



Consulting Engineers

**MECHANICAL
BUILDING SERVICES
SPECIFICATION**

FOR THE PROPOSED

Replacement

Of

Supply Air Handling Unit Heat Pumps

At the



Date: 14/01/2022
Rev: T
Status: FOR TENDER

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BSE 3D QA SYSTEM

Revision No: T
Revision Date: 14/01/2022
Reason Description: Tender Issue
File Location P:\3937 - RAF Museum Hendon\7.0 Reports & Specifications\7.5 Stage E - Detail Design\3937 RAF Museum Mechanical Specification Tender T.Docx
Filename: 3937 Raf Museum Mechanical Specification Tender T
Client Name: RAF Museum
Client Contact: Thomas Power
Project Co-ordinator: David Gomm
Editor: Alpha Soire
Authorisation By: Phil Todd
QA Checked Verification By: David Gomm



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1.0 Mechanical Specification

1.1 Introduction

This Specification sets out details and criteria to the particular requirements for the Mechanical works and shall be read in conjunction with the conditions of contract, accompanying the drawings and other associated tender documents.

The mechanical drawings accompanying this specification are indicative of the standard of mechanical installation required. The Works Contractor shall provide a full, installation, commissioning, and site supervision duties.

A suitably high standard of installation shall be maintained to comply with the requirements of this Specification and those of the relevant bodies as published in the latest editions of their standard requirements and/or regulations.

For example: -

- British standards issued by the British Standards Institute
- Building Regulations
- Requirement of the Health and Safety Executive and CDM Regulations
- Requirement of the Local Fire Officer and/or Building Control Officer
- Model water supply bylaw
- Requirements of the Local Water Supply Company
- Requirements of Local Gas Authority
- CIBSE recommendations
- HVCA Regulations
- British Gas Regulations

Any installation or parts thereof installed by the Contractor deemed by the Engineer to be untidy, installed incorrectly, not in accordance with the above will be removed and correctly installed to the satisfaction of the Engineers at the Contractors cost. Any subsequent costs caused by abortive builders works, making good, delay or disruption to other trades will be met by the Contractor.

1.2 General Scope of Works

The general scope of works comprises the design, supply, installation, and handover of the complete mechanical engineering services and include as a minimum:

1. Superintendence and management of the mechanical works.
2. Supply of samples.
3. Delivery of materials to site.
4. Testing and pre-commissioning checks.
5. Commissioning.
6. Required performance testing.
7. Operating & maintenance manuals.
8. Coordinated record documents.
9. Handover to purchaser.
10. Coordination and with all other services and building fabric.
11. Twelve months' warranty from date of practical certification of the works.
12. Instructions to purchaser's staff.
13. Supply and installation of schematic diagrams.

2.0 Specific Installation Requirements

2.1 Scope of Works

The project is located within the boundaries of the RAF Museum, Grahame Park Way, London NW9 5LL and consists of the replacement of the existing Carrier Heat Pumps and Valving that serve the Air Handling Units (AHU's) that in turn serve Hangar 6 of the museum. The site is operational 24/7 so out of hours working could be supported if deemed beneficial to the client.

The demise consists of a large aircraft hangar that houses historical Aircraft with the plant areas to one side of the building at ground floor level. The plant area is external and is housed in a caged enclosure and is immediately accessible from the perimeter road of the site.



The Contractor must include within their quote the disconnection, making safe electrically, removal from site and disposal of the existing redundant Heat Pumps. Upon disposal the client must be supplied with a copy of the waste transfer note to confirm the safe disposal of the redundant units.

The Contractor must include for the provision of new bases for the replacement heat pumps, Steel or concrete.

The Contractor is to price for the amendment of the pipework to suit the new connections of the new Heat Pumps.

The Contractor shall include for this within their costings for new electrical cabling from the existing MCC panel within the enclosure to each new heat pump.

The new Heat Pumps shall also be connected to the existing site wide BMS system. The contractor shall consult with the site incumbent contractor and include any costs for completing the works. Please refer to section 2.7 for details.

As part of the Tender process the Contractor shall attend the site and undertake a survey of the plant area and provide a plan of works within their tender return. All valves on the water side of the Heat Pump Systems are to be priced for replacement.



No other services apart from that affecting the AHU's form part of this project.

The Contractor shall, supply and install all plant, equipment, and materials to carry out the complete mechanical services installation as detailed in the documents and on the accompanying drawings.

The works shall include but shall not be limited to the following: -

- Removal of the existing plant from site and disposal
- Making Safe of all services post removal of plant
- Amend the existing plant bases to suit
- Amendment of the pipework to suit the new connections to the new Heat Pumps
- Replace / reuse the valving
- Connection to the site wide BMS
- Replace the Electrical Supply Cables from the MCC to the new units
- Full commissioning and putting to use of the new installation
- Individual Plant Controls
- Metering

2.2 Replacement Units Specified

The two specified replacement Heat Pumps are from Carrier. They are the Aquasnap 30RQ – 180R and the Aquasnap 30RQ – 050R units. These are to supply the heating and cooling coils for the existing Carrier Air Handling Units that serve Hangar 6.



Above: - the 30RQ-180R unit



Above the 30RQ – 050 unit

Selections have been made by Carrier for the project and the data sheets can be found in Appendix A of this specification.

Carrier have provided a quote numbered 34825 RAF Museum Hendon.

The Carrier contact details are: -

Mr Alex Meredith
Regional Sales Manager – London South West
TCUK Ltd.
United Technologies House
KT22 9UT
Mobile: +44 (0)7435 994 214
Email: alex.meredith@carrier.com



The contractor shall include to provide Operating and Maintenance Manuals which shall include but not be limited to a detailed introduction to the project and description of works, design criteria used in the design of all services, general operating procedures, fault finding procedures, maintenance schedules, manufacturers details and data sheets, equipment schedules of all installed services, emergency procedures, health and safety policies specific to this site, record drawings and testing & commissioning sheets/certificates.

Prior to commencement of works on site and/or ordering of any plant, equipment, and materials, detailed working drawings shall be issued for approval. The Contractor shall determine all spatial limitations and shall ensure that all specified items of plant and equipment can be satisfactorily accommodated and installed in position on site prior to procurement.

2.3 Contractor Design

The Contractor shall be responsible for the following elements of design:

- Structural steelwork connections and secondary steelworks supports for other independent works and tertiary members required by the services installation.
- Checking all fan pressures and pump heads against the Installation Drawings. This shall be done in a timely manner. Calculations shall be submitted to the Services Engineer prior to ordering plant.
- Re-design of any element of the work where equipment selected by the Mechanical Trade Contractor differs from that listed in the Specification or schedules.
- Size and selection of anti-vibration mountings and supports to meet performance criteria based on equipment selected.
- Condensate drainage pipework sizing and routes to suit the manufacturer's data of the respective equipment.
- Provision and appropriate selection of pipework movement joints.
- Provision of pipework expansion and anchoring.
- Develop and complete the connection to the site wide BMS along with the incumbent contractor.
- Design of any prefabrication element.
- Sizing and selection of commissioning sets and control valves in liaison with the referred manufacturer, including any proportioning of mains losses etc., based on pipework layouts detailed on the Contractors installation drawings and the selected plant and equipment to be installed.
- The building services have been coordinated with the building structure and fabric as far as reasonably practicable during the design period. The Contractor shall be responsible for consulting with all other subcontractors and ensuring the appropriate services are fully coordinated with the building structure, other new services, and all existing services where applicable. In the event of any clashes the contractor shall review and revise the services routes during the production of their working drawings.
- Final Builders Work requirements if any.
- The Contractor shall supply and install all equipment associated with the above and submit hydraulic calculations incorporating the water quantities, determined from the requirements of the existing AHU's, as supplied by the manufacturer. All calculations associated with the above shall be conducted by the Contractor and representative samples submitted for comment.



- Where a designed element of the works interfaces with a Contractor Designed element of the works it is deemed to be part of the Contractor Designed element to ensure that the Contractor Designed element properly integrates with the designed element to ensure a complete design solution. Any potential co-ordination problems between elements must be brought immediately to the attention of the Services Engineer during the tender period. No claim for additional costs or an extension of time will be considered for works that could reasonably have been considered and allowed for during this period.
- The principal designer shall require copies of risk assessments/hazard identification for the elements of the works for which the Contractor is acting as 'Designer' in the terms of the CDM regulations.
- These should also be sent to the Services Engineer via the principal contractor to enable all designers to consult, co-operate and reduce risk as required by CDM regulations.

The residual hazards to be incorporated into the Construction Phase Health and Safety Plan.

2.4 General Design Criteria

The Contractor's attention is drawn to the drawings contained within the tender documents which indicate the proposed services for inclusion within the design.

The design criteria for the proposed new services installations are based on Standard Design Guides and relevant British Standards. For the basis of design, the following criteria shall be used:

Note: The heat pump equipment shall be suitable to operate from -10°C to +40°C ambient.

External Design Temperature :

| | | |
|---------|---------|-------------------|
| Winter: | -4°C db | -4°C wb |
| Summer: | 30°C db | 20°C wb (FA only) |

2.5 Noise Criteria

The area is extremely noise sensitive and as such the plant and equipment has been selected to meet low Noise Criteria.

Contractors note: It shall be the responsibility of the contractor to meet the local requirements, any alternative equipment installed that is different to those specified in the BSE3D schedules will still need to meet the criteria and noise levels identified in the report.

2.6 Electrical Supplies

The existing AHU Heat Pumps are 176A and 42A, respectively. The new proposed units are 150A and 42A, respectively. This means that the existing electrical MCCB (200A and 80A) serving the units will be sufficiently sized to cater for the new units. The protection settings on the MCCB and the devices protection curve should be confirmed against the prospective start up currents to ensure full compatibility. It is noted that the new units are proposed with a soft start option.

It is required that given the age of the existing supply cables that they be replaced.



2.7 Condensate Pipe Work

The Mechanical Contractor shall install a condensate line to each unit. The minimum diameter of condensate pipe work shall be 40mm and shall be run in copper any form of plastics must not be used.

Each condensate drain shall rely on gravity and shall maintain a fall of 1:50.

2.8 Controls

The contractor shall consult with the site incumbent contractor. The units have been selected with BACnet IP option, therefore there will be a Cat5E cable socket inside the control panel for BMS integration. The Contractor is to consult with BMSI the incumbent control specialists to ensure a smooth process and commissioning post installation. The Contact details for BMSI are as follows: -

BMSI London Office,
Waterloo Business Centre,
107 Waterloo Road,
London,
SE1 8UL,

Contact: - Russell White
Support Operations Manager

Mobile: - 07827 986061
Email: - RWhite@bmsi.co.uk
Main Telephone: - 01753 738000

2.9 Log Books

Full commissioning Log Books shall be supplied by the Contractors Commissioning Engineer.

These shall be fully completed and included with the main installation and operation manuals prior to handover. In addition, copy pages shall be returned to the Manufacturer in order that the installation is logged, and warranty honoured.

2.10 Warranty

Warranty will be 2 years parts and labour allowance provided installation has been conducted satisfactorily and that future maintenance is conducted to a proven satisfactory level.

2.11 Maintenance

The maintenance of the systems will be conducted by approved maintenance contractors. All documentation and log books shall be handed over to the maintenance contractor at hand over of the project at which point the maintenance contractor will be responsible for the maintenance of the systems. The Mechanical Contractor shall note that this will not affect his responsibility for the 12 months defects period.

2.12 Commissioning

The Mechanical Contractor shall allow for 7 – 14 days to organise commissioning by the manufacturers engineer. However, this lead in time must be confirmed. The Mechanical Contractor shall complete a pre-commissioning checklist prior to attendance by the manufacturers Commissioning Engineer.



3.0 Pipework & Fittings

The Contractor shall allow for new pipework connections as shown on the Drawings.

The Contractor shall install the pipework services as shown on the drawings. The Contractor shall allow for the installation of Commissioning Sets and Isolating Valves and pressure reducing valves on all hot and cold water & heating pipework systems as indicated on the drawings.

The contractor shall allow to pressure test the proposed hot, cold water & heating pipework systems to the guidelines listed in the specification.

The contractor shall also allow for the full commissioning of the cold and heating systems and the BMS controls for the system.

Self 'temperature' regulating trace heating tape and thermal insulation (weather sealed) shall be provided to all external pipework to prevent freezing and heat exchange with atmosphere. The trace heating shall be connected to a central control/feed panel in the basement floor plant.

Pipework distribution shall be as detailed on the Drawings. The pipework specifications shall involve minimal joints. All pipework shall be medium grade steel. Fittings shall be those compatible with the manufacturers' pipe system.

All pipework shall be exposed to atmosphere with full access provided to all valves within the system.

All control, commissioning, and isolation valves shall be provided on all substantial branch runs to minimise water loss or loss of service in the event of pipework failure or routine maintenance. Isolation valves shall be butterfly type.

All pipework shall be insulated with minimum 35kg/m³ zero ozone depletion potential (ODP) rigid phenolic foam. All external pipework shall be (where not a specific pre-insulated product for external use) insulated and be finished weatherproof Polyisobutylene PIB (suitable for exposed weather conditions).

Insulation thicknesses shall be provided in accordance with BS 5422: 2001. All valves shall be insulated with valve jackets (muffs), with Velcro or buckle fasteners to allow ease of access for commissioning/maintenance. Aluminium valve boxes shall not be used.

All pipework shall be installed complete with fire stopping sleeves, at fire compartmentation boundary walls and floor slabs, as necessary.

Pipework movement due to expansion and contraction shall be made by loops or articulated bellows and shall be provided by the Contractor to suit the actual pipework configuration on site. The use of axial bellows shall only be allowed subject to demonstration by the Structural Designer that imposed loads can be accommodated. A specialist supplier shall be engaged to design and provide the expansion requirements.

The expansion requirements shall be supplied by (or approved equivalent):

Minikin & Son Ltd
Spa House
Hookstone Park Harrogate, HG2 7DB
Telephone: 01423 889845
Facsimile: 01423 880724

All items of mechanical plant incorporating moving parts shall have appropriate vibration couplings to ensure that vibration from the equipment is not transmitted to the building, other supporting structure, pipework, or ductwork.



4.0 Insulation Generally

All pipework shall be insulated to prevent heat transfer to a minimum thickness as defined in BS5422 Table 4. The insulation shall be zero ozone depletion potential (ODP) rigid phenolic foam and shall be finished with Class 0 foil face except in plant rooms which shall be finished in Aluminium Cladding. Insulation thicknesses shall be provided in accordance with BS 5422: 2009.

All valves shall be insulated with valve jackets (muffs), with Velcro or buckle fasteners to allow ease of access for commissioning/maintenance. Aluminium valve boxes shall not be used.

5.0 Controls

Controls shall be local packaged controls as provided by the manufacturer. The controls package has the potential to interface with a BMS.

All low voltage cabling shall be multi-core CU/XLPE/SWA/LSF cables.

Full demonstrations must be allowed and provided by the Contractor.

6.0 Installation and Testing

6.1 Identification and Painting

Identification of plant and pipework shall only be conducted after all insulation and painting has been completed.

6.2 Capital Plant

Each of the following items of equipment shall be identified with white "Traffolyte" or equal labels with red lettering denoting its function and the area, zone, or plant to which it relates:

- Each circulating pump, starter, and isolating switch.
- All items of control equipment, isolating switches etc.
- The main isolating valves
- External condensing units.

6.3 Pipework

Pipework shall be identified in accordance with Section 9.0 of this specification. Pipework within the plant room, shall be further identified with an arrow marking the direction of flow and lettering to denote function (i.e., DHW, DHWR, COLD FEED, etc.). Identification lettering shall be 50mm high and shall be placed on pipework at regular intervals.

6.4 Painting

All unprotected mild steel pipework and all supporting steelwork and brackets shall be thoroughly cleaned and painted with an approved chromate primer or red oxide paint immediately after erection to prevent oxidation.

Ungalvanized ferrous sheet metal or other ferrous materials shall have a protective coat of paint or other acceptable material before dispatch from works. Where applicable, the Mechanical Contractor will be required to remove radiators during decoration work and replace radiators once the works are complete.

6.5 Cleaning of Equipment Prior to Completion

The Mechanical Contractor shall ensure that during construction any equipment installed shall be suitably 'bagged' and sealed to prevent dust/debris from entering the units during construction which



may cause malfunction or premature failure of the unit. Upon completion of the works at practical completion the Mechanical Contractor shall 'de-bag' the units and clean them thoroughly.

7.0 Testing, Commissioning, Manuals & Drawings

7.1 General

The Mechanical Contractor shall conduct the testing and commissioning of the plant installed, all in accordance with the various manufacturer's instructions and CIBSE Commissioning Codes, HVCA Ductwork codes, HSE requirements and the Building Regulations Part L including.

1. Water quality
2. Water distribution and temperature.
3. Ductwork Systems and Fans.
4. Comfort Conditioning
5. Controls and Metering

All test results shall be recorded and tabulated and documentation in the form of commissioning certificates shall be issued within 14 days of practical completion for review. Further copies of all certification shall be included in the house Health & Safety File and client's handover pack.

The Mechanical Contractor shall consult with the services consultant and demonstrate to him that the system operates and is controlled in accordance with the design intent. Operation of all plant controls shall be further demonstrated to the house manager at a time to be arranged, following handover.

The Mechanical Contractor shall be responsible for the programming of all plant control systems and timeclocks. Timeclocks shall be set to the operating times required by the house manager. Under no circumstances are timeclocks or programmers to be left on constant.

Where applicable, controls shall be set in the tamperproof mode (i.e., settings can be read but not altered except by an authorised person). The Mechanical Contractor shall include for returning to each site in cold winter conditions, during the defects period, to make any final correction or adjustments to the various system controls or settings.

7.2 Heat Test

After satisfactory completion of pressure test and prior to the application of insulation, all heating systems are to be put into operation and maintained at working pressure and temperature for a minimum period of one hour, after which the systems shall be allowed to cool down. The systems shall then be examined for any defects.

7.3 Regulation and Circulation Test

The whole of the installation shall be regulated to ensure an even circulation through every branch in accordance with the commissioning and circulation test procedure laid down in the appropriate CIBSE commissioning codes.

All necessary instruments and equipment for the above tests shall be provided by the Mechanical Contractor.

7.4 Test Certificates

Each test/commissioning certificate shall contain the following information:

- Equipment location
- Identification of equipment and description of installation
- Test conducted
- Results and observations
- Settings of individual controls including heating/cooling controller, time switches etc.
- Name of commissioning engineer who conducted the test & date.



8.0 Operation & Maintenance Manuals

The Contractor shall, six weeks prior to the Date of Practical Completion of the Works supply one complete set of Operating and Maintenance Manuals applicable to the Contract Works. The contents of the manuals shall give clear and concise instructions for the starting, operation and general maintenance of the complete systems and instructions for servicing, including materials to be used, in order to maintain the installation in a good and safe condition. The maintenance and operating instructions shall state the procedures for complying with the equipment manufacturer's recommendations for operation and maintenance of the equipment, indicating any specific requirements, clauses, undertakings, or conditions imposed by manufacturers to safeguard warranties.

The Operating and Maintenance Manuals shall be produced in Microsoft office Word and bound in a stiff covered four ring binder complete with index cards separating the relevant sections of the installation. Each binder shall contain the name of the site printed on the front and spine, along with a volume number where more than one volume is necessary. A fly sheet shall be inserted into the front of the manual stating the Client Organisation, Project Manager and Consulting Engineers name and address and Date of Completion. Sections of the manual that are liable to be used during maintenance procedures shall be housed in plastic sleeves.

The Operating and Maintenance Manual shall be inclusive of the following:

- a. Full description of each section of the installation, detailing the type of plant model and serial numbers, duty rating and date of manufacture.
- b. A comprehensive list of consumable spares recommended to be stocked by the maintenance personnel.
- c. Duration of duties for equipment containing dual or standby sections.
- d. Test Certificates for each section of the works, including Manufacturer's Works Test Certificates for each item of plant, inclusive of all test results obtained during examination.
- e. All commissioning data, test results, thermograph readings against relevant design data.
- f. Recommending frequency for periodic maintenance and cleaning of plant and equipment.
- g. The names and addresses of manufacturers and suppliers of major components.
- h. A complete list of as-installed drawings allied to the Operating and Maintenance Manual.
- i. The occupier's specific maintenance duties required to meet the requirements of Health and Safety legislation.

Equipment manufacturer's data and technical information sheets may be included within the Operating and Maintenance Manuals to supplement information procedures but shall not replace them in whole or part.

The Operating and Maintenance Manual shall not contain non-relevant information.

The Data, Information and Instruction Sheets including Test Certificates and Commissioning Log Sheets shall be produced in Microsoft Office Word 2013 and/or Excel

Upon approval of the draft Operating and Maintenance Manual, the Contractor shall furnish three complete sets and one memory stick to the Project Manager not later than four weeks after practical completion of the Works.



9.0 As-Installed Drawings

The Contractor shall furnish the Project Manager, three weeks prior to practical completion of the contract, two sets of draft As Installed Drawings, indicating the full extent of the works.

The As Installed Drawings shall fully represent the constructional features of the installation, to allow safe operation and maintenance of all systems to be undertaken.

The drawings shall indicate the routes of service equipment throughout the building, detailing precise locations with regard to the building fabric.

Schematic drawings shall indicate all relevant information for the user to identify the type and operational parameters of the plant and equipment utilised.

Mechanical schematic drawings shall have displayed the values of prospective short circuit current and earth fault loop impedance at the origin of each section of the installation.

The Contractor's as Installed Drawings shall indicate the full extent of the Works. They shall be clear and concise and referenced with regard to manufacturer's drawings or details defining any area in greater detail.

As fitted drawings shall be compiled utilising Auto desk AutoCAD 15 or later and Adobe Acrobat .pdf. shall: -

- i) Fully indicate diagrammatically each individual system installed or modified, showing all plant and equipment, and identifying it with a unique number cross referenced to equipment schedules and size of each cable or containment route.
- ii) Identify all installed services on plans and sections to a scale of not less than 1:50.
- iii) Show major items of plant and system controls including all field mounted equipment locations.
- iv) Indicate plant room layouts, with sections, to a scale of not less than 1:20.
- v) Indicate on individual plans and sections to a scale of not less than 1:20 in difficult or congested areas, all building engineering services provided under the terms of the Mechanical Contract, fully identifying each service and fully indicating with accurate dimensions, the sizes and positions of all plant, coordinated services, equipment, conduits, trunking, underfloor ducting, cable tray and cables, together with all inspection, test and maintenance points and cable joints.
- vi) Indicate existing services and clearly demarcate between old and new installations.
- vii) Unless otherwise noted all drawings shall be prepared at a minimum of 1:50 scale, with larger scale details as deemed reasonable and appropriate by the Design Team.
- viii) The preparation of Record Drawings shall be a rolling programme of work as the installation proceeds - it must not be left to the last moment. The Design Team shall regularly inspect and monitor progress on the preparation of the Record Drawings.

Practical Completion will not be awarded without the receipt of final completed Record Drawings in both paper and CD Rom format.



10.0 Mechanical Tender Summary

| ITEM | DESCRIPTION | £ | £ |
|------|---|---|---|
| 1 | Removal of the existing plant from site and disposal | | |
| 2 | Making Safe of all services post removal of plant | | |
| 3 | Amend the existing plant bases to suit | | |
| 4 | Amendment of the pipework to suit the new connections to the new Heat Pumps | | |
| 5 | Install the new replacement Heat Pumps | | |
| 6 | Replace the valving | | |
| 7 | Connection to the site wide BMS | | |
| 8 | Replace the Electrical Supply Cables from the MCC to the new units | | |
| 9 | Condensate Pipework | | |
| 10 | Logbooks | | |
| 11 | Thermal Insulation | | |
| 12 | Testing & commissioning | | |
| 13 | Client training | | |
| 14 | Operating & maintenance instructions | | |
| 15 | Record Drawings | | |
| 16 | Total | | |
| | GRAND TOTAL | | |
| | | | |
| | | | |



APPENDIX A

MANUFACTURERS DATA SHEETS

30RQ- 180R

Air-to-Water scroll heat pump with Greenspeed® Intelligence

| Performance Information | | | |
|--|-------|---------|---------|
| Mode | | Cooling | Heating |
| Cooling Capacity ⁽¹⁾ | kW | 181 | - |
| Heating Capacity ⁽¹⁾ | kW | - | 192 |
| Instantaneous Heating Capacity ⁽²⁾ | kW | - | 192 |
| Cooling Efficiency (EER) ⁽¹⁾ | kW/kW | 2.73 | - |
| Heating Efficiency (COP) ⁽¹⁾ | kW/kW | - | 3.09 |
| Unit Power Input ⁽¹⁾ | kW | 66.3 | 62.0 |
| Sound power level (LwA) ⁽¹⁾ | dB(A) | 91.0 | - |
| Sound Pressure Level at 10.0m (LpA) ⁽¹⁾ | dB(A) | 59.0 | - |
| Minimum Capacity ⁽³⁾ | kW | 53.5 | - |
| Maximum Capacity | kW | 181 | - |

- (1) All performances are compliant with EN14511 – 3 : 2018. Sound power level according to ISO9614 – 1.
 (2) Not certified value not taking the potential hot gas defrost cycles into account, resulting of the climatic outdoor conditions.
 (3) Due to the minimum flow rate allowable, a lower inlet water temperature might have to be specified to achieve this performance.

| Operating Conditions | | | |
|----------------------|--|-------------------------|-------------|
| System element | | Cooling | Heating |
| Water heat exchanger | | | |
| Fluid | Fluid Type | Fresh Water | Fresh Water |
| | Fouling Factor (sqm-K)/kW | 0 | 0 |
| | Leaving Temperature °C | 7.0 | 45.0 |
| | Entering Temperature °C | 12.0 | 40.0 |
| | Fluid Flow l/s | 8.63 | 9.24 |
| | | Total Pressure Drop kPa | 25.8 |
| | | 26.4 | |
| Air heat exchanger | | | |
| Air | Entering Air Temperature (dry bulb) °C | 35.0 | 7.0 |
| | Entering Air Temperature (wet bulb) °C | - | 6.0 |
| | Relative Humidity % | - | 87 |
| Altitude | m | 0 | |

| Unit Configuration | |
|--------------------|--|
| 149 | Bacnet over IP |
| 252 | Coil defrost resistance heaters |
| 256 | Insulation of the evap. in/out ref.lines |
| 25E | Circuit Soft Starter |
| 41 | Water exchanger frost protection |
| 92A | Compressor suction and discharge valves |
| CS | Commodity Surcharge |



Non contractual picture

| Seasonal Efficiency ⁽⁴⁾ | | |
|-------------------------------------|------------------------------------|------------|
| Allowed applications for CE mark: | | |
| Low Temp. Comfort Heating : T<55°C* | SCOP 30/35°C η _s heat | 3.45 135 |
| Comfort Cooling : T>=13°C | SEER 23/18°C η _s cool | 4.47 176 |

- * ECODSIGN Compliant as per regulation (EU) N°813/2013
 (4) All data related to seasonal efficiency are given for standard units and main options (Brine, pump, energy efficiency,...).

| Unit Information | | |
|-------------------------------|--------|----------------|
| Manufacturing Source | | Montluel |
| Refrigerant type | | R32 |
| Refrigerant Weight | kg | 27 |
| Tonnes CO2 Equivalent | Tonnes | 17.9 |
| Number of Refrigerant Circuit | | 2 |
| Number of Passes (Evaporator) | | 1 |
| Number of Compressor | | 3 |
| Number of Fan | | 3 |
| Fan Power Input | kW | 5.07 |
| Operating / Shipping Weight | kg | 1575/1558 |
| Unit Dimensions (LxWxH) | mm | 2410x2253x2324 |

| Electric Information | | |
|----------------------|---------|----------|
| Unit Voltage | V-Ph-Hz | 400-3-50 |
| Standby Power | kW | 0.209 |
| Power Factor | | 0.840 |
| Electrical Circuit | | Supply 1 |
| Maximum Current | A | 150 |
| Startup Current | A | 310 |

| Documentation | |
|---------------|-------------------|
| | PSD |
| | IOM |
| | Technical drawing |
| | Revit file |

AquaSnap 30RQ- 050R

Reversible air-to-water heat pump with scroll compressor

| Performance Information | | | |
|--|-------|---------|---------|
| Mode | | Cooling | Heating |
| Cooling Capacity ⁽¹⁾ | kW | 50.6 | - |
| Heating Capacity ⁽¹⁾ | kW | - | 53.5 |
| Instantaneous Heating Capacity ⁽²⁾ | kW | - | 53.5 |
| Cooling Efficiency (EER) ⁽¹⁾ | kW/kW | 2.68 | - |
| Heating Efficiency (COP) ⁽¹⁾ | kW/kW | - | 3.12 |
| Unit Power Input ⁽¹⁾ | kW | 18.8 | 17.1 |
| Sound power level (LwA) ⁽¹⁾ | dB(A) | 84.0 | - |
| Sound Pressure Level at 10.0m (LpA) ⁽¹⁾ | dB(A) | 52.5 | - |
| Minimum Capacity ⁽³⁾ | kW | 27.3 | - |
| Maximum Capacity | kW | 50.6 | - |

- (1) All performances are compliant with EN14511 – 3 : 2018. Sound power level according to ISO9614 – 1.
 (2) Not certified value not taking the potential hot gas defrost cycles into account, resulting of the climatic outdoor conditions.
 (3) Due to the minimum flow rate allowable, a lower inlet water temperature might have to be specified to achieve this performance.

| Operating Conditions | | | |
|-------------------------|--|-------------|-------------|
| System element | | Cooling | Heating |
| Water heat exchanger | | | |
| Fluid | Fluid Type | Fresh Water | Fresh Water |
| | Fouling Factor (sqm-K)/kW | 0 | 0 |
| | Leaving Temperature °C | 7.0 | 45.0 |
| | Entering Temperature °C | 12.0 | 40.0 |
| | Fluid Flow l/s | 2.42 | 2.57 |
| Total Pressure Drop kPa | | 40.6 | 40.2 |
| Air heat exchanger | | | |
| Air | Entering Air Temperature (dry bulb) °C | 35.0 | 7.0 |
| | Entering Air Temperature (wet bulb) °C | - | 6.0 |
| | Relative Humidity % | - | 87 |
| | Altitude m | 0 | |

| Unit Configuration | |
|--------------------|--|
| 149 | Bacnet over IP |
| 25 | Compressor Soft Starter |
| 256 | Insulation of the evap. in/out ref.lines |
| 41 | Water exchanger frost protection |
| CS | Commodity Surcharge |



Non contractual picture

| Seasonal Efficiency ⁽⁴⁾ | | | |
|-------------------------------------|--|------------------------------------|------------|
| Allowed applications for CE mark: | | | |
| Low Temp. Comfort Heating : T<55°C* | | SCOP 30/35°C η _s heat | 3.84 151 |
| Comfort Cooling : T>=13°C | | SEER 23/18°C η _s cool | 5.24 207 |
| High Temp. Process Cooling : T>=2°C | | SEPR 12/7°C | 5.54 |



* ECODESIGN Compliant as per regulation (EU) N°813/2013

- (4) All data related to seasonal efficiency are given for standard units and main options (Brine, pump, energy efficiency,...).

| Unit Information | | |
|-------------------------------|----------|----------------|
| Manufacturing Source | Montluel | |
| Refrigerant type | R32 | |
| Refrigerant Weight | kg | 8 |
| Tonnes CO2 Equivalent | Tonnes | 5.26 |
| Number of Refrigerant Circuit | 1 | |
| Number of Passes (Evaporator) | 1 | |
| Number of Compressor | 2 | |
| Number of Fan | 1 | |
| Fan Power Input | kW | 0.861 |
| Operating / Shipping Weight | kg | 469/465 |
| Unit Dimensions (LxWxH) | mm | 1061x2050x1330 |

| Electric Information | | |
|----------------------|----------|----------|
| Unit Voltage | V-Ph-Hz | 400-3-50 |
| Standby Power | kW | 0.160 |
| Power Factor | 0.820 | |
| Electrical Circuit | Supply 1 | |
| Maximum Current | A | 42 |
| Startup Current | A | 115 |

| Documentation | |
|---------------|-------------------|
| | PSD |
| | IOM |
| | Technical drawing |
| | Revit file |