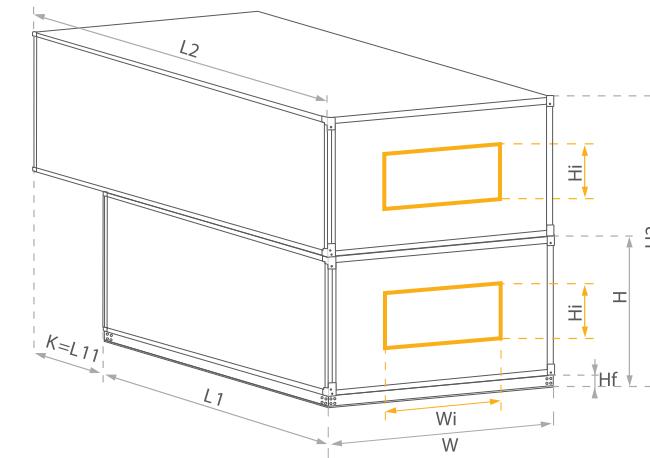


AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)				
UNIT	WA	HA	WA1	HA1
AVS 008	21.65	12.13	3.15	3.15
AVS 012	32.32	12.13	3.15	3.15
AVS 016	37.91	14.17	3.15	3.15
AVS 020	40.47	17.32	3.15	3.15
AVS 030	47.20	22.64	3.15	3.15
AVS 040	52.76	27.36	3.15	3.15

END (FS)				
UNIT	WA	HA	WA1	HA1
AVS 008	17.97	7.97	5.00	5.24
AVS 012	25.97	7.97	6.34	5.24
AVS 016	33.97	7.97	5.16	6.26
AVS 020	25.97	11.97	10.43	5.83
AVS 030	33.97	11.97	9.80	8.50
AVS 040	40.51	17.36	9.29	8.19

DIMENSIONS - AVS LITE 12 - 40 WITH ENERGY WHEEL



AIR INLET / DISCHARGE DIMENSIONS

END FULL (FF)				
UNIT	WA	HA	WA1	HA1
AVS 012	32.32	12.13	3.15	3.15
AVS 016	37.91	14.17	3.15	3.15
AVS 020	40.47	17.32	3.15	3.15
AVS 030	47.20	22.64	3.15	3.15
AVS 040	52.76	27.36	3.15	3.15

END (FS)				
UNIT	WA	HA	WA1	HA1
AVS 012	25.97	7.97	6.34	5.24
AVS 016	33.97	7.97	5.16	6.26
AVS 020	25.97	11.97	10.43	5.83
AVS 030	33.97	11.97	9.80	8.50
AVS 040	40.51	17.36	9.29	8.19

Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 008	10.94	7.94	4.33	3.74
AVS 012	10.94	7.94	4.33	3.74
AVS 016	12.94	7.94	4.33	3.74
AVS 020	15.94	11.94	4.33	3.82
AVS 030	20.94	11.94	4.33	3.98
AVS 040	16.26	14.96	6.89	8.70

Side (BS)				
UNIT	HC	LC	HC1	LC1
AVS 012	10.94	7.94	4.33	3.74
AVS 016	12.94	7.94	4.33	3.74
AVS 020	15.94	11.94	4.33	3.82
AVS 030	20.94	11.94	4.33	3.98
AVS 040	16.26	14.96	6.89	8.70

UNIT CODING

AVS - XX

AVS - type of AHU family
 XXX - size of unit (equal to the rated air flow in cfm*0.001)
 R/L - inspection side (R-right, L-left)
 PHC - symbols of main thermodynamic functions (basic functions)
 Length depends on AHU equipment

UNIT CODING

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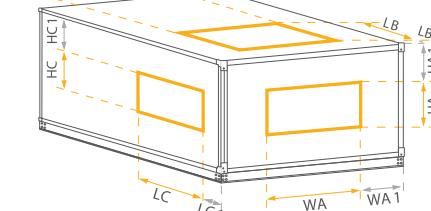
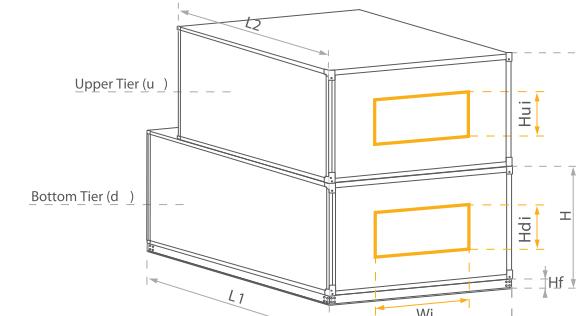


AVS - VERTICAL CONFIGURATIONS

Rated parameters		Recommended range of airflow																		
Size	AVS 008	AVS 012	AVS 016	AVS 020	AVS 030	AVS 040	AVS 008	AVS 012	AVS 016	AVS 020	AVS 030	AVS 040	AVS 008	AVS 012	AVS 016	AVS 020	AVS 030	AVS 040		
15 000	232	427	427	427	480	618	618	618	636	819	819	819	819	806	1037	1037	1037	1185	1524	
10 000	2140	1883	1254	924	3091	2719	1817	1339	4096	3605	2486	1832	5186	4564	3331	2454	7622	6708	4835	
5 000	3.54																	3563	10078	8559
0	2140	1883	1254	924	3091	2719	1817	1339	4096	3605	2486	1832	5186	4564	3331	2454	7622	6708	4835	
Min.	332	427	427	427	480	618	618	618	636	819	819	819	819	806	1037	1037	1037	1185	1524	
Max.	2140	1883	1254	924	3091	2719	1817	1339	4096	3605	2486	1832	5186	4564	3331	2454	7622	6708	4835	
H _{fd}																				
H _{fu}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
H	21.97	21.97	21.97	21.97	21.97	24.02	24.02	24.02	27.17	27.17	32.48	32.48	32.48	37.20	37.20	37.20	37.20	37.20	37.20	
W	27.95	38.62	44.21	46.77	53.50	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	59.06	
W _i	24.02	34.68	40.28	42.83	49.57	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	55.12	
H _{ui}	19.69	19.69	19.69	25.00	25.00	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	
H _{di}	14.49	14.49	16.54	19.69	25.00	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	
H ₂	45.59	45.59	47.64	56.10	61.42	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	70.87	

Basic configurations						
AVS(v)-XXX-R-HV	L2	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-CV	L1	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-HCV	L2	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-HCV	L1	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-MHV	L2	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-MCV	L1	58.65	58.65	58.65	58.65	58.65
AVS(v)-XXX-R-MHCV	L2	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-MHCV	L1	58.65	58.65	58.65	58.65	58.65
AVS(v)-XXX-R-MCHV	L2	29.86	29.86	29.86	29.86	29.86
AVS(v)-XXX-R-MCHV	L1	58.65	58.65	58.65	58.65	58.65

DIMENSIONS - VERTICAL CONFIGURATIONS



END FULL (FF)	WA	HA	WA1	HA1
AVS008	21.63	17.31	3.13	3.13
AVS012	32.31	17.31	3.13	3.13
AVS016	37.94	17.31	3.13	3.13
AVS020	40.50	22.63	3.13	3.13
AVS030	47.19	22.63	3.13	3.13
AVS 040	52.75	27.38	3.13	3.13

END FULL (FF)	WA	HA	WA1	HA1
AVS008	21.31	11.81	3.28	3.28
AVS012	32.00	11.81	3.28	3.28
AVS016	37.62	13.86	3.28	3.28
AVS020	40.19	17.01	3.28	3.28
AVS030	46.87	22.32	3.28	3.28
AVS 040	52.44	27.05	3.28	3.28

END (FS)	WA	HA	WA1	HA1
AVS008	18.00	8.00	4.60	11.12
AVS012	26.00	8.00	5.90	11.12
AVS016	34.00	8.00	4.70	10.62
AVS020	26.00	12.00	10.00	11.94
AVS030	34.00	12.00	9.40	11.94
AVS 040	48.00	12.00	5.10	16.66

TOP (US)	WB	LB	WB1	LB1
AVS008	18.00	8.00	4.60	10.90
AVS012	26.00	8.00	5.90	10.90
AVS016	34.00	8.00	4.70	10.90
AVS020	26.00	12.00	10.00	8.90
AVS030	34.00	12.00	9.40	8.90
AVS 040	48.00	12.00	5.10	8.90

Side (BS)	HC	LC	HC1	LC1
AVS008	8.00	11.00	11.12	9.40
AVS012	8.00	11.00	11.12	9.40
AVS016	8.00	13.00	10.62	8.4



05

Connection and
controls



CONNECTING POINT

The Connecting Point is the power supply and VFD Enclosure, the internal wiring system of the air-handling unit related to power supply and control of fan motors. It is mounted separately for the supply and exhaust fan sections.

It consists of a casing, a frequency converter (VFD), surge protection, emergency (service) switch, strip connector, factory-produced internal power circuits, and control wiring of the fan drive system (motor-inverter). In the case of vertical air-handling units, an external wired outlet is mounted on the casing and connected to the Connecting Point.

The Connecting Point is equipped with aggregate terminals for power supply circuits; inverter circuits are factory-connected to these terminals.



CONSTRUCTION AND WIRING



THE MAIN BENEFITS OF AIR-HANDLING UNITS EQUIPPED WITH THE CONNECTING POINT ARE AS FOLLOWS:

- » the certainty of correctness of internal connections supplying the motor and the VFD
- » reliability of factory-tested connections and air-handling unit operation
- » on-site time-savings on wiring
- » lower costs of the whole installation
- » factory installation of the service switch
- » clear liability of the producer for the connection and configuration of inverters and motors



CONTROLS

VTS uses control algorithms that have been developed with an emphasis on energy savings, while at the same time maintaining the required parameters of the air supplied and ensuring reliability of our units.

For management of our American VENTUS air handling units we recommend our control application based on PLC controller, supporting all advanced control functions and variable ways of external communication including integration with Building Management Systems.

NEW FEATURES

MEASUREMENT AND CONTROL OF THE CONSTANT AIR VOLUME

- » adjustment of the preset constant air volume under changing flow resistance - compensation of changing internal resistance of the AHU (e.g. with varying degrees of air filter dirt, different setpoint of the mixing box, etc.)
- » adjustment of the fan power to the current needs of the installation
- » readiness of the AHU to work with the required performance immediately after installation

CONSTANT PRESSURE CONTROL WITH VARIABLE AIR VOLUME

- » control of constant, preset air pressure at variable volume (efficiency change is carried out through the air distribution system – e.g. VAV controllers)

CO₂

- » automatic modulation of the amount of outside air (keeping the CO₂ concentration below the set value)
- » optimization of consumption of heat and electricity

MAIN ELEMENTS

HMI SERVICE



Function and Application

- » setting and reading of advanced operating parameters of ventilation or supply units
- » management and cancellation of units operational errors is done by full text description
- » management of the controller main calendar

Operation parameters

- » power supply: directly from the UPC3 controller
- » communication port: serial port, RS485 standard
- » communication cable length: max. 3,600ft
- » connection method: 1:1
- » protection class: NEMA 2
- » ambient temperature: -4 +140°F / φ<85%, without condensation

ELECTRIC HEATER CONTROL

- » smooth control system that adjusts power to the current demand

HUMIDITY CONTROL

- » control over air humidifying - both evaporative and steam
- » supports control of the drying process

MIXING BOX CONTROL

- » smooth control of the mixing box, external signal or as in the CO₂ control function, etc.
- » optimization of the ventilation air to save energy

VARIABLE FREQUENCY DRIVES



Function and Application

- » smooth regulation of the AHU air flow by proportional change of the motor-fan unit rotational speed
- » maintaining fixed AHU operating parameters at varying air flow resistance of the ductworks
- » protection of maximal value of motor current
- » controlling of fan start-up with simultaneous protection of maximal value of start-up current
- » integration with external analog and binary signals
- » displaying and modification of fan-set working parameters

Operation parameters

- » analog Inputs:
 - 1 insulated input. Levels: (0 to 10) V or (0 a 20) mA or (4 to 20) mA
 - programmable functions
- » digital Inputs:
 - 4 insulated inputs
 - programmable functions:
 - Active high (PNP)
 - Active low (NPN)
- » analog Output
 - 1 insulated output. Level (0 to 10) V or (0 to 20) mA or (4 to 20) mA
 - programmable functions
- » relay Output
 - 1 relay with NA/NF contact.
 - maximum voltage: 240 VAC
 - maximum current 0.5 A
 - programmable functions
- » communication Interface RS 485
 - insulated RS485
 - modbus-RTU protocol with maximum communication of 38.4kbps
- » enclosure
 - NEMA1/IP20



DUCT TEMPERATURE SENSOR

**Function and Application**

- » measurement of the temperature of supply, exhaust and outside air
- » securing max. and min. temperature of supply air
- » protection against frost on the energy recovery unit via the temperature measurement of air exhausted upstream the energy recovery unit

Operation parameters

- » measurement range: -40°F -158 °F
- » air humidity: 5 - 100 %
- » measuring element: NTC 10k
- » output signal: resistance
- » cables length: max. 300 ft
- » protection class: IP 54

DIFFERENTIAL PRESSURE SWITCH

**Function and Application**

- » monitoring the filter contamination in the Air Handling Unit by measuring the difference of static pressure before and after the filter
- » control of the operation of a direct driven fan unit in case of cooperation with electric heater

Operation parameters

- » measurement: 0.12-1.20 in WG – filters of class MERV 6 - 15
- » rated operating voltage: 250V AC (Imax=3A)
- » output signal: potential-free contact, NO or NC according to the application
- » switching capacity: 1mln of cycles (at temp. of 140 °F)
- » protection class: NEMA 3
- » ambient temperature: -4 °F +140 °F

LOW LIMIT THERMOSTAT SWITCH

**Function and Application**

- » when the air temperature drops below the minimum allowable temperature, signal from the thermostat stops AHU fans, closes external air dampers and adjusts control valve of the heater to the max. flow of heating medium
- » switching into permanent alarm condition if the AHU protection is triggered three times within an hour

Operation parameters

- » measurement range: -0.4 +59 °F
- » default switching threshold setting: 41 °F
- » hysteresis: 1.7 - 12K
- » Rated operating voltage: 30 V DC, 230 VAC
- » output signal: potential-free (switchover contact)
- » protection class: NEMA 3

THREE-WAY VALVE WITH ELECTRIC ACTUATOR

**Function and Application**

- » temperature adjustment of the medium flowing through the hydronic coil
- » quality hydronic heater capacity regulation (system based on additional recirculation pump)
- » quantity hydronic cooler capacity regulation

Operation parameters

- » actuator:
 - adjustment range: 0 -100%
 - supply voltage: 24 V AC/DC
 - input signal: 0-10 V DC
 - rotation angle: 90°
 - protection class: NEMA 2
 - ambient temperature: -22 +122 °F
- » valve:
 - operating characteristics: Equal percentage/proportional Cv: 3 / 4.7 / 7.4 / 19 / 29 / 46 / 68 / 91
 - differential Pressure: 50 psi for typical applications
 - medium temperature: 0°F - 250°F

0-10 V AIR DAMPER ACTUATOR

**Function and Application**

- » mixing ratio control for outdoor and room-exhausted air (economizer): 0-10 V actuator
- » control of bypass air damper opening level for the Plate Cross-Flow – anti-frost protection of the energy recovery system
- » 0-10 V actuator:
 - actuator with spring return
 - economizer fresh air side
- » actuator with no spring return:
 - economizer return air side
 - by-pass damper for cross-plate based energy recovery system

Operation parameters

- » regulation method: smooth 0-100%
- » supply voltage: 24 VAC
- » input signal: 0 -10 VDC
- » rated torque: 90 in-lbs
- » rotation angle 90°
- » full opening time: 0-10 V: 80 - 90s;
- » spring-forced return: 10s
- » max. air damper area: 43 ft²
- » protection class: NEMA 2
- » ambient temperature: -22 +122 °F

HUMIDITY SENSOR

**Function and Application**

- » multiple ranges as measurement windows available
- » innovative self-calibrating algorithm
- » long term stability and accuracy

Operation parameters

- » microcontroller based design
- » supply voltage: 24 V AC/DC
- » 1 analogue output (0-10 VDC / 0-20 mA)
- » modbus RTU (RS485) Communication



CONTROL APPLICATIONS LIST

AP - control system application for air supply-exhaust units with cross-flow heat exchanger

Application code	Functions available in particular applications					
	HW	DX	DX	PRC. BPS	MIX. CMBR	SUMMER
AP 32				✓		
AP 41	✓			✓		
AP 33		✓		✓		
AP 36	✓	✓		✓		
AP 37			✓	✓		
AP 40	✓		✓	✓		
AP 160				✓		✓
AP 161	✓			✓		✓
AP 164		✓		✓		✓
AP 165	✓	✓		✓		✓
AP 168			✓	✓		✓
AP 169	✓		✓	✓		✓

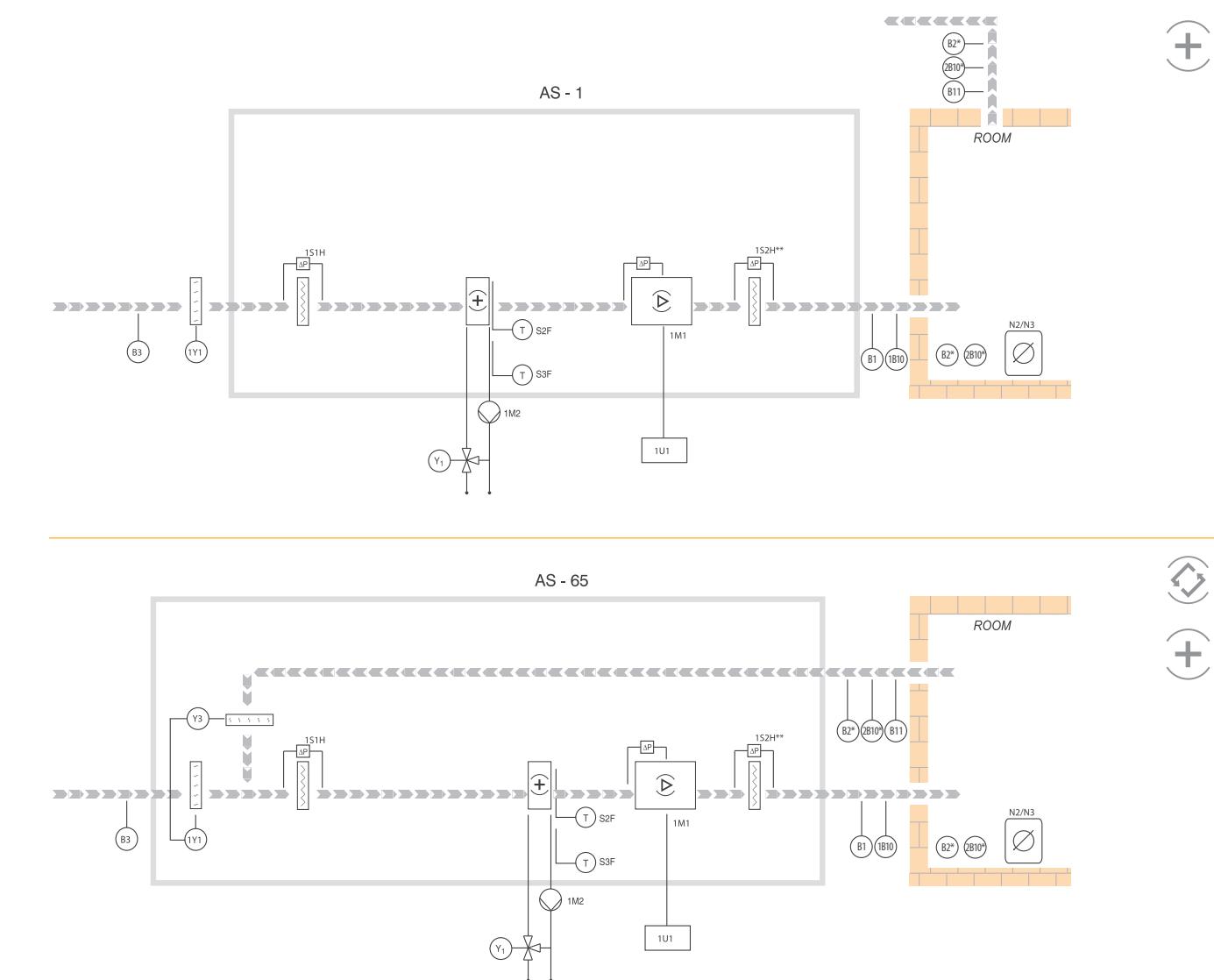
AR - control system application for air supply-exhaust units with thermal wheel

Application code	Functions available in particular applications					
	HW	DX	DX	PRC. BPS	MIX. CMBR	SUMMER
AP 0						
AP 1	✓					
AP 4		✓				
AP 5	✓	✓				
AP 8			✓			
AP 9	✓		✓			
AP 128						✓
AP 129	✓					✓
AP 132		✓				✓
AP 133	✓	✓				✓
AP 136			✓			✓
AP 137	✓		✓			✓

AS - control system application for air supply units

Application code	Functions available in particular applications					
	HW	DX	DX	PRC. BPS	MIX. CMBR	SUMMER
AP 1	✓					
AP 4		✓				
AP 5	✓	✓				
AP 8			✓			
AP 9	✓		✓			
AP 65	✓				✓	
AP 68		✓			✓	
AP 69	✓	✓			✓	
AP 72			✓		✓	
AP 73	✓		✓		✓	
AP 193	✓				✓	✓
AP 196		✓			✓	✓
AP 197	✓	✓			✓	✓
AP 200			✓		✓	✓
AP 201	✓		✓		✓	✓

SUPPLY AHUS



CONTROL

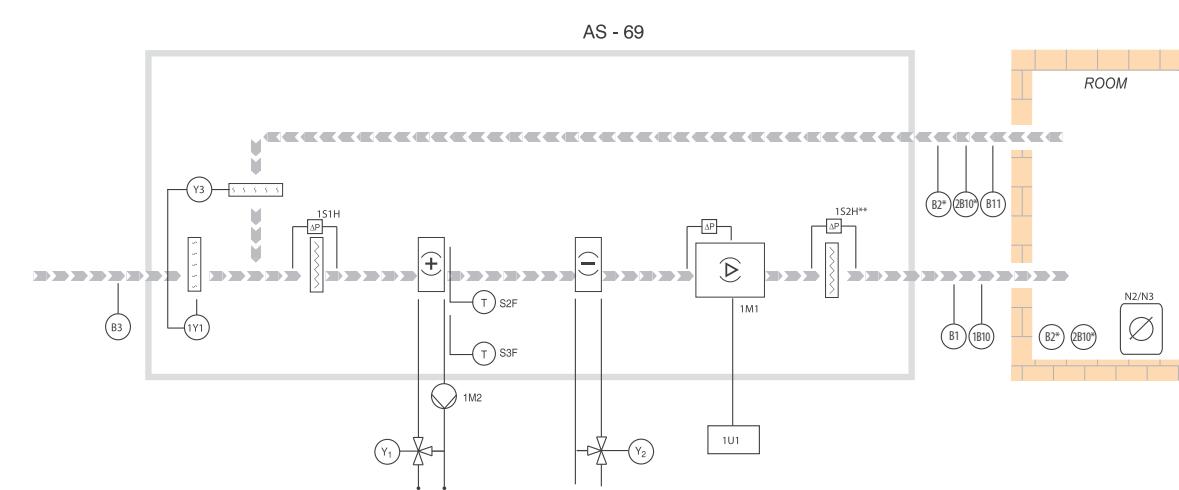
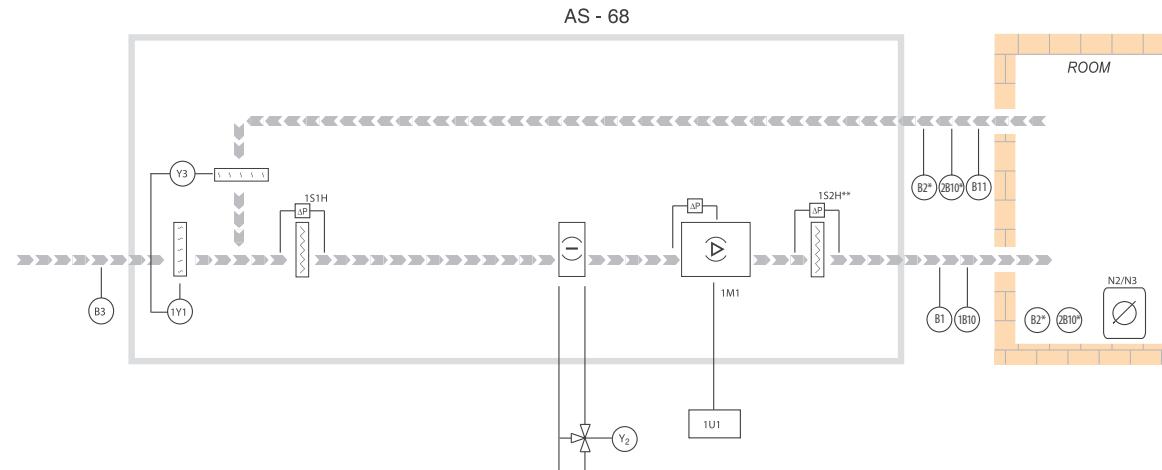
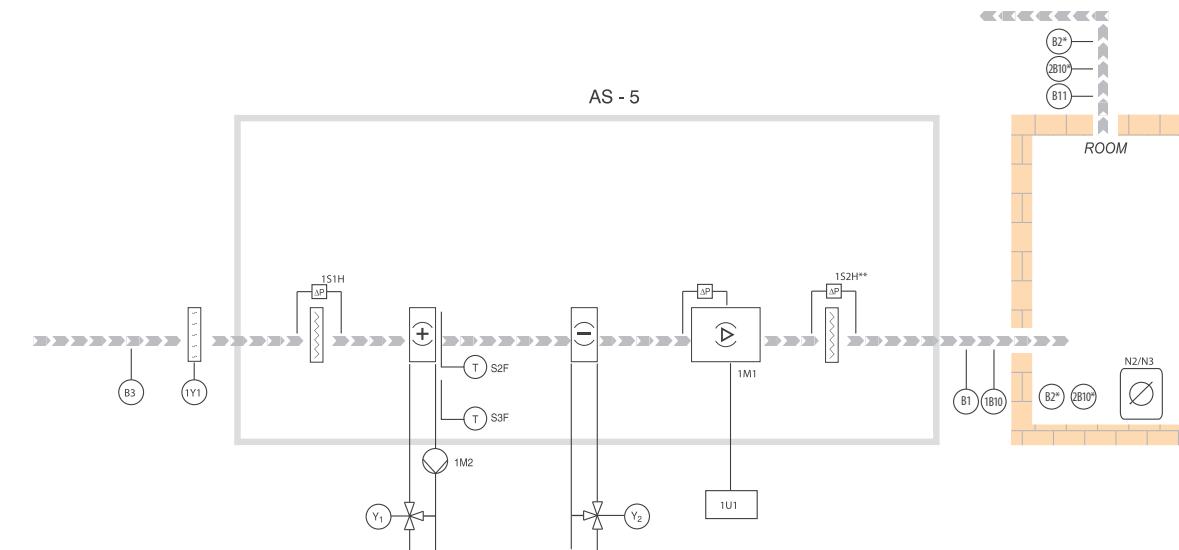
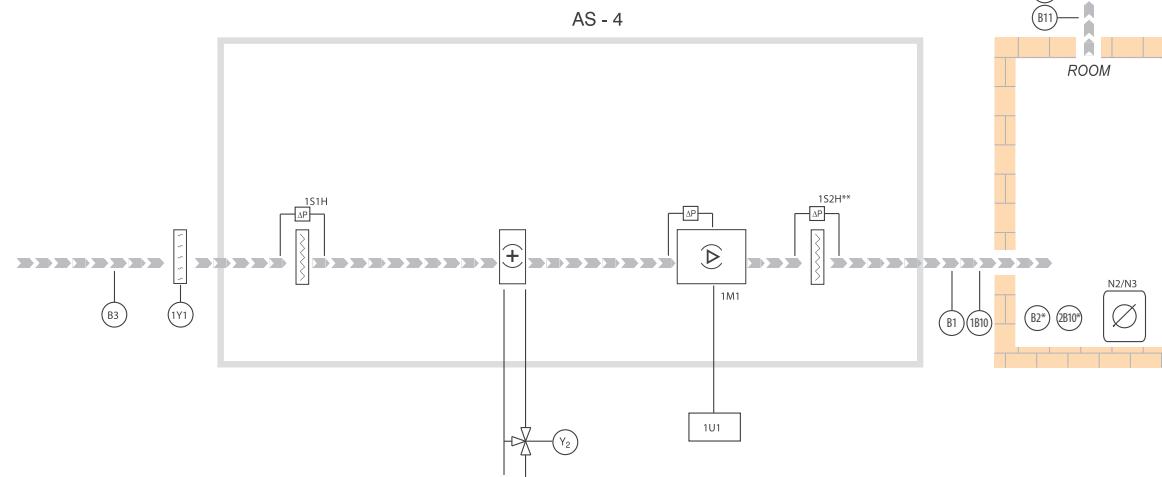
- » control of room temperature, or supply or exhaust air temperature
 - » control of the energy recovery level – first stage of heating/cooling
 - » air flow control
 - » operation according to calendar – temperature, efficiency, operation mode (OPERATION, STAND-BY, STOP)
 - » STAND-BY – maintaining the minimum, set indoor temperature.
- * Initial heating of external air

INFORMATION

- » information on outdoor, supply, exhaust and indoor air temperatures
- » filter contamination info
- » alarm status info
- » analog and digital input and output status info

PROTECTION

- » limiting the allowed supply air temperature
- » fan unit protection – the function is active:
 - if an electric heater is present
- » overload protection of a drive unit
- » anti-frost protection of a water heater
- » protection against overheating of an electric heater
- » optional protection against minimal and maximal temperature of medium returning from the water heater with use of Strap-on temperature sensor, standard NTC 10K
- » the control application layouts have been prepared on the basis of water exchangers
- » the quantity of applied pressure switches for filters depends on the filter configuration



CONTROL

- » control of room temperature, optionally supply or exhaust air temperature
 - » control of the energy recovery level – first stage of heating/cooling
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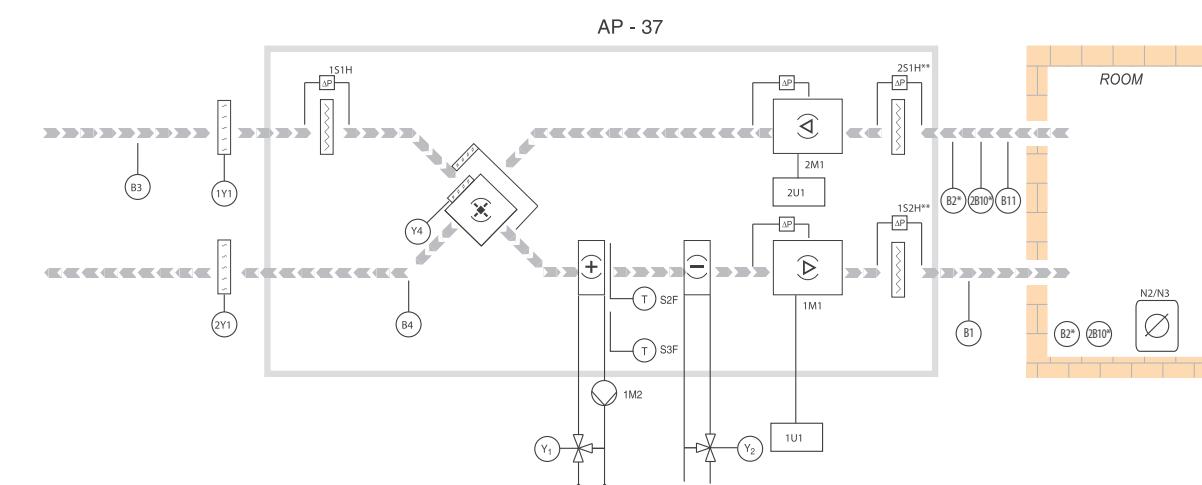
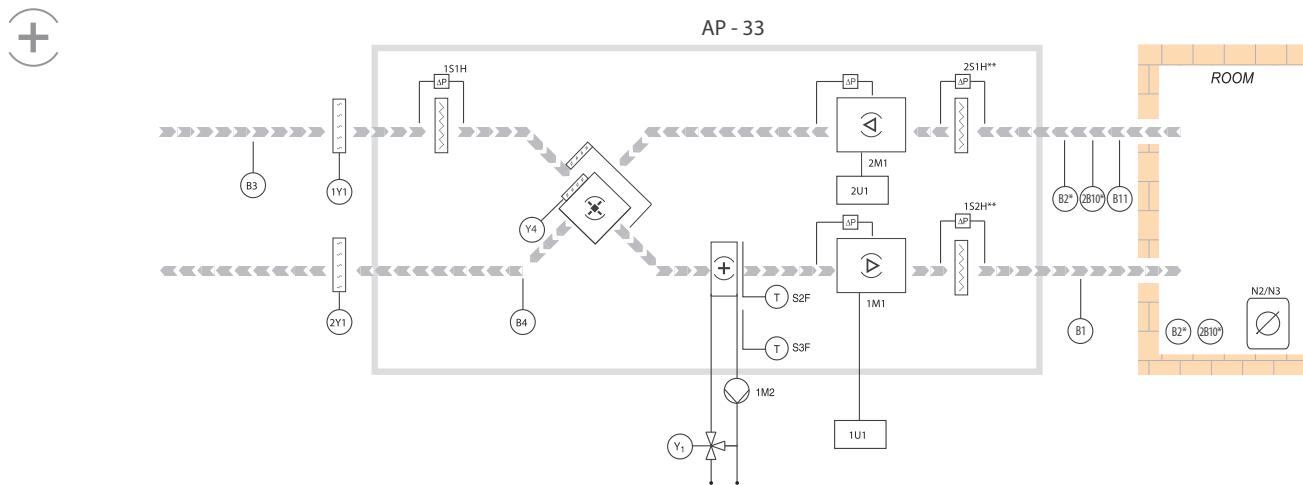
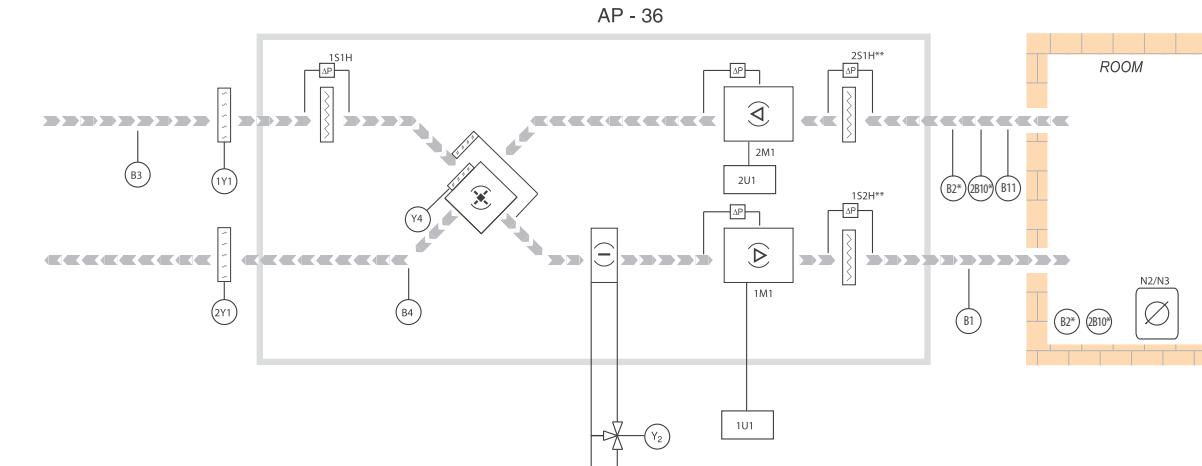
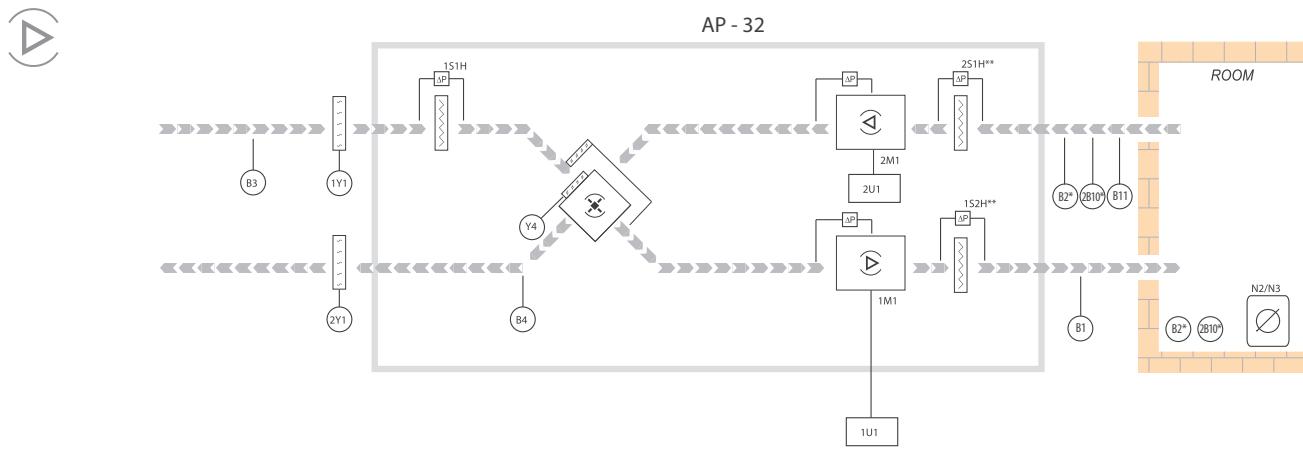
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- » optional Strap-on temperature sensor is not a part of VTS offer

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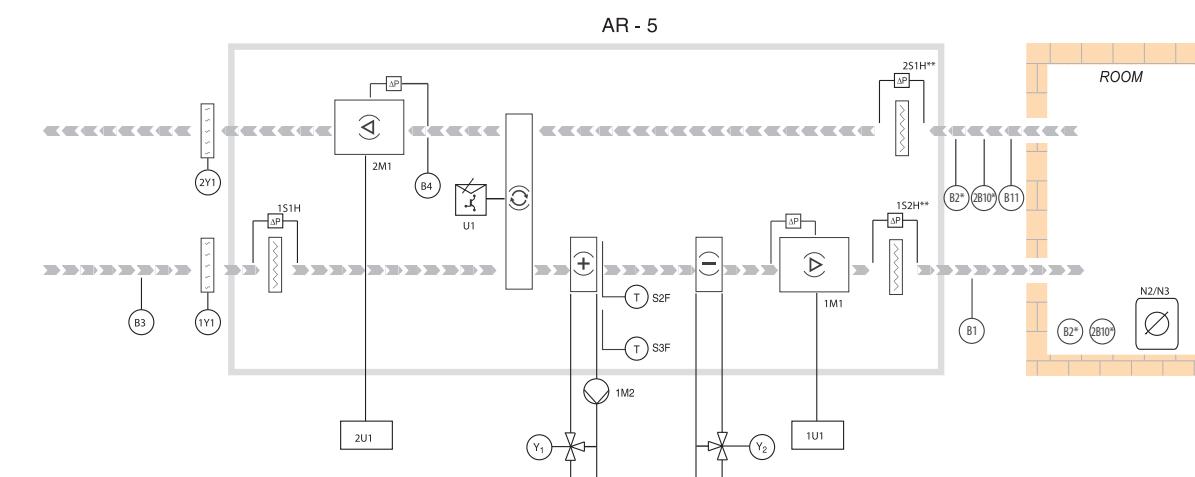
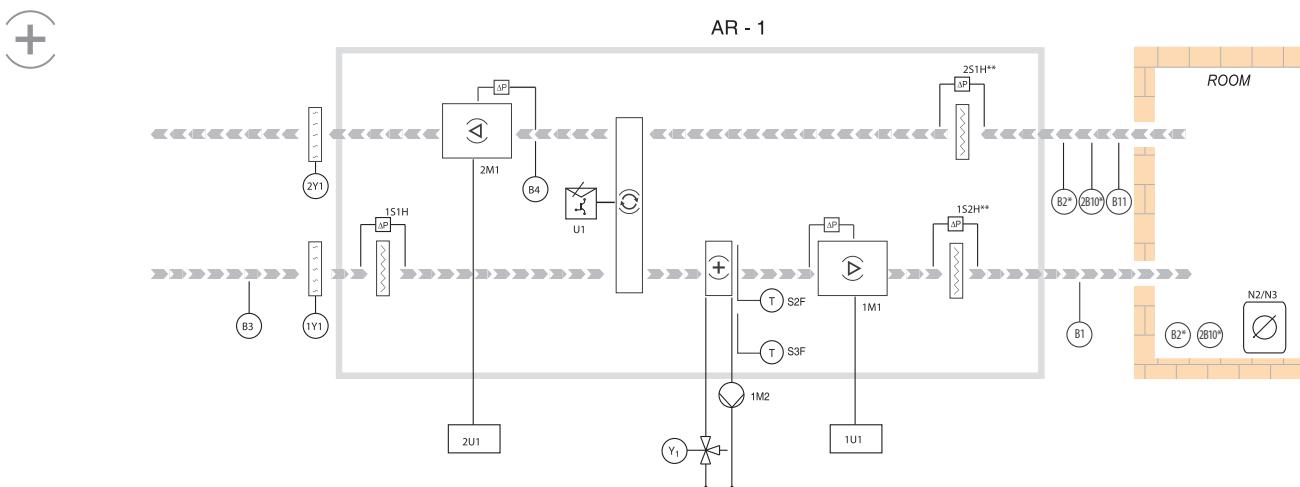
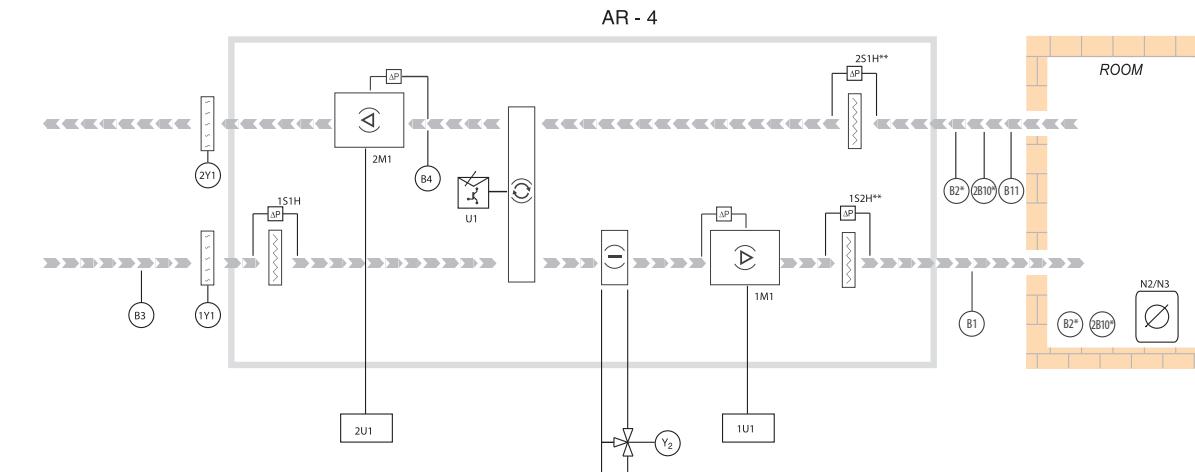
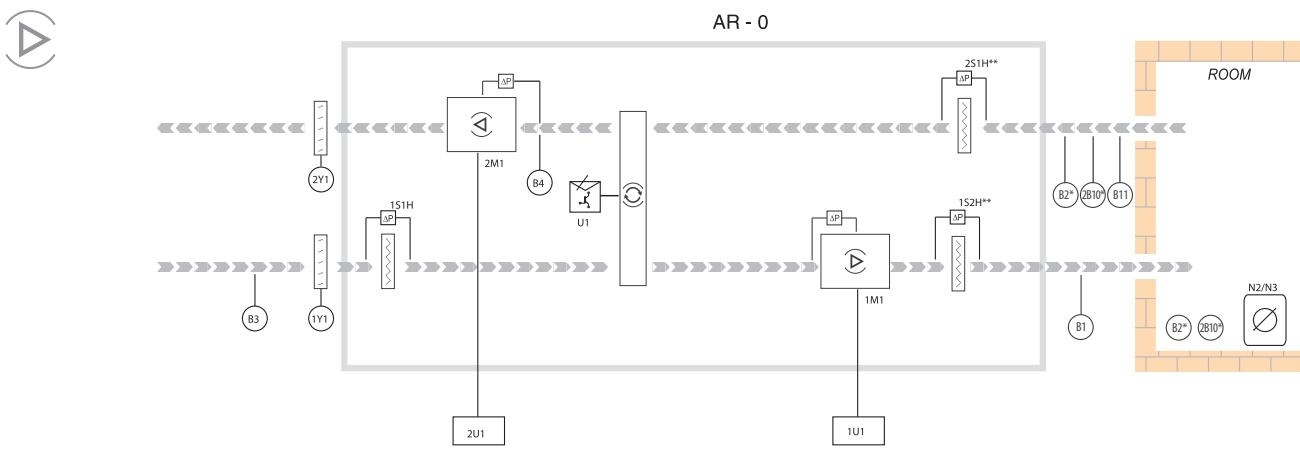
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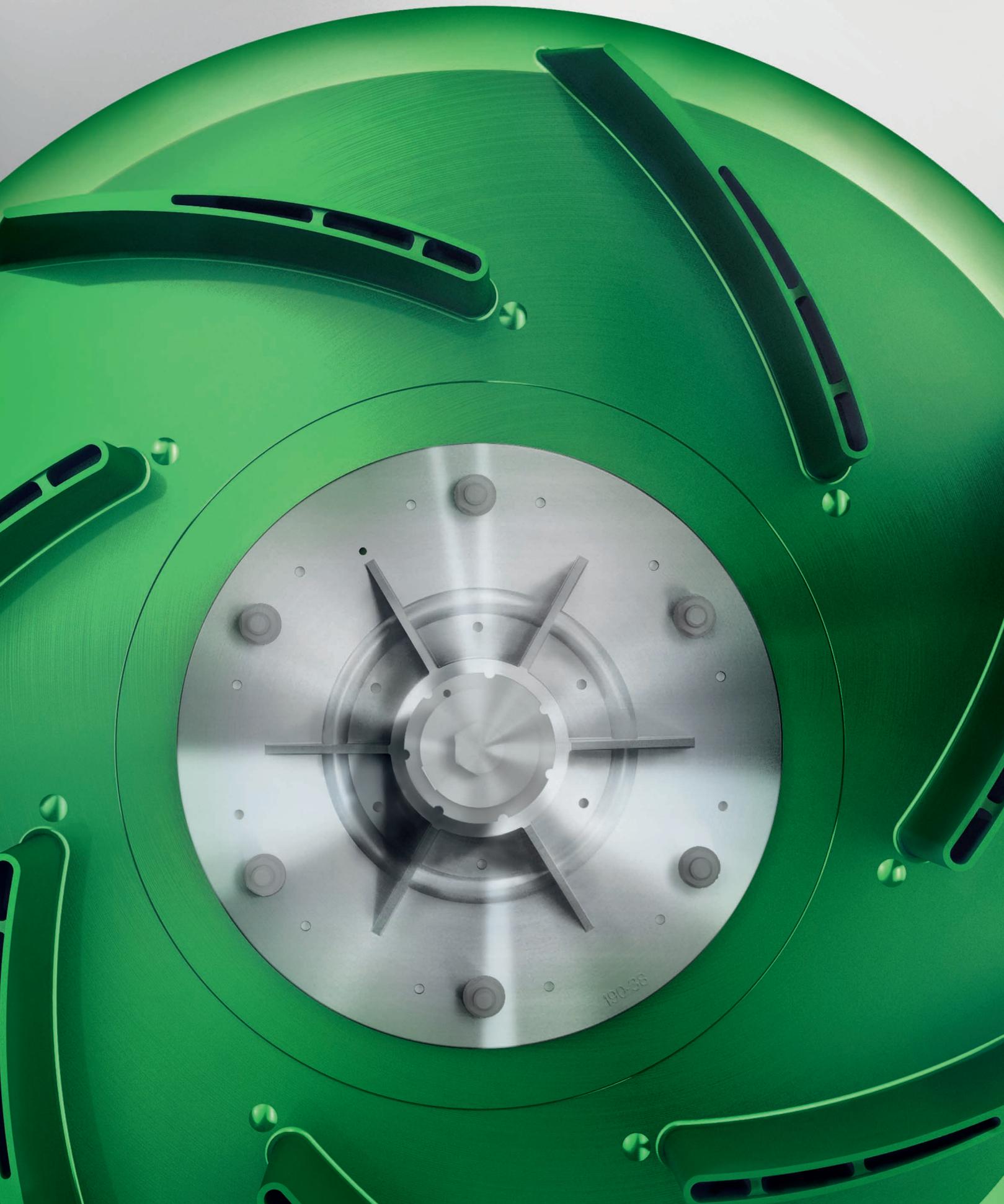
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 06
Functions



| Direct drive plenum fan

Energy efficient fans are based on single inlet, air foil backward curved radial impellers with 7 blades made of a composite material to minimize the impeller weight and provide the best operating performance and provide the best dynamically balanced operating performance.



PLENUM FAN MOTOR

Fans are driven by TEFC (Totally Enclosed Fan Cooled) foot mounted motors with double shielded bearings and range from 1 HP to 15 HP. Nominal frequency: 60 Hz. Insulation class: F. Efficiency class: Premium. Bearings live: $L_{10} = 20,000$ h, $L_{50} = 100,000$ h. Shaft grounding rings available (on request).

Fan sets used in submitted air handling units are available in a wide range of voltages: 115V/1PH/60Hz, 208V/ 1PH/60Hz, 230V/1PH/60Hz, 208V/3PH/60Hz, 230V/3PH/60Hz, 460V/3PH/60Hz, 575V/3PH.

AMCA



VTS Group certifies that the VS fan series shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. The certified ratings for the VS Fans are shown in this catalogue.

| Air-to-air energy recovery systems

AIR-TO-AIR ENERGY WHEEL

The total energy wheel is constructed with 7.9 inch Aluminum coated with non-toxic, non-corrosive Silica gel in a way that allows it to exchange sensible and latent heat between two airstreams, generally outside air and exhaust air. In the cooling mode, the wheel pre-treats the outside air by transferring sensible and latent heat to the exhaust stream. During the heating mode, the wheel pre-treats the outside air with sensible and latent heat from the exhaust air. This energy recovery is done without total separation of the supply and exhaust air flows with air leakages of 2% to 5%.



CROSS-FLOW PLATE

Cross-Flow plate is an indirect energy recovery device, that transfers heat from the exhaust air stream to the entering air stream which will be supplied to the space. Heat recovery at very high separation of the stream of supply and exhaust air (99.9%). Application in block supply-exhaust AHUs.



FLAT PREFILTER

All units have a two or four inches flat prefiler or a combination thereof

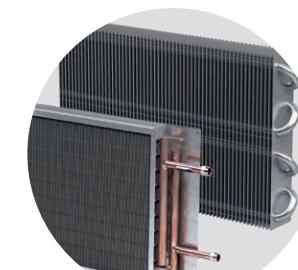
- MERV8 two-inch filter.
- MERV13 four-inch filter.



HEATERS

Heaters are available in the following versions:

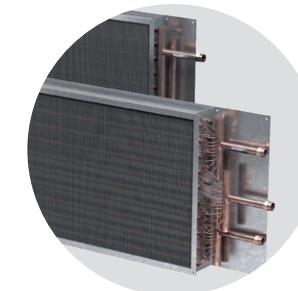
- hot water heating coils,
- resistant electric heaters,
- DX heating coils.



COOLING COILS

The cooling coils are available either as a hydronic or a DX cooling coils.

The variety of coil types allows a user to select a coil that is optimized for pressure drop and capacity requirements. The cooling coils are mounted over the drainpan to ensure water condensate flowing.

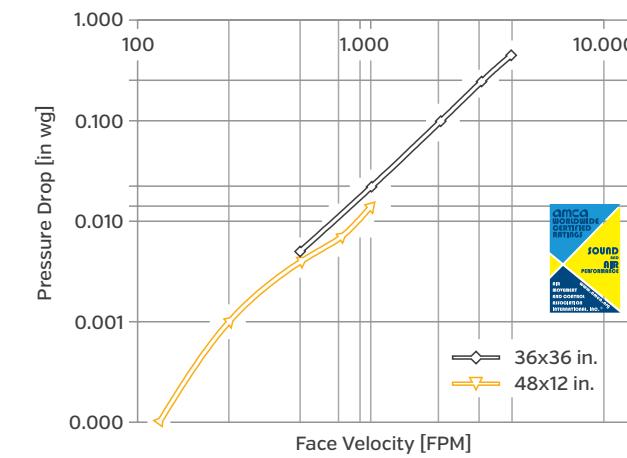
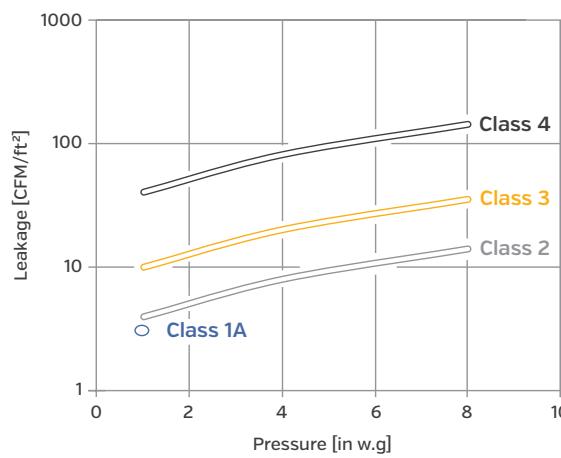


AIR DAMPERS

VTS Group certifies that the dampers shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA International Certified Ratings Seal applies to Air Performance and Air Leakage. The VTS air dampers are in 3rd class for 1, 4 and 8 in. w.g.

Leakage testing conducted in accordance with AMCA Standard 500-D-07 figure 5.4 Alternate. Data are based on a torque of 10 in-lb/ft² applied to close and seal the damper during the test. Air leakage is based on operation between 32 to 120 F. All data corrected to represent standard air density 0.075 lb/ft³.

Pressure drop testing conducted in accordance with AMCA Standard 500-D-07 figure 5.3. All data corrected to represent standard air density 0.075 lb/ft³.

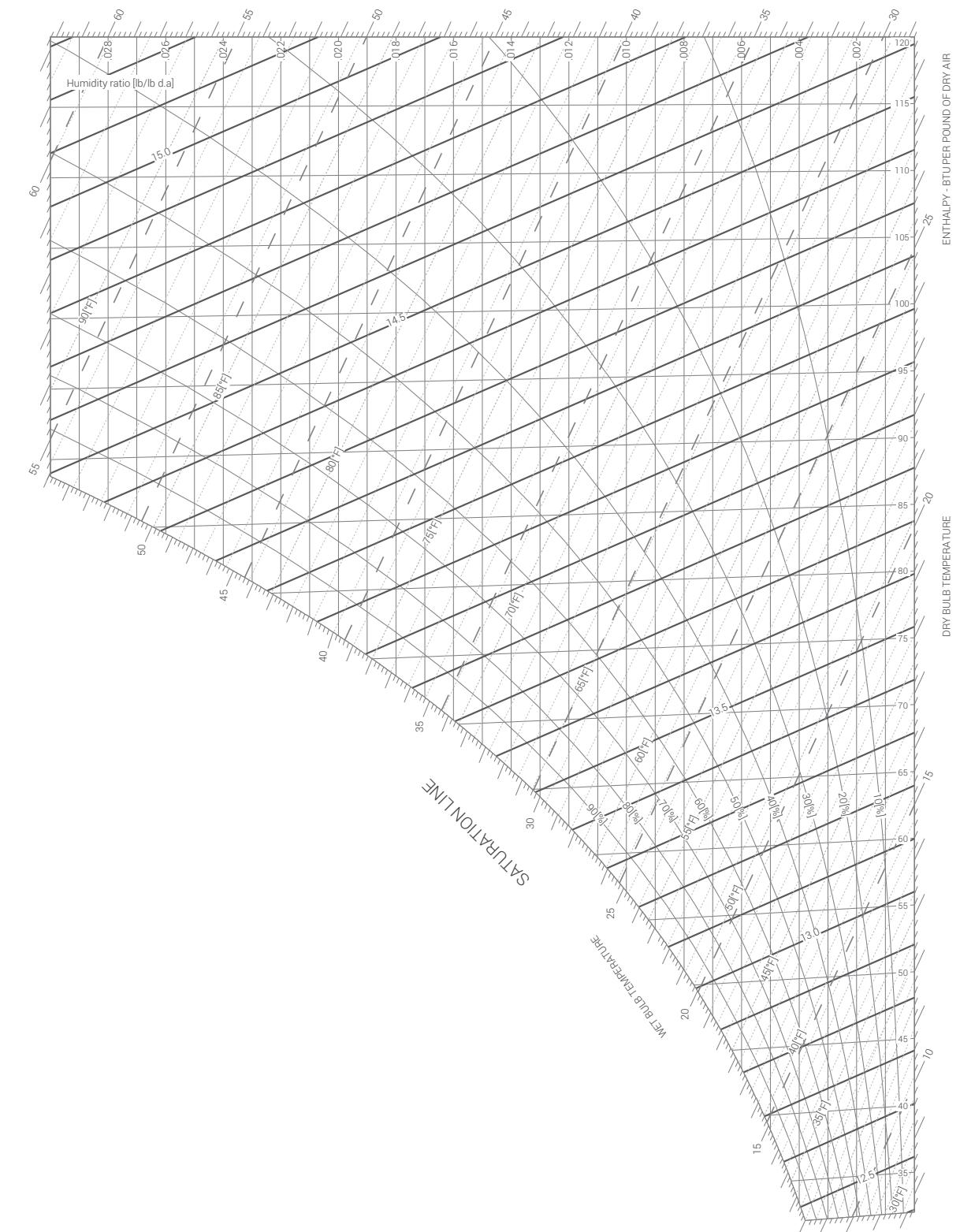


PSYCHROMETRIC CHART

Normal Temperature

Barometric Pressure: 29.921 Inches of Mercury

Sea Level



Certified fan performance data for fans of VS 225-VS 400 sizes



Unit Size	Q [cfm]	Ps [in. wg]	BHP [hp]
VS-225 3450 RPM	1,047	0.004	0.251
	944	0.661	0.277
	841	1.290	0.328
	737	0.195	0.363
	633	2.446	0.374
	522	2.868	0.381
	422	3.056	0.353
	314	3.162	0.300
	158	3.220	0.234
	0	3.423	0.158
VS-250 3450 RPM	1,447	0.015	0.421
	1,300	1.087	0.525
	1,162	2.000	0.645
	1,013	2.892	0.721
	868	3.536	0.747
	720	3.883	0.708
	594	4.065	0.646
	426	4.200	0.537
	283	4.258	0.442
	0	4.619	0.250
VS-315 3450 RPM	3,124	0.011	1.850
	2,824	1.280	2.027
	2,514	2.788	2.244
	2,196	4.281	2.490
	1,887	5.376	2.563
	1,558	6.086	2.485
	1,247	6.391	2.306
	930	6.566	2.059
	529	6.714	1.714
	0	7.275	0.945
VS-355 1750 RPM	2,344	0.001	0.395
	2,119	0.469	0.466
	1,882	0.978	0.516
	1,636	1.462	0.565
	1,396	1.834	0.585
	1,167	2.021	0.561
	937	2.093	0.524
	689	2.141	0.454
	457	2.186	0.382
	0	2.300	0.226
VS-400 1750 RPM	3,212	0.003	0.739
	2,898	0.601	0.838
	2,577	1.269	0.956
	2,245	1.815	1.034
	1,926	2.310	1.079
	1,620	2.585	1.051
	1,281	2.709	0.959
	957	2.770	0.844
	512	2.794	0.690
	0	2.921	0.432

NOTE 1: Performance certified is for installation Type A, Free Inlet, Free Outlet. Power rating (BHP) does not include transmission losses.
Performance ratings do not include the effects of appurtenances (accessories).

NOTE 2: Efficiency ratings are fan static and exclude bearing and/or Power Transmission Losses.

NOTE 3: VTS America Inc. certifies that the Model VS shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

Certified fan performance data for fans of VS 450-VS 630 sizes



Unit Size	Q [cfm]	Ps [in. wg]	BHP [hp]
VS-450 1750 RPM	4,673	0.002	1.206
	4,211	0.526	1.323
	3,740	1.377	1.544
	3,277	2.228	1.766
	2,815	2.909	1.871
	2,334	3.284	1.804
	1,874	3.393	1.662
	1,394	3.460	1.414
	651	3.526	1.056
	0	3.707	0.654
VS-500 1750 RPM	6386	0,000	1,756
	6157	0,606	1,957
	5613	1,638	2,480
	5070	2,449	2,882
	4527	3,071	3,083
	3984	3,525	3,097
	3441	3,842	2,962
	2897	4,047	2,708
	2354	4,163	2,386
	0	4,464	1,032
VS-560 1750 RPM	9064	0,000	2,828
	8240	1,566	4,062
	7441	2,738	4,906
	6643	3,633	5,416
	5844	4,296	5,550
	5045	4,757	5,362
	4247	5,050	4,946
	3448	5,223	4,383
	2649	5,303	3,740
	0	5,420	1,072
VS-630 1750 RPM	13061	0,000	4,651
	11772	1,778	7,038
	10594	3,352	8,646
	9417	4,549	9,611
	8240	5,412	9,853
	7063	6,010	9,504
	5886	6,391	8,713
	4709	6,596	7,641
	3649	6,684	6,568
	0	6,877	2,560

NOTE 1: Performance certified is for installation Type A, Free Inlet, Free Outlet. Power rating (BHP) does not include transmission losses.
Performance ratings do not include the effects of appurtenances (accessories).

NOTE 2: Efficiency ratings are fan static and exclude bearing and/or Power Transmission Losses.

NOTE 3: VTS America Inc. certifies that the Model VS shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



Certified sound pressure level for fans
of VS 225 - VS 400 sizes

Unit Size	Ps [in. wg]	Q [cfm]	Lw Loudness	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Lw[A] dB[A]	Loudness Sones			
VS-225 3450 RPM	0.000	1044	dB	95.9	75.3	76.3	81.2	79.2	80.6	80.2	82.0	88	32			
			Sones	9.1	3.2	4.5	7.3	7.7	9.9	11.6	15.8					
	1.783	778	dB	92.1	75.2	78.5	82.9	79.6	76.2	68.9	70.4	84	21			
			Sones	7.0	3.1	5.2	8.0	7.8	7.7	6.0	7.8					
	3.077	507	dB	89.8	76.8	82.0	82.5	75.3	72.3	64.8	64.0	82	19			
			Sones	5.9	3.6	6.4	7.8	6.1	6.1	4.7	5.3					
	3.377	287	dB	91.5	82.2	83.8	81.2	76.9	74.6	67.0	63.6	83	20			
			Sones	6.7	5.3	7.1	7.3	6.8	7.0	5.3	5.2					
	VS-250 3450 RPM	0.013	754	dB	66.0	68.0	68.0	68.0	67.0	67.0	69.0	61.0	74	12		
				Sones	1.0	1.9	2.7	3.2	3.8	4.5	6.0	4.3				
		0.640	580	dB	64.0	69.0	67.0	67.0	66.0	63.0	64.0	59.0	71	10		
				Sones	0.8	2.0	2.7	3.1	3.5	3.5	4.5	4.0				
		1.047	410	dB	68.0	69.0	65.0	65.0	65.0	61.0	58.0	58.0	69	9		
				Sones	1.2	2.0	2.4	2.7	3.2	3.2	3.1	3.6				
		1.111	309	dB	76.0	73.0	66.0	65.0	65.0	61.0	56.0	54.0	69	9		
				Sones	2.2	2.7	2.5	2.8	3.2	3.1	2.8	2.9				
		VS-315 3450 RPM	0.007	1625	dB	68.0	69.0	73.0	73.0	74.0	76.0	76.0	66.0	82	18	
					Sones	1.2	2.1	3.7	4.5	5.8	7.7	9.1	5.9			
			0.951	1220	dB	67.0	70.0	73.0	72.0	71.0	70.0	69.0	65.0	77	14	
					Sones	1.0	2.2	3.7	4.2	4.8	5.4	6.1	5.5			
			1.553	880	dB	70.0	72.0	72.0	71.0	69.0	67.0	62.0	64.0	74	12	
					Sones	1.4	2.5	3.5	3.9	4.1	4.5	3.9	5.2			
			1.767	782	dB	80.0	80.0	75.0	72.0	69.0	65.0	60.0	59.0	75	13	
					Sones	2.9	4.7	4.1	4.3	4.3	4.0	3.5	4.1			
			VS-355 1750 RPM	0.014	2400	dB	72.0	73.0	78.0	77.0	77.0	78.0	85.0	71.0	88	28
						Sones	1.6	2.8	5.1	5.6	6.8	8.5	16.3	8.2		
			1.177	1420	dB	69.0	73.0	76.0	75.0	76.0	71.0	74.0	60.0	80	17	
					Sones	1.2	2.7	4.5	4.9	6.4	5.5	7.8	4.2			
			2.043	1200	dB	71.0	73.0	74.0	73.0	75.0	67.0	63.0	58.0	78	13	
					Sones	1.5	2.7	3.8	4.5	6.0	4.6	4.3	3.6			
			2.164	600	dB	78.0	79.0	75.0	74.0	75.0	67.0	63.0	57.0	78	14	
					Sones	2.5	4.2	4.3	4.6	6.0	4.4	4.1	3.6			
			VS-400 1750 RPM	0.001	3296	dB	78.0	78.0	81.0	82.0	80.0	79.0	82.0	79.0	88	28
						Sones	2.5	3.8	6.0	7.5	8.0	8.9	13.4	13.4		
			1.303	2636	dB	76.0	79.0	81.0	81.0	79.0	74.0	76.0	67.0	84	21	
					Sones	2.2	4.1	5.9	7.3	7.6	6.8	9.3	6.4			
			2.674	1648	dB	78.0	78.0	79.0	81.0	78.0	66.0	64.0	61.0	82	17	
					Sones	2.4	4.0	5.5	7.2	7.0	4.2	4.5	4.3			
			2.843	988	dB	87.0	87.0	82.0	81.0	78.0	67.0	64.0	61.0	83	19	
					Sones	4.8	7.2	6.3	7.3	7.3	4.6	4.3	4.3			

NOTE 1: The sound power level ratings shown are in decibels, referred to 10-12 watts, calculated per AMCA Standard 301. Values shown are for outlet LwA sound power levels and outlet hemispherical sone levels for installation type A:Free Inlet, Free Outlet, calculated per AMCA Standard 301. The AMCA Certified Ratings Seal applies to Air performance and sound.

NOTE 2: VTS America Inc. certifies that the Model VS shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.*



Certified sound pressure level for fans
of VS 450 - VS 630 sizes

Unit Size	Ps [in. wg]	Q [cfm]	Lw Loudness	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Lw[A] dB[A]	Loudness Sones
VS-450 1750 RPM	0.001	4673	dB	82.0	82.0	88.0	86.0	95.0	86.0	81.0	88.0		



SYMBOLS AND LABELS

Basic symbols

PROCESS			FUNCTION
Symbol	Graphic	Name	Options of functions
F		AIR FILTRATION	FILTER
V		VENTILATION	FAN
C		AIR COOLING	HYDRONIC COOLING COIL DX COOLING COIL RUN-AROUND COIL
H		AIR HEATING	HYDRONIC HEATING COIL ELECTRIC HEATER DX HEATING STEAM HEATER RUN-AROUND COIL
M		MIXING BOX	MIXING BOX
P		ENERGY RECOVERY	CROSS FLOW PLATE
R		ENERGY RECOVERY	ENERGY WHEEL

Auxiliary symbols

Symbol	Graphic	Name
FC		FLEXIBLE CONNECTION
AD		DAMPER
FLG		FLANGES
E		EMPTY SECTION



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The features mentioned are subject to continuous upgrade and can change any time.
VTS assuring continuous improvement for product and data and reserves the right to change design and specifications without notice.