

OPTI HOME

domestic heat recovery units

Optimum climate in Your house





Juwent Sp. J. company has been present on the HVAC equipment manufacturers' market since 1992. From the establishment, the company strives to provide modern and reliable products, and takes special care for the environment.

The introduced quality policy along with a supplier assessment and selection system, ensures a product of unique and top quality, confirmed by ISO certificate.

Throughout more than 25-year operation, the Company has gained vast experience and knowledge in heating, ventilation and air conditioning. Variety of completed facilities, from small offices and workshops to the largest production facilities, logistics centres, supermarkets, hospitals, both in Poland and abroad, allows the Company to adapt to the highest expectations of Customers and ensure their satisfaction.



BASIC INFORMATION

The OptiHome domestic heat recovery (MVHR) units are designed for effective and cost-saving ventilation of rooms in residential, commercial or civic buildings.

The main task of the unit is to remove stale internal air and at the same time bring in fresh air from outside. In order to provide good indoor air quality which depends on appropriate humidity, concentration of CO², particulates and allergens, the air supplied to the dwelling is filtered, heated and/or cooled.

Thanks to a special design of heat recovery exchanger, when flowing through it, the supply and exhaust air streams are not mixed, while heat energy is transferred, providing considerable reduction of heating costs.

The MVHR unit is suitable for operation in insulated rooms, such as basements, lofts, store rooms, where air temperature is maintained within +5 and +45°C. Maximum permissible temperature of the handled air is 50°C.

OptiHome units are available in 2 variants of the casing differing in location of connectors for ventilation ducts. In H version, connectors are provided horizontally on sides of the casing, and in V version, connectors are provided vertically on the top of the casing. In both versions 2 sizes are provided differing in air flow capacity of 350 or 650 m³/h. Each size additionally can be fitted with a summer bypass.

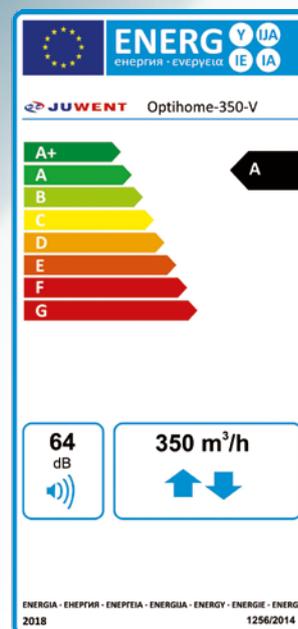
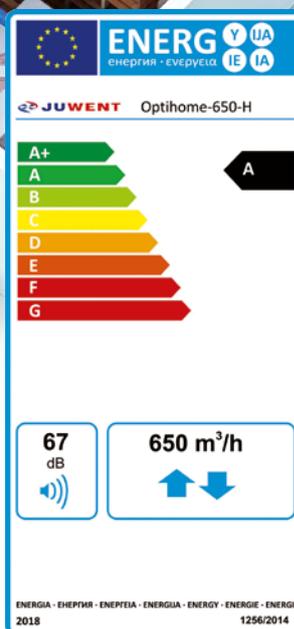
Control is possible by means of a modern panel with touch screen which can be mounted in any location within a building. Additionally, control through a smartphone app or a dedicated website is possible.

MAIN FEATURES

- Air exchange within a building, providing higher comfort of use of the dwelling
- Supply of fresh filtered air with a simultaneous heat recovery with a highly-efficient heat recovery exchanger
- Cooperation with a ground heat exchanger
- Meeting the highest hygienic standards thanks to removal of moist stale air which promotes development of fungi and mould
- Free-cooling – in the summer period the stale moist and warm air is removed from the building by a bypass, omitting heat exchanger, and replaced with fresh, cooler air



The OptiHome heat recovery units line fully meets requirements for energy efficiency class A in accordance with Directive 2009/125/EC and Commission regulation 1254/2014.



STANDARD CONFIGURATIONS AND COMPONENTS

CASING

The OptiHome heat recovery units are provided with self-supporting casing made of galvanised powder-coated steel sheet. The self-supporting structure with mineral-wool insulation reduces the risk of thermal bridges. Connectors to ventilation system are made of galvanised steel sheet, and diameter depending on the size is 160 or 200mm. The casing is fitted with adjustable feet for floor mounting or brackets for wall or ceiling mounting.



HEAT RECOVERY

A cross counter-flow heat recovery exchanger used in OptiHome units is made of plastic materials. **Heat recovery efficiency up to 92%.**

The B versions of Optihome unit are additionally fitted with a summer bypass.



FANS

Energy-saving fans integrated within the unit on the supply and exhaust with stepless adjustment of the air flow rate thanks to used EC technology. The stepless adjustment of the air flow rate allows for adaptation of the amount of the supplied air to variable needs and conditions occurring in a handled building.



AIR FILTERS

To ensure high air purity within a dwelling, the unit is fitted with M5 filter. Filter replacement requires no tools, and the OptiHome unit informs on the need to replace filter with an appropriate message on the unit controller.

The higher standard of air filtration class F8 is provided by filter boxes available as an ancillary equipment.



ELECTRIC HEATER

Additionally, as standard, units are fitted with electric post-heater enabling the supply air to be heated up to 26°C.

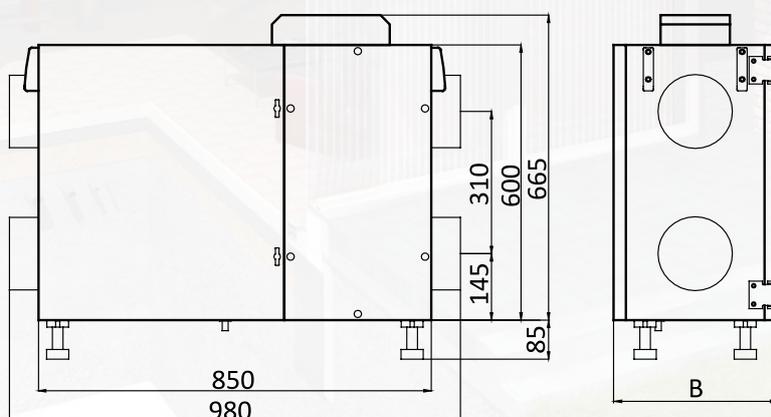


CONTROLS

Full control over the unit operation by a user is provided by a control system comprising controller mounted on the casing and remote panel with touch screen to be mounted in any location within the building.



TECHNICAL DATA FOR HORIZONTAL VERSION H

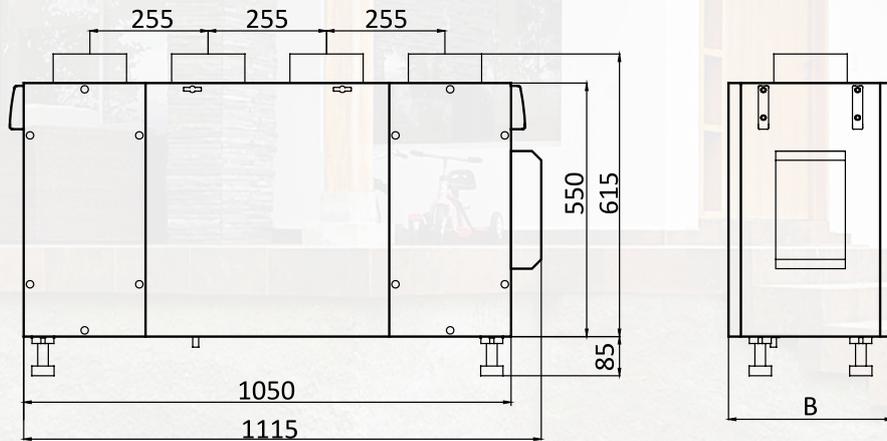
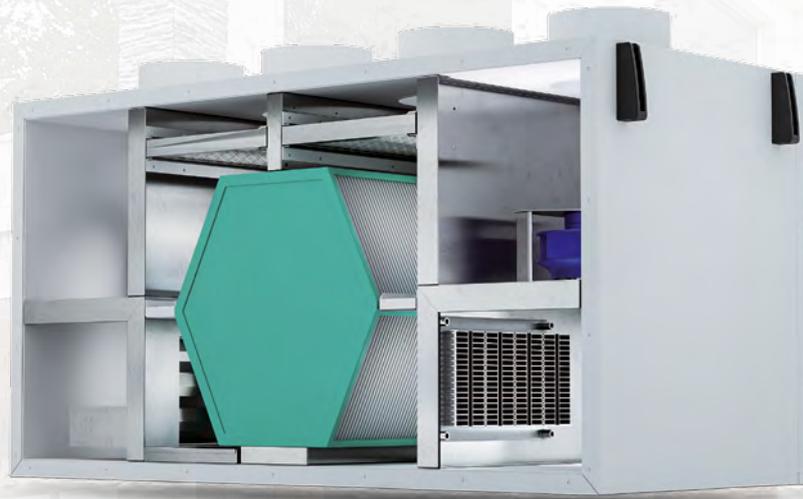


OptiHome size		350-H	350-H-B*	650-H	650-H-B*
Air flow (m ³ /h)	100 Pa	380	380	660	660
	150 Pa	365	365	630	630
	200 Pa	350	350	600	600
Heat recovery efficiency		up to 92%	up to 92%	up to 92%	up to 92%
Energy efficiency class		A	A	A	A
Power supply		230 V, 50 Hz			
Electric heater capacity (W)**		1400	1400	2800	2800
Maximum current draw (A)		7.9	7.9	15.9	15.9
Connectors D (mm)		160	160	200	200
Condensate drainage connection		14mm, flexible	14mm, flexible	14mm, flexible	14mm, flexible
Weight (kg)		48.5	62.5	79	92.5
Casing depth B (mm)		355	505	655	805

* Version with a summer bypass

** Post-heater power input is given in table on page 7

TECHNICAL DATA FOR VERTICAL VERSION V



OptiHome size		350-V	350-V-B*	650-V	650-V-B*
Air flow (m ³ /h)	100 Pa	380	380	660	660
	150 Pa	365	365	630	630
	200 Pa	350	350	600	600
Heat recovery efficiency		up to 92%	up to 92%	up to 92%	up to 92%
Energy efficiency class		A	A	A	A
Power supply		230 V, 50 Hz			
Electric heater capacity (W)**		1400	1400	2800	2800
Maximum current draw(A)		7.9	7.9	15.9	15.9
Connectors D (mm)		160	160	200	200
Condensate drainage connection		14mm, flexible	14mm, flexible	14mm, flexible	14mm, flexible
Weight (kg)		55.7	71.8	90.8	106.3
Casing depth B (mm)		355	505	655	805

* Version with a summer bypass

** Post-heater power input is given in table on page 7

Operating noise level OptiHome-350

Operating noise level	Lp (dBA)* / Lw (dBA)**				
	Normal mode				Boost mode***
Fan speed	20%	40%	60%	80%	100%
In fresh air outlet connection	<20 / 34	32 / 49	42 / 59	47 / 64	51 / 68
In exhaust air inlet connection	<20 / 35	33 / 50	43 / 60	48 / 65	52 / 69
In fresh air inlet connection	<20 / 24	22 / 39	32 / 49	37 / 54	41 / 58
In exhaust air outlet connection	<20 / 25	23 / 40	33 / 50	38 / 55	42 / 59

Operating noise level OptiHome-650

Operating noise level	Lp (dBA)* / Lw (dBA)**				
	Normal mode				Boost mode***
Fan speed	20%	40%	60%	80%	100%
In fresh air outlet connection	<20 / 37	35 / 52	45 / 62	50 / 67	54 / 71
In exhaust air inlet connection	<20 / 38	36 / 53	46 / 63	51 / 68	55 / 72
In fresh air inlet connection	<20 / 27	25 / 42	35 / 52	40 / 57	44 / 61
In exhaust air outlet connection	<20 / 28	26 / 43	36 / 55	41 / 58	45 / 61

* Lp – sound pressure at a distance of 3 m (spherical) from connection with directivity factor Q=2 in a free field

** Lw – sound power in connection

*** – boost speed used for periodic increase of air flow rate

Note! It is recommended to use silencers (from fresh air outlet connection and exhaust air inlet connection), with silencing capacity of about 10(dBA).

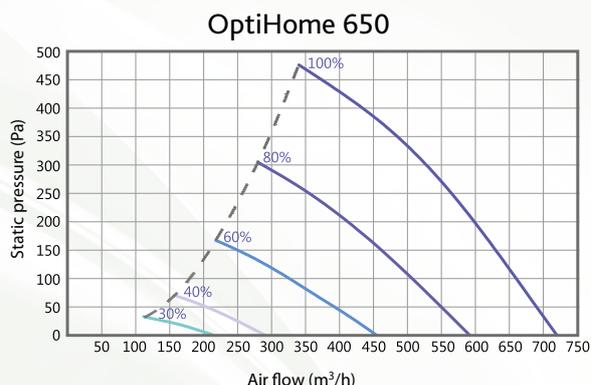
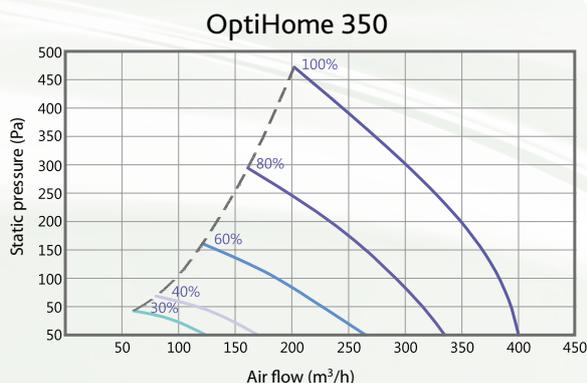
Recommended unit operation modes

Unit operation modes	Fan speed
Normal day-time mode	20 - 80%
Normal night-time mode with low air flow rate	20 - 60%
Boost mode for periodic increase in air flow rate	100%

Power input of integrated post-heater (W)

Air flow (m ³ /h)	Outlet air temperature (°C)				
	20	22	24	26	28
65	108	152	195	239	283
100	167	234	301	368	435
150	251	351	452	552	653
200	335	469	603	737	871
250	418	586	753	921	1088
350	586	820	1055	1289	1524
400	670	938	1206	1474	1742
450	753	1055	1356	1658	1959
550	921	1289	1658	2026	2395
650	1088	1524	1959	2395	2830

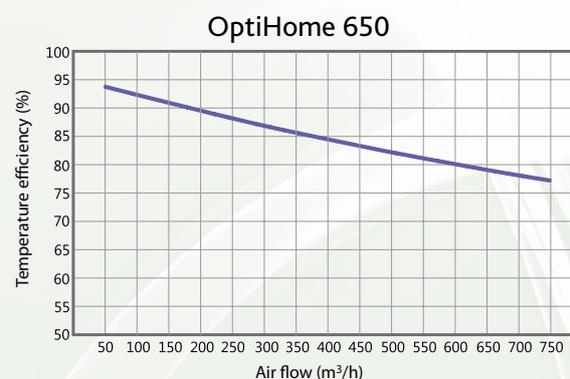
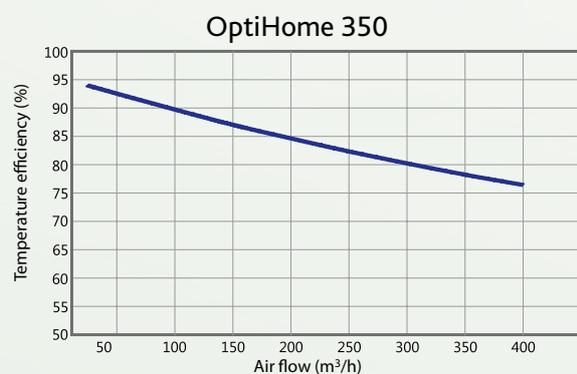
Air flow rate



Heat recovery efficiency

Heat recovery efficiency diagram in accordance with PN-EN-13141-7 in conditions as follows:

- internal air temperature $T=20^{\circ}\text{C}$, relative humidity $\text{RH}=38\%$
- external air temperature $t=7^{\circ}\text{C}$, relative humidity $\text{RH}=20\%$



CONTROLS

Control system of OptiHome units comprises a controller integrated within the unit and a room panel with thermostat.

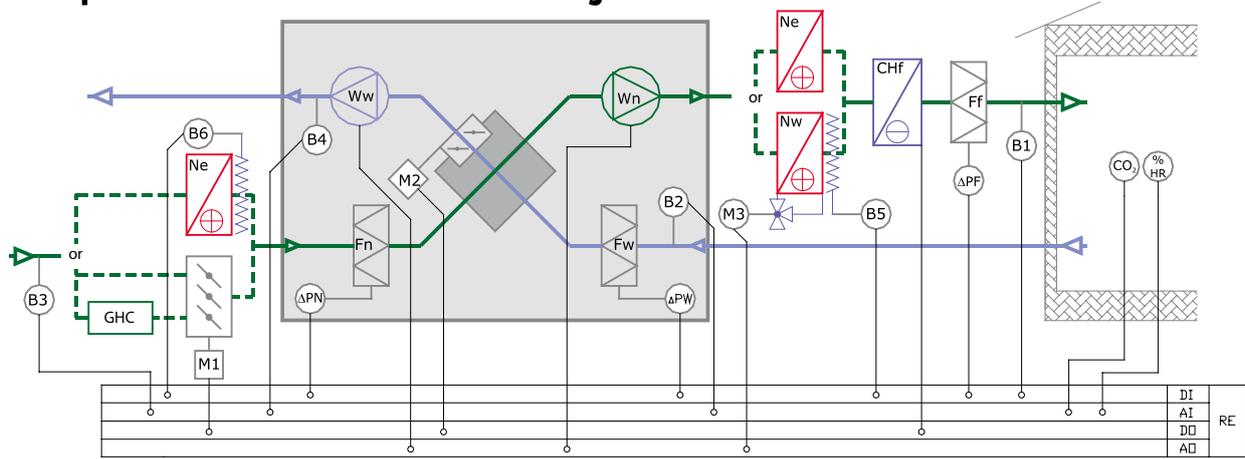
Main functions of controller:

- Remote control through the Internet, iOS systems, website and Android by a smartphone app
- Control by room panel with thermostat
- Heat exchanger anti-freezing protection – automatic and manual defrosting of the heat exchanger in the winter period
- Automatic cleaning of the exchanger
- Cooperation between controller and bypass and ground heat exchanger
- Bypass function – operation modes: open, close or automatic based on temperatures
- Free cooling function – control of bypass actuator to bypass heat exchanger during ventilation
- Cooperation with control panel of the fire alarm system
- Cooperation with Building Management System – controller monitors parameters of ventilation system and indicates alarms to ensure correct response of the BMS
- Control of unit operation based on signals from carbon dioxide sensor – if too high concentration of gas is detected, the unit goes to boost operation mode
- Control of the unit based on indications of humidity sensor – adjustment of air humidity level in rooms
- Notification on the need to replace air filters
- Control of external heat exchangers, stepless adjustment of heating and cooling coils

Operation modes:

- Adjustment with constant air flow, set when starting up or stepless adjustment with keeping of a selected constant temperature
- Option to temporary change the unit air flow rate with additional operation modes: Party, Ventilation, Leave, Comfort, Economic, Summer – Winter
- Up to 4 user-defined modes
- Up to 5 time schedules

OptiHome controls – schematic diagram



Components

B1 – supply temperature sensor

B2 – exhaust temperature sensor

B4 – temperature sensor downstream the exchanger

B3 – external temperature sensor

B5 – water heating coil anti-freezing protection (option)

B6 – safety thermostat for electric pre-heater (option)

CO₂ – carbon dioxide sensor (option)

M1 – GHC damper actuator (option)

M2 – summer bypass damper actuator

M3 – water heating coil valve actuator (option)

PN – supply filter pressure switch (option)

PW – exhaust filter pressure switch (option)

PF – filter box pressure switch

%HR – humidity sensor (option)

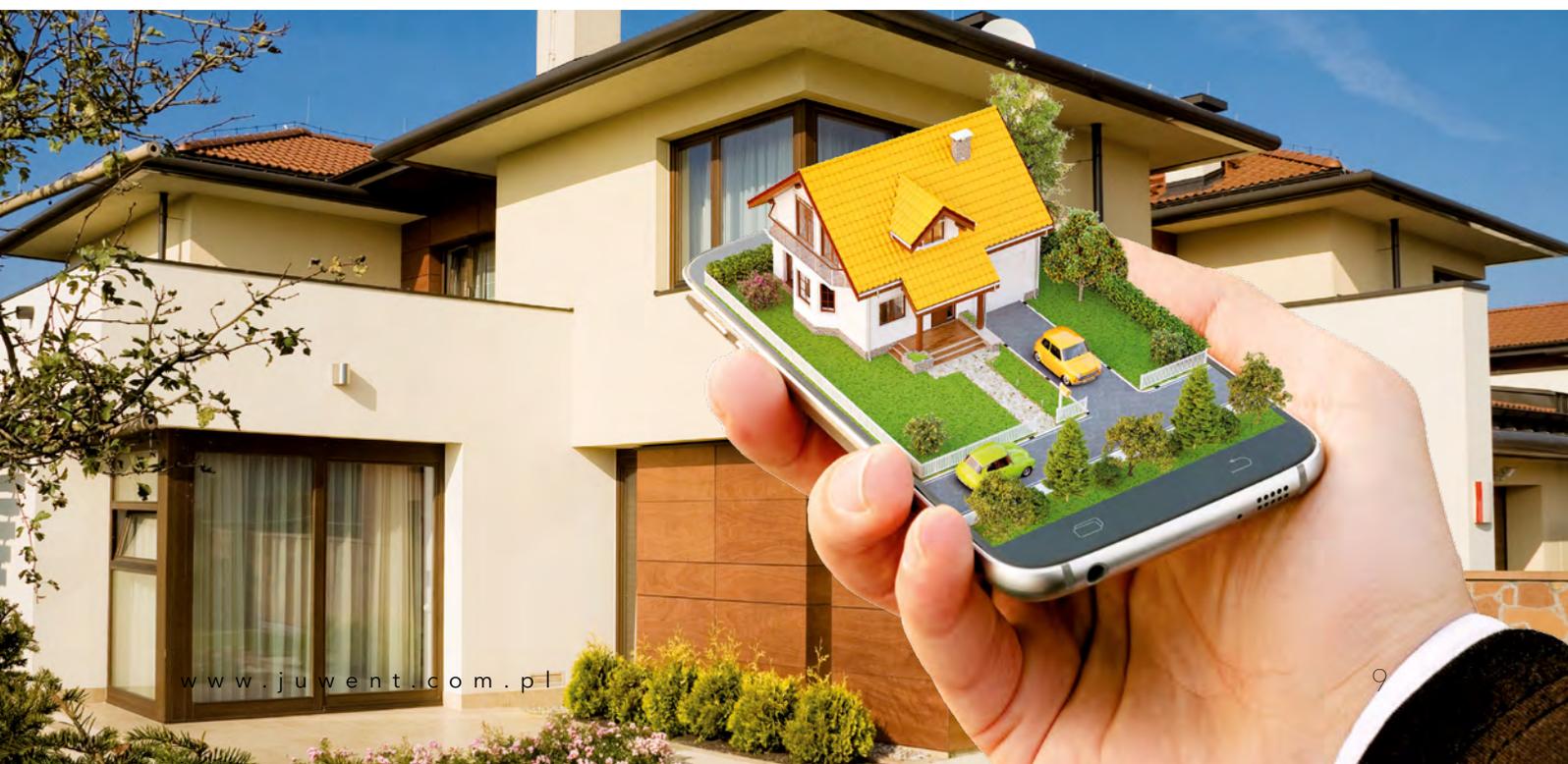
Operation

Depending on combination of functional elements the automatic control system is designed to:

- maintain preset constant temperature in exhaust duct (sensor B2) by sequential adjustment of heat exchanger, electric heater, water heating coil and cooling coil
- maintain preset humidity level and/or CO₂ concentration in a room by adjusting air flow rate

Protection devices

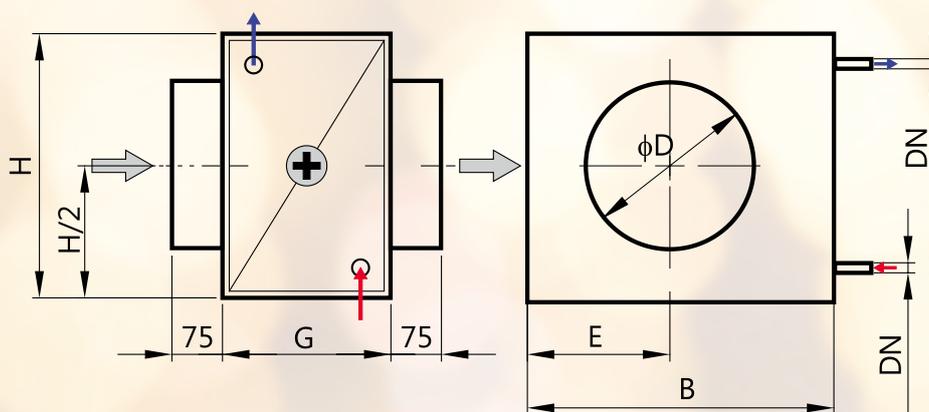
- frost protection of plate heat exchanger (sensor B4) – adjustment of electric pre-heater and/or supply air flow rate
- anti-freezing protection of water heating coil (sensor B5) – switching off the unit and opening the valve
- overheat protection of electric heater (sensor B6) – puts the heater out of operation
- according to option, information on dirty FN & FW filters is notified either according to time setting in the controller or by pressure switch (PN & PW) reading; dirty filters in filtration box by pressure switch (PF) reading
- all the above protection devices generate alarms which can be read on the controller panel



ANCILLARY EQUIPMENT

Water heating coil

Water heating coil is enclosed in a self-supporting casing made of galvanised steel sheet with round duct connections. Installed in ventilation duct downstream the OptiHome unit, the coil is intended to heat up the air after heat recovery from 15°C to a value set on the controller. Their big advantage is reduction of costs for preparation of fresh air. Costs for generation of one kilowatt of heat using natural gas may be even twice lower comparing to electric energy. Our heaters have been designed so as to cooperate well with low-temperature heat sources, enabling savings when cooperating with condensing furnaces. When working with low temperatures it is possible to interconnect the heater directly to floor-heating system, and thus distribute and adjust the whole central heating system easily. An additional advantage is that low flow resistance of heating medium is ensured, and thus savings on an expensive and complex pumping system are provided.



Type	B (mm)	H (mm)	E (mm)	G (mm)	ØD (mm)	DN (mm)	Weight (kg)
KWC-1-NLW	345	315	158	250	160	15	7.2
KWC-2-NLW	415	315	192	250	200	15	8.2
KWC-3-NLW	415	395	192	250	225	15	9.8



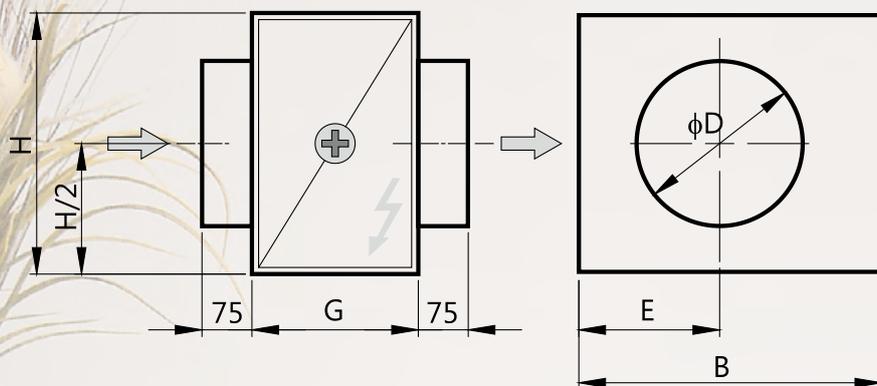
Type	KWC-1-NLW							
Inlet air temperature (°C)	15							
Water capacity (dm ³)	0.3							
Air flow (m ³ /h)	350				180			
Air flow resistance (Pa)	23				7			
Water parameters (°C)	Heat output (W), outlet air temperature (°C), medium mass flow (kg/s) and water flow resistance (kPa)							
	W	°C	kg/s	kPa	W	°C	kg/s	kPa
70/55	2750	38	0.0438	0.31	1710	42.7	0.0273	0.13
60/40	1280	25.6	0.0153	0.05	980	30.9	0.0117	0.03
55/45	1990	31.6	0.0476	0.37	1220	34.8	0.0292	0.16
40/35	1325	26	0.1	0.64	815	28	0.039	0.27

Type	KWC-2-NLW							
Supply air temperature (°C)	15							
Water capacity (dm ³)	0.4							
Air flow (m ³ /h)	600				300			
Air flow resistance (Pa)	35				11			
Water parameters (°C)	Heat output (W), outlet air temperature (°C), medium mass flow (kg/s) and water flow resistance (kPa)							
	W	°C	kg/s	kPa	W	°C	kg/s	kPa
70/55	4700	37.9	0.0749	0.99	2990	44.1	0.0476	0.45
60/40	2290	26	0.0281	0.18	1480	29.4	0.0177	0.08
55/45	3435	31.7	0.0822	1.22	2175	36.1	0.052	0.54
40/35	2260	26	0.1083	2.08	1430	28.9	0.0682	0.92

Type	KWC-3-NLW							
Inlet air temperature (°C)	15							
Water capacity (dm ³)	0.5							
Air flow (m ³ /h)	750				450			
Air flow resistance (Pa)	31				13			
Water parameters (°C)	Heat output (W), outlet air temperature (°C), medium mass flow (kg/s) and water flow resistance (kPa)							
	W	°C	kg/s	kPa	W	°C	kg/s	kPa
70/55	6465	40.1	0.0772	1.3	4650	45.2	0.0556	0.73
60/40	3700	29.4	0.0443	0.51	2600	31.8	0.0311	0.27
55/45	4700	33.3	2.64	0.1125	3365	36.8	1.46	0.0805
40/35	3070	27	0.147	4.44	2190	29.2	0.1049	2.45

Electric pre-heater

Electric pre-heater is enclosed in a self-supporting casing made of galvanised steel sheet with round duct connections. The pre-heater comprises electric heating elements with a radiator. It is designed as a duct type for installation on an air intake duct upstream of the unit. In such configuration the pre-heater is an integral part of the plate heat exchanger frost protection system.



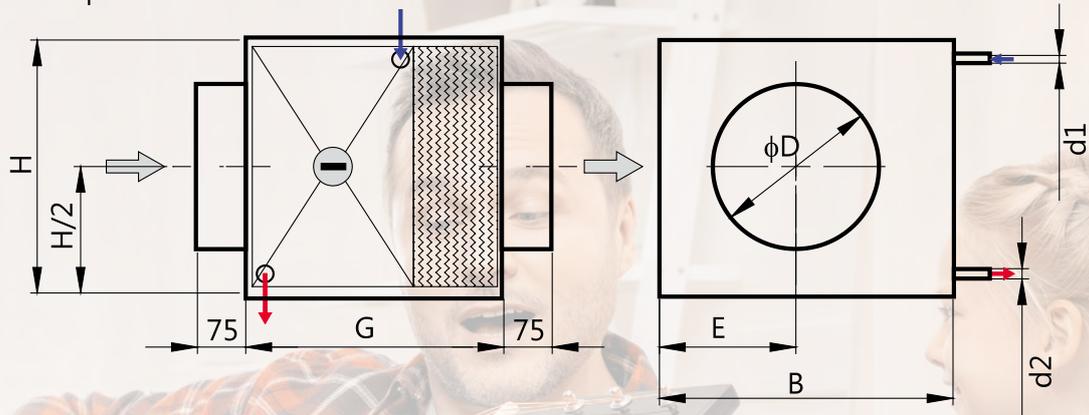
Type	B (mm)	H (mm)	E (mm)	G (mm)	D (mm)	Weight (kg)	Air flow resistance (Pa)	Heat power (kW)	Supply voltage (V)
KWC-1-NE	230	320	115	250	160	6.0	20	3.0	230
KWC-2-NE	270	320	130	250	200	6.5	35	4.5	400
KWC-3-NE	310	320	150	250	225	7.5	46	6.0	400

Pre-heater power input (W)

Air flow (m ³ /h)	Outside air temperature (°C)			
	-5	-10	-15	-20
65	130	239	348	449
100	201	368	536	691
150	301	552	804	1037
200	402	737	1072	1383
250	502	921	1340	1729
350	703	1289	1876	2421
400	804	1474	2144	2767
450	904	1658	2412	3112
550	1105	2026	2948	3804
650	1306	2395	3484	4496

DX cooling coil R407C

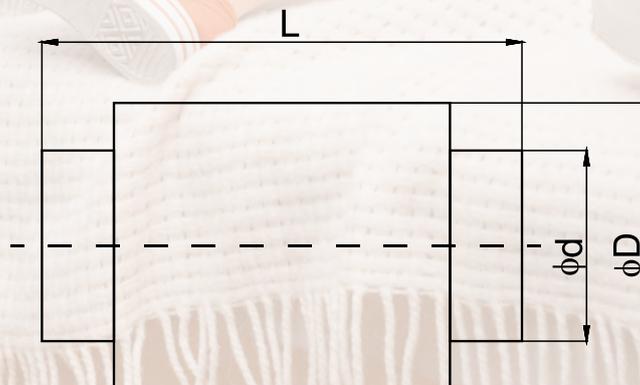
DX cooling coil is enclosed in a self-supporting casing made of galvanised steel sheet with round duct connections. The coil is made from copper tubes and aluminium fins. DX cooling coil is designed as a duct type to be installed on a supply ventilation duct to serviced rooms. The coil is fitted with condensate drip trays and droplet eliminator.



Type	B (mm)	H (mm)	E (mm)	G (mm)	D (mm)	d1 (mm)	d2 (mm)	Weight (kg)
KWC-1-CF	345	315	158	400	160	12x1	16x1	10.1
KWC-2-CF	415	315	192	400	200	12x1	16x1	11.6
KWC-3-CF	415	395	192	400	225	12x1	16x1	13.7

Type	KWC-1-CF		KWC-2-CF		KWC-3-CF	
Supply air temperature (°C)	30		30		30	
Relative humidity (%)	45		45		45	
Air flow (m ³ /h)	350	180	600	300	750	450
Air flow resistance (Pa)	30	15	40	19	62	36
Cooling output (kW)	1.2	0.85	1.95	1.45	2.7	2.16
Outlet air temperature (°C)	20	18	20	18	20	18

Duct silencers

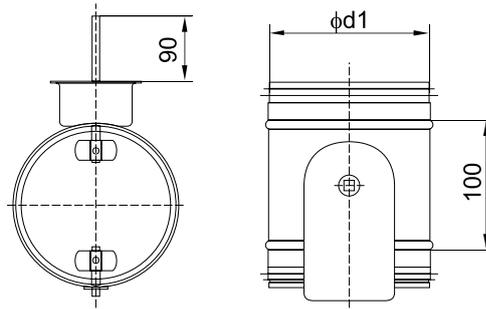


Size	Ød (mm)	ØD (mm)	L (mm)	Weight (kg)	Silencing Lw (dBA)	Resistance (Pa)
TK-160	160	250	550	9	18	15
TK-200	200	300	550	11	18	10



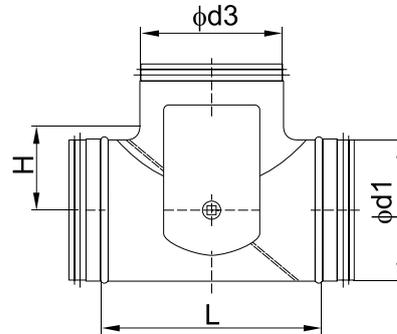
Duct regulating dampers

Regulating dampers are available with manual PRJ-....-R and motorised control PRJ-....-NE.



Size	Ød1 (mm)	Weight (kg)
PRJ-160	160	0.9
PRJ-200	200	1.1

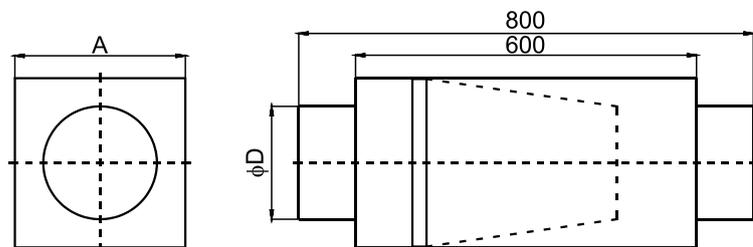
Dampers for GHX connection



Size	Ød1 (mm)	Ød3 (mm)	L (mm)	H (mm)	Weight (kg)
TPJ-160	160	160	229	105	1.7
TPJ-200	200	200	281	125	2.2

Filter boxes

The filter box casing is made of galvanised steel sheet and fitted with round duct connections. It is designed as a duct type for installation on a supply duct downstream of the unit. The box comprises a fine grade F8 bag filter and is fitted with a pressure switch.



Size	A (mm)	ØD (mm)	Air flow (m³/h)	Initial resistance (Pa)	Final resistance (Pa)
SFKO-200-F8	300	200	200-450	40-100	350
SFKO-250-F8	350	250	350-700	40-100	350

MOUNTING ACCESSORIES

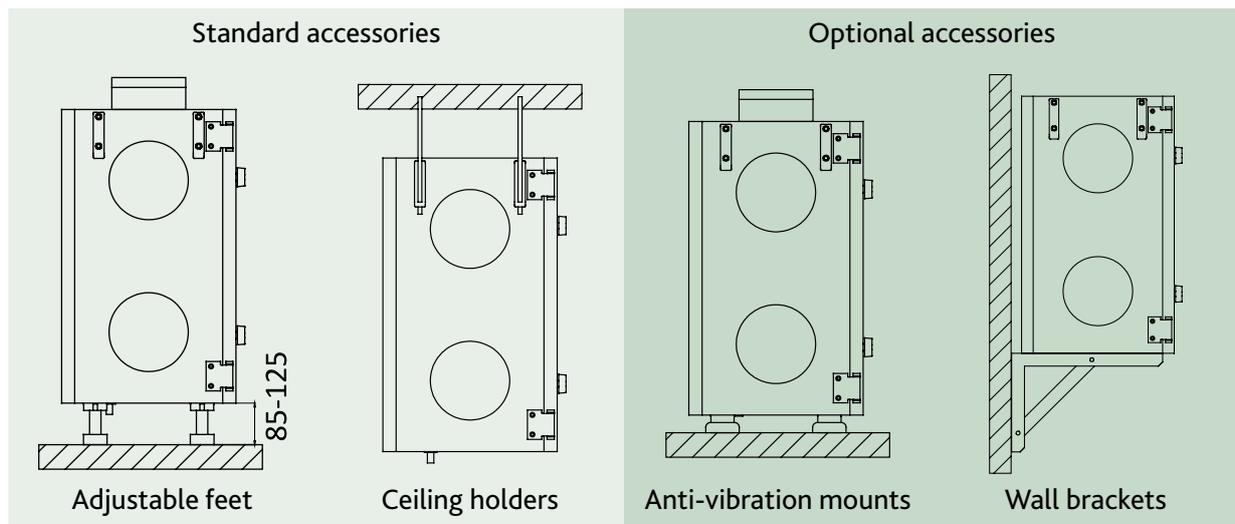
Standard accessories of the unit:

- adjustable feet for mounting on concrete floor
- ceiling holders for suspending

Optional accessories:

- anti-vibration mounts – recommended where high comfort of unit operation is required, e.g. for installation on wooden ceilings or in lofts
- wall brackets – designed for installation of the unit on a wall

Note! Fasteners are not included. Fixing and fasteners should be adapted to weight of the unit, load-bearing capacity of walls, ceilings and ground, paying attention to building regulations in force.



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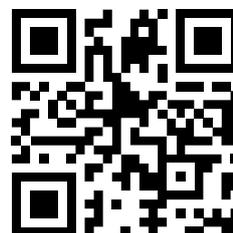
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Producent zastrzega sobie prawo wprowadzania zmian.
The manufacturer reserves the right to make changes.