

Chailey Industrial Estate

RESPONSE TO PLANNING CONDITION 21

The development shall be provided with an air-to-water reversible heat pump (ASHP), located on the roof. The unit shall be connected to the heating system, alongside gas fired boilers, and shall assist in reducing gas consumption and CO₂ emissions.

The proposed unit shall have a thermal capacity of 355.2kW and is anticipated to provide 50% of the annual heating demand. The ASHP shall be utilised as the lead equipment, raising the LTWH temperature from 40°C to 50°C. Water shall be stored in vessels, to allow the ASHP to operate independently from the boilers. Boilers would draw water from the vessels and raise the temperature to 70°C, in line with the developments thermal demand.

It is expected that the ASHP will provide 579250kWhs/annum, operating on average 4hrs per day. It is anticipated that the operation will be greater during the winter months, where heating and DHW will be required by the development, as opposed to the summer months where only DHW will be needed.

The COP of the unit at design conditions (-4°C ambient) is 2.581, while the SCOP is 3.77. Refer to the manufacturer's datasheet for additional information.

It is anticipated that the operation of the ASHP shall cost between £51-74 per flat per year. The figure is based on the expected total electrical input to the ASHP (total output divided by SCOP), multiplied by 11-16p/kWh of electricity. The calculation assumes an equal use of all flats, in reality the figure will be depending on the actual use by each tenant.

To provide accurate monitoring, the ASHP shall be connected to the developments BMS system, which will monitor the hours of operation. In addition, the ASHP circuit is provided with a dedicated heat meter. Refer to the plantroom schematic for additional information. Information from the BMS and heat meters can be logged, to allow analysis of the unit's performance as needed.

Information attached to the response:

- Manufacturer's datasheet
- MWL Energy centre schematic



EWYQ420F-XR

- > Air to water reversible heat pump
- > Scroll compressor
- > High efficiency version
- > Reduced sound configuration
- > R410A refrigerant

- ➔ **Unit description:** Daikin air to water reversible heat pump with hermetic scroll compressors and R410A refrigerant. Unit color is Ivory White (Munsell code 5Y7.5/1) (±RAL7044).
- ➔ **Compressor:** Are hermetic orbiting scroll compressors complete with motor over-temperature and over-current devices. Each compressor is equipped with an oil heater that keeps the oil from being diluted by the refrigerant when the chiller is not running. The compressors are connected in a Tandem or a Trio configuration on each of the refrigerant circuit. Each compressor is mounted on rubber antivibration mounts for a quiet operation. Unit is delivered with complete oil charge.
- ➔ **Water side Heat Exchanger:** The unit is equipped with a direct expansion plate to plate type water heat exchanger. It is made of stainless steel brazed plates and covered with a 20mm closed cell insulation material. The exchanger is equipped with an electric heater for protection against freezing. Water connections are provided with Victaulic kit (as standard), flow switch (factory mounted) and water filter (shipped loose).
- ➔ **Air side Heat Exchanger:** Internally enhanced seamless copper tubes arranged in a staggered row pattern and mechanically expanded into lanced and rippled aluminum condenser fins with full fin collars. An integral sub-cooler circuit provides sub-cooling to effectively eliminate liquid flashing and enhance cooling capacity without increasing the power input.
- ➔ **Air side Heat Exchanger fan:** The condenser fans are propeller type with high efficiency design blades to maximize performances. The material of the blades is glass reinforced resin and each fan is protected by a guard. Fan motors are internally protected from overtemperature and are IP54.
- ➔ **Refrigerant circuit:** Each unit has two independent refrigerant circuits that include: Compressors, Refrigerant, Air Cooled Condenser, Electronic expansion valve, Evaporator, Liquid line shut off valve, Sight glass with moisture indicator, Filter drier, Charging valves, High pressure switch, High pressure transducers, Low pressure transducers and Suction temperature sensor.
- ➔ **Electrical panel:** Power and control are in the main panel that is manufactured to ensure protection against all weather conditions. The electrical panel is IP54 and internally protected against possible accidental contact with live parts when the doors are open. The main panel is fitted with a main switch interlocked door that shuts off power supply when opening.
- ➔ **Controller:** Latest generation MicroTech III Type. Providing monitoring and control functions required for an efficient and trouble free operation of the chiller. Sophisticated software with predictive logic selects the most energy efficient combination of compressor load and electronic expansion valve position keeping stable operating conditions and maximizing chiller efficiency and reliability.



EWYQ420F-XR

Performances calculated according to EN14511-3:2013



Cooling mode performances

Cooling capacity	414.5 kW	Chilled water IN/OUT	12.00 °C / 7.00 °C
Power input	141.3 kW	Chilled water flow	19.80 l/s
EER Cooling Efficiency	2.935 kW / kW	Water heat exchanger pressure drops	32.0 kPa
		Ambient temperature	35.0 °C
		Lw / Lp @ 1m	90 dB(A) / 70 dB(A)
SEER / ηs	4.73 / 186.2%	Fluid	Water
		Water heat exchanger fouling factor	0.000 m²C/W

SEER declared according to EN14825, fan coil application 12/7°C (inlet/outlet) water temperatures. Sound power level according to ISO 9614-1. SEER and IPLV.IP refer to standard unit without options

Heating mode performances

Heating capacity	355.2 kW	Heated water IN/OUT	40.00 °C / 47.00 °C
Power input	137.6 kW	Heated water flow	12.30 l/s
COP Heating Efficiency	2.581 kW / kW	Water heat exchanger pressure drops	11.9 kPa
SCOP / ηs	3.770 / 147.8%	Ambient temperature	-4.0 °C

SCOP declared according to EN14825, average climate, low temperature application

Unit information

Compressor type	Scroll	Refrigerant type	R410A
Capacity control	Step	Air heat exchanger type	HFP
Compressor N°	4	Air heat exchanger fans N°	10
Circuit N°	2	Air heat exchanger fans control	DOL
Refrigerant charge	92 kg	Altitude	000 MSL
		Water heat exchanger type	Plated Heat Exchanger

Actual refrigerant charge depends on the final unit construction, refer to unit nameplate.

Electrical information

Power supply	400 V / 50.0 Hz / 3 Ph	Max. inrush current	671 A
Running current	252 A	Compressor starting method	Direct on line
Max. Running current	337 A		
Max. current wires sizing	371 A		

Voltage tolerance ± 10%. Phase Voltage unbalance ± 3%. Electrical data referred to standard unit without options, refer to unit name plate data.



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Acoustic information

Sound pressure level at 1 m from the unit (rif. 2×10^{-5} Pa)

63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
74.9	68.3	68.0	65.0	66.0	63.2	55.6	44.0	69.9

Values referred to Evap. IN/OUT 12/7°C and 35°C Amb., full load operation, standard unit configuration without options. Sound pressure level calculated from sound power level. Sound pressure in octave band is for information only and not considered binding.

Physical information

Evap. connections size	4" mm	Length	5025 mm
		Width	2258 mm
Weight shipping/operating	3900 kg / 4010 kg	Height	2220 mm

Information referred to standard unit configuration without options, refer to certified unit drawing.



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**Certification notes**

Certified in accordance with Eurovent Certification Program: Liquid Chilling Packages and Heat Pumps (LCP-HP). Standard ratings are specified in the section "Rating requirements" of the Rating Standards. All standard ratings are verified by tests conducted in accordance with the following standards: EN 14511-3:2013 (performance testing) and ISO 9614 (acoustic testing).

Outside the scope of AHRI Air-Cooled Water-Chilling Packages Certification Program or not optionally certified, but is rated in accordance with AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI).

General notes

For more information about the above selected product, please go to <http://www.daikineurope.com/industrial/>. Unit performances are reproducible in laboratory test environment only in accordance to recognized industry standards. This technical data sheet is generated by Daikin Applied Tool software designed and distributed by Daikin Applied Europe S.p.A. The present software does not constitute an offer binding upon Daikin Applied Europe S.p.A who compiled the content of this software to the best of its knowledge. No express or implied warranty is given for the completeness, accuracy, reliability or fitness for particular purpose of its content and the products and services presented therein. Specifications are subject to change without prior notice. Daikin Applied Europe S.p.A. explicitly rejects any liability for any direct or indirect damage, in the broadest sense, arising from or related to the use and/or interpretation of this document. All content is copyrighted by Daikin Applied Europe S.p.A.



