> HMW HT

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 residential plants of small and medium size.

All the units are suitable for indoor installation. The possibiliy to produce water at high temperatures makes these units particularly suitable to be applied to **radiators** plants as well as to **fan coil** plants and **radiant** floor 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 compressor 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.

The compressor is equipped with vapour and liquid injection and is placed on an economized refrigerant circuit with plate heat exchanger and electronic expansion valve dedicated to the injection.

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 hygrostat
Room humidity sensor

CONTROL SYSTEM

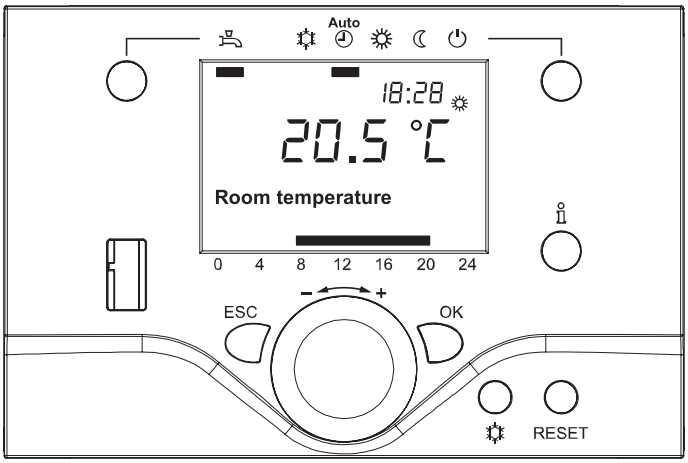
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

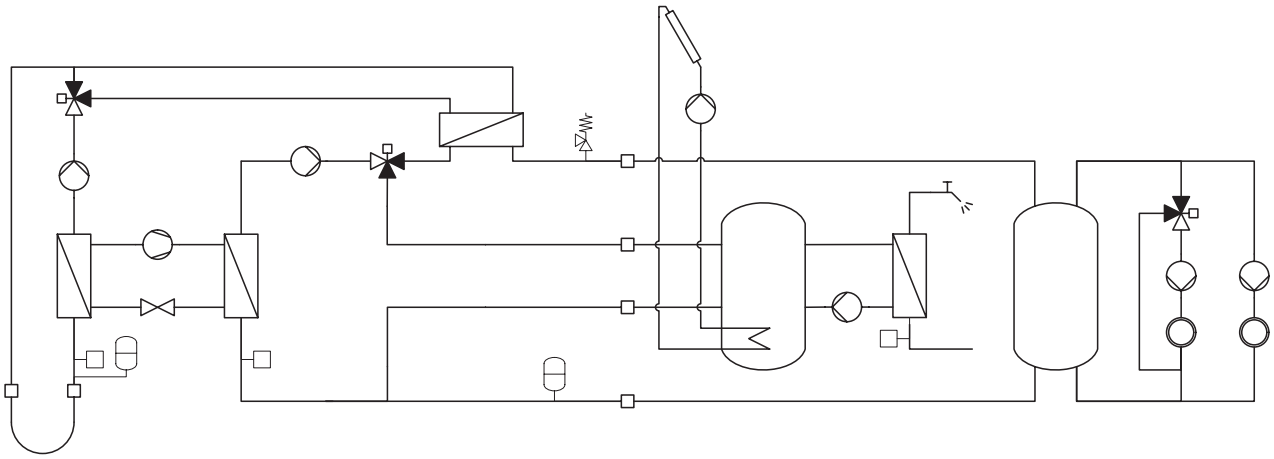
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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 algorythms 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)

		Cooling		Heating		
OPERATING LIMITS	**Unit type**	**min**	**max**	**min**	**max**	
Plant flow temperature	-	6	30	15	65 *	°C
Source return temperature (water)	-	5	50	5	25	°C
Source return temperature (brine)	-	-10	50	-15	25	°C

** The maximum water outlet temperature can be increased up to **70°C** keeping a ΔT between inlet and outlet equal to 10°C.*

NOMINAL performances - Radiant plants

IP	Acoustic setting up : AB and AS	35.1	40.1	45.1	50.1	60.1	
W10W35	Heating capacity	35,7	42,2	47,3	53,2	62,5	kW
	Power input	6,74	7,92	8,98	10,1	12,0	kW
	COP	**5,30**	**5,33**	**5,27**	**5,27**	**5,21**	-
	Water flow rate plant side	6148	7273	8139	9161	10737	l/h
	Pressure drops plant side	31	28	35	34	46	kPa
	Water flow rate source side	8394	9934	11135	12533	14752	l/h
	Pressure drops source side	55	52	64	62	84	kPa
B0W35	Heating capacity	27,6	32,6	36,6	41,1	48,2	kW
	Power input	6,40	7,53	8,47	9,51	11,2	kW
	COP	**4,31**	**4,33**	**4,32**	**4,32**	**4,30**	-
	Water flow rate plant side	4762	5628	6321	7100	8313	l/h
	Pressure drops plant side	19	18	22	21	28	kPa
	Water flow rate source side	6818	8059	9080	10193	11994	l/h
	Pressure drops source side	39	37	46	44	60	kPa
W30W18	Cooling capacity	34,8	41,1	45,9	51,7	60,5	kW
	Power input	5,91	6,94	7,83	8,79	10,4	kW
	EER	**5,89**	**5,92**	**5,86**	**5,88**	**5,82**	-
	Water flow rate plant side	6035	7121	7966	8966	10500	l/h
	Pressure drops plant side	30	27	34	33	44	kPa
	Water flow rate source side	7012	8274	9248	10408	12154	l/h
	Pressure drops source side	39	36	45	43	58	kPa
B30W18	Cooling capacity	34,1	40,3	45,2	50,8	59,4	kW
	Power input	6,03	7,08	8,01	8,98	10,6	kW
	EER	**5,66**	**5,69**	**5,64**	**5,66**	**5,60**	-
	Water flow rate plant side	5914	6983	7828	8811	10311	l/h
	Pressure drops plant side	28	26	33	32	43	kPa
	Water flow rate source side	7493	8849	9906	11149	13007	l/h
	Pressure drops source side	46	43	53	51	69	kPa

NOMINAL performances - Radiant plants

IH	Acoustic setting up : AB and AS	35.1	40.1	45.1	50.1	60.1	
W10W35	Heating capacity	36,4	43,0	48,2	54,3	63,7	kW
	Power input	6,84	8,03	9,12	10,2	12,2	kW
	COP	**5,32**	**5,35**	**5,29**	**5,32**	**5,22**	-
	Water flow rate plant side	6269	7412	8295	9352	10945	l/h
	Pressure drops plant side	32	29	36	35	47	kPa
	Water flow rate source side	8576	10143	11367	12822	15066	l/h
	Pressure drops source side	58	54	67	64	87	kPa
B0W35	Heating capacity	28,2	33,2	37,3	42,0	49,1	kW
	Power input	6,48	7,63	8,58	9,64	11,3	kW
	COP	**4,35**	**4,35**	**4,35**	**4,36**	**4,35**	-
	Water flow rate plant side	4866	5732	6442	7256	8468	l/h
	Pressure drops plant side	20	18	23	22	29	kPa
	Water flow rate source side	6990	8227	9277	10451	12249	l/h
	Pressure drops source side	41	38	48	46	62	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	35.1	40.1	45.1	50.1	60.1	
W10W45	Heating capacity	36,5	43,1	48,3	54,3	63,8	kW
	Power input	8,27	9,71	11,0	12,3	14,6	kW
	COP	**4,41**	**4,44**	**4,39**	**4,41**	**4,37**	-
	Water flow rate plant side	6309	7456	8342	9385	11001	l/h
	Pressure drops plant side	32	30	37	35	48	kPa
	Water flow rate source side	8182	9671	10835	12207	14380	l/h
	Pressure drops source side	53	49	61	59	80	kPa
B0W45	Heating capacity	28,3	33,4	37,4	42,0	49,3	kW
	Power input	7,93	9,33	10,5	11,7	13,7	kW
	COP	**3,57**	**3,58**	**3,56**	**3,59**	**3,60**	-
	Water flow rate plant side	4901	5787	6482	7282	8533	l/h
	Pressure drops plant side	20	18	23	22	30	kPa
	Water flow rate source side	6547	7734	8688	9767	11517	l/h
	Pressure drops source side	36	34	42	40	55	kPa
W30W7	Cooling capacity	26,5	31,3	35,1	39,5	46,2	kW
	Power input	5,80	6,82	7,65	8,60	9,99	kW
	EER	**4,57**	**4,59**	**4,59**	**4,59**	**4,62**	-
	Water flow rate plant side	4565	5389	6041	6796	7963	l/h
	Pressure drops plant side	17	16	20	19	26	kPa
	Water flow rate source side	5576	6581	7367	8288	9674	l/h
	Pressure drops source side	25	24	29	28	38	kPa
B30W7	Cooling capacity	26,0	30,7	34,5	38,8	45,4	kW
	Power input	5,90	6,94	7,78	8,74	10,2	kW
	EER	**4,41**	**4,42**	**4,43**	**4,44**	**4,45**	-
	Water flow rate plant side	4479	5286	5938	6676	7826	l/h
	Pressure drops plant side	17	16	19	19	25	kPa
	Water flow rate source side	5972	7048	7901	8885	10370	l/h
	Pressure drops source side	30	28	35	33	45	kPa

NOMINAL performances - Standard plants

IH	Acoustic setting up : AB and AS	35.1	40.1	45.1	50.1	60.1	
W10W45	Heating capacity	37,2	43,9	49,2	55,5	65,0	kW
	Power input	8,38	9,84	11,1	12,5	14,7	kW
	COP	**4,44**	**4,46**	**4,43**	**4,44**	**4,42**	-
	Water flow rate plant side	6430	7595	8498	9593	11210	l/h
	Pressure drops plant side	33	31	38	37	50	kPa
	Water flow rate source side	8359	9874	11064	12493	14694	l/h
	Pressure drops source side	55	51	63	61	83	kPa
B0W45	Heating capacity	28,9	34,0	38,1	43,1	50,3	kW
	Power input	8,02	9,44	10,6	12,0	13,9	kW
	COP	**3,60**	**3,60**	**3,59**	**3,59**	**3,62**	-
	Water flow rate plant side	5005	5892	6604	7456	8707	l/h
	Pressure drops plant side	21	19	24	23	31	kPa
	Water flow rate source side	6716	7896	8876	10022	11803	l/h
	Pressure drops source side	38	35	44	42	58	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 - HIGH temperature and VERY HIGH temperature plants

IP	Acoustic setting up : AB and AS	35.1	40.1	45.1	50.1	60.1	
W10W65	Heating capacity	39,2	46,4	51,9	58,5	68,5	kW
	Power input	11,9	13,9	15,6	17,6	20,4	kW
	COP	**3,29**	**3,34**	**3,33**	**3,32**	**3,36**	-
	Water flow rate plant side	3429	4059	4541	5109	5984	l/h
	Pressure drops plant side	10	9	12	11	15	kPa
	Water flow rate source side	7919	9406	10549	11864	14037	l/h
	Pressure drops source side	49	47	58	56	76	kPa
B0W65	Heating capacity	31,1	36,8	41,2	46,3	54,3	kW
	Power input	11,6	13,7	15,2	17,2	19,8	kW
	COP	**2,68**	**2,69**	**2,71**	**2,69**	**2,74**	-
	Water flow rate plant side	2721	3219	3604	4051	4750	l/h
	Pressure drops plant side	6	6	7	7	10	kPa
	Water flow rate source side	6267	7413	8367	9385	11167	l/h
	Pressure drops source side	33	31	39	38	52	kPa
W10W55	Heating capacity	37,6	44,5	49,8	56,0	65,6	kW
	Power input	9,75	11,5	12,9	14,4	16,9	kW
	COP	**3,86**	**3,87**	**3,86**	**3,89**	**3,88**	-
	Water flow rate plant side	4086	4838	5415	6091	7137	l/h
	Pressure drops plant side	14	13	16	16	21	kPa
	Water flow rate source side	8056	9548	10721	12064	14237	l/h
	Pressure drops source side	51	48	60	57	79	kPa
B0W55	Heating capacity	29,3	34,7	38,9	43,7	51,3	kW
	Power input	9,48	11,2	12,5	14,1	16,2	kW
	COP	**3,09**	**3,10**	**3,11**	**3,10**	**3,17**	-
	Water flow rate plant side	3193	3781	4239	4762	5579	l/h
	Pressure drops plant side	9	8	10	10	13	kPa
	Water flow rate source side	6379	7572	8526	9544	11326	l/h
	Pressure drops source side	35	32	41	39	54	kPa

NOMINAL performances - HIGH temperature and VERY HIGH temperature plants

IH	Acoustic setting up : AB and AS	35.1	40.1	45.1	50.1	60.1	
W10W65	Heating capacity	40,0	47,3	53,0	59,7	69,8	kW
	Power input	12,0	14,1	15,9	17,8	20,6	kW
	COP	**3,33**	**3,35**	**3,33**	**3,35**	**3,39**	-
	Water flow rate plant side	3499	4138	4628	5214	6098	l/h
	Pressure drops plant side	10	10	12	12	16	kPa
	Water flow rate source side	8119	9634	10778	12150	14351	l/h
	Pressure drops source side	52	49	60	58	80	kPa
B0W65	Heating capacity	31,8	37,5	42,0	47,4	55,3	kW
	Power input	11,7	13,8	15,5	17,4	20,0	kW
	COP	**2,72**	**2,72**	**2,71**	**2,72**	**2,77**	-
	Water flow rate plant side	2782	3281	3674	4147	4838	l/h
	Pressure drops plant side	7	6	8	7	10	kPa
	Water flow rate source side	6458	7604	8558	9672	11421	l/h
	Pressure drops source side	35	33	41	40	54	kPa
W10W55	Heating capacity	38,4	45,3	50,7	57,1	66,8	kW
	Power input	9,88	11,6	13,0	14,7	17,1	kW
	COP	**3,89**	**3,91**	**3,90**	**3,88**	**3,91**	-
	Water flow rate plant side	4173	4925	5514	6211	7268	l/h
	Pressure drops plant side	15	14	17	16	22	kPa
	Water flow rate source side	8259	9749	10949	12322	14523	l/h
	Pressure drops source side	54	50	62	60	82	kPa
B0W55	Heating capacity	30,0	35,3	39,6	44,7	52,3	kW
	Power input	9,60	11,3	12,7	14,2	16,5	kW
	COP	**3,13**	**3,12**	**3,12**	**3,15**	**3,17**	-
	Water flow rate plant side	3269	3846	4315	4871	5688	l/h
	Pressure drops plant side	9	8	11	10	14	kPa
	Water flow rate source side	6570	7731	8685	9831	11580	l/h
	Pressure drops source side	37	34	42	41	56	kPa

TECHNICAL DATA	35.1	40.1	45.1	50.1	60.1	
Power supply	400-3-50					V-ph-Hz
Compressor type	scroll with vapour injection (EVI)					-
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"1/2 M					-
Hydraulic fittings heat recovery (VD)	1"1/4 M					-

ACOUSTIC PERFORMANCES

Base acoustic setting up (AB)	35.1	40.1	45.1	50.1	60.1	
Sound power level	64	65	66	67	68	dB(A)
Sound pressure level at 1 metre	48	49	50	51	52	dB(A)
Sound pressure level at 5 metres	38	39	40	41	42	dB(A)
Sound pressure level at 10 metres	33	34	35	36	37	dB(A)
Low noise acoustic setting up (AS)	**35.1**	**40.1**	**45.1**	**50.1**	**60.1**	
Sound power level	58	59	60	61	62	dB(A)
Sound pressure level at 1 metre	42	43	44	45	46	dB(A)
Sound pressure level at 5 metres	32	33	34	35	36	dB(A)
Sound pressure level at 10 metres	27	28	29	30	31	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