

Project	2016 0067 Kantoor Hardewijk	M3,5
Nr	16.814JZ.208 Position AHU 1	25.4.2016

Customer		Designer	
Customer	Vacom Air	Designer Name	
Contact name	Gerard Kuiper	Phone	
Phone	+31 594 63 19 11		

Basic data

Product	AHU	Line	Mandík M
Total dimensions (LxWxH)	mm 2920 x 1035 x 1520	Size	M3,5
contour dimensions (LxWxH)	mm 2980 x 1135 x 1550	Panel thickness	mm 50
Weight	kg 461	Insulation density	kg/m3 50
Weight attached accessories	kg 0		
Unit fastening mode: Baseframe			
Surface treatment outside	painted RAL 7035	Surface treatment inside	painted RAL 7035
terminal panel surface	galvanised	built-in holder surface	galvanised
holder surface	galvanised		
execution: Indoor			

Test according to EN 1886 (07/2009)

Mechanical strength of casing	D1 (M)	
Casing air leakage	L1 (M)	
Filter bypass leakage	< 0,5% - F9 (M)	
Thermal transmittance	T3	
Thermal bridging of the casing	TB2	
Sound insertion loss in band	Hz	125 250 500 1000 2000 4000 8000
	dB	15.8 23.6 31.3 37.3 39.5 39.7 43.2



according EU Directive No 1253/2014: Non residential ventilation unit (NRVU) ErP 2016 comply

Unit type:	bidirectional ventilation unit (BVU)
Type of drive:	variable speed drive
type of heat recovery system:	regenerative heat exchanger
External leakage rate at - 400 Pa	0.54%
External leakage rate at +400 Pa	0.58%
Internal leakage rate at 250 Pa	2.30%
thermal efficiency of HRS	$\eta_{t1:1} / \eta_{t_limit} 2016$ % 68.5 / 67.0
Supply: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 58.4 / 35.7
Supply: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 65.0
Exhaust: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 57.7 / 32.8
Exhaust: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 68.7
internal SFP of ventilation components:	SFP int / SFP int_limit 2016 W/(m3/s) 597 / 1120
Int.press.drop of vent.components: supply / exhaust	$\Delta P_s \text{ int sup} / \Delta P_s \text{ int exh}$ Pa 197 / 150
Int.press.drop of add.components: supply / exhaust	$\Delta P_s \text{ add sup} / \Delta P_s \text{ add exh}$ Pa 283 / 88



Regularly filter change is very important for performance and energy efficiency of the unit. Maximal recommended final pressure loss according EN13053 mentioned in technical specification is not to exceed. Use visual or acoustic pressure warning device on filters.

Equipment is included in the energy class B according RLT-certification guideline .

SFP	W/(m3/s)	Supply	Exhaust
		1168	724
SFP class acc.EN13779		SFP3	SFP1
Class of power input of drive acc. EN13053		P1	P1
Class of average air velocity acc. EN13053		V5	V5
efficiency class acc.EN13053		H2	



NOTICE: Unit with efficiency label B according RLT-certification guideline cannot be installed on EU territory after 1.1.2016 !

Supply part		cross-section air velocity	m/s	2.3
Compact block A				
Terminal panel	air flow	m3/h	3000	pressure loss Pa
Damper, tightness class 2 EN1751:2003	inside 3 Nm	Ending	flange	9

Service side:

front, door with hinges and handles

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Filter	air flow	m3/h	3000	pressure loss	Pa	139
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length F7 - bag filter 630 mm
 Initial pressure loss Pa 78
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class A according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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winter calculation point

Supply

Air inlet temperature °C -10.0
 Air inlet humidity % 60.0
 air outlet temperature °C 12.0
 air outlet humidity % 40.9
 recuperation efficiency % 68.7
 Heat gain kW 28.5

Exhaust

Air inlet temperature °C 22.0
 Air inlet humidity % 40.0
 air outlet temperature °C 0.5
 air outlet humidity % 100.0

summer calculation point

Supply

Air inlet temperature °C 28.0
 Air inlet humidity % 60.0
 air outlet temperature °C 26.3
 air outlet humidity % 66.0
 recuperation efficiency % 68.7
 Heat gain kW 1.8

Exhaust

Air inlet temperature °C 25.5
 Air inlet humidity % 50.0
 air outlet temperature °C 27.2
 air outlet humidity % 45.0

Temperature efficiency dry η_t , dry1:1 % 68.5 EN13053
 Energy efficiency η_e % 66.6 EN13053

Lot 6 ErP 2016
 heat recovery class H2

execution condensation wheel, 1 segment

wheel diameter mm 850
 wave height mm 1.9

Motor 3 x 230V/50Hz, 60W, 1.56A
 Motor RPM RPM 1600

Service side:

front, removable panel , lock with clamping bolt

Accessories:

Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	attached

Compact block C

Direct evaporator	air flow	m3/h	3000	pressure loss	Pa	213
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with drop eliminator Pa 28

Condensate drain underpressure Pa DN32 -627
 Coolant R410A

count of rows 4

Evaporator operation mode

Air inlet temperature °C 26.3
 Air inlet humidity % 66.0
 air outlet temperature °C 18.0
 air outlet humidity % 90.4

Evaporation temperature °C 7.0
 count of circuits 2
 division of circuits woven

Power kW 15.0
 pressure drop of dry exchanger Pa 137
 cross-air velocity on exchanger fins m/s 4.02

pressure drop of wet exchanger Pa 185

Condenser operation mode

Air inlet temperature °C 12.0
 air outlet temperature °C 21.0
 Power kW 9.1
 cross-air velocity on exchanger fins m/s 4.02

Condensing temperature °C 30.0

Service side:

front, removable panel , lock with clamping bolt

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Accessories:

Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1	attached
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Fan	air flow	m3/h	3000	pressure loss	Pa	3			
Plug fan type	ER31C-ZID.DC.CR	Total pressure		Pa	825				
Motor technology: EC		Static pressure loss		Pa	802				
air flow	m3/h 3000	Dynamic pressure		Pa	45				
External pressure loss	Pa 300	Pressure drop build-in		Pa	22				
SFP class acc.EN13779	SFP3	SFPv		W/(m3/s)	1168				
Nominal parameters		Parameters in working point							
voltage	V 1~230	voltage		V	230				
Frequency	Hz 50	Frequency		Hz	50				
Power	kW 1.35	Power Pm / Pref		kW	1.11 / 1.53				
current	A 4.80	current		A	4.89				
RPM	RPM 2920	RPM / RPM max.		RPM	2744 / 2920				
Motor: EC blue with integrated EC controller		fan-motor efficiency		%	61.6				
Motor protection: active temperature management		Frequency band [Hz] / Lw [dB]							
	LwA	63	125	250	500	1000	2000	4000	8000
	dB(A)	70.7	69.0	77.1	76.8	80.2	78.7	73.9	70.0
	Sum	67.7	63.4	64.2	57.6	54.9	55.7	47.3	37.8
Sound power level to exhaust	84.4	62.7	53.0	53.1	45.8	43.2	38.7	33.9	27.0
Sound power level to intake	62.0								
Sound power level to surround	49.5								

Service side:

front, door with hinges and handles

Accessories:

service switch, wired	KEM 310U Y/R, 10A, lockable	1	mounted on unit
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Terminal panel	air flow	m3/h	3000	pressure loss	Pa	0
Damper	not mounted	Ending		flange		

Exhaust part

cross-section air velocity **m/s 2.3**

Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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Compact block D

Terminal panel	air flow	m3/h	3000	pressure loss	Pa	3
Damper, tightness class 2 EN1751:2003	outside 3 Nm	Ending		flange		

Service side:

front

Filter	air flow	m3/h	3000	pressure loss	Pa	116
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length M5 - bag filter 630 mm
 Initial pressure loss Pa 31
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class B according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block E

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Fan	air flow	m3/h	3000	pressure loss	Pa	3			
top: flange				Pa	0				
Plug fan type	ER31C-6ID.BD.CR			Total pressure	Pa	533			
Motor technology: EC									
air flow	m3/h	3000		Static pressure loss	Pa	510			
External pressure loss	Pa	250		Dynamic pressure	Pa	45			
				Pressure drop build-in	Pa	22			
SFP class acc.EN13779	SFP1			SFPv	W/(m3/s)	724			
Nominal parameters				Parameters in working point					
voltage	V	1~230		voltage	V	230			
Frequency	Hz	50		Frequency	Hz	50			
Power	kW	0.78		Power Pm / Pref	kW	0.70 / 0.99			
current	A	2.90		current	A	2.99			
RPM	RPM	2460		RPM / RPM max.	RPM	2376 / 2460			
Motor: EC blue with integrated EC controller				fan-motor efficiency	%	65.5			
Motor protection: active temperature management									
	LwA			Frequency band [Hz] / Lw [dB]					
	dB(A)			63 125 250 500 1000 2000 4000 8000					
	Sum								
Sound power level to exhaust	78.4	64.4	63.5	74.6	72.9	74.8	71.4	66.3	63.0
Sound power level to intake	62.0	60.7	57.9	65.3	58.7	54.9	54.0	48.2	40.5
Sound power level to surround	45.3	56.4	47.5	50.6	41.9	37.8	31.4	26.3	20.0

Service side:

front, door with hinges and handles

Accessories:

service switch, wired KEM 310U Y/R, 10A, lockable 1 mounted on unit

Control

AHU

Remote control Not selected
 Visualization Not selected
 To regulate the temperature Supply
 Air quality sensor Not selected
 Smoke sensor Not selected
 Communication module Not selected
 EPS cooperation -
 Power supply for fire dampers -
 Router UMTS -

Switchboard

Built-in section -
 Display on door -
 Frequency inverters inside -
 El. heater regulation inside -
 EMC filter (residential and industrial environment) in switchboard-
 EMC filter (residential and industrial environment) out of switchboard
 Schuko socket Type F -
 Switchboard tempering -
 Switchboard aeration -
 Input of extern devices [kW]

Supply part

Input temperature sensor Outdoor temperature sensor
 Output temperature sensor Pipe temperature sensor Siemens
 Spatial sensor Not selected
 Temperature cascade sensor Not selected

Exhaust part

Input temperature sensor Pipe temperature sensor Siemens
 Output temperature sensor Not selected
 Spatial sensor Not selected
 Temperature cascade sensor Not selected

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Terminal panel - supply - intake

Spring-return actuator Yes
Continuous control actuator -

Filter - supply

Digital differential pressure transmitter with display -

Direct evaporator - supply

Heat the condensate exhaust trap -
Type of condensation unit -

Fan - supply

Frequency inverter
FI control panel
FI wire clamp guard
Pressure/air flow regulator Not selected
Safety switch -
Auxiliary contact for safety switch -

Terminal panel - exhaust - intake

Spring-return actuator -
Continuous control actuator -

Filter - exhaust

Digital differential pressure transmitter with display -

Fan - exhaust - exhaust

Frequency inverter
FI control panel
FI wire clamp guard
Pressure/air flow regulator Not selected
Safety switch -
Auxiliary contact for safety switch -

Air handling units Mandík including control system meet the safety requirements of Directive 2006/95 / EC - low voltage electrical equipment certificate Notified Body No. E-31-00258-15.

Air handling units Mandík including control system meet the requirements of Directive 2004/108 / EC - Electromagnetic Compatibility (residential environment - immunity, industrial environment - immunity and emission) Certificate Notified Body No. E-31-00259-15.

Control elements			
description	Type	quantity	Section
Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	Rotary recuperator supply attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	Rotary recuperator supply attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	Rotary recuperator supply attached
Switchboard Siemens Climatix with control panel, TCP/IP PC connection, plastic IP65/ IP40	RP2/CRV	1	
Software and test of Switchboard		1	
Outdoor temperature air sensor	NTC10k, -40...+70°C	1	Sensor, Supply part attach
Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Supply part attach
Damper actuator, open - close, emergency function	5 Nm, AC/DC 24V, LF24A	1	Terminal panel, Supply part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Supply part attach

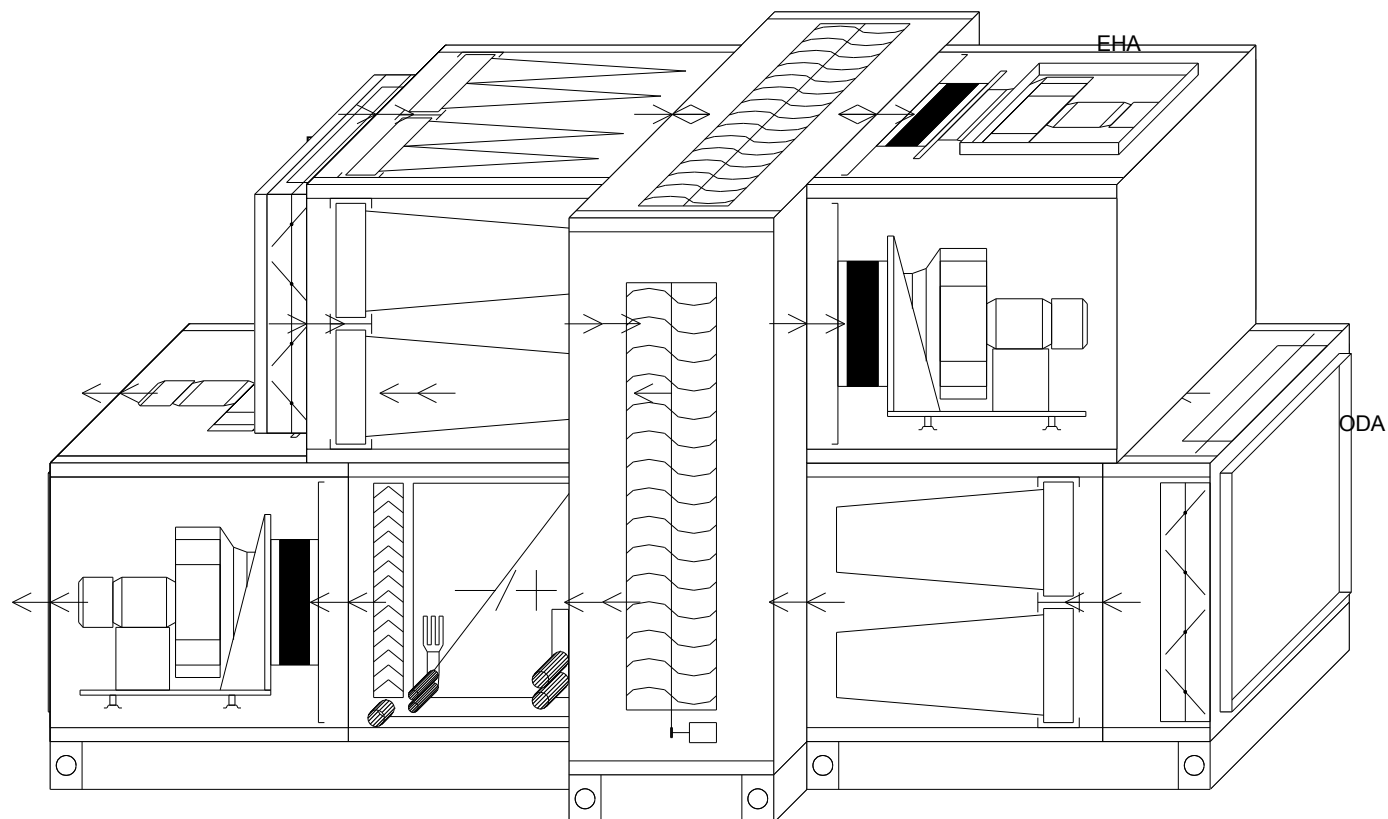
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Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Exhaust part attach
Damper actuator, open - close	5 Nm, AC/DC 24V, LM24A	1	Terminal panel, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Rotary recuperator, Exhaust part attach

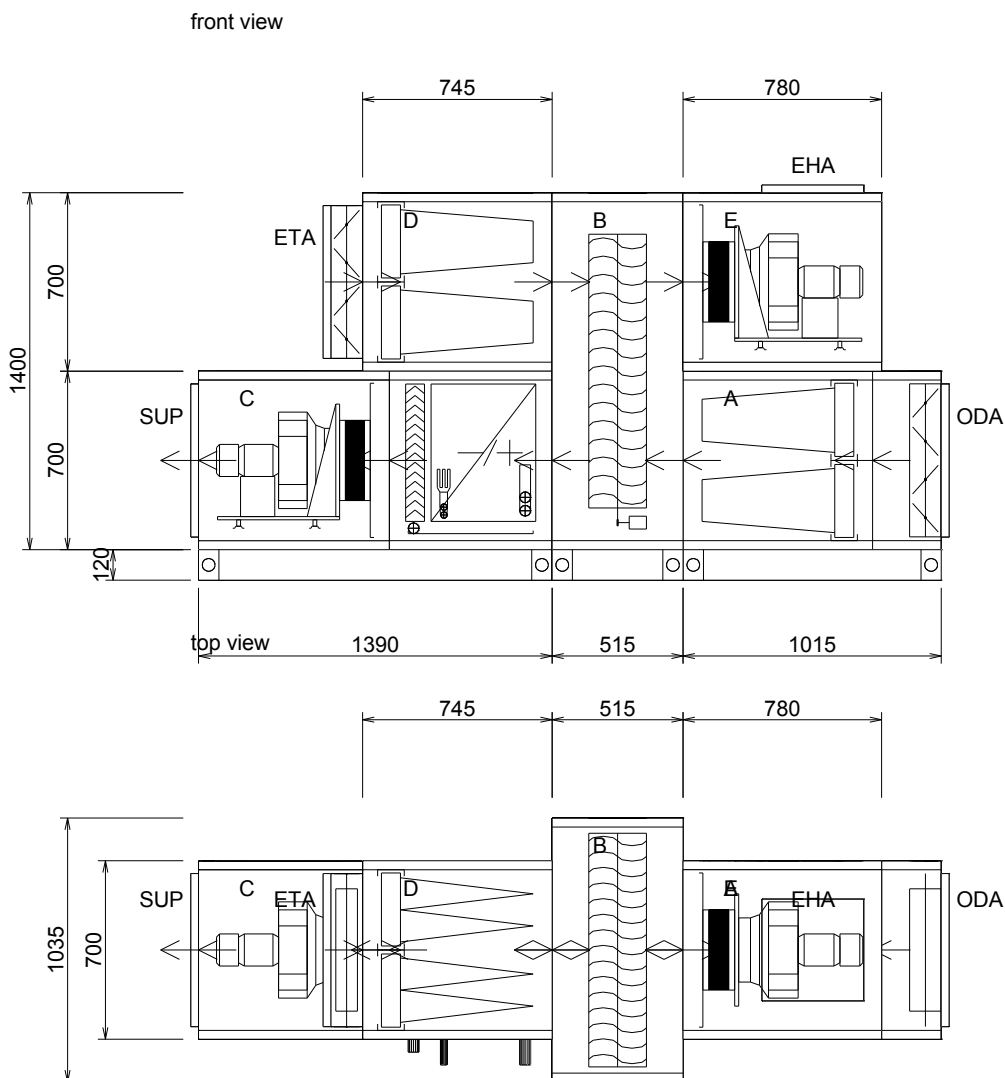
Accessories			
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description	Type	quantity	Section
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan exhaust mounted on unit
Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1	Direct evaporator supply attached
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan supply mounted on unit

perspective view



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm

Compact block	Part	Total dimensions (LxWxH) mm	contour dimensions (LxWxH) mm	Weight kg
Compact block A	supply	1015 x 700 x 820	1045 x 800 x 820	72
Compact block B	supply	515 x 1035 x 1520	515 x 1135 x 1520	134
Compact block C	supply	1390 x 700 x 820	1420 x 850 x 820	139
Compact block D	exhaust	745 x 700 x 700	900 x 800 x 700	48
Compact block E	exhaust	780 x 700 x 700	780 x 800 x 730	68
accessories attached to AHU				0

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Customer		Designer	
Customer	Vacom Air	Designer Name	
Contact name	Gerard Kuiper	Phone	
Phone	+31 594 63 19 11		

Basic data

Product	AHU	Line	Mandík M
Total dimensions (LxWxH)	mm 2920 x 1035 x 1520	Size	M3,5
contour dimensions (LxWxH)	mm 2980 x 1135 x 1550	Panel thickness	mm 50
Weight	kg 461	Insulation density	kg/m3 50
Weight attached accessories	kg 0		
Unit fastening mode: Baseframe			
Surface treatment outside	painted RAL 7035	Surface treatment inside	painted RAL 7035
terminal panel surface	galvanised	built-in holder surface	galvanised
holder surface	galvanised		
execution: Indoor			

Test according to EN 1886 (07/2009)

Mechanical strength of casing	D1 (M)							
Casing air leakage	L1 (M)							
Filter bypass leakage	< 0,5% - F9 (M)							
Thermal transmittance	T3							
Thermal bridging of the casing	TB2							
Sound insertion loss in band	Hz	125	250	500	1000	2000	4000	8000
	dB	15.8	23.6	31.3	37.3	39.5	39.7	43.2



according EU Directive No 1253/2014: Non residential ventilation unit (NRVU) ErP 2016 comply

Unit type:	bidirectional ventilation unit (BVU)
Type of drive:	variable speed drive
type of heat recovery system:	regenerative heat exchanger
External leakage rate at - 400 Pa	0.54%
External leakage rate at +400 Pa	0.58%
Internal leakage rate at 250 Pa	2.30%
thermal efficiency of HRS	$\eta_{t1:1} / \eta_{t_limit} 2016$ % 68.5 / 67.0
Supply: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 58.4 / 35.7
Supply: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 65.0
Exhaust: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 57.7 / 32.8
Exhaust: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 68.7
internal SFP of ventilation components:	SFP int / SFP int_limit 2016 W/(m3/s) 597 / 1120
Int.press.drop of vent.components: supply / exhaust	ΔP_s int sup / ΔP_s int exh Pa 197 / 150
Int.press.drop of add.components: supply / exhaust	ΔP_s add sup / ΔP_s add exh Pa 283 / 88



Regularly filter change is very important for performance and energy efficiency of the unit. Maximal recommended final pressure loss according EN13053 mentioned in technical specification is not to exceed. Use visual or acoustic pressure warning device on filters.

Equipment is included in the energy class B according RLT-certification guideline .

SFP	W/(m3/s)	Supply	Exhaust
SFP class acc.EN13779		1168	724
Class of power input of drive acc. EN13053		SFP3	SFP1
Class of average air velocity acc. EN13053		P1	P1
efficiency class acc.EN13053		V5	V5
		H2	



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Supply part		cross-section air velocity	m/s	2.3
Compact block A				
Terminal panel	air flow	m3/h	3000	pressure loss Pa
Damper, tightness class 2 EN1751:2003	inside 3 Nm	Ending	flange	9

Service side:

front, door with hinges and handles

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Filter	air flow	m3/h	3000	pressure loss	Pa	139
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length F7 - bag filter 630 mm
 Initial pressure loss Pa 78
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class A according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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winter calculation point

Supply

Air inlet temperature °C -10.0
 Air inlet humidity % 60.0
 air outlet temperature °C 12.0
 air outlet humidity % 40.9
 recuperation efficiency % 68.7
 Heat gain kW 28.5

Exhaust

Air inlet temperature °C 22.0
 Air inlet humidity % 40.0
 air outlet temperature °C 0.5
 air outlet humidity % 100.0

summer calculation point

Supply

Air inlet temperature °C 28.0
 Air inlet humidity % 60.0
 air outlet temperature °C 26.3
 air outlet humidity % 66.0
 recuperation efficiency % 68.7
 Heat gain kW 1.8
 Temperature efficiency dry η_t , dry1:1 % 68.5 EN13053
 Energy efficiency η_e % 66.6 EN13053
 execution condensation wheel, 1 segment
 wheel diameter mm 850
 wave height mm 1.9

Exhaust

Air inlet temperature °C 25.5
 Air inlet humidity % 50.0
 air outlet temperature °C 27.2
 air outlet humidity % 45.0

Lot 6 ErP 2016
 heat recovery class H2

Motor 3 x 230V/50Hz, 60W, 1.56A
 Motor RPM RPM 1600

Service side:

front, removable panel, lock with clamping bolt

Accessories:

Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	attached

Compact block C

Direct evaporator	air flow	m3/h	3000	pressure loss	Pa	213
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with drop eliminator Pa 28
 count of rows 4
 Evaporator operation mode
 Air inlet temperature °C 26.3
 Air inlet humidity % 66.0
 air outlet temperature °C 18.0
 air outlet humidity % 90.4
 Power kW 15.0
 pressure drop of dry exchanger Pa 137
 cross-air velocity on exchanger fins m/s 4.02
 Condenser operation mode
 Air inlet temperature °C 12.0
 air outlet temperature °C 21.0
 Power kW 9.1
 cross-air velocity on exchanger fins m/s 4.02

Condensate drain underpressure Pa DN32 -627
 Coolant R410A
 Evaporation temperature °C 7.0
 count of circuits 2
 division of circuits woven
 pressure drop of wet exchanger Pa 185
 Condensing temperature °C 30.0

Service side:

front, removable panel, lock with clamping bolt

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Accessories:

Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1 attached
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Fan			air flow	m3/h	3000	pressure loss				Pa	3	
Plug fan type	ER31C-ZID.DC.CR		Total pressure			Pa	825					
Motor technology: EC			Static pressure loss			Pa	802					
air flow	m3/h	3000	Dynamic pressure			Pa	45					
External pressure loss	Pa	300	Pressure drop build-in			Pa	22					
SFP class acc.EN13779	SFP3		SFPv			W/(m3/s)	1168					
Nominal parameters			Parameters in working point									
voltage	V	1~230	voltage			V	230					
Frequency	Hz	50	Frequency			Hz	50					
Power	kW	1.35	Power Pm / Pref			kW	1.11 / 1.53					
current	A	4.80	current			A	4.89					
RPM	RPM	2920	RPM / RPM max.			RPM	2744 / 2920					
Motor: EC blue with integrated EC controller			fan-motor efficiency			%	61.6					
Motor protection: active temperature management												
	LwA	Frequency band [Hz] / Lw [dB]										
	dB(A)	63	125	250	500	1000	2000	4000	8000			
	Sum											
Sound power level to exhaust	84.4	70.7	69.0	77.1	76.8	80.2	78.7	73.9	70.0			
Sound power level to intake	62.0	67.7	63.4	64.2	57.6	54.9	55.7	47.3	37.8			
Sound power level to surround	49.5	62.7	53.0	53.1	45.8	43.2	38.7	33.9	27.0			

Service side:

front, door with hinges and handles

Accessories:

service switch, wired	KEM 310U Y/R, 10A, lockable	1 mounted on unit
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Terminal panel			air flow	m3/h	3000	pressure loss				Pa	0
Damper	not mounted	Ending	flange								

Exhaust part						cross-section air velocity	m/s	2.3
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Compact block B									
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Rotary recuperator			air flow	m3/h	3000	pressure loss				Pa	116
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Compact block D									
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Terminal panel			air flow	m3/h	3000	pressure loss				Pa	3
Damper, tightness class 2 EN1751:2003	outside 3 Nm	Ending	flange								

Service side:

front

Filter			air flow	m3/h	3000	pressure loss				Pa	116
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length M5 - bag filter 630 mm
 Initial pressure loss Pa 31
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class B according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block E									
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Fan	air flow	m3/h	3000	pressure loss	Pa	3			
top: flange				Pa	0				
Plug fan type	ER31C-6ID.BD.CR			Total pressure	Pa	533			
Motor technology: EC									
air flow	m3/h	3000		Static pressure loss	Pa	510			
External pressure loss	Pa	250		Dynamic pressure	Pa	45			
				Pressure drop build-in	Pa	22			
SFP class acc.EN13779	SFP1			SFPv	W/(m3/s)	724			
Nominal parameters				Parameters in working point					
voltage	V	1~230		voltage	V	230			
Frequency	Hz	50		Frequency	Hz	50			
Power	kW	0.78		Power Pm / Pref	kW	0.70 / 0.99			
current	A	2.90		current	A	2.99			
RPM	RPM	2460		RPM / RPM max.	RPM	2376 / 2460			
Motor: EC blue with integrated EC controller				fan-motor efficiency	%	65.5			
Motor protection: active temperature management									
	LwA			Frequency band [Hz] / Lw [dB]					
	dB(A)			63 125 250 500 1000 2000 4000 8000					
	Sum								
Sound power level to exhaust	78.4	64.4	63.5	74.6	72.9	74.8	71.4	66.3	63.0
Sound power level to intake	62.0	60.7	57.9	65.3	58.7	54.9	54.0	48.2	40.5
Sound power level to surround	45.3	56.4	47.5	50.6	41.9	37.8	31.4	26.3	20.0

Service side:

front, door with hinges and handles

Accessories:

service switch, wired KEM 310U Y/R, 10A, lockable 1 mounted on unit

Control

AHU

Remote control Not selected
 Visualization Not selected
 To regulate the temperature Supply
 Air quality sensor Not selected
 Smoke sensor Not selected
 Communication module Not selected
 EPS cooperation -
 Power supply for fire dampers -
 Router UMTS -

Switchboard

Built-in section -
 Display on door -
 Frequency inverters inside -
 El. heater regulation inside -
 EMC filter (residential and industrial environment) in switchboard-
 EMC filter (residential and industrial environment) out of switchboard
 Schuko socket Type F -
 Switchboard tempering -
 Switchboard aeration -
 Input of extern devices [kW]

Supply part

Input temperature sensor Outdoor temperature sensor
 Output temperature sensor Pipe temperature sensor Siemens
 Spatial sensor Not selected
 Temperature cascade sensor Not selected

Exhaust part

Input temperature sensor Pipe temperature sensor Siemens
 Output temperature sensor Not selected
 Spatial sensor Not selected
 Temperature cascade sensor Not selected

Project	2016 0067 Kantoor Hardewijk	M3,5
№	16.814JZ.208 Position AHU 2	25.4.2016

Terminal panel - supply - intake

Spring-return actuator	Yes
Continuous control actuator	-

Filter - supply

Digital differential pressure transmitter with display	-
--	---

Direct evaporator - supply

Heat the condensate exhaust trap	-
Type of condensation unit	-

Fan - supply

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Terminal panel - exhaust - intake

Spring-return actuator	-
Continuous control actuator	-

Filter - exhaust

Digital differential pressure transmitter with display	-
--	---

Fan - exhaust - exhaust

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Air handling units Mandík including control system meet the safety requirements of Directive 2006/95 / EC - low voltage electrical equipment certificate Notified Body No. E-31-00258-15.

Air handling units Mandík including control system meet the requirements of Directive 2004/108 / EC - Electromagnetic Compatibility (residential environment - immunity, industrial environment - immunity and emission) Certificate Notified Body No. E-31-00259-15.

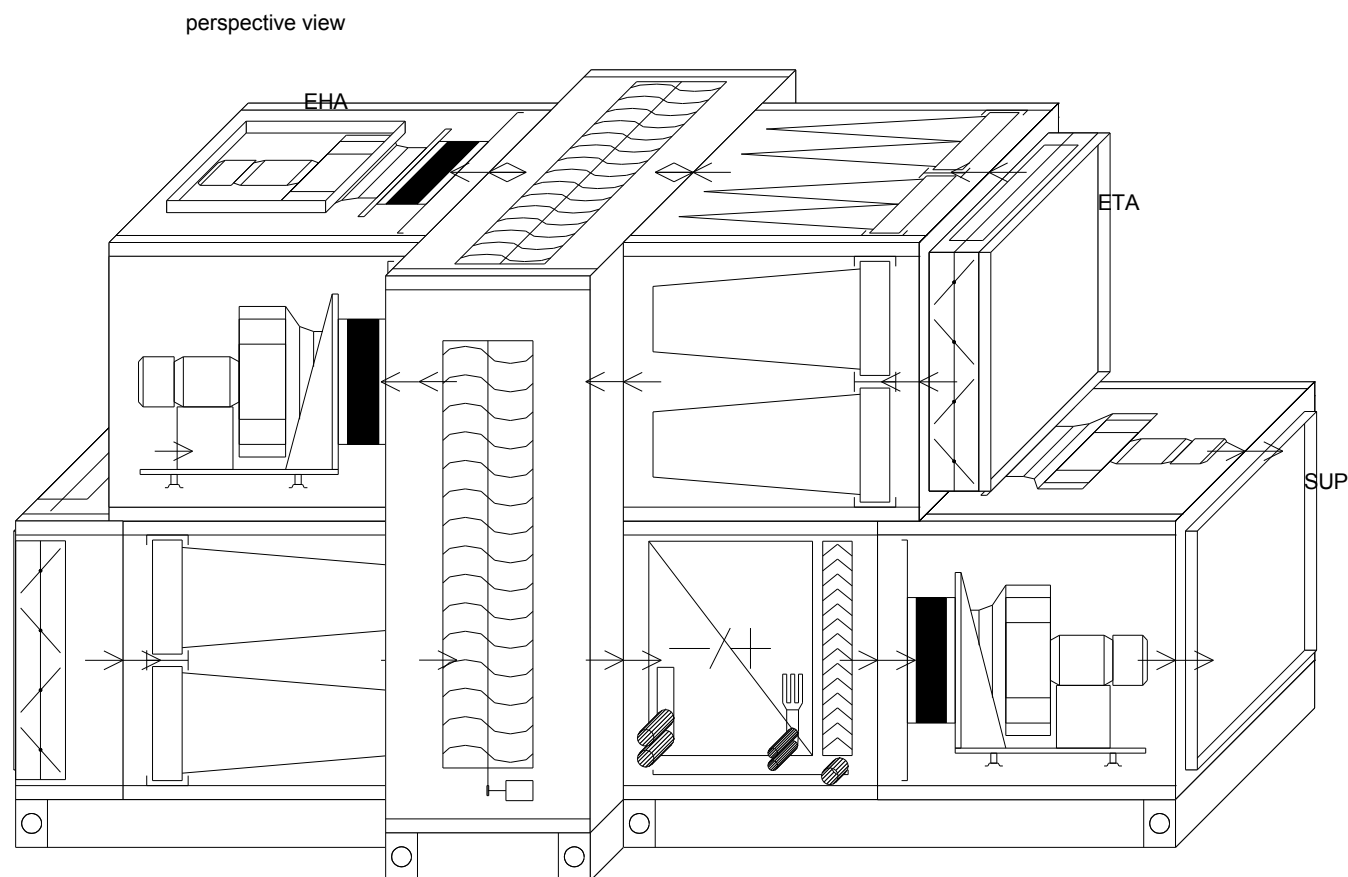
Control elements			
description	Type	quantity	Section
Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	Rotary recuperator supply attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	Rotary recuperator supply attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	Rotary recuperator supply attached
Switchboard Siemens Climatix with control panel, TCP/IP PC connection, plastic IP65/ IP40	RP2/CRV	1	
Software and test of Switchboard		1	
Outdoor temperature air sensor	NTC10k, -40...+70°C	1	Sensor, Supply part attach
Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Supply part attach
Damper actuator, open - close, emergency function	5 Nm, AC/DC 24V, LF24A	1	Terminal panel, Supply part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Supply part attach

Project	2016 0067 Kantoor Hardewijk	M3,5
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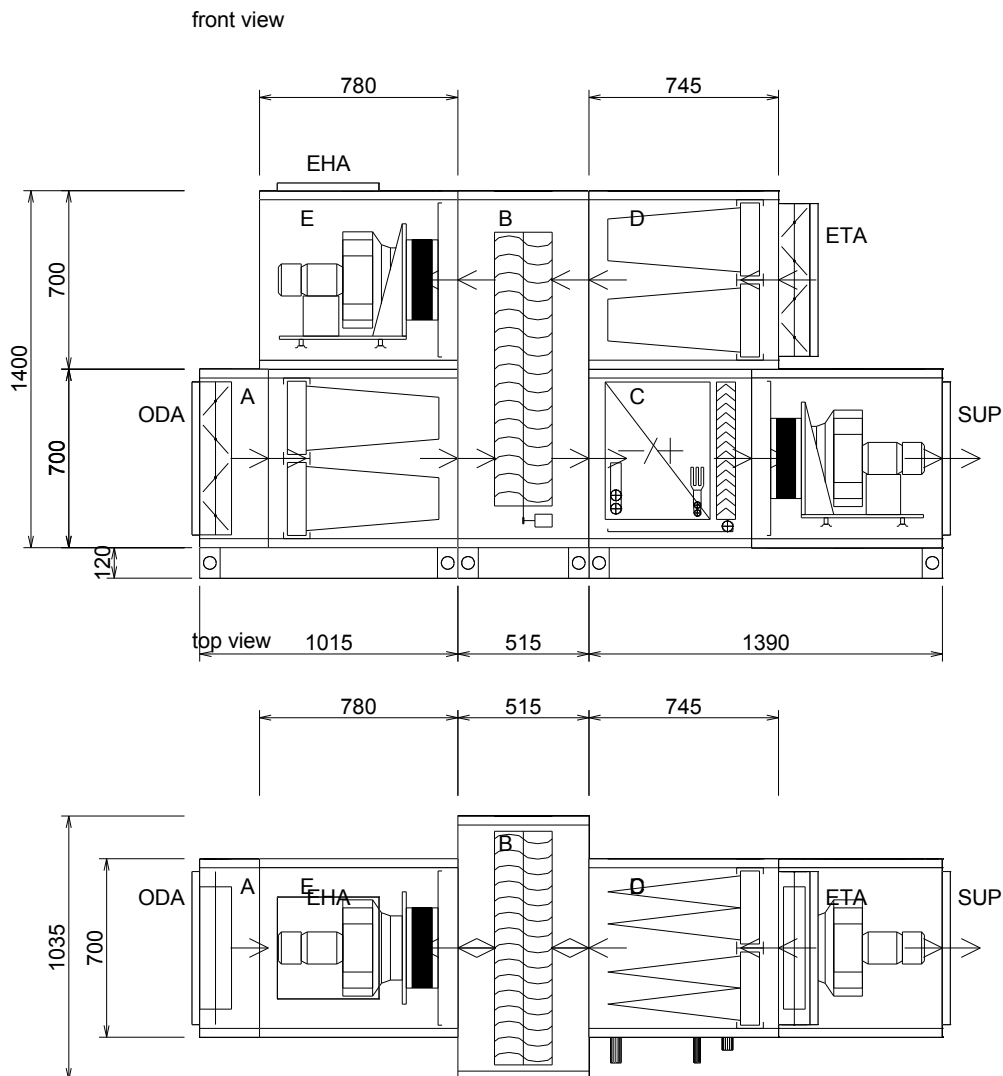
Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Exhaust part attach
Damper actuator, open - close	5 Nm, AC/DC 24V, LM24A	1	Terminal panel, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Rotary recuperator, Exhaust part attach

Accessories			
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description	Type	quantity	Section
Condensate syphon with Ball	-2000Pa/+500Pa HL136NKG	1	Direct evaporator supply attached
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan supply mounted on unit
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan exhaust mounted on unit



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm

Compact block	Part	Total dimensions (LxWxH) mm	contour dimensions (LxWxH) mm	Weight kg
Compact block A	supply	1015 x 700 x 820	1045 x 800 x 820	72
Compact block B	supply	515 x 1035 x 1520	515 x 1135 x 1520	134
Compact block C	supply	1390 x 700 x 820	1420 x 850 x 820	139
Compact block D	exhaust	745 x 700 x 700	900 x 800 x 700	48
Compact block E	exhaust	780 x 700 x 700	780 x 800 x 730	68
accessories attached to AHU				0

Project	2016 0067 Kantoort Hardewijk	M2,5
Nr	16.814JZ.208 Position AHU 3	25.4.2016

Customer		Designer	
Customer	Vacom Air	Designer Name	
Contact name	Gerard Kuiper	Phone	
Phone	+31 594 63 19 11		

Basic data

Product	AHU	Line	Mandik M
Total dimensions (LxWxH)	mm 2825 x 885 x 1320	Size	M2,5
contour dimensions (LxWxH)	mm 2885 x 985 x 1350	Panel thickness	mm 50
Weight	kg 386	Insulation density	kg/m3 50
Weight attached accessories	kg 0		
Unit fastening mode: Baseframe			
Surface treatment outside	painted RAL 7035	Surface treatment inside	painted RAL 7035
terminal panel surface	galvanised	built-in holder surface	galvanised
holder surface	galvanised		
execution: Indoor			

Test according to EN 1886 (07/2009)

Mechanical strength of casing	D1 (M)							
Casing air leakage	L1 (M)							
Filter bypass leakage	< 0,5% - F9 (M)							
Thermal transmittance	T3							
Thermal bridging of the casing	TB2							
Sound insertion loss in band	Hz	125	250	500	1000	2000	4000	8000
	dB	15.8	23.6	31.3	37.3	39.5	39.7	43.2



according EU Directive No 1253/2014: Non residential ventilation unit (NRVU) ErP 2016 comply

Unit type:	bidirectional ventilation unit (BVU)		
Type of drive:	variable speed drive		
type of heat recovery system:	regenerative heat exchanger		
External leakage rate at - 400 Pa	0.67%		
External leakage rate at +400 Pa	0.73%		
Internal leakage rate at 250 Pa	2.95%		
thermal efficiency of HRS	$\eta_{t1:1} / \eta_{t_limit} 2016$	%	68.5 / 67.0
Supply: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$	%	58.5 / 33.2
Supply: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA}	%	67.8
Exhaust: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$	%	55.1 / 30.6
Exhaust: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA}	%	67.8
internal SFP of ventilation components:	SFP int / SFP int_limit 2016	W/(m3/s)	598 / 1162
Int.press.drop of vent.components: supply / exhaust	$\Delta P_s \text{ int sup} / \Delta P_s \text{ int exh}$	Pa	193 / 148
Int.press.drop of add.components: supply / exhaust	$\Delta P_s \text{ add sup} / \Delta P_s \text{ add exh}$	Pa	298 / 89



Regularly filter change is very important for performance and energy efficiency of the unit. Maximal recommended final pressure loss according EN13053 mentioned in technical specification is not to exceed. Use visual or acoustic pressure warning device on filters.

Equipment is included in the energy class B according RLT-certification guideline .

SFP	W/(m3/s)	Supply	Exhaust
SFP class acc.EN13779		1173	777
Class of power input of drive acc. EN13053		SFP3	SFP1
Class of average air velocity acc. EN13053		P1	P1
efficiency class acc.EN13053		V4	V4
		H2	



NOTICE: Unit with efficiency label B according RLT-certification guideline cannot be installed on EU territory after 1.1.2016 !

Supply part		cross-section air velocity		m/s	2.2
Compact block A					
Terminal panel	air flow	m3/h	2000	pressure loss	Pa
Damper, tightness class 2 EN1751:2003	inside 3 Nm	Ending	flange		

Service side:

front, door with hinges and handles

Project	2016 0067 Kantoor Hardewijk	M2,5
Nr	16.814JZ.208	25.4.2016
	Position AHU 3	

Filter	air flow	m3/h	2000	pressure loss	Pa	137
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Filter parts composition: 1 x 490 x 490 mm
 pressure loss reserve Pa 63
 Filter class, length F7 - bag filter 630 mm
 Initial pressure loss Pa 74
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class A according guideline RS4/C/001-2015

Service side:

front, door with 2 step opening for pressure relief

Compact block B

Rotary recuperator	air flow	m3/h	2000	pressure loss	Pa	116
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winter calculation point

Supply

Air inlet temperature °C -10.0
 Air inlet humidity % 60.0
 air outlet temperature °C 12.0
 air outlet humidity % 40.9
 recuperation efficiency % 68.7
 Heat gain kW 19.0

Exhaust

Air inlet temperature °C 22.0
 Air inlet humidity % 40.0
 air outlet temperature °C 0.5
 air outlet humidity % 100.0

summer calculation point

Supply

Air inlet temperature °C 28.0
 Air inlet humidity % 60.0
 air outlet temperature °C 26.3
 air outlet humidity % 66.0
 recuperation efficiency % 68.7
 Heat gain kW 1.2
 Temperature efficiency dry η_t , dry1:1 % 68.5 EN13053
 Energy efficiency η_e % 66.5 EN13053
 execution condensation wheel, 1 segment
 wheel diameter mm 700
 wave height mm 1.9

Exhaust

Air inlet temperature °C 25.5
 Air inlet humidity % 50.0
 air outlet temperature °C 27.2
 air outlet humidity % 45.0

Lot 6 ErP 2016
 heat recovery class H2

Motor 3 x 230V/50Hz, 60W, 1.56A
 Motor RPM RPM 1600

Service side:

front, removable panel , lock with clamping bolt

Accessories:

Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	attached

Compact block C

Direct evaporator	air flow	m3/h	2000	pressure loss	Pa	222
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with drop eliminator Pa 29
 count of rows 4
 Evaporator operation mode
 Air inlet temperature °C 26.3
 Air inlet humidity % 66.0
 air outlet temperature °C 18.0
 air outlet humidity % 90.6
 Power kW 9.9
 pressure drop of dry exchanger Pa 143
 cross-air velocity on exchanger fins m/s 4.12
 Condenser operation mode
 Air inlet temperature °C 12.0
 air outlet temperature °C 21.0
 Power kW 6.1
 cross-air velocity on exchanger fins m/s 4.12

Condensate drain underpressure Pa DN32 -638
 Coolant R410A
 Evaporation temperature °C 7.0
 count of circuits 2
 division of circuits woven
 pressure drop of wet exchanger Pa 193
 Condensing temperature °C 30.0

Service side:

front, removable panel , lock with clamping bolt

Project	2016 0067 Kantoer Hardewijk	M2,5
№	16.814JZ.208 Position AHU 3	25.4.2016

Accessories:

Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1 attached
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Fan	air flow	m3/h	2000	pressure loss	Pa	3			
Plug fan type	ER25C-6ID.BD.CR	Total pressure		Pa	839				
Motor technology: EC		Static pressure loss		Pa	815				
air flow	m3/h 2000	Dynamic pressure		Pa	48				
External pressure loss	Pa 300	Pressure drop build-in		Pa	24				
SFP class acc.EN13779	SFP3	SFPv		W/(m3/s)	1173				
Nominal parameters		Parameters in working point							
voltage	V 1~230	voltage		V	230				
Frequency	Hz 50	Frequency		Hz	50				
Power	kW 0.78	Power Pm / Pref		kW	0.75 / 1.10				
current	A 2.90	current		A	3.21				
RPM	RPM 3600	RPM / RPM max.		RPM	3517 / 3600				
Motor: EC blue with integrated EC controller		fan-motor efficiency		%	63.8				
Motor protection: active temperature management		Frequency band [Hz] / Lw [dB]							
	LwA	63	125	250	500	1000	2000	4000	8000
	dB(A)								
	Sum								
Sound power level to exhaust	81.2	73.7	66.8	70.2	76.3	76.6	75.4	70.4	67.3
Sound power level to intake	59.2	66.4	60.1	57.8	56.4	53.9	51.8	45.9	35.9
Sound power level to surround	46.9	65.7	50.8	46.2	45.3	39.6	35.4	30.4	24.3

Service side:

front, door with 2 step opening for pressure relief

Accessories:

service switch, wired	KEM 310U Y/R, 10A, lockable	1 mounted on unit
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Terminal panel	air flow	m3/h	2000	pressure loss	Pa	0
Damper	not mounted	Ending	flange			

Exhaust part

cross-section air velocity **m/s 2.2**

Compact block B

Rotary recuperator	air flow	m3/h	2000	pressure loss	Pa	116
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Compact block D

Terminal panel	air flow	m3/h	2000	pressure loss	Pa	3
Damper, tightness class 2 EN1751:2003	outside 3 Nm	Ending	flange			

Service side:

front

Filter	air flow	m3/h	2000	pressure loss	Pa	115
Filter parts composition: 1 x 490 x 490 mm						
pressure loss reserve	Pa	86				
Filter class, length	M5 - bag filter 630 mm					
Initial pressure loss	Pa	29				
Max. allowed final pressure loss	Pa	450				
Max. final pressure loss acc. EN13053	Pa	200				
energy class B according guideline RS4/C/001-2015						

Service side:

front, door with 2 step opening for pressure relief

Compact block E

Project	2016 0067 Kantoort Hardewijk	M2,5
No	16.814JZ.208 Position AHU 3	25.4.2016

Fan	air flow	m3/h	2000	pressure loss	Pa	3			
top: flange				Pa	0				
Plug fan type	ER25C-6ID.BD.CR			Total pressure	Pa	535			
Motor technology: EC									
air flow	m3/h	2000		Static pressure loss	Pa	511			
External pressure loss	Pa	250		Dynamic pressure	Pa	48			
				Pressure drop build-in	Pa	24			
SFP class acc.EN13779	SFP1			SFPv	W/(m3/s)	777			
Nominal parameters				Parameters in working point					
voltage	V	1~230		voltage	V	230			
Frequency	Hz	50		Frequency	Hz	50			
Power	kW	0.78		Power Pm / Pref	kW	0.49 / 0.70			
current	A	2.90		current	A	2.10			
RPM	RPM	3600		RPM / RPM max.	RPM	3077 / 3600			
Motor: EC blue with integrated EC controller				fan-motor efficiency	%	62.7			
Motor protection: active temperature management									
	LwA			Frequency band [Hz] / Lw [dB]					
	dB(A)			63 125 250 500 1000 2000 4000 8000					
	Sum								
Sound power level to exhaust	78.6	66.2	63.8	71.3	72.8	73.4	73.0	68.8	65.5
Sound power level to intake	61.7	64.4	59.2	62.0	58.8	56.7	53.3	49.8	43.0
Sound power level to surround	44.1	58.2	47.8	47.3	41.8	36.4	33.0	28.8	22.5

Service side:

front, door with 2 step opening for pressure relief

Accessories:

service switch, wired KEM 310U Y/R, 10A, lockable 1 mounted on unit

Control

AHU

Remote control	Not selected
Visualization	Not selected
To regulate the temperature	Supply
Air quality sensor	Not selected
Smoke sensor	Not selected
Communication module	Not selected
EPS cooperation	-
Power supply for fire dampers	-
Router UMTS	-

Switchboard

Built-in section	-
Display on door	-
Frequency inverters inside	-
El. heater regulation inside	-
EMC filter (residential and industrial environment) in switchboard-	-
EMC filter (residential and industrial environment) out of switchboard	-
Schuko socket Type F	-
Switchboard tempering	-
Switchboard aeration	-
Input of extern devices [kW]	-

Supply part

Input temperature sensor	Outdoor temperature sensor
Output temperature sensor	Pipe temperature sensor Siemens
Spatial sensor	Not selected
Temperature cascade sensor	Not selected

Exhaust part

Input temperature sensor	Pipe temperature sensor Siemens
Output temperature sensor	Not selected
Spatial sensor	Not selected
Temperature cascade sensor	Not selected

Project	2016 0067 Kantoort Hardewijk	M2,5
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Terminal panel - supply - intake

Spring-return actuator	Yes
Continuous control actuator	-

Filter - supply

Digital differential pressure transmitter with display	-
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Direct evaporator - supply

Heat the condensate exhaust trap	-
Type of condensation unit	-

Fan - supply

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Terminal panel - exhaust - intake

Spring-return actuator	-
Continuous control actuator	-

Filter - exhaust

Digital differential pressure transmitter with display	-
--	---

Fan - exhaust - exhaust

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Air handling units Mandík including control system meet the safety requirements of Directive 2006/95 / EC - low voltage electrical equipment certificate Notified Body No. E-31-00258-15.

Air handling units Mandík including control system meet the requirements of Directive 2004/108 / EC - Electromagnetic Compatibility (residential environment - immunity, industrial environment - immunity and emission) Certificate Notified Body No. E-31-00259-15.

Control elements			
description	Type	quantity	Section
Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	Rotary recuperator supply attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	Rotary recuperator supply attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	Rotary recuperator supply attached
Switchboard Siemens Climatix with control panel, TCP/IP PC connection, plastic IP65/ IP40	RP2/CRV	1	
Software and test of Switchboard		1	
Outdoor temperature air sensor	NTC10k, -40...+70°C	1	Sensor, Supply part attach
Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Supply part attach
Damper actuator, open - close, emergency function	5 Nm, AC/DC 24V, LF24A	1	Terminal panel, Supply part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Supply part attach

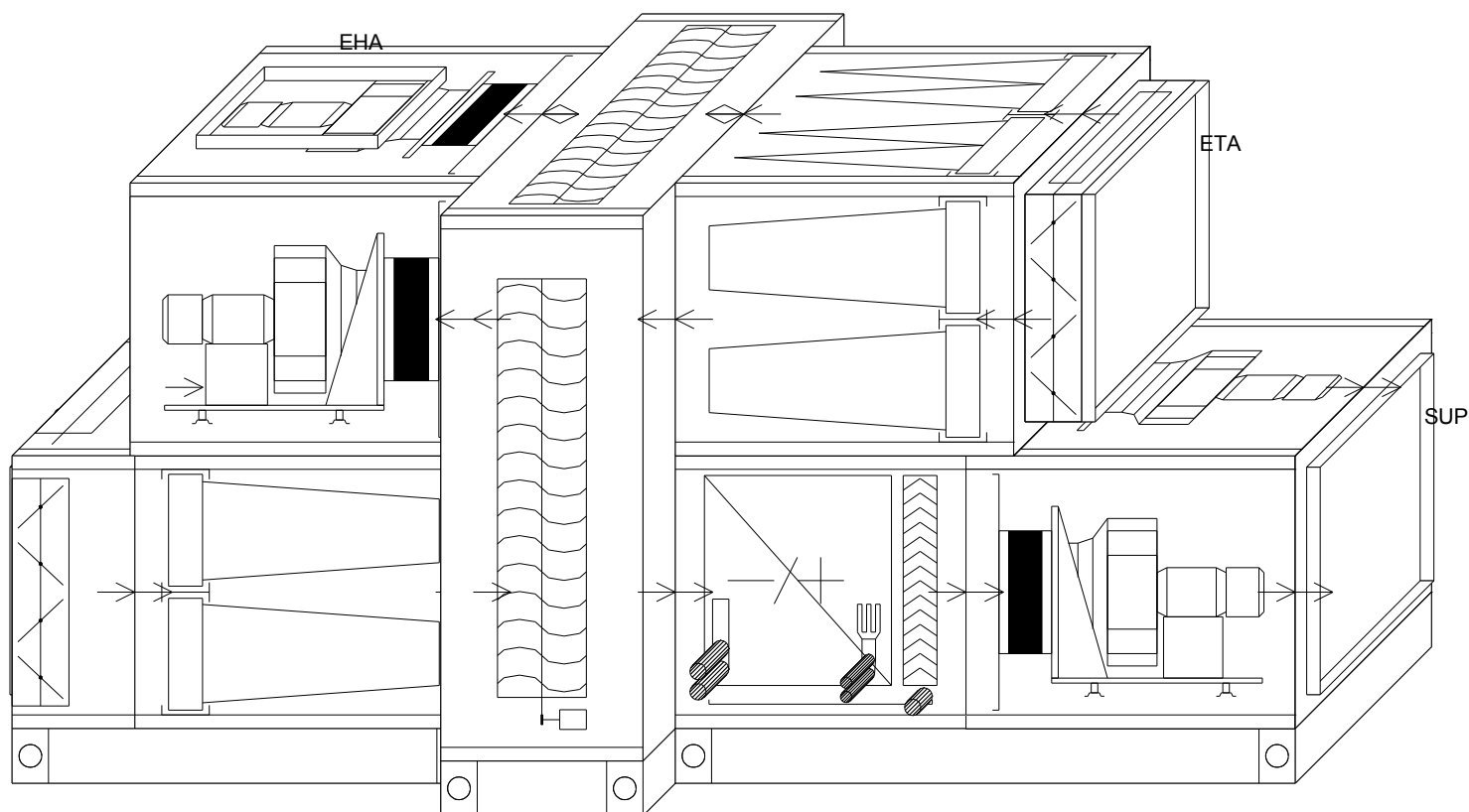
Project	2016 0067 Kantoor Hardewijk	M2,5
№	16.814JZ.208 Position AHU 3	25.4.2016

Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Exhaust part attach
Damper actuator, open - close	5 Nm, AC/DC 24V, LM24A	1	Terminal panel, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Rotary recuperator, Exhaust part attach

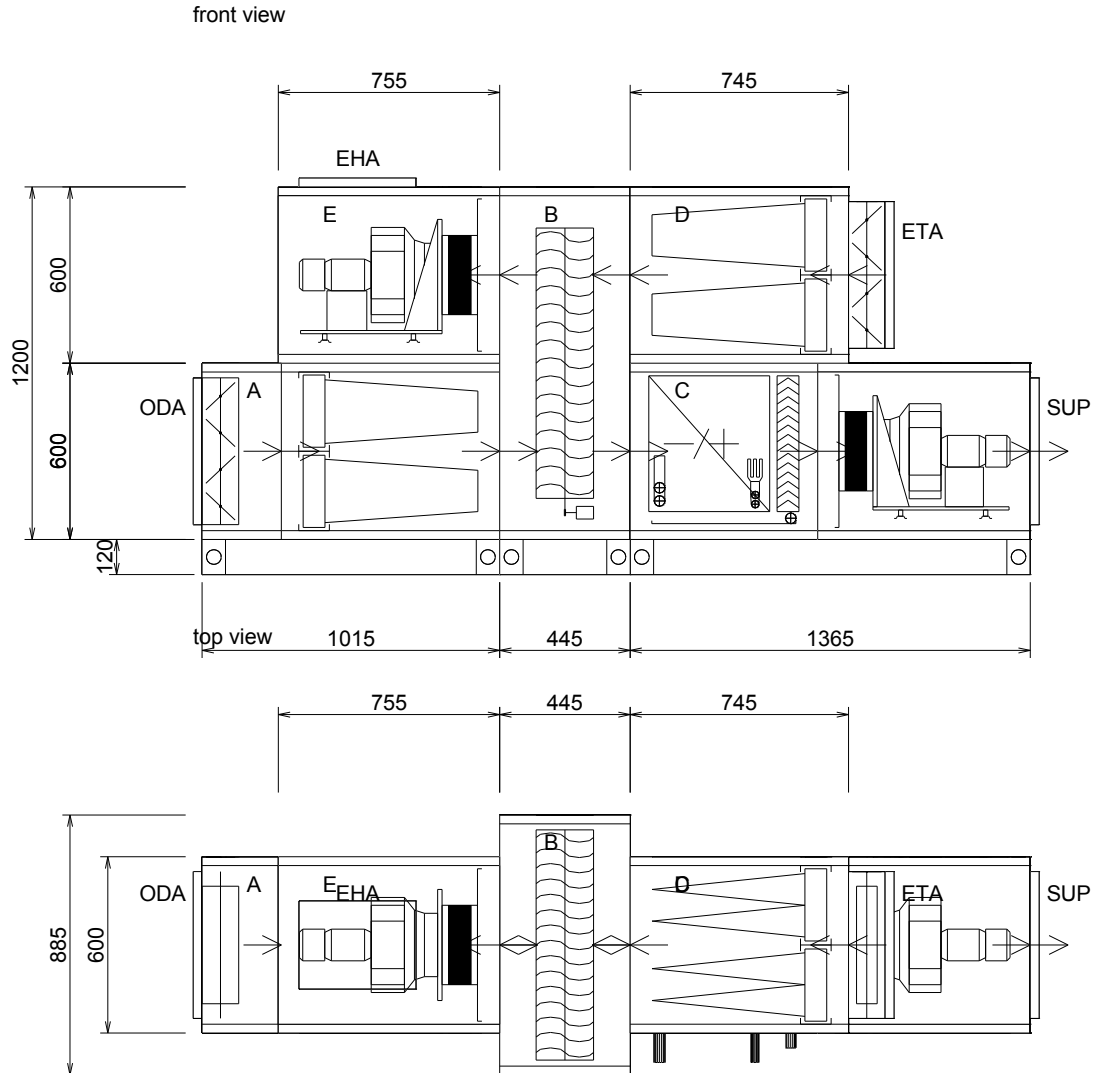
Accessories

description	Type	quantity	Section
Condensate syphon with Ball	-2000Pa/+500Pa HL136NKG	1	Direct evaporator supply attached
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan supply mounted on unit
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan exhaust mounted on unit

perspective view



HxW: ODA=500x500 mm, SUP=500x500 mm, ETA=500x500 mm, EHA=400x300 mm



HxW: ODA=500x500 mm, SUP=500x500 mm, ETA=500x500 mm, EHA=400x300 mm

Compact block	Part	Total dimensions (LxWxH) mm	contour dimensions (LxWxH) mm	Weight kg
Compact block A	supply	1015 x 600 x 720	1045 x 700 x 720	62
Compact block B	supply	445 x 885 x 1320	445 x 985 x 1320	109
Compact block C	supply	1365 x 600 x 720	1395 x 750 x 720	117
Compact block D	exhaust	745 x 600 x 600	900 x 700 x 600	41
Compact block E	exhaust	755 x 600 x 600	755 x 700 x 630	57
accessories attached to AHU				0

Project	2016 0067 Kantoort Hardewijk	M3,5
Nr	16.814JZ.208 Position AHU 4	25.4.2016

Customer		Designer	
Customer	Vacom Air	Designer Name	
Contact name	Gerard Kuiper	Phone	
Phone	+31 594 63 19 11		

Basic data

Product	AHU	Line	Mandík M
Total dimensions (LxWxH)	mm 2920 x 1035 x 1520	Size	M3,5
contour dimensions (LxWxH)	mm 2980 x 1135 x 1550	Panel thickness	mm 50
Weight	kg 461	Insulation density	kg/m3 50
Weight attached accessories	kg 0		
Unit fastening mode: Baseframe			
Surface treatment outside	painted RAL 7035	Surface treatment inside	painted RAL 7035
terminal panel surface	galvanised	built-in holder surface	galvanised
holder surface	galvanised		
execution: Indoor			

Test according to EN 1886 (07/2009)

Mechanical strength of casing	D1 (M)							
Casing air leakage	L1 (M)							
Filter bypass leakage	< 0,5% - F9 (M)							
Thermal transmittance	T3							
Thermal bridging of the casing	TB2							
Sound insertion loss in band	Hz	125	250	500	1000	2000	4000	8000
	dB	15.8	23.6	31.3	37.3	39.5	39.7	43.2



according EU Directive No 1253/2014: Non residential ventilation unit (NRVU) ErP 2016 comply

Unit type:	bidirectional ventilation unit (BVU)
Type of drive:	variable speed drive
type of heat recovery system:	regenerative heat exchanger
External leakage rate at - 400 Pa	0.54%
External leakage rate at +400 Pa	0.58%
Internal leakage rate at 250 Pa	2.30%
thermal efficiency of HRS	$\eta_{t1:1} / \eta_{t_limit} 2016$ % 68.5 / 67.0
Supply: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 58.4 / 35.7
Supply: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 65.0
Exhaust: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 57.7 / 32.8
Exhaust: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 68.7
internal SFP of ventilation components:	SFP int / SFP int_limit 2016 W/(m3/s) 597 / 1120
Int.press.drop of vent.components: supply / exhaust	ΔP_s int sup / ΔP_s int exh Pa 197 / 150
Int.press.drop of add.components: supply / exhaust	ΔP_s add sup / ΔP_s add exh Pa 283 / 88



Regularly filter change is very important for performance and energy efficiency of the unit. Maximal recommended final pressure loss according EN13053 mentioned in technical specification is not to exceed. Use visual or acoustic pressure warning device on filters.

Equipment is included in the energy class B according RLT-certification guideline .

SFP	W/(m3/s)	Supply	Exhaust
		1168	724
SFP class acc.EN13779		SFP3	SFP1
Class of power input of drive acc. EN13053		P1	P1
Class of average air velocity acc. EN13053		V5	V5
efficiency class acc.EN13053		H2	



NOTICE: Unit with efficiency label B according RLT-certification guideline cannot be installed on EU territory after 1.1.2016 !

Supply part		cross-section air velocity		m/s	2.3
Compact block A					
Terminal panel	air flow	m3/h	3000	pressure loss	Pa
Damper, tightness class 2 EN1751:2003	inside 3 Nm	Ending	flange		9

Service side:

front, door with hinges and handles

Project	2016 0067 Kantoor Hardewijk	M3,5
№	16.814JZ.208 Position AHU 4	25.4.2016

Filter	air flow	m3/h	3000	pressure loss	Pa	139
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length F7 - bag filter 630 mm
 Initial pressure loss Pa 78
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class A according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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winter calculation point

Supply

Air inlet temperature °C -10.0
 Air inlet humidity % 60.0
 air outlet temperature °C 12.0
 air outlet humidity % 40.9
 recuperation efficiency % 68.7
 Heat gain kW 28.5

Exhaust

Air inlet temperature °C 22.0
 Air inlet humidity % 40.0
 air outlet temperature °C 0.5
 air outlet humidity % 100.0

summer calculation point

Supply

Air inlet temperature °C 28.0
 Air inlet humidity % 60.0
 air outlet temperature °C 26.3
 air outlet humidity % 66.0
 recuperation efficiency % 68.7
 Heat gain kW 1.8

Exhaust

Air inlet temperature °C 25.5
 Air inlet humidity % 50.0
 air outlet temperature °C 27.2
 air outlet humidity % 45.0

Temperature efficiency dry η_t , dry1:1 % 68.5 EN13053
 Energy efficiency η_e % 66.6 EN13053

Lot 6 ErP 2016
 heat recovery class H2

execution condensation wheel, 1 segment

wheel diameter mm 850
 wave height mm 1.9

Motor 3 x 230V/50Hz, 60W, 1.56A
 Motor RPM RPM 1600

Service side:

front, removable panel , lock with clamping bolt

Accessories:

Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	attached

Compact block C

Direct evaporator	air flow	m3/h	3000	pressure loss	Pa	213
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with drop eliminator Pa 28

Condensate drain underpressure Pa DN32 -627
 Coolant R410A

count of rows 4

Evaporator operation mode

Air inlet temperature °C 26.3
 Air inlet humidity % 66.0
 air outlet temperature °C 18.0
 air outlet humidity % 90.4
 Power kW 15.0

Evaporation temperature °C 7.0
 count of circuits 2
 division of circuits woven

pressure drop of dry exchanger Pa 137
 cross-air velocity on exchanger fins m/s 4.02

pressure drop of wet exchanger Pa 185

Condenser operation mode

Air inlet temperature °C 12.0
 air outlet temperature °C 21.0
 Power kW 9.1
 cross-air velocity on exchanger fins m/s 4.02

Condensing temperature °C 30.0

Service side:

front, removable panel , lock with clamping bolt

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Accessories:

Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1	attached
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Fan	air flow	m3/h	3000	pressure loss	Pa	3			
Plug fan type	ER31C-ZID.DC.CR	Total pressure		Pa	825				
Motor technology: EC		Static pressure loss		Pa	802				
air flow	m3/h 3000	Dynamic pressure		Pa	45				
External pressure loss	Pa 300	Pressure drop build-in		Pa	22				
SFP class acc.EN13779	SFP3	SFPv		W/(m3/s)	1168				
Nominal parameters		Parameters in working point							
voltage	V 1~230	voltage		V	230				
Frequency	Hz 50	Frequency		Hz	50				
Power	kW 1.35	Power Pm / Pref		kW	1.11 / 1.53				
current	A 4.80	current		A	4.89				
RPM	RPM 2920	RPM / RPM max.		RPM	2744 / 2920				
Motor: EC blue with integrated EC controller		fan-motor efficiency		%	61.6				
Motor protection: active temperature management		Frequency band [Hz] / Lw [dB]							
	LwA	63	125	250	500	1000	2000	4000	8000
	dB(A)								
	Sum								
Sound power level to exhaust	84.4	70.7	69.0	77.1	76.8	80.2	78.7	73.9	70.0
Sound power level to intake	62.0	67.7	63.4	64.2	57.6	54.9	55.7	47.3	37.8
Sound power level to surround	49.5	62.7	53.0	53.1	45.8	43.2	38.7	33.9	27.0

Service side:

front, door with hinges and handles

Accessories:

service switch, wired	KEM 310U Y/R, 10A, lockable	1	mounted on unit
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Terminal panel	air flow	m3/h	3000	pressure loss	Pa	0
Damper	not mounted	Ending		flange		

Exhaust part	cross-section air velocity	m/s	2.3
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Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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Compact block D

Terminal panel	air flow	m3/h	3000	pressure loss	Pa	3
Damper, tightness class 2 EN1751:2003	outside 3 Nm	Ending		flange		

Service side:

front

Filter	air flow	m3/h	3000	pressure loss	Pa	116
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length M5 - bag filter 630 mm
 Initial pressure loss Pa 31
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class B according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block E

Project	2016 0067 Kantoort Hardewijk	M3,5
Nr	16.814JZ.208 Position AHU 4	25.4.2016

Fan	air flow	m3/h	3000	pressure loss	Pa	3			
top: flange				Pa	0				
Plug fan type	ER31C-6ID.BD.CR			Total pressure	Pa	533			
Motor technology: EC									
air flow	m3/h	3000		Static pressure loss	Pa	510			
External pressure loss	Pa	250		Dynamic pressure	Pa	45			
				Pressure drop build-in	Pa	22			
SFP class acc.EN13779	SFP1			SFPv	W/(m3/s)	724			
Nominal parameters				Parameters in working point					
voltage	V	1~230		voltage	V	230			
Frequency	Hz	50		Frequency	Hz	50			
Power	kW	0.78		Power Pm / Pref	kW	0.70 / 0.99			
current	A	2.90		current	A	2.99			
RPM	RPM	2460		RPM / RPM max.	RPM	2376 / 2460			
Motor: EC blue with integrated EC controller				fan-motor efficiency	%	65.5			
Motor protection: active temperature management									
	LwA			Frequency band [Hz] / Lw [dB]					
	dB(A)			63 125 250 500 1000 2000 4000 8000					
	Sum								
Sound power level to exhaust	78.4	64.4	63.5	74.6	72.9	74.8	71.4	66.3	63.0
Sound power level to intake	62.0	60.7	57.9	65.3	58.7	54.9	54.0	48.2	40.5
Sound power level to surround	45.3	56.4	47.5	50.6	41.9	37.8	31.4	26.3	20.0

Service side:

front, door with hinges and handles

Accessories:

service switch, wired KEM 310U Y/R, 10A, lockable 1 mounted on unit

Control

AHU

Remote control	Not selected
Visualization	Not selected
To regulate the temperature	Supply
Air quality sensor	Not selected
Smoke sensor	Not selected
Communication module	Not selected
EPS cooperation	-
Power supply for fire dampers	-
Router UMTS	-

Switchboard

Built-in section	-
Display on door	-
Frequency inverters inside	-
El. heater regulation inside	-
EMC filter (residential and industrial environment) in switchboard-	-
EMC filter (residential and industrial environment) out of switchboard	-
Schuko socket Type F	-
Switchboard tempering	-
Switchboard aeration	-
Input of extern devices [kW]	-

Supply part

Input temperature sensor	Outdoor temperature sensor
Output temperature sensor	Pipe temperature sensor Siemens
Spatial sensor	Not selected
Temperature cascade sensor	Not selected

Exhaust part

Input temperature sensor	Pipe temperature sensor Siemens
Output temperature sensor	Not selected
Spatial sensor	Not selected
Temperature cascade sensor	Not selected

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Terminal panel - supply - intake

Spring-return actuator	Yes
Continuous control actuator	-

Filter - supply

Digital differential pressure transmitter with display	-
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Direct evaporator - supply

Heat the condensate exhaust trap	-
Type of condensation unit	-

Fan - supply

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Terminal panel - exhaust - intake

Spring-return actuator	-
Continuous control actuator	-

Filter - exhaust

Digital differential pressure transmitter with display	-
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Fan - exhaust - exhaust

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Air handling units Mandík including control system meet the safety requirements of Directive 2006/95 / EC - low voltage electrical equipment certificate Notified Body No. E-31-00258-15.

Air handling units Mandík including control system meet the requirements of Directive 2004/108 / EC - Electromagnetic Compatibility (residential environment - immunity, industrial environment - immunity and emission) Certificate Notified Body No. E-31-00259-15.

Control elements			
description	Type	quantity	Section
Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	Rotary recuperator supply attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	Rotary recuperator supply attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	Rotary recuperator supply attached
Switchboard Siemens Climatix with control panel, TCP/IP PC connection, plastic IP65/ IP40	RP2/CRV	1	
Software and test of Switchboard		1	
Outdoor temperature air sensor	NTC10k, -40...+70°C	1	Sensor, Supply part attach
Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Supply part attach
Damper actuator, open - close, emergency function	5 Nm, AC/DC 24V, LF24A	1	Terminal panel, Supply part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Supply part attach

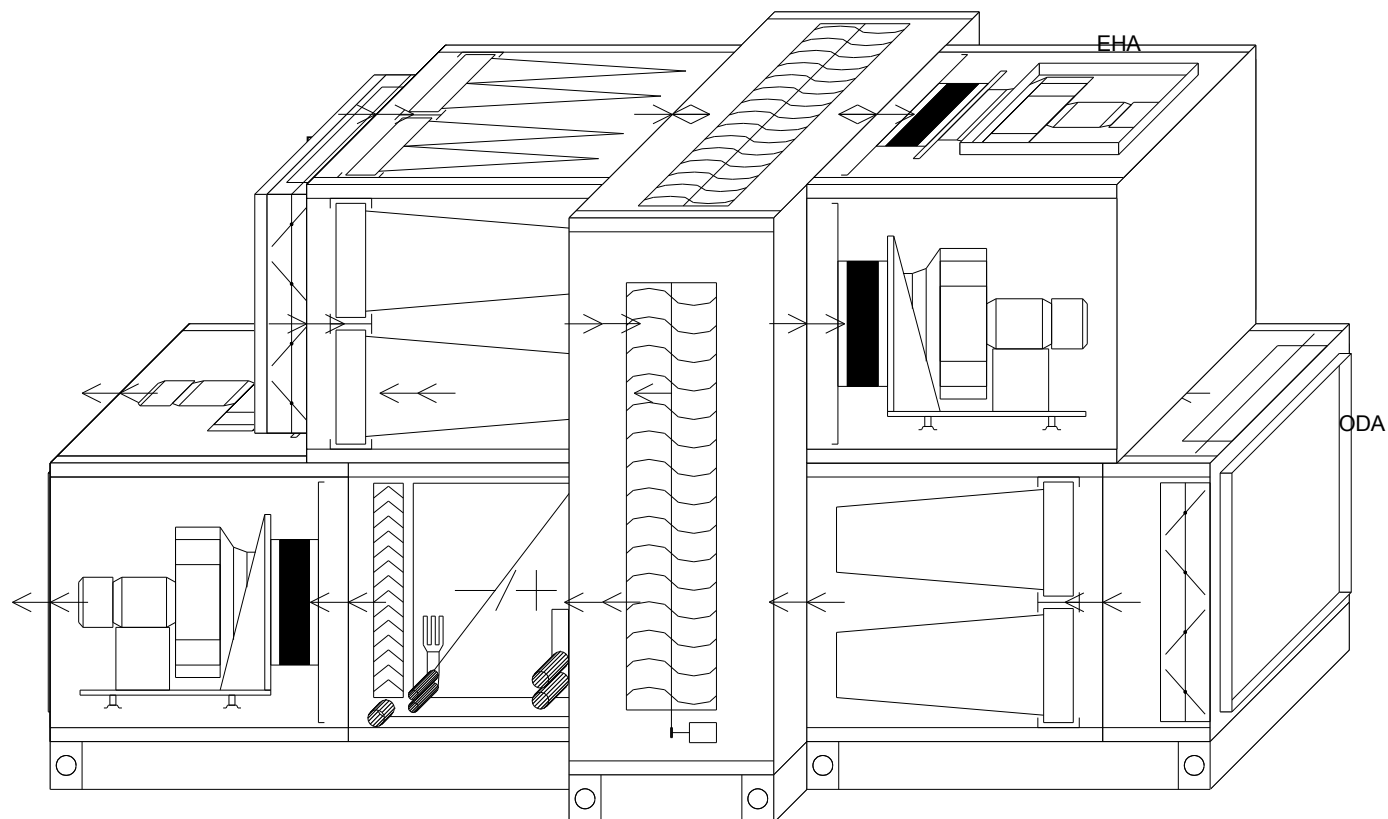
Project	2016 0067 Kantoer Hardewijk	M3,5
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Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Exhaust part attach
Damper actuator, open - close	5 Nm, AC/DC 24V, LM24A	1	Terminal panel, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Rotary recuperator, Exhaust part attach

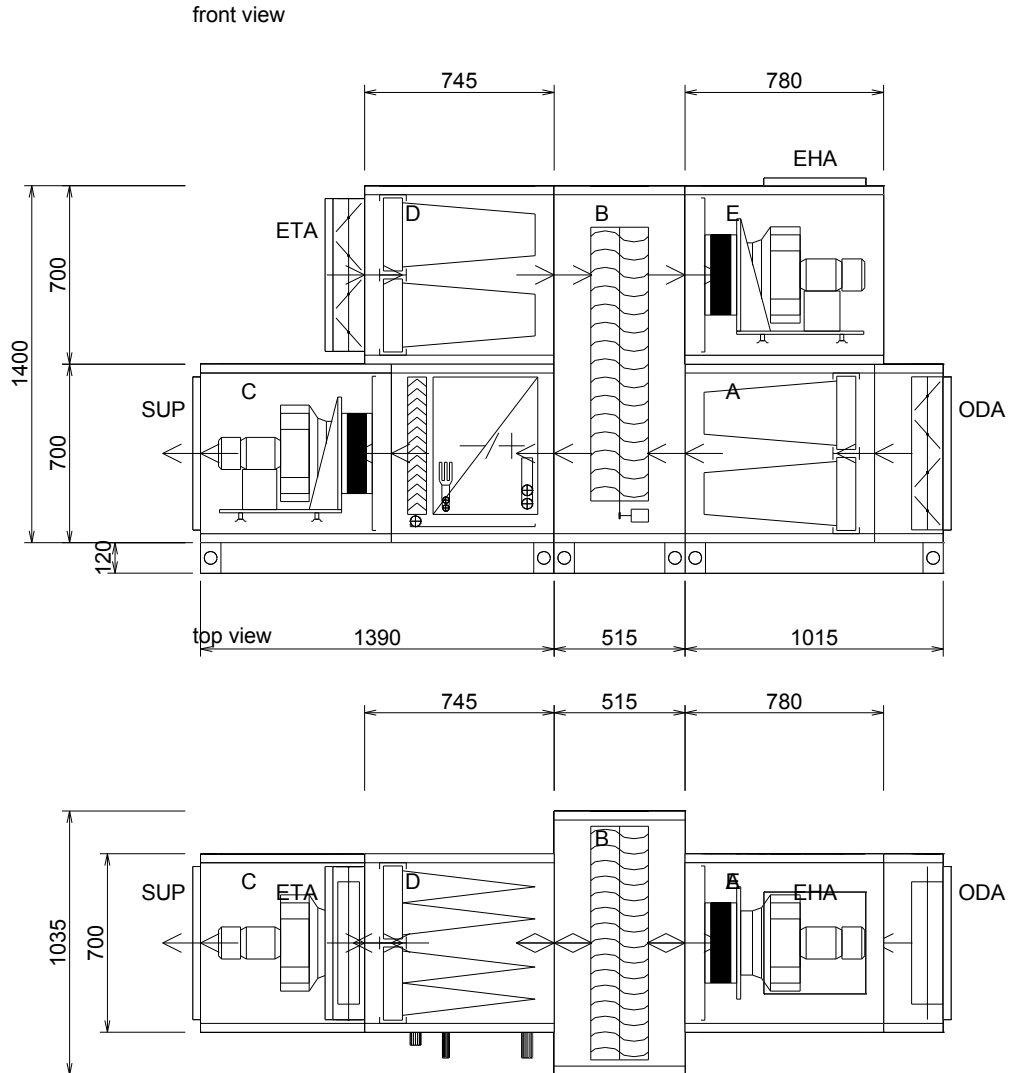
Accessories

description	Type	quantity	Section
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan exhaust mounted on unit
Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1	Direct evaporator supply attached
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan supply mounted on unit

perspective view



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm

Compact block	Part	Total dimensions (LxWxH) mm	contour dimensions (LxWxH) mm	Weight kg
Compact block A	supply	1015 x 700 x 820	1045 x 800 x 820	72
Compact block B	supply	515 x 1035 x 1520	515 x 1135 x 1520	134
Compact block C	supply	1390 x 700 x 820	1420 x 850 x 820	139
Compact block D	exhaust	745 x 700 x 700	900 x 800 x 700	48
Compact block E	exhaust	780 x 700 x 700	780 x 800 x 730	68
accessories attached to AHU				0

Project	2016 0067 Kantoor Hardewijk	M3,5
Nr	16.814JZ.208 Position AHU 5	25.4.2016

Customer		Designer	
Customer	Vacom Air	Designer Name	
Contact name	Gerard Kuiper	Phone	
Phone	+31 594 63 19 11		

Basic data

Product	AHU	Line	Mandik M
Total dimensions (LxWxH)	mm 2920 x 1035 x 1520	Size	M3,5
contour dimensions (LxWxH)	mm 2980 x 1135 x 1550	Panel thickness	mm 50
Weight	kg 461	Insulation density	kg/m3 50
Weight attached accessories	kg 0		
Unit fastening mode: Baseframe			
Surface treatment outside	painted RAL 7035	Surface treatment inside	painted RAL 7035
terminal panel surface	galvanised	built-in holder surface	galvanised
holder surface	galvanised		
execution: Indoor			

Test according to EN 1886 (07/2009)

Mechanical strength of casing	D1 (M)							
Casing air leakage	L1 (M)							
Filter bypass leakage	< 0,5% - F9 (M)							
Thermal transmittance	T3							
Thermal bridging of the casing	TB2							
Sound insertion loss in band	Hz	125	250	500	1000	2000	4000	8000
	dB	15.8	23.6	31.3	37.3	39.5	39.7	43.2



according EU Directive No 1253/2014: Non residential ventilation unit (NRVU) ErP 2016 comply

Unit type:	bidirectional ventilation unit (BVU)
Type of drive:	variable speed drive
type of heat recovery system:	regenerative heat exchanger
External leakage rate at - 400 Pa	0.54%
External leakage rate at +400 Pa	0.58%
Internal leakage rate at 250 Pa	2.30%
thermal efficiency of HRS	$\eta_{t1:1} / \eta_{t_limit} 2016$ % 68.5 / 67.0
Supply: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 58.4 / 35.7
Supply: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 65.0
Exhaust: fan static efficiency:	$\eta_{fan} / \eta_{fan_limit} 2016$ % 57.7 / 32.8
Exhaust: fan static efficiency acc. Reg. (EU) No 327/2011:	η_{statA} % 68.7
internal SFP of ventilation components:	SFP int / SFP int_limit 2016 W/(m3/s) 597 / 1120
Int.press.drop of vent.components: supply / exhaust	$\Delta P_s \text{ int sup} / \Delta P_s \text{ int exh}$ Pa 197 / 150
Int.press.drop of add.components: supply / exhaust	$\Delta P_s \text{ add sup} / \Delta P_s \text{ add exh}$ Pa 283 / 88



Regularly filter change is very important for performance and energy efficiency of the unit. Maximal recommended final pressure loss according EN13053 mentioned in technical specification is not to exceed. Use visual or acoustic pressure warning device on filters.

Equipment is included in the energy class B according RLT-certification guideline .

SFP	W/(m3/s)	Supply	Exhaust
SFP class acc.EN13779		1168	724
Class of power input of drive acc. EN13053		SFP3	SFP1
Class of average air velocity acc. EN13053		P1	P1
efficiency class acc.EN13053		V5	V5
		H2	



NOTICE: Unit with efficiency label B according RLT-certification guideline cannot be installed on EU territory after 1.1.2016 !

Supply part		cross-section air velocity	m/s	2.3
Compact block A				
Terminal panel	air flow	m3/h	3000	pressure loss Pa
Damper, tightness class 2 EN1751:2003	inside 3 Nm	Ending	flange	9

Service side:

front, door with hinges and handles

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Filter	air flow	m3/h	3000	pressure loss	Pa	139
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length F7 - bag filter 630 mm
 Initial pressure loss Pa 78
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class A according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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winter calculation point

Supply

Air inlet temperature °C -10.0
 Air inlet humidity % 60.0
 air outlet temperature °C 12.0
 air outlet humidity % 40.9
 recuperation efficiency % 68.7
 Heat gain kW 28.5

Exhaust

Air inlet temperature °C 22.0
 Air inlet humidity % 40.0
 air outlet temperature °C 0.5
 air outlet humidity % 100.0

summer calculation point

Supply

Air inlet temperature °C 28.0
 Air inlet humidity % 60.0
 air outlet temperature °C 26.3
 air outlet humidity % 66.0
 recuperation efficiency % 68.7
 Heat gain kW 1.8
 Temperature efficiency dry η_t , dry1:1 % 68.5 EN13053
 Energy efficiency η_e % 66.6 EN13053
 execution condensation wheel, 1 segment
 wheel diameter mm 850
 wave height mm 1.9

Exhaust

Air inlet temperature °C 25.5
 Air inlet humidity % 50.0
 air outlet temperature °C 27.2
 air outlet humidity % 45.0

Lot 6 ErP 2016
 heat recovery class H2

Motor 3 x 230V/50Hz, 60W, 1.56A
 Motor RPM RPM 1600

Service side:

front, removable panel, lock with clamping bolt

Accessories:

Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	attached

Compact block C

Direct evaporator	air flow	m3/h	3000	pressure loss	Pa	213
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with drop eliminator Pa 28
 count of rows 4
 Evaporator operation mode
 Air inlet temperature °C 26.3
 Air inlet humidity % 66.0
 air outlet temperature °C 18.0
 air outlet humidity % 90.4
 Power kW 15.0
 pressure drop of dry exchanger Pa 137
 cross-air velocity on exchanger fins m/s 4.02
 Condenser operation mode
 Air inlet temperature °C 12.0
 air outlet temperature °C 21.0
 Power kW 9.1
 cross-air velocity on exchanger fins m/s 4.02

Condensate drain underpressure Pa DN32 -627
 Coolant R410A
 Evaporation temperature °C 7.0
 count of circuits 2
 division of circuits woven
 pressure drop of wet exchanger Pa 185
 Condensing temperature °C 30.0

Service side:

front, removable panel, lock with clamping bolt

Project	2016 0067 Kantoar Hardewijk	M3,5
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Accessories:

Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1	attached
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Fan	air flow	m3/h	3000	pressure loss	Pa	3			
Plug fan type	ER31C-ZID.DC.CR	Total pressure		Pa	825				
Motor technology: EC		Static pressure loss		Pa	802				
air flow	m3/h 3000	Dynamic pressure		Pa	45				
External pressure loss	Pa 300	Pressure drop build-in		Pa	22				
SFP class acc.EN13779	SFP3	SFPv		W/(m3/s)	1168				
Nominal parameters		Parameters in working point							
voltage	V 1~230	voltage		V	230				
Frequency	Hz 50	Frequency		Hz	50				
Power	kW 1.35	Power Pm / Pref		kW	1.11 / 1.53				
current	A 4.80	current		A	4.89				
RPM	RPM 2920	RPM / RPM max.		RPM	2744 / 2920				
Motor: EC blue with integrated EC controller		fan-motor efficiency		%	61.6				
Motor protection: active temperature management		Frequency band [Hz] / Lw [dB]							
	LwA	63	125	250	500	1000	2000	4000	8000
	dB(A)								
	Sum								
Sound power level to exhaust	84.4	70.7	69.0	77.1	76.8	80.2	78.7	73.9	70.0
Sound power level to intake	62.0	67.7	63.4	64.2	57.6	54.9	55.7	47.3	37.8
Sound power level to surround	49.5	62.7	53.0	53.1	45.8	43.2	38.7	33.9	27.0

Service side:

front, door with hinges and handles

Accessories:

service switch, wired	KEM 310U Y/R, 10A, lockable	1	mounted on unit
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Terminal panel	air flow	m3/h	3000	pressure loss	Pa	0
Damper	not mounted	Ending	flange			

Exhaust part

cross-section air velocity **m/s 2.3**

Compact block B

Rotary recuperator	air flow	m3/h	3000	pressure loss	Pa	116
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Compact block D

Terminal panel	air flow	m3/h	3000	pressure loss	Pa	3
Damper, tightness class 2 EN1751:2003	outside 3 Nm	Ending	flange			

Service side:

front

Filter	air flow	m3/h	3000	pressure loss	Pa	116
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Filter parts composition: 1 x 592 x 592 mm
 pressure loss reserve Pa 0
 Filter class, length M5 - bag filter 630 mm
 Initial pressure loss Pa 31
 Max. allowed final pressure loss Pa 450
 Max. final pressure loss acc. EN13053 Pa 200
 energy class B according guideline RS4/C/001-2015

Service side:

front, door with hinges and handles

Compact block E

Project	2016 0067 Kantoort Hardewijk			M3,5
Nr	16.814JZ.208	Position	AHU 5	25.4.2016

Fan	air flow	m3/h	3000	pressure loss	Pa	3			
top: flange				Pa	0				
Plug fan type	ER31C-6ID.BD.CR			Total pressure	Pa	533			
Motor technology: EC									
air flow	m3/h	3000		Static pressure loss	Pa	510			
External pressure loss	Pa	250		Dynamic pressure	Pa	45			
				Pressure drop build-in	Pa	22			
SFP class acc.EN13779	SFP1			SFPv	W/(m3/s)	724			
Nominal parameters				Parameters in working point					
voltage	V	1~230		voltage	V	230			
Frequency	Hz	50		Frequency	Hz	50			
Power	kW	0.78		Power Pm / Pref	kW	0.70 / 0.99			
current	A	2.90		current	A	2.99			
RPM	RPM	2460		RPM / RPM max.	RPM	2376 / 2460			
Motor: EC blue with integrated EC controller				fan-motor efficiency	%	65.5			
Motor protection: active temperature management									
	LwA			Frequency band [Hz] / Lw [dB]					
	dB(A)			63 125 250 500 1000 2000 4000 8000					
	Sum								
Sound power level to exhaust	78.4	64.4	63.5	74.6	72.9	74.8	71.4	66.3	63.0
Sound power level to intake	62.0	60.7	57.9	65.3	58.7	54.9	54.0	48.2	40.5
Sound power level to surround	45.3	56.4	47.5	50.6	41.9	37.8	31.4	26.3	20.0

Service side:

front, door with hinges and handles

Accessories:

service switch, wired KEM 310U Y/R, 10A, lockable 1 mounted on unit

Control

AHU

Remote control Not selected
 Visualization Not selected
 To regulate the temperature Supply
 Air quality sensor Not selected
 Smoke sensor Not selected
 Communication module Not selected
 EPS cooperation -
 Power supply for fire dampers -
 Router UMTS -

Switchboard

Built-in section -
 Display on door -
 Frequency inverters inside -
 El. heater regulation inside -
 EMC filter (residential and industrial environment) in switchboard-
 EMC filter (residential and industrial environment) out of switchboard
 Schuko socket Type F -
 Switchboard tempering -
 Switchboard aeration -
 Input of extern devices [kW]

Supply part

Input temperature sensor Outdoor temperature sensor
 Output temperature sensor Pipe temperature sensor Siemens
 Spatial sensor Not selected
 Temperature cascade sensor Not selected

Exhaust part

Input temperature sensor Pipe temperature sensor Siemens
 Output temperature sensor Not selected
 Spatial sensor Not selected
 Temperature cascade sensor Not selected

Project	2016 0067 Kantoor Hardewijk	M3,5
№	16.814JZ.208 Position AHU 5	25.4.2016

Terminal panel - supply - intake

Spring-return actuator	Yes
Continuous control actuator	-

Filter - supply

Digital differential pressure transmitter with display	-
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Direct evaporator - supply

Heat the condensate exhaust trap	-
Type of condensation unit	-

Fan - supply

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Terminal panel - exhaust - intake

Spring-return actuator	-
Continuous control actuator	-

Filter - exhaust

Digital differential pressure transmitter with display	-
--	---

Fan - exhaust - exhaust

Frequency inverter	
FI control panel	
FI wire clamp guard	
Pressure/air flow regulator	Not selected
Safety switch	-
Auxiliary contact for safety switch	-

Air handling units Mandík including control system meet the safety requirements of Directive 2006/95 / EC - low voltage electrical equipment certificate Notified Body No. E-31-00258-15.

Air handling units Mandík including control system meet the requirements of Directive 2004/108 / EC - Electromagnetic Compatibility (residential environment - immunity, industrial environment - immunity and emission) Certificate Notified Body No. E-31-00259-15.

Control elements			
description	Type	quantity	Section
Frequency inverter M1, 0,37 kW	FC51 0,37 kW 1x200-240V, IP20	1	Rotary recuperator supply attached
FI wire clamp guard, M1, FC51	Nema Type 1 kit, M1 0,37-0,75 kW	1	Rotary recuperator supply attached
FI control panel, FC51 IP20, VLT	Panel LCP 11-without potentiometer	1	Rotary recuperator supply attached
Switchboard Siemens Climatix with control panel, TCP/IP PC connection, plastic IP65/ IP40	RP2/CRV	1	
Software and test of Switchboard		1	
Outdoor temperature air sensor	NTC10k, -40...+70°C	1	Sensor, Supply part attach
Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Supply part attach
Damper actuator, open - close, emergency function	5 Nm, AC/DC 24V, LF24A	1	Terminal panel, Supply part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Supply part attach

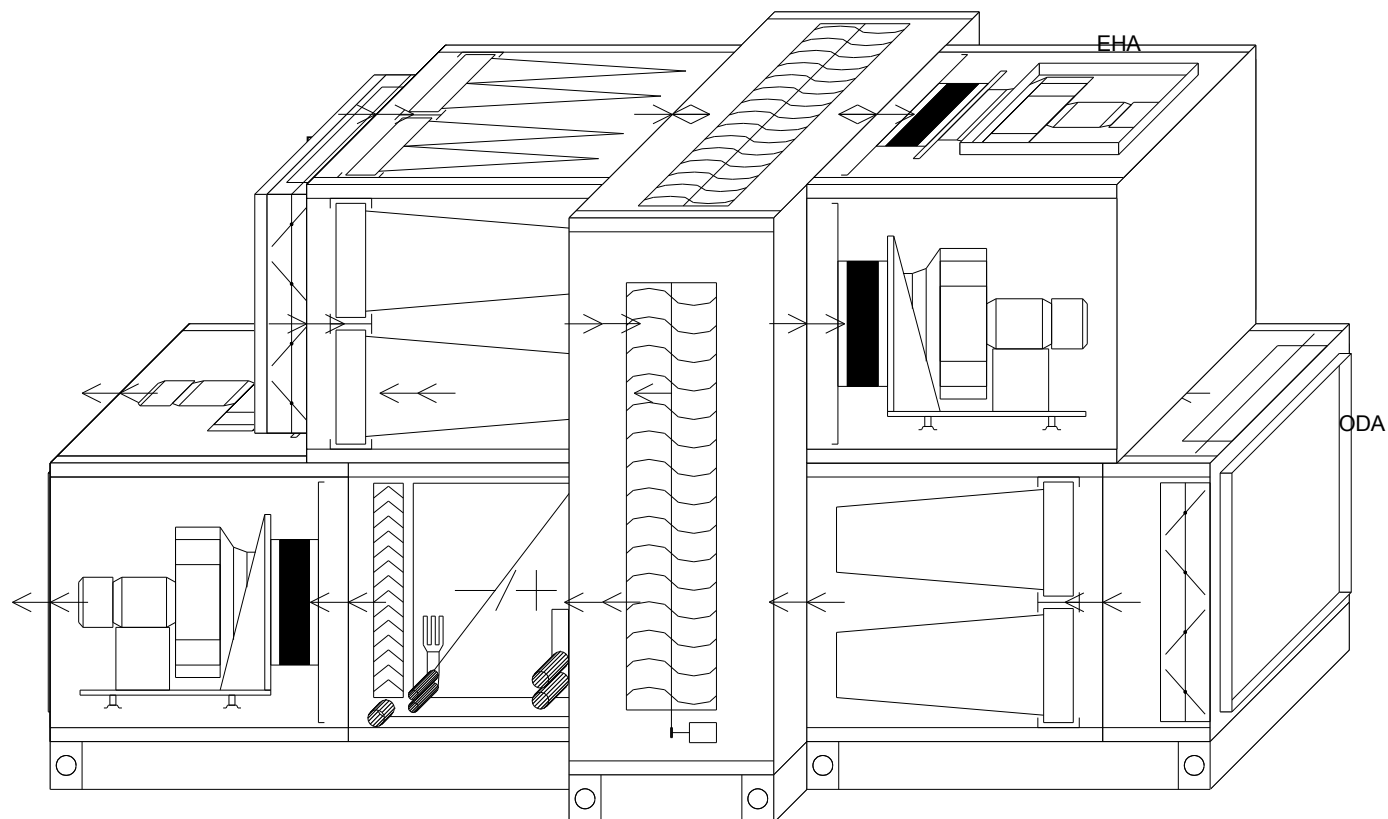
Project	2016 0067 Kantoor Hardewijk	M3,5
№	16.814JZ.208 Position AHU 5	25.4.2016

Air channel temperature sensor Siemens	0.4m NTC10k, -40...+80°C	1	Sensor, Exhaust part attach
Damper actuator, open - close	5 Nm, AC/DC 24V, LM24A	1	Terminal panel, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Filter, Exhaust part attach
Manometer with pressure switch	30..500 Pa	1	Rotary recuperator, Exhaust part attach

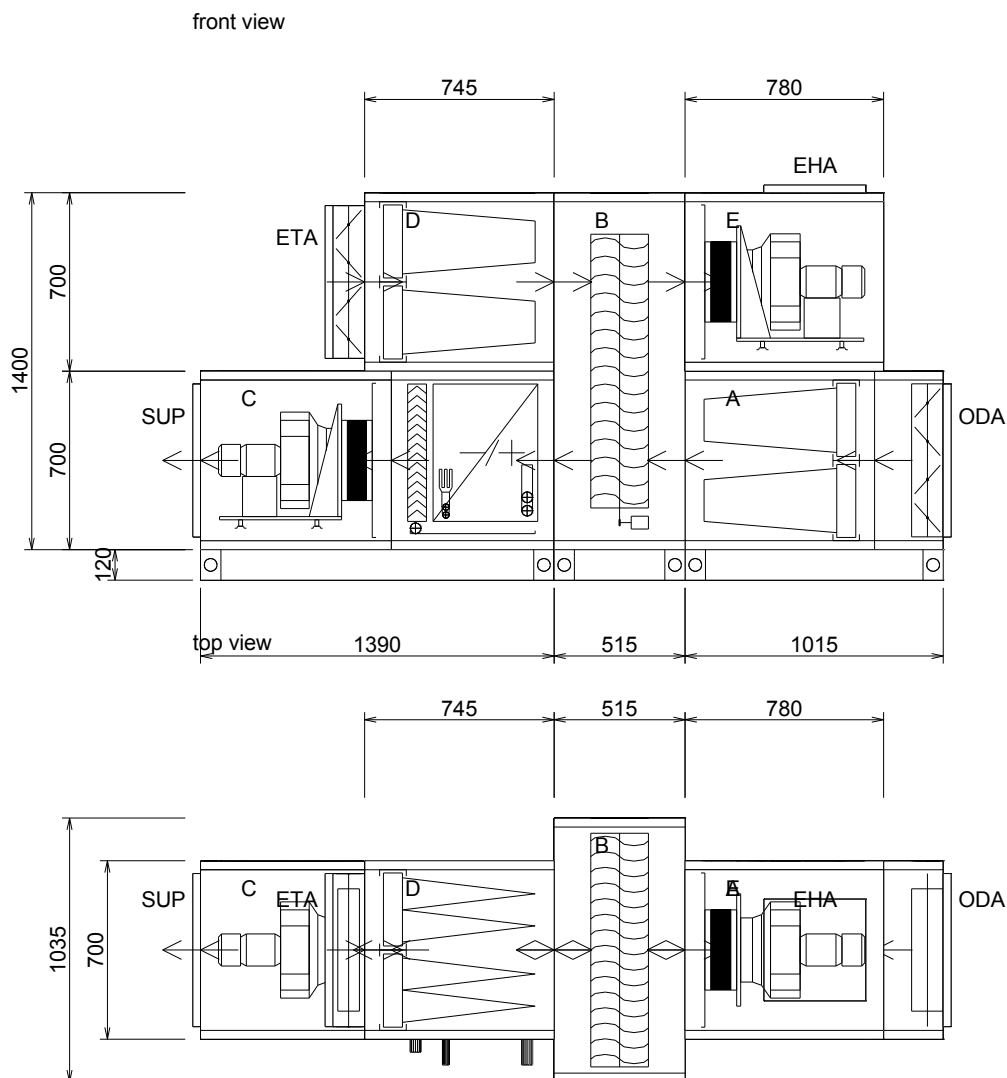
Accessories

description	Type	quantity	Section
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan exhaust mounted on unit
Condensate syphon with Ball	-2000Pa/+500Pa HL136NGG	1	Direct evaporator supply attached
service switch, wired	KEM 310U Y/R, 10A, lockable	1	Fan supply mounted on unit

perspective view



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm



HxW: ODA=600x600 mm, SUP=600x600 mm, ETA=600x600 mm, EHA=400x400 mm

Compact block	Part	Total dimensions (LxWxH) mm	contour dimensions (LxWxH) mm	Weight kg
Compact block A	supply	1015 x 700 x 820	1045 x 800 x 820	72
Compact block B	supply	515 x 1035 x 1520	515 x 1135 x 1520	134
Compact block C	supply	1390 x 700 x 820	1420 x 850 x 820	139
Compact block D	exhaust	745 x 700 x 700	900 x 800 x 700	48
Compact block E	exhaust	780 x 700 x 700	780 x 800 x 730	68
accessories attached to AHU				0