

# **PHTJ**

## **HIGH TEMPERATURE HEAT PUMP WITH HYDRAULIC EQUIPMENT AIR / WATER 14 and 20 kW**




**For boiler overhaul and boiler substitution applications**

### **Heating**

**PHTJ 14: 14.30 kW (single) - 14.10 kW (three)**

**PHTJ 19: 20.70 kW**

## MARKING

This product marked  conforms to the essential requirements of the Directives:

- Low voltage no. 2006/95/EC.
- Electromagnetic Compatibility no. 89/336 EEC, modified 92/31 and 93/68 EEC.



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### APPLIANCES FILLED WITH R 407 C

#### R 407 C

- Fluid R 407 C is not a pure fluid but a blend composed of:
  - 23% R 32 + 25% R 125 + 52% R 134 A.
- The compressors approved for operation with this fluid are filled beforehand with polyalcohol oil.

Contrary to mineral oil, it is very hygroscopic: it absorbs the humidity of the ambient air very quickly. This can modify its lubricant properties and lead in time to the destruction of the compressor.

#### MAINTENANCE INSTRUCTIONS

- 1 - Never add oil to the appliance; the compressor is filled with polyalcohol oil, a special oil which cannot tolerate the presence of other oils.
- 2 - The instruments used for:
  - filling,
  - pressure measurements,
  - emptying under vacuum,
  - recovering the fluid,must be compatible and only used for the R 407 C fluid.
- 3 - The weight of the refrigerant contained in the storage bottle must be checked constantly. Do not use it from the moment the remaining weight is less than 10% of the total weight.

- 4 - In the case of a new charge:

- do not use the charging cylinder,
- use a balance and a dip pipe type R 407 C cylinder,
- charge the weight of R 407 C as per the value indicated on the unit's identification plate,
- **IMPORTANT:** see instruction 3 above.

- 5 - The charge **must** be undertaken in liquid phase.

- 6 - In case of leakage, do not complete the charge: recover the remaining refrigerant for recycling and perform a total charge.

Recovery, recycling or the destruction of the fluid must be done in compliance with the laws in force in the country concerned.

- 7 - If the refrigerant circuit is opened, you must:

- avoid the entry of air into the circuit as much as possible,
- replace the filter drier,
- perform the "vacuum operation" at a minimum level of **0.3 mbar (static)**.

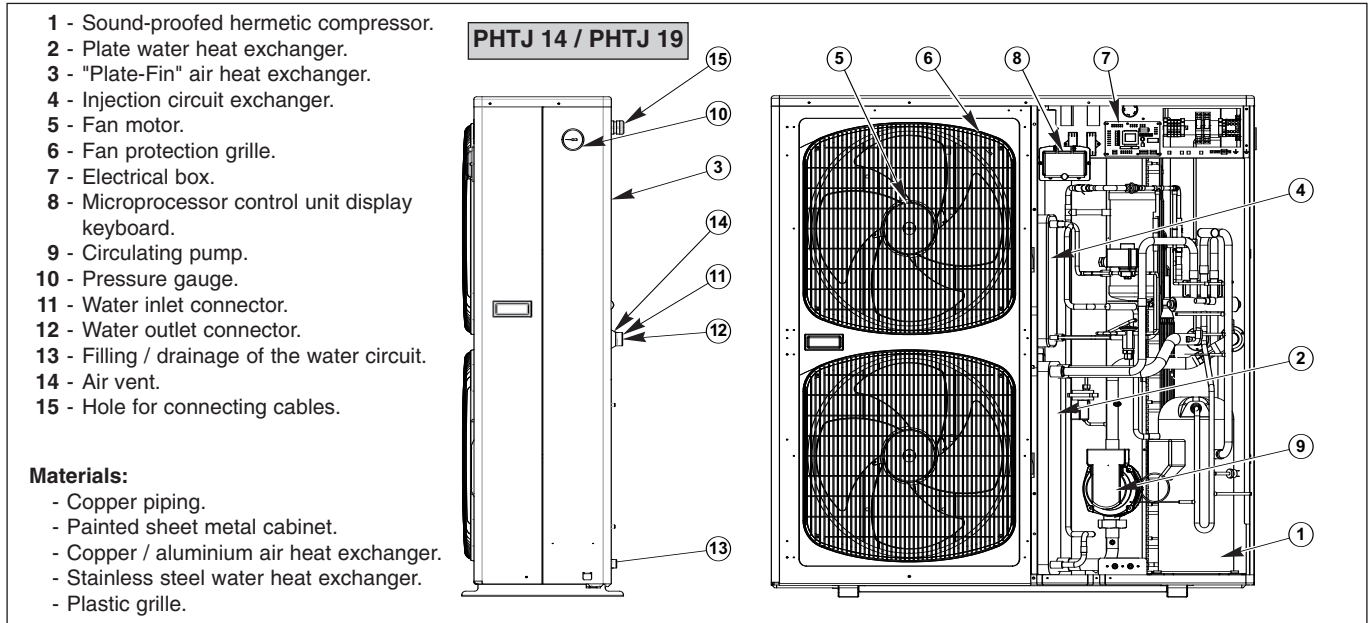
- 8 - Do not release R 407 C fluid into the atmosphere. This fluid is a fluorinated greenhouse gases, covered by the Kyoto Protocol with a Global Warming Potential (GWP) = 1653 - (EC Directive 842 / 2006).

## 1 - APPLICATION - USE

- Hot water generator for heating in buildings for **boiler substitution** applications.

## 2 - PRESENTATION

### 2.1 - DESCRIPTION



**NOTE:** The units are supplied with a water filter which is to be installed on the water intake.

### 2.2 - ELECTRICAL EQUIPMENT

- Per EN 60 335-2-40.
- "ECH" electronic control with fan speed control.
- Pressure safety cutout.
- Water flow detector.
- Compressor starter with current limiter (for single phase devices).
- Phase order controller (for three-phase devices).

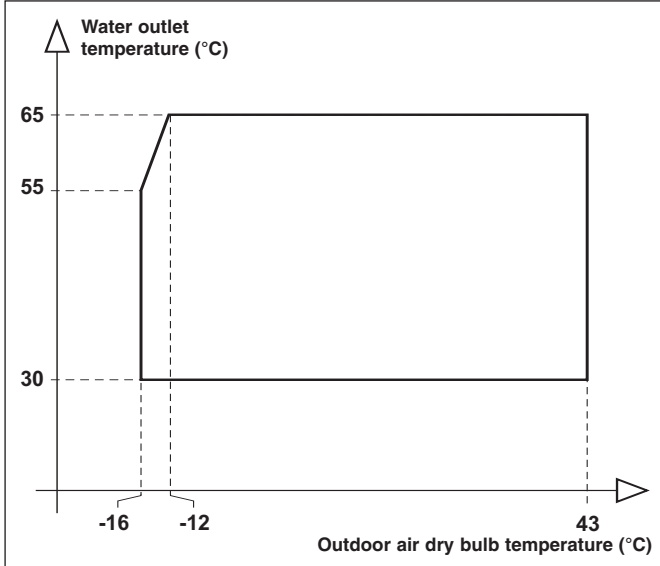
## 3 - TECHNICAL CHARACTERISTICS

Model	PHTJ 14 single	PHTJ 14 three	PHTJ 19
<b>Conditions:</b> water inlet / outlet temperature 40/45 and air inlet temperature 7/6 (dry / damp)			
Heating capacity (in kW)	14.3	14.1	20.7
Power consumption (in kW)	4.54	4.34	6.97
COP (Performance factor)	3.15	3.25	2.97
Nominal water flow (in m <sup>3</sup> /h)	2.55	2.43	3.45
<b>Conditions:</b> water inlet / outlet temperature *1/45 and air inlet temperature -7/-8 (dry / damp)			
Heating capacity (in kW)	8.6	8.4	12.8
Power consumption (in kW)	4.43	4.22	6.31
COP (Performance factor)	1.94	1.99	2.03
Nominal water flow (in m <sup>3</sup> /h)	2.55	2.43	3.45
<b>Conditions:</b> water inlet / outlet temperature 47/55 and air inlet temperature 7/6 (dry / damp)			
Heating capacity (in kW)	13.65	13.3	20.4
Power consumption (in kW)	5.33	5.04	7.55
COP (Performance factor)	2.56	2.64	2.70
Nominal water flow (in m <sup>3</sup> /h)	1.55	1.43	2.3
<b>Conditions:</b> water inlet / outlet temperature 55/65 and air inlet temperature 7/6 (dry / damp)			
Heating capacity (in kW)	13	12.5	20.1
Power consumption (in kW)	6.39	6.01	9.14
COP (Performance factor)	2.03	2.08	2.2
Nominal water flow (in m <sup>3</sup> /h)	1.25	1.08	1.8
<b>Conditions:</b> water inlet / outlet temperature 30/35 and air inlet temperature 7/6 (dry / damp)			
COP (Performance factor)	3.8	4.02	3.36
Total maximum power consumption (in kW)	6.5	6.1	9.8
Total maximum current consumption (in A)	32	13	19.3
Electric power supply	230 / 1 / 50	400 / 3N / 50	400 / 3N / 50

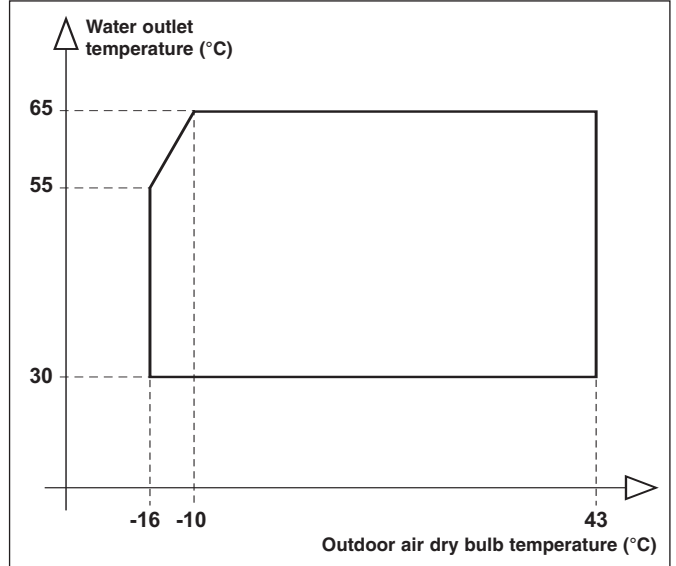
**Note:** Power consumption and COP net values.  
 Water circuit pressure : 2 bar.  
 Available pressure : see paragraph 8.  
 Noise level : see paragraph 9.

**OPERATING LIMITS (pure water)**

**PHTJ 14**



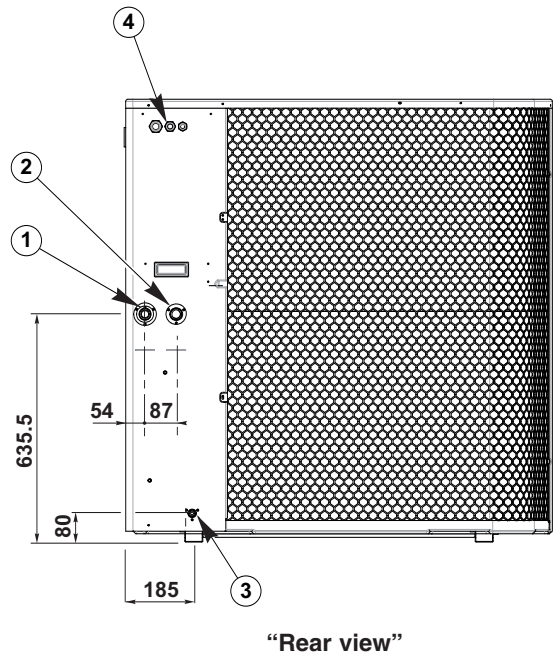
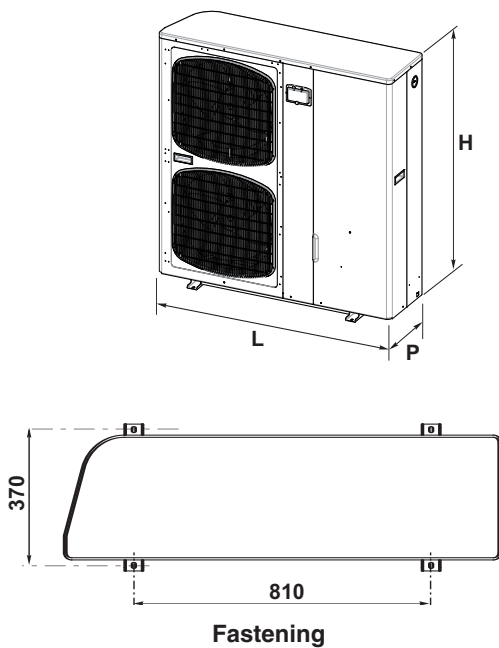
**PHTJ 19**



**4 - PHYSICAL CHARACTERISTICS**

Model		PHTJ 14	PHTJ 19
<b>Dimensions</b>	L	mm	1,190
	H	mm	1,235
	P	mm	340
	Weight	kg	141
<b>Dimensions packaged</b>	L	mm	1,270
	H	mm	1,420
	P	mm	420
	Weight	kg	154

1	Water inlet connection (male) with air vent valve
2	Water outlet connection (male)
3	Water circuit fill/drain
4	Holes for electric cables



## 5 - DESCRIPTION

Model	PHTJ 14 single	PHTJ 14 three	PHTJ 19
<b>Hermetic compressor</b>	<b>Scroll</b>	<b>Scroll</b>	<b>Scroll</b>
with thermal protection			
Sound insulation cover	●	●	●
Power supply	●		
Start-up current	45	64	101
<b>Direct drive propeller fan motor</b>			
with thermal protection, horizontal blowing			
Total air flow			
Propellor diameter	460	460	460
Power supply	●	●	●
Rotation speed	770	770	1,090
Current	1.4	1.4	2.7
Power input	0.280	0.280	0.620
<b>Air exchanger</b>	●	●	●
with louver fins and water-repellant treatment			
Expansion system	●	●	●
<b>Water exchanger</b> Plate-type stainless steel water treatment section	●	●	●
Water capacity	1.8	1.8	2.4
Expansion system	●	●	●
<b>Injection circuit exchanger</b> Plate-type stainless steel water treatment section	●	●	●
Expansion system	●	●	●
<b>Charged internal cooling system</b>			
with HP and LP switch			
<b>R 407 C refrigerant</b> Total charge	2.5	2.5	3
<b>Circulating pump</b>	●	●	●
Current	1.3	1.3	1.6
Power input	0.28	0.28	0.32
Power supply	●	●	●
<b>Pressure gauge</b> (0 to 6 bar)	●	●	●
<b>Air vent valve</b>	●	●	●
<b>Hydraulic system</b>			
Male connections			
Water capacity of the unit	2.8	2.8	3.4
Water flow rate detection pressure differential cut-out	●	●	●
Water filter supplied, uninstalled	●	●	●
<b>Water volume in system</b>			
Minimum water volume (*)	45	45	65
<b>Mains power supply</b>			
Power supply	●		
<b>Equipment protection index</b>	IP 24	IP 24	IP 24

(\*) If the water volume of the system is below the minimum, a buffer tank must be installed.

### Note:

These devices are not fitted with an expansion tank or a safety valve. These elements must be incorporated into the installation's hydraulic circuit.

# 6 - POWER TABLES

PHTJ 14  
single

Outdoor dry bulb temperature (°C)	Heating capacity (kW)			Input power (kW)		
	Water outlet temperature			Water outlet temperature		
	45° C	55° C	65° C	45° C	55° C	65° C
-16	6.54	6.43		4.34	5.12	
-15	6.72	6.61		4.35	5.12	
-14	6.90	6.79		4.36	5.12	
-13	7.09	6.98		4.37	5.12	
-12	7.27	7.16	7.01	4.38	5.13	6.02
-11	7.46	7.35	7.20	4.39	5.13	6.03
-10	7.64	7.53	7.38	4.40	5.14	6.04
-9	7.96	7.88	7.79	4.41	5.14	6.05
-8	8.28	8.23	8.17	4.42	5.15	6.06
-7	8.60	8.58	8.55	4.43	5.15	6.07
-6	8.70	8.65	8.60	4.44	5.15	6.08
-5	8.80	8.73	8.65	4.45	5.16	6.10
-4	8.90	8.80	8.70	4.46	5.16	6.12
-3	9.00	8.87	8.75	4.47	5.17	6.15
-2	9.10	8.95	8.80	4.48	5.17	6.17
-1	9.20	9.02	8.85	4.49	5.18	6.19
0	9.30	9.09	8.90	4.50	5.18	6.21
1	9.35	9.16	8.95	4.51	5.19	6.23
2	9.50	9.24	9.00	4.52	5.19	6.25
3	10.46	10.12	9.80	4.53	5.22	6.28
4	11.42	11.00	10.60	4.53	5.25	6.31
5	12.38	11.88	11.40	4.54	5.27	6.33
6	13.34	12.76	12.20	4.54	5.30	6.36
7	14.30	13.65	13.00	4.54	5.33	6.39
8	14.41	13.78	13.15	4.54	5.32	6.39
9	14.51	13.90	13.30	4.54	5.32	6.39
10	14.62	14.03	13.45	4.54	5.31	6.39
11	14.72	14.16	13.60	4.54	5.30	6.39
12	14.83	14.29	13.75	4.54	5.30	6.39
13	14.93	14.41	13.90	4.53	5.29	6.38
14	15.04	14.54	14.05	4.53	5.28	6.38
15	15.14	14.67	14.20	4.53	5.27	6.38
16	15.25	14.79	14.35	4.53	5.27	6.38
17	15.35	14.92	14.50	4.53	5.26	6.38
18	15.46	15.05	14.65	4.53	5.25	6.38
19	15.56	15.17	14.85	4.53	5.25	6.38
20	15.67	15.30	15.00	4.53	5.24	6.38
21	15.83	15.46	15.07	4.53	5.23	6.36
22	15.99	15.62	15.14	4.53	5.23	6.34
23	16.14	15.78	15.21	4.53	5.22	6.33
24	16.30	15.94	15.28	4.53	5.22	6.31
25	16.46	16.10	15.35	4.53	5.21	6.29
26	16.62	16.26	15.41	4.53	5.21	6.27
27	16.78	16.42	15.48	4.53	5.20	6.25
28	16.93	16.58	15.55	4.53	5.20	6.23
29	17.09	16.74	15.62	4.53	5.19	6.22
30	17.25	16.90	15.69	4.53	5.18	6.20
31	17.41	17.06	15.76	4.54	5.18	6.18
32	17.57	17.22	15.83	4.54	5.17	6.16
33	17.72	17.38	15.90	4.54	5.17	6.14
34	17.88	17.54	15.97	4.54	5.16	6.12
35	18.04	17.70	16.04	4.54	5.16	6.11
36	18.20	17.86	16.10	4.54	5.15	6.09
37	18.36	18.02	16.17	4.54	5.14	6.07
38	18.51	18.18	16.24	4.54	5.14	6.05
39	18.67	18.34	16.31	4.54	5.13	6.03
40	18.83	18.50	16.38	4.54	5.13	6.01
41	18.99	18.66	16.45	4.54	5.12	6.00
42	19.15	18.82	16.52	4.54	5.12	5.98
43	19.30	18.98	16.59	4.54	5.11	5.96

PHTJ 14  
three

		Heating capacity (kW)			Input power (kW)		
		Water outlet temperature			Water outlet temperature		
		45° C	55° C	65° C	45° C	55° C	65° C
Outdoor dry bulb temperature (°C)	-16	6.34	6.13		4.14	4.81	
	-15	6.52	6.31		4.15	4.81	
	-14	6.70	6.49		4.16	4.81	
	-13	6.89	6.68		4.17	4.81	
	-12	7.07	6.86	6.51	4.18	4.82	5.62
	-11	7.26	7.05	6.70	4.19	4.82	5.63
	-10	7.44	7.23	6.88	4.20	4.83	5.64
	-9	7.76	7.58	7.29	4.21	4.83	5.65
	-8	8.08	7.93	7.67	4.22	4.84	5.66
	-7	8.40	8.28	8.05	4.22	4.84	5.67
	-6	8.50	8.35	8.10	4.24	4.84	5.68
	-5	8.60	8.43	8.15	4.25	4.85	5.70
	-4	8.70	8.50	8.20	4.26	4.85	5.72
	-3	8.80	8.57	8.25	4.27	4.86	5.75
	-2	8.90	8.65	8.30	4.28	4.86	5.77
	-1	9.00	8.72	8.35	4.29	4.87	5.79
	0	9.10	8.74	8.40	4.30	4.87	5.81
	1	9.15	8.81	8.45	4.31	4.89	5.83
	2	9.30	8.89	8.50	4.32	4.89	5.85
	3	10.26	9.77	9.30	4.325	4.92	5.88
	4	11.22	10.65	10.10	4.33	4.95	5.91
	5	12.18	11.53	10.90	4.335	4.97	5.93
	6	13.14	12.41	11.70	4.34	5.02	5.96
	7	14.10	13.30	12.50	4.34	5.04	6.01
	8	14.21	13.43	12.65	4.34	5.03	6.01
	9	14.31	13.55	12.80	4.34	5.03	6.00
	10	14.42	13.68	12.95	4.34	5.02	6.00
	11	14.52	13.81	13.10	4.34	5.00	5.99
	12	14.63	13.94	13.25	4.34	5.00	5.99
	13	14.73	14.06	13.40	4.33	4.99	5.98
	14	14.84	14.19	13.55	4.33	4.98	5.98
	15	14.94	14.32	13.70	4.33	4.97	5.98
	16	15.05	14.44	13.85	4.33	4.97	5.98
	17	15.15	14.57	14.00	4.33	4.96	5.98
	18	15.26	14.70	14.15	4.33	4.95	5.98
	19	15.36	14.82	14.35	4.33	4.95	5.98
	20	15.47	14.95	14.50	4.33	4.94	5.98
	21	15.63	15.11	14.57	4.33	4.93	5.96
	22	15.79	15.27	14.64	4.33	4.93	5.94
	23	15.94	15.43	14.71	4.33	4.92	5.93
	24	16.10	15.59	14.78	4.33	4.92	5.91
	25	16.26	15.75	14.85	4.33	4.91	5.89
	26	16.42	15.91	14.91	4.33	4.91	5.87
	27	16.58	16.07	14.98	4.33	4.90	5.85
28	16.73	16.23	15.05	4.33	4.90	5.83	
29	16.89	16.39	15.12	4.33	4.89	5.82	
30	17.05	16.55	15.19	4.33	4.88	5.80	
31	17.21	16.71	15.26	4.34	4.88	5.78	
32	17.37	16.87	15.33	4.34	4.87	5.76	
33	17.52	17.03	15.40	4.34	4.87	5.74	
34	17.68	17.19	15.47	4.34	4.86	5.72	
35	17.84	17.35	15.54	4.34	4.86	5.71	
36	18.00	17.51	15.60	4.34	4.85	5.69	
37	18.16	17.67	15.67	4.34	4.84	5.67	
38	18.31	17.83	15.74	4.34	4.84	5.65	
39	18.47	17.99	15.81	4.34	4.84	5.63	
40	18.63	18.15	15.88	4.34	4.83	5.61	
41	18.79	18.31	15.95	4.34	4.82	5.60	
42	18.95	18.47	16.02	4.34	4.82	5.58	
43	19.10	18.63	16.09	4.34	4.81	5.56	

		Heating capacity (kW)			Input power (kW)		
		Water outlet temperature			Water outlet temperature		
		45° C	55° C	65° C	45° C	55° C	65° C
Outdoor dry bulb temperature (°C)	-16	9.83	9.73		6.21	7.38	
	-15	10.16	10.06		6.22	7.39	
	-14	10.49	10.39		6.23	7.40	
	-13	10.82	10.72		6.24	7.41	
	-12	11.15	11.05		6.25	7.42	
	-11	11.48	11.38		6.26	7.43	
	-10	11.81	11.71	11.61	6.27	7.44	8.98
	-9	12.14	12.04	11.94	6.28	7.45	8.99
	-8	12.47	12.37	12.27	6.29	7.46	8.99
	-7	12.80	12.70	12.60	6.30	7.47	9.00
	-6	13.06	12.96	12.86	6.31	7.48	9.01
	-5	13.32	13.22	13.12	6.32	7.49	9.01
	-4	13.57	13.47	13.37	6.33	7.49	9.02
	-3	13.83	13.73	13.63	6.34	7.50	9.02
	-2	14.08	13.98	13.88	6.36	7.51	9.03
	-1	14.34	14.24	14.14	6.37	7.52	9.03
	0	14.59	14.49	14.39	6.38	7.52	9.04
	1	14.85	14.75	14.65	6.39	7.53	9.04
	2	15.10	15.00	14.90	6.40	7.54	9.05
	3	16.22	16.08	15.94	6.51	7.54	9.07
	4	17.34	17.16	16.98	6.63	7.54	9.09
	5	18.46	18.24	18.02	6.74	7.55	9.10
	6	19.58	19.32	19.06	6.86	7.55	9.12
	7	20.70	20.40	20.10	6.97	7.55	9.14
	8	21.07	20.75	20.44	6.97	7.61	9.16
	9	21.44	21.11	20.78	6.97	7.67	9.18
	10	21.81	21.46	21.12	6.98	7.73	9.20
	11	22.18	21.81	21.46	6.98	7.79	9.22
	12	22.55	22.17	21.80	6.98	7.85	9.24
	13	22.92	22.52	22.13	6.98	7.91	9.25
	14	23.29	22.88	22.47	6.98	7.97	9.27
	15	23.66	23.23	22.81	6.99	8.03	9.29
	16	24.02	23.58	23.15	6.99	8.09	9.31
	17	24.39	23.94	23.49	6.99	8.15	9.33
	18	24.76	24.29	23.82	6.99	8.21	9.35
	19	25.13	24.65	24.16	6.99	8.27	9.37
	20	25.50	25.00	24.50	7.00	8.33	9.39
	21	25.59	25.09	24.59	7.00	8.33	9.39
	22	25.68	25.18	24.68	7.00	8.33	9.39
	23	25.76	25.26	24.76	7.00	8.33	9.39
	24	25.85	25.35	24.85	7.00	8.33	9.39
	25	25.94	25.44	24.94	7.01	8.33	9.39
	26	26.02	25.52	25.02	7.01	8.33	9.39
27	26.11	25.61	25.11	7.01	8.34	9.39	
28	26.20	25.70	25.20	7.01	8.34	9.39	
29	26.28	25.78	25.28	7.01	8.34	9.39	
30	26.37	25.87	25.37	7.01	8.34	9.39	
31	26.46	25.96	25.46	7.01	8.34	9.39	
32	26.54	26.04	25.54	7.02	8.34	9.39	
33	26.63	26.13	25.63	7.02	8.34	9.40	
34	26.72	26.22	25.72	7.02	8.34	9.40	
35	26.80	26.30	25.80	7.02	8.34	9.40	
36	26.89	26.39	25.89	7.02	8.34	9.40	
37	26.98	26.48	25.98	7.02	8.35	9.40	
38	27.07	26.57	26.07	7.02	8.35	9.40	
39	27.15	26.65	26.15	7.02	8.35	9.40	
40	27.24	26.74	26.24	7.02	8.35	9.40	
41	27.33	26.83	26.33	7.02	8.35	9.40	
42	27.41	26.91	26.41	7.02	8.35	9.40	
43	27.50	27.00	26.50	7.02	8.35	9.40	



## 7 - CORRECTIONS TO BE MADE WHEN USING ANTI-FREEZE

### IMPORTANT:

Use monopropylene glycol.

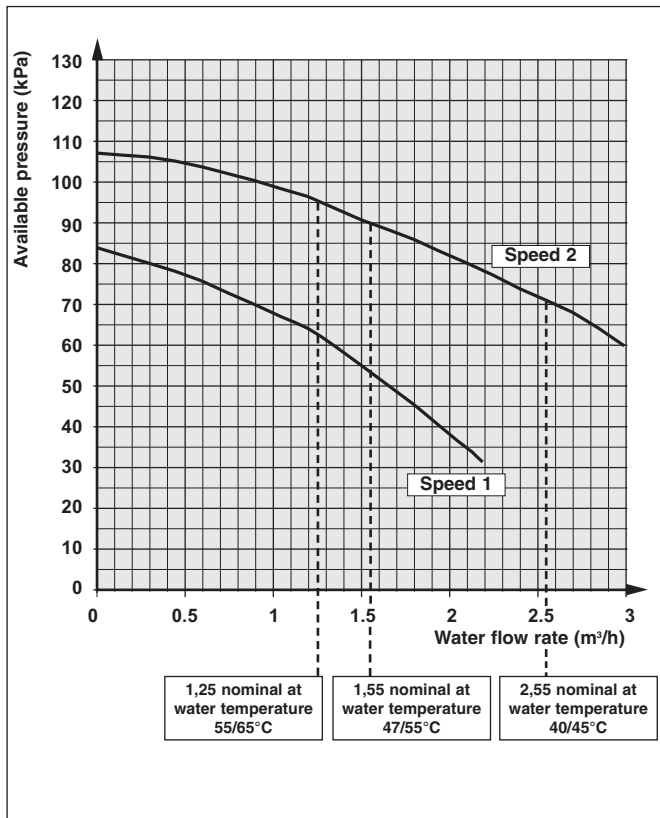
A minimum rate of 15% to 20% is needed to avoid any risk of corrosion.

Performance correction with 30 % glycol (protection to -15°C):

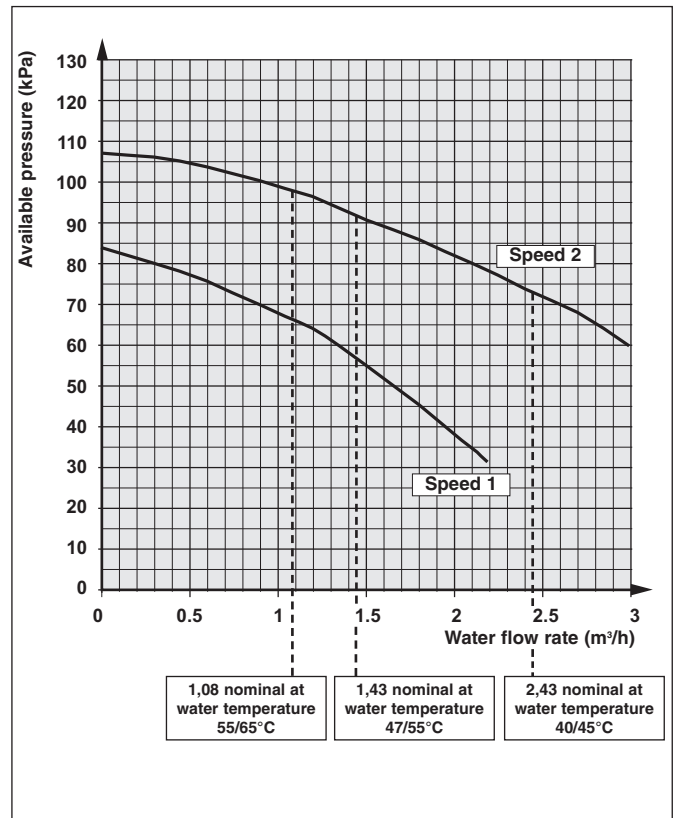
- Heating capacity = coefficient 1.
- Water flow = coefficient 1.04.
- Loss of water pressure = coefficient 1.23.

## 8 - CURVES OF AVAILABLE PRESSURES (on unit's outlet)

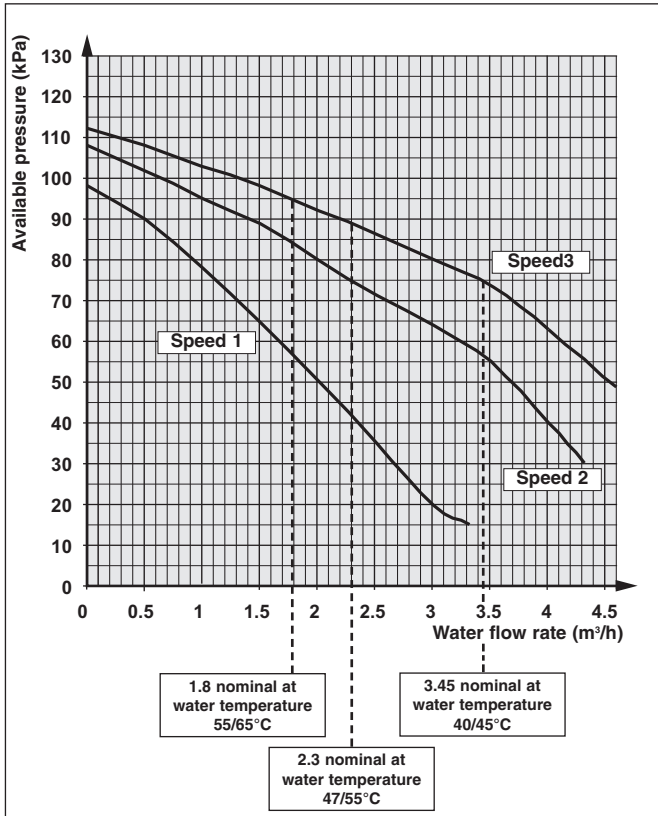
PHTJ 14  
single



PHTJ 14  
three



## PHTJ 19



## 9 - SOUND LEVELS

Model	Powerlevel L <sub>w</sub> (dBA)	Sound-pressure level L <sub>p</sub> (dBA)
PHTJ 14	67	39
PHTJ 19	73	45

### Sound-pressure level:

Unit installed outdoors (free field) on a reflective surface.  
Measurement carried out at a distance of 10 m.

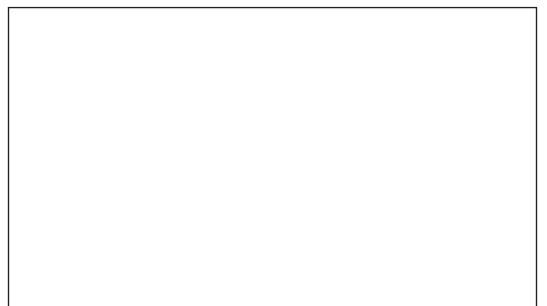


## 10 - ACCESSORIES

	PHTJ 14	PHTJ 19
Set of 2 flexible hoses length 1 m Ø 1"	●	●
Remote control	●	●
RS 485 communication interface (MODBUS protocol)	●	●
Insulated tank 35 liters 6 branch connection	●	●
Insulated tank 70 liters 6 branch connection	●	●

## 11 - "ECH" ELECTRONIC CONTROL

- Microprocessor control module, including:
  - chilled water temperature control (water return),
  - control of operating parameters,
  - self-adapting algorithm for water volume reduction,
  - circulating pump control (frost protection and anti-sticking function),
  - anti-short cycle system,
  - hour counter compressor and circulating pump,
  - alarm management,
  - anti-freeze security (water exchanger),
  - digital display of:
    - . water temperature,
    - . set-point,
    - . alarm code (HP, LP, water output, probes, anti-freeze...).
  - remote alarm reporting is possible via a potential-free contact,
  - integrated pressure regulation by fan speed control,
  - heating cord control (accessory),
  - remote control with display unit (accessory),
  - serial communications port (RS 485 interface, accessory) - MODBUS Protocol.



Due to our policy of continuous development, our products are liable to modification without notice.

**Technibel**

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