Our Ref: 3156/100630/DS5

Manufacturer's Information and Product Details

THE HATTON
51-53 HATTON GARDEN
LONDON, EC1N

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- Heat Pump Unit (Technical Details) – *Size 8, HTAT 60 SN*
- Heat Pump Unit (Technical Dimensions) – *Size 8, HTAT 60 SN*

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Caloris External Heat Pump HC, HT, HA Series Technical Data

HEAT PUMP		Size 1	Size 2	Size 3	Size 4	Size 5
Based on standard range		HCY 081	HCY 131	HCY 251	HTAT 30 SN	HTAT 35 SN
Electrical power supply		400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50
Refrigerant		R410A	R410A	R410A	R410A	R410A
Number of circuit		1	1	1	1	1
Number of compressors		1	1	2	2	2
Number of compressors (1)	[kW]	23,7	40,7	62,0	83,0	90,7
COP (1)		5,03	5,09	5,01	4,85	4,95
COP En (2)		3,32	3,35	3,32	3,16	3,22
COP Caloris (3)		3,41	3,42	3,41	3,24	3,20
Cooling Capacity (4)	[kW]	29,0	49,7	75,0	94,3	105,5
EER (4)		4,27	4,25	4,07	3,97	4,25
EER En (5)		3,05	3,06	2,94	2,84	3,00
EER Caloris (6)		3,93	3,87	3,73	3,72	3,93

HEAT PUMP		Size 6	Size 7	Size 8	Size 9	Size 10
Based on standard range		HTAT 40 SN	HTAT 55 SN	HTAT 60 SN	HAST 70 SN	HAST 80 SN
Electrical power supply		400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Refrigerant		R410A	R410A	R410A	R410A	R410A
Number of circuit		1	2	2	2	2
Number of compressors		2	4	4	4	4
Heating capacity (1)	[kW]	119,9	144,5	152,9	179,4	210,1
COP (1)		5,09	4,48	4,41	4,68	4,81
COP En (2)		3,44	3,08	3,03	3,03	3,07
COP Caloris (3)		3,45	3,31	3,22	3,17	3,31
Cooling capacity (4)	[kW]	131,5	166,9	177,4	219,9	251,1
EER (4)		3,99	3,86	3,77	4,04	3,76
EER En (5)		2,85	2,80	2,71	2,88	2,72
EER Caloris (6)		3,62	3,56	3,47	3,63	3,33

(1) Heat pump mode working conditions: T in / T out= +18/+24°C, T ambient = +7°C D.B. +6°C W.B.
(2) Heat pump mode working conditions: T in / T out= +40/+45°C, T ambient = +7°C D.B. +6°C W.B..
(3) Heat pump mode working conditions: T in / T out= +15/+20°C, T ambient = -10°C D.B. –10,5°C W.B.
(4) Chiller mode working conditions: T in / T out= +22/+16°C, T ambient = +30°C D.B.
(5) Chiller mode working conditions: T in / T out= +12/+7°C, T ambient = +35°C D.B.
(6) Chiller mode working conditions: T in / T out= +27/+22°C, T ambient = +35°C D.B.

D.B. = Dry Bulb; W.B. = Wet Bulb

Caloris External Heat Pump HC, HT, HA Series Technical Data

Standard accessories and options list

HEAT PUMP		Size 1	Size 2	Size 3	Size 4	Size 5
Based on standard range		HCY 081	HCY 131	HCY 251	HTAT 30 SN	HTAT 35 SN
Protection grade IP 54		S	S	S	S	S
Phase monitor		S	S	S	S	S
Electrical heater inside the electrical panel		S	S	S	S	S
Electronic fans speed regulation		S	S	S	S	S
Minimum pressure switch for water side		S	S	S	S	S
Electrical heater inside the tank to pre-heat the water		S	S	S	S	S
Double pump with automatic switch over		O	O	O	O	O
Low and high pressure switches		S	S	S	S	S
Soft starter		N.A.	N.A.	N.A.	N.A.	N.A.
cosphi device 0,9		N.A.	N.A.	N.A.	N.A.	N.A.
Heather inside the tank for HP switch		N.A.	N.A.	N.A.	N.A.	N.A.
Refrigerant manometers		S	S	S	S	S
Extractable cartridge filter dryer		N.A.	N.A.	O	O	O
Desuperheater		O	O	O	O	O
Condenser coils with Termoguard treatment		O	O	O	O	O
Compressors housing (compressor jacket)		O	O	O	O	O
Grille on condenser coils		S	S	S	S	S
Coils condensate basins		N.A.	N.A.	N.A.	S	S
Bigger tank		S	S	S	S	S
Differential by-pass valve for the pomp		S	S	S	S	S
IN/OUT shut-off valves on water side + filter		O	O	O	O	O
Antifreeze heater (Evaporator, Pump,…)		S	S	S	S	S
LP/HP transducers		S	S	S	S	S
Remote ON/OFF input (max 10m)		S	S	S	S	S

S = Standard accessory (it means that this feature will be installed on the unit by default)
O = Option (you can choose to order it or not)
N.A. = Not Available

THERMODYNAMIC FEATURES

All the units will be equipped with liquid receiver: it will always work by gas flow (both in chiller and heat pump mode). The models based on HTAT and HAST will be equipped by hot gas by-pass for the lowest two pipes of the condenser/evaporator coils. The models based on HTAT and HAST will be equipped with condensate basin below the condenser/evaporator coils.
For the models based on HGY, the condenser/evaporator coils will be a couple of centimeters higher than the base frame to allow the dripping during defrosting mode. Condensate basin is not available for the models based on HGY.
All the 10 sizes can't be equipped with solenoid valve to by-pass the thermostatic valve. All the components of the cooling circuit will be welded.

REFRIGERANT CIRCUIT

HCY 081 – 131

- One cooling circuit, one compressor (crankcase heater is a standard accessory);
- Finned core condenser coils, copper tubes and headers, corrugated aluminum fins;
- 4-way refrigerant cycle reversing valve;
- Liquid receiver will always work by gas flow (both in chiller and heat pump mode);
- Drier filter;
- Flow indicator;
- Solenoid valve on the liquid line;
- One way valves;
- Connections for refrigerant load;
- Thermostatic valves with external equalization (N°2 Pcs);
- The evaporator is of the stainless steel plate type brazed with copper (single refrigerant circuit and single water circuit);
- High and low pressure switches;
- High and low pressure transducers;
- High and low manometers.

HCY 251

- One cooling circuit, two compressors in tandem setup (crankcase heater is a standard accessory);
- Finned core condenser coils, copper tubes and headers, corrugated aluminum fins;
- 4-way refrigerant cycle reversing valve;
- Liquid receiver will always work by gas flow (both in chiller and heat pump mode);
- Drier filter;
- Flow indicator;
- One way valves;
- Solenoid valve on the liquid line;
- Connections for refrigerant load;
- Thermostatic valves with external equalization (N°2 Pcs);
- The evaporator is of the stainless steel plate type brazed with copper (single refrigerant circuit and single water circuit);
- High and low pressure switches;
- High and low pressure transducers;
- High and low manometers;

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HTAT 30 –35 –40

- One cooling circuit, two compressors in tandem setup (crankcase heater is a standard accessory);
- Finned core condenser coils, copper tubes and headers, corrugated aluminum fins;
- 4-way refrigerant cycle reversing valve;
- Liquid receiver will always work by gas flow (both in chiller and heat pump mode);
- Drier filter;
- Flow indicator placed on receiver;
- One way valves;
- Solenoid valve on the liquid line;
- Connections for refrigerant load;
- Thermostatic valves with external equalization (N°2 Pcs);
- The evaporator is of the stainless steel plate type brazed with copper (single refrigerant circuit and single water circuit);
- Hot gas by-pass for the lowest two pipes of the condenser/evaporator coils;
- High and low pressure switches;
- High and low pressure transducers;
- High and low manometers;

HTAT 55 – 60

- Two cooling circuits, two compressors in tandem setup for each circuit (crankcase heater is a standard accessory);
- Finned core condenser coils, copper tubes and headers, corrugated aluminum fins;
- 4-way refrigerant cycle reversing valve;
- Liquid receiver will always work by gas flow (both in chiller and heat pump mode);
- Drier filters;
- Flow indicator placed on receiver;
- One way valves;
- Solenoid valve on the liquid line;
- Connections for refrigerant load;
- Thermostatic valves with external equalization (N°4 Pz.);
- The evaporator is of the stainless steel plate type brazed with copper (dual refrigerant circuit and single water circuit);
- Hot gas by-pass for the lowest two pipes of the condenser/evaporator coils;
- The cooling circuits share the same condensing opening;
- High and low pressure switches;
- High and low pressure transducers;
- High and low manometers;

HAST 70 – 80

- Two cooling circuits, two compressors in tandem setup for each circuit (crankcase heater is a standard accessory);
- Finned core condenser coils, copper tubes and headers, corrugated aluminum fins;
- 4-way refrigerant cycle reversing valve;
- Liquid receiver will always work by gas flow (both in chiller and heat pump mode);
- Drier filters;
- Flow indicator placed on receiver;
- One way valves;
- Solenoid valve on the liquid line;

Caloris External Heat Pump HC, HT, HA Series Technical Data

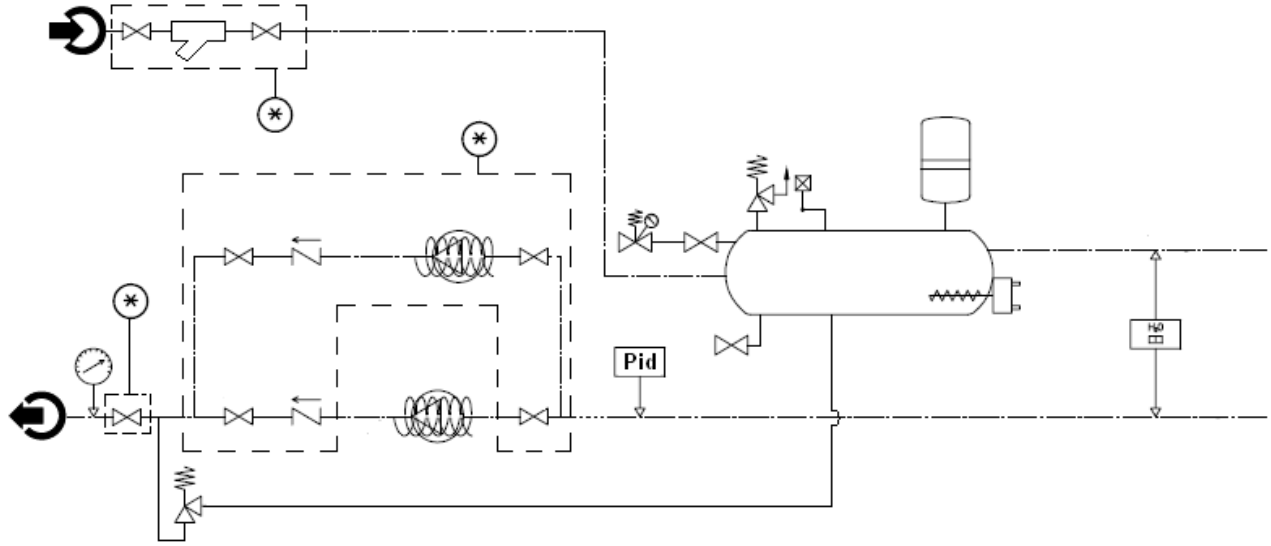
- Connections for refrigerant load;
- Thermostatic valves with external equalization (N°4 Pz.);
- The evaporator is of the stainless steel plate type brazed with copper (dual refrigerant circuit and single water circuit);
- Hot gas by-pass for the lowest two pipes of the condenser/evaporator coils;
- The cooling circuits have separate condensing openings;
- High and low pressure switches;
- High and low pressure transducers;
- High and low manometers;

Note: all the cold parts will be insulated to avoid condensing.

INTEGRATED HYDRONIC MODULE

The hydraulic circuit will be installed inside the unit. The tank will be installed on the return line from the plant, so the temperature control will be done on the returning water (see the below drawing).
All the 10 sizes will be equipped with accumulation tank, pump, expansion vessel, automatic air bleed valve on tank, relief valve, drain valve, automatic filling kit, differential pressure switch for plate evaporator, minimum static pressure switch on pump/pumps suction, manometer on pump/pumps discharge, antifreeze heater for pump/pumps, electrical heater inside the tank to per-heat the water.
The second pump in stand-by is available as an option: the controller will switch over automatically on the second pump in case of damage of the first pump and for equalization of the run times. With the second pump also shut-off valves up-line and down-line of the pumps and one way valves will be installed. So, the customer will be able to replace the damaged pump without to empty the hydraulic circuit. IN/OUT shut-off valves & filter on water side are available as an option.

Hydronic Scheme



(*) Options

Caloris External Heat Pump HC, HT, HA Series Technical Data

PUMPS AND ACCUMULATION TANKS VOLUME

		Size 1	Size 2	Size 3	Size 4	Size 5
Model		**HCY 081**	**HCY 131**	**HCY 251**	**HTAT 30 SN**	**HTAT 35 SN**
Pump type		LOWARA CIE 70/5	LOWARA CIE 120/5	LOWARA CIE 210/4	LOWARA CIE 210/4	LOWARA CIE 210/4
Tank volume	[liters]	**150**	**255**	**255**	**255**	**255**
		Size 6	**Size 7**	**Size 8**	**Size 9**	**Size 10**
Model		**HTAT 40 SN**	**HTAT 55 SN**	**HTAT 60 SN**	**HAST 70 SN**	**HAST 80 SN**
Pump type		LOWARA CIE 210/4	LOWARA CIE 370/3	LOWARA CIE 370/3	LOWARA FHE40-160/30	LOWARA FHE40-160/30
Tank volume	[liters]	**255**	**255**	**255**	**400**	**400**

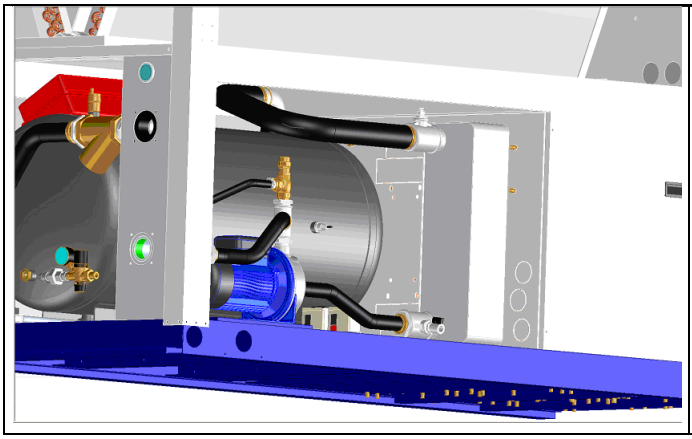
STRUCTURE AND CASING

The plinth and the outer panels are made of galvanized carbon steel sheet subjected to a phosphor degreasing treatment and painted with a polyester powder coating.
The plinth is finished in orange-peel blue RAL 5013P, while the remaining parts of the frame and panels are finished in orange-peel light grey RAL 7035P.
All the units will be equipped with a grille made of painted galvanized carbon steel in order to protect the condenser/evaporator coils.

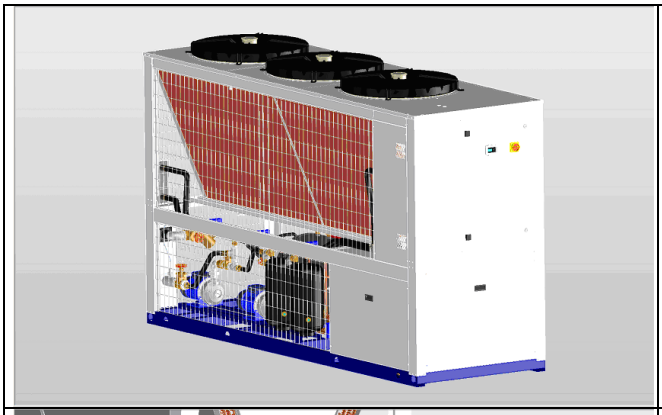
Dimensions and installed weight

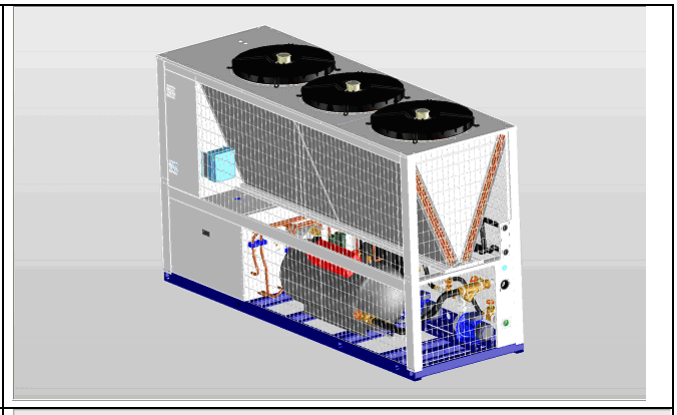
HCY 081 (W x L x H) = 1960x 810x1203 mm Estimated installed weight: 586 kg;
HCY 131 (W x L x H) = 2060x1112x1417 mm Estimated installed weight: 851 kg;
HCY 251 (W x L x H) = 2470x1112x1595 mm Estimated installed weight: 1004 kg;
HTAT 030 (W x L x H) = 2507x1110x2120 mm Estimated installed weight: 1215 kg;
HTAT 035 (W x L x H) = 2507x1110x2120 mm Estimated installed weight: 1251 kg;
HTAT 040 (W x L x H) = 2507x1110x2120 mm Estimated installed weight: 1397 kg;
HTAT 055 (W x L x H) = 3407x1110x2120 mm Estimated installed weight: 1693 kg;
HTAT 060 (W x L x H) = 3407x1110x2120 mm Estimated installed weight: 1718 kg;
HAST 070 (W x L x H) = 3495x2188x1989 mm Estimated installed weight: 2396 kg;
HAST 080 (W x L x H) = 3495x2188x1989 mm Estimated installed weight: 2518 kg;

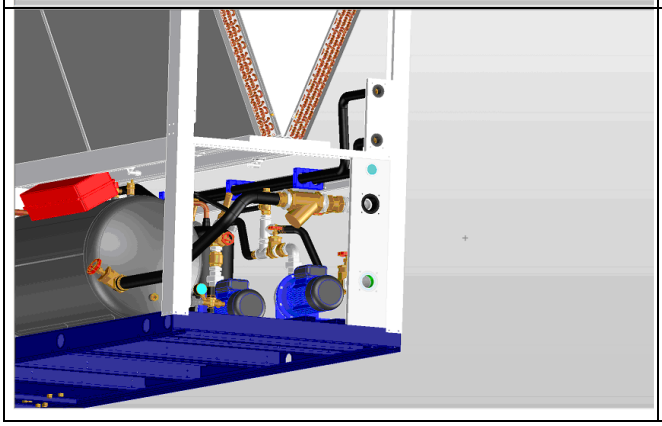
Caloris External Heat Pump HC, HT, HA Series Technical Data

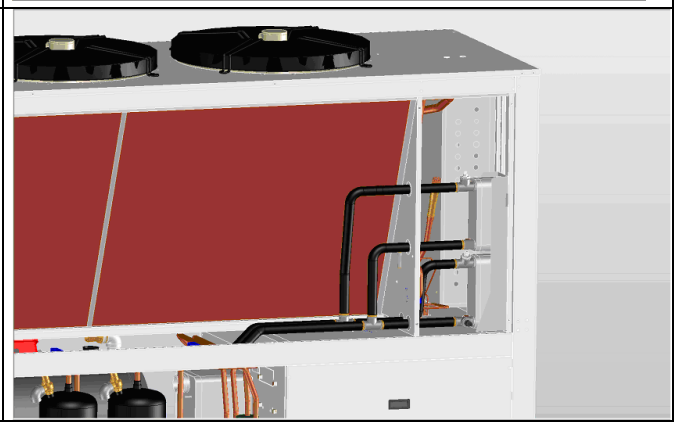


HTAT 055 – 060 PICTURES









ELECTRICAL

Sizes HCY 081, 131, 251 ==> 400V/3Ph+N/50Hz electrical power supply
Sizes HTAT 030, 035, 040, 055, 060 ==> 400V/3Ph/50Hz electrical power supply
Sizes HAST 070, 080 ==> 400V/3Ph/50Hz electrical power supply

The units will be design in compliance with the following European directives:

- Machinery Directive 2006/42/CE;
- Low Voltage Directive 2006/95;
- Electromagnetic Compatibility Directive 2004/108/CE;

Units designed in compliance with the European Norms (EN Standard) in order to comply the above mentioned Directives.
All the units will be equip with:

- Main breaker with door lock device (yellow/red);
- Automatic thermal-magnetic to protect each compressor;
- Automatic thermal-magnetic to protect pump/pumps;
- Magnetic protection with automatic switch for the heater inside the tank;
- Cumulative magnetic protection with automatic switch for phase monitor, antifreeze heater, heater inside the electrical cabinet;
- Cumulative magnetic protection with automatic switch for the primary coil of the transformer/s of power control circuit;
- Magnetic protection by fuses at the secondary coil of the transformer/s of the power control circuit;
- Magnetic protection by fuse for speed regulators;
- Phase monitor (phase sequence monitoring, operating voltage tolerance);
- High and low pressure transducers;
- High and low pressure switches;
- Differential water pressure switch;
- Minimum static pressure switch on water side;
- Arrangement for remote ON/OFF input (max 10m)
- Free voltage contact provided for a remote distance of a general alarm signal;

For the sizes HAST 070, 080 will be possible to install the cosphi device as an option.
The electrical panel has IP54 protection rating, in according to EN 60529

CONTROLLER FEATURES

The units will be equipped with the following controller: Eliwell "Energy FLEX", SB655/C/S type, DIN SE655 expansion board.

Controller SB655/C/S:

Expansion board:

Caloris External Heat Pump HC, HT, HA Series Technical Data

Remote Display:

The controller manages the following main functions:

- ✓ Temperature control of the water;
- ✓ Management of alarms;
- ✓ Pumps timing and management of the second pump in stand-by, with automatic changeover in case of a fault on the main pump and for equalization of the run times;
- ✓ Continuous electronic fan speed control;
- ✓ Management of the electrical heaters;
- ✓ Management of "intelligent" defrosting, in according to the Eliwell technical manual we already sent you;
- ✓ Programmable internal timer for different setpoint;
- ✓ Management of Modbus protocol;
- ✓ Management of dynamic setpoint, in according to the Eliwell technical manual we already sent you;
- ✓ Management of auto-adaptive setpoint, in according to the Eliwell technical manual we already sent you;
- ✓ Management of the second display;
- ✓ The operating hours for compressors and pumps will be showed;

Caloris External Heat Pump HC, HT, HA Series Technical Data

The units will be equipped with:

1. Temperature probe will be installed on the evaporator/condenser inlet;
2. Temperature probe will be installed on the evaporator/condenser outlet;
3. Air temperature probe;
4. Temperature probe inside the tank;
5. High pressure transducer;
6. Low pressure transducer;

The main alarms are:

- High pressure alarm;
- High pressure alarm;
- Compressors thermal protection trip alarm;
- Differential pressure switch trip alarm;
- Pump thermal protection trip alarm;
- Static pressure switch protection alarm;

WORKING LIMITS

- Inlet water temperature (CH): Min: +4 °C Max: +27 °C;
- Inlet water temperature (HP): Min: +18 °C Max: +45 °C;
- Ambient working temperature (CH): Min: -20 °C Max: +42 °C;
- Ambient working temperature (HP): Min: -16 °C Max: +25 °C;
- Pressure in hydraulic circuits water side Max: 3 bar;

SOUND LEVELS

		Size 1	Size 2	Size 3	Size 4	Size 5
Model		HCY 081	HCY 131	HCY 251	HTAT 30 SN	HTAT 35 SN
Sound power	[dB(A)]	75,8	77,7	80,3	80,5	80,5
		Size 6	Size 7	Size 8	Size 9	Size 10
Model		HTAT 40 SN	HTAT 55 SN	HTAT 60 SN	HAST 70 SN	HAST 80 SN
Sound power	[dB(A)]	80,3	83,3	83,3	86,0	84,7

Sound power: determined on the basis of measurements taken in accordance with the standard ISO 3744. Values with tolerance ± 2 dB. The sound levels refer to operation of the unit under full load in nominal conditions in chiller mode.

AVAIABLE BASE VERSIONS

Reversible heat pumps complete with tank and pump.

KITS

The kits have to be ordered separately. They are supplied separately, generally at the same time of the unit, and installed by the customer. They can be supplied later as spare part, modification kits, completion kits, etc)

- Anti-vibration mounts kit (for all the offered sizes);
- IN/OUT Victaulic kit (available only for HAST 070 e 080);

Caloris External Heat Pump HC, HT, HA Series Technical Data

Project B&Q Eastleigh, Unit spezification

Special heat pump HTAURUS TECH 040/ SN (R410A gas refrigerant)

MAIN FEATURES:
- R410A gas refrigerant
- standard compressors
- electrical power supply 400V/3Ph/50Hz without neutral
- 4 rows condenser coils (instead of 3 rows like the standard unit)
- gas refrigerant manometers
- by-pass valve for the pump
- volume of the tank: 255 liters (it's bigger than the standard one). It can be equipped with connection for the heater
- bigger electrical panel comparing with the standard unit
- Heliwell controller
- condensate basin equipped with antifreeze heater
- 1+1 kW electrical heaters to preheat the water and help during the starting in critical conditions (for example when the ambient temperature is 0°C and cold water temperature, for example 2°C).

Some heaters of 25 kW will be offer as an option (see below), although they are not essential to let the unit work in the right way.

Antivibration kit have to be ordered separately.

PERFORMANCES:
Performances when ambient temperature is +30°C and water 22÷16,3°C
Cooling capacity: 132,4 kW
Adsorbed power: 30,6 kW

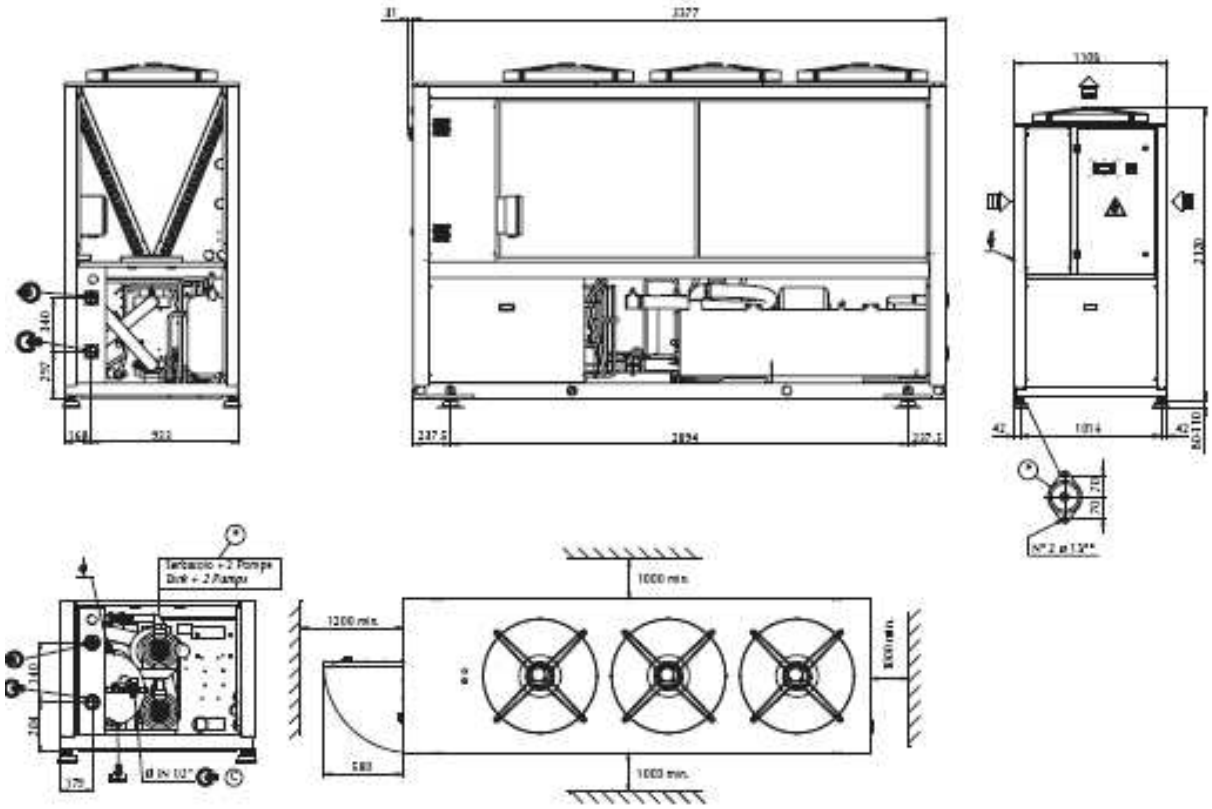
Performances when ambient temperature is +7°C and water 18÷23,7°C
Heating capacity: 120 kW
Adsorbed power: 19,4

Performances when ambient temperature is -10°C and water 26÷31,7°C
Heating capacity: 74,9 kW
Adsorbed power: 22,7

Water flow rate 5,1 l/s

Length: 2507 mm
Width: 1110 mm
Height: 2120 mm
Weight without hydraulic group: 1000 kg

Dimensions Size 7, 8:



G 2 ½"F pipe connection