ventus VVS/COMPACT

VOLCANO
WING
WING PRO

2021

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LOGISTIC
CENTER
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CLIMA GULF FZCO
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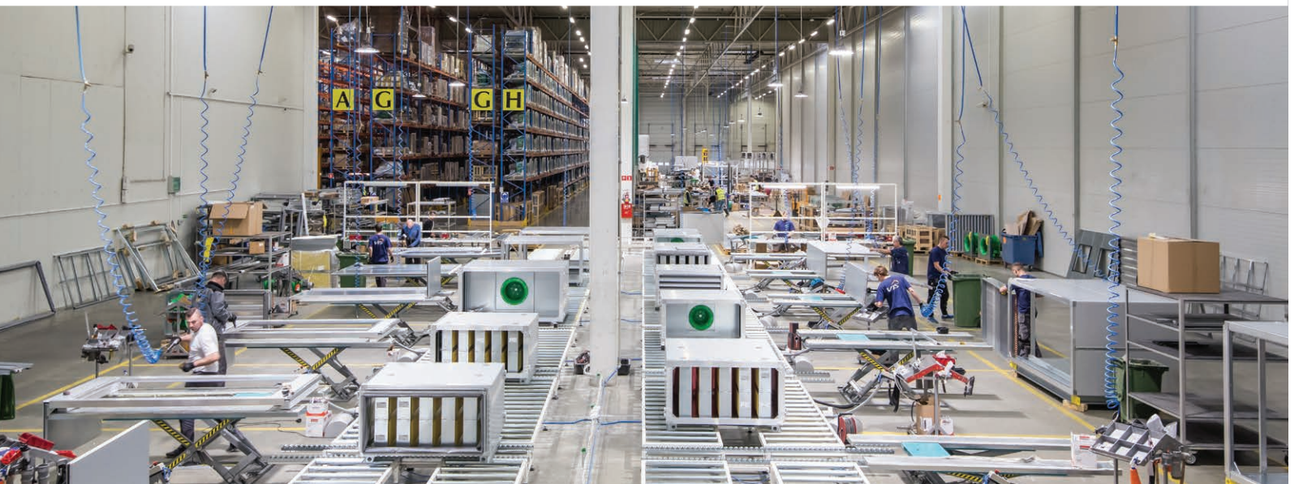
VTS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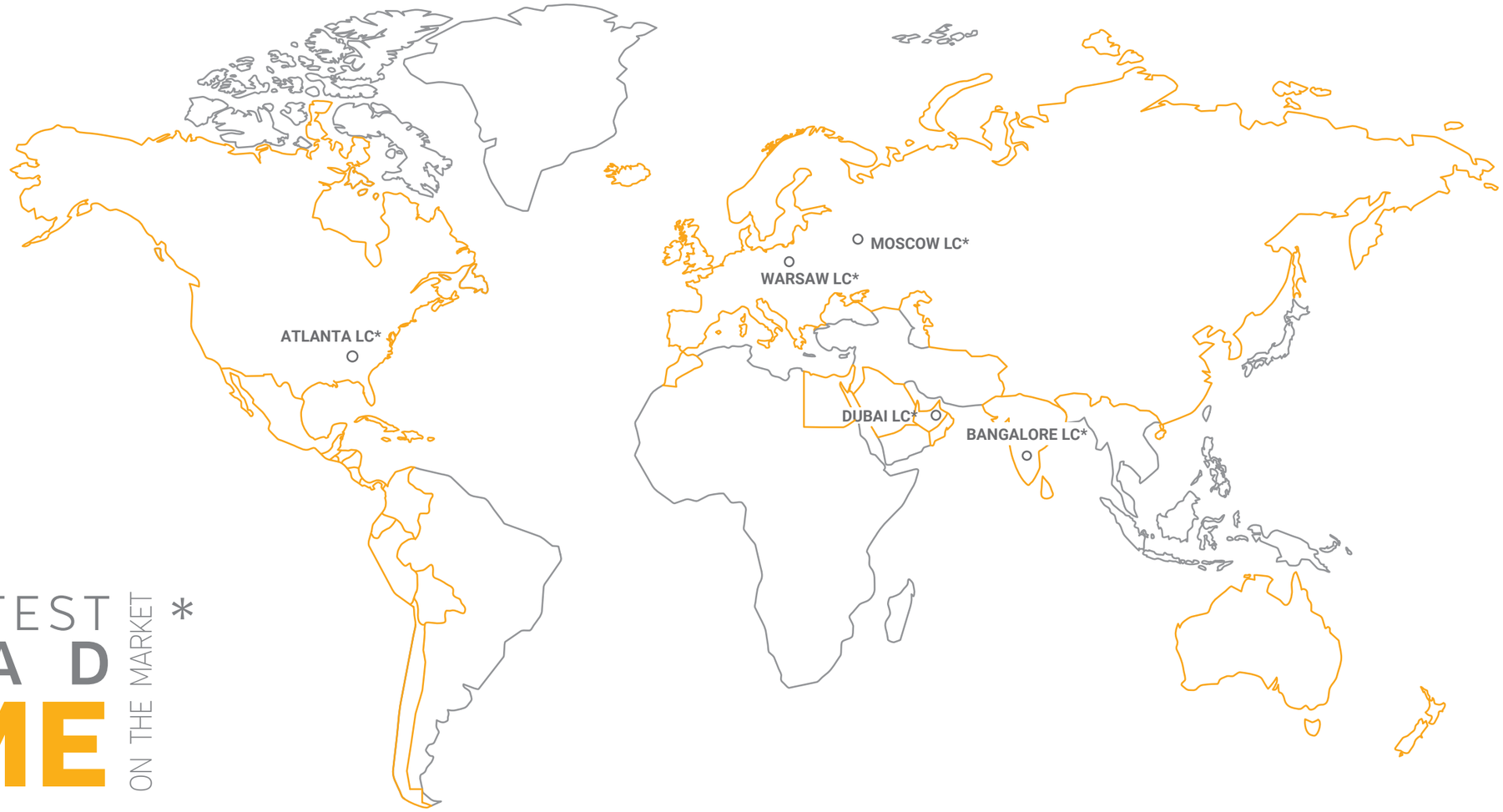
01
VTS Group

VTS Group

VTS GROUP – is a manufacturer of technically advanced HVAC equipment, combining innovative technologies in the field of research&development, production and logistics.

OUR MISSION

AHU#1



SHORTEST
LEAD
TIME *
ON THE MARKET

* Logistics center

3 PILLARS OF SUCCESS

Constantly highest quality of products. Best prices on the market. Shortest lead time. These 3 pillars of marketing policy allows VTS to be always one step head, wherever in the world.

Following the best practices of the branch, VTS has created a network of 5 efficiently running production and logistic centers (**Atlanta, Dubai, Moscow, Warsaw, Bangalore**), enable to ensure the shortest lead time on the market, wherever in the world.

SHORTEST LEAD TIME ON THE MARKET

5 CENTERS LOGISTIC

Large-scale production of repetative units allow VTS to offer them at **the most competitive price, simultaneously keeping their highest possible quality**

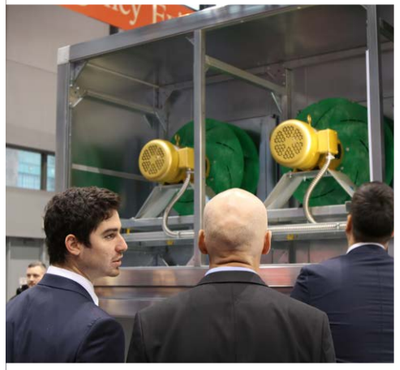
$ COMPETITIVE PRICE

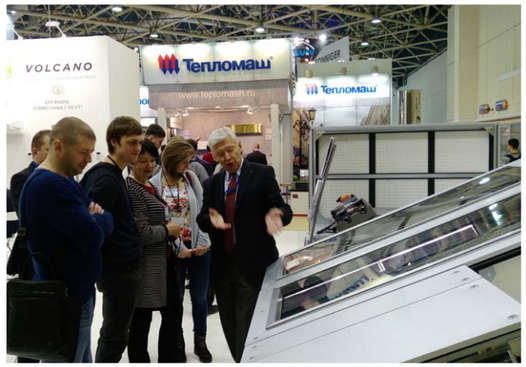
150 000 UNITS SOLD ANNUALLY

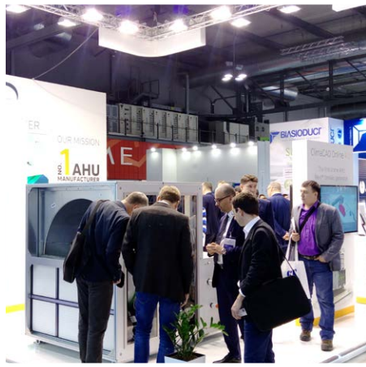
Multistage quality control system allows VTS to offer **2 years warranty, extendable even up to 5.**

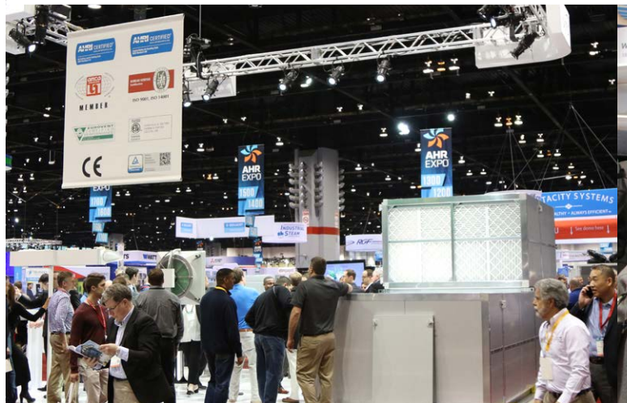
BEST QUALITY

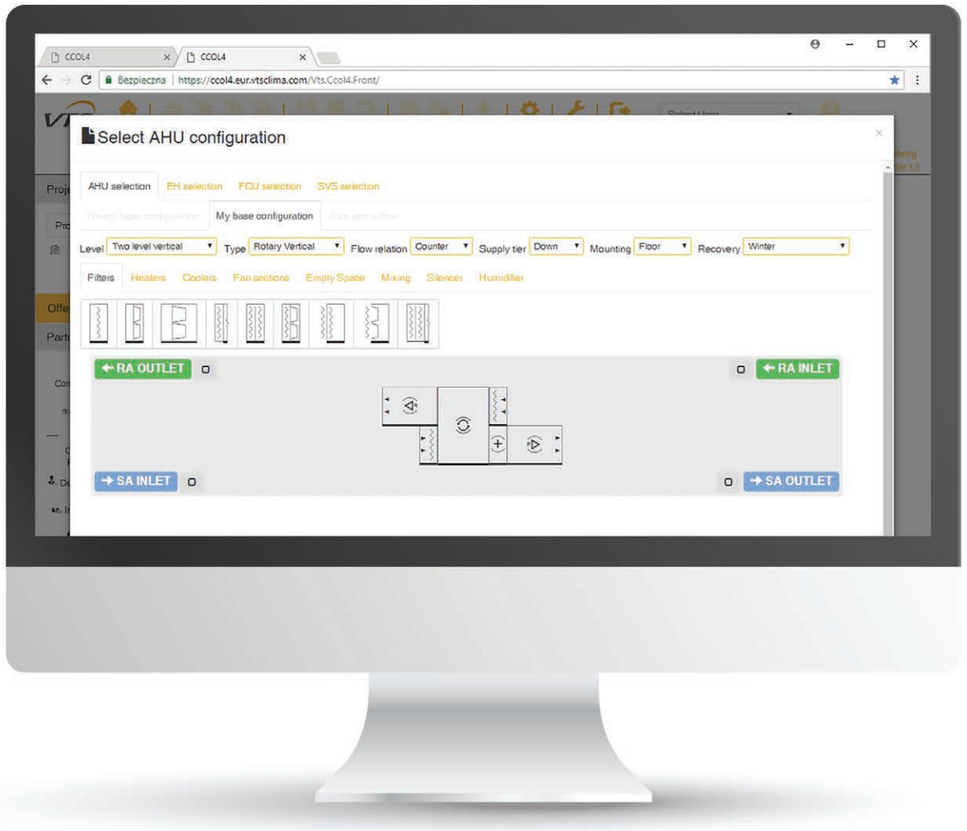
UP TO 5 YEARS WARRANTY FOR EACH UNIT











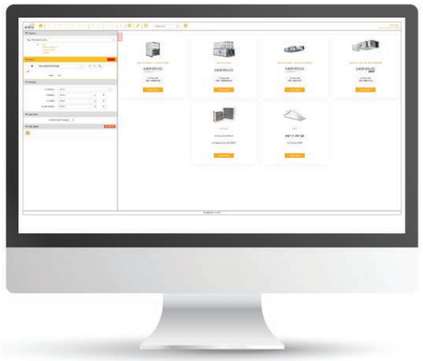
02

Support for designers

CLIMACAD ONLINE 4.0 (CCOL 4)

Infinite number of configurations

Friendly user interface



Simple and easy selection

Integration with CRM, ERP & WMA systems

Certified by

EUROVENT CERTIFIED PERFORMANCE
AHU N° 06.06.320
Range: VENTUS VVS021 - VVS650
www.eurovent-certification.com

CCOL4 OPTIMIZED FOR

» any web-browser

» any operating system

» any device

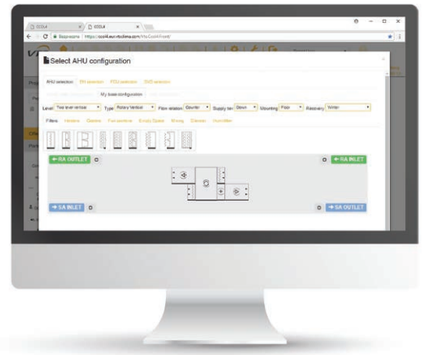
DATA EXPORT TO

PDF · CAD 2D · CAD 3D · SUBMITTAL · QUOTATION · TECHNICAL SPECIFICATION

CCOL 4.0 utilises latest technologies and software platforms. The tool has been developed in SaaS model (Software as a Service). It's best advantage is, that service is accessible wherever in the world. Any device equipped with web-browser and internet access is all you need to experience the power of our CCOL 4.0.

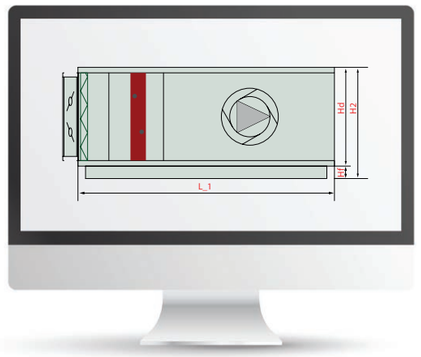
DESIGN VERSATAILTY

» Infinite units configurations.
» Detecting of configurations errors.



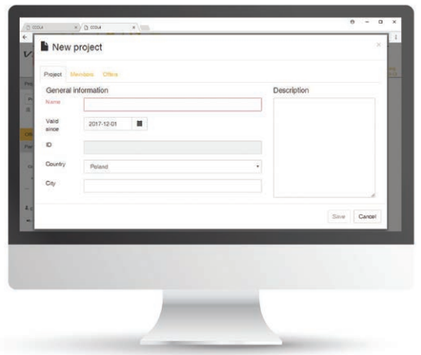
DYNAMIC AHU LENGTH DEFINITION

» CCOL4 applys dynamic optimizing of AHU length based on automatic air treatment functions. placements with regard to minimum gaps between them in order to secure their propper performance.



MANAGING OF YOUR DATA BASE

» Self-creating and devellpment by designer of own projects and AHU selections data base.
» Sharing of self-made AHU selections with VTS enginners for pricing.

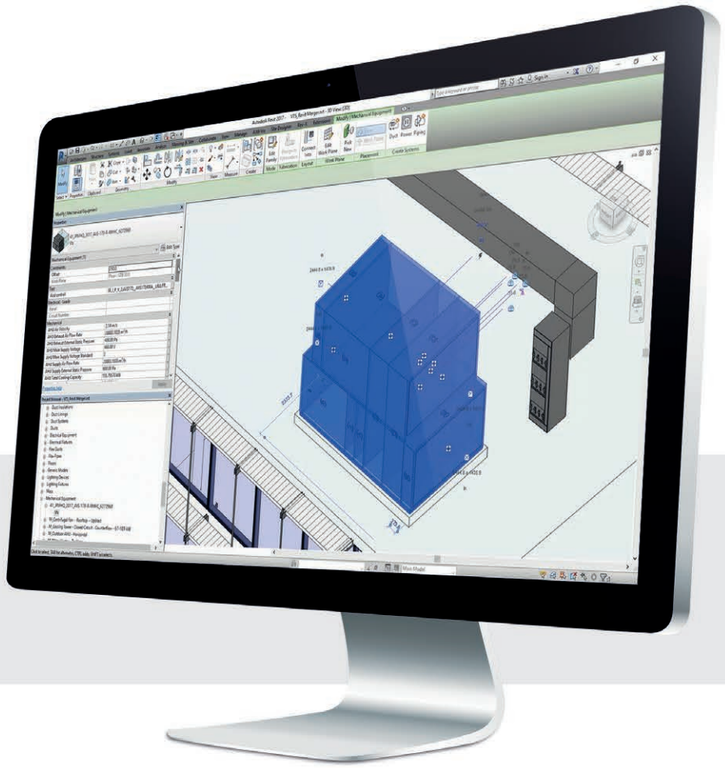


www.ccol4.com

Support for designers

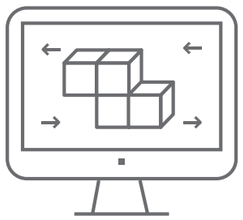
VTS **BIM** - new approach to digital models of Air Handling Units

VTS has enabled dynamic generating of VENTUS VVS, VENTUS Compact and American VENTUS AVS units digital models as on-line service. This became possible thanks to implementation of new AHU selection tool – the ClimaCAD OnLine 4.0 [CCOL 4.0], equipped with .rfa [Revit®] files generator.



The Autodesk REVIT® families shared by VTS significantly facilitate entire building modelling process done by designing bureaus. At the moment, the generator is an unique tool in entire BIM environment. It enables to generate brand new VENTUS units model on the spot, in any configuration or any parameters.

3 steps to generate the model:



1 Login to CCOL 4.0

You can login using our web-site:

www.ccol4.com

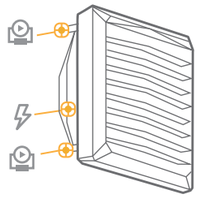
2 AHU configuration and parameters specyfing

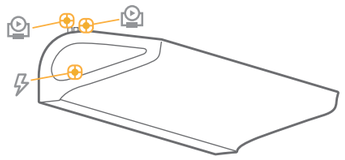
Intuitive unit configurator enables to select a unit, perfectly fitting to your design assumptions.

3 Selection export to .fra file

In order to generate .fra model, all you need to do is to enter personal information (including e-mail address) of a person to whom the model is to be sent. The system will automatically sent the link to the site from where model can be downloaded. Entire process take no longer than 15 minutes.

As a result the client is given:





Digital model of the air handling unit with fully parametrized connectors:

- **Air,**
- **Hydraulic,**
- **Sanitary,**
- **Electric,**

and also a set of complete technical and dimensioning information, including clearly marked **maintenance** and **service zone** of the unit.

VTS enables also a library of static families for WING air curtains and VOLCANO air heaters.

The models includes:

- **parametrized electric and hydraulic connectors,**
- **both vertical and horizontal mounting options,**
- **presentation of units effective air range,**
- **parametrized angle of heater's to the horizontal plane.**

Models can be downloaded from: **https://vtsgroup.com/vtsbim.html**

Support for designers

VTS **BIM** -air handling units perfectly fitted for designer's needs.

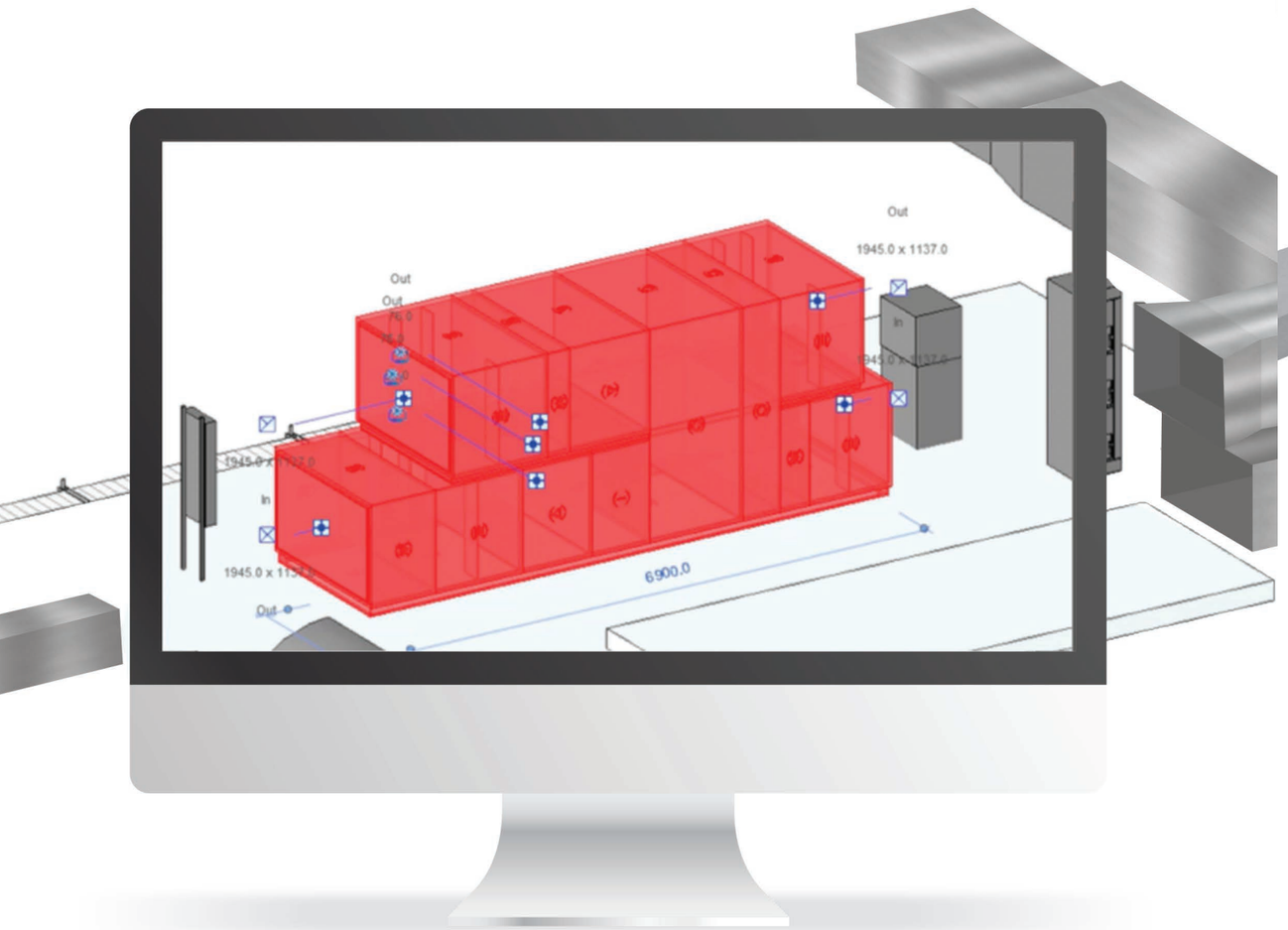
VTS supports generating of air handling units models in LOD 400 (Level Of Development) standard.

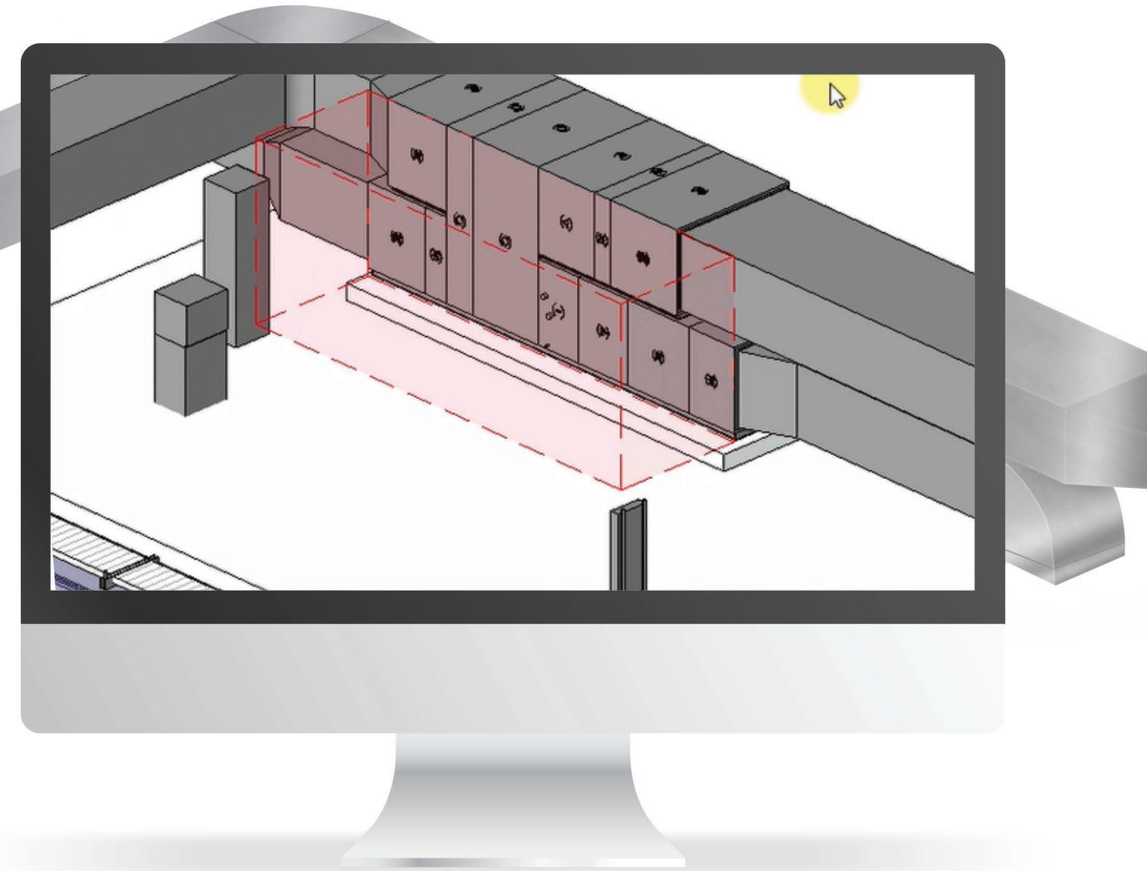
LOD
400
as standard

The VENTUS BIM families include maintenance and service zones of the units as standard.

These zones reserve minimum space to secure proper maintenance and repair conditions of the unit, and allow to avoid any collisions with remaining building elements or installations.

Service clearance
repair & maintenance
as standard.





03

VENTUS VVS

ventus
VVS

Airflow
from **1 100** m³/h
from **100 000** m³/h

Up to **92%**
of energy recovery efficiency

14
sizes

DURABLE AND TIGHT STRUCTURE

RELIABLE COMPONENTS

SMART CONTROLS

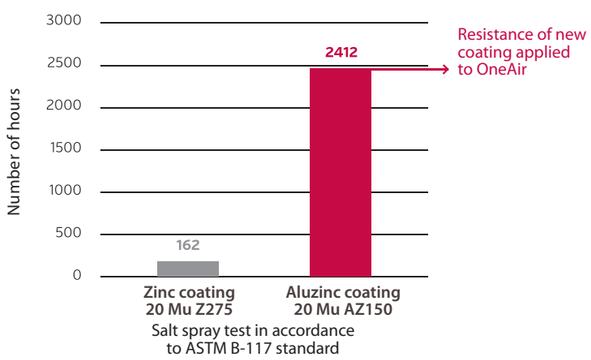
USER SAFETY

Technical Specification

STRUCTURE

STEEL SKIN COATED WITH ALUZINC AZ 150

CORROSION RESISTANCE



PROFIL V

VVS 021-180

PROFIL C

VVS 230-650

STEEL BASE FRAME AS STANDARD FOR ANY TYPE OF UNITS

ALUMINUM POSTS OF SPECIAL CONSTRUCTION IN EACH AHU TYPE

CASING SKIN

- Rigid, durable structure of the casing.
- Low absorption of heat radiation and UV.
- High resistance to weather conditions.

FAN SECTION CAGE

- Improved longitudinal rigidity of the structure.
- Facilitated sections joining.

FOUNDATION

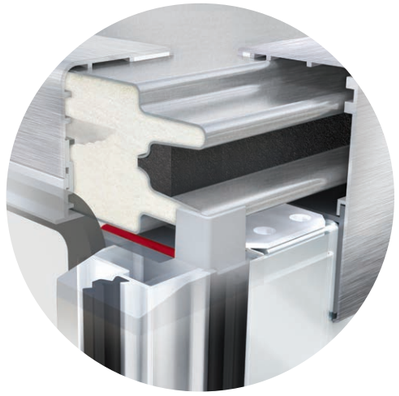
- Transport facilitation.
- High resistance of the frame to deflection.

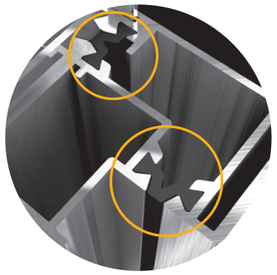
STRUCTURAL POSTS

- Broken thermal bridges as standard.
- High resistance to weather conditions and UV radiation.

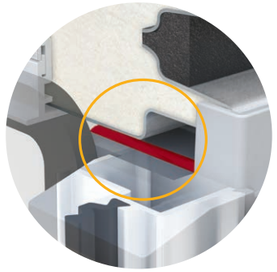
Technical Specification

TIGHTNESS





THERMAL BREAK



LABIRYNTH TIGHTNENING

ADDITIONAL POST SEALING

ADDITIONAL SEALING BLADE

CANOPY

- The canopy is made of 0,5 mm steel sheet, double side coated with 185 um of zinc (DX51D AZ185).
- Canopy is assembled of modules equipped with self-latching grooves securing perfect tightness of the joints. Modular structure of the canopy ensures its easy and safe assembly.

ERGONOMIC INSPECTION PANEL LOCK

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

ALUMINUM STRUCTURAL POSTS WITH ADDITIONAL SEALING BLADE AND THERMAL BREAK

- Broken thermal bridge as standard – eliminates humidity condensation on units structural elements.
- Blade along the inspection window ensures labyrinth tightening between panel and AHU body – currently the most effective solution on the market, mainly applied to laboratory equipment.
- Symmetrical groove in the vertical post's mounting feet secures its 100% tightness with the AHU casing structure.

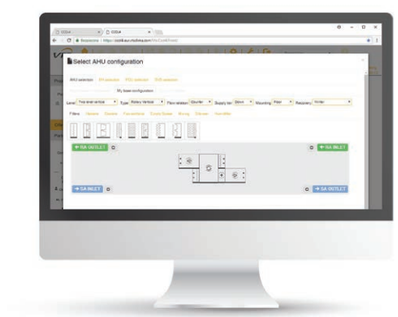
VVS 021-120 – RECUPERATOR (HEX & PREMIUM PLUS)

Nominal parameters		Recommended airflow range																		
Unit size		VVS021			VVS030			VVS040			VVS055			VVS075			VVS100			VVS120		
Min airflow	[m³/h]	806	806	806	1 180	1 180	1 180	1 958	1 958	1 958	2 878	2 878	2 878	3 805	3 805	3 805	4 863	4 863	4 863	5 815	5 815	5 815
Max airflow	[m³/h]	2 730	2 184	2 163	3 900	3 120	3 090	5 200	4 160	4 120	7 150	5 720	5 665	9 750	7 800	7 725	13 000	10 400	10 300	15 600	12 480	12 360
H_{fd}	[mm]	90			90			90			90			90			90			90		
H_{fu}	[mm]	-			-			-			-			-			-			-		
H	[mm]	538			670			670			805			925			1 025			1 062		
W	[mm]	961			961			1 168			1 339			1 480			1 660			1 891		
H_i	[mm]	368			500			500			635			755			855			892		
W_i	[mm]	881			881			1 088			1 259			1 400			1 580			1 811		
H_2	[mm]	986			1 250			1 250			1 520			1 760			1 960			2 034		
l	[mm]	40			40			40			40			40			40			40		

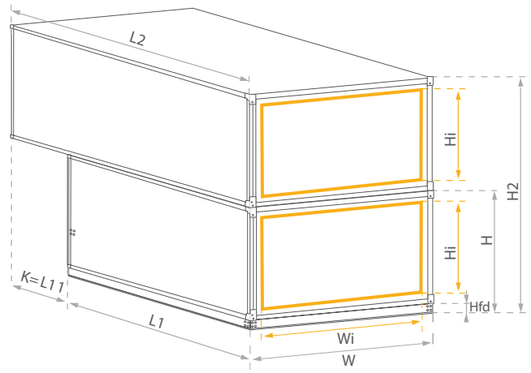
Selected configurations Dimension		Length of selected configurations						
FPDV/FVPD_cd	L2	2 928	3 294	3 294	3 294	3 294	4 026	4 026
	L1	2 562	2 928	2 928	2 928	3 294	4 026	4 026
	K	366	366	366	366	0	0	0
	Lt	2 928	3 294	3 294	3 294	3 294	4 026	4 026
FPDHV/FVPD_cd	L2	2 928	3 294	3 294	3 294	3 294	4 026	4 026
	L1	2 562	2 928	2 928	2 928	3 294	4 026	4 026
	K	366	366	366	366	0	0	0
	Lt	2 928	3 294	3 294	3 294	3 294	4 026	4 026
FPDHV/FVPD_cd	L2	2 928	3 294	3 294	3 294	3 294	4 026	4 026
	L1	2 928	3 294	3 294	3 294	3 660	4 392	4 392
	K	0	0	0	0	0	0	0
	Lt	2 928	3 294	3 294	3 294	3 660	4 392	4 392
FPDMHV/FVMPD_cd	L2	2 928	3 294	3 294	3 294	3 294	4 026	4 026
	L1	2 928	3 294	3 294	3 294	3 660	4 392	4 392
	K	0	0	0	0	0	0	0
	Lt	2 928	3 294	3 294	3 294	3 660	4 392	4 392
FPHCV/FVPD_cd	L2	2 928	3 294	3 294	3 294	3 294	4 026	4 026
	L1	3 294	3 660	3 660	3 660	4 026	4 758	4 758
	K	0	0	0	0	0	0	0
	Lt	3 294	3 660	3 660	3 660	4 026	4 758	4 758
FPDMHCV/FVMPD_cd	L2	2 928	3 294	3 294	3 294	3 294	4 026	4 026
	L1	3 294	3 660	3 660	3 660	4 026	4 758	4 758
	K	0	0	0	0	0	0	0
	Lt	3 294	3 660	3 660	3 660	4 026	4 758	4 758

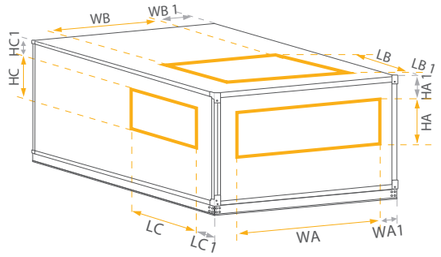
Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

www.ccol4.com



DIMENSIONS - VVS 021-120 – RECUPERATOR (HEX & PREMIUM PLUS)





Full-face horizontal outlet
END (FF)

Size	WA	HA	WA1	HA1
VVS021	821	313	70	67,5
VVS030	821	440	70	70
VVS040	1 028	440	70	70
VVS055	1 199	575	70	70
VVS075	1 340	695	70	70
VVS100	1 520	795	70	70
VVS120	1 751	832	70	70

Small horizontal inlet-outlet
END (FS)

Size	WA	HA	WA1	HA1
VVS021	500	220	228	112
VVS030	500	220	228	178
VVS040	660	250	252	163
VVS055	821	440	257	135
VVS075	1 028	440	224	195
VVS100	1 199	575	228	200
VVS120	1 199	575	344	196

Vertical inlet-outlet
END (US)

Size	WB	LB	WB1	LB1
VVS021	500	220	228	200
VVS030	500	220	228	200
VVS040	660	250	252	200
VVS055	821	440	257	200
VVS075	1 028	440	224	200
VVS100	1 199	575	228	125
VVS120	1 199	575	344	125

Vertical outlet
END (US)

Size	WB	LB	WB1	LB1
VVS021	660	250	152	212
VVS030	613	380	173	127
VVS040	821	440	175	127
VVS055	1 028	440	157	212
VVS075	1 199	575	142	212
VVS100	1 340	695	162	212
VVS120	1 520	795	187	127

Side inlet-outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	115	165
VVS030	313	380	131	165
VVS040	313	380	131	165
VVS055	413	380	149	165
VVS075	413	380	209	165
VVS100	613	380	159	165
VVS120	613	380	177	165

Side outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	114	202
VVS030	313	380	180	202
VVS040	313	380	165	202
VVS055	413	380	137	202
VVS075	413	380	197	202
VVS100	613	380	158	127
VVS120	613	380	198	127

VVS 150-650 - RECUPERATOR (PREMIUM PLUS)

Nominal parameters		Recommended airflow range																		
Unit size		VVS150			VVS180			VVS230			VVS300			VVS400			VVS500			VVS650		
Min airflow	[m³/h]	7 167	7 167	7 167	8 640	8 640	8 640	10 398	10 398	10 398	13 491	13 491	13 491	18 704	18 704	18 704	21 817	21 817	21 817	28 725	28 725	28 725
Max airflow	[m³/h]	19 500	15 600	15 450	23 400	18 720	18 540	29 900	23 920	23 690	39 000	31 200	30 900	52 000	41 600	41 200	71 500	57 200	56 650	84 500	67 600	66 950
H_{fd}	[mm]	90			120			120			120			120			120			120		
H_{fu}	[mm]	0			80			80			80			80			80			80		
H	[mm]	1 163			1 397			1 397			1 696			1 929			1 929			2 406		
W	[mm]	2 085			2 085			2 493			2 585			3 085			3 585			3 697		
H_i	[mm]	993			1 197			1 197			1 496			1 729			1 729			2 206		
W_i	[mm]	2 005			2 005			2 413			2 505			3 005			3 505			3 617		
H_2	[mm]	2 236			2 754			2 754			3 352			3 818			3 818			4 772		
l	[mm]	40			40			40			40			40			40			40		

Selected configurations Dimension		Length of selected configurations						
FPDV/FVPD_cd	L2	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	L1	4 026	4 026	4 026	5 124	5 124	5 124	5 490
	K	366	366	366	366	366	366	366
	Lt	4 392	4 392	4 392	5 490	5 490	5 490	5 856
FPDMV/FVMPD_cd	L2	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	L1	4 026	4 026	4 026	5 124	5 124	5 124	5 490
	K	366	366	366	366	366	366	366
	Lt	4 392	4 392	4 392	5 490	5 490	5 490	5 856
FPDHV/FVPD_cd	L2	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	L1	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	K	0	0	0	0	0	0	0
	Lt	4 392	4 392	4 392	5 490	5 490	5 490	5 856
FPDMHV/FVMPD_cd	L2	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	L1	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	K	0	0	0	0	0	0	0
	Lt	4 392	4 392	4 392	5 490	5 490	5 490	5 856
FPDHCV/FVPD_cd	L2	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	L1	4 758	4 758	4 758	5 856	5 856	5 856	6 222
	K	0	0	0	0	0	0	0
	Lt	4 758	4 758	4 758	5 856	5 856	5 856	6 222
FPDMHCV/FVMPD_cd	L2	4 392	4 392	4 392	5 490	5 490	5 490	5 856
	L1	4 758	4 758	4 758	5 856	5 856	5 856	6 222
	K	0	0	0	0	0	0	0
	Lt	4 758	4 758	4 758	5 856	5 856	5 856	6 222

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

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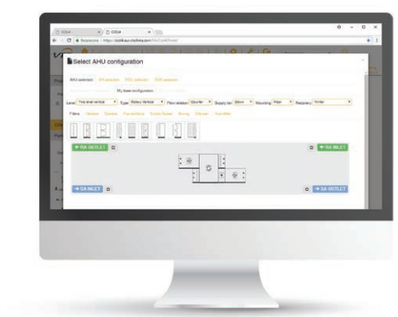
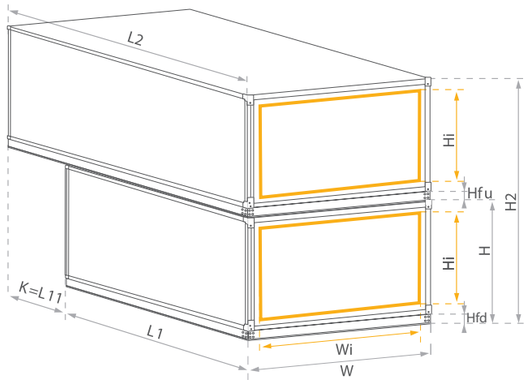
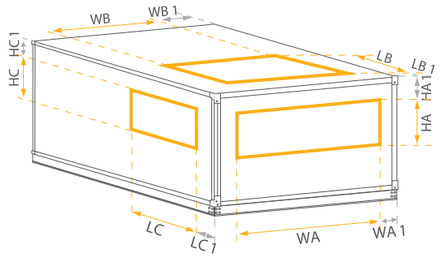


DIMENSIONS - VVS 150-650 - RECUPERATOR (PREMIUM PLUS)





Full-face horizontal outlet
END (FF)

Size	WA	HA	WA1	HA1
VVS150	1 945	933	70	70
VVS180	1 945	1 137	70	70
VVS230	2 353	1 137	70	70
VVS300	2 445	1 436	70	70
VVS400	2 945	1 669	70	70
VVS500	3 445	1 669	70	70
VVS650	3 557	2 146	70	70

Small horizontal inlet-outlet
END (FS)

Size	WA	HA	WA1	HA1
VVS150	1520	795	280	137
VVS180	1520	713	280	239
VVS230	1945	813	272	200
VVS300	1945	813	318	319
VVS400	2650	813	215	436
VVS500	3150	813	215	436
VVS650	3250	813	220	674

Vertical inlet-outlet
END (US)

Size	WB	LB	WB1	LB1
VVS150	1520	795	280	200
VVS180	1520	713	280	239
VVS230	1945	813	272	151
VVS300	1945	813	318	151
VVS400	2650	813	215	151
VVS500	3150	813	215	151
VVS650	3250	813	220	151

Vertical outlet
END (US)

Size	WB	LB	WB1	LB1
VVS150	1520	795	280	127
VVS180	1520	713	293	127
VVS230	1945	813	284	127
VVS300	1945	813	330	127
VVS400	2650	813	228	127
VVS500	3150	813	228	212
VVS650	3250	813	234	212

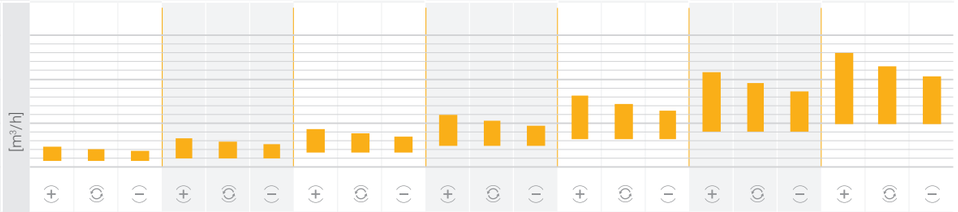
Side inlet-outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS150	713	740	178	165
VVS180	913	740	180	165
VVS230	913	740	180	165
VVS300	1 213	740	179	165
VVS400	1 513	740	146	165
VVS500	1 513	740	146	165
VVS650	1 913	740	184	165

Side outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS150	713	740	139	202
VVS180	913	740	241	202
VVS230	913	740	142	127
VVS300	1 213	740	321	127
VVS400	1 513	740	438	127
VVS500	1 513	740	438	127
VVS650	1 913	740	676	127

VVS 021-120 - ROTARY HEAT WHEEL



Nominal parameters		Recommended airflow range																		
Unit size		VVS021			VVS030			VVS040			VVS055			VVS075			VVS100			VVS120		
Min airflow		806	806	806	1 180	1 180	1 180	1 958	1 958	1 958	2 878	2 878	2 878	3 805	3 805	3 805	4 863	4 863	4 863	5 815	5 815	5 815
Max airflow		2 730	2 415	2 163	3 900	3 450	3 090	5 200	4 600	4 120	7 150	6 325	5 665	9 750	8 625	7 725	13 000	11 500	10 300	15 600	13 800	12 360
H_{fd}	[mm]	90			90			90			90			90			90			90		
H_{fu}	[mm]	0			0			0			0			0			0			0		
H	[mm]	538			670			670			805			925			1 025			1 062		
W	[mm]	961			961			1 168			1 339			1 480			1 660			1 891		
H_i	[mm]	368			500			500			635			755			855			892		
W_i	[mm]	881			881			1 088			1 259			1 400			1 580			1 811		
H_2	[mm]	986			1 250			1 250			1 520			1 760			1 960			2 034		
I	[mm]	40			40			40			40			40			40			40		

Selected configurations	Dimension	Length of selected configurations						
FRV/FRV_cd	L2	1 830	1 830	1 830	2 196	2 196	2 562	2 562
	L1	1 830	1 830	1 830	2 196	2 196	2 562	2 562
	K	366	366	366	732	732	1 098	1 098
	Lt	1 830	1 830	1 830	2 196	2 196	2 562	2 562
FRMV/FVMR_cd	L2	2 562	2 562	2 562	2 928	2 928	3 294	3 294
	L1	2 562	2 562	2 562	2 928	2 928	3 294	3 294
	K	366	366	366	366	366	366	366
	Lt	2 562	2 562	2 562	2 928	2 928	3 294	3 294
FRHV/FRV_cd	L2	1 830	1 830	1 830	2 196	2 196	2 562	2 562
	L1	2 196	2 196	2 196	2 562	2 562	2 928	2 928
	K	366	366	366	732	732	1 098	1 098
	Lt	2 196	2 196	2 196	2 562	2 562	2 928	2 928
FRMHV/FVMR_cd	L2	2 562	2 562	2 562	2 928	2 928	3 294	3 294
	L1	2 928	2 928	2 928	3 294	3 294	3 660	3 660
	K	0	0	0	0	0	0	0
	Lt	2 928	2 928	2 928	3 294	3 294	3 660	3 660
FRCV/FRV_cd	L2	1 830	1 830	1 830	2 196	2 196	2 562	2 562
	L1	2 196	2 196	2 196	2 562	2 562	2 928	2 928
	K	366	366	366	732	732	1 098	1 098
	Lt	2 196	2 196	2 196	2 562	2 562	2 928	2 928
FRMCV/FVMR_cd	L2	2 562	2 562	2 562	2 928	2 928	3 294	3 294
	L1	2 928	2 928	2 928	3 294	3 294	3 660	3 660
	K	0	0	0	0	0	0	0
	Lt	2 928	2 928	2 928	3 294	3 294	3 660	3 660

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

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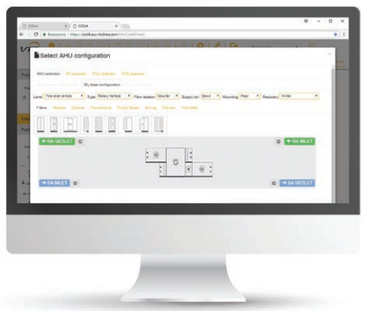
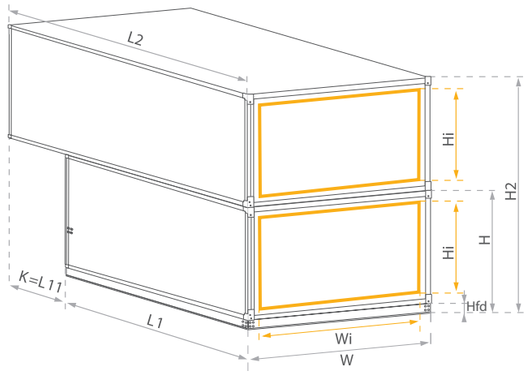
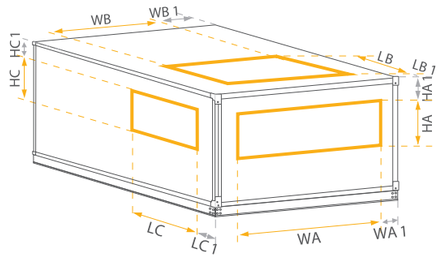


DIMENSIONS - VVS 021-120 - ROTARY HEAT WHEEL





Full-face horizontal outlet
END (FF)

Size	WA	HA	WA1	HA1
VVS021	821	313	70	67,5
VVS030	821	440	70	70
VVS040	1 028	440	70	70
VVS055	1 199	575	70	70
VVS075	1 340	695	70	70
VVS100	1 520	795	70	70
VVS120	1 751	832	70	70

Small horizontal inlet-outlet
END (FS)

Size	WA	HA	WA1	HA1
VVS021	500	220	228	112
VVS030	500	220	228	178
VVS040	660	250	252	163
VVS055	821	440	257	135
VVS075	1 028	440	224	195
VVS100	1 199	575	228	200
VVS120	1 199	575	344	196

Vertical inlet-outlet
END (US)

Size	WB	LB	WB1	LB1
VVS021	500	220	228	200
VVS030	500	220	228	200
VVS040	660	250	252	200
VVS055	821	440	257	200
VVS075	1 028	440	224	200
VVS100	1 199	575	228	125
VVS120	1 199	575	344	125

Vertical outlet
END (US)

Size	WB	LB	WB1	LB1
VVS021	660	250	152	212
VVS030	613	380	173	127
VVS040	821	440	175	127
VVS055	1 028	440	157	212
VVS075	1 199	575	142	212
VVS100	1 340	695	162	212
VVS120	1 520	795	187	127

Side inlet-outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	115	165
VVS030	313	380	131	165
VVS040	313	380	131	165
VVS055	413	380	149	165
VVS075	413	380	209	165
VVS100	613	380	159	165
VVS120	613	380	177	165

Side outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	114	202
VVS030	313	380	180	202
VVS040	313	380	165	202
VVS055	413	380	137	202
VVS075	413	380	197	202
VVS100	613	380	158	127
VVS120	613	380	198	127

VVS 150-650- ROTARY HEAT WHEEL

Nominal parameters		Recommended airflow range																		
Unit size		VVS150			VVS180			VVS230			VVS300			VVS400			VVS500			VVS650		
Min airflow	[m³/h]	7 167	7 167	7 167	8 640	8 640	8 640	10 398	10 398	10 398	13 491	13 491	13 491	18 704	18 704	18 704	21 817	21 817	21 817	28 725	28 725	28 725
Max airflow	[m³/h]	19 500	16 350	15 450	23 400	19 620	18 540	29 900	25 070	23 690	39 000	32 700	30 900	52 000	43 600	41 200	71 500	59 950	56 650	84 500	70 850	66 950
H_{fd}	[mm]	90			120			120			120			120			120			120		
H_{fu}	[mm]	0			80			80			80			80			80			80		
H	[mm]	1 163			1 397			1 397			1 696			1 929			1 929			2 406		
W	[mm]	2 085			2 085			2 493			2 585			3 085			3 585			3 697		
H_i	[mm]	993			1 197			1 197			1 496			1 729			1 729			2 206		
W_i	[mm]	2 005			2 005			2 413			2 505			3 005			3 505			3 617		
H_2	[mm]	2 236			2 754			2 754			3 352			3 818			3 818			4 772		
I	[mm]	40			40			40			40			40			40			40		

Selected configurations	Dimension	Length of selected configurations						
FRV/FRV_cd	L2	2 562	2 562	2 562	2 928	2 928	2 928	2 928
	L1	2 562	2 562	2 562	2 928	2 928	2 928	2 928
	K	1 098	1 098	1 098	1 464	1 464	1 464	1 464
	Lt	2 562	2 562	2 562	2 928	2 928	2 928	2 928
FRMV/FVMR_cd	L2	3 660	3 660	3 660	4 026	4 026	4 026	4 026
	L1	3 660	3 660	3 660	4 026	4 026	4 026	4 026
	K	0	0	0	0	0	0	0
	Lt	3 660	3 660	3 660	4 026	4 026	4 026	4 026
FRHV/FRV_cd	L2	2 562	2 562	2 562	2 928	2 928	2 928	2 928
	L1	2 928	2 928	2 928	3 294	3 294	3 294	3 294
	K	1 098	1 098	1 098	1 464	1 464	1 464	1 464
	Lt	2 928	2 928	2 928	3 294	3 294	3 294	3 294
FRMHV/FVMR_cd	L2	3 660	3 660	3 660	4 026	4 026	4 026	4 026
	L1	4 026	4 026	4 026	4 392	4 392	4 392	4 392
	K	0	0	0	0	0	0	0
	Lt	4 026	4 026	4 026	4 392	4 392	4 392	4 392
FRMHV/FVMR_cd	L2	2 562	2 562	2 562	2 928	2 928	2 928	2 928
	L1	2 928	2 928	2 928	3 294	3 294	3 294	3 294
	K	1 098	1 098	1 098	1 464	1 464	1 464	1 464
	Lt	2 928	2 928	2 928	3 294	3 294	3 294	3 294
FRMCV/FVMR_cd	L2	3 660	3 660	3 660	4 026	4 026	4 026	4 026
	L1	4 026	4 026	4 026	4 392	4 392	4 392	4 392
	K	0	0	0	0	0	0	0
	Lt	4 026	4 026	4 026	4 392	4 392	4 392	4 392

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

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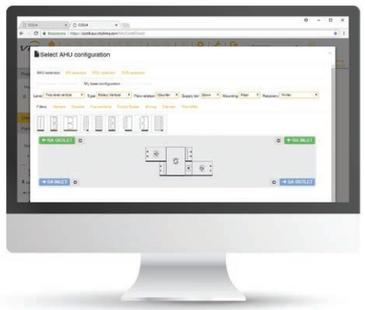
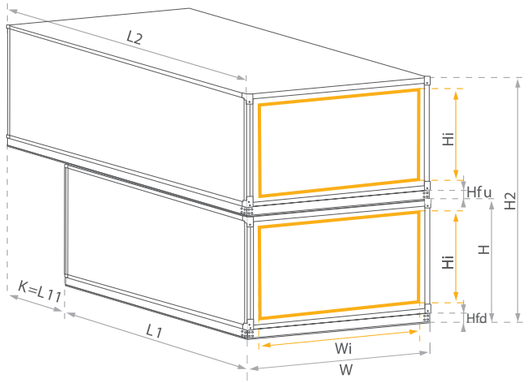
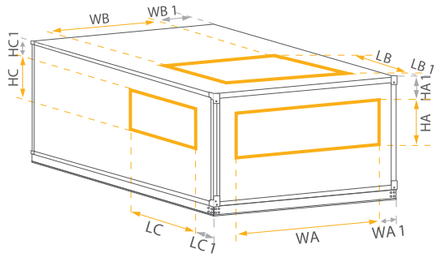


DIMENSIONS - VVS 150-650 - ROTARY HEAT WHEEL





Full-face horizontal outlet
END (FF)

Size	WA	HA	WA1	HA1
VVS150	1 945	933	70	70
VVS180	1 945	1 137	70	70
VVS230	2 353	1 137	70	70
VVS300	2 445	1 436	70	70
VVS400	2 945	1 669	70	70
VVS500	3 445	1 669	70	70
VVS650	3 557	2 146	70	70

Small horizontal inlet-outlet
END (FS)

Size	WA	HA	WA1	HA1
VVS150	1520	795	280	137
VVS180	1520	713	280	239
VVS230	1945	813	272	200
VVS300	1945	813	318	319
VVS400	2650	813	215	436
VVS500	3150	813	215	436
VVS650	3250	813	220	674

Vertical inlet-outlet
END (US)

Size	WB	LB	WB1	LB1
VVS150	1520	795	280	200
VVS180	1520	713	280	239
VVS230	1945	813	272	151
VVS300	1945	813	318	151
VVS400	2650	813	215	151
VVS500	3150	813	215	151
VVS650	3250	813	220	151

Vertical outlet
END (US)

Size	WB	LB	WB1	LB1
VVS150	1520	795	280	127
VVS180	1520	713	293	127
VVS230	1945	813	284	127
VVS300	1945	813	330	127
VVS400	2650	813	228	127
VVS500	3150	813	228	212
VVS650	3250	813	234	212

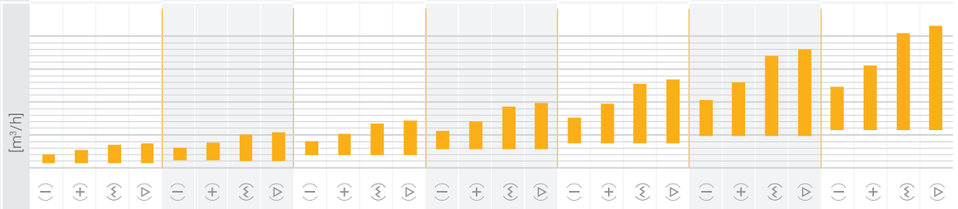
Side inlet-outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS150	713	740	178	165
VVS180	913	740	180	165
VVS230	913	740	180	165
VVS300	1 213	740	179	165
VVS400	1 513	740	146	165
VVS500	1 513	740	146	165
VVS650	1 913	740	184	165

Side outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS150	713	740	139	202
VVS180	913	740	241	202
VVS230	913	740	142	127
VVS300	1 213	740	321	127
VVS400	1 513	740	438	127
VVS500	1 513	740	438	127
VVS650	1 913	740	676	127

VVS 021-120 - SUPPLY & EXHAUST



Nominal parameters		Recommended airflow range																													
Unit size		VVS021				VVS030				VVS040				VVS055				VVS075				VVS100				VVS120			
Min airflow	[m³/h]	806	806	806	806	1 180	1 180	1 167	1 167	1 958	1 958	1 958	1 958	2 878	2 878	2 878	2 878	3 805	3 805	3 805	3 805	4 863	4 863	4 863	4 863	5 815	5 815	5 815	5 815
Max airflow	[m³/h]	2 163	2 730	3 570	3 780	3 090	3 900	5 100	5 400	4 120	5 200	6 800	7 200	5 665	7 150	9 350	9 900	7 725	9 750	12 750	13 500	10 300	13 000	17 000	18 000	12 360	15 600	20 400	21 600
H_{fd}	[mm]	90				90				90				90				90				90				90			
H	[mm]	538				670				670				805				925				1 025				1 062			
W	[mm]	961				961				1 168				1 339				1 480				1 660				1 891			
H_i	[mm]	368				500				500				635				755				855				892			
W_i	[mm]	881				881				1 088				1 259				1 400				1 580				1 811			
l	[mm]	40				40				40				40				40				40				40			

Selected configurations	Dimension	Length of selected configurations						
FV	Lt [mm]	732	732	732	1 098	1 098	1 464	1 464
FHV	Lt [mm]	1 098	1 098	1 098	1 464	1 464	1 830	1 830
FCV	Lt [mm]	1 464	1 464	1 464	1 830	1 830	2 196	2 196
FHCV	Lt [mm]	1 464	1 464	1 464	1 830	1 830	2 196	2 196
FGHV	Lt [mm]	1 830	1 830	1 830	2 196	2 196	2 562	2 562
FGV	Lt [mm]	1 830	1 830	1 830	2 196	2 196	2 562	2 562
FGCVH	Lt [mm]	1 464	1 464	1 464	1 830	1 830	2 196	2 196
	Lt [mm]	2 196	2 196	2 196	2 562	2 562	2 928	2 928

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

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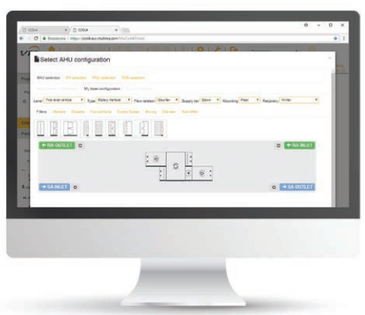
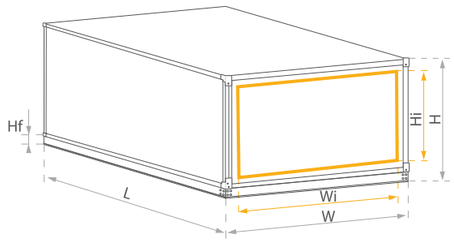
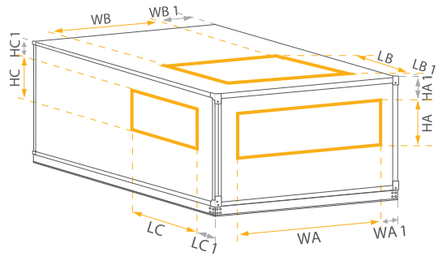


DIMENSIONS - VVS 0 21-120 - SUPPLY & EXHAUST





Full-face horizontal outlet
END (FF)

Size	WA	HA	WA1	HA1
VVS021	821	313	70	67,5
VVS030	821	440	70	70
VVS040	1 028	440	70	70
VVS055	1 199	575	70	70
VVS075	1 340	695	70	70
VVS100	1 520	795	70	70
VVS120	1 751	832	70	70

Small horizontal inlet-outlet
END (FS)

Size	WA	HA	WA1	HA1
VVS021	500	220	228	112
VVS030	500	220	228	178
VVS040	660	250	252	163
VVS055	821	440	257	135
VVS075	1 028	440	224	195
VVS100	1 199	575	228	200
VVS120	1 199	575	344	196

Vertical inlet-outlet
END (US)

Size	WB	LB	WB1	LB1
VVS021	500	220	228	112
VVS030	500	220	228	178
VVS040	660	250	252	163
VVS055	821	440	257	135
VVS075	1 028	440	224	195
VVS100	1 199	575	228	200
VVS120	1 199	575	344	196

Vertical outlet
END (US)

Size	WB	LB	WB1	LB1
VVS021	660	250	152	212
VVS030	613	380	173	127
VVS040	821	440	175	127
VVS055	1 028	440	157	212
VVS075	1 199	575	142	212
VVS100	1 340	695	162	212
VVS120	1 520	795	187	127

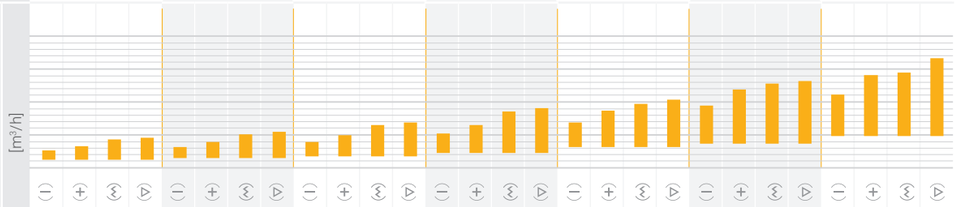
Side inlet-outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	115	165
VVS030	313	380	131	165
VVS040	313	380	131	165
VVS055	413	380	149	165
VVS075	413	380	209	165
VVS100	613	380	159	165
VVS120	613	380	177	165

Side outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	114	202
VVS030	313	380	180	202
VVS040	313	380	165	202
VVS055	413	380	137	202
VVS075	413	380	197	202
VVS100	613	380	158	127
VVS120	613	380	198	127

VVS 150-650 - SUPPLY & EXHAUST



Nominal parameters		Recommended airflow range						
Unit size		VVS150	VVS180	VVS230	VVS300	VVS400	VVS500	VVS650
Min airflow	[m³/h]	7 167 7 167 7 167 7 167	8 640 8 640 8 640 8 640	10 398 10 398 10 398 10 398	13 491 13 491 13 491 13 491	18 704 18 704 18 704 18 704	21 817 21 817 21 817 21 817	28 725 28 725 28 725 28 725
Max airflow	[m³/h]	15 450 19 500 25 500 27 000	18 540 23 400 30 600 32 400	23 690 29 900 39 100 41 400	30 900 39 000 51 000 54 000	41 200 52 000 58 000 62 000	56 650 71 500 77 000 79 000	66 950 84 500 87 000 100 000
H_{fd}	[mm]	90	120	120	120	120	120	120
H_{fu}	[mm]	0	80	80	80	80	80	80
H	[mm]	1 163	1 397	1 397	1 696	1 929	1 929	2 406
W	[mm]	2 085	2 085	2 493	2 585	3 085	3 585	3 697
H_i	[mm]	993	1 197	1 197	1 496	1 729	1 729	2 206
W_i	[mm]	2 005	2 005	2 413	2 505	3 005	3 505	3 617
H_2	[mm]	2 236	2 754	2 754	3 352	3 818	3 818	4 772
l	[mm]	40	40	40	40	40	40	40

Selected configurations	Dimension	Length of selected configurations						
V	Lt	1 464	1 464	1 464	1 830	1 830	1 830	1 830
FV	Lt	1 830	1 830	1 830	2 196	2 196	2 196	2 196
FHV	Lt	2 196	2 196	2 196	2 562	2 562	2 562	2 562
FCV	Lt	2 196	2 196	2 196	2 562	2 562	2 562	2 562
FHCV	Lt	2 562	2 562	2 562	2 928	2 928	2 928	2 928
FGHV	Lt	2 562	2 562	2 562	2 928	2 928	2 928	2 928
FGV	Lt	2 196	2 196	2 196	2 562	2 562	2 562	2 562
FGCVH	Lt	2 928	2 928	2 928	3 294	3 294	3 294	3 294

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

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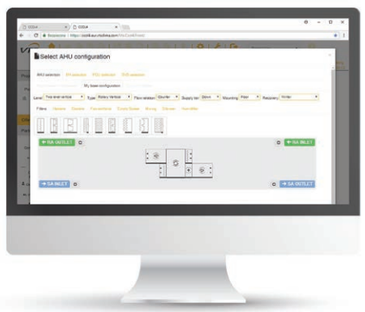
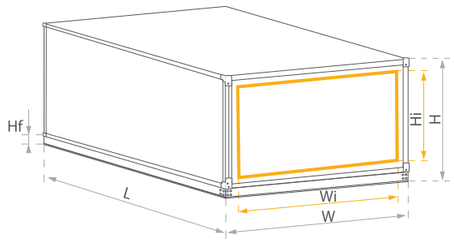
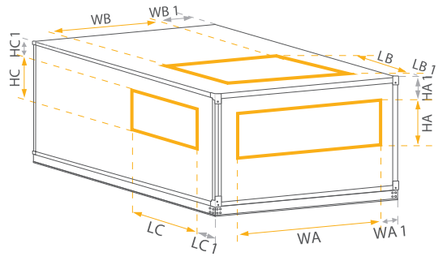


DIMENSIONS - VVS 150-650 - SUPPLY & EXHAUST





Full-face horizontal outlet
END (FF)

Size	WA	HA	WA1	HA1
VVS021	821	313	70	67,5
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VVS055	1 199	575	70	70
VVS075	1 340	695	70	70
VVS100	1 520	795	70	70
VVS120	1 751	832	70	70

Small horizontal inlet-outlet
END (FS)

Size	WA	HA	WA1	HA1
VVS150	1520	795	280	137
VVS180	1520	713	280	239
VVS230	1945	813	272	200
VVS300	1945	813	318	319
VVS400	2650	813	215	436
VVS500	3150	813	215	436
VVS650	3250	813	220	674

Vertical inlet-outlet
END (US)

Size	WB	LB	WB1	LB1
VVS150	1520	795	280	200
VVS180	1520	713	280	239
VVS230	1945	813	272	151
VVS300	1945	813	318	151
VVS400	2650	813	215	151
VVS500	3150	813	215	151
VVS650	3250	813	220	151

Vertical outlet
END (US)

Size	WB	LB	WB1	LB1
VVS150	1520	795	280	127
VVS180	1520	713	293	127
VVS230	1945	813	284	127
VVS300	1945	813	330	127
VVS400	2650	813	228	127
VVS500	3150	813	228	212
VVS650	3250	813	234	212

Side inlet-outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	115	165
VVS030	313	380	131	165
VVS040	313	380	131	165
VVS055	413	380	149	165
VVS075	413	380	209	165
VVS100	613	380	159	165
VVS120	613	380	177	165

Side outlet
END (BS)

Size	HC	LC	HC1	LC1
VVS021	213	380	114	202
VVS030	313	380	180	202
VVS040	313	380	165	202
VVS055	413	380	137	202
VVS075	413	380	197	202
VVS100	613	380	158	127
VVS120	613	380	198	127

ADDITIONAL CONFIGURATION CUNCTIONS - VVS 021-650 - RECUPERATOR (HEX & PREMIUM PLUS), REGENERATOR (HEAT WHEEL), SUPPLY & EXHAUST

Dimension			Function version	Remaining configuration functions – typical lengths of function arrangement						
				VVS021	VVS030	VVS040	VVS055	VVS075	VVS100	VVS120
F	L	[mm]	F7/F9	762	762	762	762	762	762	762
			EU4/F5	366	366	366	366	366	366	366
H	L		H	366	366	366	366	366	366	366
C	L		C	366	366	366	366	366	366	366
S	L		S	1098	1098	1098	1098	1098	1098	1098
E	L		E(e1)	366	366	366	366	366	366	366
			E(e2)	762	762	762	762	762	762	762
			E(e3)	1098	1098	1098	1098	1098	1098	1098
M	L		M	762	762	762	762	762	762	762
W	L		W	1098	1098	1098	1098	1098	1098	1098

Dimension			Function version	Remaining configuration functions – typical lengths of function arrangement						
				VVS150	VVS180	VVS230	VVS300	VVS400	VVS500	VVS650
F	L	[mm]	F7/F9	762	762	762	762	762	762	762
			EU4/F5	366	366	366	366	366	366	366
H	L		H	366	366	366	366	366	366	366
C	L		C	366	366	366	366	366	366	366
S	L		S	1098	1098	1098	1098	1098	1098	1098
E	L		E(e1)	366	366	366	366	366	366	366
			E(e2)	762	762	762	762	762	762	762
			E(e3)	1098	1098	1098	1098	1098	1098	1098
M	L		M	1098	1098	1098	1098	1098	1098	1098
W	L		W	1098	1098	1098	1098	1098	1098	1098

COMPONENTS

DIRECT DRIVE PLUG FAN SET

Design and application

- Centrifugal fan, without casing, single inlet, PLUG type, with backward curved blades.
- Impeller made of SAN (styrene/ acrylonitryle) construction material with 20% glass fiber.
- Direct drive – fan impeller installed directly on motor shaft.
- Fan section consisting of single or multiple fans (fan array) in order to ensure optimum working parameters.

Specification

- Low and medium pressure ventilation systems with fan static pressure not exceeding 2000 Pascals.
- Maximum fan set working temperature: 60°C.

> AC MOTORS

- Fan and motor mounted on common housing, separated from AHU casing by set of rubber vibration absorbing mounts.
- Motors of TEFC type (Totally Enclosed, Fan-Cooled).
- Motors fitted for IEC standard.
- Variable Frequency Drive (VFD) – standard equipment of the fan-set.

- Available Energy classes: IE2, IE3
- Rated voltage: 3x230V AC, 3x400V AC.
- Number of poles: 2 or 4.
- Motor winding insulation class: F (fitted for VFD operations).
- Bearings lifetime: L_{10}= 20000h / L_{50} = 100000h.
- Protection degree: IP55.
- Maximum working ambient temperature: 60°C.

> EC MOTORS

- Set of fan and motor mounted on common rail, fixed to the AHU fan diaphragm.
- EC motors are Permanent Magnet motor, characterised by much higher efficiency vs traditional inductive AC motors.
- EC motors (Electronically Commutated) – where mechanical commutator switching the windings has been replaced with electronic one.
- Change of revolutions is done by means of changing the frequency rate of windings switching (rate or magnetic field rotating).
- Highly inductive permanent magnets have applied in EC motors used by VTS, which enabled to achieve high torque at relatively small dimensions, together with reaching IE4 efficiency class.

- Available Energy classes: IE4.
- Rated voltage: EC motors of nominal capacity exceeding 0,75kW - 3x400V AC.
- Rated voltage: EC motors of nominal capacity equal or less 0,75kW - 1x230V AC.
- Motor widing insulation class: F.
- Protection degree: IP54.
- Maximum working ambient temperature: 55°C.
- Lifespan:
  - 70 000 hours at load not exceeding 70% of nominal capacity at ambient temperature not exceeding 35°C,
  - 30 000 hours at 100% capacity load at ambient temperature not exceeding 55°C.

CASING

Design and application

- Casing structure made of 'sandwich' type panels formed in 'C' shape and reinforced by system of internal frames.
- "Sandwich"" double skin panels made of rigid polyurethane foam.
- Indoor and outdoor application.
- Inspection panels mounted on AHU side.
- Casing supported on steel base rails.

Specification

- Working temperature: (-40)°C ÷ (+90)°C.
- Panel thickness: 40mm.
- Thermal conductivity PPU λ= 0,022 W/mK.
- Casing fire resistance: non-flamable, non fire spreading (NRO).
- Moisture absorption: 0,04%.
- PPU density: ρ= 42kg/m³.
- Eurovent certification
  - Mechanical strength of casing: -1000 Pa ÷ 1000 Pa < 2mm (D_1 - PN EN 1886: 2008),
  - Casing tightness: (MB): (-400) Pa - 0,05 l/sm², (+700) Pa - 0,13 l/sm² (L_1 -PN EN 1886: 2008); (RU): (+400) Pa - 0,93 l/sm²,
  - Casing heat transfer coefficient: K= 0,6 W/m²K (T2 - PN EN 1886: 2008),
  - Thermal bridges coefficient: K_b =0,52 (TB_3 - PN EN 1886: 2008).

PANEL FILTERS

Design and application

- Pleated filtration fabric shielded by steel net, installed in 50 mm thick frame.
- Filtration fabric made of polyester fibres.
- Applied as initial air filtration stage.

Specification

- Working temperature: max (+70)°C, 100% RH.

Filtration classes available

- ISO Coarse 75% (ISO 16890) - G4 (EN779).

BAG FILTERS

Design and application

- Filtration fabric made of polyester fibres.
- Bags fixed to to 25 mm thick frame.
- Filters of class M5 - bags length: 300 mm, Filters of class F7 & F9 - bags length: 600 mm.
- Applied as initial, secondary of final air filtration stage.

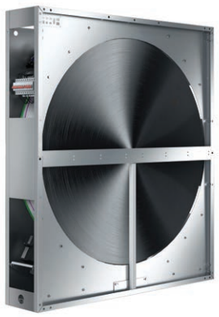
Specification

- Working temperature: max (+70)°C, 100% RH.

Filtration classes available

- ISO ePM10 50% (ISO 16890) - M5 (EN779).
- ISO ePM2,5 65% (ISO 16890) - F7 (EN779).
- ISO ePM1 70% (ISO 16890) - F9 (EN779).

ROTARY HEAT WHEEL



Design and application

- Rotor made of aluminum with shaft suspended on bearings, installed in steel housing.
- Rotor filling – two layers of alternately winded aluminium foil – one flat, the other – corrugated – making small ducts for the air.
- Rotor drive system with smooth revolutions control enabling to maintain highest recovery efficiency and to adjust degree of recovery performance.
- Purge zone reducing the cross-contamination effect of contaminated exhaust air to supply to absolute minimum.
- Set of gaskets installed both on the wheel outer edge and bar separating supply from exhaust air being an additional protection against cross-contamination.
- Rotary heat wheel recovers sensible heat from return air to supply, which passes the unit in opposite direction. The process enables heat recovery in winter time, same as cool recovery in summer.
- Humidity recovery from return to supply in case the rotor pad temperature is lower than dew point of return air – typically during winter season.

Specification

- Up to 86% of energy recovery, depending on airflow rate and its velocity in the heat wheel window.

COUNTERFLOW HEXAGONAL RECUPERATOR

Design and application

- Hexagonal heat recovery recuperator made of crosswise stamped aluminum plates, between which supply and exhaust air passes alternately in counterflow arrangement.
- As standard, the recuperator is equipped with by-pass damper, enabling its securing against frosting and heat recovery capacity regulation.
- Optionally, the recuperator can be equipped with integrated mixing box.
- The recuperator provides sensible heat recovery for warmer air to the colder one. For winter season – recovery of heat from return air to supply. For summer – recovery of chill from return air to supply.

Specification

- Energy recovery at very high supply and exhaust air stream separation (reaching 99,9%).
- Heat recovery reaching up to 93% depending on flow rate face velocity of the air passing the recuperator.

CROSSFLOW PLATE HEAT RECUPERATOR

Design and application

- Recuperator made of crosswise stamped aluminum plates, between which supply and exhaust air passes alternately in counterflow arrangement.
- As standard, the recuperator is equipped with by-pass damper, enabling its securing against frosting and heat recovery capacity regulation.
- Optionally, the recuperator can be equipped with integrated mixing box.
- The recuperator provides sensible heat recovery for warmer air to the colder one. For winter season – recovery of heat from return air to supply. For summer – recovery of chill from return air to supply.

Specification

- Energy recovery at very high supply and exhaust air stream separation (reaching 99,9%)
- Heat recovery reaching up to 80% depending on flow rate face velocity of the air passing the recuperator.

RUN-AROUND COIL

Design and application

- Set of two water coils – one in supply, the other one in exhaust airstream.
- The coil in return airstream recovers the heat (cooler) and passes it to the coil in the supply air (heater) by means of heat-transfer fluid (water-glycol mixture). In case of chill recovery, entire process is reversed.
- System applied for supply and exhaust air handling units installed remotely to each other."

Specification

- Indirect Energy recovery (sensible heat) at 100% supply and exhaust airstreams separation.
- Max heat-transfer fluid operation pressure: 1,6MPa=16bar (tested 21 bar).
- Max glycol concentration: 50%.

MIXIN SECTION

Design and application

- Section equipped with two air inlets/ outlets aided with dampers, enabling regulation of fresh and recirculation air share (recirculation).

Specification

- Direct Energy recovery (sensible and latent heat) resulting from partial mixing of fresh air with return one.
- Control of fresh air share in entire airflow supplied to handled spaces.
- Working temperature range: -40 ÷ +70°C.

WATER HEATER

Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the medium supply system).
- Heating of the air supplied to the handled spaces.
- Re-heating of the air as a part of air dehumidifying process.
- The coil can be applied if heating medium is available (local boiler or district heating system).
- Coil headers are equipped with medium damping valve and air vent.
- Connecting the coil in parallel medium flow vs air, will result in its capacity reduction by over a dozen percent.

Specification

- Max glycol concentration: 50%.
- Max medium temperature: 150°C.
- Max medium working pressure: 1,6MPa = 16bar (test: 21bar).
- Heating capacity: parameter resulting from individual performance calculaation of selected unit (CCOL).
- Medium side pressure drop – parameter resulting from individual performance calculation of selected unit (CCOL).

ELECTRIC HEATER

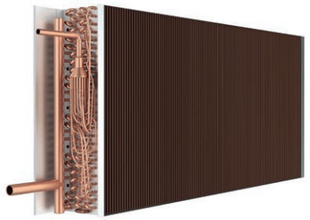
Design and application

- Set of resistive heating elements made of CR-Ni-Fe alloy, 6 kW/400V each.
- Coils mounted on hot-dip galvanized steel frame.
- Heater is equipped with power terminals and thermostat protecting against overheating.
- In case of AHU with complete controls, heater is equipped with integrated capacity control module.
- Heating capacity can be modified by means of smooth regulation module (HE module, set of Solid State Relays as optional parts of AHU controls) or by means of automatic engaging of next heating sections.

Specification

- Max permissible ambient temperature around heating elements: 65°C.

DIRECT EXPANSION COIL AS CONDENSER IN HEAT PUMP CIRCUIT



Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the cooling system circuit).
- Heating of the air supplied to the handled spaces.
- Re-heating of the air as a part of air dehumidifying process.

Specification

- Max medium temperature: 60°C.
- Max medium working pressure: 3,84MPa = 38,4bar (test: 50bar).
- Heating capacity: parameter resulting from individual performance calculaation of selected unit (CCOL).

WATER COOLER

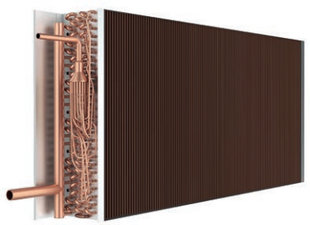
Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the medium supply system).
- Cooling of the air supplied to handled spaces.
- Cooling and dehumidifying of the air as a part of air complex dehumidifying process in summer season.
- Coil can be applied in complex air conditioning systems consisting of few or over a dozen of units supplied from common chilling source (chiller) or in case of single unit of relatively high cooling capacity.

Specification

- Max glyccol concentration: 50%.
- Min supplying medium temperature: +2°C.
- max medium working pressure: 1,6MPa = 16bar (test: 21bar).
- Cooling capacity: parameter resulting from individual parameters of selected unit (CCOL).
- Medium pressure drop / flow rate: parameter resulting from individual performance calculation of selected unit (CCOL).
- For reversed operationg mode (heating) max medium working temperature: 140°C.

DX COOLING COIL



Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the cooling system circuit).
- DX cooler is also available as heater execusion (so calleed Condenser).
- Cooling and dehumidifying of the air as a part of air complex dehumidifying process in summer season.
- Coil usually applied for smallerd cooling capacity systems vs water coolers or for individual air conditioning systems.

Specification

- Min. Refrigerant evaporation temperature: +3°C.
- Max refrigerant working pressure: 2,2MPa=22bar (test: 29 bar).
- Cooling capacity - parameter resulting from individual performance calculation of selected unit (CCOL).

EVAPORATIVE HUMIDIFIER

Design and application

- Humidifying process based on water adiabatic evaporation from the humidifier pad.
- Humidifying pad made of CELDEK II material.
- Humidifier housing made of stainless steel.
- System of direct water dropping (VVS021-VVS055).
- System of water recirculation aided by pump (VVS075-VVS650).
- Droplet eliminator integrated with humidifier filling (VVS075-VVS650).
- System is equipped with water drainage system preventing against high water level in the pan and floating valve controlling its refilling (VVS075-VVS 650).

Specification

- Max air face velocity across the humidifier pad: 3,00 m/s (VS 21-VS 55); 4,00 m/s (VS 75-VS 650).
- Water pressure range: 0,15 ÷ 0,75 MPa.
- Requirements regarding water quality – standard tap water.

SOUND ATTENUATING SECTION

Design and application

- Sound attenuator consists of noise attenuating bars installed in the AHU casing.
- Attenuating bars of 140 mm width filled with sound-absorbing, inflammable mineral wool (density: 60 and 80 kg/m^3).
- Attenuating bar housing: frame made of hot-dip galvanized steel.
- Bar outer surface: thin veil preventing against bar filling migration to the air.
- Number of attenuating bars: 2÷13, depending on block size.

Specification

- Max air face velocity: v=5m/s.
- Working conditions: -40 ÷ +70°C.".

INTERNAL LIGHT

Design and application

- Energy saving lamp with securing shade.
- Facilitation of AHU inspection actions: filter, fan and humidifier compartment.

Specification

- Working conditions: -40 ÷ +70°C.

AIR DAMPER

Design and application

- Blades made of aluminium with rubber gasket on the edges.
- Aluminum frame.
- Blades drive realized by means of gears made of composite material, installed on frame internal side.
- Damper is equipped with square pivot, fitted for actuator (dampers of cross section greater than 4 m^2 have 2 linked pivots).

Specification

- Air leakage at closted damper: 50 m^3/h*m^2 - at 100 Pascals of pressure difference.
- Workint temperature range: -40 ÷ +70°C.

FLEXIBLE CONNECTION

Design and application

- Flexible connection made of 1 mm thick and 30 mm wide hot-dip galvanized steel profiles and polyester fabric coated with PVC.
- Flame resistance: UL94 - HB [ISO 1210].
- Flexible connection resistant to UV radiation.
- Working temperature range: -30°C do +70°C.
- Max connection length (fully spread position): 110 mm.
- Flexible connection installed on each AHU/Duct joint eliminates transfer of possible AHU vibrations to the ventilation ductwork.

Specification

- Max air face velocity: 5m/s.
- Working conditions: -40 ÷ +70°C.

AIR INTAKE AND DISCHARGE LOUVERS

Design and application

- Air intake louver made of aluminum profile, blades made of ABS material.
- Air outlet louver made of aluminum profile, blades made of ABS material.
- Protection of air handling unit installed outdoor against meteorological conditions (precipitation, sand).

Specification

- Max air face velocity: 5m/s.
- Working conditions: -40 ÷ +70°C.

CONTROLS

All controls for VENTUS air handling units is available as optional equipment.

Range of controls is always fitted to configuration of the AHU selected in the CCOL4 tool. Controls is capable to regulate all user parameters: air temperature, its humidity, maximum permissible CO_2 concentration and the flow rate. Also, controls support preventive and securing functions like protection of the water heater against freezing or energy recovery system against icing, protection of motors against overloading, monitoring of air filters actual status of contamination and many other. Applied algorithms can optimize performance of all air treatment components in order to minimize consumption of all energy media supplied to the unit.

The system includes control and power supply circuit.

HMI Basic

- Engaging and disengaging the AHU, change of operational modes.
- Change of temperature, airflow, humidity, max CO_2 level settings, etc.
- Errors reporting.
- Time schedule setting.

HMI Advanced

- All users and service functions except visualization
  - AHU engaging and disengaging,
  - Change of operational modes.
- Change of temperature, airflow, humidity, max CO2 level settings, etc.
- Parameters setting and reporting.
- Errors reporting.
- Time schedule setting.

USER

BMS

- User function like in HMI Advanced.
- User's customized visualization (BMS).

Remote visualization

- All user function like in HMI Advanced:
  - VTS visualization.
- Clear interface of schedule programming, presenting unit's operating time individually for each day of the week.
- Energy consumption analysing module.
- Individual parameters monitoring of each functional block.
- Filing of all AHU's parameters recorded in few minutes intervals.

PAREMETERS REGULATION FUNCTIONS

Regulation of temperature and humidity

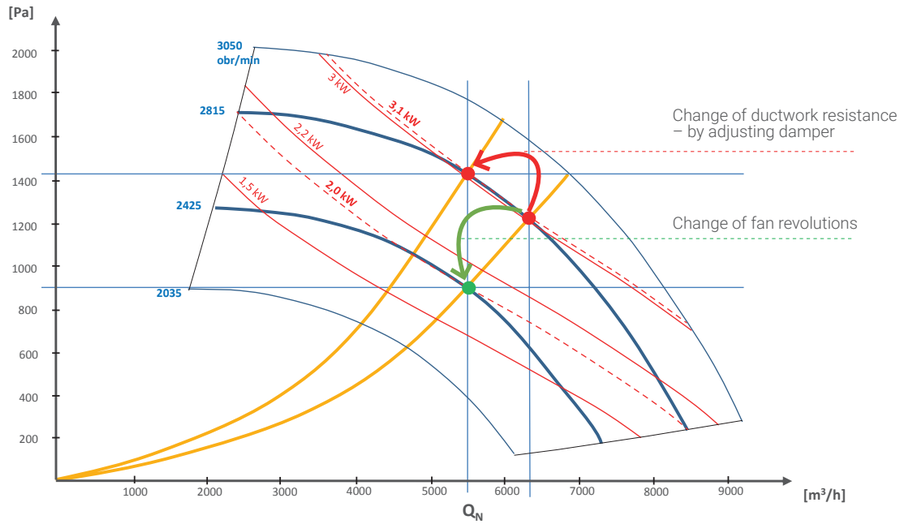
- Regulation of supply, return air temperature and humidity in handled spaces.
- Control of water coils valves (heater, cooler) and condensing unit.
- Control of rotary heat wheel revolutions, by-pass damper and mixing box, depending on AHU type and configuration.

Airflow rate regulation

- Constant Air Volume (CAV) available as standard.
- Constant static pressure maintenance in trunk duct (Variable Air Volume – VAV) available as option.
- Setting of constant revolutions for each fan individually – VFD setting for AC motors or constant revolutions percentage in case of EC motors.

CO_2 regulation

- By means of mixing box – for units with air recirculation.
- By means of airflow rate change – for all types of supply and exhaust units (function can be engages together with mixing box control).



PROTECTION FUNCTIONS

- Protection against rotary heat wheel icing, by means of wheel revolutions reduction.
- Protection against hexagonal counterflow and cross-flow recuperator icing by means of by-pass damper opening. Functions realized as optional:
  - Optimizing of icing protection function by change of minimum return air temperature threshold downstream the energy recovery unit vs return air parameters.
  - Minimizing of recovery efficiency drop during defrosting
- Anti-freezing protection of water heater
  - Antifreeze thermostat installed downstream the heater
  - Strap-on return water temperature sensor
- Fans overload protection (functions realized by EC motors drives)
- Fire alarm input – AHU immediate disengaging in case of lack of external start permission from overall fire protection system.

PREVENTIVE FUNCTIONS

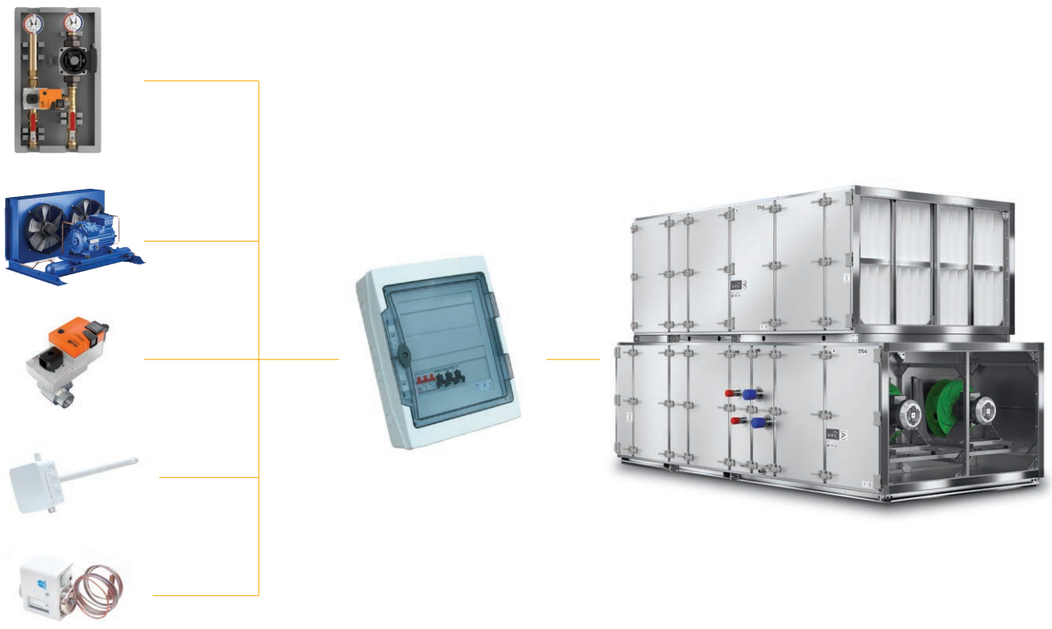
- Constant filter contamination status control:
  - Constant monitoring of filter pressure drop by means of static pressure transducers,
  - Evaluation of filter contamination status for vs actual airflow rate.
- Fans shutting-down delay – fan's run out for systems with electric heater
- Water heater pre-heating before fun's start up.
- Periodical heater pump engaging in summer – to prevent against limescale accumulation
- Opening of water heater regulation valve before engaging the fans.

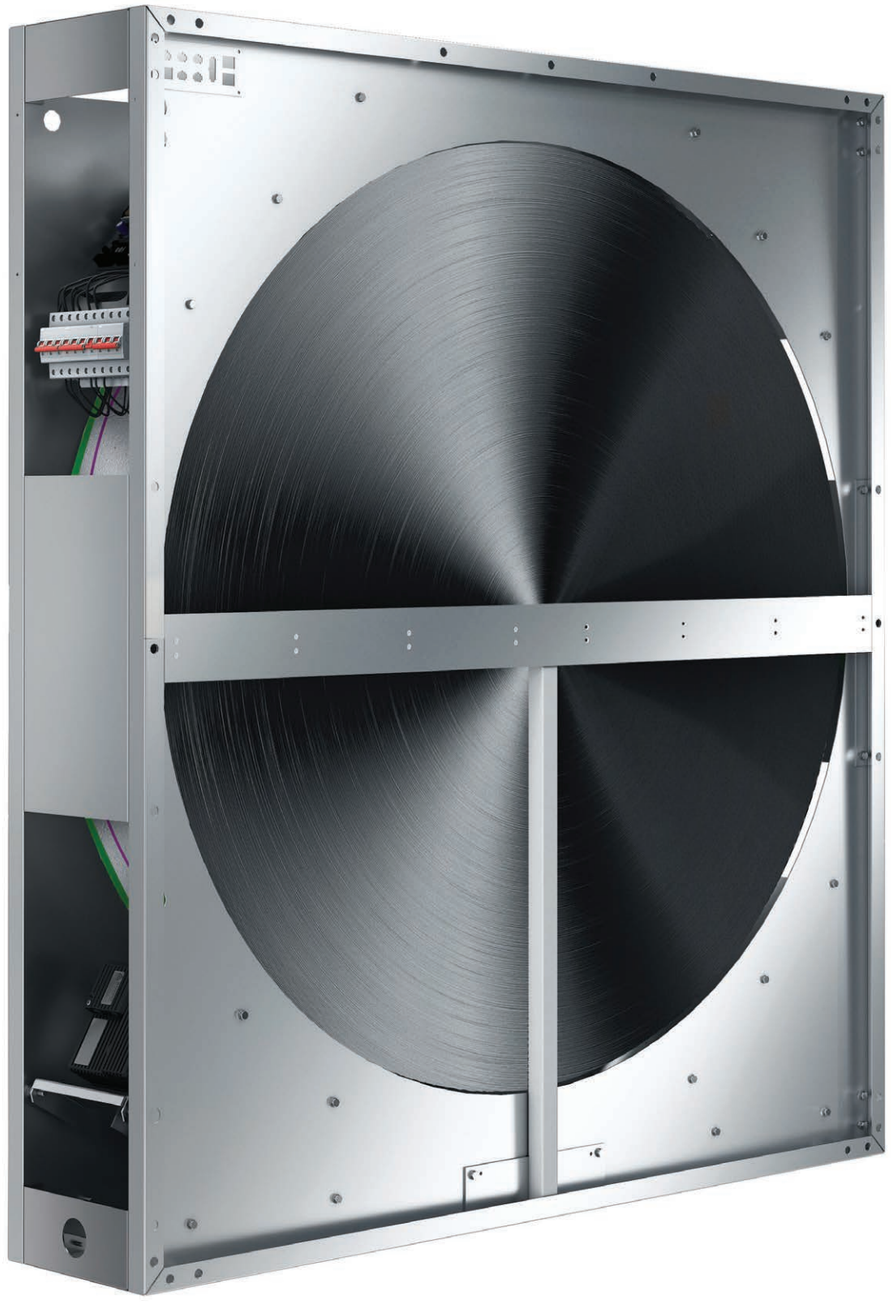
TIME SCHEDULE FUNCTIONS

- Weekly schedule operational modes programming (HMI Advanced i Basic).
- Clear visualization of schedule settings by means of web-browser (computers and mobile devices).

POWER SUPPLY AND CONTROL CIRCUITS

- The mains component of the controls is the control box – with microprocessor controller installed inside. The control box is usually mounted on side wall of the AHU or in units direct vicinity.
- Control box is equipped with controller, power protection circuits, terminal block enabling connecting of all control elements.
- Electric protection of fans, rotary heat wheel drive, control elements and heater pump are installed inside the control box.
- Control of fan-sets (variable frequency drives in case of AC motors of specialized drives for EC ones) is realized by means of digital communication based on ModBUS protocol. Fan control elements are set with individual address enabling them to be properly identified in the control system.
- Communication with static pressure and CO2 transducers also realized by ModBUS protocol.
- For other control elements, digital or analogue signals are used.





CONTROL ELEMENTS

CONTROL ELEMENTS

Functions and application

- Regulation of supply and exhaust air temperature.
- Protection of the energy recovery unit against freezing.
- Outdoor air temperature measurement in order to identify need of heat/chill recovery and engagement protecting function for water heater.

Operational parameters

- Measurement range: -50°C to +90°C.
- Measurement accuracy: ±0,5K.
- Sensor type: NTC 10k.
- Air humidity range: 5 ÷ 100%.
- Protection degree: IP67.
- Shielded cable length: max. 100 m.

ROOM AIR TEMPERATURE SENSOR

Functions and application

- Regulation o temperature in handled space.

Operational parameters

- Measurement range: -20°C do +70°C.
- Measurement accuracy: ±0,5K.
- Sensor type: NTC 10k.
- Air humidity range: 5 ÷ 95% no condensation.
- Protection degree: IP20.
- Shielded cable length: max. 100 m.

STRAP-ON MEDIUM TEMPERATURE SENSOR

Functions and application

- Protection of water heater against freezing by means of return medium temperature monitoring.

(Function supported by controller. Sensor out of VTS offer.)

Operational parameters

- Measurement range: -20°C do +70°C.
- Measurement accuracy: ±0,5K.
- Sensor type: NTC 10k.
- Air humidity range: 5 ÷ 100%.
- Protection degree: IP67.
- Shielded cable length: max. 100 m.

ANTI-FREEZE THERMOSTATE

Functions and application

- Protection of water heater against freezing by means of air off-coil temperature monitoring (recommended temperature threshold setting: +5°C).

Operational parameters

- Measurement range: -18 ÷ +15°C.
- Hysteresis: 1,7 ÷ 12K.
- Nominal voltage: 30V DC or 230V AC.
- Output signal: potential-free contact.
- Protection degree: IP 44.

OVERHEAT PROTECTION THERMOSTATE FOR ELECTRIC HEATER

Functions and application

- Protection of electric heater against overheating.

Operational parameters

- Power cut-off temperature setpoint: 65°C.
- Power re-switch on temperature setpoint : 45°C.
- Nominal voltage: 20V DC or 230V AC.
- Output signal: potential-free contact.

DIFFERENTIAL PRESSURE SWITCH

Functions and application

- Monitoring of filter's contamination.
- Control of the operation of a direct driven fan unit in case of cooperation with electric heater.

Operational parameters

- Measurement range: 30 do 500 Pa.
- Nominal operating voltage: 250V AC (Imax=3A).
- Output signal: potential free contact.
- Working temperature range: -20°C do 60°C.
- Protection degree: IP 54.

FILTER CONTAMINATION INDICATOR

Functions and application

- Measurement of air pressure drop on filters, activated manually (button).
- Signal light (LED) informing about exceeding pressure drop thresholds.
- Low battery warning light signal.

Operational parameters

- Max. Pressure difference: 800 Pa.
- Accuracy: 2,5% of the range.
- Protection degree (interface side): IP 65.

DIFFERENTIAL PRESSURE TRANSDUCER

Functions and application

- Regulation of supply and exhaust air (CAV function).
- Regulation of static pressure in ventilation system trunk duct (VAV function).
- Constant monitoring of filter pressure drop (control of filter contamination level).

Operational parameters

- Measurement range: 6000 Pa.
- Measurement accuracy: 0,25% of the range.
- Communication: ModBus RTU.
- Supply voltage: 21,5V to 30V DC or 21,5V do 26,5V AC.
- Working temperature range: -20°C do 50°C.
- Protection degree: IP 65.

AIR HUMIDITY TRANSDUCER

Functions and application

- Regulation of supply and return air humidity in handled spaces (support for air humidyfing and dehumidyfing).
- Measurement of return air humidity – automatic change of anti-freeze threshold temperature setting of cross-flow recuperator depending on return air parameters*.

Operational parameters

- Measurement range: 0-100%.
- Tolerance: +/- 3%.
- Communication: ModBus RTU.
- Supply voltage: 24V DC.
- Working temperature: -40°C to 80°C.
- Protection degree: IP 65.

* Also available as integrated with air temperature sensor

CO_2 TRANSDUCER

Functions and application

- Regulation of CO_2 concentration in handled spaces (control of mixing box or airflow rate).

Operational parameters

- Measurement range: 0 do 2000 ppm.
- Tolerance:
  - between 400 and 1250 ppm: +/-3%,
  - between 1250 and 2000 ppm: +/-5%.
- Communication: ModBus RTU.
- Supply voltage: 24V DC.
- Working temperature: 0 do 50°C.
- Protection degree: IP 54.

ON/OFF DAMPER ACTUATOR

Functions and application

- Airflow opening or closing in the AHU (connectors of air intake and discharge) – for units with water heater actuators with return spring are applied.

Operational parameters

- Regulation mode: ON/OFF (two-point).
- Angle of rotation: 90°.
- Torque: 16 Nm (max damper cross-section: 4 m^2).
- Full open/close time: 120 s (with spring: 10 s).
- Supply voltage: 24V AC/DC.
- Working temperature: -20°C do 50°C.
- Protection degree: IP 54.

SMOOTH CONTROL DAMPER ACTUATOR

Functions and application

- Smooth regulation of return and fresh air mixing (recirculation) – for units with water heater actuators with return spring are applied.
- Protection of cross-plate or hexagonal recuperator against frosting – smooth regulation of by-pass damper opening.

Operational parameters

- Regulation mode: 0 do 100% (smooth).
- Control signal: 0-10V.
- Angle de rotation: 90°.
- Torque: 16 Nm (max damper cross-section: 4 m2).
- Full open/close time: 90s (with spring: 10 s).
- Supply voltage: 24V AC/DC.
- Working temperature: -20°C do 50°C.
- Protection degree: IP 54.

SET FOR WATER HEATER CAPACITY REGULATION (PUMP GROUP)

Functions and application

- Smooth regulation of water heater capacity.

Operational parameters

- Regulation mode: 0 to 100% (smooth).
- Control signal: 0-10V.
- Full open/close time: 90 s.
- Valve supply voltage: 24V AC/DC.
- Pump supply voltage: 230V AC.
- Working temperature: +5°C do 50°C.
- Medium temperature range: -10°C to 120°C.
- Max glycol concentration: 50%.
- Protection degree: IP 54.

THREE-WAY VALVE FOR WATER HEATER OR COOLER

Functions and application

- Smooth regulation of water heater or cooler capacity.

Operational parameters

- Regulation mode: 0 do 100% (smooth).
- Control signal: 0-10V.
- Full open/close time: 90 s.
- Valve supply voltage: 24V AC/DC.
- Working temperature: +5°C do 50°C.
- Medium temperature range: -10°C do 120°C.
- Max glycol concentration: 50%.
- Protection degree: IP 54.

ELECTRIC HEATER CONTROL MODULE – MHE TYPE

Functions and application

- Power supply, protection and smooth regulation of electric (heating) capacity of multi-stage electric heaters by means of PWM (Pulse Width Modulation).

Operational parameters

- Regulation mode: 0 to 100% (smooth).
- Nominal voltage: 3*400V/50Hz.
- Control circuits supply voltage: 24V AC.
- Binary input signal: 3 x 24V DC.
- Binary output signal 6 x 24V DC.
- PWM 1 x 24V DC.
- Working temperature: 0°C do 50°C.

VARIABLE FREQUENCY DRIVE

Functions and application

- Smooth regulation of fan-set capacity.
- "Soft-start" of the fan without mechanical and electric shock.
- Motor protection against overloading and stucking.

Operational parameters

- Frequency regulation range: 10 ÷ 100 Hz.
- Communication: ModBus RTU RS485.
- Supply voltage:
  - single-phase 200 ÷ 240V AC,
  - three-phase 380 ÷ 480V AC.
- Working temperature: 0°C to 40°C.
- Protection degree: IP 20.

HMI BASIC USER INTERFACE

Functions and application

- Maintenance of Air handling unit – temperatures setting and reading, change of operating modes, independent time schedule management, alarm codes displaying.
- Configuration of controller's universal inputs and outputs.

Operational parameters

- Power supply directly from the controller.
- Communication with controller – RS485 serial port.
- Max length of communication cable: max. 500 m.
- Working temperature: -20°C to 60°C.
- Humidity: <85% (no condensation).
- Protection degree: IP 31.

HMI ADVANCED USER INTERFACE

Functions and application

- Maintenance of Air handling Unit – parameters setting and reading (temperature, airflow, CO_2, humidity etc), change of operational modes.
- Weekly schedule programming.
- Service maintenance – configuration of all advanced AHU operating parameters, configuration controllers universal inputs and outputs.
- Remote configuring of variable frequency drives.
- AHU alarms and errors monitoring (full text description) and cancelling.

Operational parameters

- Power supply directly from the controller
- Communication with controller – RS485 serial port
- Max length of communication cable: max. 1200 m,
- Working temperature: -20°C to 60°C.
- Humidity: <85% (no condensation).
- Protection degree: IP 20.

SUPPLY AND CONTROL BOX

Functions and application

- Control of all components and processes of Air Handling Unit, especially realization of regulation (temperature, airflow, CO_2, humidity) and protection functions (anti-freezing of energy recovery heat exchanger or water heater, fan-sets overloading etc).
- Alarms handling, self-diagnostics.
- Filling of all operating parameters history.
- Communication with user interfaces (HMI).

Operational parameters

- Supply voltage: 3x400 VAC or 1x230 V AC.
- Supply frequency: 50 Hz, +/- 1 Hz.
- Control circuits supply voltage: 24 V AC.
- Water heater pump supply voltage: 230 V AC (max.10A).
- Communication with internal controls circuits, VFD's or EC motors controller: ModBus RTU.
- ModBus communication: TCP/IP.
- Working temperature: 0 to 50°C.
- Humidity: <85% (no condensation).
- Protection degree: IP 54.

EUROVENT CERTIFIED PERFORMANCE
AHU N° 06.06.320
www.eurovent-certification.com

04

VENTUS Compact

SUSPENDED UNITS

Unit size

		AIRFLOW [m³/h]	LENGTH [mm]	WIDTH [mm]	HEIGTH [mm]
VVS030s		900 - 3 300	1 828	2 160	490
VVS020s		600 - 2 200	1 828	1 610	490
VVS015s		450 - 1 650	1 500	1 550	400
VVS010s		300 - 1 100	1 500	1 150	400
VVS005s		150 - 650	1 230	790	400

MINERAL WOOL INSULATION

HIGHLY EFFICIENT HEX COUNTER-FLOW HEAT RECOVERY

ENERGY SAVING AND SILENT FANS WITH EC MOTORS

PLUG&PLAY PRODUCT

INTEGRATED MULTIFUNCTIONAL CONTROLS

up to **93%** of energy recovery efficiency

FLOOR-MOUNTED UNITS

Unit size

	VVS021c	VVS030c	VVS040c	VVS055c	VVS075c	VVS100c	VVS120c	VVS150c
AIRFLOW [m³/h]	840 - 2310	900 - 3300	1200 - 4400	1650 - 6050	2250 - 8250	3000 - 11000	3600 - 13200	4500 - 16500
LENGTH [mm]	1240	1240	1240	1240	1240	1300	1300	1300
	1080	1080	1080	1080	1080	1300	1300	1300
	1080	1080	1080	1080	1080	1080	1080	1080
	2 230	2 230	2 230	2 290	2 530	2 570	2 670	2 730
	2 230	2 230	2 230	2 290	2 530	2 570	2 670	2 730
	2 500	2 500	2 500	2 560	2 800	2 800	2 900	2 940
WIDTH [mm]	967	967	1174	1345	1486	1666	1897	2091
HEIGTH [mm]	991	1255	1255	1525	1765	1965	2039	2241

MINERAL WOOL INSULATION

HIGHLY EFFICIENT ROTARY AND HEX COUNTER-FLOW HEAT EXCHANGER

ENERGY SAVING AND SILENT FANS WITH EC MOTORS

PLUG&PLAY PRODUCT

INTEGRATED MULTIFUNCTIONAL CONTROLS

up to **86%** of energy recovery efficiency with rotary heat exchanger

up to **93%** of energy recovery efficiency with hex counter-flow heat exchanger

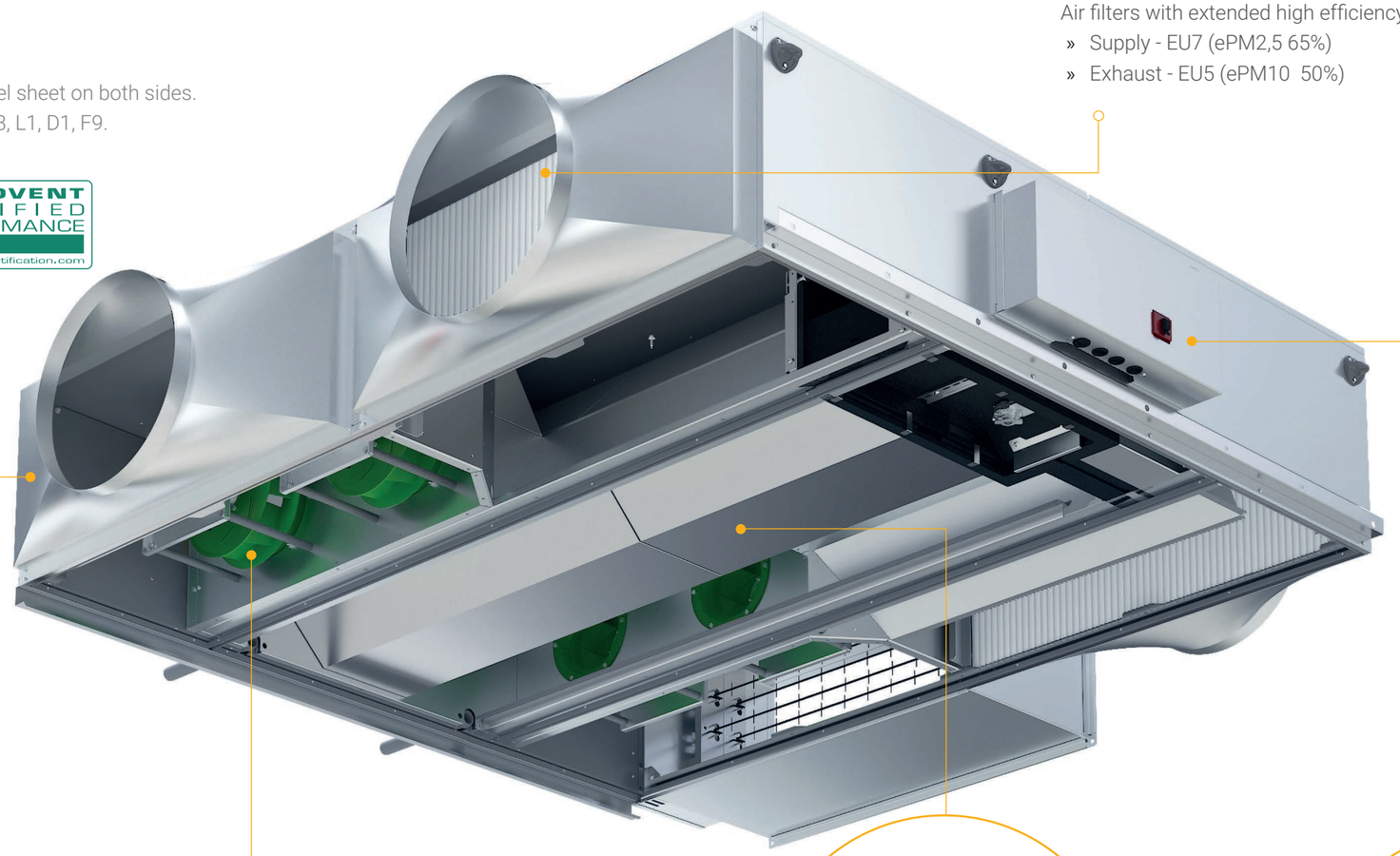
VENTUS Compact

SUSPENDED UNITS

CASING

» Panels filled with mineral wool, enclosed with steel sheet on both sides.
» Casing parameters according to EN 1886: T2, TB3, L1, D1, F9.

EUROVENT CERTIFIED PERFORMANCE
AHU N° 06.06.320
www.eurovent-certification.com



MINI-PLEAT FILTERS

Air filters with extended high efficiency filtration surface.

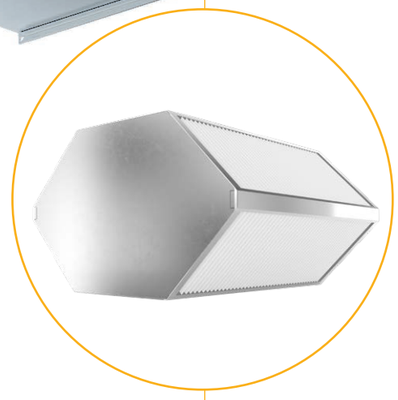
» Supply - EU7 (ePM2,5 65%)
» Exhaust - EU5 (ePM10 50%)

EC MOTORS

Efficient, silent and low vibrations fan with electronically commutated motor in a IE4 class.

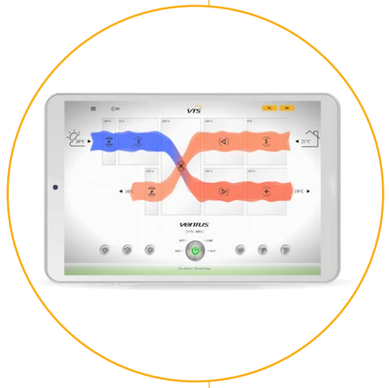
A B C D E

up to **93%** drive efficiency



ENERGY RECOVERY

» Highly efficient counterflow hex recovery with by-pass.
» Recovery efficiency reaching 93%



CONTROLS

Multifunctional controls, integrated with the unit – fully pre-configured and ready to run.

VENTUS Compact

FLOOR-MOUNTED UNITS

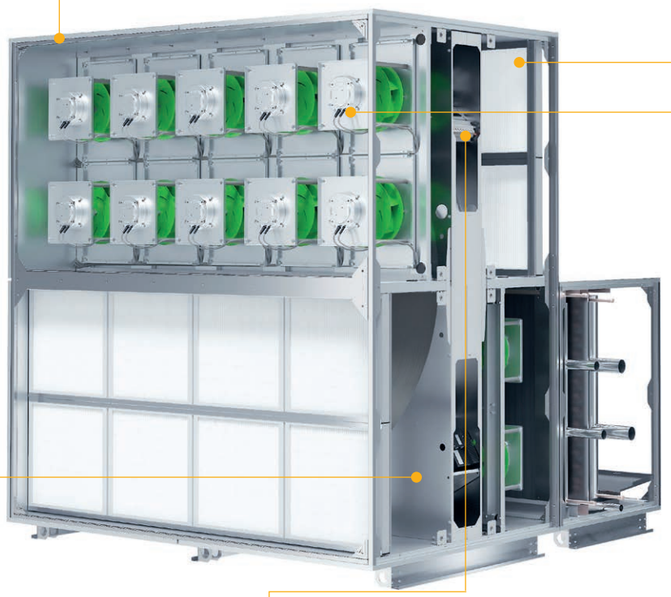
CASING

» Panels filled with mineral wool, closed with steel sheet on both sides.
» Casing parameters according to EN 1886: T2, TB3, L1, D1, F9.

MINI-PLEAT FILTERS

High performance filters with wide active filtration cross-section.

» Supply - EU7 (ePM2,5 65%)
» Exhaust - EU5 (ePM10 50%)



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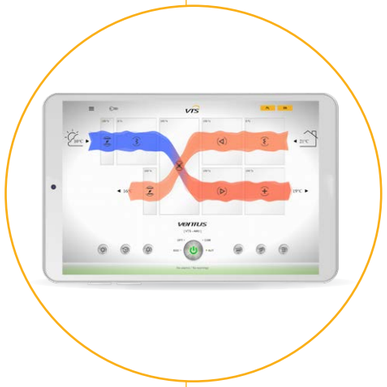
A B C D E
up to 93% drive efficiency



ENERGY RECOVERY

» Highly efficient heat wheel driven by EC motor.
» Recovery efficiency reaching 86%

CONTROLS

Multifunctional controls, integrated with the unit – fully pre-configured and ready to run.

ENERGY RECOVERY

» Highly efficient counterflow hex recovery with by-pass.
» Recovery efficiency reaching 93%

EC MOTORS

Efficient, silent and low vibrations fan with electronically commutated motor in a IE4 class.

VVS 005s-030s - SUSPENDED COMPACT UNITS

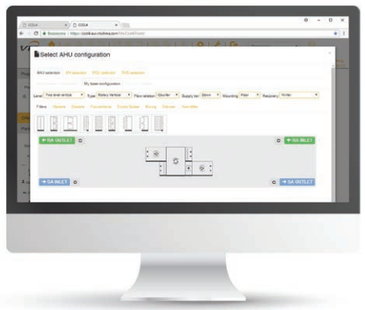
Nominal parameters		Recommended airflow range				
Unit size		VVS005s	VVS010s	VVS015s	VVS020s	VVS030s
	[m³/h]	Hex 005s	Hex 010s	Hex 015s	Hex 020s	Hex 030s
Min airflow	[m³/h]	150	300	450	600	900
Max airflow	[m³/h]	650	1 100	1 650	2 200	3 300
H	[mm]	400	400	400	490	490
W	[mm]	395	575	775	805	1080
H_i	[mm]	320	320	320	410	410
W_i	[mm]	335	515	715	745	1020
W_2	[mm]	790	1150	1550	1610	2160
l	[mm]	30	30	30	30	30

Dimension			Function version	Length of selected configurations				
FPV/FPV_cd	Lt	[mm]	Counterflow hexagonal recuperator	1230	1500	1500	1828	1828

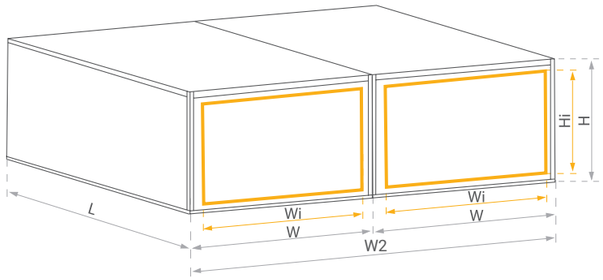
Selected configurations	Dimension		Function version	Length of supply and exhaust compact units				
V	L	[mm]	V	460	460	460	460	460
FV	L	[mm]	FV	740	740	740	740	740
FHV	L	[mm]	FH(hw)V	740	740	740	740	740
	L	[mm]	FH(el)V	1030	1030	1030	1030	1030
FCV	L	[mm]	FCV	860	860	860	860	860
	L	[mm]	FC(de)V	1030	1030	1030	1030	1030
FHCV	L	[mm]	FH(hw)CV	1030	1030	1030	1030	1030
	L	[mm]	FH(hw)C(de)V	1230	1230	1230	1230	1230
	L	[mm]	FH(el)CV	1030	1230	1230	1380	1380
	L	[mm]	FH(el)C(de)V	1230	1380	1380	1450	1450

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

www.ccol4.com



DIMENSION - VVS 005s-030s - SUSPENDED COMPACT UNITS



Duct fittings

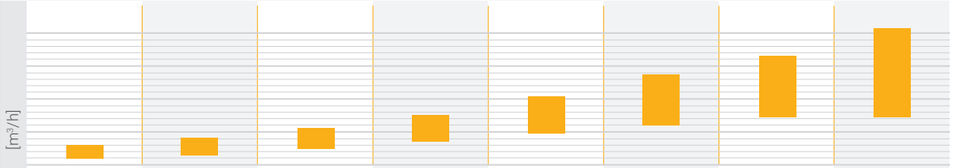
Dimension [mm] Wi x Hi / Di	VVS005s	VVS010s	VVS015s	VVS020s	VVS030s
Flexible connection	305x288	485x288	685x288	730x375	1005x375
Air damper	305x288	485x288	685x288	730x375	1005x375
Rectangular spigot	330x310/300x300	510x310/400x350	710x310/400x350	740x400/500x400	1015x400/800x400
Round spigot	330x310/355	510x310/355	710x310/355	740x400/450	1015x400/450
Air intakes and outles	335x318	515x318	715x318	743x408	1018x408

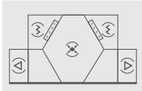
Length of additional air treatment functions

Selected configurations			Function version	Length of selected configurations				
				VVS005s	VVS010s	VVS015s	VVS020s	VVS030s
F	L	[mm]	F9	180	180	180	180	180
H	L	[mm]	H(hw) (1R-2R)	180	180	180	180	180
			H(el)	370	370	370	370	370
C	L	[mm]	C (2R-6R)	370	370	370	370	370
	L	[mm]	C(de) (2R-6R)	600	600	600	600	600
HC	L	[mm]	H(hw)C	460	460	460	460	460
			H(el)C	740	740	740	740	740
			H(hw)C(de)	600	460	460	460	460
			H(el)C(de)	860	740	740	740	740
E	L	[mm]	E(e1)	370	460	460	460	460
			E(e2)	740	740	740	740	740

VVS 021c-150c - FLOOR MOUNTED COMPACT UNITS

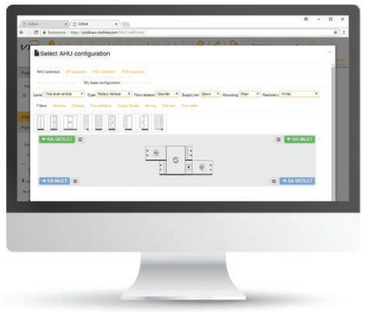
Nominal parameters		Recommended airflow range							
Unit size		VVS021c	VVS030c	VVS040c	VVS055c	VVS075c	VVS100c	VVS120c	VVS150c
Min airflow	[m³/h]	806	1 167	1 958	2 878	3 805	4 863	5 815	5 815
Max airflow	[m³/h]	2 310	3 300	4 400	6 050	8 250	11 000	13 200	16 500
H_{fd}	[mm]	90	90	90	90	90	90	90	90
H	[mm]	538	670	670	805	925	1025	1062	1163
W	[mm]	967	967	1174	1345	1486	1666	1897	2091
H_i	[mm]	368	500	500	635	755	855	892	993
W_i	[mm]	887	887	1094	1265	1406	1586	1817	2011
H_2	[mm]	986	1250	1250	1520	1760	1960	2034	2236
l	[mm]	40	40	40	40	40	40	40	40



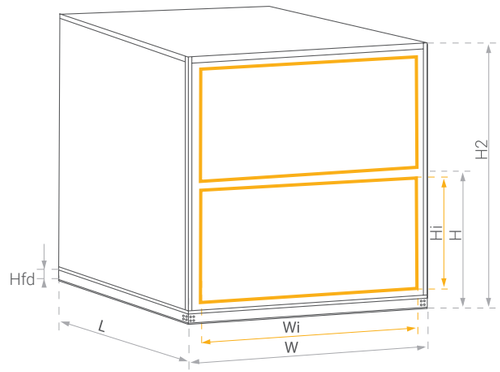
Selected configurations		Dimension of base configuration							
	Lt	1240	1240	1240	1240	1240	1300	1300	1300
	Lt	1080	1080	1080	1080	1080	1300	1300	1300
	Lt	1080	1080	1080	1080	1080	1080	1080	1080
	L2	2 230	2 230	2 230	2 290	2 530	2 570	2 670	2 730
	L1	2 050	2 050	2 050	2 110	2 350	2 350	2 450	2 490
	K	180	180	180	180	180	220	220	240
	Lt	2 230	2 230	2 230	2 290	2 530	2 570	2 670	2 730
	L2	2 230	2 230	2 230	2 290	2 530	2 570	2 670	2 730
	L1	2 050	2 050	2 050	2 110	2 350	2 350	2 450	2 490
	K	180	180	180	180	180	220	220	240
	Lt	2 230	2 230	2 230	2 290	2 530	2 570	2 670	2 730
	L2	1 600	1 600	1 600	1 660	1 900	1 900	2 000	2 040
	L1	2 500	2 500	2 500	2 560	2 800	2 800	2 900	2 940
	K								
	Lt	2 500	2 500	2 500	2 560	2 800	2 800	2 900	2 940

Entire range of configuration
in ClimaCAD OnLine 4 selection tool.

www.ccol4.com



DIMENSION - VVS 021c-150c - FLOOR MOUNTED COMPACT UNITS



Full face horizontal air inlet / outlet
END Full Front (FF) Full face air inlet / outlet

Size	WA	HA	WA1	HA1
VVS021c	821	313	70	67,5
VVS030c	821	440	70	70
VVS040c	1028	440	70	70
VVS055c	1199	575	70	70
VVS075c	1340	695	70	70
VVS100c	1520	795	70	70
VVS120c	1751	832	70	70
VVS150c	1945	933	70	70

Lengths of additional air treatment functions

Selected configurations			Function version	Other configuration functions - typical lengths.							
				VVS021c	VVS030c	VVS040c	VVS055c	VVS075c	VVS100c	VVS120c	VVS150c
V	L	[mm]	F9	240	240	240	240	240	240	240	240
H	L	[mm]	H(hw) (1R-2R)	370 - 710	370 - 710	370 - 710	310 - 630	310 - 630	310 - 630	310 - 630	310 - 630
			H(el)	370 - 710	370 - 710	370 - 710	310 - 630	310 - 630	310 - 630	310 - 630	310 - 630
C	L	[mm]	C (2R-4R)	370 - 710	370 - 710	370 - 710	450 - 790	450 - 790	890	890	920
			C (6R)	370 - 710	370 - 710	370 - 710	450 - 790	450 - 790	890	890	920
HC	L	[mm]	H(hw) + C	710	710	710	790	790	890	890	920
			H(el) + C	710	710	710	790	790	890	890	920
S	L	[mm]	S(s3)	1080	1080	1080	1080	1080	1080	1080	1080
E	L	[mm]	E	550	550	550	630	630	650	650	670

COMPONENTS

DIRECT DRIVE PLUG FAN SET

Design and application

- Single inlet, radial, backward curved, free running fan.
- Impeller made of SAN (styrene/ acrylonitryle) construction material with 20% glass fiber.
- Direct drive – fan impeller installed directly on motor shaft.
- Fan section consisting of single or multiple fans (fan array) in order to ensure optimum working parameters.

Specification

- Low and medium pressure ventilation systems with fan static pressure not exceeding 2000 Pascals.
- Maximum fan set working temperature: 60°C.

> EC MOTORS

- Set of fan and motor mounted on common rail, fixed to the AHU fan diaphragm.
- EC motors are Permanent Magnet motor, characterised by much higher efficiency vs traditional inductive AC motors.
- EC motors (Electronically Commutated) – where mechanical commutator switching the windings has been replaced with electronic one.
- Change of revolutions is done by means of changing the frequency rate of windings switching (rate or magnetic field rotating).
- Highly inductive permanent magnets have applied in EC motors used by VTS, which enabled to achieve high torque at relatively small dimensions, together with reaching IE4 efficiency class.
- Available Energy classes: IE4.
- Rated voltage: EC motors of nominal capacity exceeding 0,75kW - 3x400V AC.
- Rated voltage: EC motors of nominal capacity equal or less 0,75kW - 1x230V AC.
- Motor widing insulation class: F.
- Protection degree: IP54.
- Maximum working ambient temperature: 55°C.
- Lifespan:
  - 70 000 hours at load not exceeding 70% of nominal capacity at ambient temperature not exceeding 35°C,
  - 30 000 hours at 100% capacity load at ambient temperature not exceeding 55°C.

CASING > SUSPENDED COMPACT UNITS

Design and application

- Casing structure made of „sandwich" panels mounted to internal supporting structure.
- Panel thickness: 40 mm.
- Sheet thickness: Outer: 0.6 mm, Inner: 0.4 mm
- "Sandwich" double skin panels made of mineral wool covered on both sides with sheet metal.
- Indoor application
- Inspection panels mounted on top and bottom of the unit (maintenance from bottom).
- Casing designed to be suspended above false ceilings, equipped with elements facilitating its installation.

Specification

- Working temperature: (-40)°C ÷ (+60)°C.
- Panel thickness: 40mm.
- Thermal conductivity PPU λ= 0,039 W/mK.
- Casing fire resistance: A1 (EN 13162:2012 + A1:2015 (EN 13501-1)
- Moisture absorption:
  - short term: WS, Wp: ≤ 1 kg/m² (EN 13162:2012 + A1:2015 (EN 1609)
  - long term: WL(P), Wlp: ≤ 3 kg/m² (EN 13162:2012 + A1:2015 (EN 12087)
- PPU density: ρ= 80kg/m³.
- Corrosion protection:
  - Exterior: AZ150 (Aluzinc) coating, Coating thickness> = 150 g / m² with an additional organic coating.
  - Inside side: Coating Z140 (zinc), Coating thickness> = 140 g / m²
- Certified by Eurovent

CASING > FLOOR MOUNTED COMPACT UNITS

Design and application

- Casing structure made of „sandwich" panels mounted to internal supporting structure.
- Casing supported on base ralis or blocks.
- Panel thickness: 40 mm.
- Sheet thickness: Outer: 0.6 mm, Inner: 0.4 mm
- "Sandwich" double skin panels made of mineral wool covered on both sides with sheet metal.
- Indoor and outdoor application.
- Inspection panels mounted on AHU side.

Specification

- Working temperature: (-40)°C ÷ (+60)°C.
- Panel thickness: 40mm.
- Thermal conductivity PPU λ= 0,039 W/mK.
- Casing fire resistance: A1 (EN 13162:2012 + A1:2015 (EN 13501-1)
- Moisture absorption:
  - short term: WS, Wp: ≤ 1 kg/m² (EN 13162:2012 + A1:2015 (EN 1609)
  - long term: WL(P), Wlp: ≤ 3 kg/m² (EN 13162:2012 + A1:2015 (EN 12087)
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- Certified by Eurovent

MINI PLEAT FILTERS

Design and application

- Mini-pleat filters are special type of panel filters. They are design to provide many times larger active filtration surface followed by higher dust-holding capacity than typical panel ones, at the same outer filter cartridge dimensions. Filters consist of ultra-thin microfibers, coated with special, condensed binder. Mini-pleat are characterized by much longer life span the typical, commonly used ones.
- Applied as initial or secondary stage of air filtration.

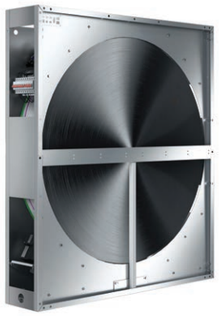
Specification

- Max working temperature: (+70)°C, 100% RH.i.

Available filtration classes

- ISO ePM10 50% (ISO 16890) - M5 (EN779),
- ISO ePM2,5 65% (ISO 16890) - F7 (EN779),
- ISO ePM1 70% (ISO 16890) - F9 (EN779)."

ROTARY HEAT WHEEL



Design and application

- Rotor made of aluminum with shaft suspended on bearings, installed in steel housing.
- Rotor filling – two layers of alternately winded aluminium foil – one flat, the other – corrugated – making small ducts for the air.
- Rotor drive system with smooth revolutions control enabling to maintain highest recovery efficiency and to adjust degree of recovery performance.
- Purge zone reducing the cross-contamination effect of contaminated exhaust air to supply to absolute minimum.
- Set of gaskets installed both on the wheel outer edge and bar separating supply from exhaust air being an additional protection against cross-contamination.
- Rotary heat wheel recovers sensible heat from return air to supply, which passes the unit in opposite direction. The process enables heat recovery in winter time, same as cool recovery in summer.
- Humidity recovery from return to supply in case the rotor pad temperature is lower than dew point of return air – typically during winter season.

Specification

- Up to 86% of energy recovery, depending on airflow rate and its velocity in the heat wheel window.

COUNTERFLOW HEXAGONAL RECUPERATOR

Design and application

- Hexagonal heat recovery recuperator made of crosswise stamped aluminum plates, between which supply and exhaust air passes alternately in counterflow arrangement.
- As standard, the recuperator is equipped with by-pass damper, enabling its securing against frosting and heat recovery capacity regulation.
- Optionally, the recuperator can be equipped with integrated mixing box.
- The recuperator provides sensible heat recovery for warmer air to the colder one. For winter season – recovery of heat from return air to supply. For summer – recovery of chill from return air to supply.

Specification

- Energy recovery at very high supply and exhaust air stream separation (reaching 99,9%).
- Heat recovery reaching up to 93% depending on flow rate face velocity of the air passing the recuperator.

MIXIN SECTION

Design and application

- Section equipped with two air inlets/ outlets aided with dampers, enabling regulation of fresh and recirculation air share (recirculation).

Specification

- Direct Energy recovery (sensible and latent heat) resulting from partial mixing of fresh air with return one.
- Control of fresh air share in entire airflow supplied to handled spaces.
- Working temperature range: -40 ÷ +70°C."

WATER HEATER

Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the medium supply system).
- Heating of the air supplied to the handled spaces.
- Re-heating of the air as a part of air dehumidifying process.
- The coil can be applied if heating medium is available (local boiler or district heating system).
- Coil headers are equipped with medium damping valve and air vent.
- Connecting the coil in parallel medium flow vs air, will result in its capacity reduction by over a dozen percent.

Specification

- Max glycol concentration: 50%.
- Max medium temperature: 150°C.
- Max medium working pressure: 1,6MPa = 16bar (test: 21bar).
- Heating capacity: parameter resulting from individual performance calculaation of selected unit (CCOL).
- Medium side pressure drop – parameter resulting from individual performance calculation of selected unit (CCOL).

ELECTRIC HEATER

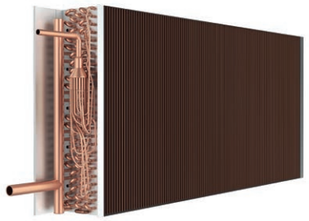
Design and application

- Set of resistive heating elements made of CR-Ni-Fe alloy, 6 kW/400V each.
- Coils mounted on hot-dip galvanized steel frame.
- Heater is equipped with power terminals and thermostat protecting against overheating.
- In case of AHU with complete controls, heater is equipped with integrated capacity control module.
- Heating capacity can be modified by means of smooth regulation module (HE module, set of Solid State Relays as optional parts of AHU controls) or by means of automatic engaging of next heating sections.

Specification

- Max permissible ambient temperature around heating elements: 65°C.
- The heater is available in a version built in the air handling unit and in a duct heater version (without thermal insulation)

DIRECT EXPANSION COIL AS CONDENSER IN HEAT PUMP CIRCUIT



Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the cooling system circuit).
- Heating of the air supplied to the handled spaces.
- Re-heating of the air as a part of air dehumidifying process.

Specification

- Max medium temperature: 60°C.
- Max medium working pressure: 3,84MPa = 38,4bar (test: 50bar).
- Heating capacity: parameter resulting from individual performance calculaation of selected unit (CCOL).
- Max. refrigerant working pressure: 3.84 MPa = 38.4 bar (test: 50 bar).
- Thermal power: parameter available from technical data of the unit (CCOL).
- Pressure loss / medium flow: parameters available from technical data (CCOL).
- Heat exchanger suitable for operation as a cooler (evaporator) and as a heater (condenser) in a heat pump circuit.

Cooling function

- Cooling of the ventilation air supplied to the room.
- Dehumidification of the ventilation air in summer.
- The exchanger is mostly used for smaller cooling capacities compared to water coolers and in "single" air-conditioning systems.

Heating function

- Heating or cooling of ventilation air supplied to the room.
- Heating of the ventilation air after a drying process.
- Cooling of the ventilation air supplied to the room.
- Dehumidification of the ventilation air in summer.
- The exchanger is mostly used for smaller cooling capacities compared to water coolers and in "single" air-conditioning systems.

WATER COOLER

Design and application

- A pack of copper tubes integrated with a pack of fins forming the heat exchange surface extension. The heat exchanger tubes are connected respectively to collectors, to which the connection pipes of the medium system are routed.
- The exchanger connecting pipes are equipped with a drain and a vent respectively.

Features

- Maximum glycol content 50%.
- Minimum temperature for chilled water +2°C.
- Maximum heating medium temperature: 150°C.
- Max. refrigerant working pressure: 1.6 MPa = 16 bar (test: 21 bar).
- Thermal power: parameter available from technical data of the unit (CCOL).
- Pressure losses on the medium side: available in technical data generated in the CCOL selection programme.
- Connecting the exchanger supply in a parallel flow circuit reduces the heater power by up to several %.

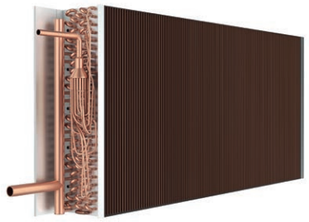
Cooling function

- Cooling of the ventilation air supplied to the room.
- Dehumidification of the ventilation air in summer.
- The exchanger is used in complex air-conditioning systems - several or more devices supplied from a single source of cold (water chiller) or in case of using a single device with relatively high cooling power.

Heating function

- Heating of the supply air to the room.
- Heating of the ventilation air after a drying process.
- The exchanger is used in case of access to a heating water system (local boiler room or municipal network).

DX COOLING COIL



Design and application

- Block of copper pipes integrated with another block of aluminum fins, creating expanded heat exchange surface. Pipes are bonded to the collectors, equipped with headers (for connecting entire coil to the cooling system circuit).
- DX cooler is also available as heater execusion (so calleed Condenser).
- Cooling and dehumidifying of the air as a part of air complex dehumidifying process in summer season.
- Coil usually applied for smallerd cooling capacity systems vs water coolers or for individual air conditioning systems.

Specification

- Min. Refrigerant evaporation temperature: +3°C.
- Max refrigerant working pressure: 2,2MPa=22bar (test: 29 bar).
- Cooling capacity - parameter resulting from individual performance calculation of selected unit (CCOL).

AIR DAMPER

Design and application

- Blades made of aluminium with rubber gasket on the edges.
- Aluminum frame.
- Blades drive realized by means of gears made of composite material, installed on frame internal side.
- Damper is equipped with square pivot, fitted for actuator (dampers of cross section greater than 4 m^2 have 2 linked pivots).

Specification

- Air leakage at closted damper: $50m^3/h*m^2$ - at 100 Pascals of pressure difference.
- Workint temperature range: -40 ÷ +70°C.

FLEXIBLE CONNECTION

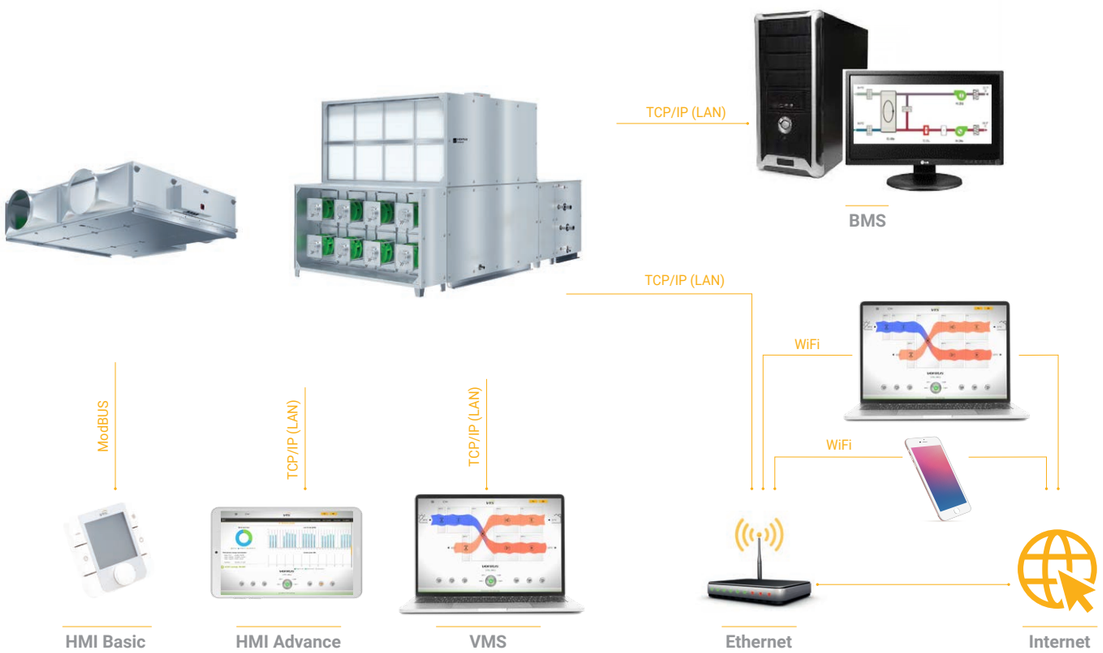
Design and application

- Flexible connection made of 1 mm thick and 30 mm wide hot-dip galvanized steel profiles and polyester fabric coated with PVC.
- Flame resistance: UL94 - HB [ISO 1210].
- Flexible connection resistant to UV radiation
- Working temperature range: -30°C do +70°C.
- Max connection length (fully spread position): 110 mm.
- Flexible connection installed on each AHU/Duct joint eliminates transfer of possible AHU vibrations to the ventilation ductwork.

Specification

- Max air face velocity: 5m/s.
- Working conditions: -40 ÷ +70°C.

ADVANCED CONTROL



Advanced control algorithms - cost minimization

VTS algorithms apply cascading regulation of room temperature, which ensures minimum consumption of heat and process cold. Moreover, control algorithms ensure precise maintenance of the preset room temperature with zero hysteresis

Economic adaptation of fan capacity parameters to the needs of the building

Algorithms of fan efficiency control were applied through ectronic measurement and automatic regulation of air efficiency expressed in m³/h - so called CAV and VAV system.

HMI Basic

The AHU is operated from a control panel with a simple service interface, which prevents any unauthorized change of the advanced operating settings of the AHU. HMI Basic is also a combination of a temperature and humidity sensor with a control panel, all in one housing.

HMI Advanced

Dedicated tablet, with Android system and Chrome browser, ensuring convenience in management and configuration of device parameters. The user receives a device for configuring and parametrizing the VENTUS air handling unit, a compilation of documents, a set of information about the product, and access to the monitoring and visualization of operating parameters of devices in the same network.

Automatic air quality control function

VTS offers the optimization of energy consumption, based on step-less, automatic adaptation of air efficiency to the needs of heating, cooling and ventilation. This adaptation is based on ensuring proper air quality - temperature, CO_2, humidity.

Three different operating modes

The user can choose one of three individual operating modes: Eco, Optimum and Comfort. Each of these modes offers individual performance parameters: main adjustment setting, e.g. temperature in the room, humidity, CO_2 level or air flow value, etc.

AHU operation calendar

VTS automation offers the possibility of programming a weekly AHU operating schedule, taking into account special days (official celebrations, holidays, days off, etc.). For each time interval, it is possible to program one of three operating modes. A graphic presentation of the user-configured schedule using visual tools is also available.

Simulation of air handling unit operation

A function is available to simulate the savings due to the application of specific functionalities, and function of simulation of working parameters of particular components.

REMOTE MONITORING AND MANAGEMENT OF THE OPERATING PARAMETERS OF THE UNIT IN REAL TIME

VTS provides a standard automation functionality in the form of a factory-implemented **VMS (Ventus Management System)** application for remote monitoring, with visualization and management of the operating parameters of the units in real time via a web browser on any device.

VISUALIZATION - presentation in the form of charts for all operating parameters of all ventilation units operating within a common network.

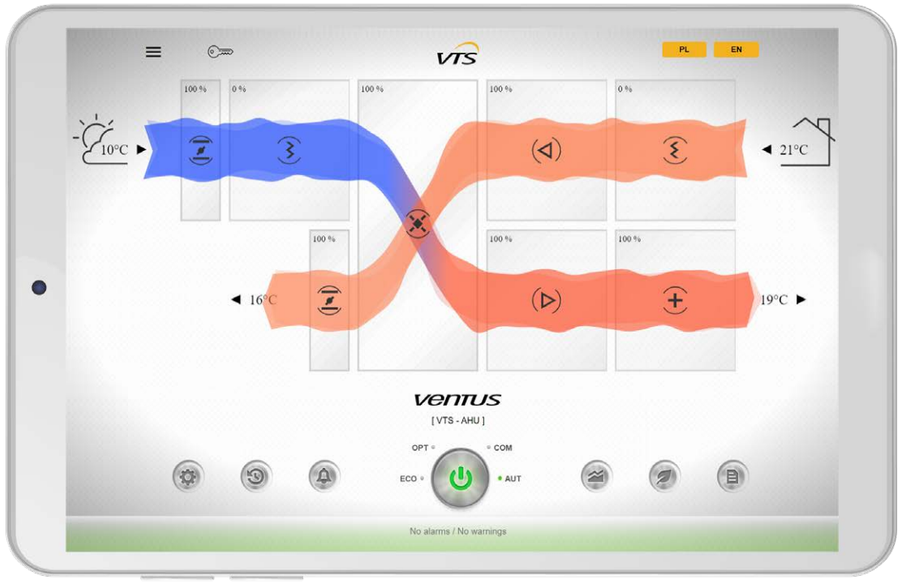
DIAGNOSTICS - this function facilitates remote diagnostics and remote support by the service personnel.

CONVENIENCE - possibility of starting the unit via a web browser on any device, remote access and remote change of parameters via a local area network or the Internet.

OPTIMIZATION - the operating parameters for each functional unit can be optimized.

ECONOMY - measurement and recording of current operating costs. Possibility of defining currencies and utility prices.

RECORDING - recording of all AHU operating parameters and alarms and warnings, including a legible description.



MAIN SCREEN

The main screen includes a graphic diagram of the air handling unit, with clearly marked air conditioning functions and current settings and parameters.

The window also includes a set of buttons offering a wide spectrum of AHU management functions. The complete window can be treated as a main navigation panel of the AHU management window. From this panels, the user can monitor the status of the AHU, switch operating modes or navigate to any of the additional functions.

The AHU diagram combines a series of functions, such as displaying the status of each function in your unit - informing the user about possible alarms directly on the applicable AHU block. The user can also monitor the parameters of air flowing into the unit and conditioned by the unit.

SCHEDULE

An air handling unit operating according to a predefined schedule is a know solution for control applications.

However, what is new is the ease, with which the user can manage schedule settings directly on the diagram - using both standard computer screen and a mouse and a touch screen on a tablet.

The schedule is designed as a series of scroll bars for individual operating modes.

All display items are displayed on a time diagram.

Using the scroll bars, the user can change the schedule of their AHU, improve the economics of the ventilation system, all within seconds.

CHARTS

Charts are a tool used for recording all operating parameters of the AHU, saving them and displaying historical AHU operating data in the form of a time chart. This tool was created to help the user to develop the best AHU operation schedule, ideally suited to the specific nature of a given ventilation system, as well as to improve the economics of operation of the system and fulfill the user's preferences.

ECO

FThe ECO function is used for calculating the savings generated through heat recovery, the application of high-performance EC fans and management of the complete device applying state of the art algorithms developed by VTS.

All the user needs to do is spend a few minutes to inform the application about the cost of each energy carrier used - expressed in any currency. In return, the application will report all savings expressed in kW and money.

Depending on the preference, the user can monitor the common savings generated through heat recovery, the application of high-performance EC fans and advanced VTS control algorithms, or display a report on a separate, very detailed diagram.

CONTROLS

VENTUS COMPACT AIR HANDLING UNITS IN PLUG&PLAY STANDARD

Savings

Comfort

Safety

Ventus Compact – range of floor-mounted units with rotary heat wheel and suspended with hexagonal recuperator. Equipped with complete, factory mounted controls, pre-configured in accordance to actual selection and ready to run just after connecting to mains.

Controls is capable to regulate all user parameters: air temperature, its humidity, maximum permissible CO_2 concentration and the flow rate. Also, controls support preventive and securing functions like protection of the water heater against freezing or energy recovery system against icing, protection of motors against overloading, monitoring of air filters actual status of contamination and many other. Applied algorithms can optimize performance of all air treatment components in order to minimize consumption of all energy media supplied to the unit. The system includes control and power supply circuits:

HMI Basic

- Engaging and disengaging the AHU, change of operational modes.
- Change of temperature, airflow, humidity, max CO_2 level settings, etc.
- Errors reporting.
- Time schedule setting.

HMI Advanced

- All users and service functions except visualization
  - AHU engaging and disengaging,
  - Change of operational modes.
- Change of temperature, airflow, humidity, max CO_2 level settings, etc.
- Parameters setting and reporting.
- Errors reporting.
- Time schedule setting.

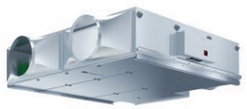
USER

BMS

- User function like in HMI Advanced.
- User's customized visualization (BMS).

Remote visualization

- All user function like in HMI Advanced:
  - VTS visualization.
- Clear interface of schedule programming, presenting unit's operating time individually for each day of the week.
- Energy consumption analysing module.
- Individual parameters monitoring of each functional block.
- Filing of all AHU's parameters recorded in few minutes intervals.



PAREMETERS REGULATION FUNCTIONS

Temperature and humidity regulation

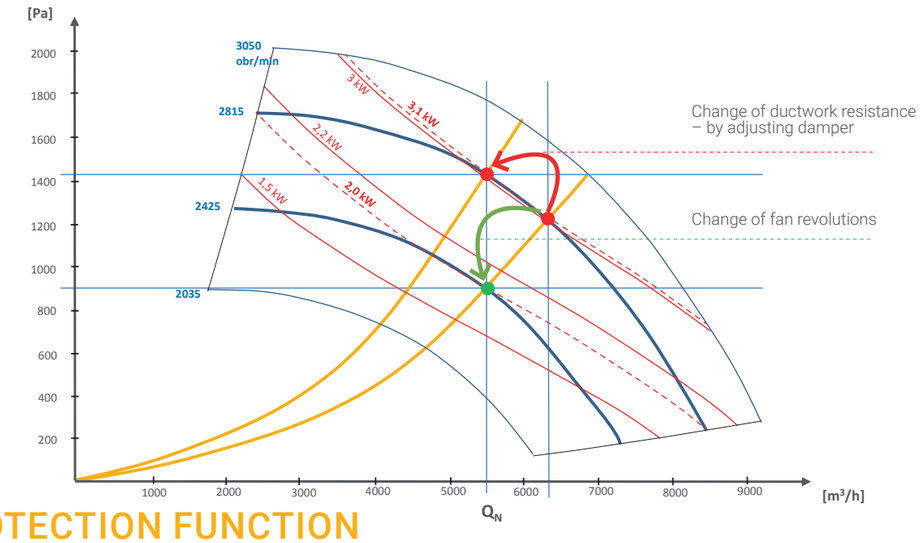
- Regulation of supply, return air temperature and humidity in handled spaces.
- Control of water coils valves (heater, cooler) and condensing unit.
- Control of rotary heat wheel revolutions and mixing box (Ventus floor-mounted Compact units), bypass-damper of hexagonal counterflow energy recovery system (suspended VENTUS Compact units).

Airflow rate regulation

- Constant Air Volume (CAV) available as standard
- Constant static pressure maintenance in trunk duct (Variable Air Volume – VAV) available as option.
- Getting of constant revolutions for each fan individually – VFD setting for AC motors or constant revolutions percentage in case of EC motors.

CO_2 regulation

- By means of mixing box – for units with air recirculation.
- By means of airflow rate change – for all types of supply and exhaust units (function can be engages together with mixing box control).



PROTECTION FUNCTION

- Protection against rotary heat wheel icing (VENTUS Compact floor mounted units), by means of wheel revolutions reduction.
- Protection against hexagonal counterflow recuperator icing (VENTUS Compact suspended units) by means of by-pass damper opening:
  - optimizing of icing protection function by change of minimum return air temperature threshold downstream the energy recovery unit vs return air parameters,
  - minimizing of recovery efficiency drop during defrosting.
- Anti-freezing protection of water heater:
  - antifreeze thermostat installed downstream the heater,
  - strap-on return water temperature sensor
- Fans overload protection (functions realized by EC motors drives)
- Fire alarm input – AHU immediate disengaging in case of lack of external start permission from overall fire protection system.

TIME SCHEDULE FUNCTIONS

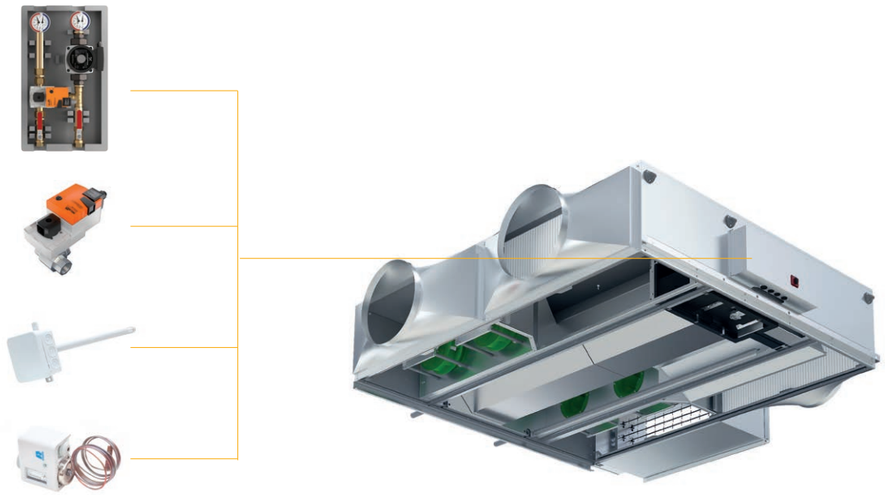
- Weekly schedule operational modes programming.
- Clear visualization of schedule settings by means of web-browser (computers and mobile devices).

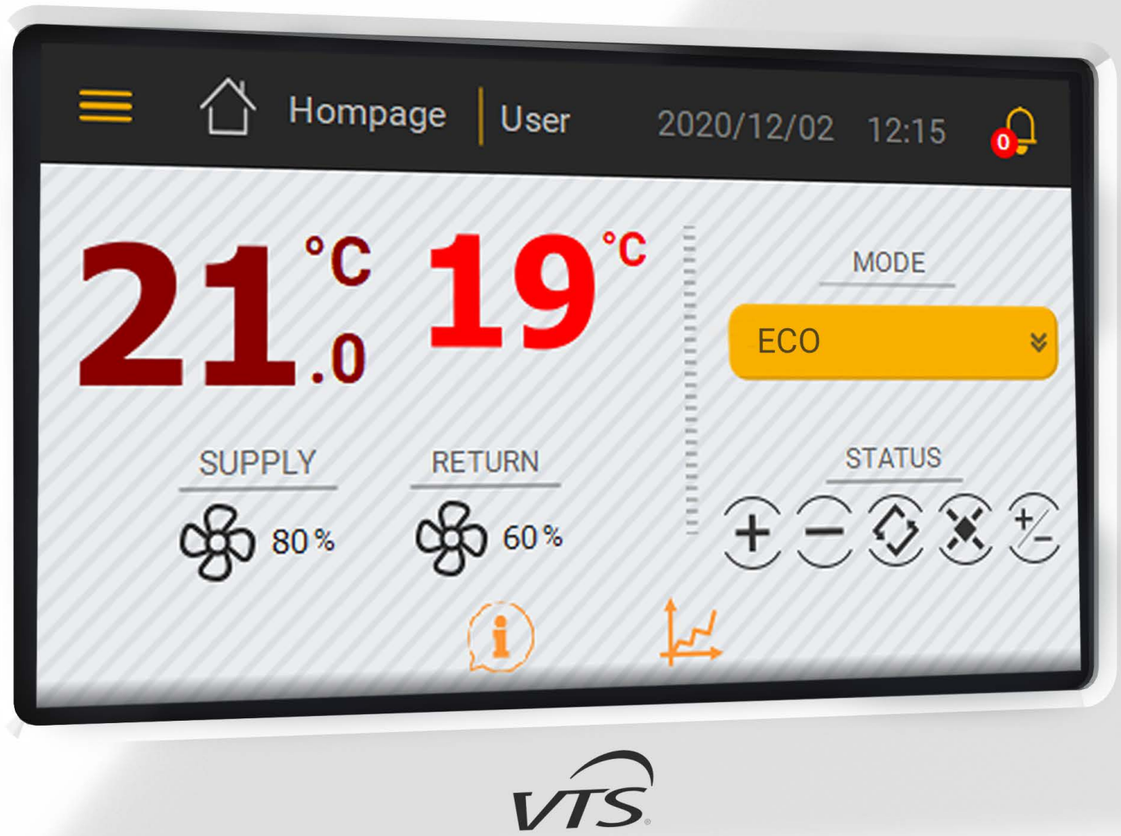
PREVENTIVE FUNCTIONS

- Constant filter contamination status control:
  - constant monitoring of filter pressure drop by means of static pressure transducers,
  - evaluation of filter contamination status for vs actual airflow rate.
- Fans shutting-down delay – fan's run out for systems with electric heater.
- Water heater pre-heating before fun's start up.
- Periodical heater pump engaging in summer – to prevent against limescale accumulation.

CONTROL CIRCUITS

- All control circuits installed inside the base unit are fully wired and configured in accordance to its technical selection.
- Control of fans operation is done by means of digital communication based using ModBUS protocol. Each of the fan is adequately programmed with individual address enabling its recognition by the control system (fans should never be swapped).
- Control elements handling external modules (antifreeze thermostat of the water heater, valves for heater and cooler, supply air temperature sensor) should be connected to terminal block.
- Clear and easy to ready description of terminal block facilitates correct connecting of control peripheral components.





POWER SUPPLY AND PROTECTION CIRCUITS

- Fan's power supply, rotary heat wheel and control circuits are fully wired.
- All electrical protection circuits of fans, rotary heat wheel drive, control circuits and water heater pump are installed inside the AHU.
- The only to be by the user is connecting the AHU to mains (to the main switch located in the connecting box) and optionally – crossing the power supply to the pump of the water heater.
- Water heater power supply terminals are crossed to the terminal block located on AHU outer wall.

CONTROL ELEMENTS

CONTROL ELEMENTS

Functions and application

- Regulation of supply and exhaust air temperature.
- Protection of the energy recovery unit against freezing.
- Outdoor air temperature measurement in order to identify need of heat/chill recovery and engagement protecting function for water heater.

Operational parameters

- Measurement range: -50°C to +90°C.
- Measurement accuracy: ±0,5K.
- Sensor type: NTC 10k.
- Air humidity range: 5 ÷ 100%.
- Protection degree: IP67.
- Shielded cable length: max. 100 m.

ROOM AIR TEMPERATURE SENSOR

Functions and application

- Regulation o temperature in handled space.

Operational parameters

- Measurement range: -20°C do +70°C.
- Measurement accuracy: ±0,5K.
- Sensor type: NTC 10k.
- Air humidity range: 5 ÷ 95% no condensation.
- Protection degree: IP20.
- Shielded cable length: max. 100 m.

ANTI-FREEZE THERMOSTATE

Functions and application

- Protection of water heater against freezing by means of air off-coil temperature monitoring (recommended temperature threshold setting: +5°C).

Operational parameters

- Measurement range: -18 ÷ +15°C.
- Hysteresis: 1,7 ÷ 12K.
- Nominal voltage: 30V DC or 230V AC.
- Output signal: potential-free contact.
- Protection degree: IP 44.

OVERHEAT PROTECTION THERMOSTATE FOR ELECTRIC HEATER

Functions and application

- Protection of electric heater against overheating.

Operational parameters

- Power cut-off temperature setpoint: 65°C.
- Power re-switch on temperature setpoint : 45°C.
- Nominal voltage: 20V DC or 230V AC.
- Output signal: potential-free contact.

DIFFERENTIAL PRESSURE SWITCH

Functions and application

- Monitoring of filter's contamination.
- Control of the operation of a direct driven fan unit in case of cooperation with electric heater.

Operational parameters

- Measurement range: 30 do 500 Pa.
- Nominal operating voltage: 250V AC (Imax=3A).
- Output signal: potential free contact.
- Working temperature range: -20°C do 60°C.
- Protection degree: IP 54.

DIFFERENTIAL PRESSURE TRANSDUCER

Functions and application

- Regulation of supply and exhaust air (CAV function).
- Regulation of static pressure in ventilation system trunk duct (VAV function).
- Constant monitoring of filter pressure drop (control of filter contamination level).

Operational parameters

- Measurement range: 6000 Pa.
- Measurement accuracy: 0,25% of the range.
- Communication: ModBus RTU.
- Supply voltage: 21,5V to 30V DC or 21,5V do 26,5V AC.
- Working temperature range: -20°C do 50°C.
- Protection degree: IP 65.

ON/OFF DAMPER ACTUATOR

Functions and application

- Airflow opening or closing in the AHU (connectors of air intake and discharge) – for units with water heater actuators with return spring are applied.

Operational parameters

- Regulation mode: ON/OFF (two-point).
- Angle of rotation: 90°.
- Torque: 16 Nm (max damper cross-section: 4 m^2).
- Full open/close time: 120 s (with spring: 10 s).
- Supply voltage: 24V AC/DC.
- Working temperature: -20°C do 50°C.
- Protection degree: IP 54.

SET FOR WATER HEATER CAPACITY REGULATION (PUMP GROUP)

Functions and application

- Smooth regulation of water heater capacity.

Operational parameters

- Regulation mode: 0 to 100% (smooth).
- Control signal: 0-10V.
- Full open/close time: 90 s.
- Valve supply voltage: 24V AC/DC.
- Pump supply voltage: 230V AC.
- Working temperature: +5°C do 50°C.
- Medium temperature range: -10°C to 120°C.
- Max glycol concentration: 50%.
- Protection degree: IP 54.

THREE-WAY VALVE FOR WATER HEATER OR COOLER

Functions and application

- Smooth regulation of water heater or cooler capacity.

Operational parameters

- Regulation mode: 0 do 100% (smooth).
- Control signal: 0-10V.
- Full open/close time: 90 s.
- Valve supply voltage: 24V AC/DC.
- Working temperature: +5°C do 50°C.
- Medium temperature range: -10°C do 120°C.
- Max glycol concentration: 50%.
- Protection degree: IP 54.

HMI BASIC USER INTERFACE

Functions and application

- Maintenance of Air handling unit – temperatures setting and reading, change of operating modes, independent time schedule management, alarm codes displaying.
- Configuration of controller's universal inputs and outputs.

Operational parameters

- Power supply directly from the controller.
- Communication with controller – RS485 serial port.
- Max length of communication cable: max. 500 m.
- Working temperature: -20°C to 60°C.
- Humidity: <85% (no condensation).
- Protection degree: IP 31.

HMI ADVANCED USER INTERFACE

Functions and application

- Maintenance of Air handling Unit – parameters setting and reading (temperature, airflow, CO2, humidity etc), change of operational modes.
- Weekly schedule programming.
- Service maintenance – configuration of all advanced AHU operating parameters, configuration controllers universal inputs and outputs.
- Remote configuring of variable frequency drives.
- AHU alarms and errors monitoring (full text description) and cancelling.

Operational parameters

- Power supply directly from the controller.
- Communication with controller – RS485 serial port.
- Max length of communication cable: max. 1200 m,
- Working temperature: -20°C to 60°C.
- Humidity: <85% (no condensation).
- Protection degree: IP 20.

HMI ADVANCED OPERATOR PANEL

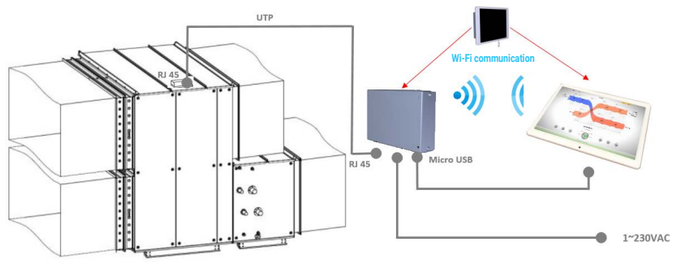
Function and application

- HMI Advanced is a dedicated tablet with the Android system and the Chrome browser, which provides comfort in managing and configuring the parameters of the device.
- The user receives a device for configuring and parametrizing the VENTUS air handling unit, a compilation of documents, a set of information about the product, and access to the monitoring and visualization of operating parameters of devices in the same network. The 10-inch high resolution display provides comfort of reading all data.
- The HMI Advanced tablet comes with a communication box.
- The tablet is mounted to the box using a set of magnets for easy attaching and detaching.
- The communication box includes a WiFi router for wireless communication with the tablet, and a power supply unit for connecting the tablet. This solution allows the remote use of the tablet within WiFi range.

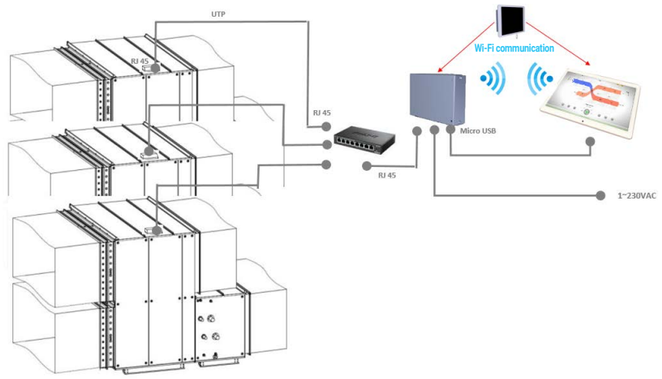
Operational parameters

- Micro USB connector
- Power supply input: 100-240V 50-60 Hz
- Tablet input: 5.0V - 2.0A
- Operation temperature: 0°C to 40°C.
- Humidity: <85% (non-condensing).
- OS: Android 9
- Screen: 10.1"
- Wifi: 802.11a/c/b/g/n
- 2G: GPRS class 12/EDGEE
- 3G: HSPA+, EVDO, GPRS EDGE;
- 4G: TDD LTE FDD LTE, VoLTE
- Bluetooth: 4.2, VoLTE
- Battery: 8000 mAh
- GSM: B2/3/5/8
- CDMA1X: BC0
- WCDMA: B1/2/5/8

Single AHU connected to tablet



Multiple AHUs connected to single tablet



CODING

Range of product

Unit size as a reflection of nominal airflow expressed in m³/h / 100. For example: 075 --> 7500 m³/h

Inspection side

Functions in supply tier in sequence accordant to air treatment process

VENTUS	VVS	-	075	-	R	-	FPHV	/	FVPD	-	c	d

Functions in exhaust tier in sequence accordant to air treatment process

Supply/exhaust airflow mutual relation
c - counter
p - paralel
x - non applicable (individual supply or exhaust air tier)

Position of supply air outlet for supply and supply/exhaust systems. Position of air outlet for individual exhaust systems
u - up
d - down

VVS075-R-FPHV/VVS075-L-FVPD_CD

CODES & SYMBOLS

CODE	SYMBOL	NAME
F		Air filter
V		Fan
C		Cooler
H		Heater
M		Mixing box
P		Plate cross-flow recuperator
R		Rotary heat wheel
G	G	Run-around coil
D		Droplet eliminator
W		Humidifier
E		Additional empty space
S		Sound attenuator

Auxiliary codes

(cw) water cooler
(dx) direct expansion cooler
(xR) coil number of rows
(hw) water heater
(el) electric heater
(sx) sound attenuator version

06

VOLCANO
WING
WING PRO

VOLCANO

EC Motor Inside

Product range

VOLCANO	VR Mini	VR-D Mini	VR1	VR2	VR3	VR-D
Type	AC/EC	AC/EC	AC/EC	AC/EC	AC/EC	AC/EC
Heating power range	3-20 kW	-	5-30 kW	8-50 kW	13-75 kW	-
Maximum air output	2100 m³/h	2330 m³/h	5300 m³/h	4850 m³/h	5700 m³/h	6500 m³/h
Horizontal range (max.)	14 m	16 m	23 m	22 m	25 m	28 m
Vertical range (max.)	8 m	10 m	12 m	11 m	12 m	15 m
Electricity consumption*	13-91 W	13-91 W	41-202 W	45-226 W	55-355 W	55-355 W

* EC motor power for the above specified fan outputs

Technical parameters

		VR Mini		VR1		VR2		VR3		VR-D		VR-D Mini	
Parameter	Unit	AC	EC	AC	EC	AC	EC	AC	EC	AC	EC	AC	EC
VTS article No.		1-4-0101-0445	1-4-0101-0455	1-4-0101-0446	1-4-0101-0442	1-4-0101-0447	1-4-0101-0443	1-4-0101-0448	1-4-0101-0444	1-4-0101-0449	1-4-0101-0450	1-4-0101-0506	1-4-0101-0498
Number of heater rows	-	2		1		2		3		---		---	
Maximum air output	m³/h	2100		5300		4850		5700		6500		2200	2330
Heating power range	kW	3-20		5-30		8-50		13-75		---		---	
Maximum temperature of the heating medium	°C	130								---		---	
Maximum working pressure	MPa	1,6								---		---	
Water capacity	dm³	1,12		1,25		2,16		3,1		---		---	
Connection pipes diameter	"	3/4								---		---	
Device weight (without water)	kg	13	14	21	21	21,5	21,5	25,5	24,5	18	15,5	10,6	8
Power supply voltage	V/Hz	1 ~ 230/50											
Motor power	kW	0,115	0,095	0,28	0,25	0,28	0,25	0,45	0,37	0,45	0,37	0,115	0,095
Rated current	A	0,53	0,51	1,3				1,95	1,7	1,95	1,7	0,53	0,51
Rated motor rotational speed	rpm	1450	1200	1380	1430	1380	1430	1380	1400	1380	1400	1450	1200
Motor protection level	IP	54											
Casing color palette		Front: RAL 9016 Traffic White, rear + console: RAL 7036 Platinum Gray, fan (EC): RAL 6038 Green											

PIPELINE DIAMETERS*

	VR Mini		VR1		VR2		VR3	
Number of heaters connected to the main line**	Max water flow [m³/h]	Pipeline diameter [*]	Max water flow [m³/h]	Pipeline diameter [*]	Max water flow [m³/h]	Pipeline diameter [*]	Max water flow [m³/h]	Pipeline diameter [*]
1	0,9	3/4	1,3	3/4	2,2	3/4	3,3	3/4
2	1,8	3/4	2,6	3/4	4,4	1	6,6	1 1/4
3	2,7	1	3,9	1	6,6	1 1/4	9,9	1 1/2
4	3,6	1	5,2	1	8,8	1 1/4	13,2	1 1/2
5	4,5	1	6,5	1 1/4	11	1 1/2	16,5	2
6	5,4	1 1/4	7,8	1 1/4	13,2	1 1/2	19,8	2
7	6,3	1 1/4	9,1	1 1/4	15,4	2	23,1	2 1/2
8	7,2	1 1/4	10,4	1 1/2	17,6	2	26,4	2 1/2
9	8,1	1 1/4	11,7	1 1/2	19,8	2	29,7	2 1/2
10	9,0	1 1/4	13	1 1/2	22	2 1/2	33	3

Controls

PARAMETERS Model		Wall controller WING/ VOLCANO	VR Thermostat	Speed regulator ARW 3.0/2	Speed regulator ARW 0.6	Potentiometer VR EC (0-10V)	Potentiometer with thermostat VR EC (0-10V)	HMI VOLCANO EC controller	Controller WING EC WIFI
VTS product number		1-4-0101-0438	1-4-0101-0038	1-4-0101-0434	1-4-0101-0167	1-4-0101-0453	1-4-0101-0473	1-4-2801-0157	1-4-2801-0156
Motor support		AC				EC			
Power supply voltage	V/ph/Hz	~230/1/50	~230/1/50	~230/1/50	~230/1/50	~230/1/50	~230/1/50	~230/1/50	~230/1/50
Permissible load current	A	6(3)	3	3	0,6	0,02 A for 0-10V		1A for 230VAC 0,02A for 0-10V	1A for 230VAC 0,02A for 0-10V
Settings range	°C	10...30	10....30	10....30	10....30	-	5...30	5...40	5...40
Work mode	---	manual	manual	manual	manual	manual	manual	manual/ automatic	manual/ automatic
Hourly-weekly calendar	---	No	No	No	No	No	No	Yes	Yes
Clock	---	No	No	No	No	No	No	Yes	Yes
Temperature measurement	---	Integrated in the device				-	Integrated in the device		
The possibility of connecting a separate temperature sensor	pcs.	No				No	1 or 4	1 or 4	1 or 4
Output signal	---	on/off				0-10 V DC			
Protection rate	IP	30		54		30		20	20

COOPERATION OF CONTROLS AND REGULATORS WITH HEATING UNITS

VR Mini/ VR D mini	pcs.	4	1	4	1	8
VR1/ VR2	pcs.	2	1	1	0	8
VR3 / VR-D	pcs.	1	1	1	0	8

Accessories

Valve with actuator

VTS article No.		1-2-1204-2019
power supply voltage	V/ph/ Hz	~230/1/50
Power consumption electrical	W	1
connection	"	3/4
Coefficient of Volume	m³/h	4,5
opening/ closing time	min.	3/3
protection rating	IP	54

Room NTC sensor (for the HMI VOLCANO EC controller)

VTS article No.		1-2-1205-0007
resistance measurement element	kΩ	NTC 10K
assembly	---	surface-mounted
max. signal wire length	m	100
ambient	°C	-20...+70
zakres pomiaru temperatury	°C	-20...+70
protection rating	IP	66

Flex. connectiong hoses (set)

VTS article No.		1-2-2702-0076
lenght	m	0,6-0,9
connectrion type	GW/GW	3/4"
max. fluid pressure	MPa	1,6
min. working temperature for water	°C	5
min. working temperature for glycol	°C	-20
max. working temperature	°C	130
set includes		hose (2 pcs) gasket (4 pcs)

WING

Product range

ECO EC Motor Inside

WING W

WATER HEAT EXCHANGER

HEATING POWER RANGE:
4 – 47 kW

EXHAUST FLOW RAT:
1850-4400 m³/h

MAXIMUM AIR COVERAGE:
3,7 m

WING E

ELECTRIC HEATER

HEATING POWER RANGE:
2 – 15 kW

EXHAUST FLOW RAT:
1850-4500 m³/h

MAXIMUM AIR COVERAGE:
3,7 m

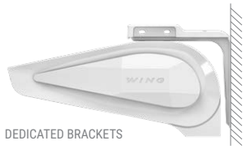
WING C

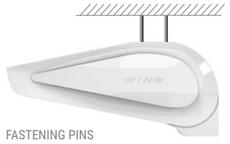
WITHOUT HEAT EXCHANGER (AMBIENT)

EXHAUST FLOW RATE:
4 m

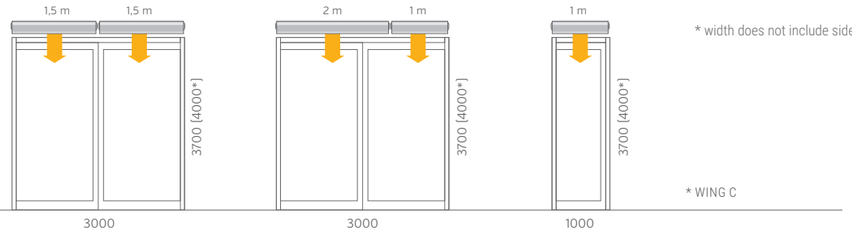
EXHAUST FLOW RAT:
1950-4600 m³/h

WING 100/150/200



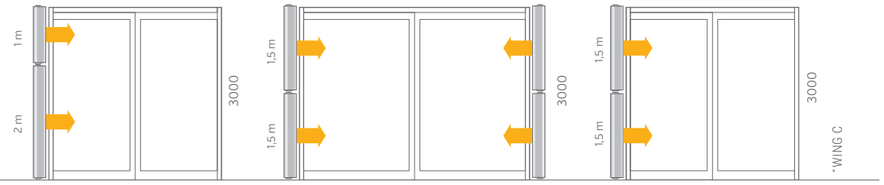


HORIZONTAL INSTALLATION



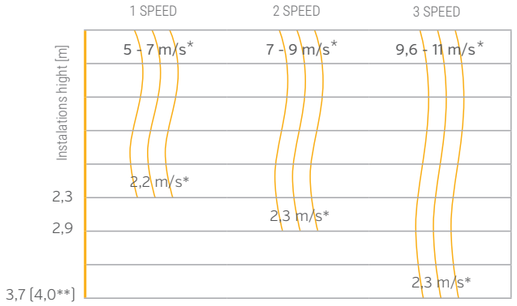
* width does not include side covers

VERTICAL INSTALLATION



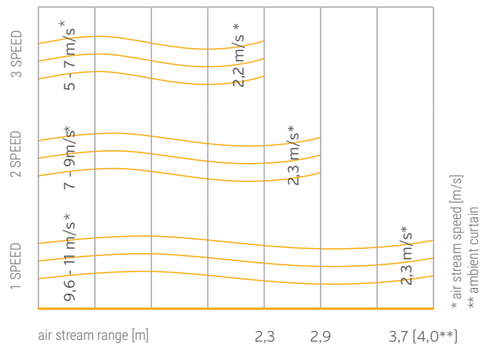
Stream range

Vertical air stream range
(maximum installation height)



* air stream speed [m/s]
** ambient curtain

Horizontal air stream range
(for vertical installation)



Technical parameters

PARAMETERS		WATER AIR CURTAIN						ELECTRIC AIR CURTAIN						AMBIENT AIR CURTAIN					
		W100		W150		W200		E100		E150		E200		C100		C150		C200	
		AC	EC	AC	EC	AC	EC	AC	EC	AC	EC	AC	EC	AC	EC	AC	EC	AC	EC
Colour ○ WHITE (RAL 9016) ● DARK (RAL 7016)		○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●	○ ●
VTS article No.		1-4-2801-0250	1-4-2801-0299	1-4-2801-0251	1-4-2801-0300	1-4-2801-0252	1-4-2801-0301	1-4-2801-0253	1-4-2801-0302	1-4-2801-0254	1-4-2801-0303	1-4-2801-0255	1-4-2801-0304	1-4-2801-0256	1-4-2801-0305	1-4-2801-0257	1-4-2801-0306	1-4-2801-0258	1-4-2801-0307
		1-4-2801-0259	1-4-2801-0308	1-4-2801-0260	1-4-2801-0309	1-4-2801-0261	1-4-2801-0310	1-4-2801-0262	1-4-2801-0311	1-4-2801-0263	1-4-2801-0312	1-4-2801-0264	1-4-2801-0313	1-4-2801-0265	1-4-2801-0314	1-4-2801-0266	1-4-2801-0315	1-4-2801-0267	1-4-2801-0316
maximum door width (1 device)	m	1		1,5		2		1		1,5		2		1		1,5		2	
maximum door height (vertical stream range)*	m	3,7						3,7						4					
maximum exhaustflow rate	m³/h	1850		3100		4400		1850		3150		4500		1950		3200		4600	
heating power range**	kW	4-17		10-32		17-47		2 lub 4/6		8/12		10/15		-					
maximum temperature of heating agent	°C	95						-						-					
maximum operating pressure	MPa	1,6						-						-					
water volume	dm³	1,6		2,6		3,6		-						-					
number of heat exchanger rows	pcs.	2						-						-					
supply voltage	V/ph/Hz	~ 230/1/50						~230/1/50 for 2kW ~400/3/50 for 4/6kW		~400/3/50				~230/1/50					
electric heating coil power	kW	-						2 and 4		4 and 8		5 and 10		-					
electric heating coil current draw	A	-						6/max.9		11,5/max.17,3		14,5/max.21,4		-					
motor power	kW	0,235	0,2	0,375	0,3	0,58	0,47	0,235	0,2	0,375	0,3	0,58	0,47	0,235	0,2	0,375	0,3	0,58	0,47
rated current	A	1,2	1,1	1,7	1,3	2,6	1,9	1,2	1,1	1,7	1,3	2,6	1,9	1,2	1,1	1,7	1,3	2,6	1,9
weight (without water)	kg	20,8	21,2	27,8	24,5	34,6	30,4	20	17,3	26,8	23,4	33,3	29,1	17,9	15,3	23,8	20,4	29,3	25,1
protection rating	IP	20																	
casing colour		RAL 9016, outlet grid: RAL 9022																	

Accessories

HMI WING EC controller

VTS article No.	1-4-2801-0155
Motor support	EC
Power supply voltage	~230V/1ph /50Hz
Permissible load	1A for 230VAC 0,02A for 0-10V
Setting range	5...40 °C
Protection rating	IP 20

Controller WING EC WIFI

VTS article No.	1-4-2801-0156
Motor support	EC
Power supply voltage	~230V/1ph /50Hz
Permissible load	1A for 230VAC 0,02A for 0-10V
Setting range	5...40 °C
Protection rating	IP 20

Wall controller WING/VOLCANO

VTS article No.	1-4-0101-0438
Motor support	AC
Power supply voltage	6(3) V/ph/Hz
Permissible load	1A for 230VAC 0,02A for 0-10V
Setting range	10...30 °C
Protection rating	IP 30

Door sensor (reed switch)*

VTS article No.	1-4-0101-0454
Contact configuration	NO
Switching current	500 mA
Switching voltage	max 200 V
Connection	screw

Door sensor adapter WING AC

VTS article No.	1-4-0101-0578
Power supply	~230V/1ph /50Hz
Rated imput power	1W
Protection rating	IP 55

Dedicated to curtains with AC motor. Adapter gives possibilty to use Door sensor (1-4-0101-0454) with Wall controller (1-4-0101-0438).

Valve with actuator

VTS article No.	1-2-1204-2019
Power supply voltage	~230V/1ph /50Hz
Opening	3/3 min
Kvs	4,5
Protection rating	IP 54

Flex. connection hoses (set)

VTS article No.	1-2-2702-0076
Lenght	0,6-0,9 m
Connectrion type	GW 3/4"
Max. fluid pressure	1,6 MPa
Min. working temperature for water	5 °C
Min. working temperature for glycol	-20 °C
Max. working temperature	130 °C
Set includes	hose (2 pcs) gasket (4 pcs)

Noise level

Fan speed	Noise level	WING W100-200			WING E100-200			WING C100-200		
		1m	1,5m	2m	1m	1,5m	2m	1m	1,5m	2m
I	dB(A)***	52	53	56	49	51	55	53	54	57
II		55	58	61	51	56	59	59	62	61
III		57	59	62	58	58	60	62	63	63

* air stream range depends on curtain operation speed
** available heating power in the control option configuration: Wing E100 2 or 4/6kW, for Wing E150 8/12kW, for Wing E200 10/15kW
*** speed measurement conditions: semi-open space, horizontal installation on the wall, measurement performed 5 m away from the device

WING PRO

EC Motor Inside

Product range

WING PRO WR2

DOUBLE ROW COIL

HEATING POWER RANGE:
17 - 88 kW

EXHAUST FLOW RATE:
7 300 - 10 700 m³/h

MAXIMUM AIR STREAM RANGE:
7 m

WING PRO WR1

SINGLE ROW COIL

HEATING POWER RANGE:
9 - 48 kW

EXHAUST FLOW RATE:
7 900 - 11 900 m³/h

MAXIMUM AIR STREAM RANGE:
7,5 m

WING PRO C

WITHOUT HEATING (AMBIENT)

EXHAUST FLOW RATE:
8 500 - 12 800 m³/h

MAXIMUM AIR STREAM RANGE:
8 m

WING PRO 200

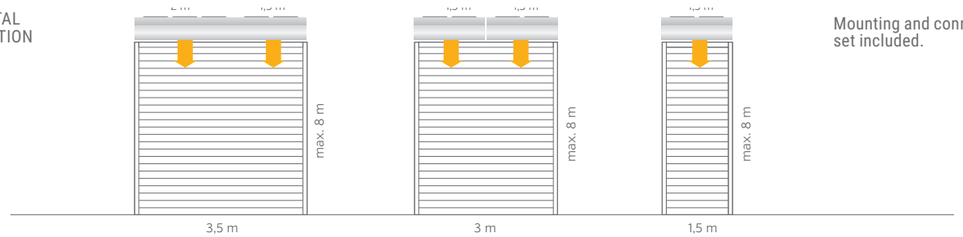
WING PRO 150

EC

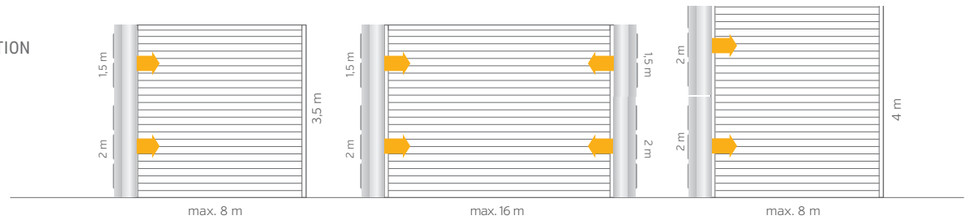
AC

Mounting and connection set included.

HORIZONTAL INSTALLATION



VERTICAL INSTALLATION



Stream range

Technical parameters

PARAMETERS		WING PRO DOUBLE ROW COIL		WING PRO SINGLE ROW COIL		WITHOUT HEATING (AMBIENT)	
		W150 EC	W200 EC	W150 EC	W200 EC	C150 EC	C200 EC
VTS article No.		1-4-2801-0349	1-4-2801-0355	1-4-2801-0348	1-4-2801-0354	1-4-2801-0347	1-4-2801-0353
Max. height of door	m	1,5	2	1,5	2	1,5	2
Max. air stream range	m	7		7,5		8	
Max. flow rate	m³/h	7 300	10 700	7 900	11 900	8 500	12 800
Heating power range	kW	17-58	28-88	3-32	15-48	-	
Max. temperature of heating medium	°C	130				-	
Max. Working pressure	MPa	1,6				-	
Diameter of stub pipe connectors	"	3/4				-	
Supply voltage	V/ph/Hz	~230/1/50					
EC motor power	kW	2 x 0,25	3 x 0,25	2 x 0,25	3 x 0,25	2 x 0,25	3 x 0,25
Rated current (EC motor)	A	2 x 1,3	3 x 1,3	2 x 1,3	3 x 1,3	2 x 1,3	3 x 1,3
Weight AC/EC (without water)	kg	53,6	69,6	50,5	66,1	43,4	58,3
IP protection rating	IP	54					

Accessories

HMI WING EC controller

VTS article No.		1-4-2801-0155
Motor support	-	EC
Power supply voltage	V/ph/Hz	~230/1/50
Permissible load	A	1A for 230VAC 0,02A for 0-10V
Setting range	°C	5...40
Protection rating	IP	20

Controller WING EC WIFI

VTS article No.		1-4-2801-0156
Motor support	-	EC
Power supply voltage	V/ph/Hz	~230/1/50
Permissible load	A	1A for 230VAC 0,02A for 0-10V
Setting range	°C	5...40
Protection rating	IP	20

Door sensor (reed switch)

VTS article No.		1-4-0101-0454
Contact configuration	-	NO
Switching current	mA	500
Switching voltage	V	max 200 V
Connection	°C	screw

Valve with actuator

VTS article No.		1-2-1204-2019
Power supply voltage	V/ph/Hz	~230/1/50
Opening	min	3/3
Kvs	-	4,5
Protection rating	IP	54

Flex. connection hoses (set)

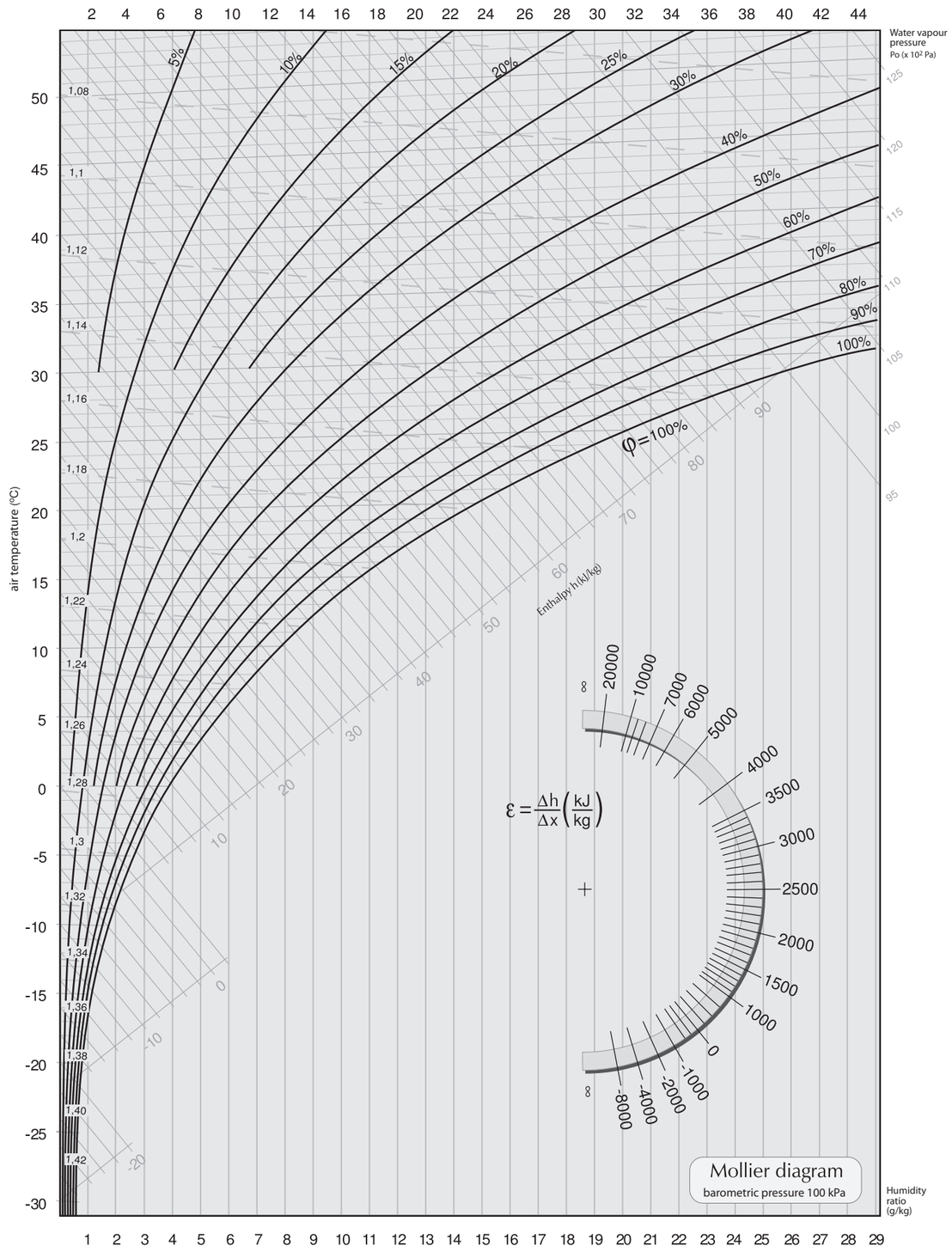
VTS article No.		1-2-2702-0076
Lenght	m	0,6-0,9
Connectrion type	GW	3/4"
Max. fluid pressure	MPa	1,6
Min. working temperature for water	°C	5
Min. working temperature for glycol	°C	-20
Max. working temperature	°C	130
Set includes	-	hose (2 pcs) gasket (4 pcs)

Noise level

Fan speed	Noise level	WING PRO W R1		WING PRO W R2		WING PRO C	
		1,5m	2m	1,5m	2m	1,5m	2m
I	dB(A)*	45	46	45	45	47	48
II		55	57	54	55	57	58
III		64	65	62	63	65	66

* speed measurement conditions: semi-open space, horizontal installation on the wall, measurement performed 5 m away from the device

PSYCHROMETRIC CHART



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