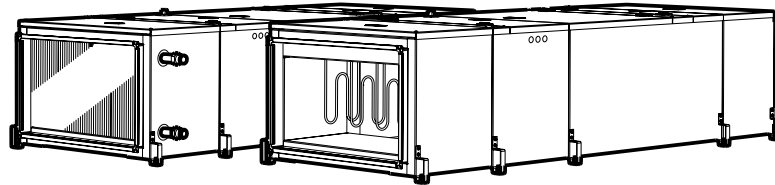




# Sensaire Air Handling Units


## Installation, Operation and Maintenance Manual




**Important**  **This manual must be read in full before Installation, Operation and Maintenance of the units supplied**

Please ensure that this document is passed to the end user. This manual forms an integral part of the product and should be kept for the working life of the product. Additional copies of this and supporting documents are available by contacting VES or by visiting [www.ves.co.uk](http://www.ves.co.uk) and following the 'Download O & M's' link.

The following symbols used within this document refer to potential dangers or advice for safe operation

**Warning**  Indicates hazards associated with electric current and high voltages

**Caution**  Indicates hazards that require safety advice for personnel or potential unit/property damage

**Important**  Indicates important information

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**Introduction** **1** The **Sensaire** series is a range of small air handling units (AHU), supply and extract, with direct-driven backward curve fans, with duties up to 2m<sup>3</sup>/s. Suitable for internal use only, each unit will have been supplied with either no pre-wiring, pre-wired to an external isolator or with fitted control panel as specified at the time of order. The standard operating temperature of these units is -20 to +35°C. For further technical details regarding dimensions and weights, contact VES on **08448 15 60 60**, quoting the sales order (SO) number and the unit type as found on the unit nameplate or visit [www.ves.co.uk](http://www.ves.co.uk).

**Receipt of Goods & Handling** **2** Immediately upon receipt of goods, check for possible damage in transit paying particular attention to fan impellers, coil connections and unit casing. Prior to installation please check to ensure alignment and smooth rotation of the impeller after transit. Also check to ensure that any ancillary items are included. These will normally be supplied fitted or, in the case of small items, taped to the unit.  
In the event of any damage having occurred or if any item is found to be missing, it is essential to inform VES Andover Ltd. within **7 days** of delivery quoting sales order number and the unit type, as found on the unit nameplate.  
After this period, VES would be unable to accept any claim for damaged or missing goods.



# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual

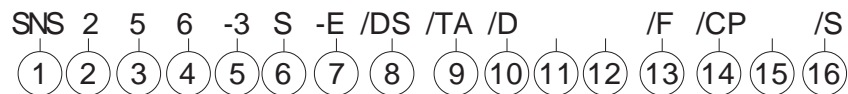
### Unit Description 3

#### Part Number Coding

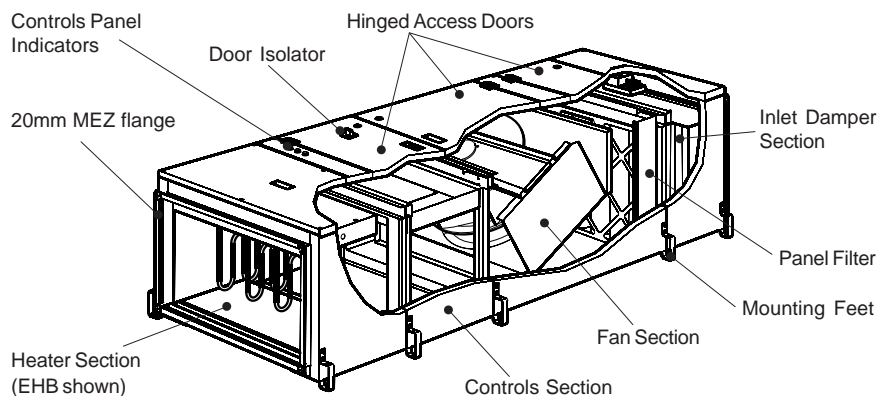
	Point Description	Point Variants	Details (as appropriate)
1	Product	SNS	Sensaire Air Handling Units
2	Unit Size	1...5	Sequential – see unit outline for details
3	Fan Type	5	Backward curve fan
4	Fan Size	3...8	Sequential
5	Phase	-1 -3	230V 50Hz Single Phase 400V 50Hz Three Phase
6	Wiring	Null S D /S	Not appropriate Star Delta Non Standard Extract Unit
7	Main Heating	Null -E -W	No Heating Electric Heater Battery LPHW Coil
8	Infill	Null /DS /PB /S	Single Skinned Double Skinned, mineral wool infill Double Skinned, Plasterboard infill Non Standard Supply Unit
9	Handing	/TA /BA	Top Access Bottom Access
10	Damper	Null /D	No Damper Damper fitted
11	Frost Heating	Null /FCE /FCW	No Frost Heating Frost Electric Heater Battery Frost LPHW Coil
12	Pre Filter	Null /F /R5...R8	No pre-filter EU4 Pleated Filter High efficiency filter
13	Main Filter	Null /F /R5...R8	No main filter EU4 Pleated Filter High efficiency filter
14	Control Panel Section	Null /CP	No fitted controls Fitted control section
15	Colour	Null /00A05	Galvanised finish Powdercoated finish, BS00A05 etc...
16	Special	/S	Special Unit

#### Typical Example

SNS256-3S-E/DS/TA/D/F/CP/S



#### Typical Unit Layout Fig. 2





# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual


**Installation 4** The entire system must be considered for safety purposes and it is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturer's recommendations, with due regard to the current HEALTH AND SAFETY AT WORK ACT and conforms to all relevant statutory regulations.

Where a unit is installed so that a failure of components could result in injury to personnel, precautions should be taken to prevent such an injury. If the unit is installed where there is a reasonable possibility of persons or objects coming into contact with the impeller whilst operational, a guard should be fitted or steps taken to prevent this.

It is the installer's responsibility to ensure that access panels are not obstructed in any way and safe working access for maintenance must be provided in accordance with Health and Safety and Building Regulations. For confirmation of required access please see the appropriate unit outline drawing. Please note that some access doors are hinged.

For optimum unit performance, careful consideration must be paid to the location of the unit in relation to the ductwork and associated items; placing the unit directly adjacent to a bend in ductwork will impede airflow and reduce performance.

Consideration must also be given by the installer for adequate illumination of the unit location in order for safe maintenance.

**Caution**  Handles, lids, housings and coil connections must not be used as lifting points

When moving the unit, handle with care and in such a manner as to avoid damaging the external finish as this may reduce the ability to resist corrosion. Units are to be rigged and lifted using spreaders, taking into account the weight of the unit, and lifting gear should be arranged so as not to bear on the casework.

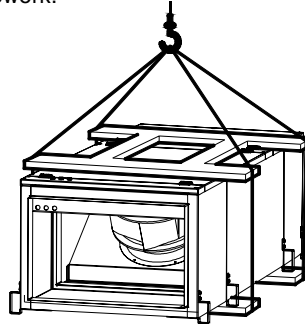



Fig. 3  
Showing Unit lifted  
using spreaders

**Important**  Sensaire unit construction is modular. It is important to ensure that all sections are secured together prior to positioning and installation.

Units are supplied in one section as standard will be factory assembled with the appropriate fixings. Units over 2.5 metres in length and units with fitted silencers may be supplied in sections, and some site assembly will be required. The illustration below shows how each section fits together. Units supplied in sectional form should be assembled using self-adhesive rubber tape at the joints prior to assembly so as to prevent air leakage; replace with similar if damaged.

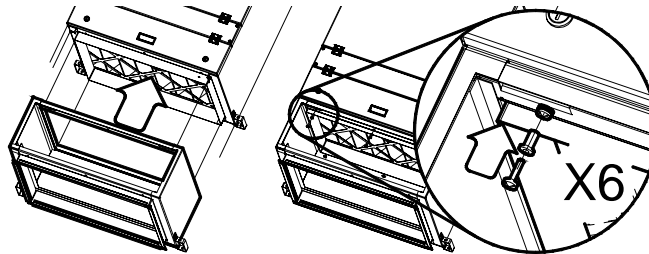


Fig. 4  
Section Joints

Modular sections are secured at six positions, at each of the adjoining bulkheads. Slide the adjoining cases together using the opposing spigot for alignment and secure into place using the fixings supplied (M6x50 POZI setscrews). Replace all removed access panels as appropriate.



# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual

### Installation 4 continued

It may be necessary to remove certain components in order to access section fixings (for example the EHB duct). In this event ensure that all components removed are correctly refitted by a competent engineer.

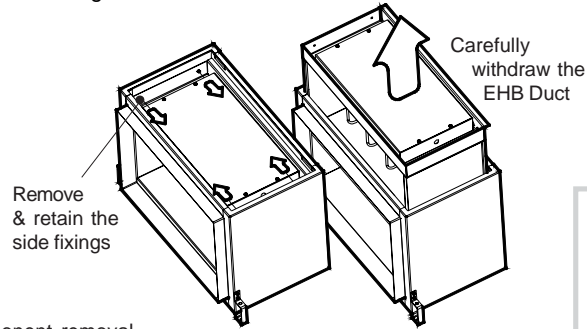


Fig. 5  
Component removal

**!** Ensure the unit is fully isolated & the system has been allowed to completely cool before attempting any work of this nature

**Caution** **!** Only experienced fitters should undertake this work. Take necessary safety precautions when working in elevated positions.

Units are supplied with feet suitable for floor or drop-rod mounting, in either top or bottom access orientation, with airflow in the horizontal plane. For alternative mounting please consult your outline drawing as supplied with the unit, or refer to VES Customer Services for further information.

**Important** **!** When hanging units from drop-rods ensure that the load is evenly spread and that **all** feet are used within the support.

**Caution** **!** When accessing the unit always use the handles to ensure the access panels are handled and lowered in a controlled manner so as to avoid damage to the unit or injury to personnel. This is particularly important with hinged doors; ensure that when open, the unit is so positioned so as not to close unintentionally.

#### Electric Heater Batteries

On **Sensaire-E** units, an electric heater battery (EHB) coil will be installed. Supply to the heater should be 1ph or 3ph with separate neutrals; confirmation of this can be found on the unit nameplate. Cables should be of silicone rubber, fibreglass or of a similar high temperature insulated type and be installed to current I.E.E. Regulations, ensuring a sufficient earth connection to the terminal provided. Care should be taken not to overstrain the terminal pillars as this may permanently damage the elements.

**Important** **!** The heater is fitted with a manual-reset high temperature cutout with normally closed (NC) terminals and is set to break if the duct temperature rises above 130°C. There is an additional 70°C auto-reset cutout situated on the fan plate. It is important that **both** cutouts are connected in series with the main contactor coil circuit if the heater is to be isolated in the event of overheating.

The electrical supply **must** be isolated before attempting to reset the manual cut-out.

For further information regarding electric heaters please see **VES Ref. ID431**.

#### Fan Speed Controllers & EHBs

If a speed controller is fitted to the system, it must not stop the fan independently of the control system, or allow airflow to fall below the stated volume on the electric heater battery. Suitable speed controllers without on/off switches are available from VES Andover.

#### Hot Water (LPHW) Coils

On **Sensaire-W** units, a Low Pressure Hot Water (LPHW) coil will be installed. The coils are normally suitable for LPHW at 82°C flow and 71°C return temperature. LPHW coils are supplied as standard with an air vent and drain plug located on the pipe work immediately adjacent to the coil connections on the AHU. The air vent should be at the highest point, with the drain at the lowest. The coil should be regularly vented so as to avoid potential air locks, resulting in a fall off of duty.



# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual

### Installation 4 continued

#### Hot Water (LPHW) Coils

It is recommended that a check be made as to whether any treatment is required to the water supply for prevention of corrosion and scaling of the equipment. Information regarding the necessary action to be taken can be obtained from the relevant Water Supply Authority. The unit will have been supplied with connections either left or right-hand side looking in direction of airflow. Please see order acknowledgement for confirmation of this handing. Should you need to alter this please consult VES as unit adjustment may invalidate your warranty.

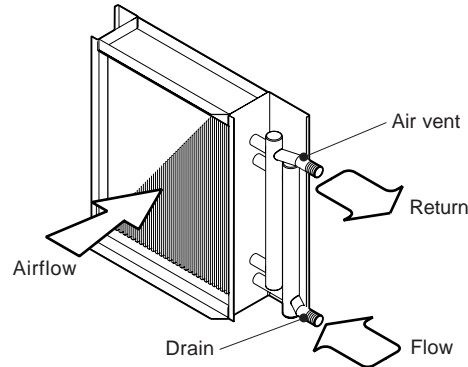


Fig. 6  
Typical LPHW Coil

#### Caution

Heating coils do not cool immediately when the hot water supply is cut off. The residual heat must be dissipated to avoid damage. The continuous running of the fan after shutdown resolves this, by operation of a run-on timer. The recommended length of run-on is two minutes minimum.

#### Steam Coils

Steam coils are suitable for use with saturated steam up to 100psi. The pipework must be so arranged to provide adequate drain lines with a suitable strainer and steam trap. All steam and drain lines should be lagged. The supply should be taken from the top of the steam main, to avoid the introduction of moisture or air into the coil. The pipe shall be arranged so that it does not interfere with the coil expansion. Where steam coils are fitted it is essential that a time delay is installed in the fan starter control circuit. The fan shall be kept running for at least two minutes after the steam supply to the coils has been shut off, so that residual heat of the coil is dissipated. If the pipe run is unduly long and prone to water logging, it should be properly trapped, just before the coil.

If the steam is from a high pressure steam main, it is essential to have a working pressure relief valve on the low side to ensure that dangerous overheating of the air and excessive pressure cannot occur. Fitting a frost thermostat at the unit inlet and ensuring that boilers run continuously in low ambient temperatures can prevent this.

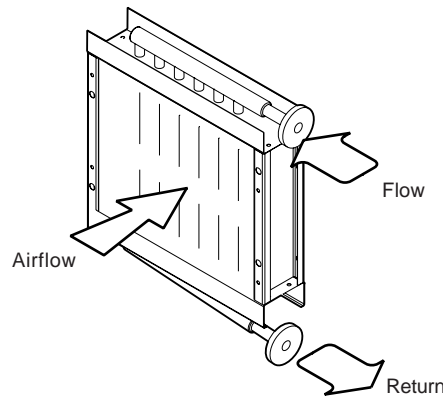


Fig. 7  
Typical Steam Coil

#### Important

It is important that water and steam coils are protected against damage from extreme weather conditions during the winter season. If the water is allowed to freeze in the coil system, damage may occur potentially bursting pipes and resulting in emergency problems. Fitting a frost thermostat at the unit inlet and ensuring that boilers run continuously in low ambient temperatures can prevent this.



# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual

### Installation 4 continued

#### DX Cooling Coils

All cooling coils have fully boxed and insulated cases, with moisture eliminators fitted as standard. The drain pan will require trapping to the drain line, for further information please see **VES Ref. ID665**. DX and Condenser Coils (See Fig.5) must be connected to systems in accordance with accepted refrigeration codes of practice and if fitted upstream to steam or water coils, care must be taken to ensure that the air temperature does not drop below 0°C. For units supplied with condensing units, please refer to the appropriate supporting documentation.

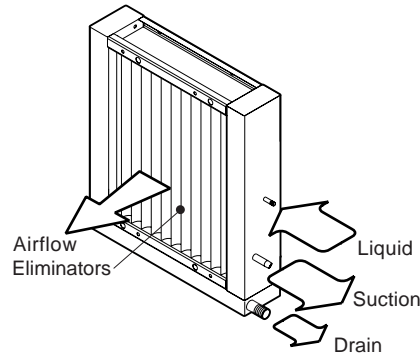


Fig. 8  
Typical DX Cooling Coil

#### Important !

Where provided, flanges and spigots should not be used to support the ductwork and used solely as a means of ductwork connection. Further consideration should be given to the unit's position and secured into place as appropriate.

### Standard Wiring 5

#### Warning ⚠

Electrical supply must be fully isolated before attempting to affect any work on this unit. All electrical connections to any unit must be carried out in accordance with the current edition of the **I.E.E Regulations** and only competent Electricians should be allowed to affect any electrical work to our units.

#### Important !

It is the customer's responsibility to supply earth fault protection through the building installation device and a dedicated, isolated power supply with overload protection, to account for motor start up currents. See fan wiring diagram 95003298 for specific fan details.

#### Warning ⚠

Do not connect any unit to an electrical supply voltage outside of the specification.

The following wiring diagrams are a guide to installing the standard fan and actuator options found on Sensaire units. If in any doubt, or for special versions of the units, consult the wiring diagram in your document pack or contact our customer services department on **08448 15 60 60**, quoting the sales order (SO) number and unit type as found on the unit name plate.

For Three Phase Fans, a trial connection of the three phase supply should be made to check that the fan rotates in the correct direction as indicated on the fan. If the rotation is incorrect, interchange any two phases of the incoming supply at the terminal block.

For incorrect rotation of single phase fans, check with the VES Service department for advice, on **08448 15 60 60**.

#### Important !

Pre-wired units supplied in sections **will require reconnection of numbered wires** to either the isolator/control panel or, in the case of multiple sections, a local terminal box. For further information regarding **Sensaire** fitted control, please see **VES Ref. ID736**



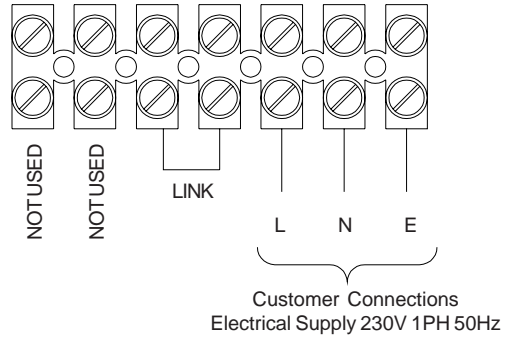
# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual

### Standard Wiring 5 continued

Standard fan wiring arrangement 230V 1PH 50Hz  
 Fig. 9

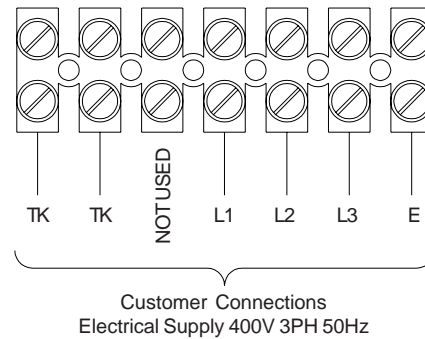
Model		230V 1PH 50Hz			
Sensaire Unit	Fan	Motor Power (kW)	FLC (A)	SC (A)	C400V (µF)
1	SNS321	0.51	2.2	5.2	10
2	SNS641	0.49	2.2	5.0	10
3	SNS641	0.49	2.2	5.0	10
4	SNS741	0.73	3.3	7.0	12
5	SNS841	1.30	5.7	15.0	30



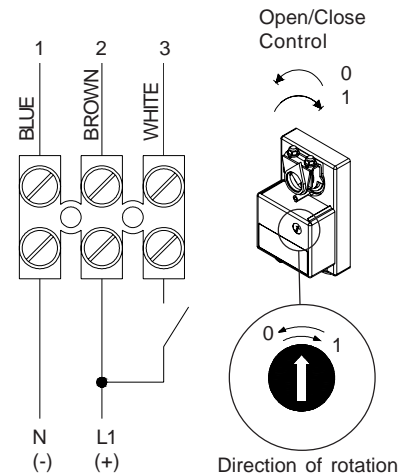
Note: Diagrams shown are for standard single and three phase Sensaire wiring into fan terminal block. For connection to units with Sensaire Controls, refer to wiring diagram found in control panel.

Standard fan wiring arrangement 400V 3PH 50Hz  
 Fig. 10

Model		400V 3PH 50Hz		
Sensaire Unit	Fan	Motor Power (kW)	FLC (A)	SC (A)
1	N/A	-	-	-
2	SNS643	0.32	0.51	0.97
3	SNS643	0.45	0.86	2.90
4	SNS743	0.69	1.30	3.40
5	SNS843	1.15	2.00	8.60



Damper actuator wiring arrangement 230V 1PH 50Hz (24V 1PH 50Hz)  
 Fig. 11



**Warning** ⚡

**NM230A/NM24A Damper Actuator**  
 To isolate from the main power supply, the system must incorporate a device which disconnects all the phase conductors

Remote speed controller wiring

When installing a remote speed controller, wiring connections should be made to the fan terminal block on the fan plate. When connecting wires penetrate the fan section casework, appropriate cable glands and strain relief should be used. For connection details, consult the wiring diagram in your document pack.

**Important** !


When making connections in the fan section, ensure that cable runs are secure and do not foul the fan impellor





# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual


### Maintenance 6

**Important**  Before attempting to carry out any work on our units, all accompanying documentation including warning labels on the unit must be referenced.

**Warning**  Before attempting to carry out any maintenance work, investigative or repair work on our units, the unit **MUST BE COMPLETELY ISOLATED** from its electrical supply. Ensure a minimum of two minutes after electrical disconnection before removing access panels. This will allow any moving parts to come to a rest. When used in conjunction with an Inverter for speed control, a minimum of **Five minutes** should be given to allow for the capacitors to discharge before starting work.

**Caution**  Ensure that the AHU has been allowed to completely cool before attempting any work to the unit

In general, this series of units require very little maintenance. In the unlikely event of component failure, spares are available from stock at VES Andover Ltd.


**Caution**  When accessing the unit always use the handles to ensure the access panels are handled / lowered in a controlled manner so as to avoid damage to the unit or injury to personnel. This is particularly important with hinged doors in both top and bottom access units; ensure that when open, the doors are so positioned so as not to close unintentionally.

**Recommended Checks** In order to keep the unit in good order the following maintenance routine is recommended:

**Three Monthly Checks** Filters should be inspected every three months. If they are found to be heavily soiled or damaged in any way they should be replaced.


**Six Monthly Checks** The fan impeller should be cleaned every 6 months. Remove the fan assembly from the case, then carefully clean with a vacuum cleaner and brush. Failure to clean the fan on a regular basis could result in loss of fan performance, or cause it to fall out of balance. Dampers can be afforded some protection by pre-filtration. If necessary, clean blades, cogs and frames and lubricate with PTFE aerosol or equivalent. Failure to keep dampers clean could result in the damper becoming jammed.

**Twelve Monthly Checks** *Sensaire* units are supplied with both unpainted galvanised sheet steel cases and powder coat paint finish. Check all painted items to ensure that they have not deteriorated, particularly where adverse environmental conditions prevail. Re-paint as necessary. Paint can be supplied upon request.

**Caution**  It is critical that after any maintenance work has been conducted that all components removed/ replaced be refitted correctly by a competent engineer

**Spares & Repairs** When enquiring after or ordering spares contact VES Spares Department, quoting the sales order (SO) number and unit type as found on the unit nameplate.

**Telephone 08448 15 60 60 • Fax 023 8026 1204**

**WEEE Directive**  At the end of their useful life the packaging and product should be disposed of via a suitable recycling centre. Do not dispose of with normal household waste. Do not burn.



**PLEASE ENSURE THAT THIS DOCUMENT IS PASSED ON TO THE END USER**

We reserve the right to alter the specification without notice

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# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual



### **Declaration of Conformity**

Date: 1st March 2007  
Product: SENS Aire Air Handling Units  
Type: SNS  
Manufacturer: VES Andover Limited

The product above is produced in accordance with EC Council Directives:

89/336/EEC and amendment 92/31/EEC, 93/68/EEC and 91/263/EEC  
(Electromagnetic Compatibility Directive)  
73/23/EEC and amendment 93/68/EEC (Low Voltage Directive)

The European Harmonised Standards applied are:

BS EN ISO 12100, EN 294, EN61000, EN 60204-1

Basis of Self attestation:

Quality Assurance to ISO 9001-2000, BSI Reg. Firm Cert. No. Q5375

Signature of Manufacturer:

A handwritten signature in black ink, appearing to read 'C. White'.

Position of Signatory: Technical Director



# Sensaire Air Handling Units

## Installation, Operation and Maintenance Manual

### Warranty 8 Extended Warranties

All VES Andover Products come with a one year guarantee from date of dispatch, which covers parts and labour.

You can now extend this with the following options:

#### Option 1. **FREE extended Warranty**

We can offer you a maintenance agreement that keeps this equipment in tip-top condition. If you take out this agreement, we will extend the warranty **free of charge for up to 5 years**, providing the regular maintenance agreement remains in place.

#### Option 2. **12-24 Month Extended Warranty**

12-24 months from the date of dispatch. This can be covered at a cost of just 3% of order value. (minimum charge £50.00).

#### Option 3. **12-36 Month Extended Warranty**

12-36 months from date of dispatch. For this cover, the charge is 6% of order value (Minimum charge £80)

Please State which option you require when you place your order. A transferable certificate will then be issued to you.

*Please note, this offer excludes condensing units. We would be happy to quote you for these separately.*

#### **Register for separate spares reminders and get a 10% discount**

Register for this free service and we will automatically send you a regular reminder detailing the consumable spares for this unit, together with their current list prices.

**You will then be entitled to a 10% discount off any spares.**

To arrange any of these options

**Phone: 08448 15 60 60**  
**or Email: spares@ves.co.uk**

Stating the sales order and reference number from the unit.