

# > HGW

## WATER - WATER AND BRINE - WATER HEAT PUMPS FOR INDOOR INSTALLATION

### Available range

#### Unit type

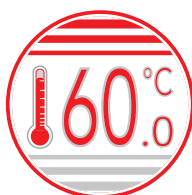
- IH Heat pump
- IP Reversible heat pump  
(reversible on the refrigerant side)

#### Versions (heat recovery)

- VB Base version
- VD Desuperheater version

#### Acoustic setting up

- AB Base setting up
- AS Low noise setting up



### Unit description

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

All the units are suitable for 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. During cooling mode operation a part of the heating power in excess

can be recovered for the domestic hot water production (VD version).

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 scroll compressors mounted on damper supports, brazed plate heat exchangers, electronic 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 compressors are arranged in tandem on a single refrigerant circuit and allow the capacity modulation according to the plant requests in order to guarantee a high seasonal efficiency.

In the low noise setting up units (AS) the outdoor structure is **thermally and acoustically insulated** in order to reduce sound propagation and to allow the installation in domestic places.

The heat exchangers and all the hydraulic pipes are thermally insulated to avoid condensate generation and reduce thermal losses.

All the units are supplied with phase sequence and voltage controller and 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

#### Source side flow rate management

- not present
- standard pump
- high head pump
- modulating pump
- 2 way valve

#### Domestic hot water production

- not present
- 3 way valve

#### Passive cooling

- not present
- standard

#### Soft starter

- not present
- standard

### Accessories

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

## CONTROL SYSTEM

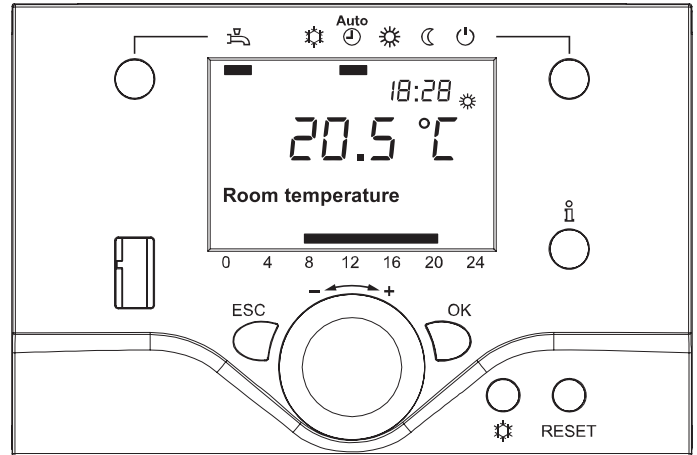
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

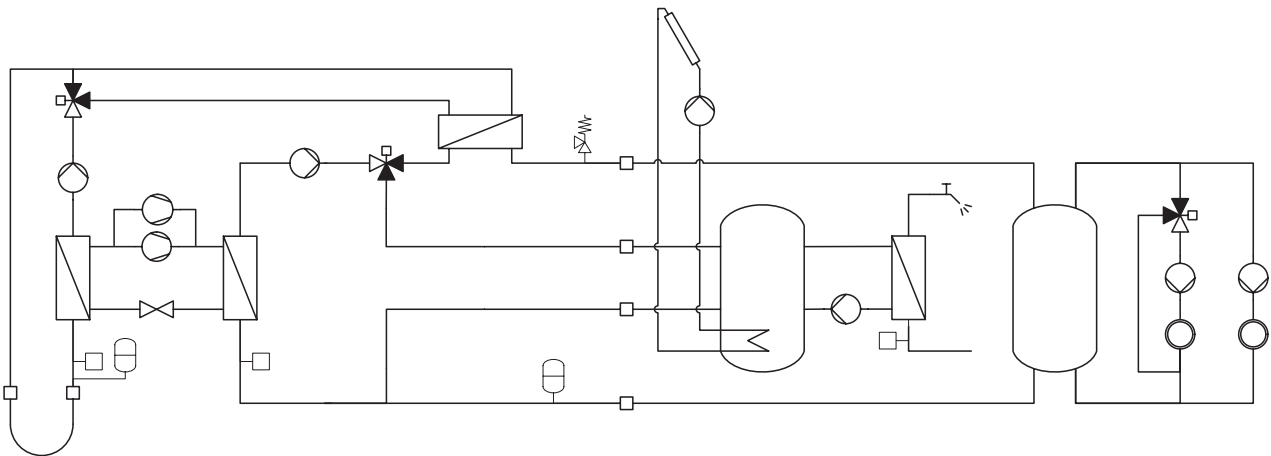
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles...)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct 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 and AS	55.2	65.2	75.2	85.2	95.2	110.2	
<b>W10W35</b>	Heating capacity	53,1	61,3	72,9	82,7	91,3	107	kW
	Power input	9,62	11,1	13,1	14,9	16,3	19,4	kW
	<b>COP</b>	<b>5,52</b>	<b>5,52</b>	<b>5,56</b>	<b>5,55</b>	<b>5,60</b>	<b>5,52</b>	-
	Water flow rate plant side	9161	10581	12573	14253	15742	18495	l/h
	Pressure drops plant side	24	25	27	28	24	25	kPa
	Water flow rate source side	12510	14466	17210	19526	21556	25272	l/h
	Pressure drops source side	24	24	27	28	24	24	kPa
<b>B0W35</b>	Heating capacity	40,8	47,1	56,1	63,6	70,2	82,4	kW
	Power input	9,48	10,9	12,9	14,6	16,0	19,1	kW
	<b>COP</b>	<b>4,30</b>	<b>4,32</b>	<b>4,35</b>	<b>4,36</b>	<b>4,39</b>	<b>4,31</b>	-
	Water flow rate plant side	7048	8139	9681	10979	12122	14235	l/h
	Pressure drops plant side	15	15	17	18	15	15	kPa
	Water flow rate source side	10012	11580	13807	15684	17307	20234	l/h
	Pressure drops source side	17	17	19	20	17	17	kPa
<b>W30W18</b>	Cooling capacity	57,2	66,1	78,5	89,0	98,5	116	kW
	Power input	9,76	11,3	13,2	15,1	16,5	19,7	kW
	<b>EER</b>	<b>5,86</b>	<b>5,85</b>	<b>5,95</b>	<b>5,89</b>	<b>5,97</b>	<b>5,89</b>	-
	Water flow rate plant side	9914	11449	13604	15432	17052	20018	l/h
	Pressure drops plant side	28	28	31	33	28	28	kPa
	Water flow rate source side	11565	13352	15828	17959	19846	23344	l/h
	Pressure drops source side	21	21	23	24	21	21	kPa
<b>B30W18</b>	Cooling capacity	56,7	65,5	77,8	88,1	97,5	114	kW
	Power input	9,81	11,3	13,4	15,2	16,7	19,8	kW
	<b>EER</b>	<b>5,78</b>	<b>5,80</b>	<b>5,81</b>	<b>5,80</b>	<b>5,84</b>	<b>5,76</b>	-
	Water flow rate plant side	9828	11345	13483	15277	16880	19811	l/h
	Pressure drops plant side	28	28	31	32	28	28	kPa
	Water flow rate source side	12463	14385	17074	19330	21380	25122	l/h
	Pressure drops source side	25	25	28	29	25	25	kPa

**NOMINAL performances - Radiant plants**

IH	Acoustic setting up : AB and AS	55.2	65.2	75.2	85.2	95.2	110.2	
<b>W10W35</b>	Heating capacity	54,2	62,6	74,4	84,4	93,1	109	kW
	Power input	9,7	11,2	13,3	15,0	16,5	19,6	kW
	<b>COP</b>	<b>5,56</b>	<b>5,59</b>	<b>5,59</b>	<b>5,63</b>	<b>5,64</b>	<b>5,56</b>	-
	Water flow rate plant side	9352	10789	12832	14547	16054	18859	l/h
	Pressure drops plant side	25	25	28	29	25	25	kPa
	Water flow rate source side	12799	14780	17610	19983	22042	25815	l/h
	Pressure drops source side	25	25	28	29	25	25	kPa
<b>B0W35</b>	Heating capacity	41,6	48,0	57,3	64,9	71,6	84,1	kW
	Power input	9,6	11,0	13,0	14,7	16,2	19,4	kW
	<b>COP</b>	<b>4,34</b>	<b>4,36</b>	<b>4,41</b>	<b>4,41</b>	<b>4,42</b>	<b>4,34</b>	-
	Water flow rate plant side	7187	8295	9888	11205	12365	14530	l/h
	Pressure drops plant side	16	16	18	18	16	16	kPa
	Water flow rate source side	10238	11835	14157	16066	17721	20711	l/h
	Pressure drops source side	17	18	20	21	18	18	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 and AS	55.2	65.2	75.2	85.2	95.2	110.2	
<b>W10W45</b>	Heating capacity	48,9	56,4	67,1	76,0	84,0	98,6	kW
	Power input	11,6	13,4	15,7	17,8	19,6	23,4	kW
	<b>COP</b>	<b>4,22</b>	<b>4,21</b>	<b>4,27</b>	<b>4,27</b>	<b>4,29</b>	<b>4,21</b>	-
	Water flow rate plant side	8464	9767	11609	13156	14546	17084	l/h
	Pressure drops plant side	21	21	23	24	21	21	kPa
	Water flow rate source side	10692	12350	14752	16724	18497	21613	l/h
	Pressure drops source side	18	18	20	21	18	18	kPa
<b>B0W45</b>	Heating capacity	38,0	43,8	52,1	59,0	65,2	76,6	kW
	Power input	11,3	13,0	15,4	17,3	19,2	22,8	kW
	<b>COP</b>	<b>3,36</b>	<b>3,37</b>	<b>3,38</b>	<b>3,41</b>	<b>3,40</b>	<b>3,36</b>	-
	Water flow rate plant side	6587	7595	9037	10236	11314	13278	l/h
	Pressure drops plant side	13	13	15	15	13	13	kPa
	Water flow rate source side	8526	9831	11739	13330	14698	17180	l/h
	Pressure drops source side	12	13	14	15	12	12	kPa
<b>W30W7</b>	Cooling capacity	43,7	50,5	59,9	68,0	75,1	88,2	kW
	Power input	9,69	11,2	13,2	14,9	16,4	19,5	kW
	<b>EER</b>	<b>4,51</b>	<b>4,51</b>	<b>4,54</b>	<b>4,56</b>	<b>4,58</b>	<b>4,52</b>	-
	Water flow rate plant side	7517	8684	10314	11704	12922	15171	l/h
	Pressure drops plant side	17	17	19	20	17	17	kPa
	Water flow rate source side	9223	10650	12625	14322	15811	18599	l/h
	Pressure drops source side	13	14	15	16	13	14	kPa
<b>B30W7</b>	Cooling capacity	43,3	50,0	59,3	67,3	74,3	87,3	kW
	Power input	9,72	11,2	13,3	15,0	16,6	19,5	kW
	<b>EER</b>	<b>4,45</b>	<b>4,46</b>	<b>4,46</b>	<b>4,49</b>	<b>4,48</b>	<b>4,48</b>	-
	Water flow rate plant side	7448	8598	10211	11584	12785	15016	l/h
	Pressure drops plant side	17	17	19	19	17	17	kPa
	Water flow rate source side	9940	11470	13614	15419	17036	20026	l/h
	Pressure drops source side	16	16	18	19	16	16	kPa

**NOMINAL performances - Standard plants**

IH	Acoustic setting up : AB and AS	55.2	65.2	75.2	85.2	95.2	110.2	
<b>W10W45</b>	Heating capacity	49,9	57,5	68,5	77,6	85,7	101	kW
	Power input	11,8	13,5	16,0	18,1	19,8	23,6	kW
	<b>COP</b>	<b>4,23</b>	<b>4,26</b>	<b>4,28</b>	<b>4,29</b>	<b>4,33</b>	<b>4,28</b>	-
	Water flow rate plant side	8637	9958	11853	13434	14842	17414	l/h
	Pressure drops plant side	22	22	24	25	22	22	kPa
	Water flow rate source side	10949	12636	15095	17124	18925	22099	l/h
	Pressure drops source side	19	19	21	22	19	19	kPa
<b>B0W45</b>	Heating capacity	38,7	44,7	53,2	60,3	66,5	78,2	kW
	Power input	11,4	13,1	15,5	17,5	19,3	23,0	kW
	<b>COP</b>	<b>3,39</b>	<b>3,41</b>	<b>3,43</b>	<b>3,45</b>	<b>3,45</b>	<b>3,40</b>	-
	Water flow rate plant side	6708	7751	9228	10445	11540	13556	l/h
	Pressure drops plant side	14	14	15	16	14	14	kPa
	Water flow rate source side	8717	10085	12058	13648	15080	17625	l/h
	Pressure drops source side	13	13	15	15	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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 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 - HIGH temperature and plants**

IP	Acoustic setting up : AB and AS	55.2	65.2	75.2	85.2	95.2	110.2	
<b>W10W55</b>	Heating capacity	44,3	51,1	60,9	69,0	76,3	89,5	kW
	Power input	13,4	15,5	18,2	20,6	22,6	27,0	kW
	<b>COP</b>	<b>3,31</b>	<b>3,30</b>	<b>3,35</b>	<b>3,35</b>	<b>3,38</b>	<b>3,31</b>	-
	Water flow rate plant side	4827	5568	6625	7508	8303	9741	l/h
	Pressure drops plant side	7	8	8	9	8	8	kPa
	Water flow rate source side	8862	10235	12236	13894	15380	17925	l/h
	Pressure drops source side	13	13	14	15	13	13	kPa
<b>B0W55</b>	Heating capacity	35,1	40,5	48,2	54,6	60,4	70,9	kW
	Power input	12,9	14,9	17,5	19,8	21,8	26,0	kW
	<b>COP</b>	<b>2,72</b>	<b>2,72</b>	<b>2,75</b>	<b>2,76</b>	<b>2,77</b>	<b>2,73</b>	-
	Water flow rate plant side	3825	4413	5252	5949	6581	7726	l/h
	Pressure drops plant side	5	5	6	6	5	5	kPa
	Water flow rate source side	7095	8176	9799	11103	12312	14348	l/h
	Pressure drops source side	9	9	10	10	9	9	kPa

**NOMINAL performances - HIGH temperature plants**

IH	Acoustic setting up : AB and AS	55.2	65.2	75.2	85.2	95.2	110.2	
<b>W10W55</b>	Heating capacity	45,2	52,1	62,2	70,4	77,8	91,3	kW
	Power input	13,5	15,6	18,4	20,8	22,9	27,3	kW
	<b>COP</b>	<b>3,35</b>	<b>3,34</b>	<b>3,38</b>	<b>3,38</b>	<b>3,40</b>	<b>3,34</b>	-
	Water flow rate plant side	4925	5677	6767	7660	8466	9937	l/h
	Pressure drops plant side	8	8	9	9	8	8	kPa
	Water flow rate source side	9091	10492	12550	14237	15752	18354	l/h
	Pressure drops source side	13	13	15	16	13	13	kPa
<b>B0W55</b>	Heating capacity	35,8	41,3	49,2	55,7	61,6	72,3	kW
	Power input	13,0	15,0	17,7	19,9	22,0	26,3	kW
	<b>COP</b>	<b>2,75</b>	<b>2,75</b>	<b>2,78</b>	<b>2,80</b>	<b>2,80</b>	<b>2,75</b>	-
	Water flow rate plant side	3901	4500	5361	6069	6712	7878	l/h
	Pressure drops plant side	5	5	6	6	5	5	kPa
	Water flow rate source side	7285	8399	10053	11421	12630	14698	l/h
	Pressure drops source side	9	9	10	11	9	9	kPa

