DOĞU
İKLİMLENDİRME | HVAC SYSTEMS

FOUR HPGK

Heat Pump Heat Recovery Device

fourSEASON

Operating with more than 200 personnel in 45.000 $m^{2,}$ total area in two factories, primary products of Doğu İklimlendirme are culverts, diffusers, blinds, fire damper, air adjustment damper, HEPA filter box, laminar flow ceiling, VAV-CAV devices, circular channel and high performance kitchen fume hoods. In 2011, with acquisition of Klimakar A.Ş. into its body, it has expanded its product range with package hygienic air conditioning power plant, pool dehumidification power plant, heat recovery device and heater apparatus products

Currently having 120 different wide ranges of products, Doğu İklimlendirme enables easy and fresh breathing by regulating air flow in hundreds of public and private institutions throughout Turkey. It performs export to the countries more than 30.

FOUR HPGK

Heat Pump Heat Recover Device

HPGK series heat recovery devices are designed to increase room air quality and also conditioning while making heat recovery.

Total heating/cooling efficiency is greatly higher than common heat pump systems. All materials and equipments are suitable for long life usage. The harmony between all equipments is calculated with certificated and approved, sensitive softwares. Automation and power connections are included and ready to use as “plug&play”.

AE 41

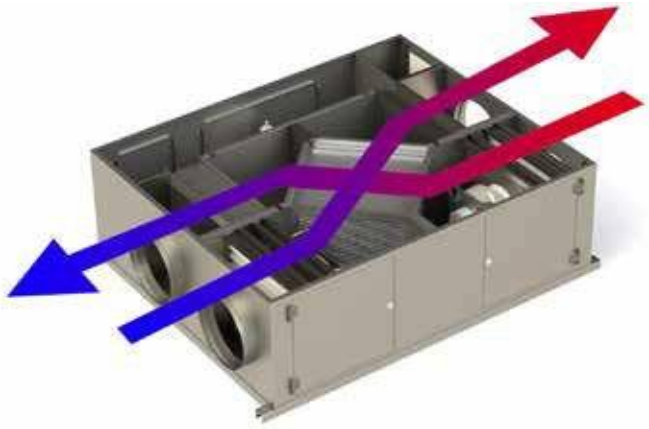
- Cross Flow Heat Exchanger
- HEATPUMP System
- Fans
- Equipments and Materials
- Performance Charts
- Technical Features
- Measurements
- Air Flow Diagram
- Control Box

General Features

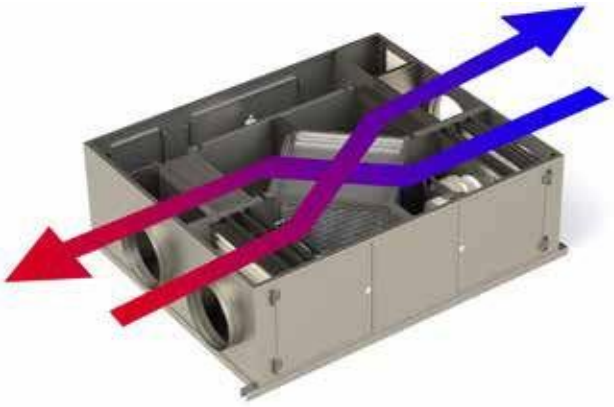
Requirement of fresh air with the rooms which are getting heated-cooled with climate systems is greatly increasing heating-cooling load and energy usage. With HPGK series devices, room and ambient air are drawn into the supply and exhaust lines via special fans. The air advancing on these lines do cross between each other while passing through a plate heat exchanger and then passes through the heat pump featured coils. It is preferred not to put all heating-cooling load of fresh air ventilation on climate devices.

Heat pump systems are up to 3-6 times more efficient compared to electrical heaters.

HPGK is compact, no need of a condensing unit and can be operated easily through control panel inside room.



Summer Conditions



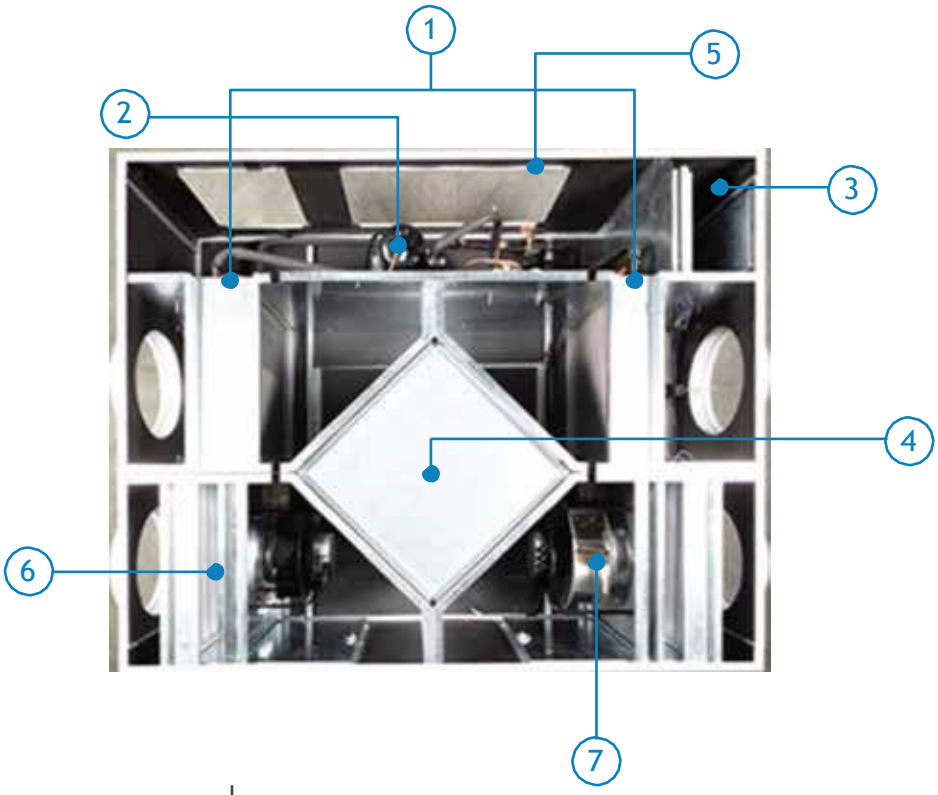
Winter Conditions

Cross Flow Heat Exchanger

On the crossflow plate heatexchanger, supply and exhaust air make heat transfer between, without interfering eachother.
Heat efficiency – pressure drop relation well optimised plate heat exchangers are used on HPGK series units. A condensate drip pan made of stainless steel exists for collecting condensate water drips.

HEATPUMP

Heatpump is a mechanism of trasfering heat via making coolant condensing and evaporation. The coolant in gas form gets compressed with a compressor then gets uncompressed back within a expansion valve. Between these expansion and compression cycles the coolant absorbs and convects heat while passing through condenser and evaporator coils. As “heat recovered” air passes through fins of the both coils, efficiency value (COP) of overall device will be greatly bigger than common heat pump cycles. “Rotary” type compressors are used with HPGK series.



1. Condenser and Evaporator
2. Compressor
3. Power Box
4. Aluminum plated Heat Recovery Heat Exchanger
5. Service Doors
6. Filters
7. Fans

1 – Condenser and Evaporator

1- Condenser and Evaporator

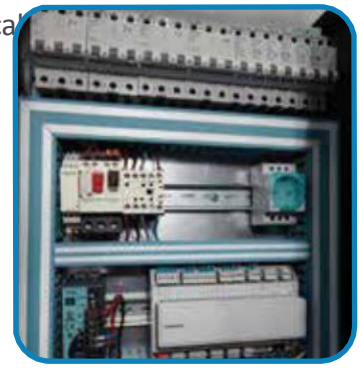
Condenser and evaporator are copper piped and aluminum finned type. Optimized design as low air pressure drop, thermal efficiency high. Condensate water is getting collected and drained with a stainless steel drip pan.

2 - Compressor

High efficient “rotary” type compressor is available. R 410A is used as coolant therefore the device operating environment friendly. Operates on cooling or heating mode depends on season conditions. All safety measures available such as LOW / HIGH pressure protection therefore operating time of the device greatly increased.

3 - Power Box

Power box is located inside device, in a cell separated from air flow. All electrical components are high quality with safety protections.



3 - Elektrik Panosu

4 - Cross Flow Heat Exchanger

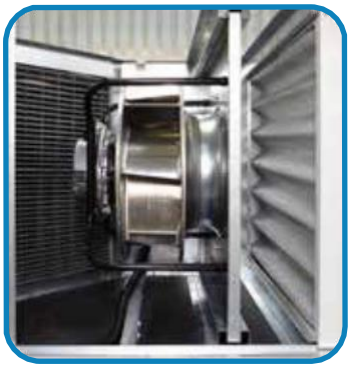
Heat exchanger is leak proof thanks to its special design. Size is well optimized with pressure drop – efficiency relation depending on capacity. All heat exchangers are EUROVENT certificated. Drip pans are available on both sides (supply air and exhaust sides) of the heat exchanger.

5 - Service Doors

Lockable service doors excising on casing to reach fans and filters.

6- Filters

With G4 class filters, heat exchangers are kept clean therefore operates high efficient long time. Also filters cleaning fresh air before it reaches inside room.



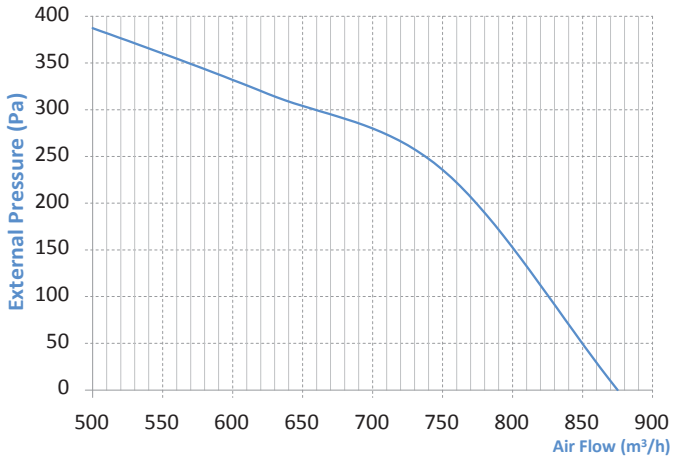
6 Filtreler

7- Fans

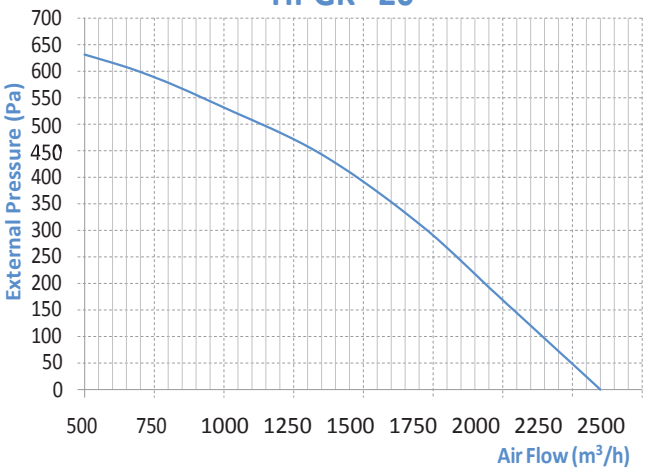
Fans are backward curved centrifugal type, motors and fans are direct coupled. Backward curved type centrifugal fans are high efficient and have low sound pressure level (dB).

Performance Charts

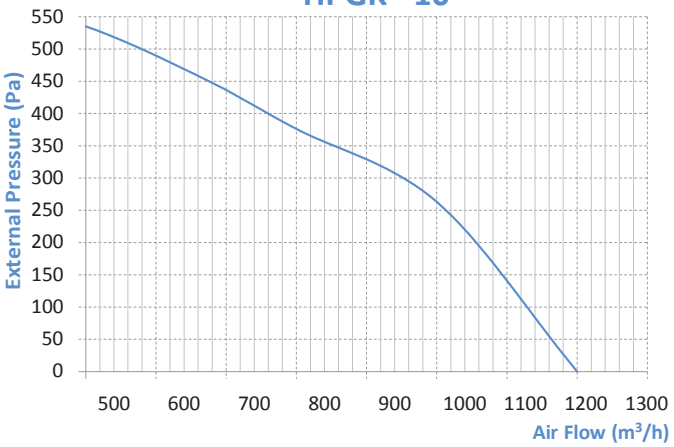
HPGK - 7



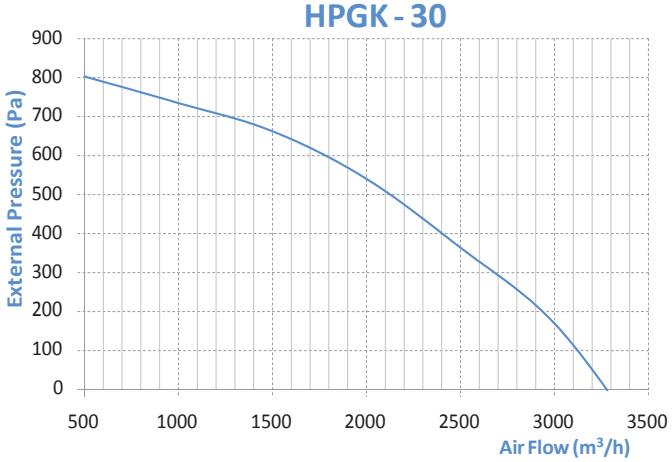
HPGK - 20



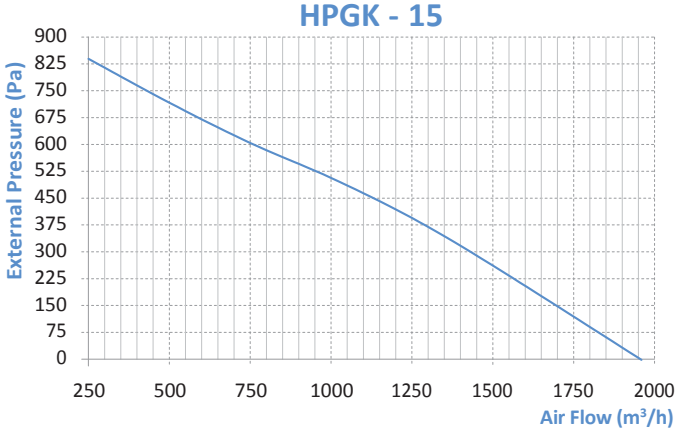
HPGK - 10



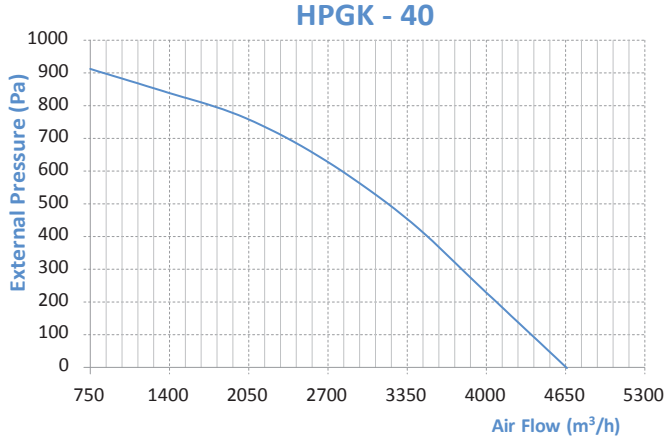
HPGK - 30



HPGK - 15



HPGK - 40



Technical Features

Fans

Device Features		HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
Air Flow	m³/h	750	1000	1500	2000	3000	4000
External Pressure	Pa	235	263	261	170	170	230
Power Supply	V-Hz	230 - 50	230 - 50	230 - 50	230 - 50	380 - 50	380 - 50
Total Fan Motor Power*	kW	0,5	1,03	0,90	0,92	1,79	2,28
Motor Type		AC	AC	EC	EC	EC	EC

*Total value f aspirator and ventilator fan motor powers.

Compressor

Device Features		HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
Power Input	kW	0,92	1,22	1,92	2,26	3,05	3,35
Power Supply	V-Hz	230 - 50	230 - 50	230 - 50	230 - 50	380 - 50	380 - 50

Cooling Capacity

Device Features		HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
Total Cooling Capacity	kW	3,74	4,88	9,70	10,04	16,00	18,24
Total Cooling COP		4,07	4,00	5,05	4,44	5,25	5.44

Heating Capacity

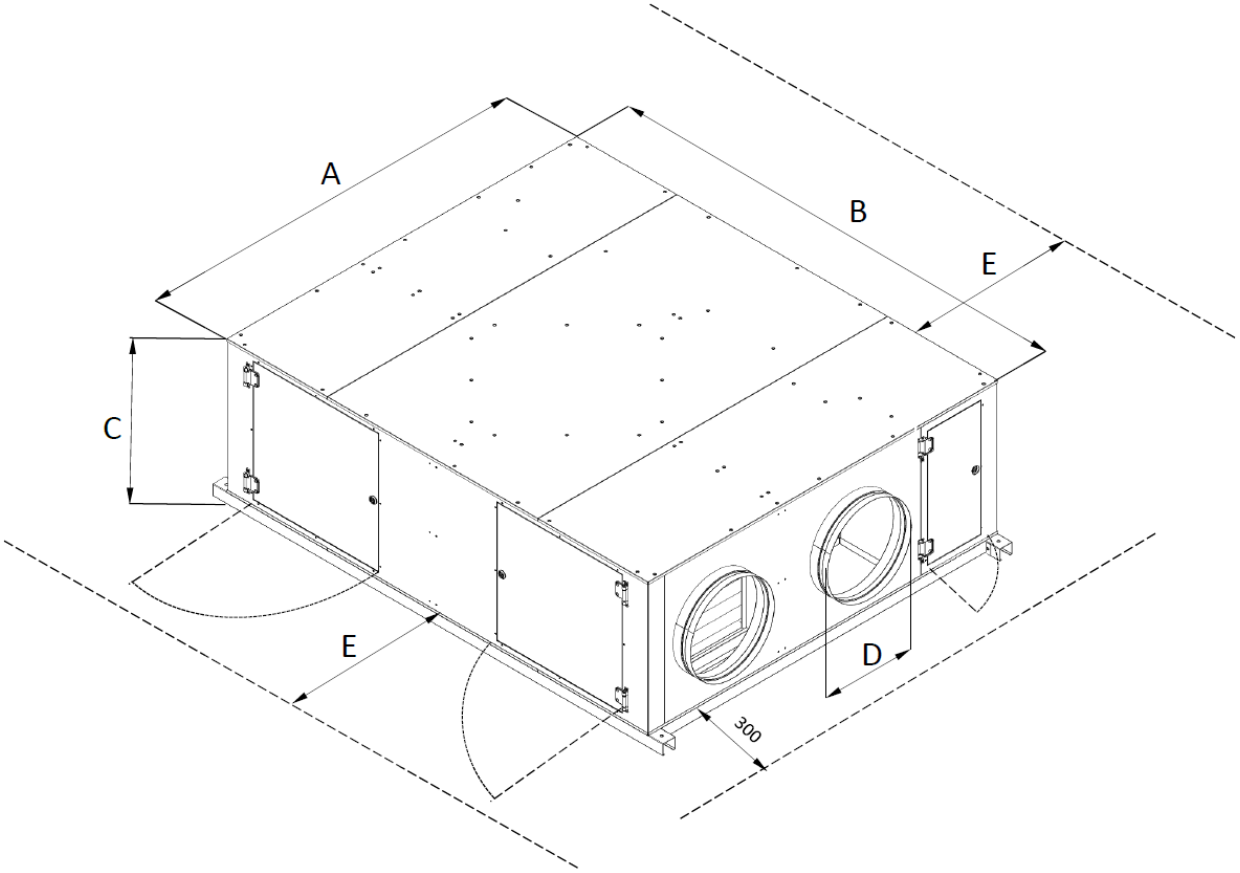
Device Features		HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
Total Heating Capacity	kW	4,65	6,85	11,09	12,59	21,58	25,26
Total Heating COP		5,05	5,61	5,78	5,57	7,08	7,54

Electrical Heater (Optional)

Device Features		HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
Capacity	kW (max)	1,5	2	4	10	10	10

Filter

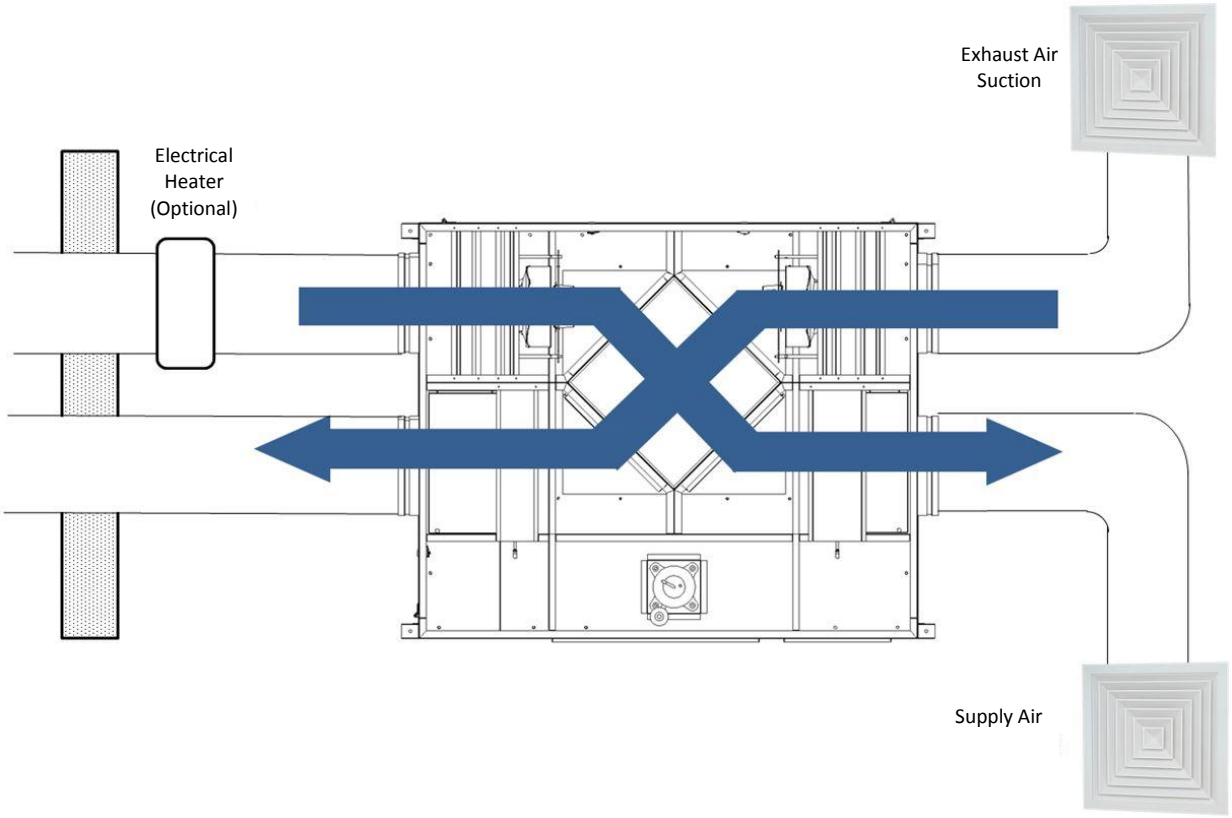
Device Features		HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
Cassette Type Filter Class		G4	G4	G4	G4	G4	G4

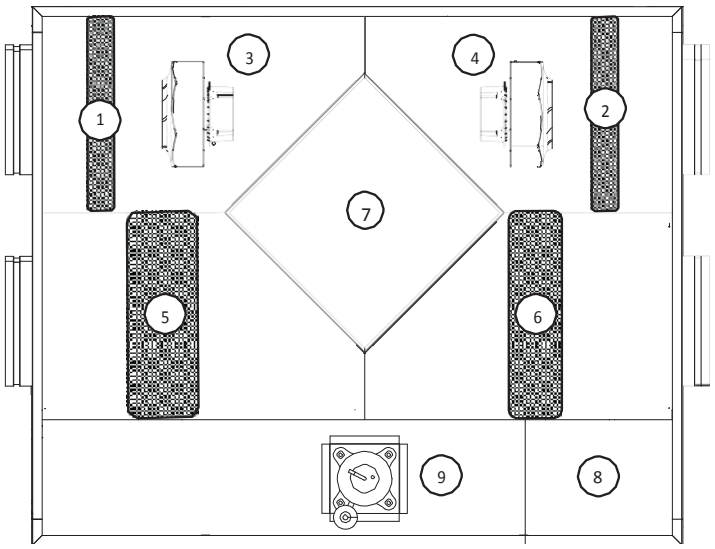


Measurements

	HPGK-07	HPGK-10	HPGK-15	HPGK-20	HPGK-30	HPGK-40
A	1140	1232	1446	1506	1680	1817
B	1617	1635	1767	2004	2140	2140
C	427	436	511	583	683	748
D	250	250	280	355	400	450
E	550	550	550	650	750	750

***All measurements are “mm”





1. Supply Air Filter
2. Exhaust Air Filter
3. Supply Air Fan
4. Exhaust Air Fan
5. Evaporator
6. Condenser
7. Aluminum plated heat recovery heat exchanger
8. Power Box
9. Compressor and piping cell

Control Panel

Features	Operating System	Status
On- Off	ON-OFF can be done on control pannel	Standard
Display	On the room control panel; fan speed, faults/alarms and temperature values can be seen.	Standard
Fan Control	Aspirator and Ventilator wans can operate manual or automatic.	Standard
	On automatic mode, depending on info gathered via differential pressure or air quality sensors (these values can be set as required) fans operate on required speed. HPGK can be designed to increase fan speed and keep air flow constant even if filters are polluted.	Optional
	If fault of fan occurs, device automatically shuts off to protect itself.	Standard
Heat Pump Control	On room control panel, heating-cooling mode can be manually selected or device can be operated automatically. On Automatic mode, heat pump system will be activated or deactivated to keep room temperature as set value.	Standard
	Usage of low/high pressure safety components, allows system operate safe and efficient.	Standard
	If fault of the heat pump system occurs, system automatically shuts down to protect itself.	Standard
Timer	Clock-date setup or daily operating programs (can be set different program per days of week) can be configured via room control panel.	Standard
BMS	Compatible with BMS system of the building.	Standard
Modbus	Compatible with ModBus protocol.	Standard
Filter Pollution	Information of filter pollution which gets obtained via sensors exist inside the device, can be watched on room control panel.	Standard

NOTES

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