AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

KLIMOR EVO-S

Date:

2024-11-19

SELECTION:

1016931

AHU NAME:

Deansgate Manchester_M7B

PROJECT:

K-2024-10-062044

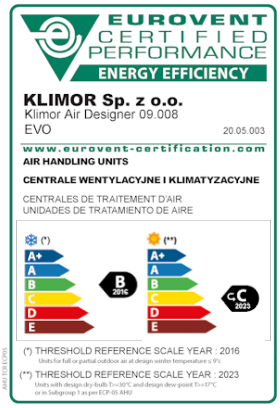
CVS - Deansgate Manchester

Contact: Krzysztof Kwarciak | kkwarciak@klimor.com

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa



ASHRAE 2017 (ref. city/db/wb/dp)
London/27.1/18.3/13.4

DEVICE DATA

DEVICE PARAMS		
Type	**EVO-S**	
Size	**5310**	
Casing	**Steel frame**	
Insulation	**Mineral wool - 50mm**	
Execution	**Standard**	
Version	**Outdoor**	
Automation	**Yes**	
Width	**1800**	mm
Height	**2470**	mm
Length	**3400**	mm
Base rail	**Full base rail 120.0**	mm
Weight	**2115**	kg
Regulation UE 1253/2014		2018
EUROVENT - Energy Efficiency Class	**B(2016)/C↬ (2020)**	
Absorbed power factor (fs-pref) - winter	**0.98 (2016)/0.9 (2020)**	

* Dimensions do not include protruding elements, including: roofs, dampers with pins, actuators, exchanger connectors, condensate drain connectors with siphons, etc.

CASING PARAMETERS AC.EN1886:2007 (MB)		
Mechanical strength +/-1000 Pa	< 2 mm	**D1 (M)**
Thermal transmittance	k = 0,94 W/m²K	**T2 (M)**
Thermal bridging factor	kb = 0,45	**TB3 (M)**
Air leakage factor -400 Pa	0,11/0,26 l/(sm²)	**L1 (M)/L2 (R)**
Air leakage factor +700 Pa	0,29/0,45 l/(sm²)	**L2 (M)/L2 (R)**
Filter bypass leakage +/-400 Pa	0,2/0,3 %	**F9 (M)**

	SUPPLY	EXHAUST	
Air volume	**3780**	**3780**	l/s
External Pressure	**300**	**300**	Pa
Air velocity	**2.1**	**2.1**	m/s
Fan power consumption	**4.46**	**4.8**	kW
Power of fan motors	**4.6**	**5.2**	kW
Current	**7.4**	**8.2**	A
Power voltage		**3x400/50**	V/Hz
Service side	**Left**	**Right**	
Air density according to EN 13053: 2019		**1,2**	kg/m3
SFPv		**2332**	W/m3/s
SFPe		**2449**	W/m3/s

PROJECT CONDITIONS		
Outdoor air parameters		
Winter	**-5.0 / 100.0**	°C / %
Summer	**30.0 / 45.0**	°C / %
Inside air parameters		
Winter	**20.0 / 40.0**	°C / %
Summer	**24.0 / 55.0**	°C / %
Recirculation	**0**	%

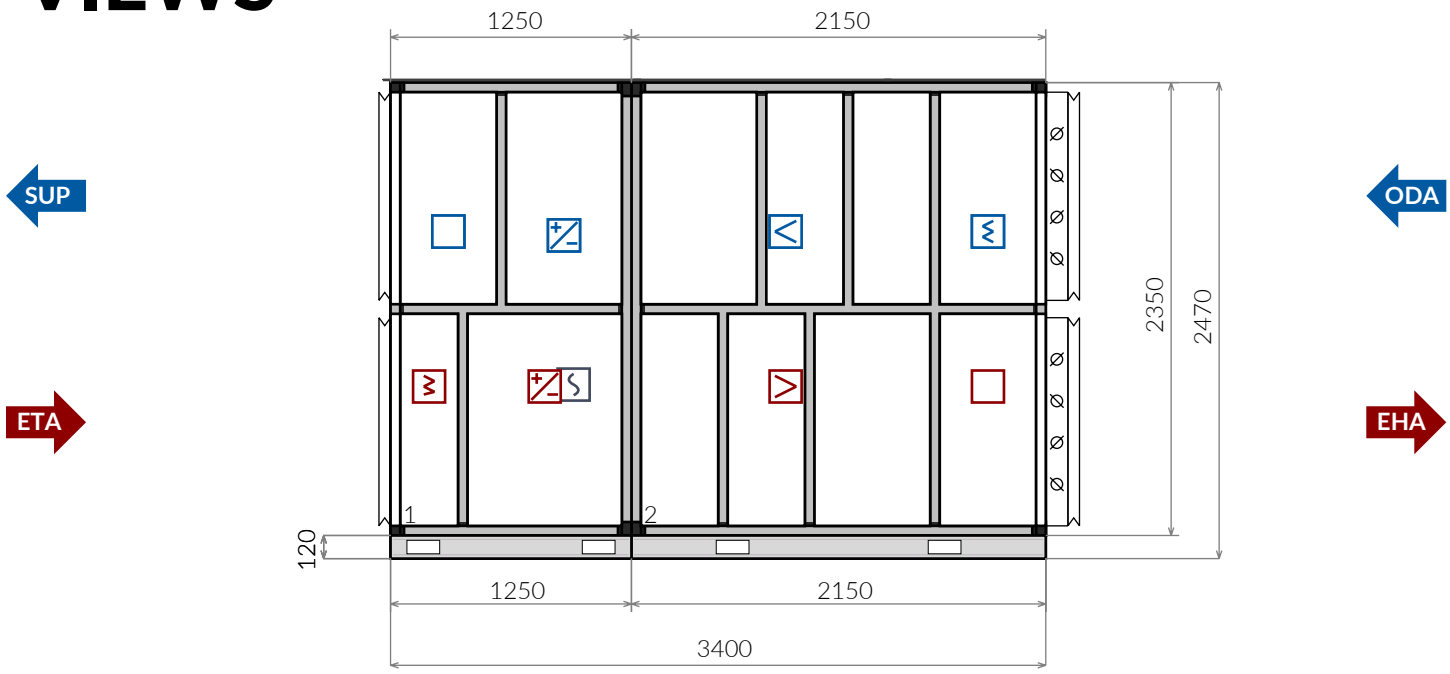
AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

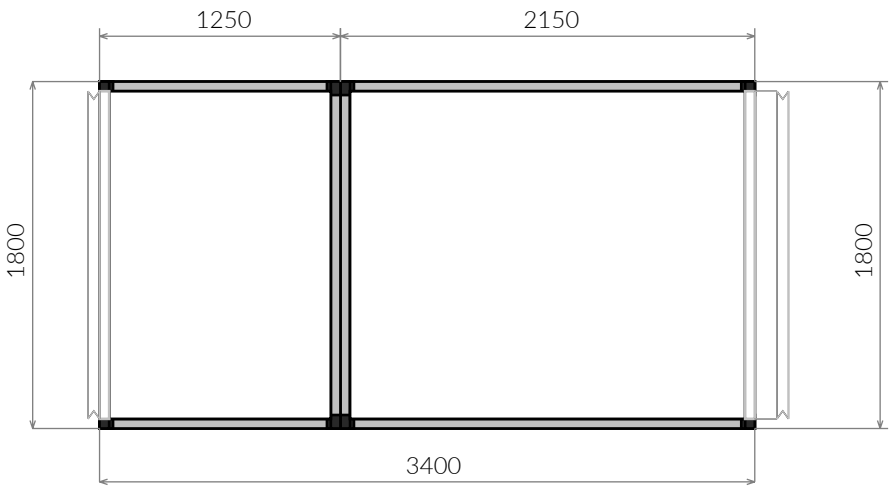
Exhaust: 3780 l/s 300 Pa

VIEWS

Elevation view



Plan view



!ATTENTION! The center of gravity can be shifted relative to the block axis. The dimensions of the holes for the forks are 170 mm x 70 mm.

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

SECTIONS WEIGHTS AND DIMENSIONS

Section number	Weight [kg]	Length [mm]	Height [mm]	Width [mm]
1	**1356**	**1250**	**2350**	**1800**
2	**712**	**2150**	**2350**	**1800**
Other	**47**			
Sum	**2115**			

* Weight tolerance +/- 10%%

CONDENSATE DRAINAGE

Function	Side	Siphon/drain connection type	Quantity
Run-around coil system (RG)	Exhaust	Single siphon 32 mm	1

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

BASIC FUNCTIONS

Supply

Flexible connection

Width/Height	**1700/1080**	mm

Air damper

Width/Height/Length	**1700/1080/115**	mm

Filter (PF/SF)

Name	**EVO 5310 B_FLR**	
Filter type	**F7 / ePM1 55%**	
Filter type	**Bag**	
Energy performance (Class / AEC)	**D / 1778**	
Filter insert (W x H x L - pcs) no. 1	**592x490x500 - 4**	
Filter insert (W x H x L - pcs) no. 2	**490x490x500 - 2**	
Air velocity	**2.3**	m/s
Pressure drop	**134**	Pa
Air pressure drop - Clean filter	**84**	Pa
Air pressure drop – Maximum	**184**	Pa

* Is not Eurovent certified

Fan (VF)

Name	**EVO 5310 VF8 EC x1**

Exhaust

Flexible connection

Width/Height	**1700/1080**	mm

Filter (PF/SF)

Name	**EVO 5310 B_FLR**	
Filter type	**M5 / ePM10 50%**	
Filter type	**Bag**	
Energy performance (Class / AEC)	**E / >1100**	
Filter insert (W x H x L - pcs) no. 1	**592x490x300 - 4**	
Filter insert (W x H x L - pcs) no. 2	**490x490x300 - 2**	
Air velocity	**2.3**	m/s
Pressure drop	**117**	Pa
Air pressure drop - Clean filter	**67**	Pa
Air pressure drop – Maximum	**167**	Pa

* Is not Eurovent certified

Glycol heat exchanger

Name	**EVO 5310 RG_HE**	
Air pressure drop Winter	**428**	Pa
Air velocity	**2.6**	m/s
EAT Temperature/Humidity Winter	**20/40**	°C/%
LAT Temperature/Humidity Winter	**5.2/97**	°C/%

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

Fan (VF)

Air volume	**3780**	l/s
External Pressure	**300**	Pa
Dynamic pressure	**43**	Pa
Static pressure	**794**	Pa
Total pressure	**837**	Pa
K-factor		**355**
Rotations	**1761**	1/min
Absorbed electrical power (clean filter)	**4.24**	kW
Absorbed electrical power	**4.46**	kW
Fan efficiency for UVUs (ηVU)	**51.27**	%
SFP	**1121**	W/m3/s
Internal Specific Fan Power SFPint (Eurovent)	**1180**	W/m3/s
Fan set static efficiency	**67.28**	%
Fan set total efficiency	**70.94**	%
Fan sound power	**91.92**	dB

Frequency	125	250	500	1K	2K	4K	8K	Hz
Inlet	82.2	79.1	73.5	70.9	68.1	64.4	69.7	[dB]
Outlet	87.9	83.4	84.5	80	77.2	73.3	72.7	[dB]

Motor type		**EC**
Rated power	**1 x 4.6**	kW
Voltage	**400**	V/Hz
Control voltage	**9.9**	V
FLA	**1 x 7.4**	A
Nominal Rpm	**1780**	1/min
NEMA Class		**EC**
Protection class		**IP55**

* Fan set designed for wet operating conditions

* The fan parameters take into account the influence of the installation in the device

Glycol heat exchanger

Name	**EVO 5310 RG_HE**	

Glycol heat exchanger

Exchanger capacity	**109.7**	l
EAT Temperature/Humidity Summer	**24/55**	°C/%
LAT Temperature/Humidity Summer	**24/55**	°C/%
Medium pressure drop	**94.9**	kPa
EWT/LWT winter	**-0.2/15.3**	°C / °C
Air pressure drop - Droplet eliminator	**28**	Pa

Fan (VF)

Name	**EVO 5310 VF8 EC x1**	
Air volume	**3780**	l/s
External Pressure	**300**	Pa
Dynamic pressure	**43**	Pa
Static pressure	**873**	Pa
Total pressure	**916**	Pa
K-factor		**355**
Rotations	**1798**	1/min
Absorbed electrical power (clean filter)	**4.58**	kW
Absorbed electrical power	**4.8**	kW
Fan efficiency for UVUs (ηVU)	**51.72**	%
SFP	**1211**	W/m3/s
Internal Specific Fan Power SFPint (Eurovent)	**1270**	W/m3/s
Fan set static efficiency	**68.76**	%
Fan set total efficiency	**72.16**	%
Fan sound power	**92.49**	dB

Frequency	125	250	500	1K	2K	4K	8K	Hz
Inlet	81.2	79.4	74.1	71.6	68.2	65.2	69	[dB]
Outlet	89.1	83.5	84.3	80.5	77.8	74.5	72.2	[dB]

Motor type		**EC**
Rated power	**1 x 5.2**	kW
Voltage	**400**	V/Hz
Control voltage	**9.7**	V

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

Glycol heat exchanger

Air pressure drop Winter	**360**	Pa
Air velocity	**2.6**	m/s
EAT Temperature/Humidity Winter	**-5/100**	°C/%
LAT Temperature/Humidity Winter	**11.2/32**	°C/%
Thermal dry efficiency - winter (CR 1253/2014)	**70.20**	%
Thermal efficiency Winter	**64.70**	%
Rated power Winter	**74.5**	kW
Medium type		**Ethylene**
Glycol content	**35**	%
Installation capacity	**7**	l
System capacity	**226.3**	l
Exchanger capacity	**109.7**	l
EAT Temperature/Humidity Summer	**30/45**	°C/%
LAT Temperature/Humidity Summer	**30/45**	°C/%
Thermal efficiency Summer	**0.00**	%
Rated power Summer	**74.5**	kW
Medium pressure drop	**94.9**	kPa
EWT/LWT winter	**15.3/-0.2**	°C / °C
Medium flow	**4.63**	m3/h
Circulation pump lifting height	**206.41**	kPa
Hydraulic installation		**Yes**
Connection size IN/OUT		**1 1/2"**
Tube / Fin material		**Cu/Al**
Fins per inch	**2.5**	mm
Number of rows		**18**
Air pressure drop - Droplet eliminator	**0**	Pa
MOTOR		
Rated power	**2.2**	kW
Voltage	**230**	[V]
Frequency	**50**	[Hz]
FLA	**8.3**	[A]
Inverter		

Fan (VF)

FLA	**1 x 8.2**	A
Nominal Rpm	**1860**	1/min
NEMA Class		**EC**
Protection class		**IP55**

* Fan set designed for wet operating conditions

* The fan parameters take into account the influence of the installation in the device

Empty section (ES)

Pressure drop	**0**	Pa

Air damper

Width/Height/Length	**1700/1080/115**	mm

Flexible connection

Width/Height	**1700/1080**	mm

Contact: Krzysztof Kwarciak | kkwarciak@klimor.com

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

Glycol heat exchanger

Voltage	**3x400**	[V]
Frequency	**50/60**	[Hz]
FLA	**6.3**	[A]

Empty section (ES)

Pressure drop	**0**	Pa

Flexible connection

Width/Height	**1700/1080**	mm

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

ACOUSTICS

SOUND POWER LEVEL

Frequency	Hz	125	250	500	1000	2000	4000	8000	SUM
Outdoor air (ODA)	dB	80.2	76.1	68.5	59.9	51.1	40.4	40.7	81.9
Outdoor air (ODA)	dB (A)	64.1	67.5	65.3	59.9	52.3	41.4	39.6	71.1
Supply air (SUP)	dB	87.9	82.4	83.5	79.0	75.2	69.3	68.7	90.6
Supply air (SUP)	dB (A)	71.8	73.8	80.3	79.0	76.4	70.3	67.6	84.6
Extract air (ETA)	dB	76.2	74.4	67.1	63.6	57.2	49.2	51.0	78.9
Extract air (ETA)	dB (A)	60.1	65.8	63.9	63.6	58.4	50.2	49.9	70.2
Exhaust outlet (EHA)	dB	89.1	83.5	84.3	80.5	77.8	74.5	72.2	91.8
Exhaust outlet (EHA)	dB (A)	73.0	74.9	81.1	80.5	79.0	75.5	71.1	86.2

SOUND POWER LEVEL OUTSIDE OF AHU

	dB	75.9	62.2	55.0	53.2	49.9	35.8	35.5	76.1
	dB (A)	59.8	53.6	51.8	53.2	51.1	36.8	34.4	62.3

SOUND PRESSURE LEVEL OUTSIDE OF AHU AT THE DISTANCE 1M (3.28 FOOT)

	dB (A)	52.3	46.1	44.3	45.7	43.7	29.3	26.9	54.8

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

REGULATION UE 1253/2014

EU REGULATION 1253/2014

a) manufacturers name	**Klimor Spółka z ograniczoną odpowiedzialnością**	
b) manufacturers model identifier	**EVO-S**	
c) declared typology	**NRVU-BVU**	
d) type of drive installed	**Variable speed drive**	
e) type of HRS	**UOC with intermediate**	
f) Thermal efficiency of heat recovery	**70.20**	[%]
g) nominal NRVU flow rate	**3.78 / 3.78**	[m3/s]
h) effective electric power input	**4.24 / 4.58**	[kW]
i) Internal specific fan power SFPint / SFPint_limit	**1322.5/1366.0**	[W/(m3/s)]
j) face velocity	**2.1 / 2.1**	[m/s]
k) nominal external pressure dps_ext	**300 / 300**	[Pa]
l) internal pressure drop of ventilation components dps,int	**443 / 434**	[Pa]
m) internal pressure drop of non-ventilation components dps,add	**51 / 139**	[Pa]
n) static efficiency of fans ac. with Regulation EU No 327/2011	**67.3 / 68.8**	[%]
o) declared maximum external leakage rate	**0.08**	[%]
p) energy performance of the filters (type/class/annual energy consumption)		
q) description of visual filter warning for NRVUs	**In control system**	
r) the casing sound power level LWA	**62.3**	[dB(A)]
s) internet address	**www.klimor.com**	
The UNIT complies with the requirements of Regulation UE 1253/2014	**2018 Yes**	

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

AUTOMATION

Application code: RGCS 0

Symbol	Name	Index	Quantity
Service Switch	Safety switch	99000581001643	1
EVO TEMP.SNR DUCT	Duct temperature sensor	1007626	3
EVO TEMP.SNR ROOM LCD 4,3"	HMI panel with room temperature sensor	1019725	1
EVO ALL DFF.PRSS.GG	Pressure gauge	1000264	3
CG.ETH EVOS NW11-1/400 ETH OUTSIDE	Control Unit with built in ethernet card	1026997	1
EVO FUSE gG 10A type10x38	Fuse	1008619	1
EVO FUSE gG 10A type10x38	Fuse	1008619	1
EVO ALL FUSE gG 32A type10x38	Fuse	1008622	1
EVO A.DPR.ACTUR ON-OFF 8	Air damper actuator	1011476	2

AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

PRINCIPLES OF CONTROL SYSTEM OPERATION

1. Control of all air supply AHU's functions is provided via the control box or control panel installed in a remote location.

2. Cascading operation of exchangers: the recirculation unit or heat exchanger is turned on first and then the heater/cooler.

3. In case of systems with the water heater in the heating period defined by external temperature the so called „hot start" is realized. Once the AHU is turned on, first the water heater valve is open at 100% and the circulation pump is started. Once the set delay time pass, the fans are started and the dampers begin to open..

4. In the case of systems with electric and gas heaters, the heater is switched off first, and after a set delay – fans and air dampers begin to close.

5. Systems with the water heater are equipped with the air supply damper with the actuator with a return spring..

6. Systems with water coolers and/or heaters are equipped with the three-way mixing valves. Assembly method of the heaters/coolers supply node should be the same as in case of solutions listed in the corresponding control system diagrams.

7. After power failure or emergency power shutdown the air supply AHU system remembers the last operation algorithm (before the shutdown). Once the power is resumed the system AUTOMATICALLY RESUMES OPERATIONS WITH THE PREVIOUS SETTINGS.

8. The temperature control based on the leading sensor selected in the controller menu. It can be:
a) air supply temperature sensor
b) room temperature sensor
c) air exhaust temperature sensor

Due to the control algorithm and energy saving option each air supply system with mixing chamber and air supply/exhaust system with the recirculation and/or heat recovery has to be equipped with air exhaust temperature sensor – regardless the leading sensor selection. If the room sensor is selected as the leading sensor, it is recommended to use also the air supply temperature sensor.

9. Each air supply AHU's control system is equipped with a non-voltage contact for concurrent control of an additional air exhaust fan.

10. Systems with the DX cooler are equipped with two non-voltage contacts which enable control of the two-speed cooler.

11. Each control system of air supply AHUs can be additionally equipped with:
a) system maintaining constant air flow or constant air pressure– additional pressure transducers (one for SCS systems and two for the other onces);
b) indication of additional filter contamination – additional pressure gauge.

12. In each system equipped with the gas heater – the gas module is equipped with its own control system with th algorithm ensuring its correct operation. The principles of operation are provided in the module's documentation. The module with 230V power supply provided by a separate cable.

13. Air exhaust AHUs – two-speed, enabling signal control using CO/LPG sensors.

14. The cooling systems and heat pumps are provided in the following versions:
- only cooling systems – CM system
- heat pump – HPM
Both system are on inverter or digital compressors.

15. The control system of the HPM heat pump or the CM cooling system consists of one control gear. The control system consists of:
- the control gear with the PLC controller with the operational algorithm of the cooling system or heat pump
- the power supply module of the cooling system or heat pump
Separate power supply should be provided to the control gear module.

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Supply: 3780 l/s 300 Pa

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16. The CM cooling systems and the heat pump work only at the max AHU output.

17. Systems with electric heater are equipped with a separate heater control module. 3x400V power supply, with a separate cable.

18. Standard control gear works only with electrode steam humidifier.

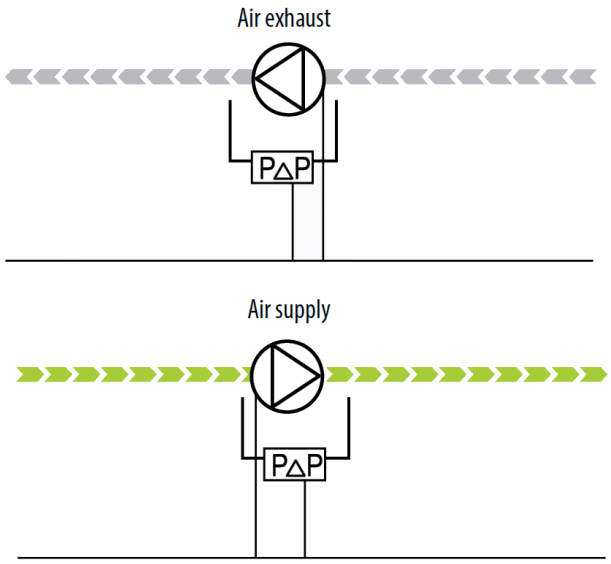
19. The humidifier is equipped with its own control system with the algorithm ensuring its correct operation. The principles of operation are provided in the humidifier's documentation. The 3x400V 50Hz power supply using a separate cable.

20. Possibility of cooperation with BMS using Modbus RTU or BACnet MS/TP protocols.

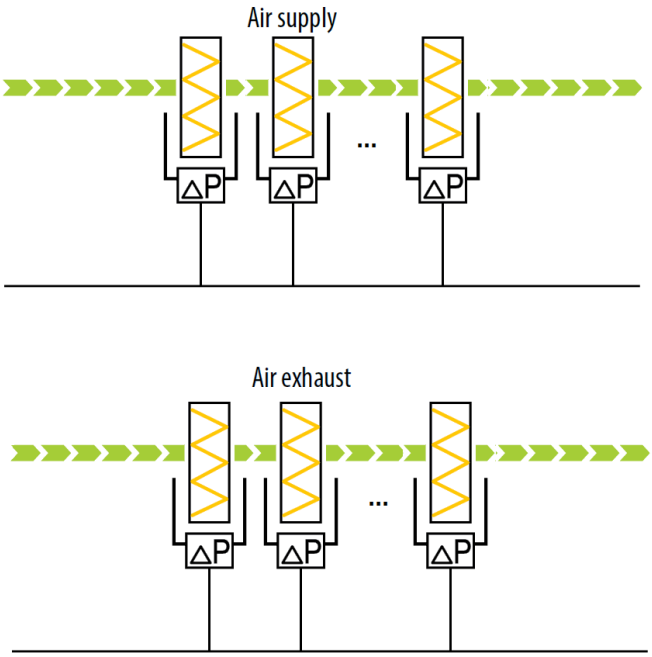
21. The possibility of communication via ETHERNET - a separate series of controllers, not interchangeable with the standard solution.

Auxiliary equipment diagrams:

System maintaining constant air flow.
Maintaining constant fan output (or fans in air supply/exhaust systems). The pressure transducer via inverter adjusts the fan motor RPMs, maintaining constant pressure, regardless the air flow resistance fluctuation



Additional filter contamination indication.

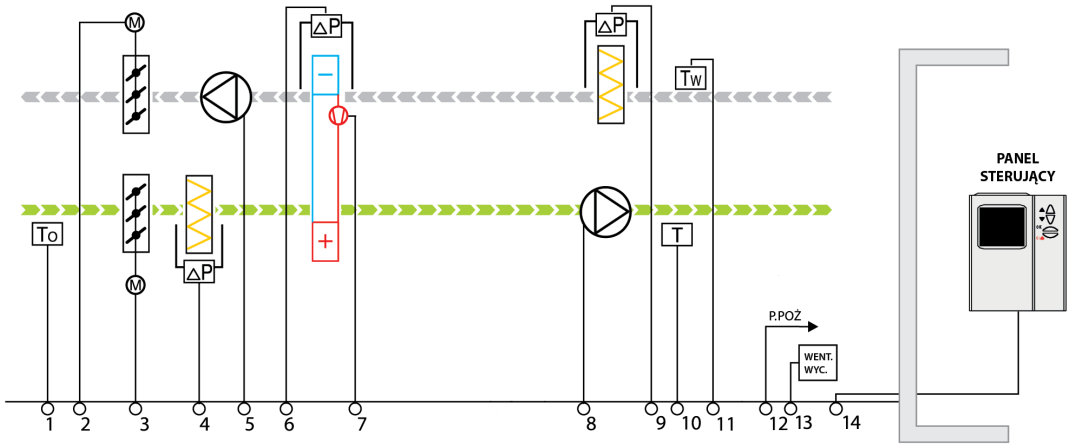


AHU name: KLIMOR EVO-S 5310 13630LPFVFRGES/13630RPFRGVFES+FC+AD+O+CS

Supply: 3780 l/s 300 Pa

Exhaust: 3780 l/s 300 Pa

Układ automatyki zespołu nawiewno-wywiewnego z glikolowym odzyskiem ciepła



Specyfikacja dostawy:

Lp.	Opis	Pozycja na schemacie	Ilość (szt.)
01	Kanałowy czujnik temperatury	1,10,11	3
02	Presostat	4, 6, 9	3
03	Siłownik przepustnicy ON/OFF	2	1
04	Pompa układu glikolowego	7	1
05	Falownik silnika wentylatora – dostawa luzem	5, 8	2
06	Rozdzielnica ze sterownikiem PLC zasilana 3x400V		1
07	Panel zdalnego sterowania	14	1

UWAGA! Pompa obiegowa nagrzewnicy nie wchodzi w zakres dostawy.

Nastawa parametrów pracy centrali z rozdzielnicy lub panelu zdalnego sterowania.

1. Czujnik temperatury zewnętrznej To (1) zezwala na „gorący start" układu oraz na pracę chłodnicy DX w zależności od temperatury zewnętrznej.
2. Przepustnice otwierają się po starcie wentylatorów.
3. Sygnalizacja zanieczyszczenia filtra.
4. Zabezpieczenie wymiennika glikolowego przed zeszronieniem – presostat (6). Wzrost ciśnienia powyżej nastawy /zaszronienie wymiennika/ powoduje zmniejszenie wydajności pompy, aż do wyłączenia.
5. Regulacja wydajności powietrza (przemienniki częstotliwości).

Właściwości dodatkowe układu:

- Praca układu według kalendarza – temperatura, wydajność, tryb pracy
- Informacje o stanach alarmowych
- Zabezpieczenie układu napędowego przed przeciążeniem
- Możliwość pracy w protokole komunikacyjnym MODBUS RTU lub BACnet MS/TP
- Komunikacja przez ETHERNET – patrz pkt 23 str. 9
- Zasilanie pompy obiegowej nagrzewnicy o mocy do 500W i napięciu 1X230V 50 Hz

OPCJE – patrz rozdział „OGÓLNE ZASADY PRACY AUTOMATYKI" z katalogu AUTOMATYKI.

- Sygnalizacja zanieczyszczenia filtra dodatkowego
- Utrzymanie stałego wydatku