

# HRCF- II Series

5kw – 50kw

*AIR COOLED WATER CHILLERS AND  
HEAT PUMPS WITH AXIAL FANS*

R407C



Mod: 5, 7, 8.5



Mod: 20, 25, 30



Mod: 10, 12.5, 15



Mod: 40, 45, 50

## Unit description

HCF/HRCF series packaged air cooled heat pump water chiller are designed for outdoor installation and for both residential and commercial applications with the ability of 24 hours/day operation. The units are fully factory tested. The range is made up of 12 models cooling only and heat pump units, with cooling capacities from 5 to 50 kW in the following versions:

HCF Cooling only 5-7-8.5-10-12.5-15-20-25-30-40-45-50

HRCF Heat pump 5-7-8.5-10-12.5-15-20-25-30-40-45-50

## Features

### Structure

Panels and base frame are made from galvanized steel protected with polyester powder coating to ensure total resistance to atmospheric agents.

### Hermetic compressors

Single phase rotary compressor (mod. 5 only) and 3-phase scroll compressor (mod.7-50) with thermal overload cut-out and crankcase heater, mounted on rubber vibration isolators. The compressor is located in a separate compartment to the condenser. Models 7-10 are available also with single phase scroll compressor.

### Axial fans

External rotor type axial fans, equipped with single phase direct drive motors, low noise 6 poles, protection level IP54, provided with a protective outlet grille.

### Evaporator

High efficiency AISI 316 stainless steel brazed plate heat exchanger, insulated with flexible close cell material to reduce heat losses.

### Condenser

Built with high efficiency internal screw threads red copper tube mechanically expanded into hydrophilic aluminum fins, provided with protective grille.

### Refrigerant circuit

Copper tube connected with charge valve, one way valve, filter drier, sight glass, thermal expansion valve (expansion capillary tubes for mod 5-10), gas-liquid separator, high pressure switch with manual reset, low pressure switch with automatic reset. The heat pump versions are available also with 4-way valve, liquid receiver.

### Hydronic circuit

Built with inertial water storage tank (mod.5-15 with rectangle shape carbon steel plate, mod.20-50 with cylinder shape stainless plate), air vent valve, water drain connection, safety valve, water pump(mod.5-30kW), expansion vessel, pressure difference switch and female-threaded hydraulic connections.

## Power and electrical control panel

- Electrical enclosure accessible from side panel.
- Main switch;
- Transformer 220V/24V for general alarm;
- Compressor contactor;
- Water pump contactor (only for 3-phase power supplied units);
- Compressor protection breaker;
- Water pump protection breaker (only for 3-phase power supplied units);
- Fan motor protection breaker;
- Control circuit protection breaker;
- Phase sequence relay (only for 3-phase power supplied units);
- Fan speed regulator (for mod. 20-50)
- Programmable microprocessor controller;
- Output for remote line controller;
- Output for remote general alarm;
- Output for remote compressor running indicator.

## Microprocessor control system

Programmable electronic circuit board receives commands from the keypad control board installed on the units. The microprocessor control can monitor the operating conditions of the critical parts to avoid the occurrence of the hazardous situations.

### The electronic board controls:

- Digital input from a set of pushbuttons situated on the keypad control board:
- Regulation of temperature settings for water inlet/outlet,
- Management of defrosting (only for heat pump),
- Safety timers,
- Management of water pump;
- Compressor delay relay;
- Stepless fan speed control;
- Alarm management and signaling;
- Alarm reset;

### Visual signaling on display:

- Inlet and outlet water temperature;
- Set point and differential setting;
- Alarm decodification;
- Cooling and heating mode operation leds;
- Defrosting operation led (only for heat pump);
- Self diagnosis with continuous checks on machine operating status.

### Optional accessories

- Metallic filter for hydronic circuit;
- Remote control board (wired control);
- Rubber antivibration mounting.
- Hydraulic circuit antifreezing electric heater
- Automatic water filling valve

## Technical data 5S-10S-7

HCF/HRCF	Unit	5S	7S	8.5S	10S	7
<b>Cooling:</b>						
Nominal cooling capacity *	kW	5.28	7.92	9.35	10.89	7.2
<b>Heating:</b>						
Nominal heating capacity **	kW	6.27	9.24	11.11	12.87	8.4
<b>Hermetic compressor:</b>						
Type	/	Rotary	Scroll			
n° of compressor / circuit	/	1/1	1/1	1/1	1/1	1/1
Cooling input power	kW	1.9	2.3	3.2	3.6	2.3
Heating input power	kW	2.1	2.4	3.3	3.7	2.4
<b>Axial fan</b>						
Air flow	m <sup>3</sup> /h	2180	3100	3800	4400	3100
Nominal power input × n°	kW×n°	0.165×1	0.165×1	0.165×1	0.165×2	0.165×1
<b>Evaporator:</b>						
Type	/	Plate exchanger				
Water flow	m <sup>3</sup> /h	0.82	1.19	1.42	1.66	1.19
Water side pressure loss	bar	0.11	0.18	0.22	0.36	0.18
Diameter of hydraulic connections	inch	1"	1"	1"	1"	1"
<b>Water pump:</b>						
Nominal power input	kW	0.27	0.27	0.27	0.48	0.27
Available pressure head	mH <sub>2</sub> O	11.8	11.3	10.9	22.8	11.3
<b>Refrigerant:</b>						
Type	/	R407C				
Charge amount	kg	2.3	3.3	3.8	4	3.3
<b>Oil:</b>						
Type	/	HAF68DE	FV68S			
Charge amount	ml	1500	1700	1700	1700	1700
<b>Electric data:</b>						
Power supply	V/Ph/Hz	230/1/50				400/3/50
Max. power input	kW	2.35	4.62	5.04	5.59	3.86
Max. current	A	10.17	22.5	24.1	9.22	6.45
Starting current	A	51	105	110	55	42
<b>Overall dimensions</b>						
<b>Length</b>	mm	1300	1300	1300	1300	1300
<b>Width</b>	mm	460	460	460	560	460
<b>Height</b>	mm	975	975	975	1275	975
<b>Net weight</b>	kg	100	125	130	150	125
<b>Sound pressure level ***</b>	dB(A)	50	55	56	60	55
<b>Water storage tank volume</b>	L	13.5	13.5	13.5	13.5	13.5

\* Ambient air temperature 35°C, evaporator water temperature inlet/outlet 12/7 °C;

\*\* Ambient air temperature 7°C DB, 6°C WB; condenser water temperature inlet/outlet 40/45°C;

\*\*\* Sound pressure level measured at distance of 1 m and a height of 1.5 m above the ground in a free field (fan side)

**Technical data 8.5-20**

<b>HCF/HRCF</b>	<b>Unit</b>	<b>8.5</b>	<b>10</b>	<b>12.5</b>	<b>15</b>	<b>20</b>
<b>Cooling:</b>						
Nominal cooling capacity *	kW	8.5	9.9	13.75	16.07	22.05
<b>Heating:</b>						
Nominal heating capacity **	kW	10.1	11.7	16.28	18.8	23.21
<b>Hermetic compressor:</b>						
Type	/	Scroll				
n° of compressor / circuit	/	1/1	1/1	1/1	1/1	1/1
Cooling input power	kW	3.2	3.6	4.5	5.2	6.2
Heating input power	kW	3.3	3.7	4.6	5.3	6.3
<b>Axial fan</b>						
Air flow	m <sup>3</sup> /h	3800	4400	5550	6700	8200
nominal power input × n°	kW×n°	0.165×1	0.165×2	0.165×2	0.165×2	0.40×1
<b>Evaporator:</b>						
Type	/	Plate heat exchanger				
Water flow	m <sup>3</sup> /h	1.46	1.66	2.23	2.43	3.34
Water side pressure loss	bar	0.22	0.24	0.25	0.25	0.26
Diameter of hydraulic connections	inch	1"	1"	1"	1"	3/2"
<b>Water pump:</b>						
Nominal power input	kW	0.27	0.48	0.48	0.48	0.80
Available pressure head	mH <sub>2</sub> O	10.9	22.8	20	18.9	19.1
<b>Refrigerant:</b>						
Type	/	R407c				
Charge amount	kg	3.8	4.0	4.5	5.1	7.5
<b>Oil:</b>						
Type	/	FV68S		PVE	160SZ	
Charge amount	ml	1700	1700	2000	2500	3250
<b>Electric data:</b>						
Power supply	V/Ph/Hz	400/3/50				
Max. power input	kW	4.58	5.59	6.89	7.54	8.33
Max. current	A	7.53	9.22	11.65	12.62	14.7
Starting current	A	42	55	63	63.1	73.5
<b>Overall dimensions</b>						
Length	mm	1300	1300	1300	1300	1200
Width	mm	460	560	560	560	1011
Height	mm	975	1275	1275	1275	1110
<b>Net weight</b>	kg	130	150	160	180	200
<b>Sound pressure level ***</b>	dB(A)	56	60	60	62	65
<b>Water storage tank volume</b>	L	13.5	13.5	13.5	13.5	75

\* Ambient air temperature 35°C, evaporator water temperature inlet/outlet 12/7 °C;

\*\* Ambient air temperature 7°C DB, 6°C WB; condenser water temperature inlet/outlet 40/45°C;

\*\*\* Sound pressure level measured at distance of 1 m and a height of 1.5 m above the ground in a free field (fan side)

**Technical data 25-50**

HCF/HRCF	Unit	25	30	40	45	50
<b>Cooling:</b>						
Nominal cooling capacity *	kW	26.57	29.82	40	45.2	50.6
<b>Heating:</b>						
Nominal heating capacity **	kW	31.5	35.7	52.2	50.4	60
<b>Hermetic compressor:</b>						
Type	/	Scroll				
n° of compressor / circuit	/	1/1	1/1	2/2	2/2	2/2
Cooling input power	kW	9.2	11.2	5.2X2	7.04 X 2	7.5X2
Heating input power	kW	9.6	12.5	5.7X2	7.2 X 2	8.0X2
<b>Axial fan</b>						
Air flow	m <sup>3</sup> /h	10900	12500	16500	18700	21800
nominal power input x n°	kWxn°	0.55x1	0.55X1	0.55X2	0.55 X 2	0.55X2
<b>Evaporator:</b>						
Type	/	Plate heat exchanger				
Water flow	m <sup>3</sup> /h	4.38	4.82	7	7.7	9
Water side pressure loss	bar	0.3	0.55	0.62	0.66	0.70
Diameter of hydraulic connections	inch	3/2"	3/2"	3/2"	3/2"	3/2"
<b>Water pump:</b>						
Nominal power input	kW	0.80	0.80	--	--	--
Available pressure head	mH <sub>2</sub> O	16.7	15.6	--	--	--
<b>Refrigerant:</b>						
Type	/	R407c				
Charge amount	kg	8	8.5	7.5 X 2	8 X 2	8.5 X 2
<b>Oil:</b>						
Type	/	FV68S		PVE	160SZ	
Charge amount	ml	1700	1700	2000	2500	3250
<b>Electric data:</b>						
Power supply	V/Ph/Hz	400/3/50				
Max. power input	kW	4.58	5.59	6.89	7.54	8.33
Max. current	A	7.53	9.22	11.65	12.62	14.7
Starting current	A	42	55	63	63.1	73.5
<b>Overall dimensions</b>						
Length	mm	1300	1300	2200	2200	2200
Width	mm	1111	1111	1111	1111	1111
Height	mm	1110	1110	1110	1110	1110
<b>Net weight</b>	kg	130	150	160	180	200
<b>Sound pressure level ***</b>	dB(A)	56	60	60	62	65
<b>Water storage tank volume</b>	L	75	80	80	80	80

\* Ambient air temperature 35°C, evaporator water temperature inlet/outlet 12/7 °C;

\*\* Ambient air temperature 7°C DB, 6°C WB; condenser water temperature inlet/outlet 40/45°C;

\*\*\* Sound pressure level measured at distance of 1 m and a height of 1.5 m above the ground in a free field (fan side)