STIEBEL ELTRON

STIEBEL ELTRON system manual

www.stiebel-eltron.co.uk/toolbox/navigator

Building project

Showhome

Customer

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Questions or comments?

Your contact person at Stiebel Eltron will gladly assist you if you have any question about quotation, costing or anything about your project.

CW

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STIEBEL ELTRON heat pump system WPL-A 07 HK 230 Premium with HSBC 200

Heat source
Outside air

Outdoor installation
Floor installation

With buffer storage
Combi cylinder HSBC

With hot water
Combi cylinder HSBC

Distribution system
Radiators

Without cooling

Building heat load
7 KW

Air source heat pump WPL-A 07 HK 230 Premium

Order number 200123

- The air source heat pump for heating and cooling is installed outdoors
- Inverter technology allows ideally matched heating output through the variable speed compressor
- Suitable for energy modernisation projects, as the high supply flow temperature is available all year round
- Quiet operation thanks to encapsulated refrigerant circuit and variable matched fan speed

+

Integral cylinder set HSBC 200 S (GB) Set

Order number 236917

- The integral cylinder for DHW heating is combined with a heating heat pump and integrated into the heating system.
- Space saving positioning thanks to integration of DHW cylinder, buffer cylinder and hydraulic working parts into a single appliance
- Installation requires little effort thanks to high level of integration including WPM heat pump manager
- Large area heat exchanger for high DHW demand

Your configuration

Building project	Showhome
Design outside temperature	-3 °C
Project type	Modernization
Building type	Single-family house
Year of construction	before 1980
Renovation measures	New windows + Roof insulation + Insulation of exterior walls
Location	SN9 Kennet
Living space	140 m²
Persons	2
Old heating system	Old heating system: Oil heating
Old hot water preparation:	Old hot water preparation: Oil heating
Heating load	7 KW (Input by user)
Building services	Heating + Hot water
Heat source	Air-source heat pump | Externally installed
Distribution system	Radiator heating
Hot water generator	Heating heat pump
Storage tank	Integral cylinder HSBC 200

Your material list

1 x Air source heat pump WPL-A 07 HK 230 Premium

Order number 200123

1 x Connection set AS-WP 2

Order number 233623

1 x Internet Service Gateway ISG web, control unit accessory

Order number 229336

1 x Remote control FET, control accessory

Order number 234723

1 x Integral cylinder set HSBC 200 S (GB) Set

Order number 236917

1 x Safety assembly ZH 1, for floor mounted DHW cylinders, 6/10 bar

Order number 74370

+

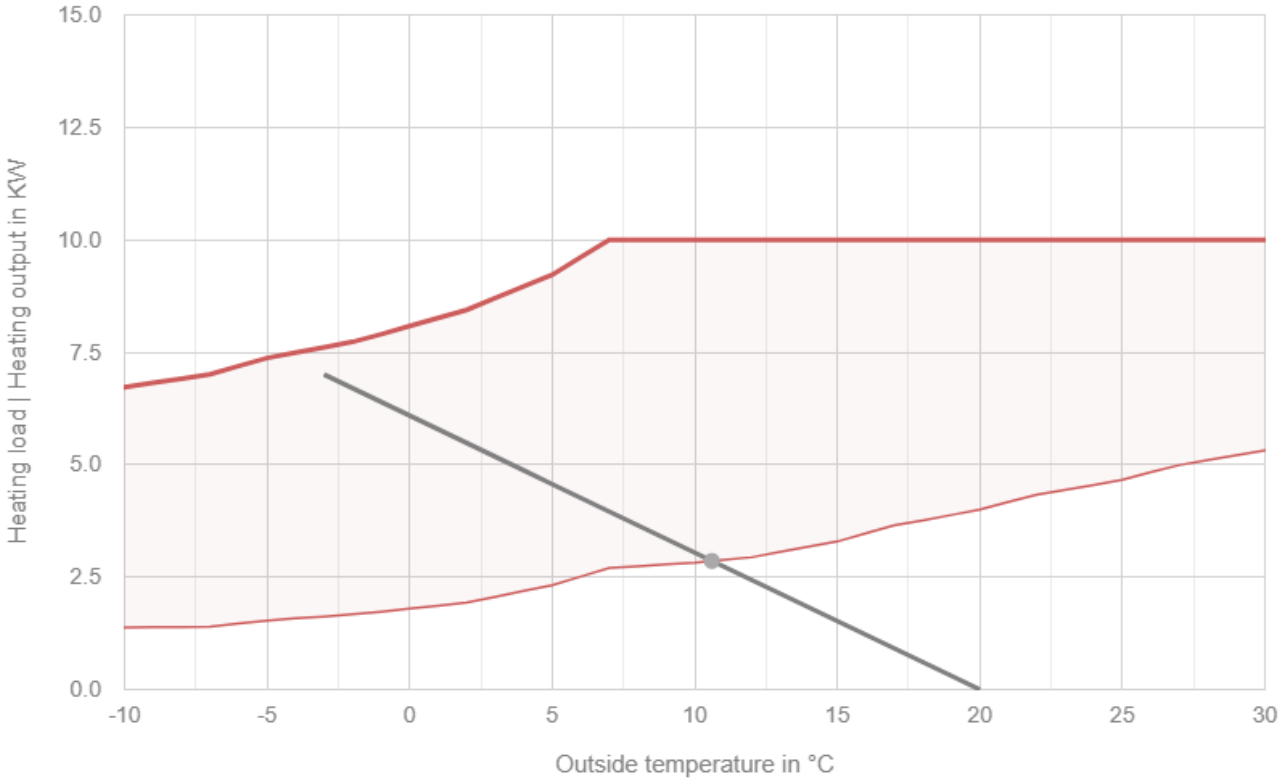
Optional accessories

1 x DHW circulation pump UPZ with control thermostat

Order number 233719

Heat output & bivalence point

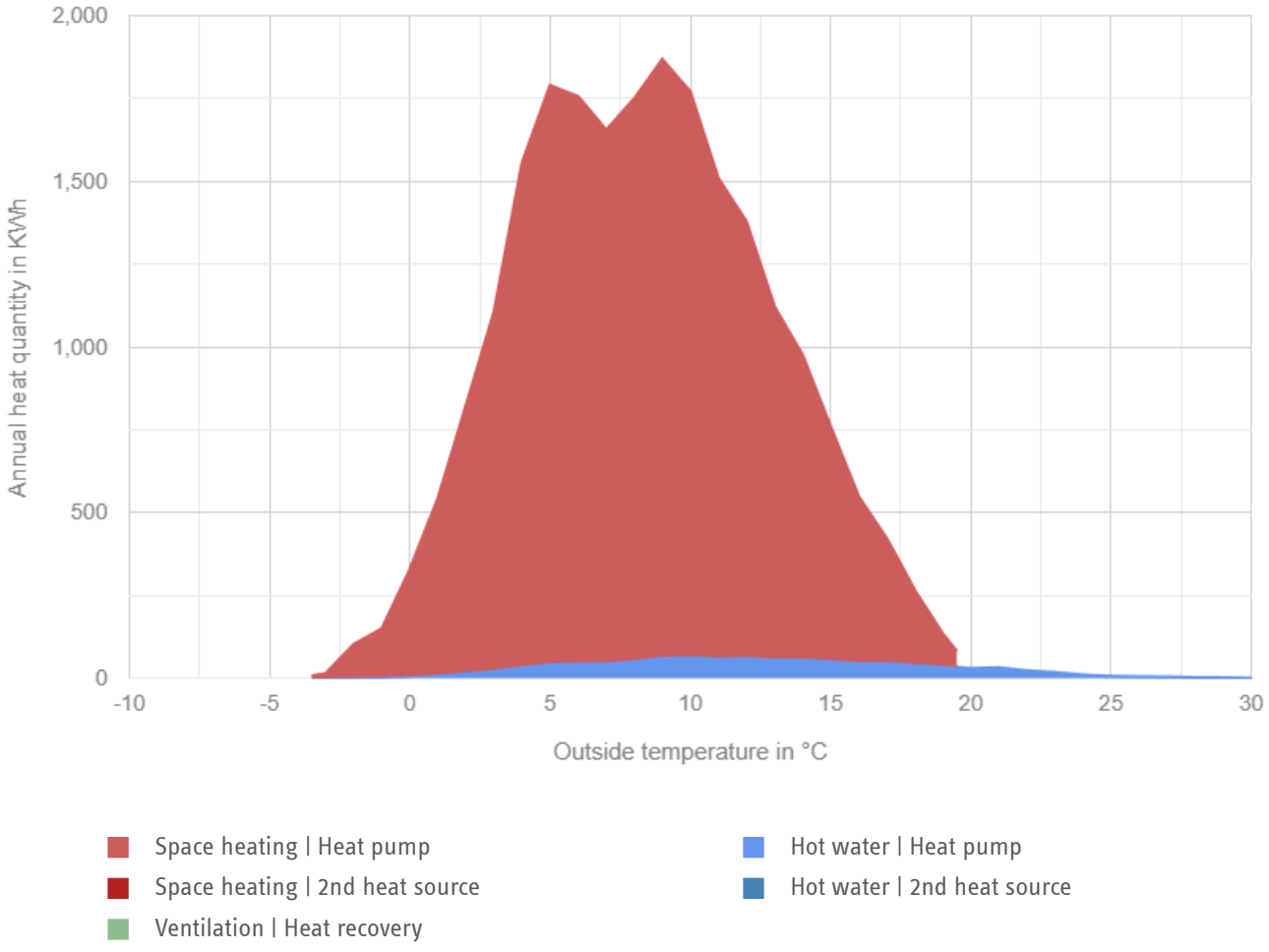
Dual-mode point	Mono-mode
Heat pump coverage heat demand	100 %
Heat pump coverage heating power	100 %
Heat demand building	7 KW
Surcharge for water heating	0 KW
Design outside temperature	-3 °C



- Heat pump heating output WPL-A 07 HK Premium | Flow temperature 55 °C
- Heating capacity
- Heating load with extra amount

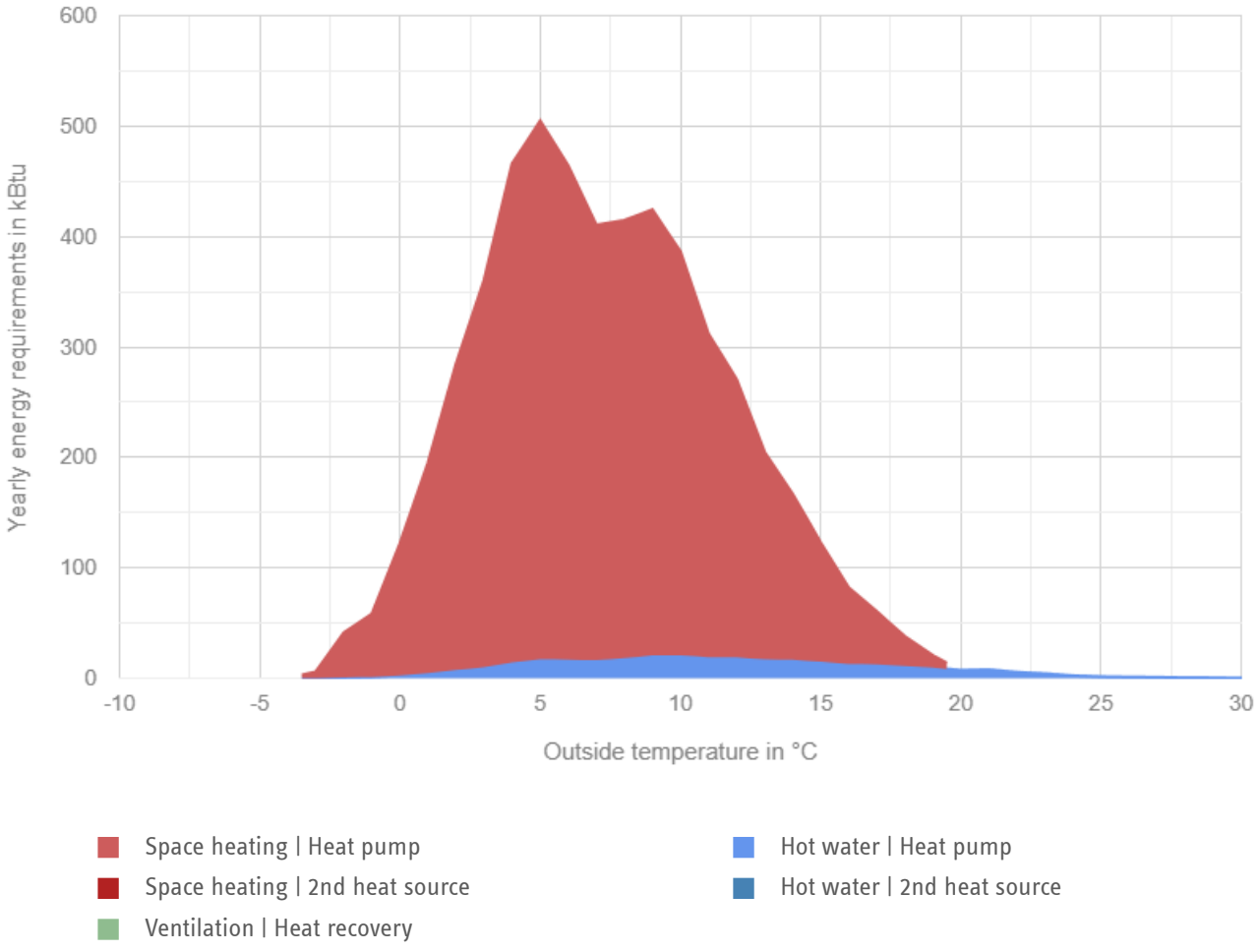
Heat demand

Total building heat demand	22,460 kWh/year
Heat demand Space heating	21,430 kWh/year
Heat demand Hot water	1,040 kWh/year
Ventilation Heat recovery	0 kWh/year
Space heating Heat pump | 2nd heat source	21,430 kWh/year | 0 kWh/year
Hot water Heat pump | 2nd heat source | Thermal solar system	1,040 kWh/year | 0 kWh/year | 0 kWh/year



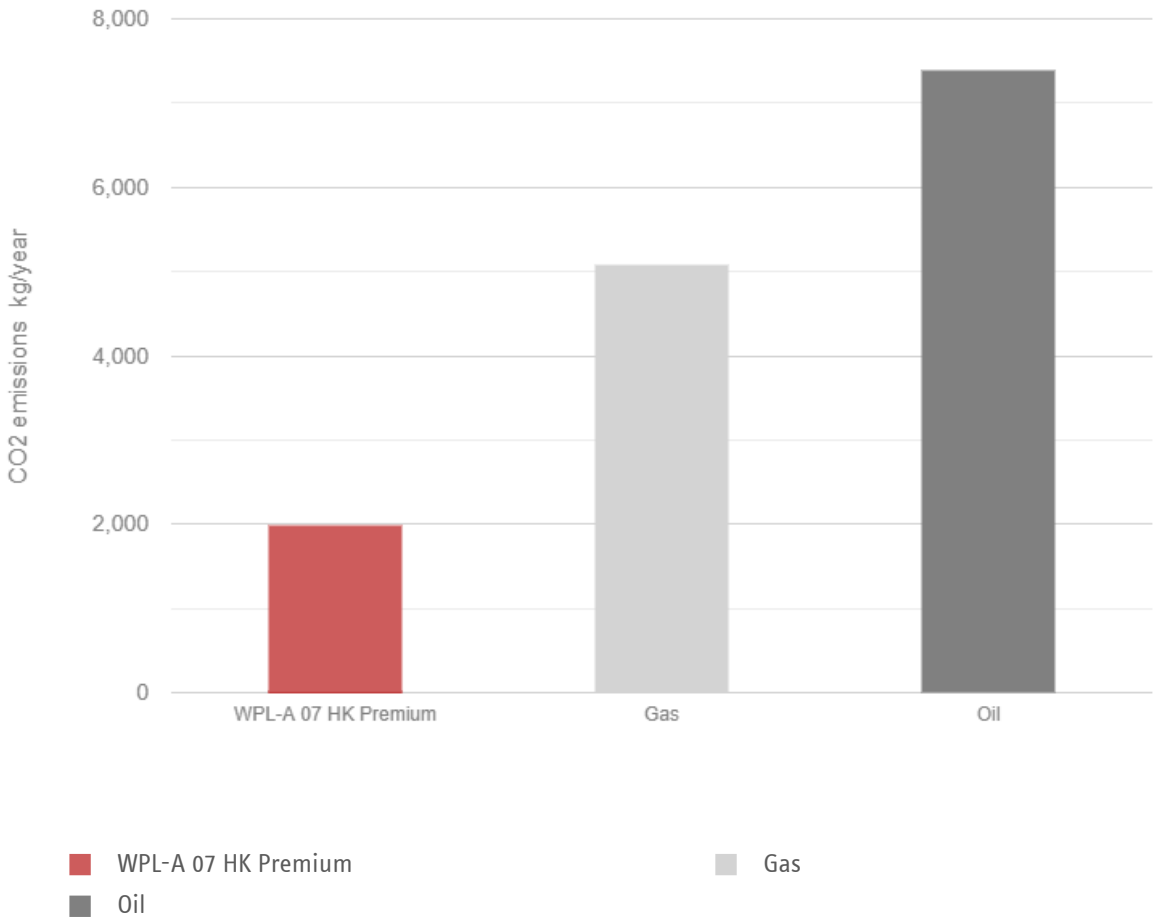
Electricity demand

Total electricity demand	5,450 kWh/year
Electricity demand Space heating	5,130 kWh/year
Electricity demand Hot water	320 kWh/year
Electricity demand Ventilation	0 kWh/year
Space heating Heat pump | 2nd heat source	5,130 kWh/year | 0 kWh/year
Hot water Heat pump | 2nd heat source | Thermal solar system	320 kWh/year | 0 kWh/year | 0 kWh/year



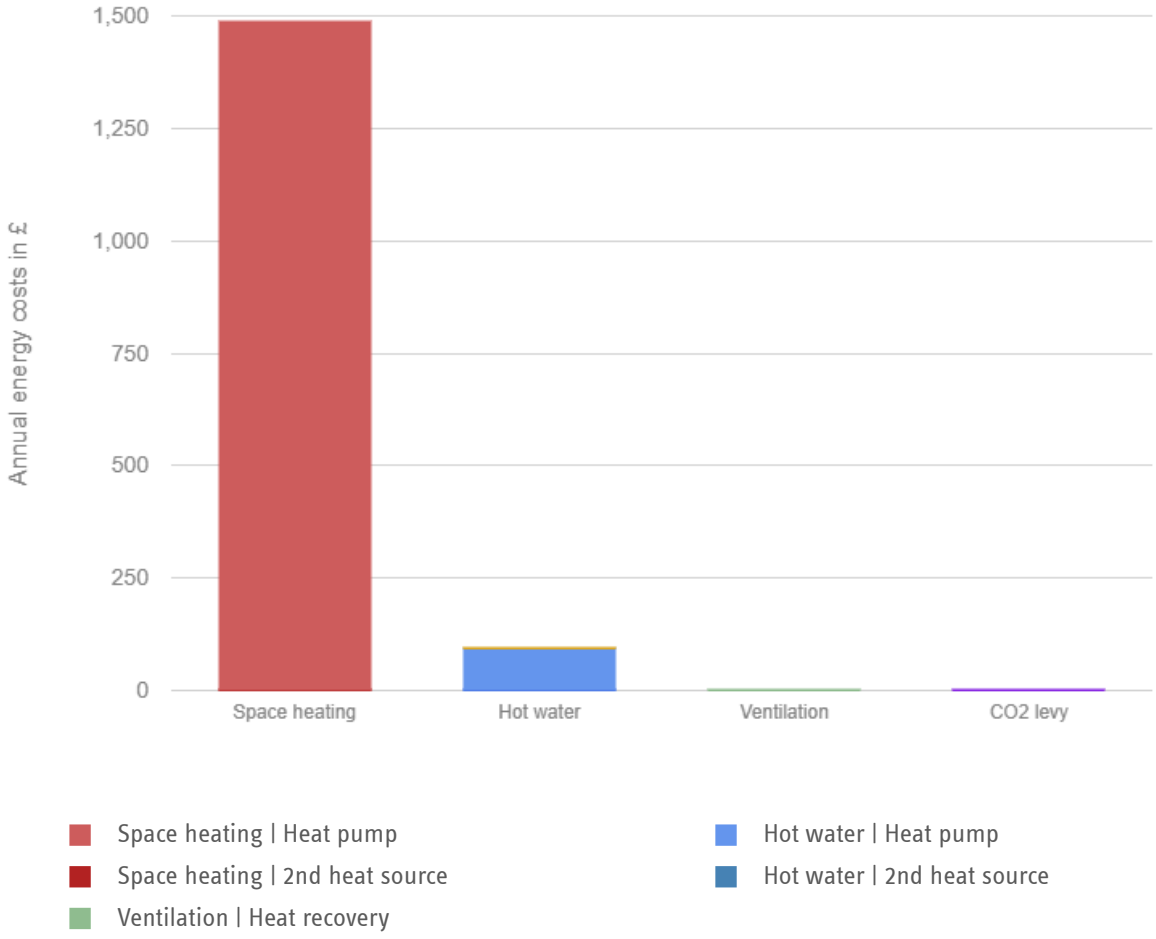
CO2 emissions

CO2 emissions Heat pump system	1,980 kg/year
CO2 emissions Gas for comparison	5,070 kg/year (+157 %)
CO2 emissions Oil Gas for comparison	7,380 kg/year (+273 %)



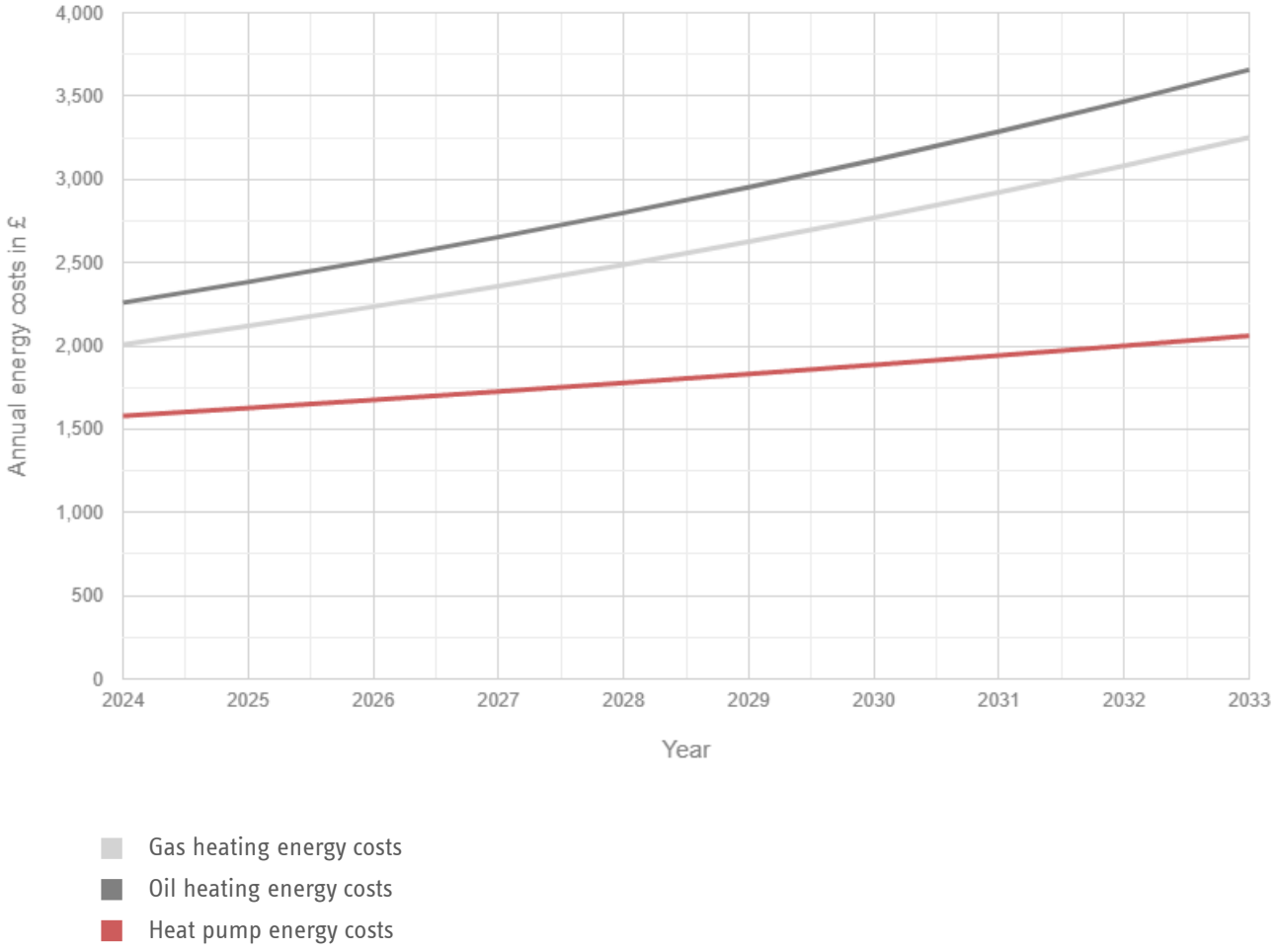
Energy costs

Overall energy costs	£1,579 per year
Energy costs Space heating	£1,488 per year
Energy costs Hot water	£92 per year
Energy costs Ventilation	£0 per year
CO2 levy	

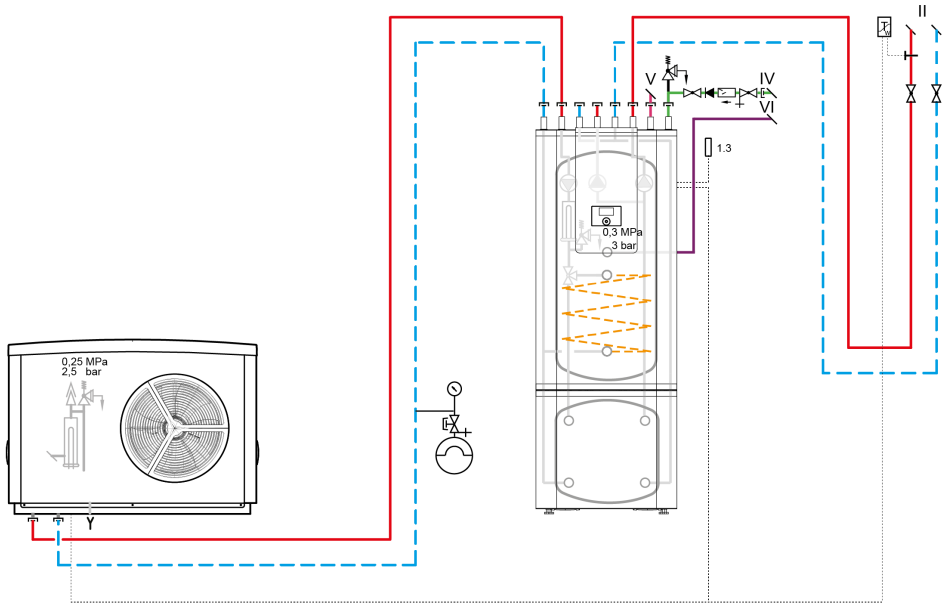


Economic efficiency

Heat pump energy costs	£1,579 per year
Gas heating energy costs	£2,008 per year
Oil heating energy costs	£2,259 per year
10-year heat pump costs	£18,101
10-year gas heating costs	£25,854
10-year oil heating costs	£29,085



SCHEMATICS | HYDRAULIC

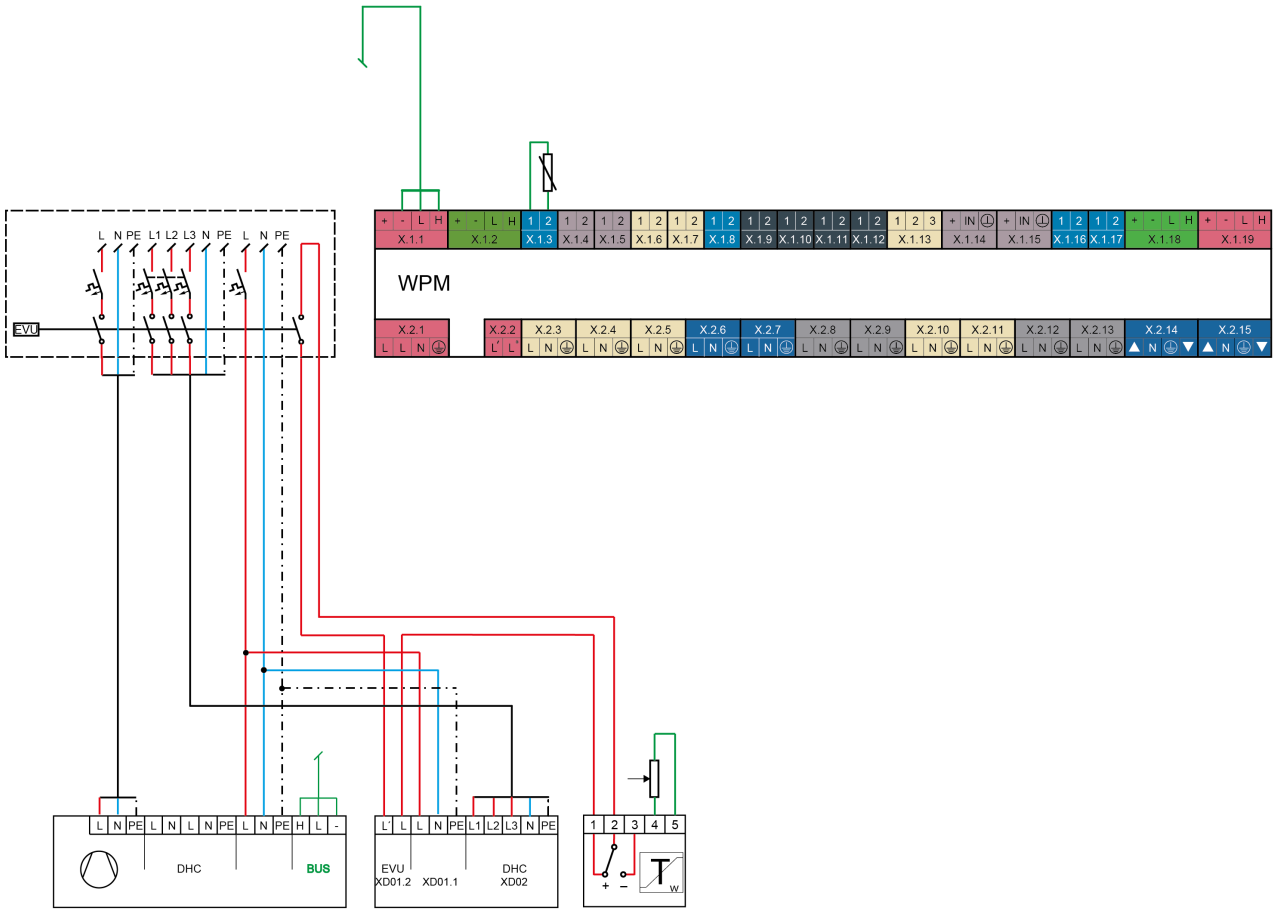


AC1-00-00-00-31-31-10

- Air
- Outdoor installation
- WPL-A 07 HK Premium
- Heat pump 230V
- Auxiliary heating 400V
- HSBC 200 GB
- HSBC 200 GB
- 1 heating circuit
- No 2. heat source
- Without cooling
- Without solar
- Without pool

The drawing is a system sketch and does not replace the project-specific planning.

SCHEMATICS | ELECTRIC



AC1-00-00-00-31-31-10

- Air
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- No 2. heat source
- Without cooling
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- Without pool

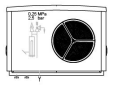
The drawing is a system sketch and does not replace the project-specific planning.

WPMsystem | LWZ

1.1	CAN A	2.1	Power supply	3.1	CAN A	4.1	Power supply	I	Heat source
1.2	CAN B	2.2	Pump L	3.2	CAN B	4.2	Pump L	II	Heating circuit radiator
1.3	Sensor outside temperature	2.3	Heating circulation pump 1	3.3	Sensor Buffer 2	4.3	Heating circulation pump 4	III	Heating circuit underfloor heating
1.4	Sensor Buffer or heating circuit 1	2.4	Heating circulation pump 2	3.4	Primary pool sensor	4.4	Heating circulation pump 5	IV	Cold water inlet
1.5	Sensor forward flow	2.5	Heating circulation pump 3	3.5	Secondary pool sensor	4.5	DHW loading pump 2	V	DHW outlet
1.6	Sensor heating circuit 2	2.6	Buffer loading pump 1	3.6	Sensor heating circuit 4	4.6	Buffer loading pump 3	VI	DHW circulation
1.7	Sensor heating circuit 3	2.7	Buffer loading pump 2	3.7	Sensor heating circuit 5	4.7	Buffer loading pump 4	VII	Swimming pool
1.8	Sensor DHW cylinder	2.8	DHW loading pump	3.8	Sensor DHW cylinder 2	4.8	Buffer loading pump 5	VIII	Solar panel
1.9	Sensor heat source	2.9	Heat source pump / Defrost	3.9	Differential sensor 1.1	4.9	Buffer loading pump 6	IX	Differential controller
1.10	Sensor second heat source	2.10	Error output	3.10	Differential sensor 1.2	4.10	Differential controller output 1		
1.11	Sensor Forward flow cooling	2.11	Circulation pump / Second heat source DHW	3.11	Differential sensor 2.1	4.11	Differential controller output 2	MFA	Multi functional output for
1.12	Sensor Circulation / Buffer 2	2.12	2nd heat source heating	3.12	Differential sensor 2.2	4.12	Primary swimming pool pump		Solarpump /
1.13	Remote control FE 7	2.13	Cooling	3.13	Sensor Reserve	4.13	Secondary swimming pool pump		2nd heat source / Cooling /
1.14	Analog input 1 (0...10V / 4...20mA)	2.14	Mixer heating circuit 2	3.14	Analog input 3 (0...10V / 4...20mA)	4.14	Mixer heating circuit 4		Circulation pump /
1.15	Analog input 2 (0...10V / 4...20mA)	2.15	Mixer heating circuit 3	3.15	Analog input 4 (0...10V / 4...20mA)	4.15	Mixer heating circuit 5		2nd heat source DHW
1.16	PWM Output 1			3.16	PWM Output 3				
1.17	PWM Output 2			3.17	PWM Output 4				
1.18	CAN B			3.18	CAN B				
1.19	CAN A			3.19	CAN A				

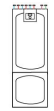
WPM3 | WPMi

1	Heat pump	2a	Temperature sensor: Outside temperature	2f	Temperature sensor: Heat source 2	3	Circulation pump: Heat pump - heat source	3e	Circulation pump: Swimming pool
2	Control unit: WPM	2b	Temperature sensor: Return temperature	2g	Temperature sensor: Heat source	3a	Circulation pump: Heat pump - heating side	3f	Circulation pump: Solar DHE heating
2-1	Swimming pool module: MSM	2c	Temperature sensor: Flow temperature	2h	Temperature sensor: Swimming pool water heating	3b	Circulation pump: DHW heating	3g	Circulation pump: Solid fuel boiler
		2d	Sensor DHW	2k	Temperature sensor: Solar panel	3c	Circulation pump: Heating circuit 1		
		2e	Temperature sensor: Mixer control	2s	Temperature sensor: Storage tank - solar system/ Cooling	3d	Circulation pump: Heating circuit 2		



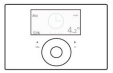
WPL-A 05/07 HK Premium

Heat pump



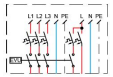
HSBC 200 GB

Combination storage



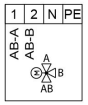
FET/FEK

remote Control



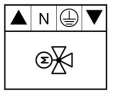
House connection

Electrical wiring diagram



switching valve

Electrical wiring diagram

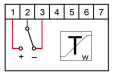


mixer

Electrical wiring diagram

circulating pump

Electrical wiring diagram



Protection thermostat

Electrical wiring diagram

Expansion vessel

Circulation pump

Mixing valve

Changeover valve

Filter

Safety valve

Vent

Gravity brake

Shut-off

Filling and drain cock

Contact thermostat

Flow sensor

Pressure indicator

Brine pressure limiter

Central Thermostat ZTA

Heat exchanger

Vibration damper

Booster heating DHC

Screw-in radiator BGC

Electric heating flange FCR

Hydraulic installation

Heating connection

Volume flow

Nominal volume flow	0.7 m³/h
Minimum volume flow	0.7 m³/h

Pressure loss

Pressure loss heat pump at nominal flow rate	45 hPa
Buffer charging pump	Integrated in HSBC 200
Heating circuit pump	Integrated in HSBC 200
Remaining head	656 hPa

Pipe diameters

Recommended nominal diameter	DN 20
Recommended internal pipe diameter	20 mm
Max. Total length of the connecting line	30 m
Max. Number of changes of direction 90°	15 x

Buffer

Buffer	Integrated in HSBC 200 (100L)
Minimum water content open heating circuits	16 l
Number of open heating circuits	3 x 70 m
Required base area of the guide chamber	21 m²

Expansion tank

Expansion tank	Not integrated
Recommended size of MAG	18
Max. Water volume of the system	350

Safety valve

Safety valve	Integrated in HSBC 200
Safety valve set pressure	2,5 bar

Hot water connection

Type Hot water tank	Integrated in HSBC 200 (168 L)
Nominal size Heat pump connection	DN 20
Recommended internal pipe diameter	20 mm
Max. Simple length of the connecting cable	15 m
Max. Number of changes of direction 90°	15 x
Nominal size cold water connection	22 mm
Nominal size Hot water connection	22 mm
Circulation connection	12 mm

Electrical Installation

Heat pump connection

Max. Power consumption	5.4 KW
Nominal compressor voltage	230 V | 1/N/PE
Operating current	24 A
Max. Starting current of the heat pump	2 A
Type FI circuit breaker	B
Connection cable (installation type A2, B2 or C)	3 x 4.0 mm²
Protection (installation type A2, B2 or C)	1 x B 25

Additional heating connection

Additional heating connection	HSBC 200
Max. Power consumption	8,8 KW
Nominal voltage	400 V | 3/N/PE
Operating current	12,8 A
Connection cable (installation type A2, B2 or C)	3 x 2,5 mm²
Protection (installation type A2, B2 or C)	3 x B16

heat pump controller

heat pump controller	Integrated in HSBC 200
Type Controller	WPMsystem
Max. Power consumption	500 W
Nominal voltage	230 V | 1/N/PE
Connecting cables heatpump	5 x 1.5 mm²
Anschlusskabel HSBC (Verlegeart A2, B2 oder C)	5 x 1.5 mm²
Type Fuse	1 x B 16
Bus | Control line	j-Y 2x2x0.8 mm²

Cable list

Power supply

Description	Starting point	Target point	Voltage	Cross section	Fuse
Compressor	HP - terminal XD01	Control cabinets / subdistribution	230V	3x4,0mm²	1xB25A
Control voltage	HP - terminal XD03	Control cabinets / subdistribution	230V	3x1,5mm²	1xB16A
HSBC 200 / (EVU contact)	HSBC 200 - terminal XD01.1	Control cabinets / subdistribution	230V	5x1,5mm²	1xB16A
HSBC 200 (2nd heat source)	HSBC 200 - terminal XD02	Control cabinets / subdistribution	400V	5x2,5mm²	3xB16A

Data line

Description	Starting point	Target point	Voltage	Cross section	Fuse
CAN A	WPM International - terminal X.1.1	Heat pump	Low voltage	J-Y (St) 2x2x0,8	via WPM International
CAN B	WPM International - terminal X.1.2	Remote control FET	Low voltage	J-Y (St) 2x2x0,8	via WPM International

Sensor line

Description	Starting point	Target point	Voltage	Cross section	Fuse
Outside temperature sensor	WPM International - terminal X.1.3	North side building facade	Low voltage	2x2x0,8mm / 2x0,75mm²	via WPM International

Controller settings

MENU > SETTINGS > HEATING > HEATING CIRCUIT 1 > ECO TEMPERATURE

Recommendation: 18 °C | Controller default: 20 °C | Adjustment range: 5...30 °C

MENU > SETTINGS > HEATING > HEATING CIRCUIT 1 > HEATING CURVE RISE

Recommendation: 0.8 | Controller default: 0,6 | Adjustment range: 0,2...3

MENU > SETTINGS > HEATING > STANDARD SETTING > BUFFER OPERATION

Recommendation: 'ON' | Controller default: OFF | Adjustment range: OFF...ON

MENU > SETTINGS > HEATING > STANDARD SETTING > SUMMER MODE > SUMMER MODE

Recommendation: 'ON' | Controller default: OFF | Adjustment range: OFF...ON

MENU > SETTINGS > HEATING > STANDARD SETTING > SUMMER MODE > OUTSIDE TEMPERATURE

Recommendation: 18 °C | Controller default: 20 °C | Adjustment range: 10...30 °C

MENU > SETTINGS > HEATING > ELECTRIC REHEATING > DUAL MODE TEMP HZG

Recommendation: -7 °C | Controller default: -20 °C | Adjustment range: -20...40 °C

MENU > SETTINGS > DHW > ELECTRIC REHEATING > DUAL MODE TEMP WW

Recommendation: -7 °C | Controller default: -20 °C | Adjustment range: -20...40 °C

MENU > COMMISSIONING > HEATING > CONTROLLER DYNAMICS

Recommendation: 50 K | Controller default: 100 K | Adjustment range: 1...500 K

MENU > COMMISSIONING > COMPRESSOR > HEATING SYSTEM SIZING > DESIGN TEMPERATURE

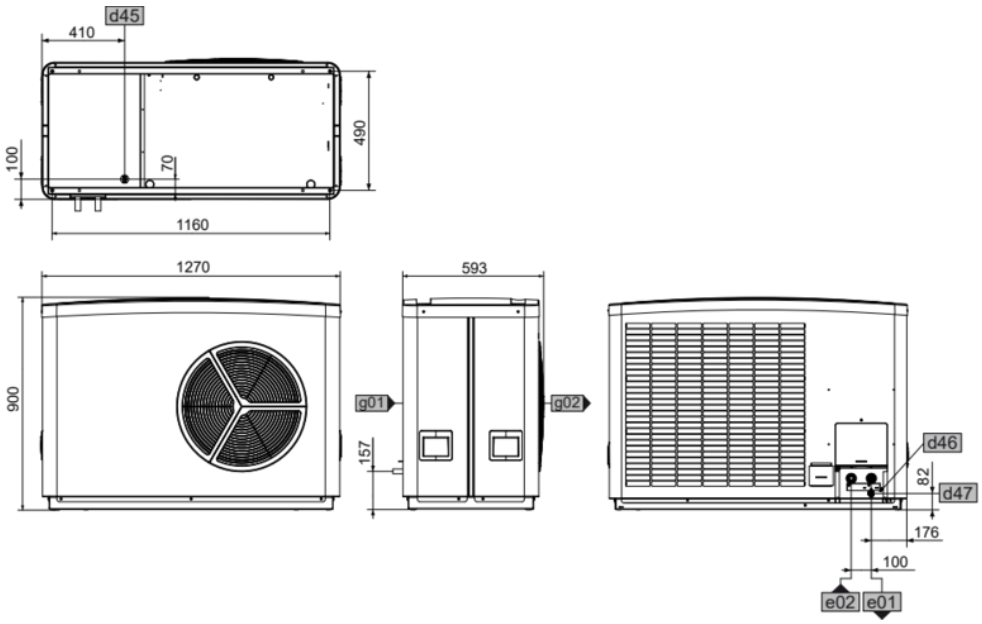
Recommendation: 'From planning' | Controller default: -15 °C | Adjustment range: -20...0 °C

MENU > COMMISSIONING > COMPRESSOR > HEATING SYSTEM SIZING > HEAT DEMAND

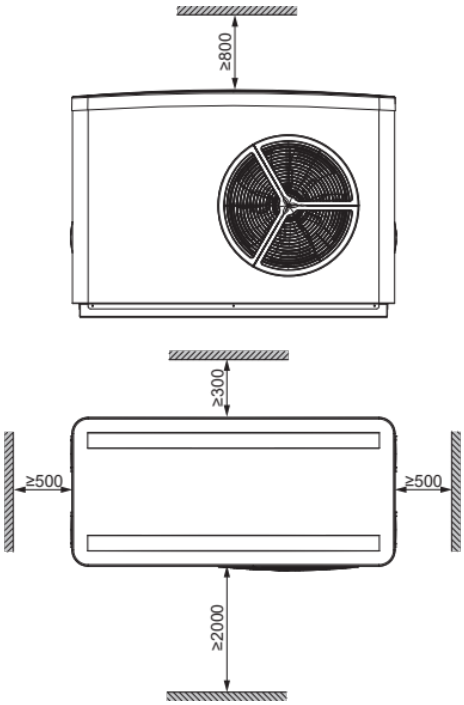
Recommendation: 'From planning' | Controller default: 15 kW | Adjustment range: 5...20 kW

Dimension drawings

Dimensional drawings Air source heat pump WPL-A 07 HK 230 Premium



Minimum distance Air source heat pump WPL-A 07 HK 230 Premium



Article details

Air source heat pump WPL-A 07 HK 230 Premium

Product Area Heat pump

Position	**1**
Name	WPL-A 07 HK 230 Premium
Order number	200123

Product data

Application • This air source heat pump with output-dependent control and inverter technology is designed as a compact mono block appliance for outdoor installation. It delivers the required heating output, ensures a reliable supply of domestic hot water and can be used for efficient cooling through circuit reversal. • A flow temperature of up to 75 °C is available for heating mode and DHW heating. Protection against legionella is ensured without the need for an electric auxiliary heater. • The heat pump can also be used to heat older buildings via radiators, as a flow temperature of 55 °C can still be achieved even when there is a heavy frost (-25 °C outside temperature).
Convenience features • Very quiet operation is made possible by the encapsulated refrigerant circuit and acoustically isolated compressor. Contributing to the low sound power level are the modulating fan and the wide gaps between the evaporator fins which reduce air resistance. • High DHW temperatures are assured without the need for electric backup, even in the winter; this is because the heat pump works with high flow temperatures all year round. • The system can be integrated into a home network and controlled from a mobile device. For this, the on-site heat pump manager is combined with the Internet Service Gateway. With integral heat and electricity metering via refrigerant circuit data. • Mono energetic operation is possible thanks to the integral electric emergency/auxiliary heater. • The enamelled, corrosion-protected metal casing is made from hot-dip galvanised, powder coated sheet steel. Fan grille, recessed grips and cover are made from weatherproof and UV-resistant plastic.
Efficiency • The refrigerant circuit works with the eco-friendly, futureproof refrigerant R454C. When combined with the optimally matched components, highly efficient operation is possible all year round. This efficiency is helped by demand-dependent defrosting via circuit reversal and the heating of the condensate pan via the refrigerant circuit. The hydrophilic coating on the fan nozzle prevents ice from forming, meaning that no electric heating is required.
Installation • The integral anti-vibration mount enables the heat pump to be connected directly to the heating system. • Simplified installation thanks to pivoting electrical connection panel. • Quick access to the condensate pan is possible via the cleaning aperture on the back of the casing.

Connection set AS-WP 2

Product Area Heat pump

Position	**2**
Name	AS-WP 2
Order number	233623

Product data

Description • The connection set for supply lines from the ground is supplied with a painted cover that protects against the elements.

Internet Service Gateway ISG web, control unit accessory

Product Area Heat pump

Position	**3**
Name	ISG web
Order number	229336

Product data

Application • The ISG Internet Service Gateway connects the heat pump to the home network and enables the appliance to be operated using a browser. • Once enabled, appliance data is transferred to the Stiebel Eltron Internet Service Portal. • The ISG plus is a required accessory for use of the SG Ready functions of the WPM heat pump manager. The ISG can be integrated into an existing building management system via the Modbus TCP/IP data interface.

Remote control FET, control accessory

Product Area Heat pump

Position	**4**
Name	FET
Order number	234723

Product data

Description • The FET digital remote control can be used to conveniently control a heating zone. • The remote control measures the relative humidity and room temperature.

Integral cylinder set HSBC 200 S (GB) Set

Product Area Heat pump

Position	**5**
Name	HSBC 200 S (GB) Set
Order number	236917

Product data

Application • This integral cylinder is suitable for DHW heating in heat pump mode. It can be simultaneously integrated into heating systems for the hydraulic connection and is used for delivery to/separation between the heat pump and heating circuit. • Designed for heating and cooling in family houses.
Convenience features • The DHW cylinder comprises an enamelled steel cylinder with directly applied foam insulation, an internal indirect coil and a magnesium signal anode for additional corrosion protection. • The buffer cylinder consists of a steel cylinder with directly applied foam insulation. • The integral cylinder is equipped with the following components: heat pump manager, cylinder charging pump, circulation pump, 3/2-way diverter valve, safety valve with drain routed out of the rear of the appliance, T&P valve and electric emergency/auxiliary heater. • The appliance is prepared for optional extension with a heating circuit with mixer. • The cylinder casing consists of a plastic jacket, permanently attached at the back and sides. The front is made of sheet metal with a design cover.
Installation • The two cylinders are arranged one above the other, can be separated from each other for easier installation and are equipped with recessed grips.
Efficiency • Low standby losses because both the cylinder volume and the indirect coil surface area are matched to the application.

Safety assembly ZH 1, for floor mounted DHW cylinders, 6/10 bar

Product Area Hot water

Position	**6**
Name	ZH 1
Order number	74370

Product data

Description • The safety assembly is suitable for combination with pressure-tested electric and integral cylinders. • Standard delivery includes a shut-off valve, non-return valve with service valve, pressure gauge connection, diaphragm safety valve and drain outlet. • To ensure that no waste water is sucked back, a pipe break is integrated into the drain outlet of the safety valve. • With its threaded fitting, the safety valve can be rotated, repositioned or replaced to match it to different installation situations. • The safety assembly enables angled or straight-through installation in horizontal and vertical pipework. • In vertical pipework, install the safety assembly only in a bottom to top flow direction. • A pressure reducing valve can be retrofitted if required.

DHW circulation pump UPZ with control thermostat

Product Area Heat pump

Position	**7**
Name	UPZ
Order number	233719

Product data

Application • DHW circulation pump with automatic ventilation mode, suitable for detached houses and apartment buildings. • The highly efficient DHW circulation pump can be controlled via the electronic control thermostat and/or the time switch. • The pump shutdown temperature can be adjusted by means of a rotary selector – this allows the pump runtime and the electronic energy demand for DHW provision to be reduced to a minimum. • Insulation shell, time switch and non-return valve are included in the standard delivery.

Basis of calculation

Energy carrier	System efficiency Space heating	System efficiency Hot water	CO2-Emmision
Electricity (heat pump)	100 %	100 %	363 g/kWh
Electricity (household)	100 %	100 %	363 g/kWh
Gas	90 %	80 %	202 g/kWh
Oil	90 %	80 %	294 g/kWh
Solid fuel	90 %	80 %	29 g/kWh
District heating	95 %	95 %	280 g/kWh
LPG	90 %	80 %	239 g/kWh

Energy carrier	Energy price	Price increase	Primary energy factor
Electricity (heat pump)	29,0 pence/kWh	3,0 % per year	1,8
Electricity (household)	29,0 pence/kWh	3,0 % per year	1,8
Gas	8,0 pence/kWh	5,5 % per year	1,1
Oil	9,0 pence/kWh	5,5 % per year	1,1
Solid fuel	5,0 pence/kWh	5,5 % per year	0,2
District heating	9,0 pence/kWh	5,5 % per year	1,1
LPG	7,5 pence/kWh	5,5 % per year	1,1

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