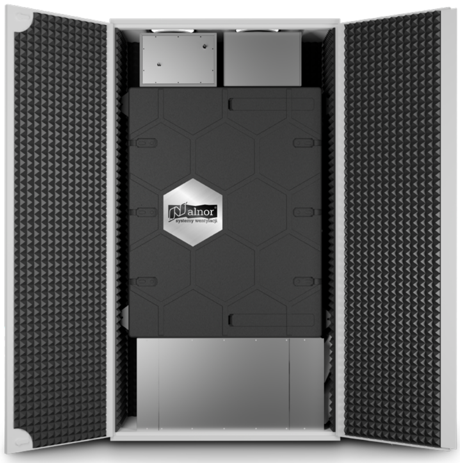
Heat recovery unit for schools

HRU-TeachAIR



Description

TeachAIR is an advanced mechanical ventilation system with heat recovery, designed to ensure the highest air quality in classrooms and educational spaces. A capacity of 700 or 900 m³/h allows for effective ventilation of rooms for up to 30 students, in accordance with the minimum requirement of 30 m³/h per person.

The system is compatible with various air distribution methods, such as displacement diffusers, long-range nozzles, or classic linear diffusers. In the case of a displacement diffuser, fresh air is supplied at low speed and with low turbulence. The version with a carbon filter also effectively neutralizes odors.

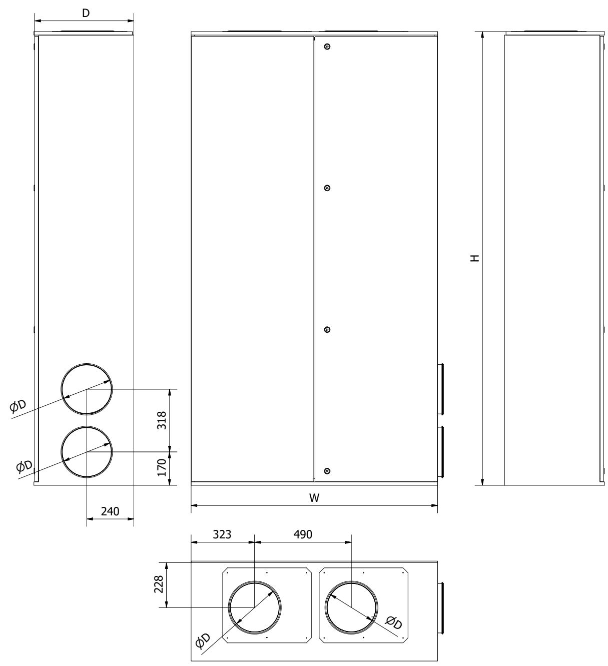
The device offers a choice of two types of heat exchangers: thermal and enthalpy, which allows not only heat energy but also moisture to be recovered. An advanced algorithm manages the system's operation based on CO2 concentration and specified thermal comfort parameters, ensuring optimal conditions in the classroom throughout the day.

The aesthetic and functional housing effectively dampens noise without disrupting the learning process – the sound level at a distance of 1 m from the device is only 30 dB. The unit is equipped with an advanced air filtration system based on an electrostatic filter. The integrated cooler-heater ensures thermal comfort regardless of external conditions, while the use of an air recirculator enables effective air exchange, maintaining thermal comfort and saving energy.

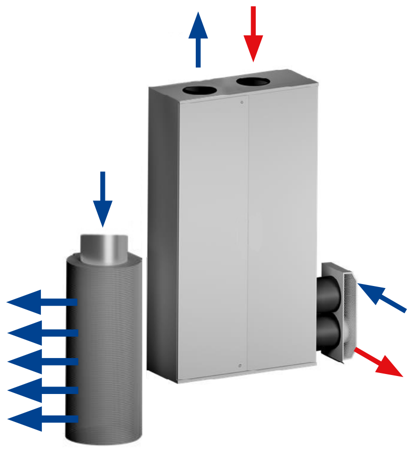
Thanks to access to the AIR Alnor cloud system, it is possible to centrally manage multiple units in a single facility (e.g., an entire school), which significantly simplifies operation and increases the energy efficiency of the building. Additionally, TeachAIR can be integrated with Loxone's SmartHOME solution, which allows for the synchronization of multiple devices in a facility, increasing the level of automation and user comfort.

Heat recovery selector

Dimensions



	ØD [mm]	D [mm]	W [mm]	H [mm]
TeachAIR-700	250	500	1250	2300
TeachAIR-900	250	500	1250	2300



Product code examples

Product code:

HRU-TeachAIR-900E-H-CF-RC-F-CH-SI-J-P

type
air flow [m³/h]
enthalpic heat exchanger
pre-heater
constant flow
recirculator
electrostatic filter
cooler-heater
silencer
jet diffuser
wired control

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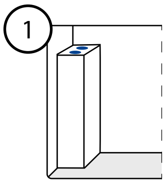
Installation



Model	HRU-TeachAIR-700	HRU-TeachAIR-900
Suspended	X	X
Vertical	✓	✓
Horizontal	X	X

Technical data

		HRU-TeachAIR-700	HRU-TeachAIR-700E	HRU-TeachAIR-900	HRU-TeachAIR-900E
Air flow [m³/h] @ 100 Pa		700	700	900	900
Maximal efficiency %[1]		95,0	90,6	94,5	90,1
Efficiency % (acc. 1254/2014)[2]		88,0	81,1	86,1	78,2
Maximal moisture efficiency %			73		71,7
Heat exchanger		counterflow, PET	enthalpic	counterflow, PET	enthalpic
Voltage [V/Hz]		230 / 50	230 / 50	230 / 50	230 / 50
Maximum power consumption [W]		344	344	508	508
Sound level [dB][3]		29	29	30,8	30,8
Weight [kg]		150	150	150	150
Elektrostatic filter[4]	ePM_{10}	≥90%	≥90%	≥90%	≥90%
	$ePM_{2,5}$	≥80%	≥80%	≥75%	≥75%
	ePM_1	≥75%	≥75%	≥65%	≥65%
Filters		ISO Coarse 70% / ISO ePM1 55% (opcjonalnie)			
Built-in pre-heater		✓	✓	✓	✓
Pre-heater power [W]		3000	3000	3000	3000
Built-in RH sensor		✓	✓	✓	✓
The electric preheater protects the heat exchanger from freezing in the following conditions[5]		to -15˚C	to -15˚C	to -10˚C	to -10˚C

[1] Maximal thermal efficiency acc. to EN13141-7 at minimum air flow
[2] Thermal efficiency in reference point acc. to EN 13141-7, in compliance with UE 1254/2014
[3] Total sound pressure level measured at a distance of 1 meters in accordance with PN-EN ISO-3744/2010
[4] Tested in accordance with ISO 16890, ePM class according to ISO 16890-1
[5] Tested in accordance with EN-13141-7

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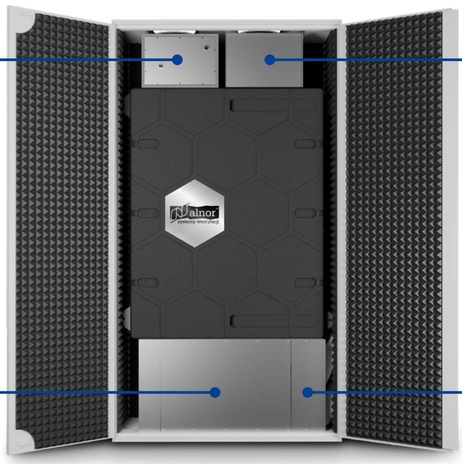


Cooler-heater

The cooling and heating exchanger is used to regulate the temperature of the air supplied to the room.

Acoustic silencer

The use of a silencer helps to ensure proper acoustic comfort for users.

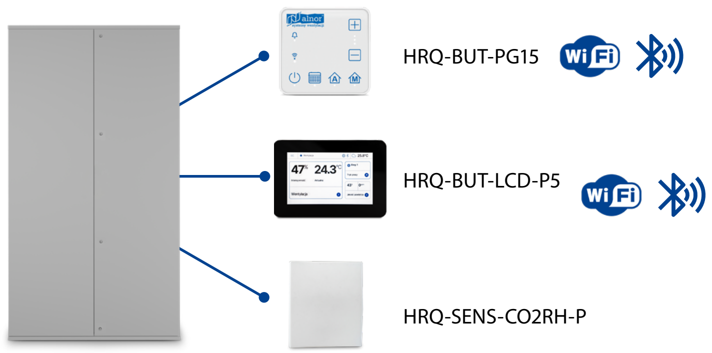
Recirculator

The use of a recirculator ensures effective air exchange, thermal comfort, and energy savings.

Electrostatic filter

The use of an electrostatic filter on the air intake allows for the retention of contaminants, protection of the ventilation system, and partial reduction of odors.

Wired control



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Modbus

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LOXONE
SMART HOME

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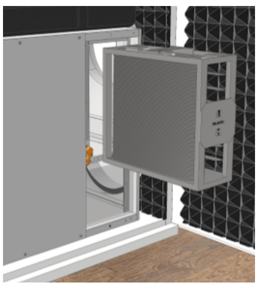
Filters

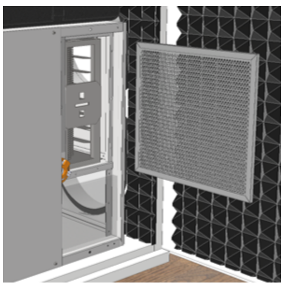
Alnor's heat recovery unit code	*Filters code*	*ISO filtration class 16890*	*Filtration class in accordance with EN 779:2012*	*Dimensions [mm]*
HRU-TeachAIR-700/900	HRF-SlimAIR-G4-438-254-46	ISO coarse 70%	G4	438x254x46
HRU-TeachAIR-700/900	HRF-SlimAIR-F7-438-254-46	ISO ePM1 55%	F7	438x254x46

ISO coarse 70% filters according to ISO 16890 (formerly G4) and ISO ePM1 55% filters according to ISO 16890 (formerly F7) have a pleated design, which provides a larger filtration area and low pressure drops.

Electrostatic filter

The use of an electrostatic filter on the air intake allows for the retention of contaminants, protection of the ventilation system, and partial reduction of odors.



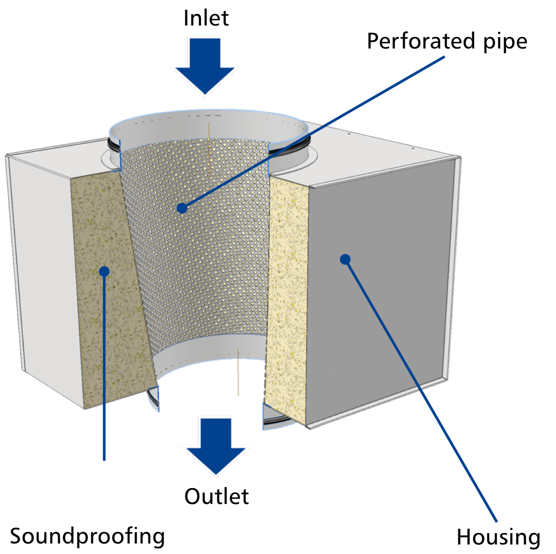


Constant Flow (CF)

SlimAIR air handling units optionally can be equipped with the Constant Flow system, whose task is to maintain a constant air flow in the installation. CF works by reading the difference between the dynamic pressure around the fan and the static pressure in the duct in front of the fan. The CF system constantly monitors the pressure in the ducts and if the resistance increases, it increases the speed of the fans to maintain a constant flow, such as on the first day when the ventilation unit was commissioned. During exploitation, the installation pressure is naturally disrupted (dirty filters, condensation of water in the heat exchanger, temperature difference changing the air mass). CF counteracts to those changes, thanks to which the airflows remain sustainable, and only a sustainable system takes full advantage of the air handling unit's capabilities.

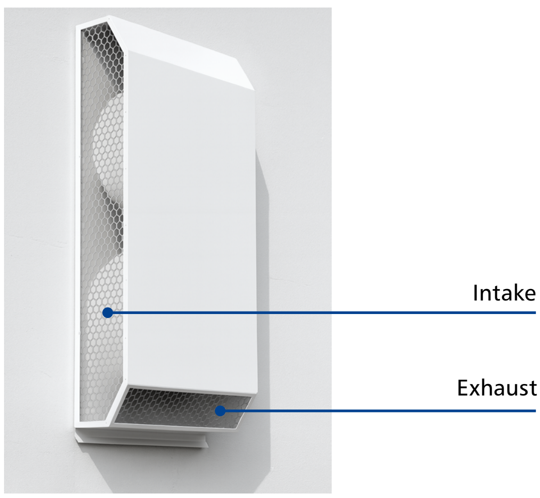
Acoustic silencer

The use of a silencer helps to ensure proper acoustic comfort for users.



Integrated intake and exhaust system

The air intake and exhaust unit is a compact component mounted on the exterior wall of a building, allowing fresh air to be distributed to the ventilation unit and exhaust air to be discharged outside.



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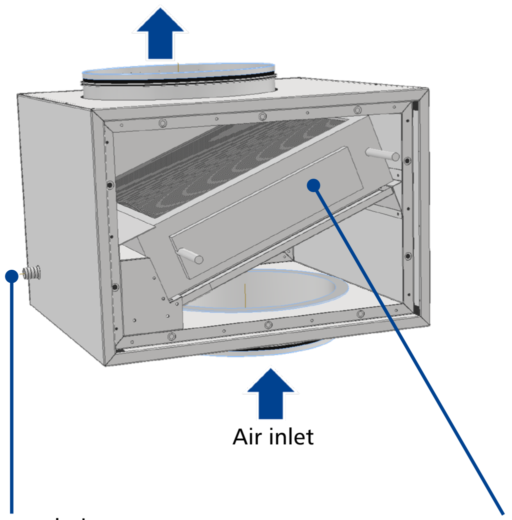
Cooler-heater

The cooling and heating exchanger is used to regulate the temperature of the air supplied to the room.



	TeachAIR-700				*TeachAIR-900*			
	Heating mode		*Cooling mode*		*Heating mode*		*Cooling mode*	
Efficiency	0,96 kW		0,96 kW		1,23 kW		1,23 kW	
Surface area	1,16 m2		1,16 m2		1,155 m2		1,155 m2	
Humid air	(700 m³/h)		(700 m³/h)		(900 m³/h)		(900 m³/h)	
Pressure	1013 hPa		1013 hPa		1013 hPa		1013 hPa	
Condensate			< 1 kg/h				< 1 kg/h	
Flow resistance	13,5 Pa		13,8 pa		19,8 Pa		20,81 pa	
	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
Temperature	17°C	21°C	25°C	21°C	17°C	21°C	25°C	21°C
Relative humidity	75%	58%	45%	70%	75%	58%	45%	70%
Flow rate	700 m³/h	700 m³/h	939 m³/h	927 m³/h	880 m³/h	893 m³/h	939 m³/h	927 m³/h
Speed	2,35 m/s	2,38 m/s	3,22 m/s	3,18 m/s	3,02	3,06 mis	3,22	3,18 mis
Medium	water		water		water		water	
Flow rate	0,16 m³/h		0,14 m³/h		0,21 m³/h		0,18 m³/h	
Speed	0,75 m/s		0,62 m/s		0,98 m/s		0,81 m/s	
Flow resistance	9,11 kPa		9,12 kPa		15,06 kPa		15,07 kPa	
	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
Temperature	40°C	35°C	6°C	12°C	40°C	35°C	6°C	12°C

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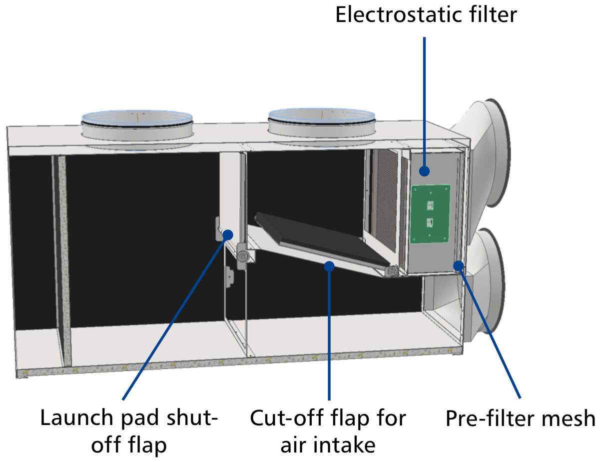
Recirculator

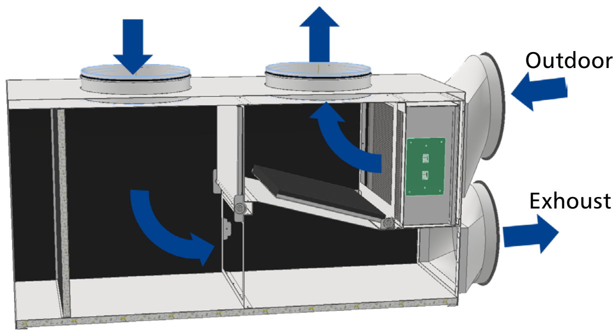
The use of a recirculator ensures effective air exchange, thermal comfort, and energy savings, especially at night when there are no students in the classrooms and there is no need to remove excess CO2. In such cases, the air will circulate in a closed circuit.

Construction

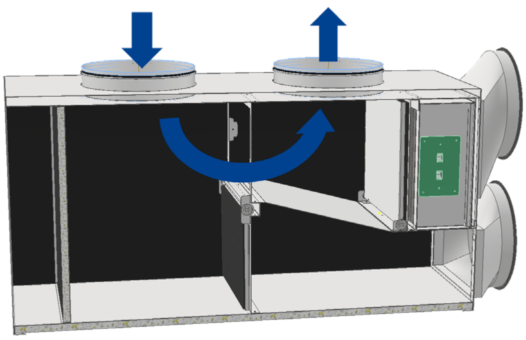


How it works

Airflow mode



100% recirculation mode

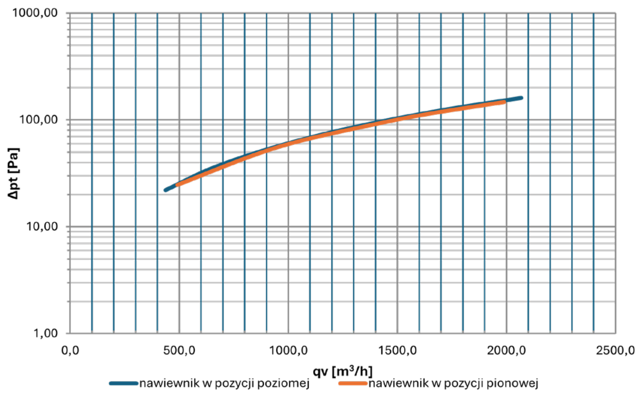


Displacement ventilator with activated carbon

The use of a displacement diffuser with activated carbon combines the advantages of displacement ventilation and air filtration through activated carbon.

Construction

Diagram of resistance generated by a displacement diffuser filled with activated carbon granules:



HRU-TeachAIR

Energy class

Model	Sound power level L_{WA} dB(A)* [dB]	Air flow rate [m^3/h]	Energy class			
			Manual control	Clock control	Central demand control (1 sensor)	Local demand control (2 sensors)
HRU-TeachAir-700	44	700	A	A	A	A+
HRU-TeachAir-700E	44	700	A	A	A	A
HRU-TeachAir-900	46	900	B	A	A	A
HRU-TeachAir-900E	46	900	B	B	A	A