

HRV Plus Ceiling Type Heat Recovery Equipment

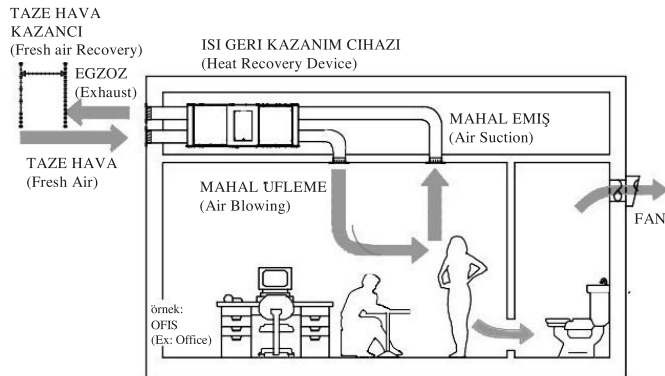
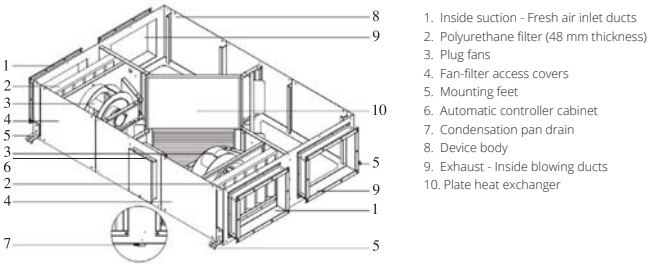
The heat recovery fresh air device is called HRU or VAM device in short. HRU devices are designed to meet the exhaust and fresh air needs in indoor spaces and thanks to its special plate heat exchanger and with the help of the built-in fans, it provides energy saving by recovering the heat energy without mixing the exhaust air with fresh air.

► Product Material

The carrier casing is double walled made of 1 mm thick galvanized sheet, and interior of the device has a 30 mm thick sound insulation. It has self-powered, imported, silent, mono-phase (230 V) and plug-in fans suitable for speed control. 40-50% efficiency heat exchangers are used in our heat recovery devices.

► Usage Features

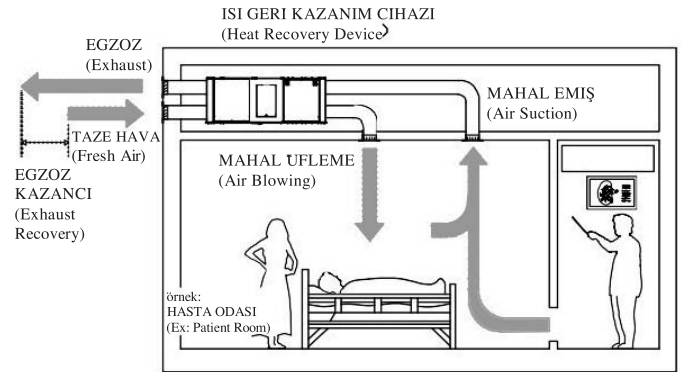
Ceiling type heat recovery devices are designed to provide high indoor air quality as well as energy saving. Aluminum plate heat exchangers with high performance and thermal conductivity ensure efficient heat transfer between warm and cold air streams. They are devices that provide energy saving advantage as well as meet the need for fresh air at businesses, banks, offices, hotels, houses, cinemas, fair, exhibition areas, hospitals, multipurpose halls, restaurants and such areas that need to be exhausted too much.



► Supply Air Enriching Mode

It is in order to increase the air supply, and prevent back flow of the restroom-kitchen odors or humidity. Increases room pressure.

They are produced as standard 9 models with air flow range of 500 m³/h to 5000 m³/h. The models are designed to be placed between the suspended ceiling, installed and maintained easily.

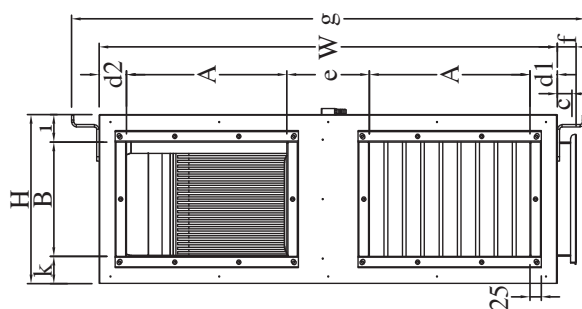
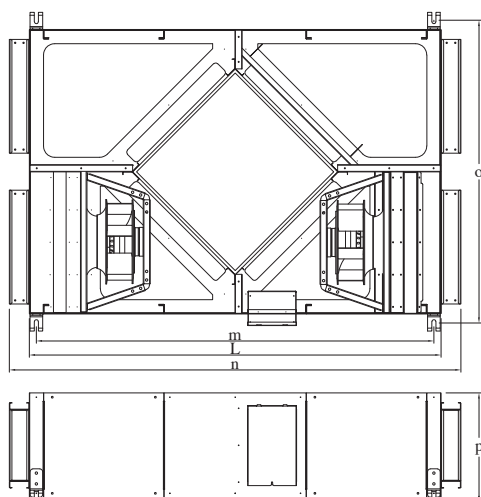


► Exhaust Air Enriching Mode

It is adjusted in order to increase the exhaust air, and prevent odor or bacteria from seepage into other rooms. Decreases room pressure.

► Function

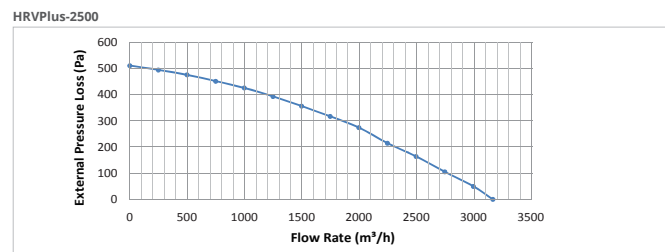
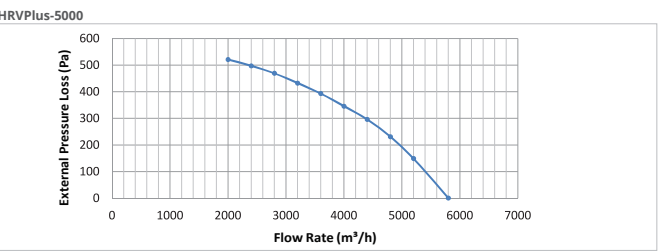
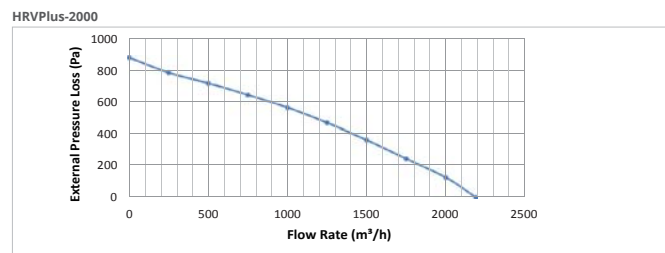
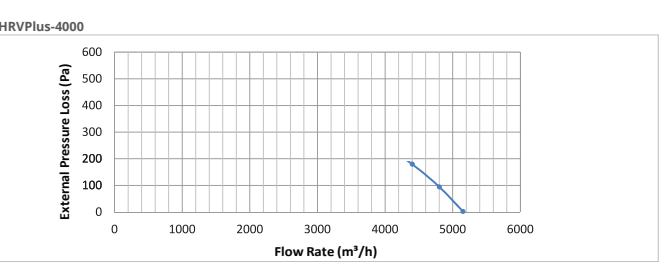
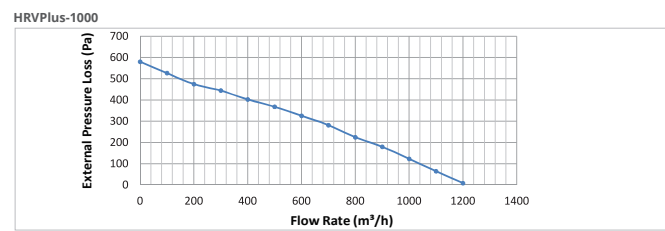
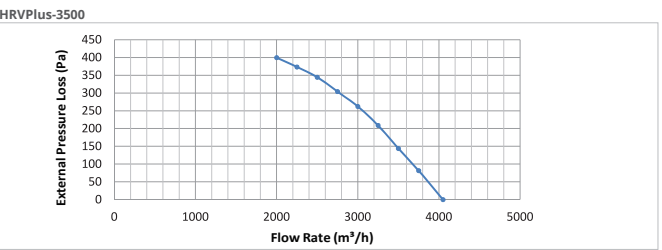
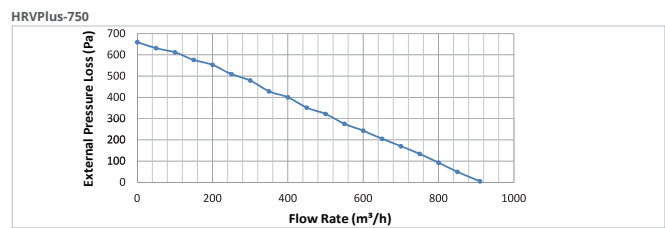
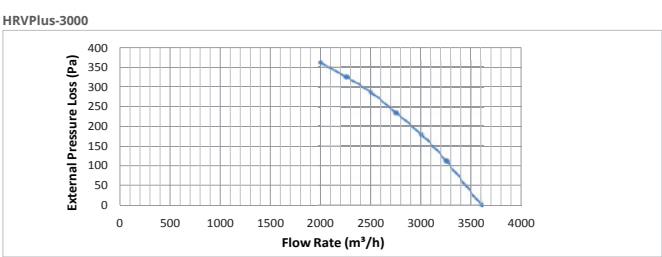
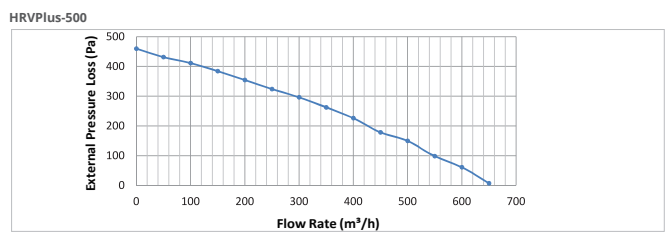
- Supplies the required fresh air to indoors and improves the air quality.
- Discharges indoor air with low quality.
- Utilizes the energy of exhaust air to condition fresh air.
- Filters fresh air supplied to the indoor.



HRVPlus Ceiling Type Heat Recovery Devices; Dimension, Flowrate - External Pressure Loss and Electric Power Table

MODEL			HRVPlus-500	HRVPlus-750	HRVPlus-1000	HRVPlus-2000	HRVPlus-2500	HRVPlus-3000	HRVPlus-3500	HRVPlus-4000	HRVPlus-5000
Air Flow Rate		m³/h	500	750	1000	2000	2500	3000	3500	4000	5000
External Static Pressure		Pa	150	135	125	125	165	180	145	245	190
Electrical Ratings	Voltage	V	230	230	230	230	230	230	230	230	230
	Voltage Inc. Electric heater	V	230	230	230	230	380	380	380	380	380
	Power	w	300	400	500	1030	1000	1660	1660	3100	3100
	Current	A	1,4	1,8	2,2	4,5	3,6	8,2	8,2	13,6	13,6
Noise Level		dB(A)	44	46	46	50	48	46	47	52	52
Length		mm	1150	1150	1150	1420	1750	1750	1850	1850	1900
Width		mm	800	800	800	1000	1150	1150	1200	1200	1400
Height		mm	370	370	370	370	560	560	600	600	750
Channel Link (AxB)		mm	280x250	280x250	280x250	350x250	400x350	400x350	450x400	450x400	450x400
c		mm	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5	38,5
d1		mm	60	60	60	60	125	125	100	100	133
d2		mm	60	60	60	60	50	50	37,5	37,5	133
e		mm	120	120	120	180	175	175	162,5	162,5	233
f		mm	41	41	41	41	41	41	41	41	41
g		mm	920	920	920	1120	1270	1270	1320	1320	1520
i		mm	60	60	60	60	105	105	100	100	175
k		mm	60	60	60	60	105	105	100	100	175
m		mm	1100	1100	1100	1370	1700	1700	1800	1800	1850
n		mm	1290	1290	1290	1560	1890	1890	1990	1990	2040
o		mm	877	877	877	1077	1227	1227	1277	1277	1477
p		mm	383	383	383	383	573	573	613	613	763
Weight		Kg	65	69	75	123	182	182	206	206	292
Electric Heater		kW	1,5	2,5	3	6	7,5	9	10	12	12
(80-60°C) Water Heater		kW	2,7	3,4	3,9	7	8	8,5	9,4	10	12,4

External Static Pressure Flow Rate Diagrams of **HRV Plus** Ceiling Type Heat Recovery Devices



► Points to take into consideration in the Ceiling Type Heat Recovery Equipment

- This device is not used in heated swimming pools, cold storage depots, and environments where humidity and temperature are vastly different.
- It is not used in environments, which are exposed to rain. (Otherwise, you may be exposed to electric shocks, and your device will not operate correctly.)
- Don't use this device in aggressive environments such as acids, which cause corrosion (greasy smoke, paint, noxious gases, etc.). Don't use the device in flammable atmospheres (which comprise explosive gases).
- Securing the device with rods should be carried out in an adequately durable and safe way.
- When connecting the device, consideration must be given to the service openings, otherwise it will not be possible to intervene the device in case of such situations as filter exchange and intervention to the fan motors.
- The exhaust and fresh air inlet of the device (the outdoor section) should be in a shape, which will not let the rainwater in the device.
- During installation of the devices into the channel system; sharp turns, multiple bends, and sudden contractions or expansions in the channel diameters must not be allowed.

► The Ceiling Type Heat Recovery Equipment Type of Mounting

Mounting feet serves to hang the devices to ceiling. Use steel dowels and rods when hanging the devices to the ceiling. Use of rubber vibration damper is recommended. Fix the Rubber Vibration Damper at the four mounting feet with M12 rod, M12 Washer, M12 Nut. When mounting, check the strength of the rods.



Accessory

Heat Recovery Equipment Automatic Controller (Standard Type)

- Turkish and English display
- Control unit with stylish LCD display
- 230 V AC supply
- Possibility to adjust the set value of 5-30°C range
- Possibility to see the ambient temperature with the control unit
- Possibility to access directly to the feature, which is requested to be used.
- Possibility to control both aspirator and ventilator motor speeds manually at 6 individual stages individually.
- Possibility to manually control the stages of 2-stage resistance.
- The electric heater does not activate unless the ventilator fan operates, and when the device is switched off, first the electric heater deactivates, and the ventilator fan operates for a certain time in order to remove the heater load.
- Possibility to operate the electric or water heater automatically or manually.
- Possibility to see the fan speed phases while working in manual mode.
- Possibility to start and stop the device from the central automation system of the building.
- Possibility to see the line connection failure.
- Possibility to communicate at a distance of 50 meters via 4x0,22 mm shielded cable.
- Feature of resuming from the last operating position of the device in a power outage when the power returns.
- Optionally, feature of connectivity to the differential pressure switch for filter impurity.
- Optionally, feature of connectivity to the temperature sensor.



The Accessory

Heat Recovery Equipment Automatic Controller (Special Type)

- 220 V AC supply
- 2 pcs 220V AC (triac) outputs
- Fuse and varistor protection; to protect the device from high current ratings and the high voltage ratings, the fuse and varistor protection was made, respectively.
- DS18B20 temperature sensor is used at the heater air intakes in order to make sure the error conditions occurred in the heaters are detected, showed on the display, and precaution is taken. Measurement is possible between -55 and +125°C.
- BMS Run feature to start-stop the operation. Operates according to the data coming from the BMS (building central system). The fans do not function if the BMS is off The BMS is switched off if the fans stop.
- In order to filter the noise resulting from the mains and decrease the current and voltage harmonics, modules can be added as per the customer requirements.
- RFI/EMI filter
- Heater controlled
- Standard 2 stages, optional 3 stages
- Optionally, more comfortable time proportional progressive heater control.
- Pre-heater control
- Heater failure inputs
- Detecting the failure situations occurred in the heaters, showing them on the display, and optionally taking precaution.

► Electric Heater

- It is used in the device, on the side of blowing into the interior environment (location) of the heat recovery device in order to give extra heat to the location side in cold climates.
- The body and resistance consist of galvanized sheet, and stainless pipe, respectively.
- Electric heaters contain two pcs of 80°C limit thermostat with spare.
- Thanks to the automatic controller, the electric heater does not activate unless the ventilator fan operates, and when the device is switched off, first the electric heater deactivates, and the ventilator fan operates for a certain time in order to remove the heater load.
- The single phase electric heaters are made as single phase, and the three phases electric heaters are made as 2-phase.

► The Electric Heater Capacity Table for the Heat Recovery Devices

MODEL	HRVPlus-500	HRVPlus-750	HRVPlus 1000	HRVPlus 2000	HRVPlus-2500	HRVPlus-3000	HRVPlus-3500	HRVPlus-4000	HRVPlus-5000
Electric Heater Power (kW)	1,5	2,5	3	6	7,5	9	10	12	12
Electric Heater Stages	1	1	1	1	1 // 2	1 // 2	1 // 2	1 // 2	1 // 2
Voltage (V)	230	230	230	230	380	380	380	380	380
Current (A)	6,6	10,9	13,1	26,1	11,4	13,7	15,2	18,3	18,3

► Water Heater

- Thanks to the mechanical link between the aluminum lamella and the copper pipe, the water heaters realize the heat transfer at the top level between the air and the internal fluid (water). In places where there is a hot water boiler, it is used in the device, on the side of blowing into the interior environment (location) of the heat recovery device in order to give extra heat to the location side in cold climates.
- Thanks to the automatic controller, the water heater can be operated automatically or manually with the motorized valve.
- It can be manufactured in standard capacities.

► The Electric Heater Capacity Table for the Heat Recovery Devices

MODEL	HRVPlus-500	HRVPlus-750	HRVPlus-1000	HRVPlus-2000	HRVPlus-2500	HRVPlus-3000	HRVPlus-3500	HRVPlus-4000	HRVPlus-5000
Volumetric Flowrate (m ³ /h)	500	750	1000	2000	2500	3000	3500	4000	5000
Water Coil Heater Power (kW)	2,7	3,4	3,9	7	8	8,5	9,4	10	12,4
Water Side Pressure Loss (kPa)	3	4	6	18	10	7	8	9	17

Fluid Side Temperature (Inlet/Outlet):

(NOTE: These values are valid for a heat recovery device working under İstanbul conditions.)

With Internal Water Heater

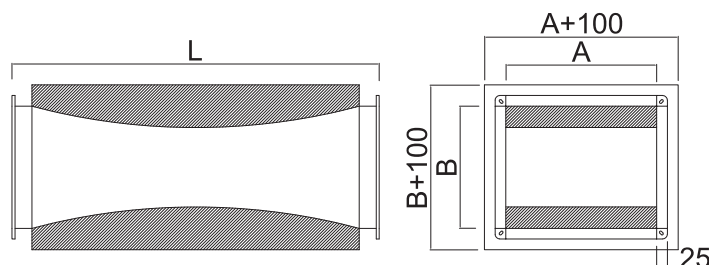


Internal Electric Heater



► The Silencer

External surface of the silencer is made of galvanized sheet, and its internal surface is made of galvanized perforated sheet, and the packing material used between the two surface is manufactured from noncombustible rock wool with 50 mm thickness, 70 kg/m³ density, and covered by fiberglass on one side. In situations where very low noise level is required two silencers can be used together.



Silencer Sizes: (mm)			Sound Absorption Capacity (dB)	Pressure Loss (Pa)
A	B	L	for 250 Hz	
280	250	1000	5	10
350	250	1000	5	10
400	350	100	5	11
450	400	100	6	12