

# > HSW LT

WATER - WATER AND BRINE - WATER  
HEAT PUMPS  
FOR OUTDOOR OR INDOOR INSTALLATION

## Available range

### Unit type

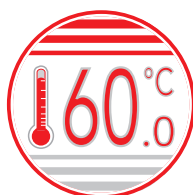
- IH Heat pump
- IP Reversible heat pump  
(reversible on the refrigerant side)

### Versions

- VB Base version

### Acoustic setting up

- AB Base setting up



## Unit description

This series of **water-water** heat pumps satisfies the heating, cooling and domestic hot water production requirements of residential plants of small and medium size.

All the units are suitable for outdoor or indoor installation and can be applied to **fan coil** plants, **radiant** floor plants and high efficiency **radiators** plants.

As source both water (from well, river, lake...) or brine solutions (from geothermic probes) can be used.

The control system allows to manage not only the refrigerant circuit but the whole plant with the possibility to choose different solutions both for the heating and cooling plant and for the domestic hot water management. The possibility of solar panels or other heating sources integration is also available.

The **heating** function optimizes the flow water temperature according both to the ambient temperature and to the outdoor temperature through climatic curves adaptable to the building features. It's possible to manage a storage tank and two independent circuits (a direct one and a mixed one).

The **domestic hot water** management allows to control the three way valve, the storage tank and the anti-legionella cycles (if necessary).

The **cooling** function can be realized through "passive cooling" (free cooling), through "active cooling" (refrigerant circuit inversion) or through both systems actuated in sequence. When the unit is used in

radiant floor plants, to avoid condensate generation, a room humidity sensor can be installed.

The **internal programmer clock** allows to define different daily switching programs for heating, cooling and domestic hot water production.

The refrigerant circuit is equipped with rotary compressor mounted on damper supports, brazed plate heat exchangers, thermostatic expansion valve and reverse cycle valve (for reversible units). The circuit is protected by high and low pressure switches and flow switches on both the exchangers.

The outdoor structure is **thermally and acoustically insulated** in order to reduce sound propagation and to allow the installation in domestic places.

All the hydraulic pipes are thermally insulated to avoid condensate generation.

All the units are supplied with an outdoor temperature sensor in order to realize the climatic control.

All the units are accurately built and individually tested in the factory. Only electric and hydraulic connections are required for installation.

## Options

### Plant side flow rate management

- not present
- standard pump
- high head pump
- modulating pump

### Soft starter

- not present
- standard

## Accessories

- Rubber vibration dampers
- Spring vibration dampers
- Remote thermostat (wired or wireless)
- Remote control (wired or wireless)
- Wireless transmitter
- Wireless repeater
- Condensate sensor
- Room hygostat
- Room humidity sensor
- Plant tank

### CONTROL SYSTEM

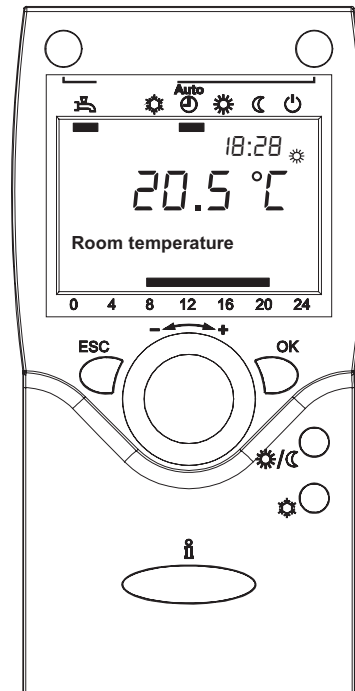
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

The main **functions** of the control system are :

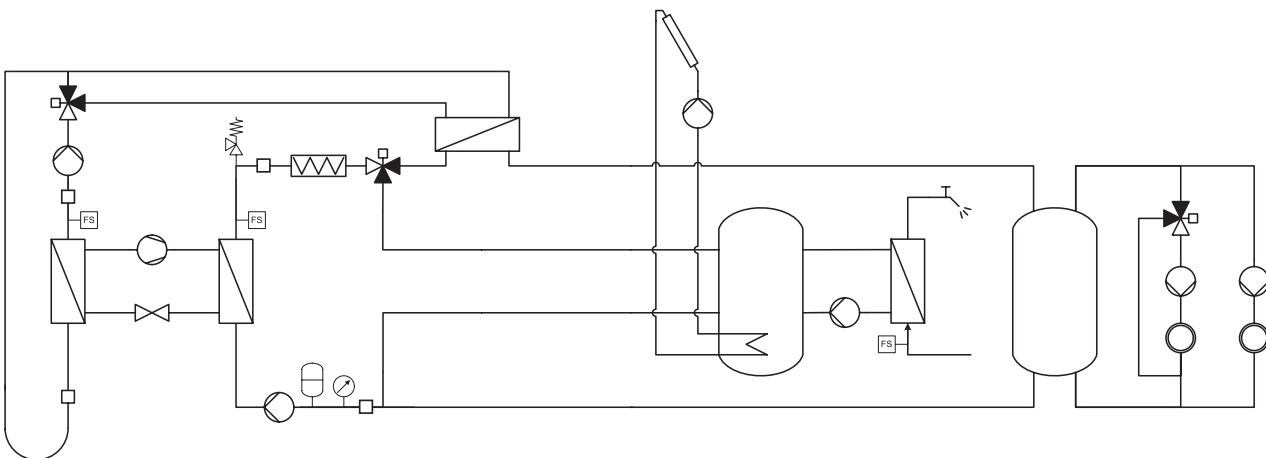
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles...)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (only pump)
- management of a storage tank for heating and/or cooling
- management of electrical heaters for heating and domestic hot water (3 steps logic)
- solar panels integration
- passive cooling
- room humidity control for cooling with radiant systems
- internal programmer clock (for heating, cooling and domestic hot water)
- digital input for electrical energy low tariff
- alarm memory management and diagnostic
- compressor and pump operating hour counter
- possibility to manage more units in cascade (maximum 16)

Besides the standard user interface to be placed indoor, wired or wireless remote thermostats are available which allow to control all the operating parameters of the unit and to acquire the temperature in the different zones in order to realize a more precise and comfortable control.

The unit controller is able to manage a lot of different plant solutions enabling automatically the necessary control algorithms according to the components which have been connected.



The management of such components is possible through additional expansion modules which communicate with the unit by means of an internal bus and provide all the inputs and outputs required to fulfil a complete system.



The controller is able to manage up to **two zones in heating** (one by means of a mixed circuit and the other by means of a direct circuit) and **one zone in cooling** (by means of a mixed circuit).

It's possible to realize more complex plants connecting to the heat pump controller further expansion modules in order to extend without limits the number of zones to be managed.

For each zone the following parameters can be set :

- set point
- daily or weekly operating time table
- climatic control curve
- room control sensor : it can be in common with the other zones or independent (in that case it's necessary to install an additional room thermostat)

OPERATING LIMITS	Unit type	Cooling		Heating		°C
		min	max	min	max	
Plant flow temperature	-	6	30	15	60	°C
Source return temperature (water)	-	5	45	5	25	°C
Source return temperature (brine)	-	-10	45	-10	25	°C

**NOMINAL performances - Radiant plants**

IP	Acoustic setting up : AB	3.1	5.1	7.1	9.1	11.1	
<b>W10W35</b>	Heating capacity	3,30	5,01	6,72	9,13	11,6	kW
	Power input	0,58	0,89	1,23	1,67	2,15	kW
	<b>COP</b>	<b>5,69</b>	<b>5,63</b>	<b>5,46</b>	<b>5,47</b>	<b>5,40</b>	-
	Water flow rate plant side	571	866	1160	1576	2009	l/h
	Pressure drops plant side	5	11	19	21	22	kPa
	Water flow rate source side	780	1181	1578	2147	2730	l/h
	Pressure drops source side	6	13	21	24	25	kPa
<b>B0W35</b>	Heating capacity	2,44	3,70	4,97	6,74	8,57	kW
	Power input	0,57	0,88	1,21	1,64	2,12	kW
	<b>COP</b>	<b>4,28</b>	<b>4,20</b>	<b>4,11</b>	<b>4,11</b>	<b>4,04</b>	-
	Water flow rate plant side	423	641	859	1165	1481	l/h
	Pressure drops plant side	2	7	11	13	13	kPa
	Water flow rate source side	595	900	1199	1632	2062	l/h
	Pressure drops source side	4	9	14	16	17	kPa
<b>W30W18</b>	Cooling capacity	3,59	5,43	7,27	9,87	12,6	kW
	Power input	0,59	0,90	1,25	1,69	2,17	kW
	<b>EER</b>	<b>6,08</b>	<b>6,03</b>	<b>5,82</b>	<b>5,84</b>	<b>5,81</b>	-
	Water flow rate plant side	619	938	1257	1709	2173	l/h
	Pressure drops plant side	6	13	21	24	25	kPa
	Water flow rate source side	722	1094	1470	1995	2541	l/h
	Pressure drops source side	6	12	19	21	22	kPa
<b>B30W18</b>	Cooling capacity	3,51	5,30	7,11	9,63	12,3	kW
	Power input	0,60	0,92	1,28	1,72	2,22	kW
	<b>EER</b>	<b>5,85</b>	<b>5,76</b>	<b>5,55</b>	<b>5,60</b>	<b>5,54</b>	-
	Water flow rate plant side	605	916	1229	1667	2121	l/h
	Pressure drops plant side	6	13	21	23	24	kPa
	Water flow rate source side	771	1166	1570	2127	2710	l/h
	Pressure drops source side	7	13	22	25	26	kPa

**NOMINAL performances - Radiant plants**

IH	Acoustic setting up : AB	3.1	5.1	7.1	9.1	11.1	
<b>W10W35</b>	Heating capacity	3,37	5,11	6,85	9,31	11,8	kW
	Power input	0,59	0,89	1,24	1,69	2,18	kW
	<b>COP</b>	<b>5,71</b>	<b>5,74</b>	<b>5,52</b>	<b>5,51</b>	<b>5,41</b>	-
	Water flow rate plant side	584	883	1183	1607	2043	l/h
	Pressure drops plant side	5	12	19	22	22	kPa
	Water flow rate source side	798	1209	1612	2193	2782	l/h
	Pressure drops source side	7	14	22	25	26	kPa
<b>B0W35</b>	Heating capacity	2,49	3,78	5,07	6,88	8,72	kW
	Power input	0,58	0,89	1,23	1,66	2,14	kW
	<b>COP</b>	<b>4,29</b>	<b>4,25</b>	<b>4,12</b>	<b>4,14</b>	<b>4,07</b>	-
	Water flow rate plant side	431	655	876	1190	1507	l/h
	Pressure drops plant side	3	7	12	13	13	kPa
	Water flow rate source side	608	923	1228	1670	2103	l/h
	Pressure drops source side	4	9	15	17	17	kPa

Data declared according to **EN 14511**. The values are referred to units without options or accessories. Brine = water with 30% ethylene glycol.

W10W65 = source: water in 10°C out 7°C / plant: water in 55°C out 65°C  
W10W55 = source: water in 10°C out 7°C / plant: water in 47°C out 55°C  
W10W45 = source: water in 10°C out 7°C / plant: water in 40°C out 45°C  
W10W35 = source: water in 10°C out 7°C / plant: water in 30°C out 35°C  
W30W7 = source: water in 30°C out 35°C / plant: water in 12°C out 7°C  
W30W18 = source: water in 30°C out 35°C / plant: water in 23°C out 18°C

B0W65 = source: brine in 0°C out -3°C / plant: water in 55°C out 65°C  
B0W55 = source: brine in 0°C out -3°C / plant: water in 47°C out 55°C  
B0W45 = source: brine in 0°C out -3°C / plant: water in 40°C out 45°C  
B0W35 = source: brine in 0°C out -3°C / plant: water in 30°C out 35°C  
B30W7 = source: brine in 30°C out 35°C / plant: water in 12°C out 7°C  
B30W18 = source: brine in 30°C out 35°C / plant: water in 23°C out 18°C

**NOMINAL performances - Standard plants**

IP	Acoustic setting up : AB	3.1	5.1	7.1	9.1	11.1	
<b>W10W45</b>	Heating capacity	3,03	4,61	6,19	8,40	10,6	kW
	Power input	0,71	1,09	1,50	2,02	2,59	kW
	<b>COP</b>	<b>4,27</b>	<b>4,23</b>	<b>4,13</b>	<b>4,16</b>	<b>4,09</b>	-
	Water flow rate plant side	527	799	1072	1456	1842	l/h
	Pressure drops plant side	4	10	16	18	19	kPa
	Water flow rate source side	666	1009	1347	1835	2310	l/h
	Pressure drops source side	5	10	16	19	19	kPa
<b>B0W45</b>	Heating capacity	2,27	3,44	4,62	6,27	7,96	kW
	Power input	0,69	1,06	1,46	1,96	2,53	kW
	<b>COP</b>	<b>3,29</b>	<b>3,25</b>	<b>3,16</b>	<b>3,20</b>	<b>3,15</b>	-
	Water flow rate plant side	395	598	801	1088	1382	l/h
	Pressure drops plant side	2	6	10	11	12	kPa
	Water flow rate source side	503	760	1009	1378	1737	l/h
	Pressure drops source side	3	6	11	12	13	kPa
<b>W30W7</b>	Cooling capacity	2,73	4,13	5,54	7,52	9,54	kW
	Power input	0,59	0,91	1,26	1,69	2,16	kW
	<b>EER</b>	<b>4,63</b>	<b>4,54</b>	<b>4,40</b>	<b>4,45</b>	<b>4,42</b>	-
	Water flow rate plant side	469	710	952	1294	1641	l/h
	Pressure drops plant side	3	8	13	15	16	kPa
	Water flow rate source side	575	873	1174	1592	2021	l/h
	Pressure drops source side	4	8	13	15	15	kPa
<b>B30W7</b>	Cooling capacity	2,67	4,05	5,42	7,35	9,33	kW
	Power input	0,60	0,92	1,28	1,72	2,21	kW
	<b>EER</b>	<b>4,45</b>	<b>4,40</b>	<b>4,23</b>	<b>4,27</b>	<b>4,22</b>	-
	Water flow rate plant side	458	695	932	1265	1605	l/h
	Pressure drops plant side	3	8	13	15	15	kPa
	Water flow rate source side	615	933	1256	1702	2162	l/h
	Pressure drops source side	4	9	15	17	18	kPa

**NOMINAL performances - Standard plants**

IH	Acoustic setting up : AB	3.1	5.1	7.1	9.1	11.1	
<b>W10W45</b>	Heating capacity	3,10	4,70	6,31	8,58	10,8	kW
	Power input	0,72	1,10	1,51	2,04	2,62	kW
	<b>COP</b>	<b>4,31</b>	<b>4,27</b>	<b>4,18</b>	<b>4,21</b>	<b>4,12</b>	-
	Water flow rate plant side	539	815	1093	1486	1877	l/h
	Pressure drops plant side	5	10	17	19	19	kPa
	Water flow rate source side	683	1032	1378	1878	2361	l/h
	Pressure drops source side	5	10	17	19	20	kPa
<b>B0W45</b>	Heating capacity	2,32	3,51	4,72	6,40	8,12	kW
	Power input	0,70	1,07	1,47	1,99	2,55	kW
	<b>COP</b>	<b>3,31</b>	<b>3,28</b>	<b>3,21</b>	<b>3,22</b>	<b>3,18</b>	-
	Water flow rate plant side	403	610	819	1111	1408	l/h
	Pressure drops plant side	2	6	10	12	12	kPa
	Water flow rate source side	515	779	1037	1409	1778	l/h
	Pressure drops source side	3	7	11	13	13	kPa

Data declared according to EN 14511. The values are referred to units without options or accessories. Brine = water with 30% ethylene glycol.

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 W10W35 = source: water in 10°C out 7°C / plant: water in 30°C out 35°C  
 W30W7 = source: water in 30°C out 35°C / plant: water in 12°C out 7°C  
 W30W18 = source: water in 30°C out 35°C / plant: water in 23°C out 18°C

B0W65 = source: brine in 0°C out -3°C / plant: water in 55°C out 65°C  
 B0W55 = source: brine in 0°C out -3°C / plant: water in 47°C out 55°C  
 B0W45 = source: brine in 0°C out -3°C / plant: water in 40°C out 45°C  
 B0W35 = source: brine in 0°C out -3°C / plant: water in 30°C out 35°C  
 B30W7 = source: brine in 30°C out 35°C / plant: water in 12°C out 7°C  
 B30W18 = source: brine in 30°C out 35°C / plant: water in 23°C out 18°C

**NOMINAL performances - HIGH temperature and plants**

IP	Acoustic setting up : AB	3.1	5.1	7.1	9.1	11.1	
<b>W10W55</b>	Heating capacity	2,76	4,19	5,61	7,63	9,69	kW
	Power input	0,82	1,27	1,74	2,33	3,00	kW
	<b>COP</b>	<b>3,37</b>	<b>3,30</b>	<b>3,22</b>	<b>3,27</b>	<b>3,23</b>	-
	Water flow rate plant side	301	457	611	830	1055	l/h
	Pressure drops plant side	1	3	6	7	7	kPa
	Water flow rate source side	555	838	1112	1518	1918	l/h
	Pressure drops source side	3	7	12	14	14	kPa
<b>B0W55</b>	Heating capacity	2,10	3,19	4,28	5,81	7,37	kW
	Power input	0,79	1,21	1,67	2,24	2,89	kW
	<b>COP</b>	<b>2,66</b>	<b>2,64</b>	<b>2,56</b>	<b>2,59</b>	<b>2,55</b>	-
	Water flow rate plant side	229	348	466	633	803	l/h
	Pressure drops plant side	1	1	3	4	5	kPa
	Water flow rate source side	417	630	834	1139	1432	l/h
	Pressure drops source side	2	5	8	9	9	kPa

**NOMINAL performances - HIGH temperature plants**

IH	Acoustic setting up : AB	3.1	5.1	7.1	9.1	11.1	
<b>W10W55</b>	Heating capacity	2,82	4,27	5,72	7,78	9,85	kW
	Power input	0,84	1,28	1,75	2,37	3,03	kW
	<b>COP</b>	<b>3,36</b>	<b>3,34</b>	<b>3,27</b>	<b>3,28</b>	<b>3,25</b>	-
	Water flow rate plant side	307	465	623	847	1072	l/h
	Pressure drops plant side	1	3	6	7	8	kPa
	Water flow rate source side	566	858	1141	1552	1955	l/h
	Pressure drops source side	3	8	12	14	15	kPa
<b>B0W55</b>	Heating capacity	2,15	3,25	4,36	5,93	7,50	kW
	Power input	0,81	1,23	1,68	2,27	2,92	kW
	<b>COP</b>	<b>2,65</b>	<b>2,64</b>	<b>2,60</b>	<b>2,61</b>	<b>2,57</b>	-
	Water flow rate plant side	234	354	475	646	817	l/h
	Pressure drops plant side	1	1	3	4	5	kPa
	Water flow rate source side	426	643	856	1168	1463	l/h
	Pressure drops source side	2	5	8	9	10	kPa

TECHNICAL DATA	3.1	5.1	7.1	9.1	11.1	
Power supply	230 - 1 - 50					V-ph-Hz
Compressor type	rotary					-
N° compressors / N° refrigerant circuits	1 / 1					n°
Plant side heat exchanger type	stainless steel brazed plates					-
Source side heat exchanger type	stainless steel brazed plates					-
Hydraulic fittings	1" M					-
Weight *	91	101	103	112	115	kg
Maximum power input *	1,1	1,5	2,0	2,7	3,5	kW

\* base unit without options and accessories

### ACOUSTIC PERFORMANCES

Base acoustic setting up (AB)	3.1	5.1	7.1	9.1	11.1	
Sound power level	60	61	61	62	62	dB(A)
Sound pressure level at 1 metre	46	47	47	48	48	dB(A)
Sound pressure level at 5 metres	34	35	35	36	36	dB(A)
Sound pressure level at 10 metres	28	29	29	30	30	dB(A)

The acoustic performances are referred to units operating in cooling mode at nominal conditions W10W35.

Unit placed in free field on reflecting surface (directional factor equal to 2).

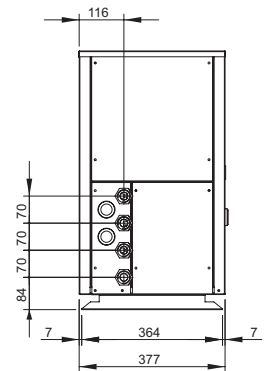
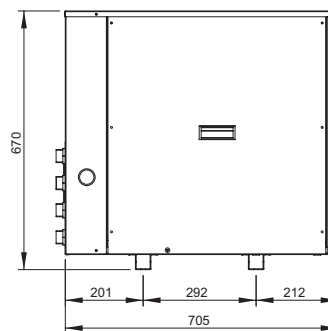
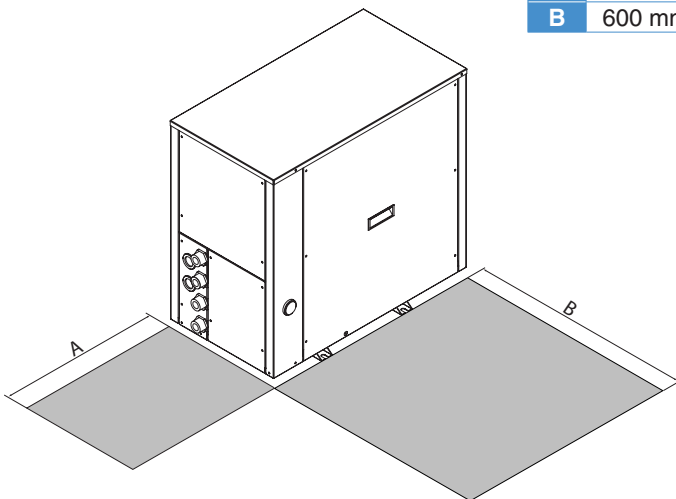
The sound power level is measured according to ISO 3744 standard.

The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

### DIMENSIONS AND MINIMUM OPERATING AREA

Respect the free area around the unit as shown in figure in order to guarantee a good accessibility and facilitate maintenance and control operations.

A	600 mm
B	600 mm



Unit with accessory "Plant tank"

