

# > HGW 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 autonomous or centralized residential plants of medium and large size.

All the units are suitable for indoor installation. The possibility 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.

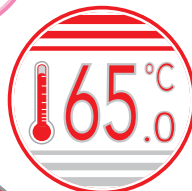
As source both water (from well, river, lake...) or brine solutions (from geothermic probes) can be used.

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 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.

Both the compressors are equipped with vapour and liquid injection and are placed on an economized refrigerant circuit equipped with a plate heat exchanger and an 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 indi-

vidually 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

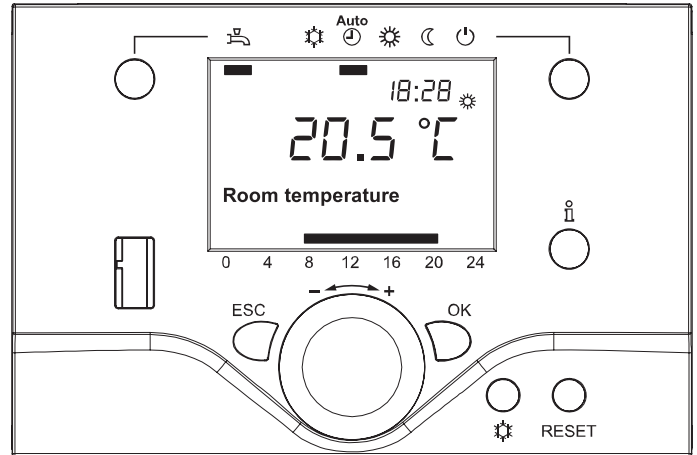
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

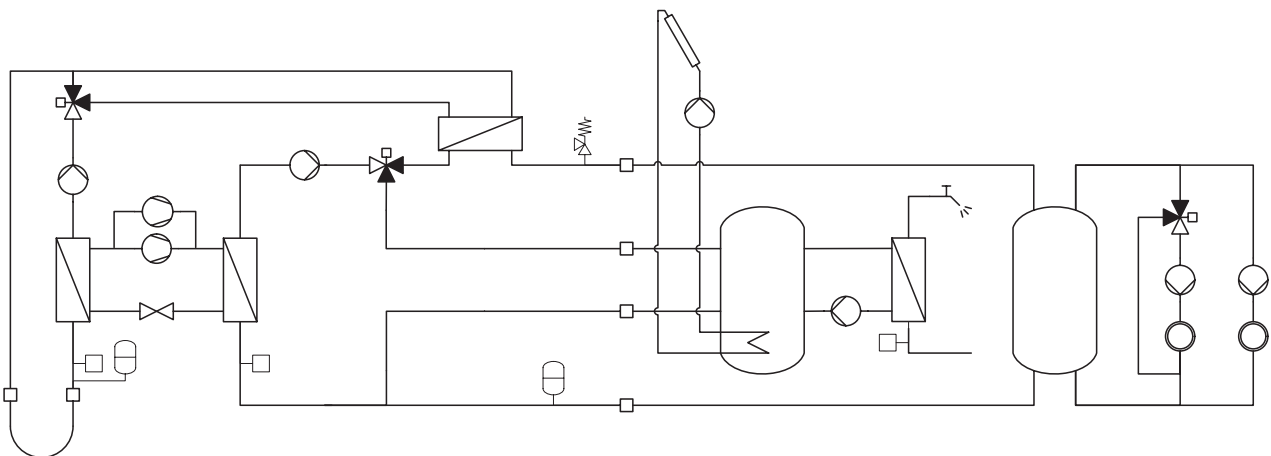
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles...)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct 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	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  $\Delta T$  between inlet and outlet equal to 10°C.

## NOMINAL performances - Radiant plants

IP	Acoustic setting up : AB and AS	70.2	80.2	90.2	100.2	120.2	
W10W35	Heating capacity	69,1	81,4	91,0	102	120	kW
	Power input	12,7	15,0	16,8	18,8	22,0	kW
	<b>COP</b>	<b>5,44</b>	<b>5,43</b>	<b>5,42</b>	<b>5,43</b>	<b>5,45</b>	-
	Water flow rate plant side	11915	14027	15673	17664	20625	l/h
	Pressure drops plant side	31	33	33	30	30	kPa
	Water flow rate source side	16267	19154	21384	24128	28131	l/h
	Pressure drops source side	30	33	33	30	30	kPa
B0W35	Heating capacity	53,5	62,9	70,3	79,1	92,6	kW
	Power input	12,1	14,3	16,1	18,0	21,2	kW
	<b>COP</b>	<b>4,42</b>	<b>4,40</b>	<b>4,37</b>	<b>4,39</b>	<b>4,37</b>	-
	Water flow rate plant side	9230	10858	12140	13664	15984	l/h
	Pressure drops plant side	19	21	21	19	19	kPa
	Water flow rate source side	13235	15557	17371	19566	22843	l/h
	Pressure drops source side	22	24	24	21	21	kPa
W30W18	Cooling capacity	67,3	79,1	88,4	99,6	116	kW
	Power input	11,3	13,2	14,9	16,6	19,6	kW
	<b>EER</b>	<b>5,96</b>	<b>5,99</b>	<b>5,93</b>	<b>6,00</b>	<b>5,92</b>	-
	Water flow rate plant side	11656	13707	15328	17259	20173	l/h
	Pressure drops plant side	29	32	32	29	29	kPa
	Water flow rate source side	13560	15932	17837	20071	23483	l/h
	Pressure drops source side	22	23	24	21	21	kPa
B30W18	Cooling capacity	66,1	77,6	86,9	97,9	114	kW
	Power input	11,4	13,4	15,1	16,9	19,9	kW
	<b>EER</b>	<b>5,80</b>	<b>5,79</b>	<b>5,75</b>	<b>5,79</b>	<b>5,73</b>	-
	Water flow rate plant side	11449	13449	15052	16949	19811	l/h
	Pressure drops plant side	28	31	31	28	28	kPa
	Water flow rate source side	14517	17036	19086	21493	25141	l/h
	Pressure drops source side	26	28	28	25	25	kPa

## NOMINAL performances - Radiant plants

IH	Acoustic setting up : AB and AS	70.2	80.2	90.2	100.2	120.2	
W10W35	Heating capacity	70,6	83,1	92,8	105	122	kW
	Power input	12,8	15,2	17,1	19,0	22,3	kW
	<b>COP</b>	<b>5,52</b>	<b>5,47</b>	<b>5,43</b>	<b>5,53</b>	<b>5,47</b>	-
	Water flow rate plant side	12157	14304	15984	18010	21041	l/h
	Pressure drops plant side	32	34	35	31	31	kPa
	Water flow rate source side	16638	19583	21841	24643	28760	l/h
	Pressure drops source side	32	34	35	31	31	kPa
B0W35	Heating capacity	54,5	64,2	71,6	80,8	94,4	kW
	Power input	12,3	14,5	16,4	18,3	21,5	kW
	<b>COP</b>	<b>4,43</b>	<b>4,43</b>	<b>4,37</b>	<b>4,42</b>	<b>4,39</b>	-
	Water flow rate plant side	9404	11083	12365	13941	16296	l/h
	Pressure drops plant side	20	22	22	19	20	kPa
	Water flow rate source side	13521	15939	17721	20011	23352	l/h
	Pressure drops source side	23	25	25	22	22	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	70.2	80.2	90.2	100.2	120.2	
<b>W10W45</b>	Heating capacity	70,6	83,2	92,9	105	122	kW
	Power input	15,7	18,5	20,8	23,1	27,2	kW
	<b>COP</b>	<b>4,50</b>	<b>4,50</b>	<b>4,47</b>	<b>4,55</b>	<b>4,49</b>	-
	Water flow rate plant side	12200	14373	16058	18092	21133	l/h
	Pressure drops plant side	32	34	35	31	31	kPa
	Water flow rate source side	15809	18640	20784	23471	27359	l/h
	Pressure drops source side	29	31	32	28	28	kPa
<b>B0W45</b>	Heating capacity	54,8	64,3	72,0	81,1	94,8	kW
	Power input	15,1	17,9	20,1	22,5	26,4	kW
	<b>COP</b>	<b>3,63</b>	<b>3,59</b>	<b>3,58</b>	<b>3,60</b>	<b>3,59</b>	-
	Water flow rate plant side	9489	11140	12461	14042	16423	l/h
	Pressure drops plant side	20	22	22	20	20	kPa
	Water flow rate source side	12694	14857	16607	18739	21888	l/h
Pressure drops source side	20	22	22	20	20	kPa	
<b>W30W7</b>	Cooling capacity	51,4	60,3	67,5	76,0	88,9	kW
	Power input	11,2	13,2	14,8	16,5	19,5	kW
	<b>EER</b>	<b>4,59</b>	<b>4,57</b>	<b>4,56</b>	<b>4,61</b>	<b>4,56</b>	-
	Water flow rate plant side	8838	10383	11618	13077	15291	l/h
	Pressure drops plant side	18	19	20	17	17	kPa
	Water flow rate source side	10806	12694	14218	15984	18721	l/h
Pressure drops source side	14	15	16	14	14	kPa	
<b>B30W7</b>	Cooling capacity	50,5	59,2	66,3	74,6	87,3	kW
	Power input	11,3	13,3	15,0	16,8	19,6	kW
	<b>EER</b>	<b>4,47</b>	<b>4,45</b>	<b>4,42</b>	<b>4,44</b>	<b>4,45</b>	-
	Water flow rate plant side	8684	10194	11412	12837	15016	l/h
	Pressure drops plant side	17	19	19	17	17	kPa
	Water flow rate source side	11583	13595	15231	17130	20045	l/h
Pressure drops source side	17	18	18	16	16	kPa	

## NOMINAL performances - Standard plants

IH	Acoustic setting up : AB and AS	70.2	80.2	90.2	100.2	120.2	
<b>W10W45</b>	Heating capacity	72,1	84,8	94,7	107	125	kW
	Power input	15,8	18,7	21,1	23,5	27,6	kW
	<b>COP</b>	<b>4,56</b>	<b>4,53</b>	<b>4,49</b>	<b>4,55</b>	<b>4,53</b>	-
	Water flow rate plant side	12461	14651	16371	18439	21568	l/h
	Pressure drops plant side	33	36	36	32	32	kPa
	Water flow rate source side	16210	19068	21241	23957	27988	l/h
	Pressure drops source side	30	33	33	29	29	kPa
<b>B0W45</b>	Heating capacity	55,8	65,7	73,4	82,7	96,6	kW
	Power input	15,3	18,1	20,3	22,7	26,7	kW
	<b>COP</b>	<b>3,65</b>	<b>3,63</b>	<b>3,62</b>	<b>3,64</b>	<b>3,62</b>	-
	Water flow rate plant side	9663	11383	12704	14320	16736	l/h
	Pressure drops plant side	21	23	23	20	20	kPa
	Water flow rate source side	12948	15271	16989	19184	22365	l/h
Pressure drops source side	21	23	23	20	20	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	70.2	80.2	90.2	100.2	120.2	
<b>W10W65</b>	Heating capacity	76,0	89,4	99,9	113	132	kW
	Power input	22,7	26,7	29,9	33,6	39,5	kW
	<b>COP</b>	<b>3,35</b>	<b>3,35</b>	<b>3,34</b>	<b>3,36</b>	<b>3,34</b>	-
	Water flow rate plant side	6640	7812	8731	9842	11496	l/h
	Pressure drops plant side	10	11	11	10	10	kPa
	Water flow rate source side	15352	18068	20155	22756	26501	l/h
	Pressure drops source side	27	30	30	27	27	kPa
<b>B0W65</b>	Heating capacity	60,3	70,9	79,3	89,3	104	kW
	Power input	22,2	26,3	29,4	33,1	38,9	kW
	<b>COP</b>	<b>2,72</b>	<b>2,70</b>	<b>2,70</b>	<b>2,70</b>	<b>2,67</b>	-
	Water flow rate plant side	5275	6203	6938	7812	9133	l/h
	Pressure drops plant side	7	7	8	7	7	kPa
	Water flow rate source side	12185	14285	15971	18007	20966	l/h
	Pressure drops source side	19	20	20	18	18	kPa
<b>W10W55</b>	Heating capacity	72,7	85,6	95,7	108	126	kW
	Power input	18,5	21,9	24,5	27,4	32,4	kW
	<b>COP</b>	<b>3,93</b>	<b>3,91</b>	<b>3,91</b>	<b>3,94</b>	<b>3,89</b>	-
	Water flow rate plant side	7911	9316	10406	11724	13708	l/h
	Pressure drops plant side	14	16	16	14	14	kPa
	Water flow rate source side	15609	18382	20498	23128	26959	l/h
	Pressure drops source side	28	31	31	27	27	kPa
<b>B0W55</b>	Heating capacity	57,0	66,9	74,9	84,3	98,5	kW
	Power input	18,2	21,4	24,1	27,0	31,8	kW
	<b>COP</b>	<b>3,13</b>	<b>3,13</b>	<b>3,11</b>	<b>3,12</b>	<b>3,10</b>	-
	Water flow rate plant side	6200	7279	8150	9175	10722	l/h
	Pressure drops plant side	9	10	10	9	9	kPa
	Water flow rate source side	12408	14539	16257	18325	21347	l/h
	Pressure drops source side	19	21	21	19	19	kPa

**NOMINAL performances - HIGH temperature and VERY HIGH temperature plants**

IH	Acoustic setting up : AB and AS	70.2	80.2	90.2	100.2	120.2	
<b>W10W65</b>	Heating capacity	77,5	91,2	102	115	134	kW
	Power input	22,8	26,9	30,4	33,9	39,8	kW
	<b>COP</b>	<b>3,40</b>	<b>3,39</b>	<b>3,36</b>	<b>3,39</b>	<b>3,37</b>	-
	Water flow rate plant side	6771	7970	8906	10035	11723	l/h
	Pressure drops plant side	11	12	12	11	11	kPa
	Water flow rate source side	15752	18525	20612	23299	27159	l/h
	Pressure drops source side	29	31	31	28	28	kPa
<b>B0W65</b>	Heating capacity	61,4	72,3	80,8	91,2	106	kW
	Power input	22,5	26,5	29,9	33,5	39,3	kW
	<b>COP</b>	<b>2,73</b>	<b>2,73</b>	<b>2,70</b>	<b>2,72</b>	<b>2,70</b>	-
	Water flow rate plant side	5372	6325	7060	7970	9308	l/h
	Pressure drops plant side	7	8	8	7	7	kPa
	Water flow rate source side	12471	14666	16289	18452	21475	l/h
	Pressure drops source side	19	21	21	19	19	kPa
<b>W10W55</b>	Heating capacity	74,2	87,3	97,6	110	128	kW
	Power input	18,7	22,1	24,9	27,8	32,7	kW
	<b>COP</b>	<b>3,97</b>	<b>3,95</b>	<b>3,92</b>	<b>3,96</b>	<b>3,91</b>	-
	Water flow rate plant side	8074	9502	10613	11953	13980	l/h
	Pressure drops plant side	15	16	16	15	15	kPa
	Water flow rate source side	15981	18811	20955	23642	27588	l/h
	Pressure drops source side	29	32	32	29	29	kPa
<b>B0W55</b>	Heating capacity	58,0	68,3	76,3	86,0	100	kW
	Power input	18,4	21,6	24,4	27,3	32,1	kW
	<b>COP</b>	<b>3,15</b>	<b>3,16</b>	<b>3,13</b>	<b>3,15</b>	<b>3,12</b>	-
	Water flow rate plant side	6309	7431	8303	9360	10940	l/h
	Pressure drops plant side	10	10	11	9	9	kPa
	Water flow rate source side	12662	14953	16607	18770	21888	l/h
	Pressure drops source side	20	22	22	20	20	kPa

TECHNICAL DATA	70.2	80.2	90.2	100.2	120.2	
Power supply	400-3-50					V-ph-Hz
Compressor type	scroll with vapour injection (EVI)					-
N° compressors / N° refrigerant circuits	2 / 1					n°
Plant side heat exchanger type	stainless steel brazed plates					-
Source side heat exchanger type	stainless steel brazed plates					-
Hydraulic fittings	2" M					-
Hydraulic fittings heat recovery (VD)	1"1/4 M					-

## ACOUSTIC PERFORMANCES

Base acoustic setting up (AB)	70.2	80.2	90.2	100.2	120.2	
Sound power level	71	72	73	74	75	dB(A)
Sound pressure level at 1 metre	55	56	57	58	59	dB(A)
Sound pressure level at 5 metres	45	46	47	48	49	dB(A)
Sound pressure level at 10 metres	39	40	41	42	43	dB(A)
Low noise acoustic setting up (AS)	70.2	80.2	90.2	100.2	120.2	
Sound power level	65	66	67	68	69	dB(A)
Sound pressure level at 1 metre	49	50	51	52	53	dB(A)
Sound pressure level at 5 metres	39	40	41	42	43	dB(A)
Sound pressure level at 10 metres	34	35	36	37	38	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

