

## **MECHANICAL ENGINEERING SPECIFICATION**

**Ware Priory Lido  
Priory Street, Ware  
Hertfordshire.  
SG12 0DE**

**Proposed Extension and Refurbishment  
On Behalf Of  
Ware Town Council**

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## **1 Particulars of Contract**

### **1.1 Program**

Refer to main contract prelims

### **1.2 Site Visits**

Tenderers are advised to visit the site before submitting their Fixed Price Tender to satisfy themselves of the local conditions, accessibility of the areas of work, the full extent and nature of the works and general conditions affecting the execution of the works.

Submitted tenders will be deemed to be fully inclusive offers in accordance with the Tender Documents unless precisely qualified otherwise.

No claim for additional payments in respect of lack of knowledge will be considered by the Employer

Site Visits to be arranged with the contract administrator:

Stuart Roberts  
iCON Building Consultancy Limited  
Chartered Building Surveyors & Project Managers  
T: 01279 653 386  
M: 07788 190 625  
E: [stuart.roberts@iconbc.co.uk](mailto:stuart.roberts@iconbc.co.uk)

### **1.3 Method Statements and Risk Assessments**

The successful contractor shall allow to provide the client with risk assessments and method statements for all works prior to starting on site.

## **2 Materials and Workmanship Clauses**

Materials and workmanship are to be of the best quality and standards.

All materials and workmanship are to be to the latest British Standards where applicable, including BS 8000.

Test all materials in accordance with the relevant British Standard when requested to do so by the Contract Administrator.

All proprietary items are to be fixed completely in accordance with the manufacturers or supplier's instructions and/or recommendations.

Contractors are to ensure that all materials specified are available within the contract period. Any deviations due to anticipated problems must be stated on submission of tender.

### **3 General Description of Works and Intent**

The works described herein and on the associated drawing comprise the mechanical engineering services in relation to the extension and refurbishment of the main building at Ware Lido, as shown on the tender drawings and described in this specification.

The whole of the installation carried out under this contract must comply with the following regulations and requirements, together with the latest revisions and amendments, which apply at the time of installation.

Building Regulations.

Local Authority Bye-Laws, Regulations and Notices.

British Standards and European whether applicable in part or whole.

Relevant British Standard Codes of Practice.

BS 7671: 2008, Requirements for Electrical Installations Wiring Regulations Seventeenth Edition.

Management of Health and Safety at Work Regulations 1999

Electrical Equipment (Safety) Regulations 1994 (3260).

The local Fire Authorities requirements.

The Construction (Design and Management) Regulations 2007

Work Equipment Regulations 1998

Manual Handling Operations Regulations 1992

Workplace (Health Safety and Welfare) Regulations 1992

Personal Protective Equipment at Work Regulations 1992

Display Screen Equipment Regulations 1992

Asbestos Licensing Regulations 1998

The Control of Asbestos Regulations 2006

Construction (Head protection) Regulations 1989

Construction (Health, Safety and Welfare) Regulations 1996

Control of Lead at Work Regulations 2002

Control of Substances Hazardous to Health Regulations 2002

Pollution Prevention and Control Act 1999

Waste Management Licensing Regulations 1994

Reporting of Injuries, Disease and Dangerous Occurrences Regulations 1995

The works covered by this contract will comprise of the following:

#### **3.1 Heating and Cooling**

A new air to water heat pump will supply primary heating to the changing village via underfloor heating as well as providing primary supply to a hot water calorifier

A new heat pump system will provide heating and cooling to the community studio and therapy rooms.

In the remaining areas heating will be provided by electric ceiling mounted radiant panels,

### **3.2 Domestic Hot and Cold Water**

A new ASHP will serve primary supplies to an indirect calorifier which in turn will provide all hot water to the changing village.

In all other parts of the building local electric point of use water heaters will be installed.

The existing cold water main is to be retained and used to serve a new cold water storage tank and mains water outlets.

A boosted cold water system will be installed to serve the changing village.

### **3.3 Mechanical Ventilation**

In both the changing village and community studio, mechanical heat recovery ventilation systems are to be installed with associated ductwork, grilles etc.

Local extract ventilation will be provided to sanitary accommodation, kitchen areas and the staff office.

### **3.4 Above Ground Drainage**

New above ground drainage is to be installed connected to both existing and new below ground drainage pop ups (by others).

## **4 Pricing**

This contractor shall complete the summary of tender breakdown at the rear of this specification to enable a full tender evaluation to be completed by the contract administrator.

## 5 Drawings

### 5.1 Tender Drawings

The following form the tender drawings for this contract:

240502-M01	Proposed Heating and Cooling Services Plan 1 of 2
240502-M02	Proposed Heating Services Plan 2 of 2
240502-M03	Proposed Hot and Cold Water Services Plan 1 of 2
240502-M04	Proposed Hot and Cold Water Services Plan 2 of 2
240502-M05	Proposed Hot and Cold Water Services Schematic
240502-M06	Proposed Mechanical Ventilation Services Plan 1 of 2
240502-M07	Proposed Mechanical Ventilation Services Plan 2 of 2
240502-M08	Proposed Mechanical Ventilation Services Roof Plan
240502-M09	Proposed Mechanical Ventilation Schematic
240502-M10	Proposed Above Ground Drainage Services
240502-M11	Proposed Plant Layout and Schematic

Tender drawings are generally diagrammatic and do not show all fittings, bends etc. necessary to carry out the works. It is therefore essential that, the contractor visits site to ascertain the full extent of the works, as no additional funding will be made available for a lack of knowledge

### 5.2 Installation Drawings

The Tender drawings issued are provided to show primary routes, , component order etc.  
They shall not be used as working or fabrication drawings.

The Services Contractor shall develop the tender drawings in order to provide a complete set of working and fabrication drawings for the installation works

In particular detailed layout drawings for plant rooms and air source heat pump installations shall be provided showing all necessary manufacturers maintenance clearances.

The Contractor shall issue the working drawings to the Contract Administrator, however, comments received from the Contract Administrator shall not relieve the Contractor of his responsibility for overall co-ordination.

### 5.3 Record Drawings

The Services Contractor shall provide record drawings that are:

- 1) Based upon the installation drawings.
- 2) An accurate record of the actual installation including any deviations from the working drawings that have occurred on site.
- 3) Fully co-ordinated
- 4) Indicate the layout identity, size and position of all services installed.
- 5) Provided in electronic format and issued at Practical Completion.

## 6 O&M Manuals

The Services Contractor shall produce all information necessary for inclusion in the building Health and Safety file, referred to as Operating and Maintenance (O&M) manuals below.

Program for production of O&M manual.

- 1) Initial Draft Copy shall be provided prior to Commencement of Commissioning (minimum of 21 days before Client demonstrations and contract completion.)
- 2) Allow a minimum of seven days for the Engineer to comment.
- 3) Incorporate all comments, re issue for comment if substantial change required.
- 4) Prior to Practical Completion supply final copies.

The O&M manuals shall include:

- 1) Bound in covers capable of withstanding continual heavy use.
- 2) An Index.
- 3) Helpful telephone numbers.
- 4) Instructions for dealing with emergency conditions for each plant.
- 5) All information to enable operational staff to comprehend fully the extent, purpose and method of operation of the plant(s) including a full description of operation.
- 6) Detailed schedules of all plant and equipment installed, including model numbers, serial numbers and capacities and with reference numbers which agree with the detailed labelling strategy agreed with the engineer.
- 7) Schedule of manufacturers' names, addresses and telephone numbers.
- 8) Detailed instructions on the starting up, running and shut-down of all systems
- 9) Description of operational routines, together with diagrams showing the functions of all controls.
- 10) Clearly set out the extent and frequency for which maintenance is required, in detail, and how it should be carried out
- 11) Maintenance and lubrication schedules listed in order of frequency.
- 12) Information to facilitate the ordering of spares and replacements
- 13) Common fault finding measures and remedial actions.
- 14) Any precautionary measures necessary to prevent corrosion or freezing etc
- 15) Care required of plant which is or may be subject to seasonal or occasional use
- 16) A final copy of the report(s) prepared during testing and commissioning, including all test certificates.
- 17) Maintenance information may be supported in detail, but not replaced, by maintenance instructions provided by the suppliers of equipment and/or plant
- 18) The instructions shall provide a complete and co-ordinated package
- 19) A full set of Record or 'As Fixed' Drawings.
- 20) Valve charts referenced to coincide with the marking of valve labels etc..

The manual to contain a flash drive version to contain the following:

CAD drawings (Latest AutoCAD version) and PDF copies of all Record and 'As Fitted' drawings.  
Microsoft Word (Latest version) and PDF of all of Services Contractors written instructions.  
PDF copies of all manufacturers O&M manuals  
PDF Copies of all certificates, commissioning results, test certificates etc.  
Electronic copy of control strategies as final commissioned state.

Include for the provision of 1No valve chart in the plantroom

This shall contain a schematic drawing of the system which shall be fully noted with each valve referenced according to the labels/discs fitted. A full schedule shall be included to give details of the valve number, description, function, size and make.

## 7 Basis of Design

The following criteria have been used in the design of the mechanical services.

ASHP Primary Heating Flow Temp.	55°C
ASHP Primary Heating Return Temp.	50°C
ASHP Primary HWS Flow Temp.	63°C
ASHP Primary HWS Return Temp.	58°C
Secondary Heating Flow Temp.	55°C
Secondary Heating Return Temp	45°C
HWS Flow Temp.	60°C
HWS Return Temp.	55°C
External Design Temperature	-4°C
Changing Village Ventilation Rate	Normal 6 Ach/hr Boost 10 Ach/hr
Community Room Ventilation Rate	10 l/s per person

## 8 Contractors Design Portion (CDP)

The Services Contractor shall assume full design responsibility for the following items:

- All builderswork requirements associated with the services installation including provision of all necessary drawings.
- Design of all necessary services supports/fixings, including guides and anchors
- Design all necessary means for expansion and contraction for the Mechanical Services.
- Design of automatic controls via specialist sub-contractor
- Design of roof mounted support system for ductwork and plant
- The co-ordination of all services installations with all other trades on site and the building structure and fabric.

## **9 Removals and Strip Out**

### **9.1 General**

Allow to regularly collect, centrally store and subsequently remove from site all surplus materials before the completion of the works. Keep the site safe and tidy at all times.

Dispose of any old or scrap materials in such a way that results in the least damage to the environment. Any materials that can be recycled or sold as scrap (e.g. copper, steel etc.) should be. Allow for all such proper disposal costs within the tender offer.

Ensure that any construction waste is removed, recycling where possible to minimise the amount of waste taken to landfill.

If the building is to remain occupied for the duration of the contract, allow for the fitting and if necessary removal of temporary valves and bypasses to enable the services to be maintained to the occupied part of the building.

### **9.2 Existing Heating Services**

All existing electric heating within the building is to be removed in its entirety.

### **9.3 Existing Hot and Cold Water Services**

The existing incoming cold water main is to be retained where it enters the plant room and serves the pool plant and external bib taps.

The existing cold water main serving the building along with the associated remote hot water cylinders and all other pipework and fittings within the building are to be removed.

## **10 Connections to Existing Services**

The Contractor shall be responsible for all new connections required to existing services.

The Contractor shall make due allowance in his tender for isolating where required, of all existing mains to which he makes new connections.

The Contractor shall not isolate any section of any existing service unless the CA or his representative has previously approved in writing the time and date of isolation.

The Contractor shall include in his tender for the provision of any temporary connections to existing services where these are necessary to prevent interference with the operation of existing services.

## 11 Builders Works

It is intended that all major builders work will be carried out by a Main Contractor, this includes construction of ASHP compounds and bases, construction of plinths for plant room equipment, holes through fabric for ductwork (larger than 50mm diameter) including making good painting of exposed pipework etc.

The mechanical contractor shall allow for drilling for fixings for all mechanical equipment, pipework, ductwork etc.

The mechanical contractor shall allow to provide a detailed builders work schedule and associated drawing to the main contractor.

## 12 Air Source Heat Pump

Provide and fit 1 No, Strebel S-ASX-NT - 70 Air to Water Heat Pump with rated output of 66.7KW at air 7°C and water 35°C.

All the above as manufactured by:

Strebel Ltd  
Unit 10, Invincible Road  
Farnborough  
Hampshire  
GU14 7QU  
Tel: 01276 685 422  
Email: [info@strebel.co.uk](mailto:info@strebel.co.uk)  
Website: <https://strebel.co.uk>

Strebel Quotation Reference 419104 dated 27/08/24

Include for commissioning by the manufacturer.

The air source heat pump shall be serviced by the manufacturer at the end of the defect period or one year after commissioning of the equipment (whichever is shortest).

## 13 Thermal Store

Provide and fit 1 No, Strebel TSE 800/3 Thermal Store, with a capacity of 800 litres and complete with 12KW back up immersion heater, thermometer kit and pressure gauge.

All the above as manufactured by:

Strebel Ltd  
Unit 10, Invincible Road  
Farnborough  
Hampshire  
GU14 7QU  
Tel: 01276 685 422  
Email: [info@strebel.co.uk](mailto:info@strebel.co.uk)  
Website: <https://strebel.co.uk>

Strebel Quotation Reference 419104 dated 27/08/24

Include for commissioning by the manufacturer.

## 14 Hot Water Cylinder

Provide and fit 1 No, Strebel S-LC-I 800 SS Calorifier, with a capacity of 800 litres and complete with 12KW three phase immersion heater, Unvented Pack 6e.80 - 1 1/4 Controls & 1 1/2" T&P valve

All the above as manufactured by:

Strebel Ltd  
Unit 10, Invincible Road  
Farnborough  
Hampshire  
GU14 7QU  
Tel: 01276 685 422  
Email: [info@strebel.co.uk](mailto:info@strebel.co.uk)  
Website: <https://strebel.co.uk>

Strebel Quotation Reference 419104 dated 27/08/24

Include for commissioning by the manufacturer.

## 15 Heating Pump

Provide and fit 1No Grundfos Magna 1 25-60 single head single phase variable speed pump, capable of 0.378 l/s @ 20Kpa as manufactured by:

Grundfos Pumps Ltd  
Grovebury Road  
Leighton Buzzard  
Beds  
LU7 4TL  
Tel: 01525 85 00 00  
Email: [grundfos-uk@sales.grundfos.com](mailto:grundfos-uk@sales.grundfos.com)

## 16 Secondary Hot Water Pump

Provide and fit 1No Grundfos Alpha 1 15-50 N 130 single head single phase variable speed pump capable of 0.05 l/s @ 25Kpa as manufactured by:

Grundfos Pumps Ltd  
Grovebury Road  
Leighton Buzzard  
Beds  
LU7 4TL  
Tel: 01525 85 00 00  
Email: [grundfos-uk@sales.grundfos.com](mailto:grundfos-uk@sales.grundfos.com)

## 17 Pressurisation Unit and Expansion Vessel

Provide and fit 1No EFD digital electronic pressurisation unit and 1No MikroPro 100 litre expansion vessel as manufactured by:

Mikrofill Systems Ltd  
1 Merse Rd,  
Moons Moat North Industrial Estate,  
Redditch  
B98 9HL  
Tel: 03452 606020  
Email: [sales@mikrofill.com](mailto:sales@mikrofill.com)

## 18 Chemical Dosing Pot

Provide and fit 1No DP6 stainless steel chemical dosing pots as manufactured by:

Fabricated Products UK Ltd  
Unit 1  
Fullerton Road  
Rotherham  
South Yorkshire  
S60 1DH  
Tel: 01709 720 842  
Email: [sales@fabricatedproducts.co.uk](mailto:sales@fabricatedproducts.co.uk)

## 19 Gauges and Thermometers

Provide and fit as shown on the drawings, 100mm dial pressure gauges, 0 Bar to 6 Bar and 100mm dial thermometers, 0°C to 100°C complete with ½ inch BSP connections and ½ inch BSP pockets in accordance with BS EN13190

## 20 Underfloor Heating

Allow for the complete installation of all new underfloor heating to the changing area, including provision of manifolds, heat packs, thermostats, Wavin 5 layer PERT pipework, clip rails etc as shown on the tender drawing and supplied and installed by:

Floor Heat Systems Ltd  
88a Lovell Road  
Oakley  
Bedford  
England  
MK43 7RX  
Tel: 01234608722  
Mob: 07846135531  
Email: [info@floorheatsystems.co.uk](mailto:info@floorheatsystems.co.uk)

## 21 Electric Radiant Panels

Provide and fit as shown on the drawings and schedule, 17No IP44 rated steel panel electric radiant panels as manufactured by

BN Thermic Ltd  
34 Stephenson Way,  
Three Bridges,  
Crawley  
RH10 1TN  
Tel: 01293 547361  
Email: [sales@bnthermic.co.uk](mailto:sales@bnthermic.co.uk)

## 22 Cold Water Storage Tank

Provide and fit 1No 3,000 litre GRP sectional cold water tank complete with 25mm drain assembly, 40mm equilibrium ball valve, 65mm overflow, 50mm outlet connection.

Tank external dimensions 3140mm x 1150mm x 1207 high and to be mounted on builderwork plinth to provide minimum of 1,000mm static pressure to booster set.

Tank model PW.3x1x1.IFB.AG as supplied by:

Tanks Direct,  
Channel House,  
Mart Road,  
Minehead,  
TA24 5BJ  
Tel: 0333 272 3827  
Email: [sales@tanks-direct.co.uk](mailto:sales@tanks-direct.co.uk)

Or Equal and Approved

## 23 Cold Water Booster Set

Provide and fit 1No, 1 No Stuart Turner, Aquaboost SP2V-10HM04S-VARIFLO-24, single phase twin pump cold water booster set capable of 3.3 l/s @ 3.0Bar as manufactured by

Stuart Turner Ltd,  
Unit 6 North Point Business Park  
Eggborough  
North Yorkshire  
DN14 0JT  
Tel: 01977 801911

Or Equal and Approved

## 24 Water Conditioner

Provide and fit as shown on the drawings 1No Aquabion AB-H50 in line water conditioner as manufactured by:

Aquabion UK Ltd  
25 High Street,  
Corsham,  
Wiltshire,  
SN13 0ES

Tel: 01380 609395  
Email: [info@aquabion-uk.com](mailto:info@aquabion-uk.com)

Or Equal and Approved

## 26 Point of Use Electric Water Heaters

Provide and Fit 4No 10 litre unvented hot water heaters in the Stephenson building as shown on the drawings.

Water heaters to be as model Andis Lux 10UR, 3KW complete with all necessary expansion and pressure relief ancillaries and as manufactured by:

Ariston  
Artisan Building,  
Hillbottom Rd,  
High Wycombe  
HP12 4HJ  
Tel: 0333 240 8777  
Email: <https://www.ariston.com/en-uk/support>

## 27 Thermostatic Blending Valves

Where indicated on the tender drawings provide and fit TMV3 15mm and 22mm thermostatic blending valves complete with isolation valves, strainers and check valves.

Valves to be as contractors' choice

## 28 Thermostatic Balancing Valves

Where indicated on the tender drawings, provide and fit 15mm thermal balancing valves which shall be installed as close to the associated blending valves as possible and be as model 2900 as manufactured by:

Hattersley  
Epsilon Terrace,  
West Road,  
Ipswich,  
Suffolk,  
IP3 9FJ,;  
Tel: 0333 240 8777

Or Equal and Approved

## 29 Shower Panels

Where indicated on the tender drawings provide and fit Delabie SPORTING 2 time flow shower panels complete with soft-touch operation, automatic mechanical flush with every use, time flow ~30 seconds, flow rate 6 lpm at 3 bar, tamperproof, scale-resistant fixed shower head with automatic flow rate regulation, adjustable spray, accessible filters and non-return valves and Integrated stopcock.

## 30 Flow Restrictors

Wash hand basins and sinks to be fitted with combined flow restrictor/ball isolation valves as model CP961 manufactured by:

Cottam and Preedy  
Bishopsgate Works,  
68 Lower City Road,  
Tividale,  
West Midlands,  
B69 2HF  
Tel: 0121 552 5281  
Email: [enquiries@cottamandpreedy.co.uk](mailto:enquiries@cottamandpreedy.co.uk)

Or Equal and Approved

## 31 Trace Heating

New Cold Water pipework installed externally within the plant compound is to be trace heated using Raychem self-regulating cable to provide frost protection

## 32 MHRV Units

### 32.1 Changing Village

Provide and fit as shown on the drawings, 1No VES MAX31/B/FW/S heat recovery unit complete with control panel, and electric heater battery and capable of 1.6m<sup>3</sup>/s @ 140Pa as manufactured by:

VES  
Eagle Close  
Chandlers Ford Industrial Estate  
Chandlers Ford  
Eastleigh  
Hampshire  
SO53 4NF  
Tel: 02380 461150  
Email: [emailenquiries@ves.co.uk](mailto:emailenquiries@ves.co.uk)

Allow for commissioning by the manufacturer.

All the above as VES quotation reference Q1209490 dated 3<sup>rd</sup> October 2024

### 32.2 Community Studio

Provide and fit as shown on the drawings, 1No VES No. EVCB385-1/FW-E/EE/LT/G4/CPSC externally mounted Ecovent Counterflow heat recovery air handling unit complete with control panel, and electric heater battery and capable of 0.4m<sup>3</sup>/s @ 100Pa as manufactured by:

VES  
Eagle Close  
Chandlers Ford Industrial Estate  
Chandlers Ford  
Eastleigh  
Hampshire  
SO53 4NF  
Tel: 02380 461150  
Email: [emailenquiries@ves.co.uk](mailto:emailenquiries@ves.co.uk)

All the above as VES quotation reference Q1209490 dated 3<sup>rd</sup> October 2024

### 33 Heat Pump Installation

Provide and at fit within the Community Studio and Therapy rooms as shown on the drawings, 1No heat pump system comprising of outdoor unit, 4No ceiling cassette units and 3No room controllers all as manufactured by:

Mitsubishi Electric Europe B.V.,  
Travellers Lane,  
Hatfield,  
Herts,  
AL10 8XB  
Tel: 01707 276100  
Email: [Hatfield.Technical@meuk.mee.com](mailto:Hatfield.Technical@meuk.mee.com)

As their quotation reference QUO-0004-552389/1 / 1 (Heat Pump Option)

The whole of the heat pump installation including controls wiring shall be carried out by a specialist Mitsubishi accredited sub-contractor.

### 34 Extract Fans

Provide and fit 7No Manrose ceiling mounted extract fans and associated ductwork and roof cowls as shown on the drawings and scheduled at the rear of this specification.

Fans as manufactured by:

Manrose  
Unit 23, Suttons Park Avenue,  
Earley,  
Reading,  
RG6 1AZ  
Tel: 01753 691399  
Email: [sales@manrose.com](mailto:sales@manrose.com)

Or Equal and approved.

### 35 Grilles

Provide and fit 16 No ceiling mounted grilles, plenum boxes and extract valves as shown on the drawings and scheduled at the rear of this specification.

Grilles as manufactured by:

Gilberts (Blackpool) Ltd  
Clifton Rd,  
Blackpool,  
Lancashire  
FY4 4QT  
Tel: 01253 766911  
Email: [estimating@gilbertsblackpool.com](mailto:estimating@gilbertsblackpool.com)  
Or Equal and approved.

### 36 Ductwork

The duct installation shall be manufactured in full compliance with HVCA Specification DW 144.

Ductwork air flow leakage testing shall be undertaken in full compliance with HVCA DW 143.

Performance Standards of Ductwork: -.

Low Pressure - Class A

Leakage Classification - Class A

Positive & Negative Pressures Range - Class A

Include for all necessary access/cleaning access, regulating dampers, flexible ductwork etc.

All primary and secondary ductwork supports shall be included.

### 37 Pipework and Fittings

All new pipework installations to be carried out using Light gauge copper tubes in half hard temper in accordance with BS EN 1057 and BS EN 12449.

Pressfit or Capillary joints to BS EN 1254/1 shall be used

All copper pipe fittings used in conjunction with both external and internal installations shall conform to BS EN 1254/1.

All fittings shall be potable type i.e. containing lead free solder. Where end feed fittings are used the solder shall be of the lead free type.

Under no circumstances will fittings of duplex brass (i.e. hot pressed fittings and fittings containing beta brass) or fittings prone to dezincification be permitted.

The ends of tubes shall be correctly cleaned and all rough edges removed before any joint is made.

Tube formed bends may be used in concealed positions only, and shall be smooth and free from corrugation, backs of bends shall not be overstretched.

All pipework shall be supported by substantial brackets, hangers or clips of approved type.

The layout of the piping shall take into account expansion and contraction particularly at the ends of runs where changes of direction occur.

Include for all drilling of walls and slabs etc for fixing screws, rawlbolts, resin bonded bolts etc and for the fixings themselves.

Main walls or partition walls etc where pipes pass through sleeves shall not be considered as pipe supports.

Care must be taken to ensure that the axis of the pipe is parallel with the axis of the pipe ring or hanger.

Pipes shall have sufficient clearance behind for the proper application of the insulating material where necessary. The finished surface of any covering shall be at least 5mm from the walls etc., and the bare pipes shall be at least 10mm clear from adjacent walls etc.

Wherever possible the layout of the pipework shall take into account expansion. Ensure that hangers, anchors and expansion points meet this requirement. Adequate provision shall be made at all connections to plant and appliances to avoid stresses due to expansion and contraction.

Where the available pipework layout does not permit the above, proprietary manufacture guided stainless steel pre-expanded expansion bellows shall be used. In addition, at the recommended positions indicated by the bellows manufacturer, additional pipework guides and the necessary anchors shall be installed.

Generally pipes to have a gradient set to allow for venting and draining the system of not less than 25mm in 6 metres and pipes to be fitted clear of all walls and floors. Careful observation of parallels and symmetry of arrangement is required throughout and in special instances the gradient of pipework may be lessened in order that this may be maintained.

All pipe passing through walls, floors, ceilings, etc. shall be provided with an oversize pipe sleeve of the same material as the pipe cut to finish flush with the surface of the building fabric.

### 38 Roof Ductwork/Plant Bracketry

All roof plant and ductwork shall be installed on proprietary demountable brackets such as big foot H frame or similar.

Care shall be taken to ensure roof coverings are fully protected by installing an additional layer of felt beneath the feet of all brackets.

### 39 Valves

All valves shall be as Oventrop or equal and approved

SERVICE	< or = 50mm	>50mm
Isolation	Oventrop 107 90	Oventrop 104 82
Lockshield	Oventrop 107 92	-
Check	Oventrop 107 50	Oventrop 107 25
Drain Cocks	Oventrop 103 20	-

### 40 Thermal Insulation

The whole of the new heating, domestic water pipework installations and ductwork installations shall be insulated in accordance with BS 5422:2001, BS 5970:2001 and executed by Specialist Contractors.

Pipework in the plant room to be isogenopak finished and Identification banding shall be fitted throughout in accordance with BS1710.

Where pipework concealed within the wall insulation (i.e. to shower panels) the contractor shall utilise Armaflex insulation, 9mm thick.

Allow for aluminium pipe insulation cladding to the external cold water pipework within air source heat enclosure and for insulated aluminium valve boxes to external valves.

Exposed ductwork on roofs to be aluminium clad.

## **41 Building Management System (CDP)**

The controls package is a contractors design portion and will be developed by the BMS specialist with further liaison with Strebel (ASHP) and VES (MHRV Units) to ensure all manufacturer supplied sensors/standalone controls etc are incorporated.

The new BMS shall be based around Trend IQ4E (or equal and approved) and incorporate the following items:

- Air Source Heat Pump Installation
- MHRV units
- Heating Pump
- Hot water Pump
- Cold Water Booster Set
- Pressurisation Plant
- Inputs for Electric Meter Monitoring (7 No)

All necessary loose controls (motorised valves, actuators, sensors etc) shall be provided by the controls specialist.

All controls wiring to be carried out by the specialist sub-contractor

The specialist controls supplier shall submit their design drawings and controls strategy for comment by the CA prior to construction.

## **42 Chlorination**

All new domestic water pipework is to be flushed and chlorinated in accordance with BS8558

## **43 Water Treatment**

Allow for the new ASHP installation to be chemically treated as manufacturers recommendations, including provision of suitable anti-freeze if required.

## **44 Commissioning and Testing**

Carry out all inspections, tests and commissioning in accordance with the requirements of the appropriate CIBSE Commissioning Codes, BRISA Guides, Building Regulations, IEE Wiring Regulations, manufacturers' requirements, and the requirements and recommendations of any other certifying bodies.

After commissioning and prior to handover, ensure all consumable items such as filters, strainers etc are thoroughly cleaned.

Provide all necessary original certifications at Practical Completion Stage. These certificates include, but are not limited to:

- Pipework Pressure Test Certificates
- Water Treatment/Inhibitor Certificates
- Chlorination Certificates
- Ductwork Commission Certificates
- Air Source Heat pump commissioning Certificates
- Heat Pump Installation Commission Certificates

## **45 Legionella Risk Assessment**

On completion the installation, the contractor shall allow to complete a Legionella Risk Assessment in accordance with the Health and Safety at Work etc Act 1974 (HSWA), The Management of Health and Safety at Work Regulations (MHSWR), the Control of Substances Hazardous to Health Regulations 2002 (COSHH) and The Approved Code of Practice: Legionnaires' disease: The control of Legionella bacteria in water systems (L8)

## 46 Summary of Tender for Mechanical Services

### MAIN SUMMARY

- |           |  |
|-----------|--|
| <b>1</b>  | Strip Out and Removals   |
| <b>2</b>  | Supply and Installation of new Electric Radiant Panels   |
| <b>3</b>  | Supply and Installation of new heat pump system to community room/therapy rooms complete including commissioning                   |
| <b>4</b>  | Supply and Installation of underfloor heating system to changing village complete including commissioning.                         |
| <b>5</b>  | Supply and Installation of Air Source Heat Pump including thermal store, hot water cylinder etc. complete including commissioning. |
| <b>6</b>  | Heating Installation within plant room (excluding Item 5 above)  |
| <b>7</b>  | Supply and Installation of new hot and cold water system complete excluding shower panels  |
| <b>8</b>  | Supply and installation of shower panels.  |
| <b>9</b>  | Supply and Installation of new MHRV system to changing village complete including commissioning                                    |
| <b>10</b> | Supply and Installation of new MHRV system to community studio complete including commissioning                                    |
| <b>11</b> | Supply and Installation of new local extract fans complete   |
| <b>12</b> | Supply and Installation of new above ground drainage complete  |
| <b>13</b> | Design, Supply and Installation of new BMS controls complete   |
| <b>14</b> | Thermal Insulation to pipework including trace heating   |

**MAIN SUMMARY (Continued)**

- |           |   |  |  |
|-----------|---|--|--|
| <b>15</b> | Thermal Insulation to Ductwork                                    |  |  |
| <b>16</b> | Legionella Risk Assessment  |  |  |
| <b>16</b> | Water Treatment   |  |  |
| <b>17</b> | Chlorination  |  |  |
| <b>18</b> | Handover Information (Record Drawings ,O&M Manuals, Valve Charts) |  |  |
| <b>19</b> | Any other items (contractor to state)                             |  |  |

**TOTAL MECHANICAL SERVICES**

## 47 Appendix 1 Extract Fan Schedule

EXTRACT FAN SCHEDULE								
Ref	Location	Fan						
		Manufacturer	Model	Type	Height mm	Length mm	Volume (ls)	Pressure (Pa)
EF01	Access WC	Manrose	X5	QF100TX5OP	160	160	15	20
EF02	Office	Manrose	X5	QF100SX5OP	160	160	10	20
EF03	Kitchen	Manrose	X5	QF100HTX5OP	160	160	23	10
EF04	Access WC	Manrose	X5	QF100TX5OP	160	160	15	20
EF05	WC	Manrose	X5	QF100TX5OP	160	160	15	20
EF06	Kitchenette	Manrose	X5	QF100HTX5OP	160	160	10	20
EF07	Staff Room	Manrose	X5	QF100HTX5OP	160	160	10	20

## 48 Appendix 2 Grille Schedule

GRILLE SCHEDULE								
Ref	Location	No Off	Manufacturer	Model	Height mm	Length mm	Volume (ls)	Pressure (Pa)
SG01	Community Studio	3	Gilberts	DG4	300	300	135	6
SG02	Changing Village	5	Gilberts	DG4	375	375	200	6
SG03	Changing Village	2	Gilberts	DG3	375	375	200	6
EG01	Community Studio	3	Gilberts	DG4	300	300	135	8
EV	Changing Village	47	Gilberts	GX150	202 Dia		30	45

## 49 Appendix 3 Radiant Panel Schedule

ELECTRIC RADIANT PANEL SCHEDULE							
Ref	Emitter						
	Manufacturer	Type	Height (mm)	Length (mm)	Depth (mm)	Model	Output (w)
RP01	BN Thermic	RP3	25	595	595	RP3-03	300
RP02	BN Thermic	RP3	25	1192	595	RP3-06	600
RP03	BN Thermic	RP3	25	1192	595	RP3-06	600
RP04	BN Thermic	RP3	25	1192	595	RP3-06	600
RP05	BN Thermic	RP3	25	1192	595	RP3-06	600
RP06	BN Thermic	RP3	25	595	595	RP3-03	300
RP07	BN Thermic	RP3	25	595	595	RP3-03	300
RP08	BN Thermic	RP3	25	595	595	RP3-03	300
RP09	BN Thermic	RP3	25	1192	595	RP3-06	600
RP10	BN Thermic	RP3	25	595	595	RP3-03	300
RP11	BN Thermic	RP3	25	1192	595	RP3-06	600
RP12	BN Thermic	RP3	25	1192	595	RP3-06	600
RP13	BN Thermic	RP3	25	1192	595	RP3-06	600
RP14	BN Thermic	RP3	25	595	595	RP3-03	300
RP15	BN Thermic	RP3	25	595	595	RP3-03	300
RP16	BN Thermic	RP3	25	1192	595	RP3-06	600
RP17	BN Thermic	RP3	25	1192	595	RP3-06	600

## 50 Appendix 4 Electric Water Heater Schedule

ELECTRIC WATER HEATER SCHEDULE								
Ref	Heater							
	Manufacturer	Type	Capacity (litres)	Height (mm)	Length (mm)	Depth (mm)	Model	Rating (KW)
EWH01	Ariston	Andris Lux	10	360	360	298	10 U	3.0
EWH02	Ariston	Andris Lux	15	360	360	346	15 U	3.0
EWH03	Ariston	Andris Lux	15	360	360	346	15 U	3.0
EWH04	Ariston	Andris Lux	15	360	360	346	15 U	3.0

## **51 MHRV Unit Technical Submission and Quotation**

PB Design  
 9 Bournside  
 Brickhill  
 Bedford.  
 MK41 7EG

Page 1 of 2

## Quotation

**Customer Reference:**  
 Ware Lido

Customer Name: Peter Murphy  
 Company Name: PB Design  
 Tel Number: 07772 261 184  
 Account Number

Quotation Number: Q1209490  
 Quotation Date: 03/10/2024  
 Your Sales Contact: Paul Neville

Required?	Item	Qty	Part Number	Description	Price Each	Total Price
<input type="checkbox"/>	1	1	MAX31/B/FW/S	AHU Unit Reference :Pool Changing	£24,829.56	£24,829.56
<input type="checkbox"/>	1	1	CPS/FT/S	Bespoke Control Panel - Fitted	£6,024.26	£6,024.26
<input type="checkbox"/>	2	1	EVCB385-1/FW-E/EE/LT/G4/CPSC	Fan Unit Unit Ref: : Community Room	£5,008.27	£5,008.27
<input type="checkbox"/>	2	1	EHEVCB3/12KW/1X3	Electric Heater Battery	£199.40	£199.40
<input type="checkbox"/>	3	1	CPEVCB3/12KW-3/BACMS	BlueSense Control Package BACnet MSTP Integration port Unit Ref: Community Room	£2,154.10	£2,154.10
<input type="checkbox"/>	3	1	PSEL900463	Commissioning Tool	£248.09	£248.09
<input type="checkbox"/>	4	1	SERVICE/SALES/POSTINST/CP/S	Post Installation and Controls Check :- VES engineer to attend site within normal working hours to check the control component installation, loop set-up and ensure system is configured for optimum energy saving prior to setting the AHU to work. Conditions Apply: When you are ready to book in your visit please contact the Customer Services Team on Tel: 08448 156 060 Ext 652 or email customerservices@ves.co.uk quoting your Sales Order No. *Please Note: A minimum of 8 - 10 weeks notice required prior to site visit*	£669.50	£669.50

Sub Total                    £39,133.18

Required?	Item	Qty	Part Number	Description	Price Each	Total Price

\*\* Standard Delivery Charge, based on 5% of the order value. £1,956.66

Grand Total (Excl. VAT) £41,089.84

**Please note: BIM Files are available for these products, upon request. Please be advised they will be according to the current quotation and may be subject to later modification. If the quotation entails bespoke units, the CAD outline, will be the dimensions that are manufactured to and will supersede any BIM's previously supplied.**

**Please contact your local RSE to obtain current product lead-times prior to ordering.**

\*

Thank you for your enquiry. Our quotation is valid for 7 days from the above date. Should you wish to purchase these items please state the VES quotation number on your purchase order.

As required please mark the boxes corresponding to each item line required, confirming the quantity, return the completed document to VES together with your Purchase Order. Stating Invoice address, delivery address and requested delivery date.

\*\* Standard delivery excludes offloading, dedicated vehicles, specialist vehicles to suit site conditions, FORs certified delivery, delivery outside UK mainland and timed delivery, unless otherwise stated within this quotation. Carriage will be based on delivery location. **Please note should the delivery location change or should deliveries be split after order receipt the carriage charge is subject to change.** For orders below £1000.00, a minimum carriage charge of £40.00 will be made. For deliveries beyond the UK mainland, please contact the sales

Visit our Corporate website: [www.ves.co.uk](http://www.ves.co.uk)

**Sales Freephone 0800 31 66 000**

VES is a trading name of VES Andover Ltd. Registered in England No. 02303719. Registered Office as above.

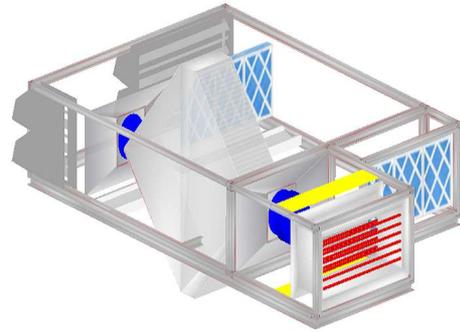


**PROJECT DETAILS**

Project no	Q1209490\Rev-00\	Date	03 Oct 2024	Unit No	Q1209490-01-0	Project Reference	Ware Lido
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**UNIT DETAILS**

Unit Model	MAX31/B/FW/S
Customer Reference	Pool Changing
Unit Location	External
Access Side	Right
Frame Construction	50mm Post - 50mm Panels
Frame Finish	STD R7004 Powdercoated
Panel Insulation	Mineral Wool - 50mm
Panel Internal Sheet	Std P/Coat Galv. Steel - (0.8)
Panel External Sheet	Std P/Coat Galv. Steel - (0.8)
Roof Type	Twin Pitched Roof
Roof Height	125 mm
Base Frame	75mm Sheet Steel (3)
Width	3100 mm
Height	850 mm
Length	5075 mm
Weight Approx +-5%	1460.5 kg
Section Quantity	5
	<b>Supply Extract</b>
Duty	1.60 1.60 m <sup>3</sup> /s
External Pressure	140 140 Pa
Total Pressure	325 359 Pa
SFP	0.56 0.60 W//s
Unit Combined SFP	1.16 W//s
Unit Rating & Performance To	EN13053:2006 +A1:2011
Unit Mechanical Construction To	EN1886:2007
Leakage Class	L2 to EN1886:2007


**SECTION WEIGHTS AND DIMENSIONS**

Section No	Width	Height	Length	Weight Approx +-5%
A	3100 mm	850 mm	3550 mm	NaN kg
B	1550 mm	850 mm	1525 mm	260 kg
C	1550 mm	850 mm	600 mm	115 kg

**SUPPLY SIDE SECTION A**

**001 INLET SECTION****Weather Hood Galv**

<b>Width</b>	1450 mm	<b>Height</b>	750 mm
<b>Velocity</b>	1.47 m/s	<b>Pressure Drop</b>	7.00 Pa
<b>Finish</b>	Painted	<b>Position</b>	Onair

**Fresh Air Damper**

<b>Width</b>	1450 mm	<b>Height</b>	750 mm
<b>Velocity</b>	1.47 m/s	<b>Pressure Drop</b>	7.00 Pa
<b>Material</b>	Aluminium	<b>Position</b>	Onair
<b>Finish</b>	None	<b>Mounting</b>	Internal

**EXTRAS****ACCESSORIES**

24V Open Close Damper Motor

**002 PANEL FILTERS**

<b>Stage #</b>	1	<b>Face Velocity</b>	1.85 m/s
<b>Type</b>	Panel	<b>Pressure Drop</b>	23 Pa
<b>Media</b>	Cotton / Synthetic Fibre	<b>Withdrawl</b>	Front
<b>Filter Grade</b>	G4 (ISO Coarse 65%)	<b>Framework Material/Type</b>	
<b>Filter Type</b>	AP	<b>Spare Filters</b>	None

**EXTRAS****ACCESSORIES**

Filter Pressure Switch - Fitted

**DUAL SIDE SECTION A****003 PLATE HEAT EXCHANGER**

<b>Material</b>	GOLD_EPOXY_PAINTED_EXTRA	<b>Condensate Rate</b>	-24.75 L/h
		<b>Connection Diameter</b>	15 mm
<b><u>Fresh Air</u></b>		<b><u>Extract Air</u></b>	
<b>Air Volume</b>	1.60 m³/s	<b>Air Volume</b>	1.60 m³/s
<b>kW Rating</b>	45.85 kW	<b>kW Rating</b>	45.85 kW
<b>Wet Efficiency</b>	91.10 %	<b>Wet Efficiency</b>	91.10 %
<b>Pressure Drop</b>	154.3	<b>Pressure Drop</b>	154.3
<b>Inlet</b>	Temperature -4.00 °C	<b>Inlet</b>	Temperature 22.00 °C
	Humidity 100.0 %		Humidity 60.0 %
<b>Outlet</b>	Temperature 19.69 °C	<b>Outlet</b>	Temperature 7.33 °C
	Humidity 19.03 %		Humidity 98.98 %

**EXTRAS****ACCESSORIES**

24V Modulating Damper Motor c/w IP66 Rating

Coated drainpan.

**NOTES**

Please Note. This unit has a channel base. Please ensure that you mount the unit sufficiently clear of the floor to enable you to fit the required depth of trap on the drain pan. Failure to trap the pan sufficiently deep enough will lead to water leaking from this unit.

**DRAIN PAN**

<b>Material</b>	Galvanised Steel	<b>Drain size</b>	3000 mm
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**SUPPLY SIDE SECTION B**

**004 SUPPLY PLENUM FAN - SINGLE FAN**

<b>Model</b>	GR40I-ZID.DC.CR-116895/A01		<b>Working RPM</b>	1853 RPM				
<b>Efficiency</b>	63.2 %		<b>Maximum Speed</b>	2360 RPM				
<b>Sound Power</b>	80 dbW		<b>Fan Speed % of Max RPM</b>	78.52 %				
<b>Fan Blade Type</b>	Backward Curve		<b>Absorbed Power</b>	0.89 kW				
<b>Fan Finish</b>	Standard		<b>Motor Type:</b>	EC (0-10 volt input required for speed control)				
<b>Motor Power (Each)</b>	2.10 kW		<b>Motor Voltage</b>	400				
<b>FLC (Each)</b>	3.40 A		<b>Number of Fans</b>	1				
<b>Frequency</b>	<b>63 Hz</b>	<b>125 Hz</b>	<b>250 Hz</b>	<b>500 Hz</b>	<b>1 kHz</b>	<b>2 kHz</b>	<b>4 kHz</b>	<b>8 kHz</b>
<b>Inlet-db</b>	73	75	73	70	63	62	62	64
<b>Outlet-db</b>	73	83	77	77	75	70	67	69

**EXTRAS****ACCESSORIES**

Airflow Pressure Switch - Fitted

**NOTES**

The fan and motor sit on a common sub-frame within the casing that is fully vibration isolated.

The fan has a fitted inlet flexible connection.

Where this unit has to pass through restricted access ways, it may be necessary to supply the fan section in more than one piece. This will then require the fan/motor assembly and casing to be bolted together on-site by others.

**005 PLENUM**

Length 300.0 mm

**006 ELECTRIC HEATER**

<b>Air On DB</b>	-4.0 °C	<b>Air Off DB</b>	22.0 °C
<b>Maximum Heater Duty</b>	54.0 kW	<b>Total Load</b>	50.4 kW
<b>Stages</b>	1	<b>Pressure Drop</b>	0.00 Pa
<b>Voltage</b>	Three phase	<b>Velocity</b>	2.06 m/s
<b>Control</b>	Thyristor		

**EXTRAS****ACCESSORIES**

Fitted &amp; Pre-Wired Isolator

**007 OUTLET SECTION**50mm Spigot Galv

<b>Width</b>	1450 mm	<b>Height</b>	750 mm
<b>Velocity</b>	1.47 m/s	<b>Pressure Drop</b>	1.00 Pa
<b>Finish</b>	Painted	<b>Position</b>	Ofair

**EXHAUST SIDE SECTION C****008 INLET SECTION**50mm Spigot Galv

<b>Width</b>	1450 mm	<b>Height</b>	750 mm
<b>Velocity</b>	1.47 m/s	<b>Pressure Drop</b>	1.00 Pa
<b>Finish</b>	Painted	<b>Position</b>	Onair

**009 PANEL FILTERS**

<b>Stage #</b>	1	<b>Face Velocity</b>	1.85 m/s
<b>Type</b>	Panel	<b>Pressure Drop</b>	23 Pa
<b>Media</b>	Cotton / Synthetic Fibre	<b>Withdrawl</b>	Rear
<b>Filter Grade</b>	G4 (ISO Coarse 65%)	<b>Framework Material/Type</b>	
<b>Filter Type</b>	AP	<b>Spare Filters</b>	None

**EXTRAS****ACCESSORIES**

Filter Pressure Switch - Fitted

**EXHAUST SIDE SECTION A****0010 EXHAUST PLENUM FAN - SINGLE FAN**

<b>Model</b>	GR40I-ZID.DC.CR-116895/A01		<b>Working RPM</b>	1886 RPM				
<b>Efficiency</b>	64.4 %		<b>Maximum Speed</b>	2360 RPM				
<b>Sound Power</b>	80 dbW		<b>Fan Speed % of Max RPM</b>	79.92 %				
<b>Fan Blade Type</b>	Backward Curve		<b>Absorbed Power</b>	0.96 kW				
<b>Fan Finish</b>	Epoxy		<b>Motor Type:</b>	EC (0-10 volt input required for speed control)				
<b>Motor Power (Each)</b>	2.10 kW		<b>Motor Voltage</b>	400				
<b>FLC (Each)</b>	3.40 A		<b>Number of Fans</b>	1				
<b>Frequency</b>	<b>63 Hz</b>	<b>125 Hz</b>	<b>250 Hz</b>	<b>500 Hz</b>	<b>1 kHz</b>	<b>2 kHz</b>	<b>4 kHz</b>	<b>8 kHz</b>
<b>Inlet-db</b>	73	76	73	70	63	62	62	64
<b>Outlet-db</b>	73	84	78	77	75	70	67	69

**EXTRAS****ACCESSORIES**

Airflow Pressure Switch - Fitted

Liftoff door - end of section.

**NOTES**

The fan and motor sit on a common sub-frame within the casing that is fully vibration isolated.

The fan has a fitted inlet flexible connection.

Where this unit has to pass through restricted access ways, it may be necessary to supply the fan section in more than one piece. This will then require the fan/motor assembly and casing to be bolted together on-site by others.

**0011 OUTLET SECTION****Exhaust Air Damper**

<b>Width</b>	600 mm	<b>Height</b>	750 mm
<b>Velocity</b>	3.56 m/s	<b>Pressure Drop</b>	41.00 Pa
<b>Material</b>	Aluminium	<b>Position</b>	Lfair
<b>Finish</b>	None	<b>Mounting</b>	Internal
<b>Weather Hood Galv</b>			
<b>Width</b>	600 mm	<b>Height</b>	750 mm
<b>Velocity</b>	3.56 m/s	<b>Pressure Drop</b>	41.00 Pa
<b>Finish</b>	Painted	<b>Position</b>	Lfair

**EXTRAS****ACCESSORIES**

24V Open Close Damper Motor c/w IP66 Rating

Powdercoated damper

**AHU ACOUSTIC DATA****Connection Noise Spectra - Supply Section**

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Overall dB
Inlet Linear Sound Pressure Level $L_p$ dB	69	69	64	60	53	52	49	51	62
Outlet Linear Sound Pressure Level $L_p$ dB	70	78	70	71	70	65	60	62	74

**Connection Noise Spectra - Extract Section**

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Overall dB
Inlet Linear Sound Pressure Level $L_p$ dB	69	70	64	60	53	52	49	51	62
Outlet Linear Sound Pressure Level $L_p$ dB	71	80	72	72	72	67	64	66	76

**Casing Noise Breakout Spectrum at 3m Distance**

Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Supply Fan Power Spectrum $L_w$ dB	73	83	77	77	75	70	67	69
Extract Fan Power Spectrum $L_w$ dB	73	84	78	77	75	70	67	69
Combined Fan Power Spectrum $L_w$ dB	76	87	81	80	78	73	70	72
Case Insertion Reduction	13	17	18	35	39	39	38	38
Reduction for 3m Distance	18	18	18	18	18	18	18	18
Resultant Linear Sound Pressure Level at 3m $L_p$ dB	45	52	45	27	21	16	14	16
NR Level at 3m	36							
Resultant A-Weighted Sound Pressure Level at 3m $L_p$ dB(A)	19	36	36	24	21	17	15	15

**NOTES:**

Section A: Weight  $\pm 5\%$  = 124Kgs

**Components**

- 1 Inlet Section 350 mm
- 2 Panel Filter 500 mm

Section A: Weight  $\pm 5\%$  = 819Kgs

**Components**

- 3 Plate Heat Exchanger 2450 mm

Section B: Weight  $\pm 5\%$  = 260Kgs

**Components**

- 4 Plug Fan 575 mm
- 5 Plenum 300 mm
- 6 Electric Heat Coil 450 mm
- 7 Outlet Section mm

Section C: Weight  $\pm 5\%$  = 115Kgs

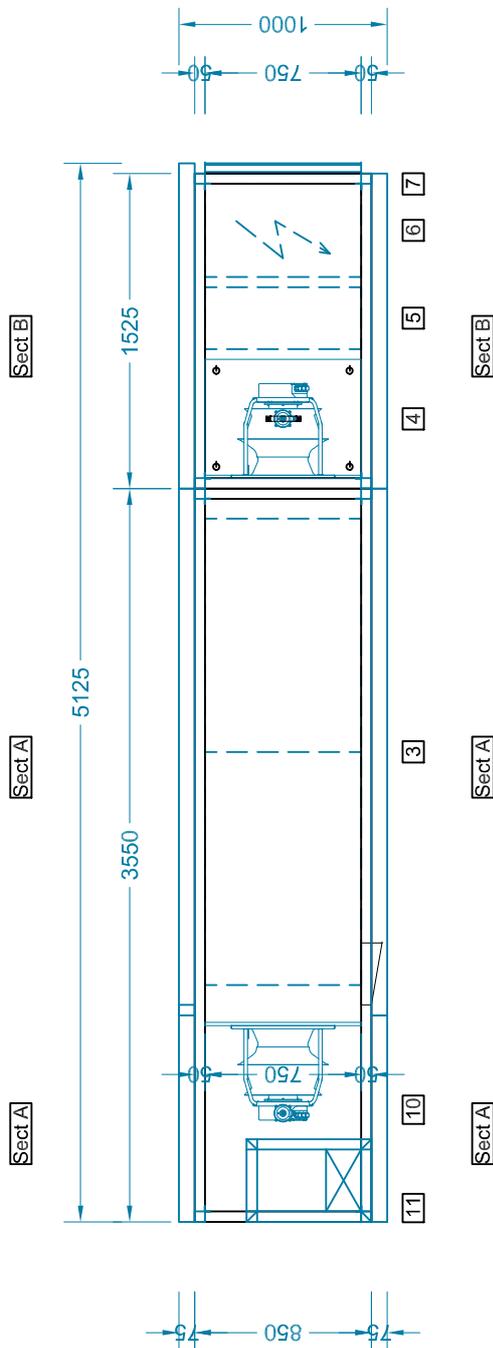
**Components**

- 8 Inlet Section mm
- 9 Panel Filter 500 mm

Section A: Weight  $\pm 5\%$  = 142Kgs

**Components**

- 10 Plug Fan 850 mm
- 11 Outlet Section mm



## ELEVATION FRONT

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YES ANDOVER LTD.  
 EAGLE CLOSE,  
 CHANDLERS FORD INDUSTRIAL ESTATE,  
 HAMPSHIRE, ENGLAND, SO53 4NF  
 TEL: (08448) 15 60 60  
 FAX: (023) 80261204  
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PROJECT:

Ware Lido

UNIT REFERENCE:

Pool Changing

MODEL:

MAX31/B/FW/S

AHU No.:

1

QUANTITY:

1

DRAWN:

DATE:

APPROVED:

DATE:

UNIT No.:

1209490-1-0



ALL DIMENSIONS IN mm

DO NOT SCALE

IF IN DOUBT PLEASE CONTACT VES DESIGN OFFICE

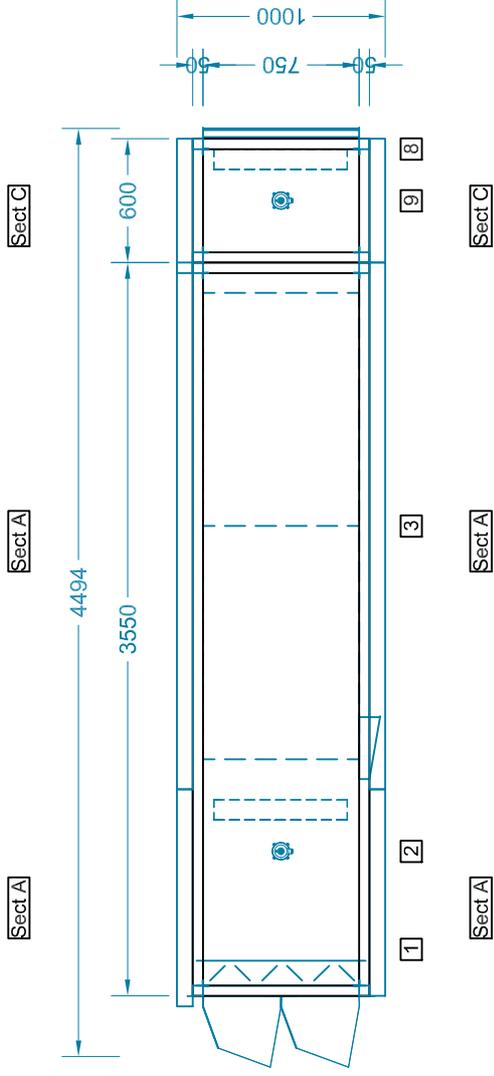
REVISION.:

DATE:

No.:

**NOTES:**

- Section A: Weight  $\pm 5\%$  = 124Kgs  
 Components  
 1 Inlet Section 350 mm  
 2 Panel Filter 500 mm  
 Section A: Weight  $\pm 5\%$  = 819Kgs  
 Components  
 3 Plate Heat Exchanger 2450 mm  
 Section B: Weight  $\pm 5\%$  = 260Kgs  
 Components  
 4 Plug Fan 575 mm  
 5 Plenum 300 mm  
 6 Electric Heat Coil 450 mm  
 7 Outlet Section mm  
 Section C: Weight  $\pm 5\%$  = 115Kgs  
 Components  
 8 Inlet Section mm  
 9 Panel Filter 500 mm  
 Section A: Weight  $\pm 5\%$  = 142Kgs  
 Components  
 10 Plug Fan 850 mm  
 11 Outlet Section mm

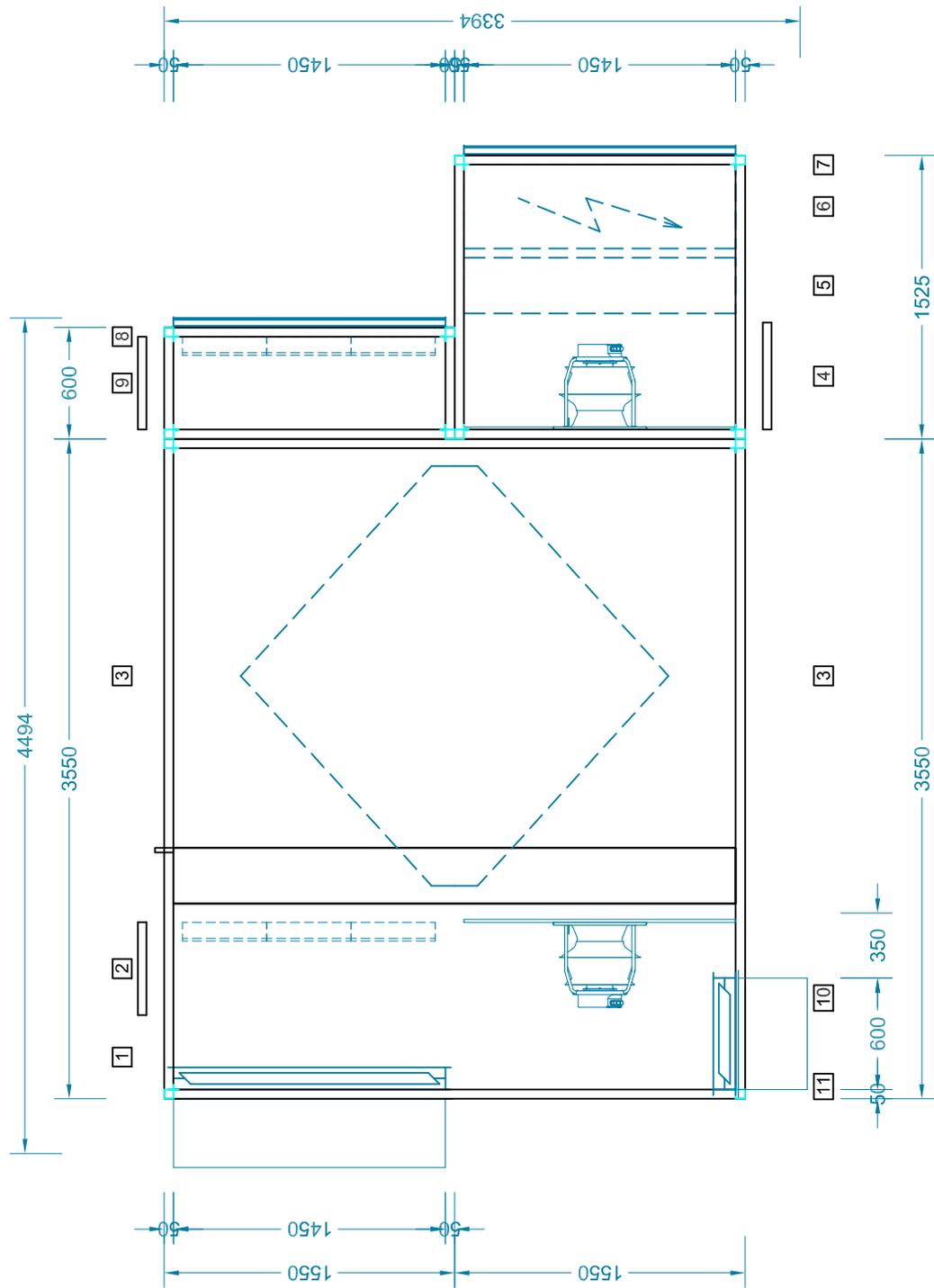


**ELEVATION BACK**

2014 PRODUCT PROTECTED BY DESIGN RIGHT		PROJECT: <b>Ware Lido</b>		ALL DIMENSIONS IN mm		DO NOT SCALE	
 <p><b>VES</b></p> <p>EXCEPT FOR ARCHITECTURAL DETAILS THIS SCHEME IS COPYRIGHT &amp; CONFIDENTIAL AND IS THE PROPERTY OF VES ANDOVER LTD. RIGHTS OF REPRODUCTION ARE RESERVED AND THE PLAN MUST NOT BE SHOWN TO THIRD PARTIES WITHOUT THE COMPANY'S WRITTEN PERMISSION</p>		UNIT REFERENCE: <b>Pool Changing</b>		IF IN DOUBT PLEASE CONTACT VES DESIGN OFFICE		REVISION:	
YES ANDOVER LTD. EAGLE CLOSE, CHANDLERS FORD INDUSTRIAL ESTATE, CHANDLERS FORD, EASTLEIGH, HAMPSHIRE, ENGLAND, SO53 4NF TEL: (084448) 15 60 60 FAX: (023) 80261204 EMAIL: vesitd@ves.co.uk WEB SITE: www.ves.co.uk		MODEL: <b>MAX31/B/FW/S</b>		No.:		DATE:	
AHU No.: <b>1</b>		QUANTITY: <b>1</b>		DUTY: <b>1.6/1.6</b> M3/S		APPROVED:	
DATE:		DATE:		DATE:		DATE:	
UNIT No.: <b>1209490-1-0</b>		APPROVED:		DATE:		DATE:	

**NOTES:**

- Section A: Weight  $\pm 5\%$  = 124Kgs  
 Components  
 1 Inlet Section 350 mm  
 2 Panel Filter 500 mm  
 Section A: Weight  $\pm 5\%$  = 819Kgs  
 Components  
 3 Plate Heat Exchanger 2450 mm  
 Section B: Weight  $\pm 5\%$  = 260Kgs  
 Components  
 4 Plug Fan 575 mm  
 5 Plenum 300 mm  
 6 Electric Heat Coil 450 mm  
 7 Outlet Section mm  
 Section C: Weight  $\pm 5\%$  = 115Kgs  
 Components  
 8 Inlet Section mm  
 9 Panel Filter 500 mm  
 Section A: Weight  $\pm 5\%$  = 142Kgs  
 Components  
 10 Plug Fan 850 mm  
 11 Outlet Section mm



**PLAN DECK**

2014 PRODUCT PROTECTED BY DESIGN RIGHT

**VES**

VES ANDOVER LTD.  
 EAGLE CLOSE,  
 CHANDLERS FORD INDUSTRIAL ESTATE,  
 CHANDLERS FORD, EASTLEIGH,  
 HAMPSHIRE, ENGLAND, SO53 4NF  
 TEL: (084448) 15 60 60  
 FAX: (023) 80261204  
 EMAIL: vesitd@ves.co.uk  
 WEB SITE: www.ves.co.uk

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PROJECT: <b>Ware Lido</b>		MODEL: <b>MAX31/B/FW/S</b>	
UNIT REFERENCE: <b>Pool Changing</b>		APPROVED: DATE:	
AHU No.: <b>1</b>	QUANTITY: <b>1</b>	DUTY: <b>1.6/1.6</b> M3/S	DATE:
UNIT No.: <b>1209490-1-0</b>		DATE:	

ALL DIMENSIONS IN mm		DO NOT SCALE	
IF IN DOUBT PLEASE CONTACT VES DESIGN OFFICE			
No.:	REVISION.:	DATE:	

## Bespoke Control Panel Model CPS/S

### Control Panel Specification

Control panel utilising the latest VES BlueSense technology and designed around a Siemens Climatix PLC platform. All necessary software is pre-loaded and tested, with the controls philosophy ready to be optimised to minimise system energy usage. Customer terminals, component labelling and MCB protection are provided for ease of installation and maintenance. All signal cabling is tri-rated, protected within slotted conduit and terminated with ferrules.

### BMS Integration

BACnet MS/TP open protocol communication port is supplied to support system integration. Standard object list and integration guide available upon request. Integration by others

Basic integration is available via remote volt-free enable contacts and common trip and run output indications via volt-free contacts. Enable input may be from remote BMS, time clock or switch etc.

### User Interface

Remote wall mounted IP30 controller (Roller HMI) is provided for intuitive user adjustment of temperature set point, time clock programming and off/on/timer selection. System status and alarms displayed in plain text. Pin protected access to commissioning levels. Interconnection low voltage cable by others

### Enclosure Specification

Main panel IP54 powder coated RAL7035 steel enclosure mounted to the AHU and pre-wired to the AHU internal components only, installation and wiring of external components & power supply by others. Door-interlocked isolator accepts a single power supply for all AHU mounted components.

### Temperature Control Philosophy

Cascade control for close and stable return/room air temperature control with adjustable PID loop control and adjustable dead band. Alternatively, supply control can be selected via HMI if preferred. Close control stability may be impacted by external influences such as site conditions, space usage/environment and other external influences.

### Supply Fan Control

1 x supply fan starter, 3PH - 400VAC 2.1kW interlocked to AHU mounted EC fan motor for demand control and commissioning. Fixed speed operation for normal running. Speed setpoint adjustable within pin protected commissioning levels.

### Extract Fan Control

1 x extract fan starter, 3PH - 400VAC 2.1kW interlocked to AHU mounted EC fan motor for demand control and commissioning. Fixed speed operation for normal running. Speed setpoint adjustable within pin protected commissioning levels.

### Heat Recovery Control

Face and bypass damper automatically modulated to achieve the set point and hence maximum energy saving. Free heating, heat recovery, free cooling or cooling recovery is optimised prior to mechanical heating or cooling.

### Main Heating Control

Electric heater thyristor control. Maximum load 54kW 3PH - 400VAC. Supply fan airflow interlock and run on timer adjustable on HMI.

### Dirty Filter Indication

Common input for dirty filter differential pressure switches for alarm indication via HMI interface or via BMS.

### Damper Control

1 x 24VAC open/close supply damper signal.  
1 x 24VAC open/close extract damper signal.

### Remote Shut Down

Fire alarm shut down via 24VDC input by others in series with panel enable to disable panel and AHU (Run on timer still applicable in EHB applications). Volt-free shut down via removable link for hard wired connection to BMS system or other enable switch.

### Auxiliary Volt-Free Contacts

Common trip indication for hardwire connection to BMS or other device. Maximum circuit protection 2A 230VAC.  
Common run indication for hardwire connection to BMS or other device. Maximum circuit protection 2A 230VAC.

### Additional Specification Requirements

Control panel design and build conforms to Form 1 standards.

### Exclusions

Controls and commissioning excludes wiring, integration, air volume measurement, condenser operation and any item not specifically stated above. Estimated commissioning time assumes that the AHUs & controls will be fully installed and ready to run, aborted visits and additional time will be charged as quoted. Continuous, unrestricted and safe access to be provided. A normal day is 7.5 hours Monday to Friday 08.00 – 1700. No allowance has been made for out of hours working. A minimum of 20 days notice required prior to site visit.

Post installation commissioning not included within VES control panel cost or within sales order. Commissioning and set up of the VES control panel by others. VES commissioning can be ordered at a later date if later decided to be required.

Unit Ref: : **Community Room**

1 No. **EVCB385-1/FW-E/EE/LT/G4/CPSC** externally mounted Ecovent Counterflow heat recovery air handling unit.

Supply air volume **0.4m<sup>3</sup>/s** of air against an external resistance of 100Pa.

Extract air volume **0.4m<sup>3</sup>/s** of air against an external resistance of 100Pa.

Specific supply fan power **0.55watts/litre/second** at this duty.

Specific extract fan power **0.55watts/litre/second** at this duty.

This unit with low energy, high efficiency fans is constructed from tubular aluminium frame and 50mm double skinned galvanised steel panels, with resin bonded mineral wool slab infill. Mounted on support feet, the unit has the option of floor fixing with self-levelling feet, ***purchased separately*** or drop rods, ***supplied by others***. In this flat configuration, the unit has top access via the roof, with additional left or right access to filters through side panels.

Overall unit dimensions 2200mm long, 1800mm wide, 765mm high. Unit weight: 375kg.

Unit supplied with EC fan motors with built in speed control, overload and over current safety functions. If a VES control package is *not* supplied, additional inputs are required for fixed speed commissioning or remote variable speed.

The fan may be run at full speed by insertion of a link or modulated via either an external 0-10Volt input eg BMS, or remote manual potentiometer eg CFSC1

The unit can be supplied with a fitted, pre-wired and factory commissioned VES control panel or alternatively the electrical components within the unit are pre-wired to integral isolators, with the low voltage components to user terminals.

**The supply side comprises the following components:**

- a: Inlet Cowl 450mm wide x 450mm high x 500mm Deep.
- b: Pleated filter to grade G4, withdrawal through side access panel.
- c: Premiere high efficiency plate heat exchanger using counterflow technology to achieve a reclaim rate of between 85% to 90% based on sensible conditions.
- d: Supply EC fan, backward curved impellor, single inlet, running at 1680RPM and direct driven by a 0.56kW, 230Volt ac, 1 phase motor, with fitted quick change plug connector to pre-wired control panel or isolator. The fan is also fitted with external pressure ports piped to the outside of the case.  
Full load current 2.8amps.

Sound Power Level Spectrum

Hz	63	125	250	500	1k	2k	4k	8k
PWL, dBW	70	66	62	49	46	46	39	33

Casing noise breakout; NR 36 at 1 metre and NR 30 at 3 metres.  
dBA 40 at 1 metre and dBA 34 at 3 metres.

- e: 12kW electric heater battery arranged in 1 x 3 ph step suitable for modulating Thyristor control. The elements are sheathed in tubular incolloy, with an internal nickel chromium powder. An over heat thermal cut out is fitted which must be wired in to the control circuitry together with a fan run-on timer, VES control panels include this feature.
- f: Discharge spigot 450mm wide x 450mm high.

**The exhaust side comprises the following components:**

- a: Inlet spigot 450mm wide x 450mm high.
- b: Pleated filter to grade G4, withdrawal through side access panel.
- c: Extract EC fan, backward curved impellor, single inlet, running at 1680RPM and direct driven by a 0.56kW, 230Volt ac, 1 phase motor, integral speed control, with fitted quick change plug connector to pre-wired control panel or isolator. The fan is also fitted with external pressure ports piped to the outside of the case. Full load current 2.8amps.

Sound Power Level Spectrum

Hz	63	125	250	500	1k	2k	4k	8k
PWL, dBW	70	66	62	49	46	46	39	33

Casing noise breakout; NR 36 at 1 metre and NR 30 at 3 metres.  
 dBA 40 at 1 metre and dBA 34 at 3 metres.

- d: Premier high efficiency plate heat exchanger with counterflow technology, with condensate drain pan. The efficiency stated is based on an extract air temperature of 21°C db / 50% RH, providing sensible heat recovery. Face and Bypass damper located onto exhaust side of plate heat exchanger, with 24Volt ac, modulating actuator to enable heating and or cooling recovery. This is controlled automatically when using a VES control panel.
- e: Discharge Cowl 450mm wide x 450mm high x 500mm Deep.

Control Panel Option:

Integral control package fitted to the AHU, priced separately and described fully elsewhere. An alternative remote, wall mounted enclosure control panel is available, contact the sales office for details.

<b>Qty</b>	<b>Description</b>	<b>Part Number</b>
1	<b>Fan Unit</b>	EVCB385-1/FW-E/EE/LT/G4/CPSC
1	Electric Heater Battery	EHEVCB3/12KW/1X3

**Please specify left or right handings at time of ordering.**

Unit Ref: Community Room

**Control package** utilizing the latest **BlueSense** technology optimised to minimise energy usage over the systems' full life cycle, *to include the following standard features.*

Chassis mounted and located within AHU controls compartment, with door-interlocked isolator and pre-wired to AHU internal components.

Fan control

Supply and extract fan starters with control signals directly connecting to EC fans or inverter speed controllers for demand control and commissioning

Demand control

Input from Air Quality for modulating applications

Input from PIR or switch for 2 speed High/Low applications

Temperature control. The temperature control mode can be selected, with accurate control options of supply air, return air or return air with supply limits being available at the user interface.

Heat exchanger control.

The face and bypass damper is automatically modulated to achieve temperature set point and hence maximum energy saving. Free heating, heat recovery, free cooling or cooling recovery is optimised prior to mechanical heating.

Heater control.

Modulating thyristor control of electric heater with independent safety circuit

Damper control. Inlet and return damper open signals, with option of either 24 Volt ac or 230 Volt ac auxiliary power supply.

Auxiliary connections

Fire alarm shut down, in response to 24 Volt dc input, *24vdc supplied by others*

Remote enable/disable via removable link, *volt free contacts supplied by others*

Common trip indication via volt free contacts

Run indication via volt free contacts.

Inlet and return damper, with option of either 24 Volt ac or 230 Volt ac auxiliary power supply.

Dirty filter differential pressure switch common inputs, 2 off.

All necessary fusing, labelling and terminals are located within the panel together with gland plate for cable entry to ease installation and maintenance.

<b><u>Qty</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	BlueSense Control Package BACnet MSTP Integration port	CPEVCB3/12KW-3/BACMS

Additional remote User Interface options.  
A remote mounted user interface to simplify end user control.

<b><u>Qty</u></b>	<b><u>Description</u></b>	<b><u>Part Number</u></b>
1	Commissioning Tool	PSEL900463

## **52 Air Source Heat Pump Quotation**



**Bristol**

Old Gloucester Road  
Bristol  
BS16 1FX  
TEL 01454 202 050  
Fax 01454 202 900

<b>Pages:</b> 7 <b>To:</b> Peter Murphy <b>Company:</b> PB Design Brickhill MK41 7EG Bedford.  <b>Date:</b> 04/10/2024 08:34	<b>From:</b> Scott Evemy <b>Mobile:</b> +447968108286 <b>Email:</b> Scott.Evemy@meuk.mee.com <b>Prepared by:</b> Jason Shek <b>Phone:</b> <b>Email:</b> Jason.Shek@meuk.mee.com
---	--

<b>Project ref:</b> PRO-92804   Ware Lido Ware Lido <b>Proposal no:</b> QUO-0004-552389/1 / 1 Please quote this proposal number on all correspondence relating to this proposal <b>Validity:</b> 30 days from the above date
--

Dear Peter,

Thank you for your valued enquiry in respect of the above project. I have pleasure in submitting our proposal as detailed herein. The proposal is subject to the additional proposal information detailed within. I trust the enclosed meets with your current requirements and would like to take this opportunity to draw your attention to a few of the benefits of dealing with Mitsubishi Electric Direct.

**Commissioning by Mitsubishi Electric:** The Technical Services Department of Mitsubishi Electric provides a comprehensive, underwritten commissioning service at competitive rates. This service will give you peace of mind and will hold us fully accountable for this essential element of the installation process.

**Training:** All of our air conditioning training courses are CPD approved. We have training facilities in Hatfield, Birmingham, Manchester, Bristol, Reigate and our factory in Livingston, Scotland.

**e-Shop:** Online ordering is available to all credit account customers across all Mitsubishi Electric product lines. For more information on the finished goods and spares available, please visit: <https://les.mitsubishielectric.co.uk/installers/e-shop>

Please do not hesitate to contact me at the above office should you wish to amend any details or require any further information.

Assuring you of our best attention at all times.

Regards,  
Scott Evemy

<b>REMINDERS</b> <ul style="list-style-type: none"><li>- This quotation is given by Mitsubishi Electric in good faith based upon information provided by you or your company.</li><li>- We have not undertaken a site survey to support this quotation. Whilst we endeavour to factor into our quotation any special site conditions or user requirements which you may have expressly identified to us previously in writing, this quotation is not a project system design and is not a confirmation of project volumetric or yield analysis. We recommend that you assess final product selection and make the final system design based upon your own volumetric or yield analysis and project knowledge, including any project requirements which might impact on that selection.</li><li>- Please check carefully any requirement for a Mitsubishi Electric product to integrate with any third party equipment. We are not responsible for integration capability of our products with any third party equipment unless we have expressly confirmed that this integration is approved in the current Mitsubishi Electric product specification or in a current technical bulletin.</li><li>- If this quote contains Heating Products. Purchasing and installing customers must pass the relevant Heating Training Course before an order can be placed. Call on 0161 866 6089 to book.</li><li>- All quotations containing CAHV, Wizard AHU, QAHV, e-Series, s-MEXT, CRHV and/or Cascade Systems must be accompanied by a Mitsubishi Electric technical proposal. Please contact your Account Manager if you have not received one.</li></ul>
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Page: 2  
Proposal: QUO-0004-552389/1 / 1  
Project: Ware Lido / PRO-92804  
Date: 04/10/2024 08:34

Qty	Model	Description	Unit Price	Net Price
<b>It is the contractor's responsibility to check this quotation is in line with the latest edition of project particular specification tender documents before ordering.</b>				
<b>Diversity 88%</b>				
1	PUMY-P200YKM3 (613793-UK)	PUMY-P200YKM3 Outdoor Unit R410A	£4,806.00	£4,806.00
3	CMY-Y62G-E Branch Joint PUMY-P (165132)	CMY-Y62G-E Branch Joint PUMY-P	£72.00	£216.00
Community Studio				
2	PLFY-M63VEM6-E.TH (622830-UK)	6.4kW R410A/R32 VRF Cassette/Indoor Unit	£1,026.00	£2,052.00
Treatment 1&2				
2	PLFY-P25VFM-E1R1.TH (601846-UK)	600x600 4-Way Blow Ceiling Cassette	£796.00	£1,592.00
2	PLP-6EAR1 WHITE GRILLE (303659-UK)	PLP-6EAR1 WHITE GRILLE	£205.00	£410.00
2	SLP-2FA (289069)	SLP-2FA GRILLE	£112.00	£224.00
1	PAR-41MAA (606129-UK)	Standard wired remote controller	£103.00	£103.00
<b>Subtotal:</b>			<b>£9,403.00</b>	
<b>TOTAL NET PRICE EXCLUDING VAT</b>				<b>£9,403.00</b>

Mitsubishi Electric Europe B.V. incorporated in the Netherlands with limited liability. Registered in England as a branch No. BR003391. Place of registration: Travellers Lane, Hatfield, Hertfordshire, AL10 8XB. This document is confidential and may also be privileged. If you are not the intended recipient, please notify this office immediately. You may not copy it, use it for any purpose nor disclose its contents to any other person. This quotation is issued subject to Mitsubishi Electric's Terms & Conditions of Sale.

## **53 Heat Pump Quotation**

Unit 10, Invincible Road  
 Farnborough  
 Hampshire  
 GU14 7QU

Company Reg. 01197182  
 VAT no. 212 7889 50

**PB Design & Consultancy Ltd**

Woodside Cottage  
 Wood Lane  
 Renhold  
 Bedford  
 MK41 0LT  
 VAT no.

**Page** 1  
**Customer no.** 33074  
**Currency** GBP  
**Date of quotation** 27/08/2024  
**Price valid 30 days from the date of quotation**  
**Prices are Exclusive of VAT**

Our ref. Jonathan Hunter  
 Your ref. Peter Murphy

**Project  
 16089 - Ware Lido (Male/Female/Family Showers)**

Product no.	Product description	Qty.	Unit price	Discount	Total
-------------	---------------------	------	------------	----------	-------

BUDGET QUOTATION - SUBJECT TO APPROVAL

801309	S-ASX-NT - 70 Air to Water Heat Pump The S-ASX-NT 70 is a monobloc design air-to-water heat pump comprising of three fans and two scroll compressors.	1.00	47,765.00	0.00%	47,765.00
--------	--	------	-----------	-------	-----------

The S-ASX-NT range utilises R290 refrigerant and a stainless-steel brazed heat exchanger to generate LTHW at between 35°C and 72°C.

The unit comes with soft start compressor, low noise acoustic set up and a modulating pump within its casing to transfer the system water from the S-ASX heat pump to a thermal store.

Technical Data:

Output at A7/W35 is 66.7 KW  
 SCOP at 35°C is 4.06 (EN 14511)

Electrical Supply : 400 - 3 - 50

Length - 2480 mm  
 Width - 930 mm  
 Height - 1830 mm  
 Transport Weight - 730 Kg

Sound power level is 77 dB(A) in Low Noise Acoustic Setting (ISO 3744)  
 Sound pressure at 10 metre is 45 dB(A) in Low Noise Acoustic Setting (ISO 3744)

801360	Remote Support Hardware for 1 x S-ASX Unit The S-ASX-NT 60 is a monobloc design air-to-water heat pump comprising of three fans and two scroll compressors.	1.00	633.00	0.00%	633.00
--------	--	------	--------	-------	--------

The S-ASX-NT range utilises R290 refrigerant and a stainless-steel brazed heat exchanger to generate LTHW at between 35°C and 72°C.

The unit comes with soft start compressor, low noise acoustic set up and a modulating pump within its casing to transfer the system water from the S-ASX heat pump to a thermal store.

Technical Data:

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**Project**  
**16089 - Ware Lido (Male/Female/Family Showers)**

Product no.	Product description	Qty.	Unit price	Discount	Total
	Output at A7/W35 is 55.1 KW SCOP at 35°C is 4.05 (EN 14511)  Electrical Supply : 400 - 3 - 50  Length - 2480 mm Width - 930 mm Height - 1830 mm Transport Weight - 708 Kg  Sound power level is 77 dB(A) in Low Noise Acoustic Setting (ISO 3744) Sound pressure at 10 metre is 45 dB(A) in Low Noise Acoustic Setting (ISO 3744) .				
104149	Strebel TSE 800/3 Thermal Store	1.00	1,800.00	0.00%	1,800.00

The Strebel TSE/3 carbon steel thermal stores are suitable for closed heating or cooling circuits for installations that require correct energy management, especially for systems that use renewable energy sources such as:

- Biomass.
- Heat Pumps.
- Solar Energy.

The TSE/3 thermal store is designed to provide an extraordinary storage capacity that translates directly into high savings. The over dimensioned, rigid, mould-injected PU thermal insulation maintains the storage temperature over lengthy periods of time without requiring any additional energy input. This means less start-ups and adjustments of external energy sources, with less energy consumption and a more economical cost.

In addition, the TSE/3 thermal stores come with 3 x 2" immersion heater connections to allow immersion heaters to be connected so that there is back up heating in cases where the external energy source fails. Immersion heater options are available at an additional cost.

Technical Specifications of the TSE 800/3 Thermal Store:

Tank Capacity: 800 Litres.  
 Height: 1840 mm.  
 Diameter including insulation: 950 mm.  
 Empty Weight: 120 kg.  
 PU Thermal Insulation Thickness: 80mm - This can be removed to allow the thermal store to fit through an 800mm door frame.

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 GU14 7QU

Company Reg. 01197182  
 VAT no. 212 7889 50

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**Page** 3  
**Customer no.** 33074  
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**Date of quotation** 27/08/2024

**Price valid 30 days from  
 the date of quotation  
 Prices are Exclusive of VAT**

Our ref. Jonathan Hunter  
 Your ref. Peter Murphy

**Project  
 16089 - Ware Lido (Male/Female/Family Showers)**

Product no.	Product description	Qty.	Unit price	Discount	Total
	Number of Side Connections: 6				
	Side Connection Sizes: 3" Female				
	Top AAV Connection Size: 1" Male				
	Immersion Heater Connections: 3				
	Connection Sizes: 2" F				
	We can offer a 9kW or 12kW immersion heaters for the TSE 800/3 at an additional cost, therefore a total of 36kW maximum.				
104235	Thermometer Kit 0-120°C	1.00	29.00	0.00%	29.00
104236	Pressure Gauge Kit 0-16 Bar	1.00	48.00	0.00%	48.00
	.				
801291	Strebel S-LC-I 800 SS Calorifier c/w Immersion Heater	1.00	6,639.00	0.00%	6,639.00

The Strebel S-LC-I 800 is a stainless steel AISI 316 indirect cylinder which has a high performance coil with a large heat exchange surface area for production of DHW by means of low temperature energy sources such as heat pumps or solar collectors with low solar radiation.

This cylinder is thermally insulated by direct mould injection with CFC and HCFC-free PU material of 80mm thickness.

Also comes equipped with a 12kW 3PH immersion heater supplied loose.

S-LC-I 800 Specification:

- DHW Capacity = 800 Litres
- Overall Diameter = 950 mm
- Overall Height = 1840 mm
- Diagonal Dimension = 2071 mm
- Empty Weight = 221 Kg
- Maximum Working Pressure (Primary Coil) = 25 bar.
- Maximum Working Pressure (DHW) = 8 bar.

DHW Connection Sizes:

- Cold Water Inlet = 1 ¼" M
- DHW Outlet = 1 ½" M
- Secondary Recirculation = 1 ½" M
- Primary Coil Connections = 1 ¼" M
- Immersion Heater Connection = 2" F

Based on a primary flow temperature of 55c; Cold Water Temperature of 10c; Hot Water Outlet Temperature of 45c:

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 Hampshire  
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**Customer no.** 33074  
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Our ref. Jonathan Hunter  
 Your ref. Peter Murphy

**Project  
 16089 - Ware Lido (Male/Female/Family Showers)**

Product no.	Product description	Qty.	Unit price	Discount	Total
	- Maximum Power Absorption = 78kW - Primary Flow Rate = 8 m3/h - Continuous Flow Rate at 45c = 1919 l/h				
	Based on a primary flow temperature of 70c; Cold Water Temperature of 10c; Hot Water Outlet Temperature of 60c: - Maximum Power Absorption = 107kW - Primary Flow Rate = 8 m3/h - Continuous Flow Rate at 60c = 1844 l/h				
	N.B. If system is to be Mains fed then an Unvented Kit will be required at an additional cost.				
800477	"Unvented Pack 6e.80 - 1 1/4"" Controls & 1 1/2"" T&P"	1.00	852.00	0.00%	852.00
196	Dedicated Delivery on Hiab - Delivery up to 5pm	1.00	1,628.00	0.00%	1,628.00
900363	STREBEL Commissioning S-ASX ASHP - One Unit	1.00	892.50	0.00%	892.50
			<b>Total</b>		<b>60,286.50</b>

**ACOUSTIC ENCLOSURE - PRE FITTED TO ASHP**

104652	S-ACE15/3 Acoustic Housing 11-15dBA Reduction (3 Fan Model)	1.00	21,995.00	0.00%	21,995.00
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The S-ACE15 enclosure range offers reductions in noise emissions between 11dB(A) to 15dB(A) and are designed to be used specifically with our S-ASX air source heat pumps with a vertical air discharge arrangement.

Each S-ACE15 unit comprises air intake acoustic louvres, a fan discharge attenuator pod, specifically engineered acoustic walls and panels as well as an anti-vibration base with built-in drainage system.

The overall acoustic performance of the S-ACE15:

- Octave Band Centre Frequency 63 Hz : Insertion Loss 8 dB
- Octave Band Centre Frequency 125 Hz : Insertion Loss 11 dB
- Octave Band Centre Frequency 250 Hz : Insertion Loss 16 dB
- Octave Band Centre Frequency 500 Hz : Insertion Loss 23 dB
- Octave Band Centre Frequency 1 KHz : Insertion Loss 26 dB
- Octave Band Centre Frequency 2 KHz : Insertion Loss 28 dB
- Octave Band Centre Frequency 4 KHz : Insertion Loss 30 dB
- Octave Band Centre Frequency 8 KHz : Insertion Loss 28 dB

The Dimensions and Weight for the S-ACE 15/3:

Unit 10, Invincible Road  
Farnborough  
Hampshire  
GU14 7QU

Company Reg. 01197182  
VAT no. 212 7889 50

**PB Design & Consultancy Ltd**

Woodside Cottage  
Wood Lane  
Renhold  
Bedford  
MK41 0LT  
VAT no.

Our ref. Jonathan Hunter  
Your ref. Peter Murphy

**Page** 5  
**Customer no.** 33074  
**Currency** GBP  
**Date of quotation** 27/08/2024  
**Price valid 30 days from  
the date of quotation**  
**Prices are Exclusive of VAT**

**Project  
16089 - Ware Lido (Male/Female/Family Showers)**

<i>Product no.</i>	<i>Product description</i>	<i>Qty.</i>	<i>Unit price</i>	<i>Discount</i>	<i>Total</i>
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- Width = 3150mm
- Depth = 1565mm
- Height = 2985mm
- Approximate Weight (Excluding ASHP) = 1480kg

The minimum required clearance around the enclosure is:

- Left Hand End Side = 500mm
- Right Hand End Side = 500mm
- Rear Long Side (Finned Coil) = 500mm
- Front Long Side (Electrical Panel) = 800mm From Solid Wall/Fence or 500mm From Another ASHP

The S-ACE modular units are offered, as standard, prefabricated around the S-ASX heat pump units which then can be delivered, by HIAB, to site.

Alternatively, the S-ACE can be assembled with our team of skilled fabricators if required, at additional cost.

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**Total 21,995.00**



## Quotation Ref 419104

Unit 10, Invincible Road  
Farnborough  
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## Project 16089 - Ware Lido (Male/Female/Family Showers)

Product no.	Product description	Qty.	Unit price	Discount	Total
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Any Queries on this Quotation please contact our Area Manager  
Mr Jonathan Hunter on 07767 625106  
jonathan.hunter@strebel.co.uk

Please also Read the VERY IMPORTANT information which is contained within the Strebel Ltd Terms of Business document CD1: V6 01/2020 which is sent along with this quotation. If you do not have a copy of our Terms of Business please contact the Strebel Ltd office and a copy will be sent to you. Alternatively our Terms of Business are available to download from our website at [www.strebel.co.uk](http://www.strebel.co.uk)

Conditions of Sale: We respectfully request that any orders placed with us clearly specify that Strebel Conditions prevail.