



Air to Water Heat Pumps

SPECIFICATION SHEET

Heatking **BWarm** air source heat pumps (ASHP) are designed to provide comfort heating by extracting heat from the outside air at temperatures as low as -20°C , using the latest scroll compressor technology and sophisticated pre-programmed controls. This combination provides a very energy efficient alternative heating system with Coefficients of Performance up to 4.3. The **BWarm** will generate 50°C from ambient temperatures down to -15°C , and 45°C from ambient temperature between -16°C and -20°C (9000i & 13000i unit will generate 60°C from ambient temperatures down to -15°C , and 55°C from ambient temperature between -16°C and -20°C).

Heatking heat pumps are designed for ease of installation and operation. The heat pumps sits outside, either wall or floor mounted, thus causing minimal disruption to the householder, especially in retrofit situations. All heat pumps leave the factory fully programmed and tested, only requiring connection to a suitable wet heating system, an electrical supply and a thermostat/timeclock.

The Heatking ASHP's are specifically designed to operate with low temperature heating systems, with radiator temperatures of 50°C and underfloor temperatures of 35°C . Heat pumps are particularly effective in well insulated buildings with minimal heat loss.

The heat pumps are designed primarily for space heating but can, with the addition of a valve pack, be used to provide pre-heating of up to 50°C (60°C 9000i & 13000i) for domestic hot water systems. An additional boost heater (such as an immersion heater) is required to raise the DHW temperature as required. Heat pumps are also well suited to operating in conjunction with other environmentally friendly systems such as solar energy for DHW.

Units are designed for long life and safe operation, and are fitted with various safety features fitted to the unit. The unit operates using R407C, a CFC free, non-flammable, biodegradable refrigerant, fully contained within the unit. The pre-programmed controller monitors the operation of the heat pump and all alarm conditions, ensuring optimum operation at all times.

Designed to operate in outdoor temperatures of between -20°C and $+30^{\circ}\text{C}$ (6000 units), and $+35^{\circ}\text{C}$ (8000/9000i/12000/13000i units) the heat pumps are fitted with a weather compensation system and current limiter.

Heatking **BWarm** ASHP's are available for connection to 1 phase or 3 phase electric supplies. There are 5 sizes of unit, the **6000/8000/9000i/12000/13000i** providing nominal heating duties of 6kW, 8kW, 9kW, 12kW & 13kW. (See page 3 for performance details at different conditions)

QUALITY

All **Bwarm** Heating air source heat pumps are manufactured to ISO 9001:2001, quality management system. BSI registered firm certificate no FM00671. Ensuring all **Bwarm** products are manufactured to the highest quality standards.

ENVIRONMENT

All **BWarm** Heating air source heat pumps are also manufactured to ISO 14001:2004, Environmental management system. BSI registered firm certificate no. EMS91502. Ensuring all **BWarm** products are built in an environmentally sustainable manner.

CONSTRUCTION

Unit bases, feet and internal metal work are constructed from galvanised mild steel sheet (0.9mm minimum thickness). Outer panels are fabricated from 0.9mm Plastisol pre-coated steel sheet, providing a durable scratch resistant finish, with a Class 1 fire rating to BS 476 Part 7 (surface spread of flame).

COLOUR

Outer panels and lids have a hard wearing, corrosion resistant light grey textured finish.

ACCESS

Access to components for general maintenance is by removal of the side panels & lid, providing access to electrics, compressor and refrigeration components. The fan/motor assembly may be removed through the front of the unit by removing the fan guard. Pipe connections are 22mm copper pipes from the side of the unit.

AIR FLOW

Air is drawn in through the heat exchanger at the back of the unit and discharged out through the front. The fan guard is designed to dissipate the air as it leaves the unit, lowering noise levels and reducing the velocity and throw of the air from the front of the unit. Units are designed for outside applications and are not suitable for ducting.

FANS and MOTORS

BWarm units are fitted with a single fan & motor assembly. Fans are sickle bladed axial type with plastic fan blades mounted on a steel hub, statically and dynamically balanced for quiet operation. Motors are totally enclosed, tapped wound permanent split capacitor type with thermal protection and are suitable for speed control. Motors have Class 'F' insulation, rated for continuous operation to 60°C.

HEAT EXCHANGER

Heat exchangers are manufactured using copper tubes and aluminium fins; collars spaced and mechanically bonded to ensure good heat transfer, and are pressure tested to 31.5 bar. The heat exchanger is coated through a cathaphoresis process for extra protection against corrosion. When cleaning coils, cleansing agents containing hydrofluoric acid must not be used as they may damage other components within the unit. The waterside Heat exchanger is of the compact brazed plate type for the condensing side of the refrigeration system.

ELECTRONIC EXPANSION VALVE

All **Bwarm** Heating air source heat pumps are supplied with an electronic expansion valve fitted as standard. This ensures that the **Bwarm** unit gives maximum efficiency across a range of conditions, improving the systems seasonal COP.

COMPRESSORS

All **BWarm** units are fitted with Copeland dedicated Heat pump ZH scroll compressors and are all charged with zero ozone depleting R407C refrigerant.

ELECTRICS

Units are available in 230V, 1ph, 50Hz, and 380V, 3ph, 50Hz versions.

CONTROLS

Each **BWarm** heat pump is fitted with a microprocessor controller, factory set, simplifying installation. The controller can be programmed for use with either radiator heating or under floor heating. There is a requirement for additional external controls for the system to operate; (TEV Ltd recommends the use of a programmable time clock and thermostat designed to make best use of off peak supplies). Whatever external controls are used the heat pump itself simply requires a 230V signal to switch on when there is a demand for heating.

ACCESSORIES

- **Wall mounting brackets:** Brackets are supplied complete with anti-vibration mounts to allow the heat pump to be mounted on a wall at high or low level.
- **Condensate drain tray:** for fitting beneath a wall-mounted unit to collect and drain away condensate, preventing water dripping from the unit.
- **2kW Boost Heater:** The boost heater is used to supplement the heating in lower ambient conditions to meet the heating demands of the building. It is also used to assist in defrost on the Bwarm 6000

- **Second Set Point Kit:** Where the heat pump is required to heat two separate set points, (for example under floor and direct hot water preheating), then this kit is available for switching between the two modes ensuring maximum efficiency.
- **Ambient Stat Kit:** The digital stat kit is used as a supplement to the Boost Heater to increase the efficiency of operation through user settable parameters
- **Other Options:** A full range of buffer tanks, thermal stores and fast recovery cylinders are available on request.

TECHNICAL SPECIFICATION

	6000 units	8000 units	9000i units	12000 units	13000i units
Unit Weight (unpacked)	87Kg	110Kg	115Kg	173Kg	178Kg
Refrigerant Type	R407C	R407C	R407C	R407C	R407C
Refrigerant Charge Weight	1700gms	3500gms	3500gms	6800gms	6800gms
Pump Delivery	15 l/m	20 l/m	25 l/m	30 l/m	35 l/m
Pump	85watts	85watts	85watts	70watts	70watts
Min Return Water	60°C	60°C	60°C	60°C	60°C
Max Return Water	45°C	45°C	60°C	45°C	60°C
Minimum Operating Ambient Temperature	-20°C	-20°C	-20°C	-20°C	-20°C
Maximum Operating Ambient Temperature	+30°C	+35°C	+35°C	+35°C	+35°C
Heat Output/Input=cop 7db/6wb°C @ 30-35°C kW	6.00/1.63 = 3.7	8.10/2.03 = 4.0	9.1/2.35 = 3.9	12.1/2.85 = 4.0	12.8/3.39 = 3.8
Heat Output/Input=cop 2db/1wb°C @ 30-35°C* kW	5.30/1.63 = 3.3	7.20/2.03 = 3.5	8.35/2.55 = 3.6	10.7/2.79 = 3.8	11.8/3.32 = 3.5
Heat Output/Input=cop 7db/6wb°C @ 40-45°C kW	5.70/1.95 = 2.9	7.75/2.35 = 3.3	9.1/2.72 = 3.3	11.5/3.35 = 3.4	13.0/4.01 = 3.2
Heat Output/Input=cop 2db/1wb°C @ 40-45°C* kW	5.05/1.95 = 2.6	6.85/2.35 = 2.9	8.25/2.72 = 3.0	10.1/3.28 = 3.1	12.0/3.94 = 3.0
Cool Output/Input=eer 27°C @ 7-12°C kW	4.70/1.97 = 2.39	5.75/2.16 = 2.66	5.75/2.16 = 2.66	9.70/3.93 = 2.47	9.70/3.93 = 2.47
Cool Output/Input=eer 27°C @ 18-23°C kW	5.80/2.13 = 2.72	8.65/2.55 = 3.39	8.65/2.55 = 3.39	11.9/4.22 = 2.82	11.9/4.22 = 2.82
Cool Output/Input=eer 35°C @ 7-12°C kW	4.46/2.19 = 2.04	5.60/2.47 = 2.27	5.60/2.47 = 2.27	9.26/4.37 = 2.12	9.26/4.37 = 2.12
Cool Output/Input=eer 35°C @ 18-23°C kW	5.75/2.40 = 2.40	8.15/2.88 = 2.83	8.15/2.88 = 2.83	11.75/4.74 = 2.98	11.75/4.74 = 2.98
Air volume	m ³ /h	2900 (max)	2900 (max)	2900 (max)	3700 (max)
Fan rating	W	220	220	220	260

*Operating point to BS EN 14511-2:2004. Power input shown without water pump.

Capacity should be adjusted by 10% for defrost when considering seasonal efficiencies.

ELECTRICAL

	6000 units	
	1ph	3ph
Supply Voltage	220 - 240v 50hz	380 - 420v 50hz
Starting Current	20 Amps	18 A/Ph
Normal Operating Current	10.7 Amps	3.4 A/Ph
Maximum Operating Current	14.5 Amps	5 A/Ph
Fitted Compressor Protection (D motor rated MCB)	25 Amps	10 A/Ph
Recommended Supply Protection (D motor rated MCB)	32 Amps	16 A/Ph
Locked Rotor Current	58 Amps	26 A/Ph

	8000 units	
	1ph	3ph
Supply Voltage	220 - 240v 50hz	380 - 420v 50hz
Starting Current	24 Amps	29 A/Ph
Normal Operating Current	13.5 Amps	4.3 A/Ph
Maximum Operating Current	18.5 Amps	7 A/Ph
Fitted Compressor Protection (D motor rated MCB)	25 Amps	10 A/Ph
Recommended Supply Protection (D motor rated MCB)	32 Amps	16 A/Ph
Locked Rotor Current	76 Amps	32 A/Ph

	9000i units	
	1ph	3ph
Supply Voltage	220 - 240v 50hz	380 - 420v 50hz
Starting Current	26 Amps	29 A/Ph
Normal Operating Current	13.5 Amps	4.3 A/Ph
Maximum Operating Current	20.9 Amps	6 A/Ph
Fitted Compressor Protection (D motor rated MCB)	25 Amps	10 A/Ph
Recommended Supply Protection (D motor rated MCB)	32 Amps	16 A/Ph
Locked Rotor Current	97 Amps	40 A/Ph

	12000 units	
	1ph	3ph
Supply Voltage	220 - 240v 50hz	380 - 420v 50hz
Starting Current	31 Amps	34 Amps
Normal Operating Current	19 Amps	6.5 A/Ph
Maximum Operating Current	25 Amps	11 A/Ph
Fitted Compressor Protection (D motor rated MCB)	32 Amps	16 A/Ph
Recommended Supply Protection (D motor rated MCB)	40 Amps	20 A/Ph
Locked Rotor Current	108 Amps	51.5 A/Ph

	13000i units	
	1ph	3ph
Supply Voltage	220 - 240v 50hz	380 - 420v 50hz
Starting Current	33 Amps	34 Amps
Normal Operating Current	19 Amps	6.5 A/Ph
Maximum Operating Current	30 Amps	10 A/Ph
Fitted Compressor Protection (D motor rated MCB)	32 Amps	16 A/Ph
Recommended Supply Protection (D motor rated MCB)	40 Amps	20 A/Ph
Locked Rotor Current	160 Amps	64 A/Ph

SOUND LEVELS

	Unit	125	250	500	1000	2000	4000	8000
	Sound Power	6000	79.6	76.2	67.8	65.7	59.1	53.8
8000		80.6	76.6	67.9	65.7	59.1	53.8	48.2
9000i		81.6	77.1	68.0	65.7	59.1	53.8	48.2
12000		84.6	80.8	73.9	70.0	65.3	59.1	51.2
13000i		85.6	81.3	74.0	70.0	65.3	59.1	51.2
6000 (with attenuation FFO)		74.8	67.4	64.0	62.6	54.3	48.0	45.0
8000 (with attenuation FFO)		75.8	67.8	64.1	62.6	54.3	48.0	45.0
9000i (with attenuation FFO)		76.8	68.3	64.2	62.6	54.3	48.0	45.0
12000 (with attenuation FFO)		77.0	72.6	67.7	63.0	58.5	52.1	46.0
13000i (with attenuation FFO)		78.0	73.1	67.8	63.0	58.5	52.1	46.0

	Unit	125	250	500	1000	2000	4000	8000	dBA	NR
	Sound Pressure (SPL)	6000	62.1	58.7	50.3	48.2	41.6	36.3	30.7	54.5
8000		63.1	59.1	50.4	48.2	41.6	36.6	30.7	54.8	51
9000i		64.1	59.6	50.5	48.2	41.6	36.3	30.7	55.2	51
12000		67.1	63.3	56.4	52.5	47.8	41.6	33.7	59.6	55
13000i		68.1	63.8	56.5	52.5	47.8	41.6	33.7	59.9	56
6000 (with attenuation FFO)		57.3	49.9	46.5	45.1	36.8	30.5	27.5	49.4	45
8000 (with attenuation FFO)		58.3	50.3	46.6	45.1	36.8	30.5	27.5	49.7	45
9000i (with attenuation FFO)		59.3	50.8	46.7	45.1	36.8	30.5	27.5	50.0	45
12000 (with attenuation FFO)		59.5	55.1	50.2	45.5	41.0	34.6	28.5	52.4	47
13000i (with attenuation FFO)		60.5	55.6	50.3	45.5	41.0	34.6	28.5	52.7	47

Sound Pressure figures taken at 3metres using a floor standing unit with no other reflective surfaces
 Test Method – BS EN ISO 3744:1995 as required by BS EN 12102:2008 and BS EN 14511-4:2007 6.2.3.