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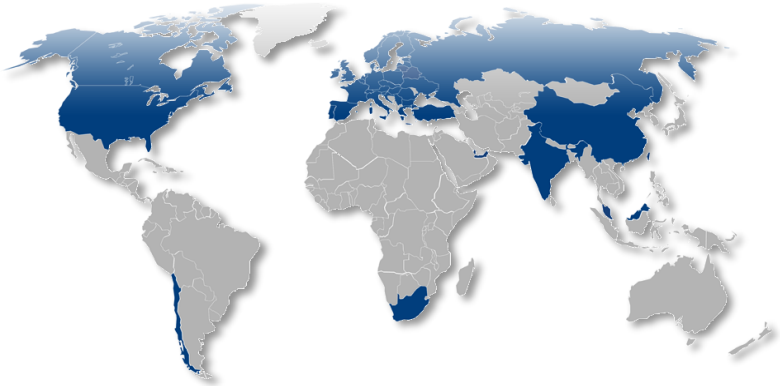
a systemair company

Fakta om systemair



- Sektorer: Värme, Ventilation & Luftkonditionering
- Huvudkontor i Skinnskatteberg/Sweden
- 55 avdelningar/försäljningsenheter i 46 länder
- 22 fabriker
- Mer än 6.500 anställda
- Omsättning 2017/2018: 730 Mio. €

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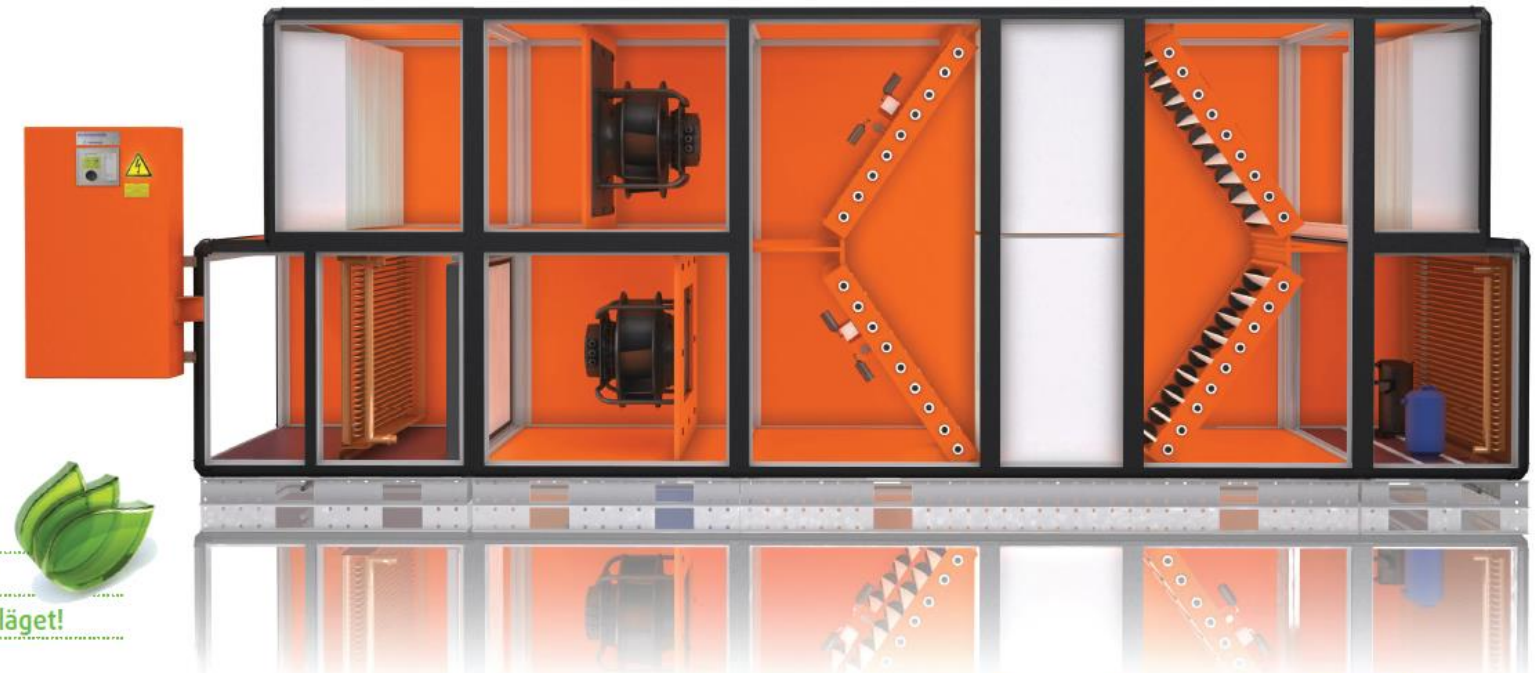
Luftbehandlingsaggregat med högeffektiva regenerativa kammarväxlare



Resolair 68 10 01 - förenklad visualisering

Väljer automatiskt det mest ekonomiska driftläget!

Resolair

Resolair 64 och 68

LUFTMÄNGD: 3.900 – 23.100 m³/h

EUROVENT CERTIFIED PERFORMANCE
AHU No.: 14.11.003
Range: Menerga Air
www.eurovent-certification.com

Eurovent-märkningen avser utförande Menerga Air, information på sida 6. Du kan kontrollera certifikatets giltighet på www.eurovent-certification.com eller www.certiflash.com.

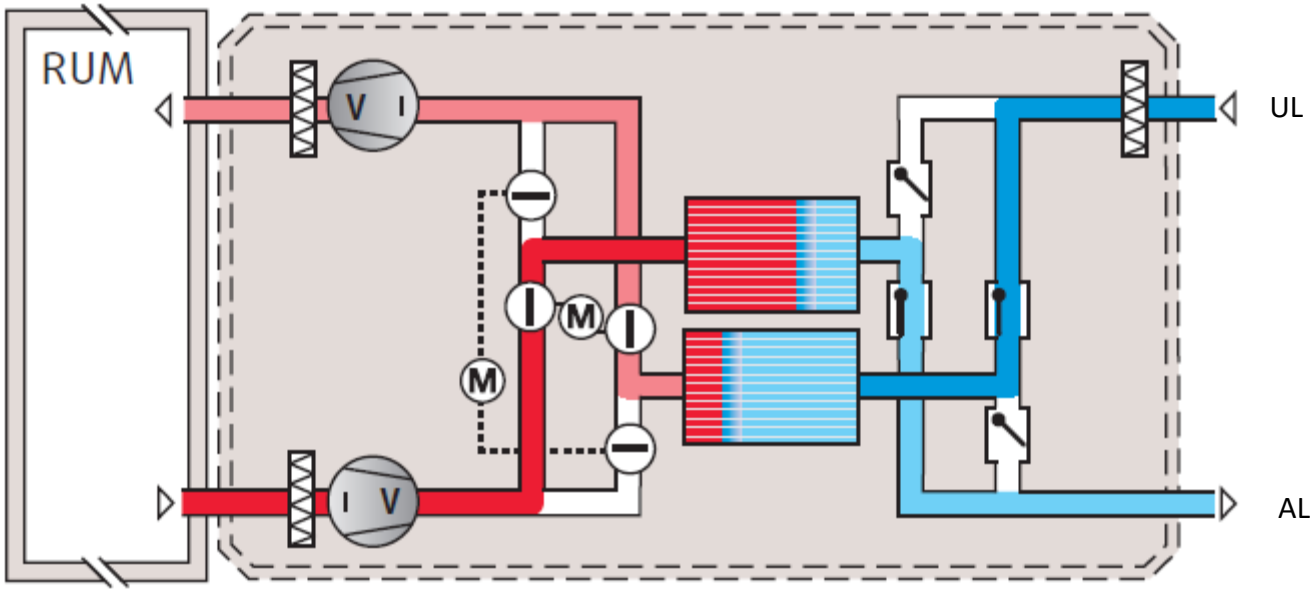
Energieeffizienzklasse A+

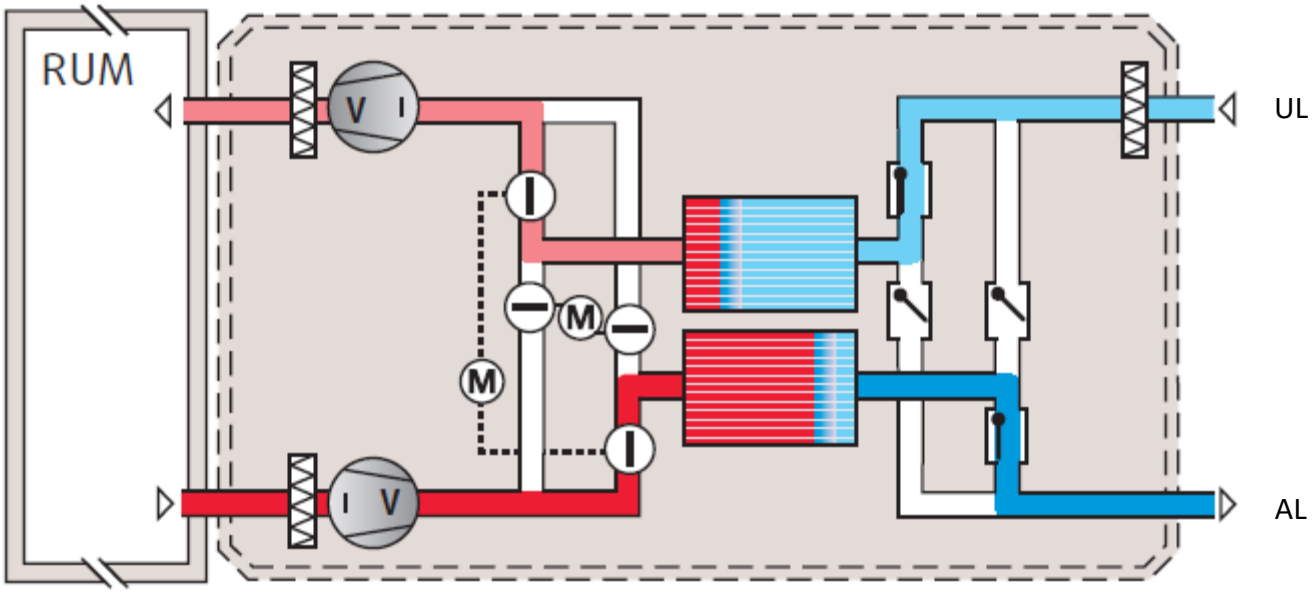
CERTIFIED COMPONENT
Passive House Institute

Passivhusmärkningen avser 64-serien.

fulfills ECODESIGN DIRECTIVE 2009/125/EC 2016 + 2018

Princip Menerga Resolair





CERTIFICATE

Certified Passive House Component

Valid until 31st December 2019

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

Category:	**Air handling unit with heat recovery**
Manufacturer:	**Menerga GmbH**
	Germany
Product name:	**Ventilation unit series**
	Resolair 64 05 01 – 64 32 01
Specification:	Airflow rate > 600 m³/h
Heat exchanger:	Regenerative

This certificate was awarded based on the product meeting the following main criteria

Heat recovery rate	η_{HR}	≥	75 %
Specific electric power	$P_{el,spec}$	≤	0.45 Wh/m³
Leakage		<	3 % [2]
Performance number		≥	10
Comfort	Supply air temperature ≥ 16.5 °C at outdoor air temperature of -10 °C		

Airflow range

1000-15000 m³/h

at an external pressure of

265-390 Pa [1]

Requirements non-residential buildings (Therefore also applicable for residential buildings)

Heat recovery rate

η_{HR} ≥ 86 %

Specific electric power

$P_{el,spec}$ ≤ 0.45 Wh/m³

Performance number

10

[1] The pressure drop of filters is covered in the listed external pressure. Additional components (e.g. heating coil) decrease the available external pressure accordingly.

[2] It must be taken into account that in this regenerative heat recovery system an exhaust air transfer of more than 3 % of exhaust airflow volume occurs. The use of exhaust air from rooms with a high degree of contamination must therefore be examined project-specific.

cool, temperate climate

CERTIFIED COMPONENT

Passive House Institute

www.passivehouse.com

menerga
a systemair company

Menerga GmbH
Alexanderstraße 69, 44625 Herne, Germany
☎ +49 (0) 208 99 81 - 0 | ✉ info@menerga.com | http://www.menerga.com |

Component ID	Unit model	Testing requirements	Airflow range Min m³/h	Airflow range Max m³/h	External pressure Pa	Actual available external pressure [1] Pa	Specific electric power Wh/m³	Heat recovery rate %	Performance number -
0854vl03	640501	Non-residential	1000	3000	290	254	0.44	86	10
0591vl03	640701	Non-residential	1500	4500	316	281	0.45	86	10
0855vl03	641001	Non-residential	2000	6000	333	299	0.44	86	10
0856vl03	641201	Non-residential	3000	7000	3463	310	0.44	86	10
0857vl03	641501	Non-residential	3200	8800	359	325	0.43	87	10
0858vl03	642101	Non-residential	5000	11000	371	340	0.45	88	10
0859vl03	642601	Non-residential	7000	13000	381	352	0.45	87	10
0860vl03	643201	Non-residential	9000	15000	390	362	0.44	87	10

Table 1: Certified values for each unit model. [1] Pressure drop of filters were taken into account.

Passive House comfort criterion

A supply air temperature of 16.5 °C is maintained at an outdoor air temperature of about -10.0 °C.

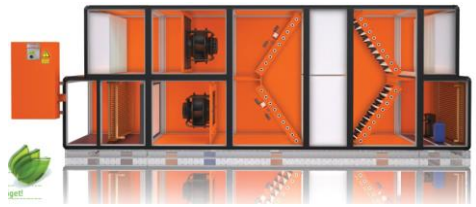
Efficiency criterion (heat recovery rate)

The effective heat recovery rate is measured at a test facility using balanced mass flows of the outdoor and exhaust air. The boundary conditions for the measurement are documented in the testing procedure.

$$\eta_{HR} = \frac{(\theta_{ETA} - \theta_{EHA}) + \frac{P_{el}}{\dot{m} \cdot c_p}}{(\theta_{ETA} - \theta_{ODA})}$$

With

η_{HR}	Heat recovery rate in %
θ_{ETA}	Extract air temperature in °C
θ_{EHA}	Exhaust air temperature in °C
θ_{ODA}	Outdoor air temperature in °C
P_{el}	Electric power in W
$\dot{m}$	Mass flow in kg/h
c_p	Specific heat capacity in Wh/(kg.K)



- The heat recovery rates for each model of the unit are listed in Table 1.

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Luftbehandlingsaggregat med motströmsvärmeväxlare och evaporativ kyla

Väljer automatiskt det mest ekonomiska driftläget!

Adconair 76 13 01 med AdiabaticPro
- förenklad visualisering

Adconair 76

LUFTMÄNGD: 2.600 – 23.600 m³/h

EUROVENT CERTIFIED PERFORMANCE
AHU No.: 14.11.003
Range: Menerga Air
www.eurovent-certification.com

Energieeffizienzklasse A+

CERTIFIED COMPONENT
Passive House Institute

fulfills ECODESIGN DIRECTIVE 2009/125/EC 2016 + 2018

Eurovent-märkningen avser utförande Menerga Air, information på sida 6. Du kan kontrollera certifikatets giltighet på www.eurovent-certification.com

CERTIFICATE

Certified Passive House Component

Valid until 31st December 2019

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

Category:	**Air handling unit with heat recovery**
Manufacturer:	**Menerga GmbH**
	Germany
Product name:	**Ventilation unit series**
	Adconair 76 03 01 – 76 37 01
Specification:	Airflow rate > 600 m³/h
Heat exchanger:	Recuperative

This certificate was awarded based on the product meeting the following main criteria

Heat recovery rate	η_{HR}	≥	75 %
Specific electric power	$P_{el,spec}$	≤	0.45 Wh/m³
Leakage		<	3 %
Performance number		≥	10
Comfort	Supply air temperature ≥ 16.5 °C at outdoor air temperature of -10 °C		

Airflow range
1000-15000 m³/h
at an external pressure of
265-390 Pa [1]
Requirements non-residential buildings (Therefore also applicable for residential buildings)
Heat recovery rate
η_{HR} ≥ 88 %
Specific electric power
$P_{el,spec}$ ≤ 0.45 Wh/m³
Performance number
> 10

[1] The pressure drop of filters is covered in the listed external pressure. Additional components (e.g. heating coil) decrease the available external pressure accordingly.

cool, temperate climate

CERTIFIED COMPONENT

Passive House Institute

Menerga GmbH
Alexanderstraße 69, 44625 Herne, Germany
☎ +49 (0) 208 99 81 - 0 | ✉ info@menerga.com | http://www.menerga.com |

Component ID	Unit model	Testing requirements	Airflow range Min m³/h	Airflow range Max m³/h	External pressure Pa	Actual available external pressure [1] Pa	Specific electric power Wh/m³	Heat recovery rate %	Performance number -
0845vl03	760301	Non-residential	1000	2000	265	228	0.45	88	10
0846vl03	760501	Non-residential	1200	2800	286	250	0.44	89	10
0847vl03	760601	Non-residential	1000	3000	290	255	0.45	91	10
0502vl03	761001	Non-residential	1500	4500	316	281	0.42	93	11
0848vl03	761301	Non-residential	2000	6000	333	299	0.43	91	11
0849vl03	761601	Non-residential	3000	7000	343	312	0.43	91	11
0850vl03	761901	Non-residential	3200	8800	359	326	0.43	94	11
0851vl03	762501	Non-residential	6000	10000	365	337	0.44	94	11
0852vl03	762901	Non-residential	8500	11500	376	349	0.45	94	11
0853vl03	763701	Non-residential	8000	15000	390	363	0.45	94	11

Table 1: Certified values for each unit model. [1] Pressure drop of filters were taken into account.

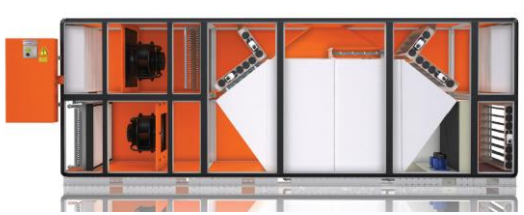
Passive House comfort criterion

A supply air temperature of 16.5 °C is maintained at an outdoor air temperature of about -10.0 °C can only be maintained if an adequate frost protection system with pre or post heating coils is installed. The controller comes with corresponding algorithms.

Efficiency criterion (heat recovery rate)

The effective heat recovery rate is measured at a test facility using balanced mass flows of the outdoor and exhaust air. The boundary conditions for the measurement are documented in the testing procedure.

$$\eta_{HR} = \frac{(\theta_{ETA} - \theta_{EHA}) + \frac{P_{el}}{\dot{m} \cdot c_p}}{(\theta_{ETA} - \theta_{ODA})}$$



Adconair

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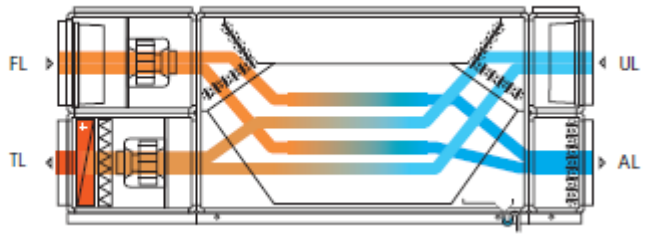
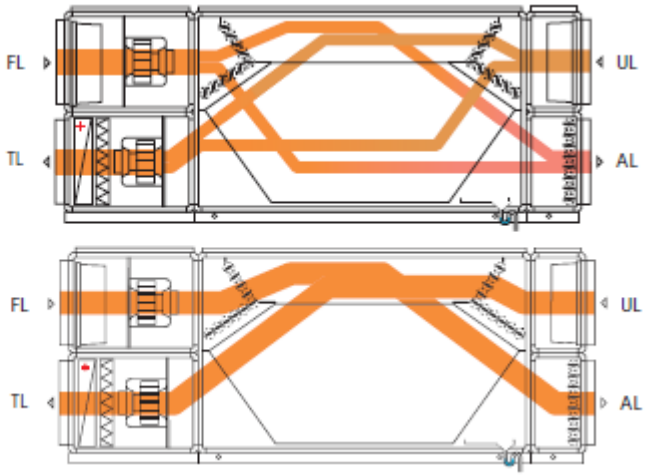
Vinterdrift

Vid låga utetemperaturer går anläggningen helt i värmeåtervinningsdrift. Motströms-värmeväxlaren gör det möjligt att återvinna mer än 90% av värmen som finns i frånluften. Det vattenburna värmebatteriet, som ingår i standardutförandet, jämnar ut byggnadens ventilations- och transmissions-förluster efter behov.



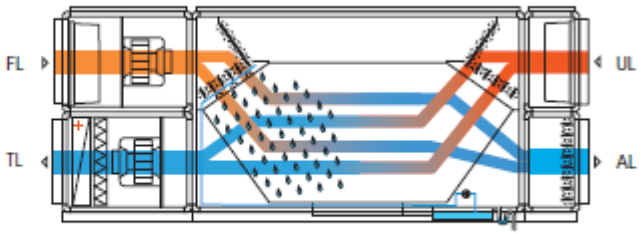
Övergångsdrift - mellan årstiderna

När utetemperaturen stiger minskar värmeåtervinningsbehovet. Bypass-spjällen som går över aggregatets hela djup regleras kontinuerligt för att uppnå den önskade tilluftstemperaturen. När utetemperaturen stiger ytterligare kringgås värmeåtervinningen komplett med den integrerade bypassen. Bypassens konstruktion i båda luftriktningar garanterar låga tryckförluster internt i aggregatet och därmed låg energiförbrukning för båda fläktarna i bypassdrift.



Adiabatik, indirekt evaporativ kyla (tillval)*

En väsentlig del i den indirekta evaporativa kylningen är motströmsvärmeväxlaren där frånluften kyls evaporativt. Uteluften kyls med den fuktigt-kalla avluften utan att bli befuktad själv. Den goda effektiviteten beror på att båda processerna (evaporativ kylning av frånluften + kylning av uteluften) sker samtidigt i värmeväxlaren. På grund av den höga temperaturverkningsgraden för värmeväxlaren kan man uppnå en stark nedkylning av ute-tilluften.



* Vid tillval av evaporativ kyla rekommenderas att köra högst med optimalt luftflöde.

Referens Vegaskolan i Vännäs

Fakta Vegaskolan

- Dimensionerande ute temp vinter **-27° C**
- Total luftmängd **9,65M³/s**
- Antal aggregat **3st**

- Aggregat i liggande utförande
- Aggregat levererat **utan** eftervärmningsbatteri
- Inget behov av avfrostning
- TL-temperaturverkningsgrad **90%**

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3.2 Leistungsdaten

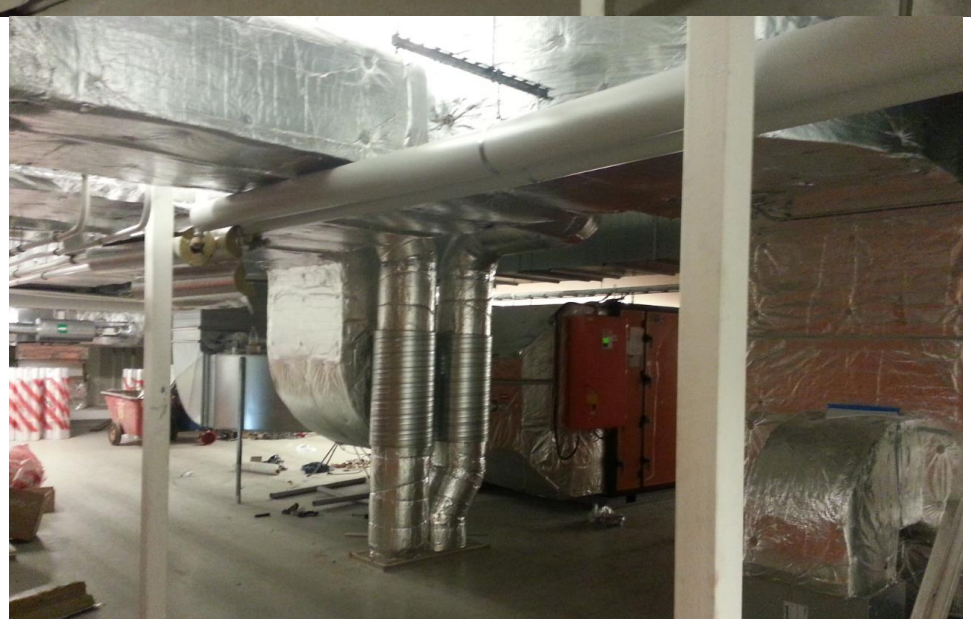
Tabelle 5: Leistungsdaten Wärmebereitstellungsgrad

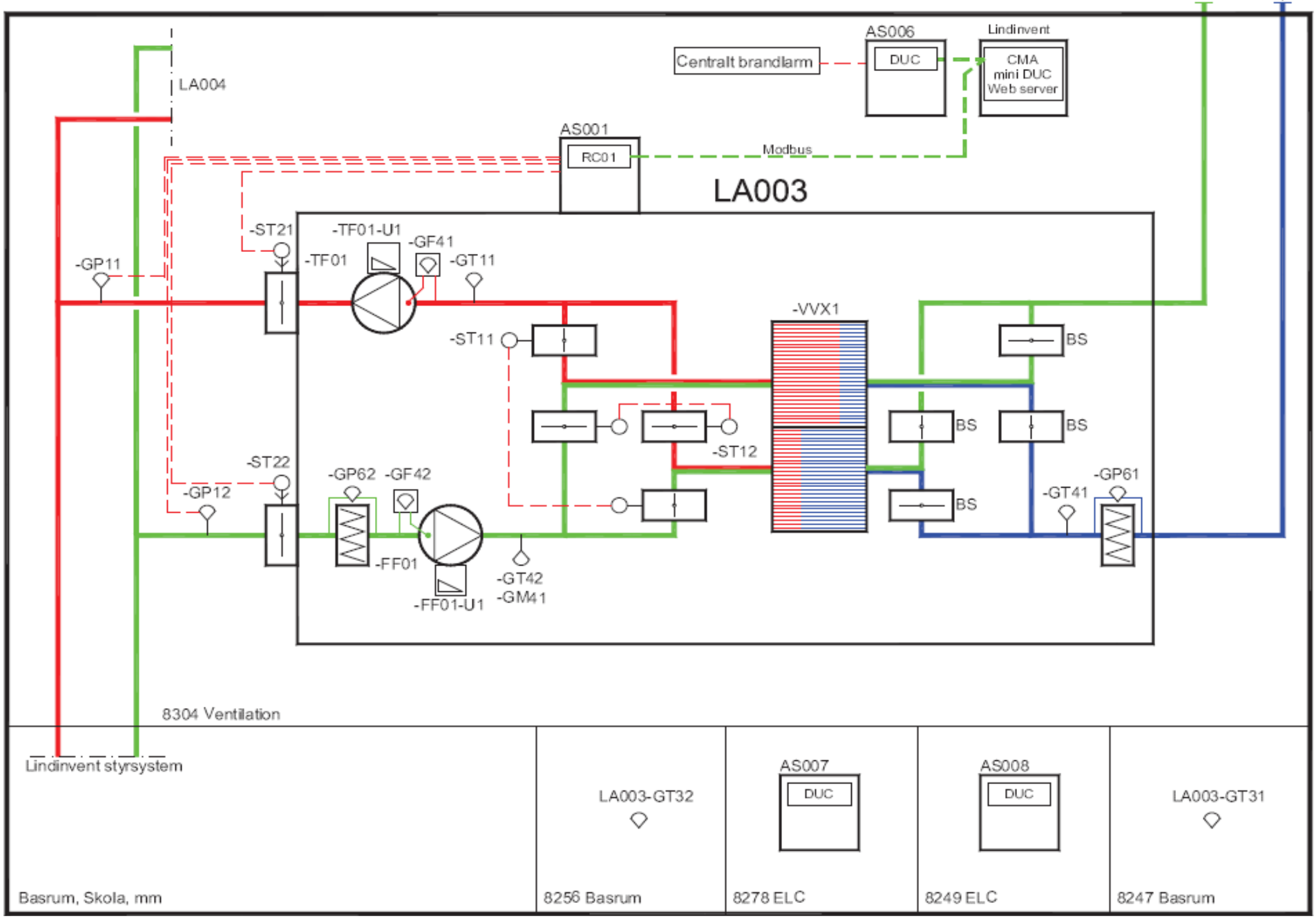
Wärmebereitstellungsgrad		Passivhaus Institut	Technisches Datenblatt	Messung	Ab-weichung
Bezugsvolumenstrom	m³/h		12960	12960	
Leistungsaufnahme gesamt inkl. MSR / ohne MSR	kW		- / 5,26	5,00 / 4,95	- / -5,89 %
Volumenstrom ETA bei 1,2 kg/m³	m³/h		12960	12804	
Volumenstrom SUP bei 1,2 kg/m³	m³/h		12985	13295	
Wärmebereitstellungsgrad*	%	≥75	96,52	94,88%	-1,7 %

*Bei ϑ_{ETA} = 21 °C und ϑ_{ODA} = 4 °C

Tabelle 6: Leistungsdaten spezifische Ventilatorleistung

Spezifische Leistung Ventilatoren		Passivhaus Institut	Technisches Datenblatt	Messung	Ab-weichung
Bezugsvolumenstrom	m³/h		12960	12960	
Leistungsaufnahme gesamt inkl. MSR / ohne MSR	kW		- / 5,26	5,00 / 4,95	- / -5,89 %
Volumenstrom ETA bei 1,2 kg/m³	m³/h		12960	12804	
Volumenstrom SUP bei 1,2 kg/m³	m³/h		12985	13295	
Spez. Leistung Ventilatoren	Wh/m³	≤0,45	0,40	0,38	-5 %




LA004
AS006
DUC
Lindinvent
CMA
mini DUC
Web server
Centralt brandlarm
AS001
RC01
Modbus
LA003
-ST21
-TF01-U1
-GF41
-TF01
-GT11
-GP11
-VVX1
-ST11
BS
BS
BS
BS
-ST12
-ST22
-GP62
-GF42
-GP12
-GP61
-GT41
-FF01
-GT42
-GM41
-FF01-U1
8304 Ventilation
Lindinvent styrsystem
LA003-GT32
AS007
DUC
AS008
DUC
LA003-GT31
Basrum, Skola, mm
8256 Basrum
8278 ELC
8249 ELC
8247 Basrum

Referenser Passivhus Europa

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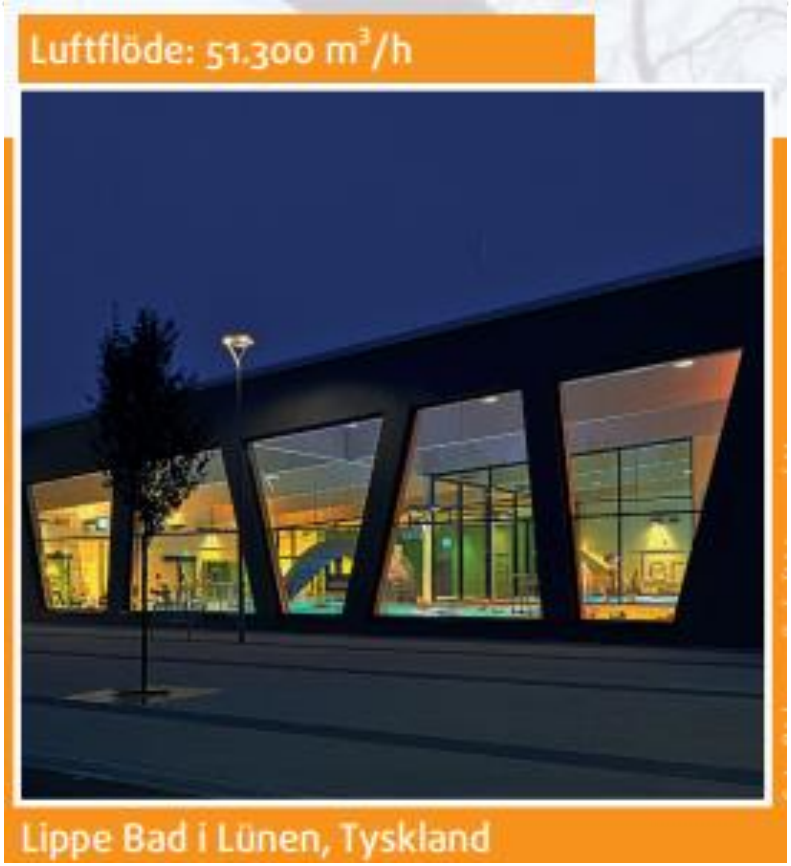
Kompakt vattenkylare för uppställning inomhus
med frikyla, evaporativ kyla
och integrerad kompressordriven kylanläggning

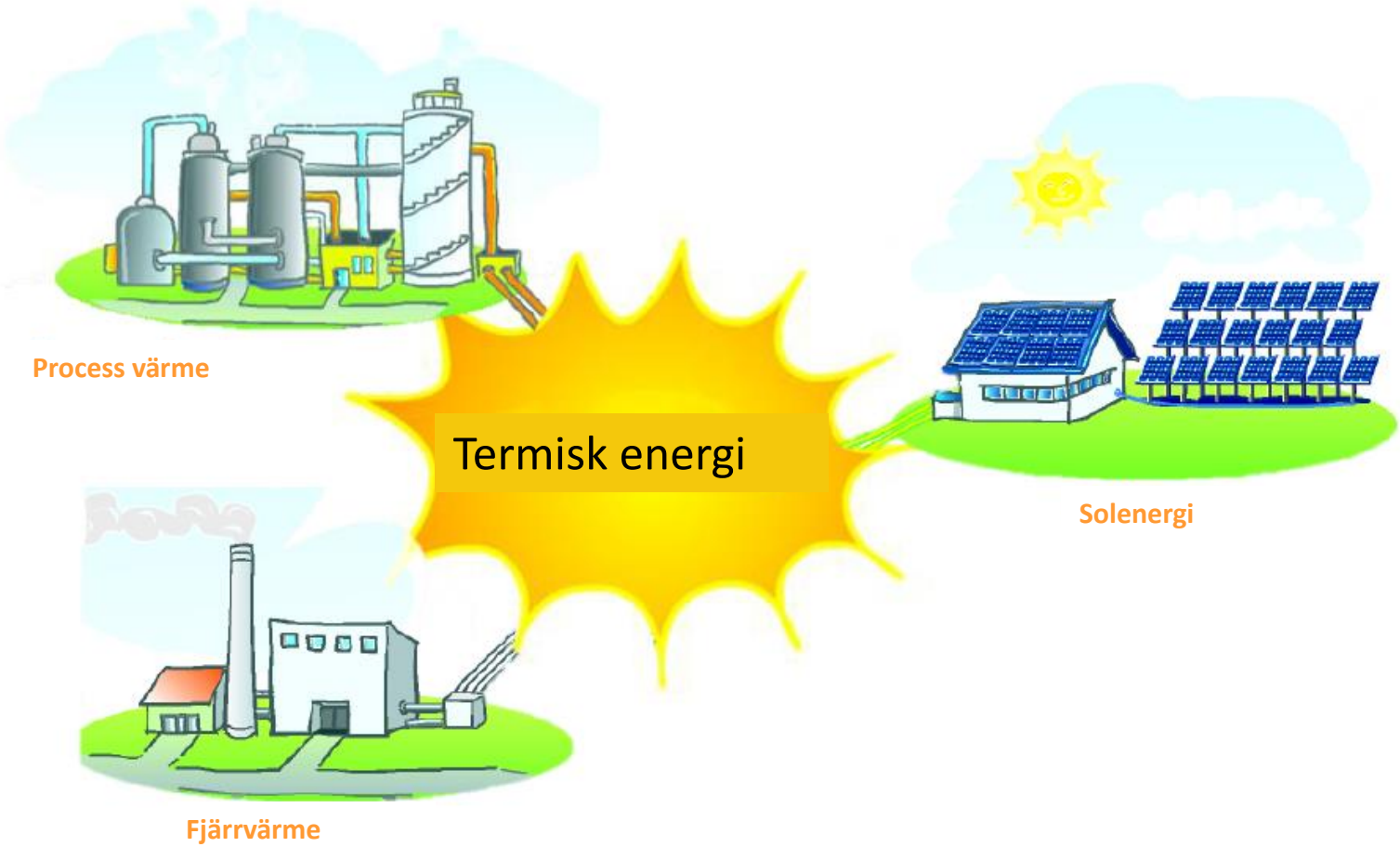
Luftbehandlingsaggregat med dubbla plattvärmeväxlare
med indirekt evaporativ kyla

Referenser Passivhus Europa



Luftavfuktare med 3-stegs
plattvärmeväxlare för mindre simhallar

Förnybar energi



TACK!

Kent Granberg Menerga AB