



# Instruction Manual

## EVO3 Fan Unit

Installation  
Operation  
Maintenance

# Instruction manual – EVO3 Fan Unit

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## 1.0 Introduction

These Installation Operation and Maintenance instructions relate solely to the EVO3 Fan Unit product as manufactured by CAICE Acoustic Air Movement Ltd.

The information herein provides guidance on how the product should be installed, operated and maintained. Qualified and professional personnel should be used in all instances to determine exact methods of working using these instructions as a guide to good practice.

General information regarding product specifications can be obtained by reference to our sales literature. Information on performance under any particular application can be obtained by reference to project specific documentation, or by contacting your local technical representative.

This instruction document forms an important part of the technical information associated with the product, and should be passed to the end user for reference during the working life of the product. This instruction document is provided to the purchaser as part of project specific documentation, but may also be obtained by either contacting your local technical representative, or by visiting our website at [www.caice.co.uk](http://www.caice.co.uk) and following the links to our product information.

The following symbols are used within these instructions to highlight references to potential danger, advice for safe operation, or other important information



### Warning

Indicates hazards relating to electric current or high voltages



### Caution

Indicates hazards requiring safety advice for personnel or with regard to possible damage to the equipment or property



### Important

Indicates important information

“EVO3” is a purpose built range of ventilation fans. The units are intended for horizontal installation only in ceiling or floor voids, or alternatively in an exposed location such as a plantroom.

The product is only for indoor use where dry conditions can be guaranteed, in an ambient temperature range of 0°C – 40°C, and at altitudes not exceeding 500m above sea level. The product is intended for connection to two separate air distribution ducts.

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## 2.0 Safety



### Important

Before commencing any work to install, operate or maintain this product, the personnel undertaking the work must ensure:

- That these instructions have been read and understood fully and completely
- That the nature of the installation site and associated working conditions have been appraised and hazards identified
- That all necessary risk assessments have been undertaken, and all ensuing safety measures have been implemented
- That they understand fully the scope of the work required, and that they have been trained and are competent to undertake the work
- That they wear the correct personal protective equipment
- That they have the correct tools and equipment to undertake the various tasks

The equipment is to be assembled into a system of ventilation which may, or may not, incorporate additional components. For the purposes of safety, the entire system must be considered, and it is the responsibility of the installer to ensure that all equipment is installed in accordance with manufacturer's recommendations, and with consideration to any relevant industry standards and codes of practice, and in conformance with all statutory legislation or regulations that are applicable.

Each unit is fitted with a rating plate indicating the nature of the supply voltage and the declared current. Warning labels are also fitted where required.

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## 3.0 Delivery and Receipt of Equipment

### 3.01 Receipt of goods on site

A Delivery Advice Note will be issued in advance of any delivery, usually providing 2-3 working days' notice of the delivery date, destination and any other delivery conditions.

Prior to dispatch all equipment is tested and inspected in accordance with our Quality Assurance procedures. On arrival to site the client must thoroughly inspect the goods before signing the Delivery Note, Any damage or shortages in delivery must be confirmed by writing on the note and also by reporting the matter to our main sales office within 48 hours of receipt.

No responsibility will be accepted for damage sustained during offloading from the delivery vehicle or thereafter from distribution of goods around the site.

### 3.02 Offloading and distribution



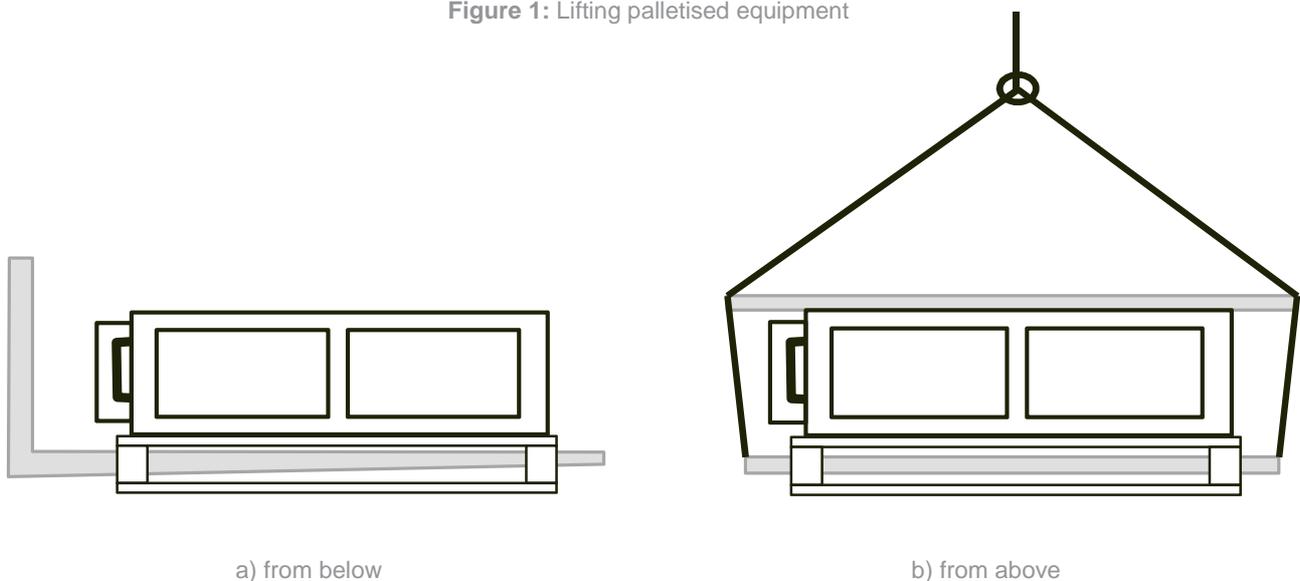
#### Caution

**It is the purchaser's responsibility to ensure that offloading of equipment from the delivery vehicle is undertaken in an appropriate manner, and that suitable mechanical lifting and/or moving devices are available to suit the delivery vehicle and site conditions.**

Equipment will be palletised for delivery, and each unit will have an individual identification label affixed bearing the weight of the equipment. It is recommended that offloading is undertaken using a suitably rated fork-lift truck or other mechanical lifting device. Note that pallets may contain more than one unit.

Alternatively, the equipment may be lifted from above using a crane. Lifting beams should be passed through the pallet in the same way as the forks of a forklift truck would be inserted. When lifting in this way, spreaders must be used to avoid damage to the casings of the equipment. Care must be taken to ensure that slings are correctly positioned.

Figure 1: Lifting palletised equipment



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Care must be taken at all times to prevent damage to the equipment. Corners, edges and protruding components may be particularly susceptible to damage if handled incorrectly. **In particular controls enclosures, duct connectors, pipework connections or drain trays must not be used as lifting points.**

Distribution of equipment should be undertaken using suitable mechanical handling devices. Care must be taken to avoid subjecting the equipment to any shocks or impacts, as these may result in misalignment of the fan impellor, or damage to internal components.

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## 4.0 Storage

### Important

#### 4.01 General

The equipment must be stored in dry internal conditions. Duct connection apertures must remain sealed against the ingress of dust, debris or any other foreign matter.

The equipment should be stored on its delivery pallets, and must remain in horizontal orientation and the correct way up. It is not acceptable to store the equipment in any other orientation, i.e. equipment must not be stored on its side, or on its end, or in any inclined position.

#### 4.02 Extended Storage

If the equipment is likely to be in storage for a period exceeding two months, the following instructions should be observed in order to preserve the life of all static and moving parts of the equipment which may be particularly susceptible to deterioration. It is strongly advised to pay careful attention to stored equipment and to make regular inspections to ensure that adequate storage conditions are being maintained.

Although other procedures or considerations commensurate with good engineering practice may be necessary but not detailed in this document, the purchaser's attention is particularly drawn to the following items:

##### ➤ Unit Interior & Exterior Surfaces

If ducting is not connected it is essential that all inlet openings, discharge openings and pipe openings are completely sealed. Whenever any access panels are removed for inspection purposes they must be replaced and made secure.

The exterior should be kept free from any falling building materials dampness or extreme cold or heat. The unit exterior surfaces must be inspected on a monthly basis, and any signs of corrosion or scratches should be treated immediately.

##### ➤ Static Indentation

Machines fitted with ball bearings may be damaged if left stationary for long periods. The balls and races may suffer damage by fretting corrosion (false brinelling, stationary vibration or static vibration marking). No unit should therefore be permitted to stand on a vibrating floor while in storage. Where this is absolutely unavoidable, then the equipment should be isolated by placing on thick blocks of rubber, cork or felt.

##### ➤ Filters

All filters must be suitably wrapped and sealed to prevent damp and ingress of dust or foreign bodies, and must be held in a dry store.

When the equipment is ready to be put into commission, the instructions in this documentation should be strictly adhered to.

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## 5.0 Installation

### 5.01 General

#### Important

Prior to installation, it is the installer's responsibility to observe the environmental and operational limitations of the equipment and ensure that they are compatible with the installation location.

The method of support must be suitable for the installation location of the equipment. Any proprietary support system must be capable of taking the full unit weight and must be installed in full accordance with the manufacturer's instructions.

The installer must also take responsibility for ensuring that access panels are not obstructed, and that safe working access for maintenance can be provided. Reference should be made to project specific drawings and data sheets in order to identify the handling, orientation and access requirements of any particular unit, and to verify that the installation location does not compromise these aspects of the equipment.

Provision should also be made for installation of adequate illumination of the unit in order for safe maintenance.

Each unit will be fitted with an identification label.

### 5.02 Erection and Assembly

Although the equipment is of robust construction, care must be taken when handling during final positioning and installation operations. Particular care should be taken to avoid damage to protruding parts such as pipe connections to coils or condensate drain, the electrical controls enclosure, and duct connectors.

#### Caution

**Controls enclosures, duct connectors or pipework connectors are NOT designed to be load bearing, and under no circumstances must these be used move or support equipment during installation. Failure to observe this point may result in severe injury or damage to the equipment.**

Units must be installed in accordance with good industry practice, horizontal and level across the width and along the length of the equipment. Units may be installed on a prepared base (this may include a suitably designed, suspended platform). Support positions should be determined to provide a distributed support over the underside of the equipment.

Alternatively, access slots are provided in the unit casings to facilitate the installation of drop rods and Unistrut support channels.

Each individual section must be supported at both ends to avoid undue stresses to the assembled unit or any ductwork connections pieces. Support positions must not obstruct access panels, controls enclosures, ductwork or pipework connections.

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Prior to assembly, individual sections should be laid out in accordance with the positions and handings shown on the corresponding fan unit data sheet. If any aspect of the unit configuration cannot be achieved, contact Caice for further advice.

Ductwork connections to the equipment may be rectangular or circular. Rectangular connections are compatible with 30mm Doby/Mez flanging systems.

Ductwork joints should be prepared by using suitable duct sealing tape (closed cell foam). M10 nut and bolt fixings will be required for flange corners. It is recommended that joints between any unit sections or ducts are clamped at maximum 300mm centres using suitable drive cleats or flange clamps as appropriate.

Circular ductwork joints should be made in accordance with standard ductwork installation practice.

## Important

The connecting ductwork should be designed and installed in accordance with good industry practice. In some instances, the configuration and geometry of the connecting ductwork may impair the performance of the equipment. For example, installation of a 90° bend immediately adjacent to the equipment may result in increased noise levels and reduced airflow.

### 5.03 Access

Access into the equipment is via access panels located on either the bottom, top or side of the unit. Sufficient unobstructed free space must be allowed in order to facilitate inspection, maintenance, service, repair and replacement of components, and connection of services. The minimum recommended clear space for access is shown on the equipment data sheets.

## Caution

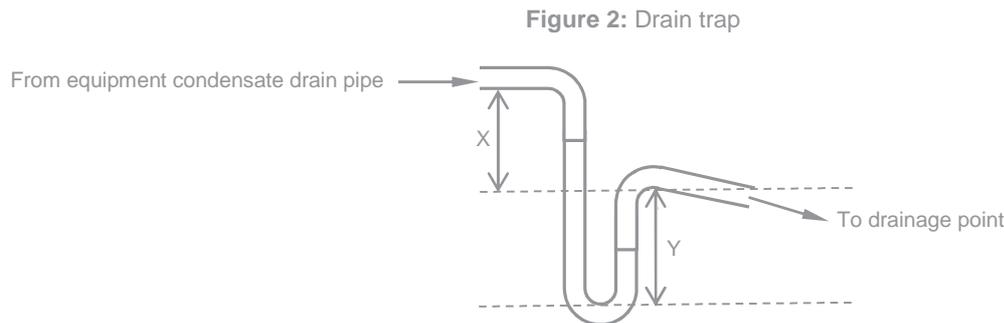
Where access to rotating parts or parts that can become electrically live is not prevented by the equipment's access panels or by the fixed installation (i.e. by means of connection of four individual air distribution ducts to the equipment), then appropriate guarding must be fitted before operating the equipment.

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## 5.04 Connecting the water to air heat exchangers and condensate drain

The equipment may include heat exchange coils, which in turn may produce condensate during use. Condensate drip trays are fitted and provided with a 22mm plain pipework outlet, and this should be connected via pipework to a suitable drainage point.

The drainage pipework should be fitted with a suitable trap. The dimensions of the trap must be correctly sized to overcome either the pressure of the fans. In the case of a draw through coil, the fan inlet pressure must be considered. In the case of a blow through coil, the fan outlet pressure must be considered. It is recommended that the trap is arranged generally as shown in Figure 2.



Dimensions X and Y should be as follows:

**X = fan inlet (or outlet) pressure (mm H<sub>2</sub>O) + 25mm (minimum), Allow 100mm if pressure is unknown**

**Y = not less than X / 2**

The installation of a supplementary condensate pump should be considered in situations where gravity drainage alone is insufficient.

The coils may be provided with either plain pipe or threaded connections. All pipework connections to heating and cooling coils must be made in accordance with industry standards.

Reference should be made to the project specific equipment data sheets for information on:

- The type of connection included.
- Identification of heating and cooling flow and return connections,



## Caution

The coil connections are fragile and care must be taken during installation to avoid any undue stresses which may fracture the joint between the connection and coil body. All external pipework and ancillary components must be supported independently from the coil, and where necessary must be insulated.

Coils must be protected against damage from frost or extreme weather conditions. Provision must be made to prevent water from freezing in the coil system. Such provision may include frost thermostats or the addition of a suitable anti-freeze solution.

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It is the installer's responsibility to check whether the water supply requires any treatment for the prevention of corrosion or scaling of equipment. Information regarding the necessary actions to be taken can be obtained from the relevant water supply authority, particulars of which can be found in the Water Engineer Handbook Yearly Edition.

All aspects of the system should be installed with consideration to any relevant industry standards and codes of practice, and must conform to all statutory legislation or regulations that are applicable.

## 5.05 Connecting the Electrical supply



### Warning

The electrical installation must conform to the requirements of the local electrical safety regulations (such as but not limited to the IEE regulations and any local by-laws).

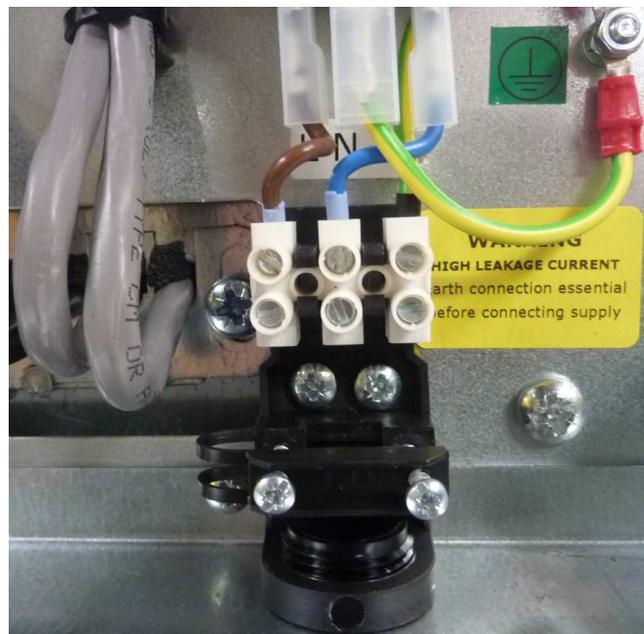
The fan and speed control equipment is intended for connection to a 230v, single phase, 50Hz mains power supply.

**WARNING: The equipment must not be connected to an electrical supply voltage outside of the specification.**

The power supply should be via a switched and suitably rated fused spur. The declared current for the equipment is shown on the rating plate fixed to each unit.

The equipment should be connected to the mains power supply by means of a suitably rated flexible supply cord. The supply connection point can be found within the controls enclosure which is fitted on the side of the equipment. Provision is made for clamping the incoming cable.

Figure 3: Power supply connection point



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**WARNING: It is essential that an earth connection is made prior to connecting the mains supply.**

The electrical installation must incorporate a method of disconnection in the fixed wiring, in accordance with local regulations. It is the installer's responsibility to provide a suitable local isolating switch and fuse.

Holes are provided for access into electrical controls enclosure to allow the routing of the mains cord and any other controls cables or wiring.

A single 22mm diameter panel hole fitted with an M20 cable entry bush is provided for the mains cord. Other panel holes of 15mm diameter are provided for all other controls cables, sensor cables or SELV wiring.

These holes should be fitted with PG13.5 cable glands suitable for 22mm panel holes, or PG9 cable glands suitable for 15mm diameter panel holes. Glands must provide adequate strain relief and protection for the incoming cables.

**WARNING: In order to restrict access to live parts housed within the electrical controls enclosure, it is the installer's responsibility to ensure that any unused panel holes are blocked by fitting of cable glands which must be screwed closed.**

Where equipment is provided with an optional electric heater section, it will be necessary to connect a separate suitably rated electrical supply. The supply requirement may be 230v/1ph or 415v/3ph depending on the heating load. Reference should be made to the information on the fan data sheets. 25mm diameter holes (suitable for PG16 cable glands) are provided in the top and bottom of the electrical heater termination enclosure for power cord access.

All electric heaters are fitted with a manual reset linear thermal cut-out with a switch rating of 16A and with a fixed temperature setting of 125°C. Other devices may be required to comply with IEE or other local regulations, and the operation of the heater must be interlocked with the fan to ensure that it cannot be energised unless the fan is running.

## 5.06 Connecting the controls cabling



### Important

In order to operate the equipment, it may be necessary to connect controls cabling according to the intended mode of operation and controls strategy being implemented.

Equipment may be fitted with one of two fan speed controller options:

- EC Fan Control Interface
- EC Twin-fan Auto-changeover

The installer should refer to the wiring diagrams and controller guides to identify the controller, connectivity and functionality applicable to the equipment supplied. This information may be found in Appendices 1, 2-1 & 2-2 of these instructions.

Controls cables, sensor cables or SELV wiring should not be installed or routed in the same cable tray which carries mains power or 230V switched power.

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## 6.0 Commissioning and setting to work

### 6.01 General



#### Important

Prior to commissioning and setting to work, and with the unit disconnected from the power supply, pre-commissioning checks should be performed as follows:

- Inspect all internal sections of the equipment and faces of the filters, heat exchangers and coils (where applicable) to ensure that they are not obstructed, and that they are clean and free from dust, debris or foreign bodies.
- Perform a trial spin by hand of all fans to ensure that the rotating impellor is not rubbing on the fixed inlet ring or on any other part inside the fan chamber.
- Where applicable, check all water connections for leaks. Ensure that all air is vented independently from the coils and the circulating system.
- Where applicable, introduce a small amount of water into the condensate tray to prime the trap and verify free flow into the drain.
- Check that the electrical installation is in accordance with the required legislation and standards, and that all the correct electrical safety measures (such as earth connection, fuses, isolators) are in place.
- Check that all access panels are in place and that they are securely fastened.
- Check the guarding of the system.
- Check that the controls enclosure cover is fitted and securely fastened.
- Check operation of Isolators/Controls.



#### Caution

**If any aspect of the pre-commissioning checks is found to be unsatisfactory, the equipment must not be put into service until the matters have been corrected.**

### 6.02 Initial start-up

On completion of the general pre-commissioning checks and rectification of any problems, the unit may be started. The following checks and adjustments should be performed:

- Ensure that any dampers in the connected ventilation system are fully opened.
- Connect the power supply and apply the necessary speed control signals.
- Operate the fans for approximately 10-15 minutes. For twin-fans with run/standby configuration, operate both fans sequentially for 10-15 minutes each.
- Verify that the unit air volume and external pressure is in accordance with the design duty. Adjust the fan speed by way of the speed control setting and record the control voltage values.
- Check that the equipment current draw does not exceed the value on the rating plate.
- Check the functioning of the equipment controls.
- Where applicable, check the fluid flow and return temperatures in the water circulating system and verify the fluid flow rate. Adjust to the design specification as necessary.

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## 6.03 Checks after two weeks running

After initial start-up and continuous running of the equipment for a period of two weeks, it is recommended that the following checks are performed.

- Check the equipment current draw.
- Check condition of filters
- Check condensate trays and drains for free flow and leaks.
- Check any valve connections for leaks.
- Check operation of controls.



### Caution

Where these actions require access into the equipment, ensure that the maintenance procedures provided within this instruction document are followed.

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## 7.0 Maintenance

### 7.01 General



#### Warning

Before attempting to perform any maintenance work whatsoever on the equipment, it is essential that the equipment is disconnected and completely isolated from the mains power supply. A minimum of 5 minutes should be allowed after electrical disconnection to allow for capacitors to discharge.



#### Caution

After disconnection of the mains power supply, a minimum of 2 minutes should be allowed for any rotating parts to come to rest before access panels are removed. However, care should still be taken as it is possible for airflow generated in other parts of the system to cause the fan impellor to rotate (windmill effect) even when power is not present.

Access panels are not fitted with restraints.



#### Important

Appropriate PPE should be worn and correct tools should be used when undertaking these various maintenance tasks.

Access panels that are removed for maintenance operations should be placed at floor level in a safe location until they are ready to be re-fitted. Replace access panels at the same locations and in the same orientation as found, and ensure that the screw fixings are fastened securely, but not over-tightened.

If failure of the equipment occurs or is suspected, then it should be taken out of service until the appropriate maintenance or repair can be undertaken.

### 7.02 Filters

Access to the filters is obtained by removing the screws which hold the access panels in position.

The filters are disposable, and they should be changed when they are damaged, heavily soiled with dust, or when the signals from the differential pressure switches indicate a dirty filter condition.

When refitting new filters into the equipment, it is important to ensure these are fitted correctly in respect of airflow. Observe the direction of airflow indication on the filter body, insert the filter into the retaining channel and re-fit the access panel.

On completion of the maintenance of the filters, re-fit the access panels.

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## 7.03 Condensate drip trays and drains

Drain lines should be checked to ensure that they are unobstructed and free draining. Drain traps should be checked that they are fully primed and functioning correctly.

Drain trays should be checked to ensure they are free from debris. They should be periodically flushed out and chemically treated as necessary to remove any contamination.

On completion of the maintenance of the drip trays and drains, re-fit the access panels.

## 7.04 Heating and cooling coils

The finned surfaces of coils should be inspected for accumulation of dirt, dust or biological contaminants.

If necessary, the coil fins may be vacuumed. Any remaining affected areas may be cleaned with a soft brush and warm water mixed with a mild detergent solution compatible with the materials used in the construction of the coils (copper tubes, aluminium fins). Care must be taken not to damage the finned surface of the coil.

Compressed air may be used to blow through the coil fins, and any residual water should be dried with a cloth.

Coils should also be inspected for evidence of any leaks. If found, the coil block should be removed, and either repaired or replaced. After isolation of the water circulation system, the coil should be drained down and disconnected. If necessary, remove any ancillary components that may have been installed as part of the system.



### Caution

**Any treated water within the coil fluid circulation system should not be drained into any waste water disposal system without Local Authority approval. It is the responsibility of the user and the maintenance personnel to ensure that all Local Authority and prevailing environmental legislation/guidelines are adhered to.**

**After disconnection of pipework and removal of access panel, the coil may then be slid out of the unit. Note that there may still be residual fluid within the coil block. The finned edges of coil blocks are sharp and may cause cuts if handled incorrectly. Suitable gloves must be worn.**

Re-fit the new or repaired coil, and then re-fit and secure the access panels. Finally re-connect the drainage and water systems, vent the coil and the system independently and check for leaks.

## 7.05 Electric Heaters

Electric heaters are generally maintenance free, although it is recommended that all dust carryover from the heater elements is removed when the filters are changed.

All heaters are fitted with a manual reset linear thermal cut-out with a fixed temperature setting. The device consists of a fluid filled capillary tube which is located across the width on the outlet of the heater. With low or non-uniform airflow the cut-out will de-energise the entire heater if any section of the capillary is overheated. Once tripped, it is necessary to re-set the device manually to return the heater to operation.

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## 7.06 Fans

The fan assembly (comprising the impellor and the motor) should be cleaned regularly, as any excessive build-up of dust or debris may cause the impellor to fall out of balance, or the motor to overheat. The impellor and motor should only be cleaned with a soft dry brush to remove dust deposits.

The fixings holding the fan motor to its mounting bracket or diaphragm plate should be checked and tightened if necessary. In addition, the fixing screws holding the motor bracket to the inner casing of the equipment should also be checked and tightened as required. These fixings must be secure before checking the fan bearings.

Standard fan bearings are “sealed for life”, therefore no specific maintenance is possible. In normal service, the fans have an anticipated life of 40,000 hours. However, the condition of the bearings should be checked and assessed at regular intervals as follows:

- The fan impellor should be rotated manually to detect any roughness or flat spots in the bearings.
- Gentle lateral pressure should be applied back and forth on the impellor to detect any excessive movement or play in the bearings.

If any roughness, flat spots or excessive movement is found, then the fans should be replaced as follows:

- a) Ensure a wiring diagram is available, or note the wiring connections before undoing any wires.
- b) On units with fan model designation A, locate the wiring loom multi-plugs and separate the two halves of each connection. On units with fan model designation B, C or D, locate the terminal strip on the fan motor mounting bracket, loosen the clamping screws and remove the wires from the connector.
- c) Release any securing devices which may be used to retain the cables running back to the fan motor.
- d) On units with fan model designation A, remove the screws holding the fan outlet flange to the mounting plate and manoeuvre the entire fan and scroll assembly out of the unit.
- e) On units with fan model designation B, C or D, loosen the screws holding the fan motor to bracket, but do not remove them at this time. Loosen and remove screws holding the fan mounting bracket to main body of the fan unit. Move the fan mounting bracket and fan impellor away from inlet ring, and then towards the access opening. Whilst supporting the fan assembly, remove the screws holding the bracket to the fan motor and manoeuvre the fan assembly out of unit.
- f) Check that the new fan assembly bears the same manufacturer identification as the unit which has been removed. If any differences are found, then the re-installation cannot be completed and the correct fan type must be obtained.
- g) To refit a new fan, it is necessary to generally reverse the above procedure. Once all screws are tightened, check that the impellor spins freely. In particular for fan model designation B, C or D, check that the impellor is not fouling on the inlet ring or any other part of the unit. Re-connect wiring.

On completion of the maintenance of the fans, re-fit the access panels.

## 7.07 Internal and external surfaces

The internal and external surfaces of the equipment should be regularly checked for scratches, corrosion, or for peeling of painted surfaces. If found, thoroughly clean affected areas with a wire brush, apply a coat of zinc rich primer or similar, and re-touch with suitable finishing paint.

All nuts, bolts and fixings should be checked for tightness. The general condition of all components and the equipment overall should be checked.

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## 7.08 Controls, PCBs and wiring

The controls and electrical connections should be checked regularly.

The mains power supply cord should be visually checked. If there is any evidence whatsoever of damage or deterioration of the power supply cord, then the unit must not be put back into service until the supply cord has been replaced by suitably qualified personnel.

The condition of the controls devices, terminals, PCB and any associated wiring should be checked by visual inspection. Any signs of discolouration, arcing or charring of any component, wire or terminal block should be investigated immediately, and the equipment must not be returned to service until the problem has been found and rectified.

PCBs incorporate fusible links which protect certain components. In the event of a blown fuse, only new fuses of equivalent specification, size and rating must be used. The correct fuse ratings are permanently shown on the PCB. If fuses are blowing persistently, this condition must be investigated immediately, and the equipment must not be returned to service until the problem has been found and rectified.

If the PCB is found to be faulty, a new unit may be fitted. Ensure a wiring diagram is available, or note the wiring connections before undoing any wires, then proceed as follows:

### Fans fitted with EC Fan Control Interface only

- a) Unscrew the wiring clamps and withdraw the wiring from each terminal. For variants with optional transformer, remove the spade terminals from the terminals marked T4 & T7 on the PCB.
- b) Release the existing PCB from its mountings by gently squeezing the sides of the plastic riser mounts. Once all the mounts have been released, the existing PCB can be lifted away.
- c) Align the mounting holes in the new PCB with the riser, and apply even and gentle pressure until the PCB locates securely on each of the individual riser mountings.
- d) Ensure that the mode and fan type jumper settings on the new PCB match those from the previous PCB.
- e) Establish settings for the local and boost speed control potentiometers as necessary.

### Fans fitted with EC Fan Auto-changeover control only

- f) It is recommended that the wiring receptacles be removed from the PCB without unscrewing or removing the existing wiring, as this will minimise the likelihood of errors in re-connection.
- g) With a new PCB to hand, remove the corresponding unwired multi-plug from the new PCB and replace it with the pre-wired multi-plug from the existing installation.
- h) Continuing around the PCB in a logical sequence, and follow a similar process for each pre-wired multi-plug on the existing PCB.
- i) Carefully set the new PCB to one side.
- j) Release the existing PCB from its mountings by gently squeezing the sides of the plastic riser mounts. Once all the mounts have been released, the existing PCB can be lifted away.
- k) Align the mounting holes in the new PCB with the riser, and apply even and gentle pressure until the PCB locates securely on each of the individual riser mountings.
- l) Ensure that the dip-switches and jumper settings on the new PCB match those from the previous PCB.
- m) Establish settings for the run-on timer, local and boost control potentiometers as necessary.

### ALL UNITS

- n) Re-fit the controls enclosure cover before re-connecting the power supply.

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## 8.0 Service

In order to maximise the useful life of the equipment and keep it operating in good order, the maintenance checks and tasks detailed in these instructions should be performed as part of a regular and routine service schedule. Under normal operating conditions, the following schedule is recommended:

| Maintenance item                 | Frequency |                |                |                 |
|----------------------------------|-----------|----------------|----------------|-----------------|
|                                  | Monthly   | Every 3 months | Every 6 months | Every 12 months |
| Filters                          |           | ✓              |                |                 |
| Condensate drip trays and drains |           |                | ✓              |                 |
| Heating and Cooling coils        |           |                | ✓              |                 |
| Fans                             |           |                | ✓              |                 |
| Internal and External surfaces   |           |                |                | ✓               |
| Controls / PCB / Fuses           |           |                |                | ✓               |
| Electric Heater                  |           |                |                | ✓               |

Spares parts are available by contacting Caice main sales office. Enquiries should include details of the unit reference and contract number, which will be displayed on the identification label. Alternatively, details of the product and the model can be found on the rating plate.



At the end of their useful life, the product, components and packaging should be disposed of via a suitable recycling facility.

Do not dispose of any part of the product, components or packaging with normal household waste. Do not burn.

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## 9.0 Warranty

### 9.01 Warranty

Except where stated otherwise, this product is covered by our standard warranty valid for 12 months from the date of delivery to site or date of invoice, whichever is the earlier. The warranty undertakes to supply only a replacement for any mechanical or electrical component that fails within this period, except dirty disposable filters.

Except where stated otherwise, the Warranty does not undertake to provide labour (or reimburse any costs associated with labour) for removal or refitting the faulty component, and does not undertake to cover any costs or financial penalties incurred due to any other works which may be necessary to remove or re-fit any component.

The warranty does not cover damage due to misuse (i.e. operation outside of the intended function of the product, or operation which exceeds the technical limitations of the product), lack of maintenance or failure to comply with these instructions.

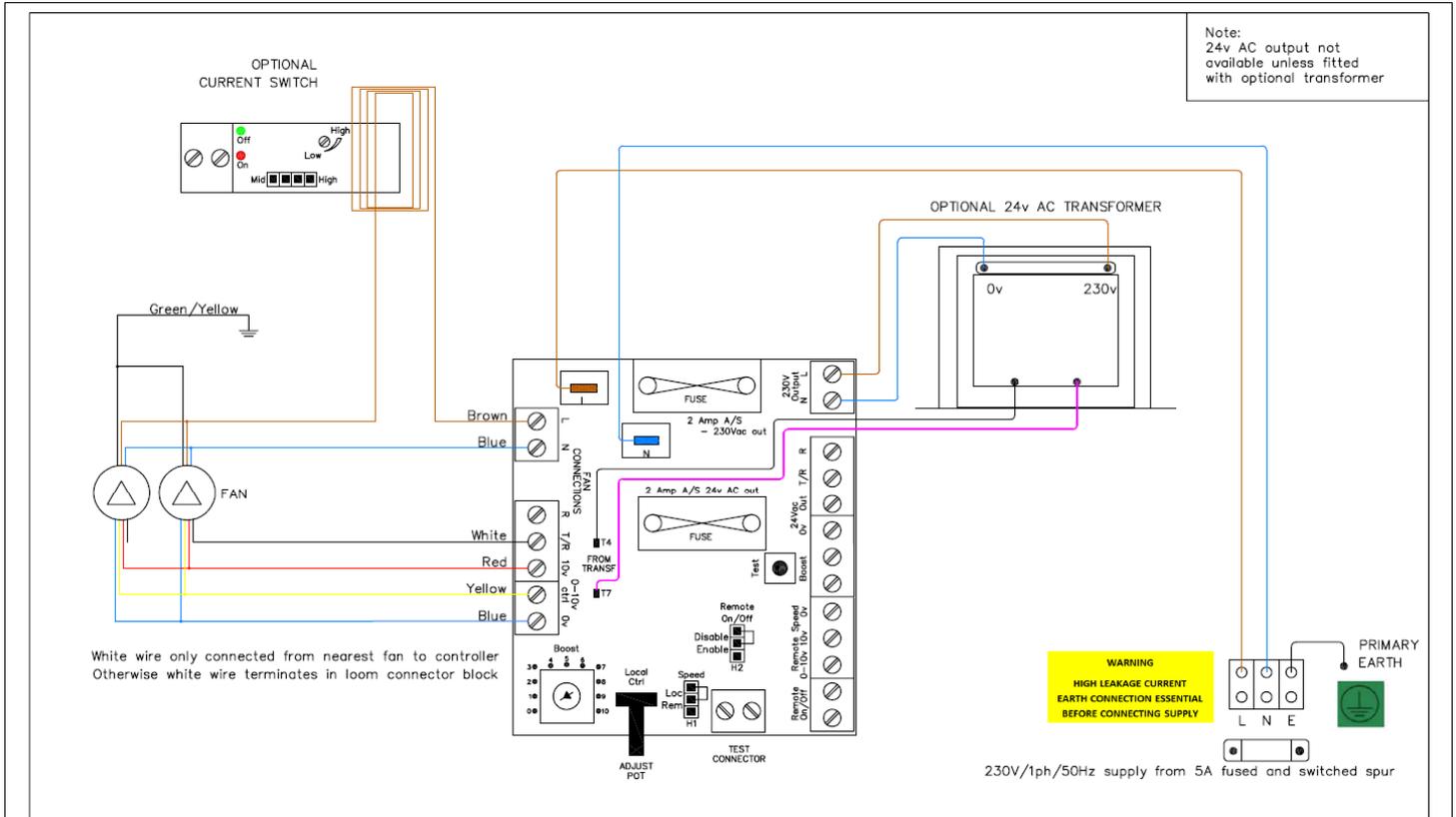
The warranty will become void if any aspect of the product is modified or repaired without the written approval of CAICE.

If a fault is identified that cannot be resolved by site personnel then our Engineers are available to attend site. In these instances we will advise an attendance cost and a formal order must be issued before we visit site. An invoice will be issued where our Engineer identifies that the fault is not covered by our Warranty.

## APPENDIX 1 – Wiring Diagrams

# Instruction manual – EVO3 Fan Unit

Wiring Diagram WD-EVO-101 (EC Fan Interface – fan models A1 & A2)

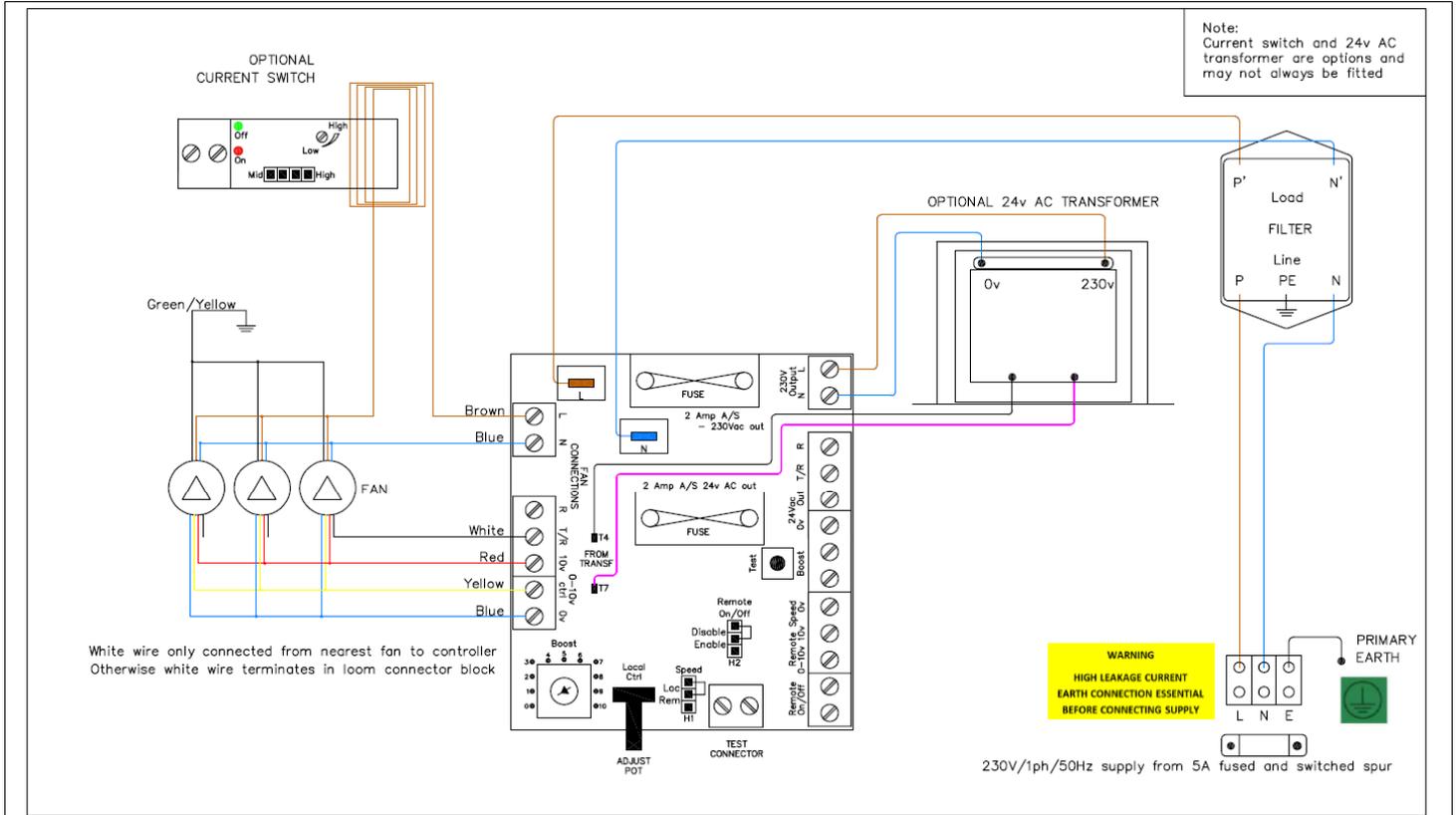


|  |   |                                 |                           |   |  |
|--|---|---------------------------------|---------------------------|---|--|
| <p><b>TITLE:</b><br/>WIRING CONNECTIONS FOR EVO3 FAN UNITS<br/>FITTED WITH EC FAN INTERFACE BOARD<br/>EVO3 FAN MODEL A1 &amp; A2</p> | <p><b>DRAWING No.</b> WD-EVO-101<br/><b>SCALE:</b> NTS<br/><b>DRAWN BY:</b> FZ<br/><b>CHECKED:</b> DA</p> | <p><b>DATE</b><br/>24/02/14</p> | <p><b>ISSUE</b><br/>A</p> | <p><b>COMMENTS</b><br/>FOR CONSTRUCTION</p> |  <p>RIVERSIDE HOUSE<br/>3 WINNERSH FIELDS<br/>GAZELLE CLOSE<br/>WINNERSH<br/>BERKSHIRE<br/>RO41 6GS<br/>Tel: 0118-918-6470<br/>Fax: 0118-918-0-80<br/>enquiries@caice.co.uk</p> |
|--|---|---------------------------------|---------------------------|---|--|

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# Instruction manual – EVO3 Fan Unit

Wiring Diagram WD-EVO-102 (EC Fan Interface – fan model A3)



**TITLE:**  
WIRING CONNECTIONS FOR EVO3 FAN UNITS  
FITTED WITH EC FAN INTERFACE BOARD  
EVO3 FAN MODEL A3

**DRAWING No.** WD-EVO-102  
**SCALE:** NTS  
**DRAWN BY:** FZ  
**CHECKED:** DA

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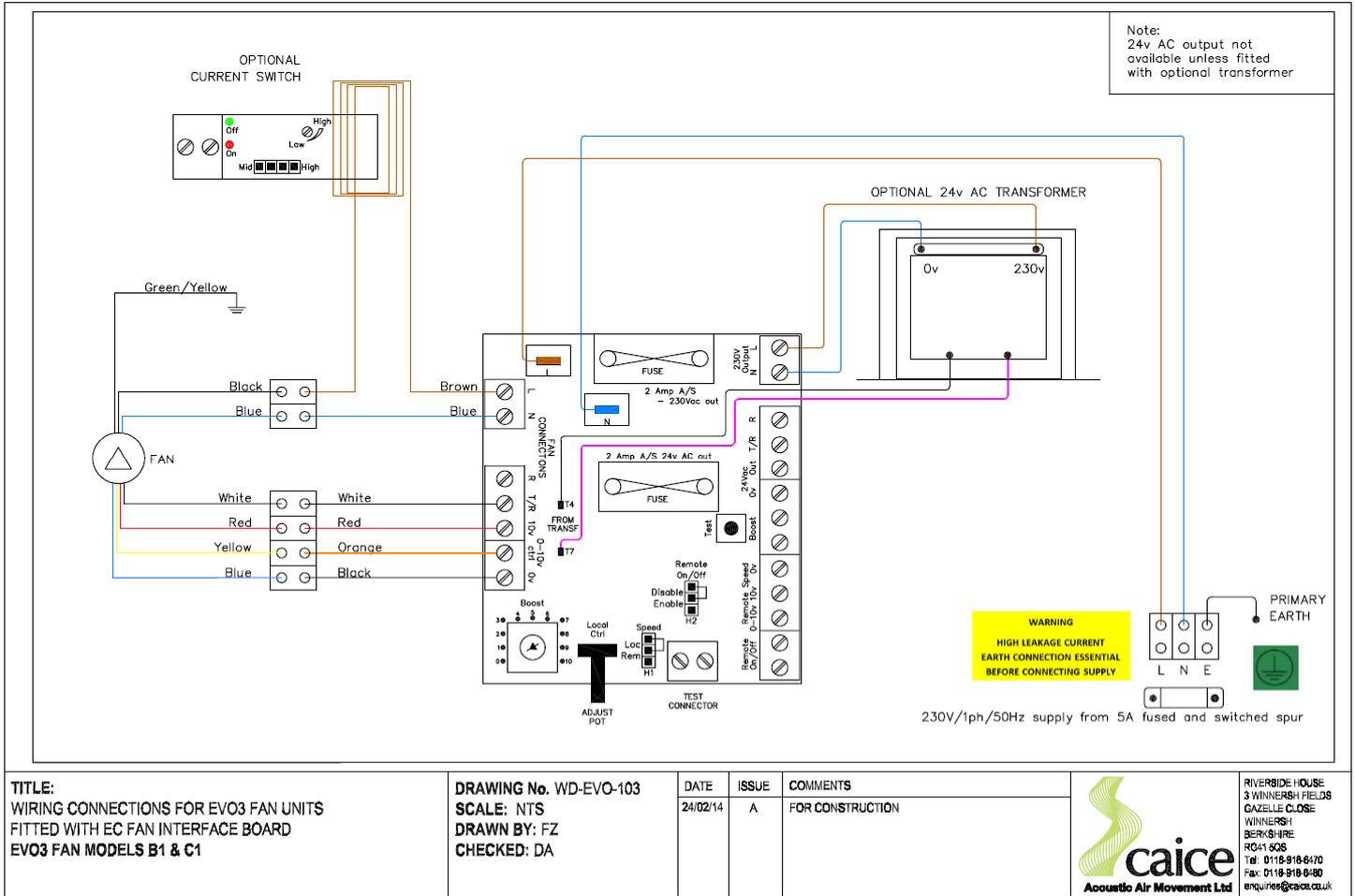
**caice**  
Acoustic Air Movement Ltd

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# Instruction manual – EVO3 Fan Unit

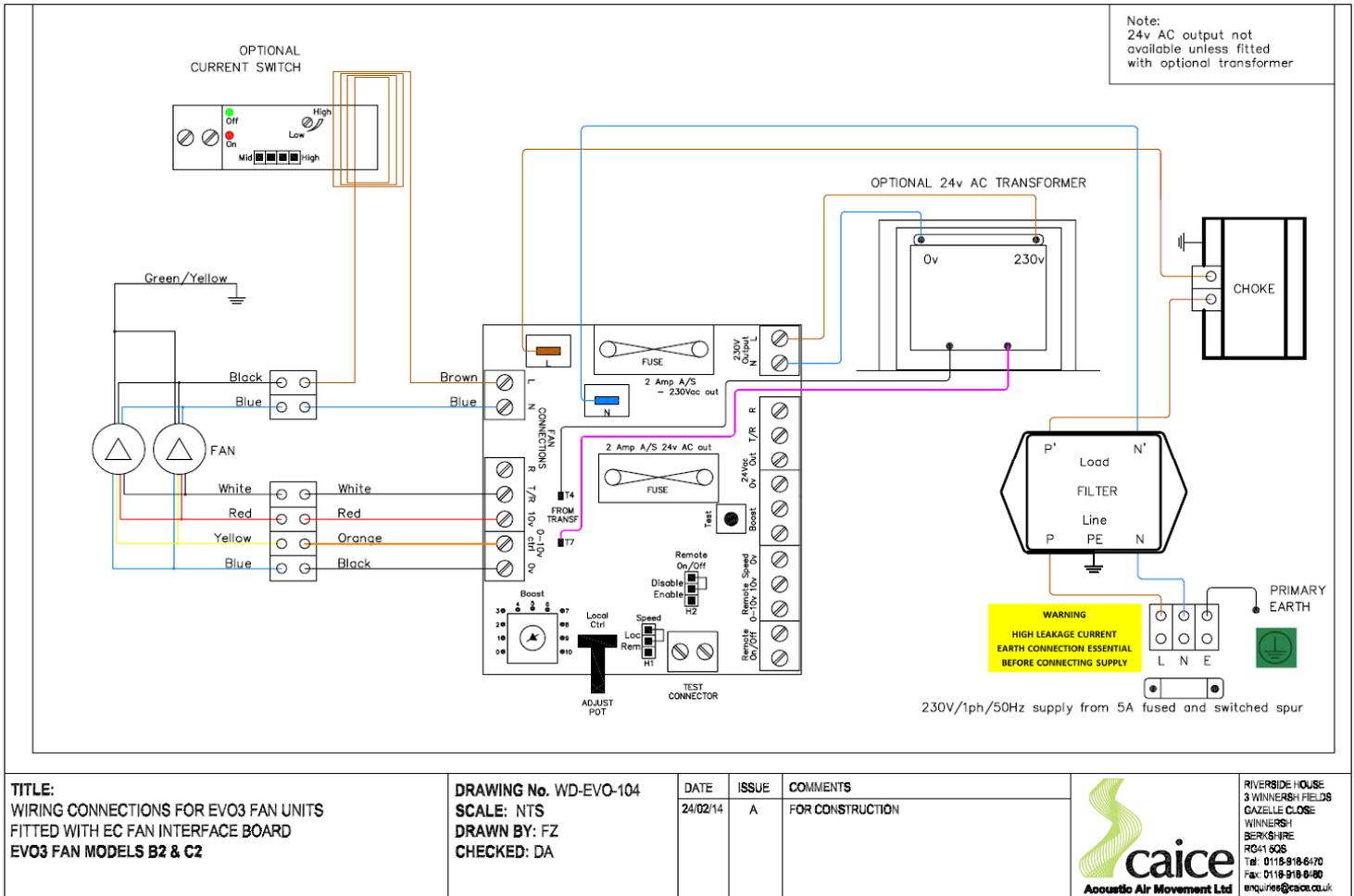
Wiring Diagram WD-EVO-103 (EC Fan Interface – fan models B1 & C1)



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# Instruction manual – EVO3 Fan Unit

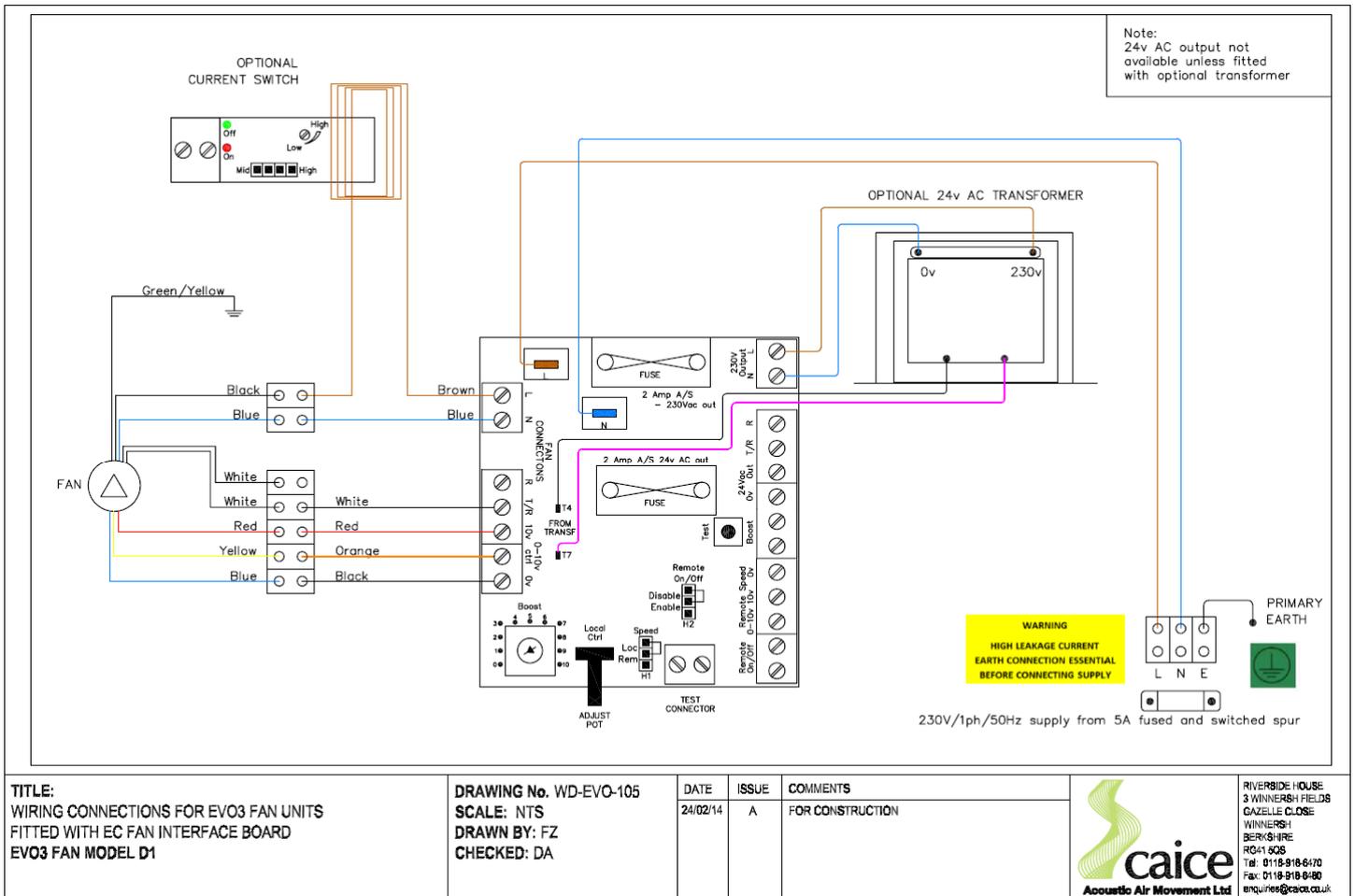
Wiring Diagram WD-EVO-104 (EC Fan Interface – fan models B2 & C2)



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# Instruction manual – EVO3 Fan Unit

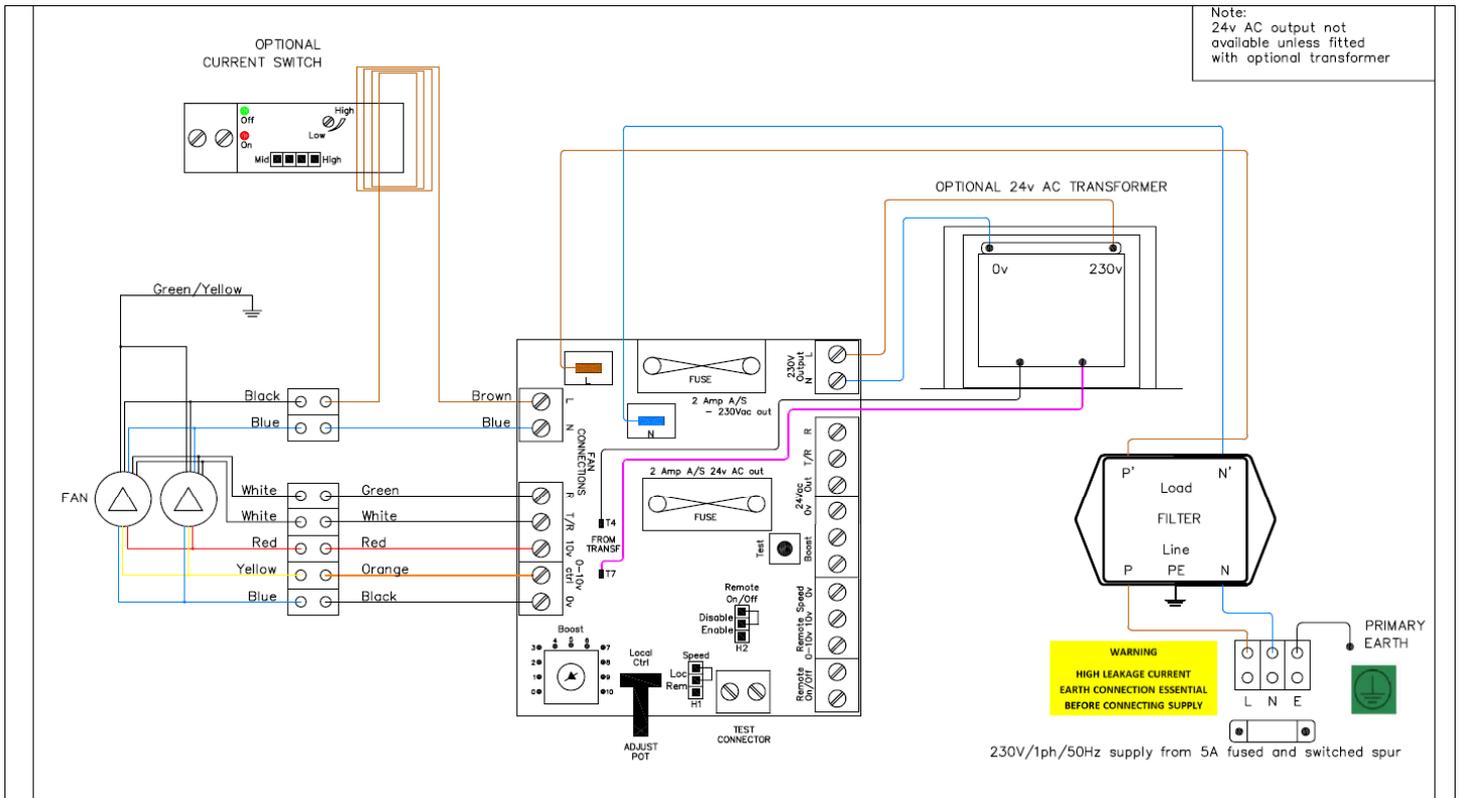
Wiring Diagram WD-EVO-105 (EC Fan Interface – fan model D1)



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# Instruction manual – EVO3 Fan Unit

Wiring Diagram WD-EVO-106 (EC Fan Interface – fan model D2)



**TITLE:**  
WIRING CONNECTIONS FOR EVO3 FAN UNITS  
FITTED WITH EC FAN INTERFACE BOARD  
EVO3 FAN MODEL D2

**DRAWING No.** WD-EVO-106  
**SCALE:** NTS  
**DRAWN BY:** FZ  
**CHECKED:** DA

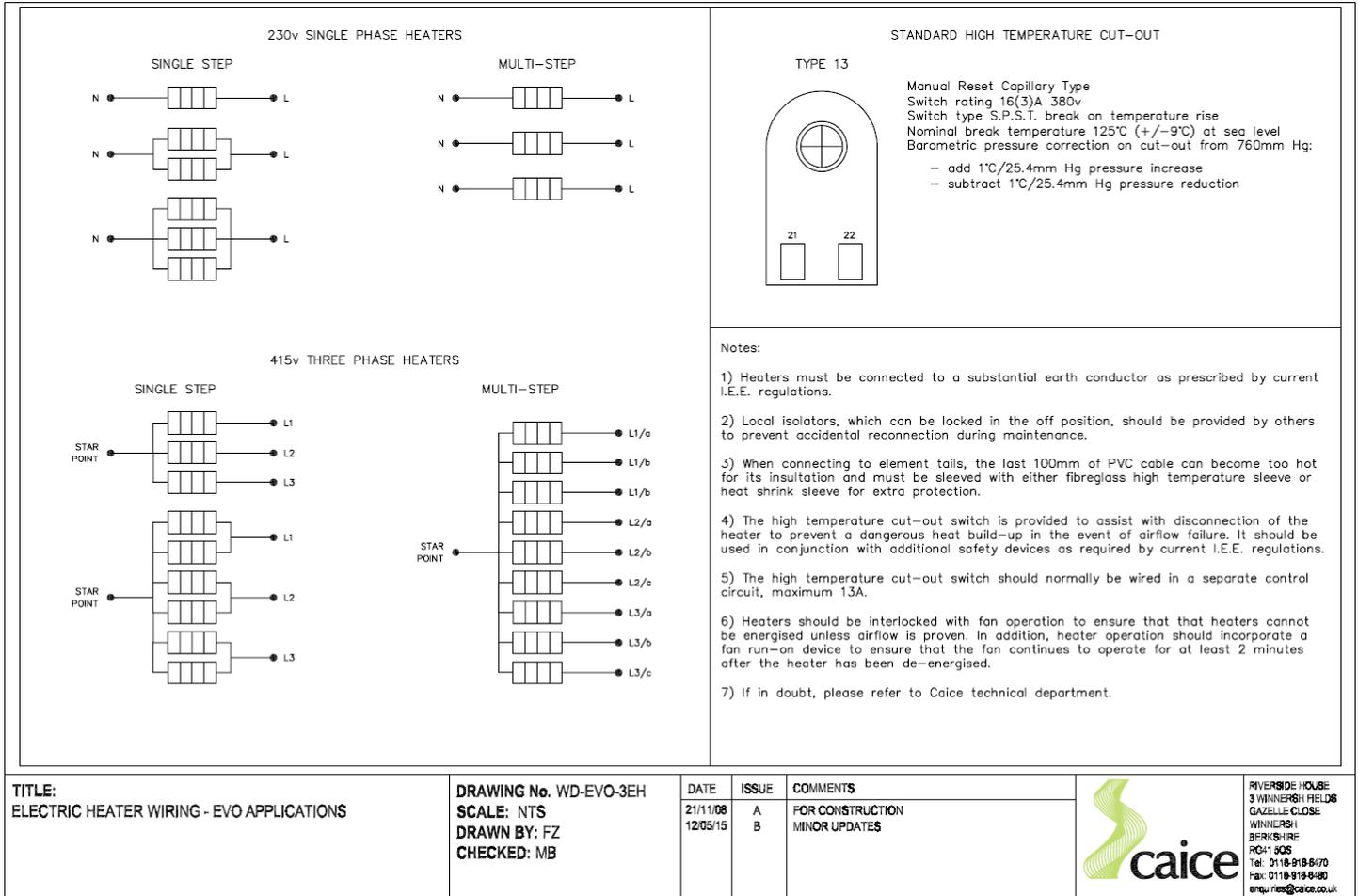
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# Instruction manual – EVO3 Fan Unit

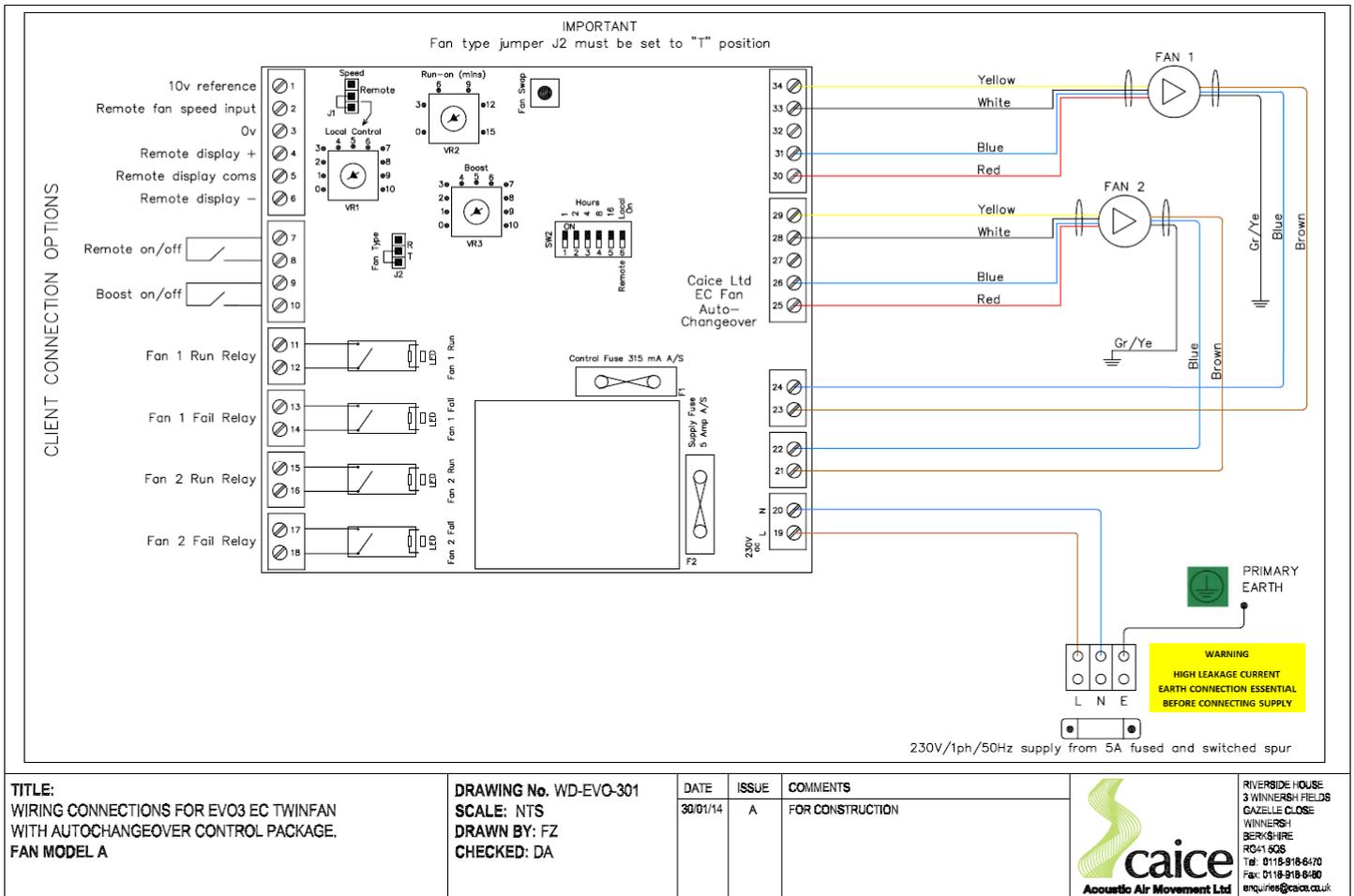
## Wiring Diagram WD-EVO-3EH (Electric Heater Wiring – EVO Applications)



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# Instruction manual – EVO3 Fan Unit

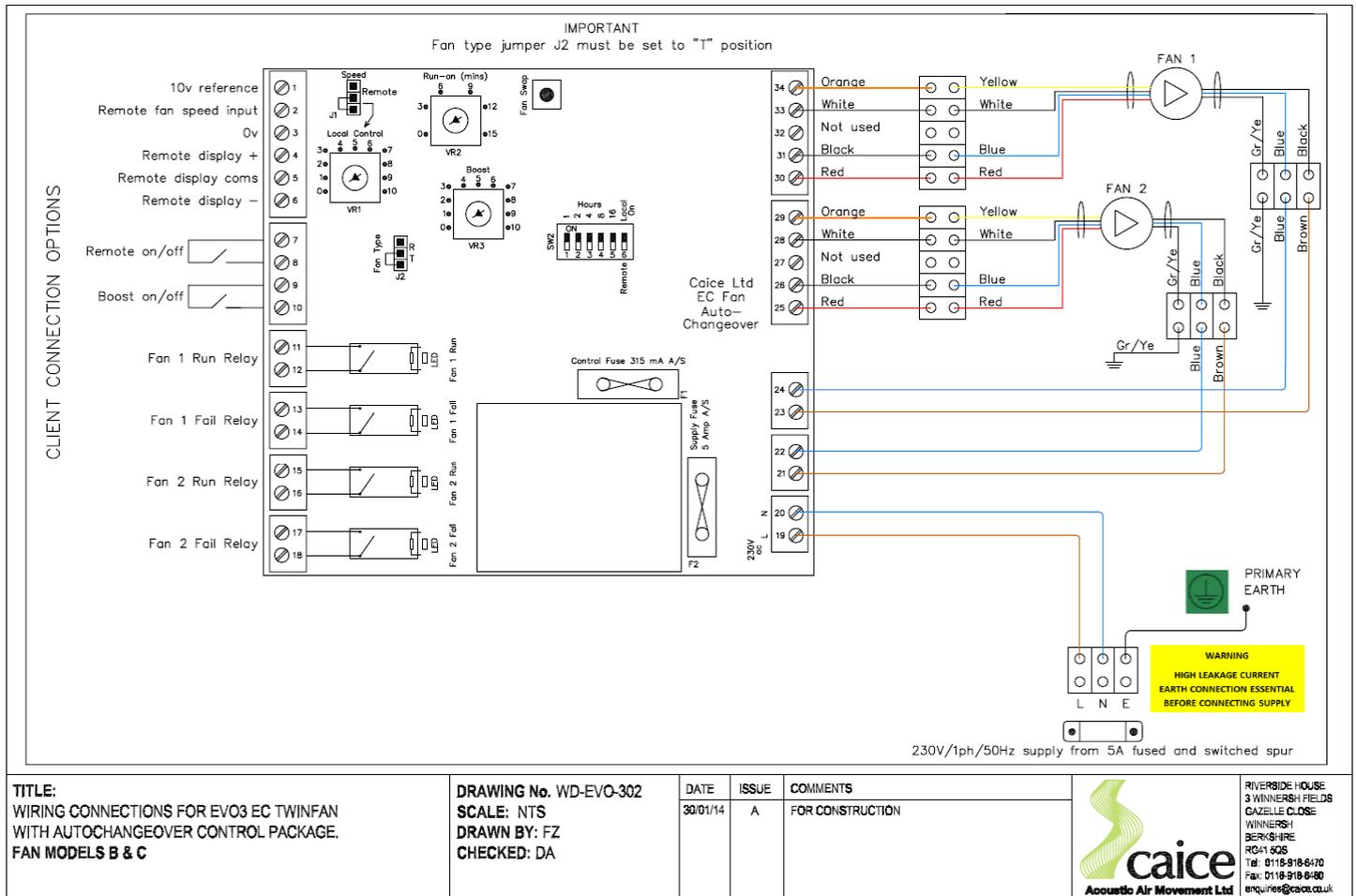
Wiring Diagram WD-EVO-301 (EC Twin-fan Auto-changeover – fan model A)



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# Instruction manual – EVO3 Fan Unit

Wiring Diagram WD-EVO-302 (EC Twin-fan Auto-changeover – fan models B & C)



**TITLE:**  
WIRING CONNECTIONS FOR EVO3 EC TWINFAN  
WITH AUTOCHANGEOVER CONTROL PACKAGE,  
FAN MODELS B & C

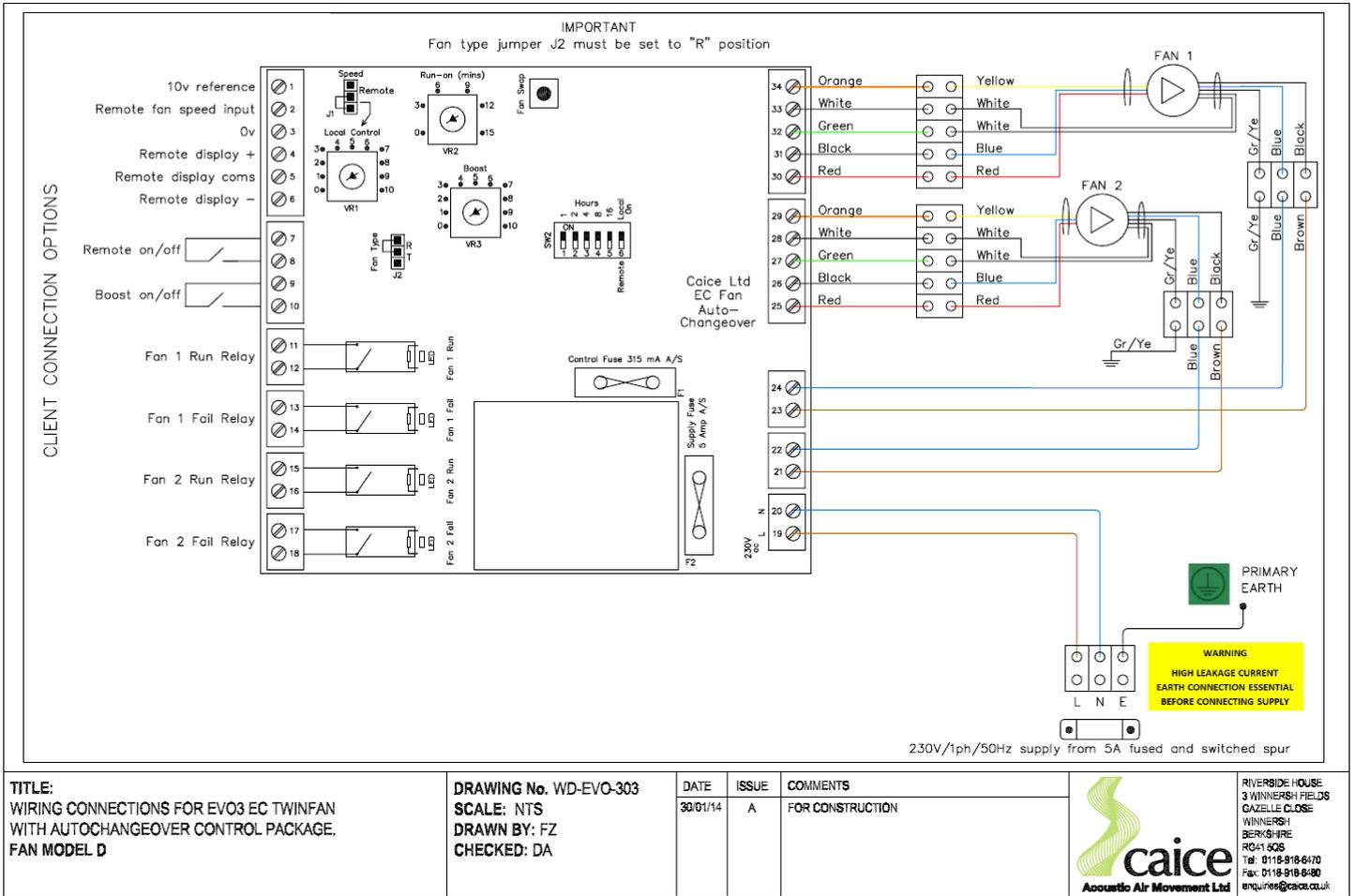
**DRAWING No.** WD-EVO-302  
**SCALE:** NTS  
**DRAWN BY:** FZ  
**CHECKED:** DA

| DATE     | ISSUE | COMMENTS         |
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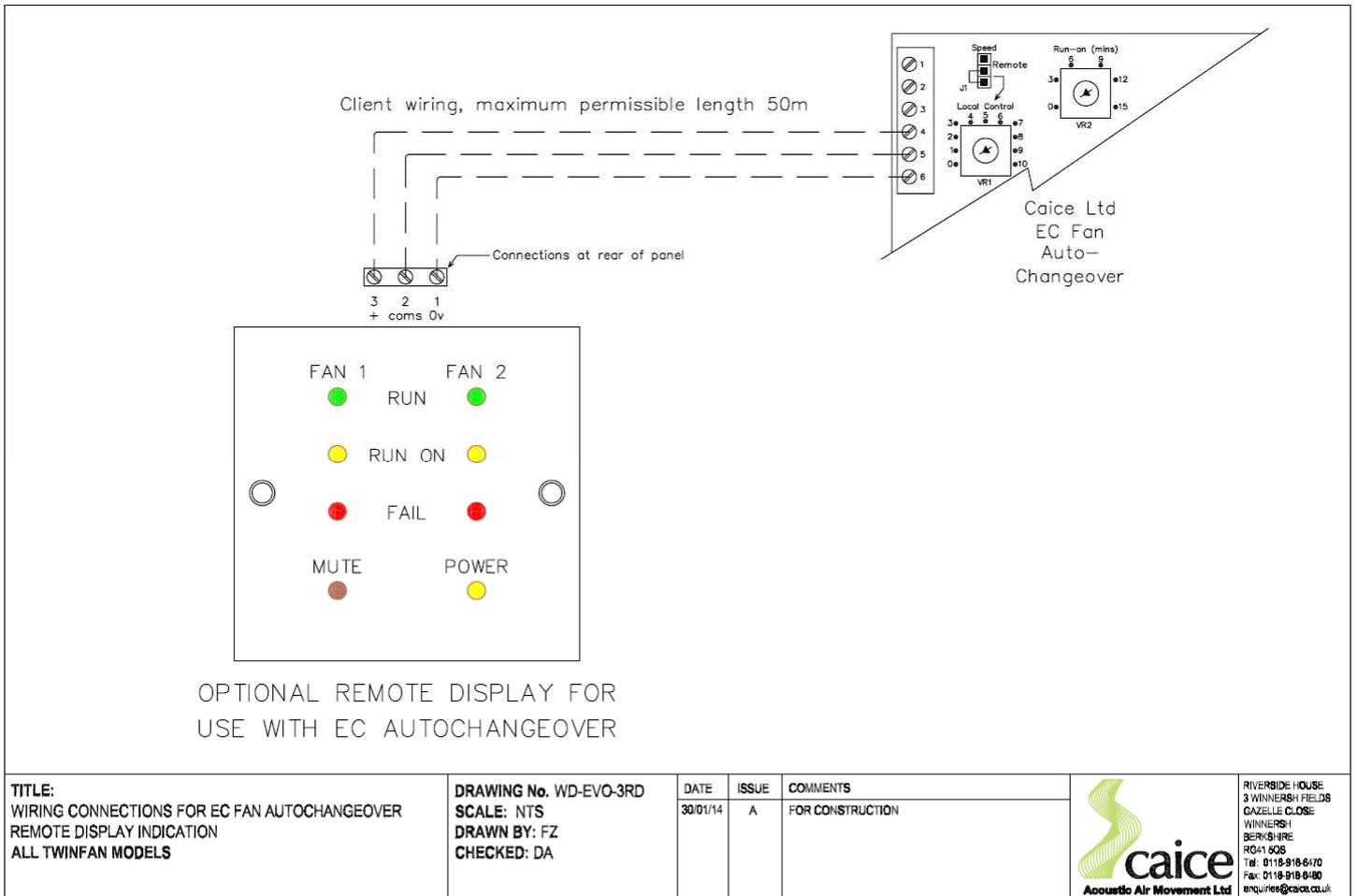
# Instruction manual – EVO3 Fan Unit

Wiring Diagram WD-EVO-303 (EC Twin-fan Auto-changeover – fan model D)



# Instruction manual – EVO3 Fan Unit

Wiring Diagram WD-EVO-3RD (remote display for optional use with EC twin-fan auto-changeover PCB)



## APPENDIX 2-1

### Guide to EC Fan Control Interface

# Instruction manual – EVO3 Fan Unit

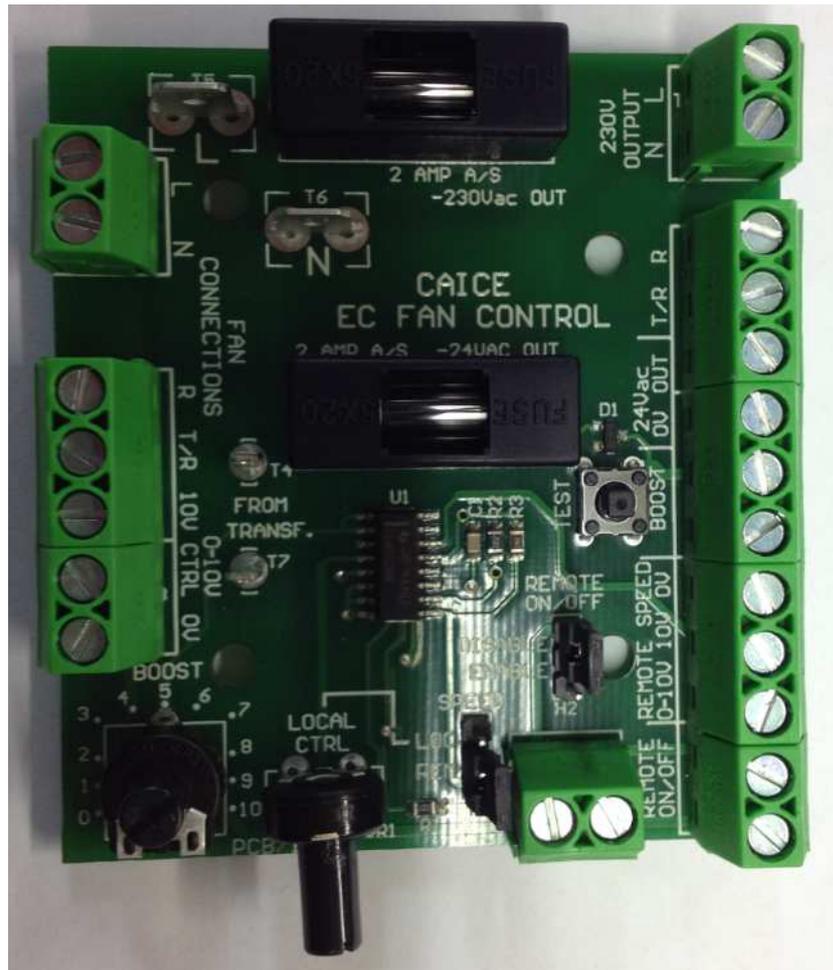
## Controller Identification

Caice EC Fan Control Interface

## Application

Caice EVO3 fan unit range (models A1, A2, A3, B1, B2, C1, C2, D1, D2 only)

## Picture



# Instruction manual – EVO3 Fan Unit

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## Warning

It is important that the content of this document is read in full (in conjunction with the appropriate wiring diagrams) before attempting to connect to or operate this controller. This work should not be undertaken by anyone other than suitably qualified personnel, as incorrect connection may damage the controller and invalidate the warranty.

In the event of any query, please contact the Caice technical department.

## Technical Summary

### General

- Power supply: 230V AC single phase, 50Hz
- Maximum load: 10A total on mains power input or fan output
- Fuses: 2-off 20mm, 250V 2A anti-surge type (providing protection for the 230V output and 24Vac outputs)
- Connections: Rising clamp screw terminals
- Fan compatibility: see below
- Usage: Internal use only
- Enclosure: Metal de-mountable enclosure to IP20
- Ambient temperature: 0°C to 40°C

### Fan compatibility

- Suitable fan types: EC only with either tachometer output or status relay output
- Power supply: 230V AC, single phase, 50Hz
- Maximum current: Not to exceed 10A total
- Speed control: via application of 0-10V dc signal
- Fan tachometer output: 1 pulse per revolution, square wave
- Fan relay output: Open contact to signal alarm

### Current switch (Optional)

- Type: E.C. Products CSW-NO-ASD
- Input range: 1-200A (selectable in 3 ranges, low 1-50A, mid 50-100A, high 100-200A)
- Switching (max): 0.3A@135V (AC/DC)

### Transformer (Optional)

- Type: Blore Bowron B5920 chassis mount
- Rating: 50vA (230vAC primary, 24vAC secondary)

# Instruction manual – EVO3 Fan Unit

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## Required user inputs

- Mains power connection: Live Neutral and Earth connections from fused spur with local isolator switch

## Optional user inputs

- Fan speed control input: 0-10V dc (10V maximum, 1mA max load), from BMS, or from set-point potentiometer minimum value of 10k $\Omega$  if using the 10V output.
- Fan on/off control input enable signal (volt free contact, rated at >6V to switch 1mA). Wetting current 0.5mA.
- Fan boost speed input enable signal (volt free contact, rated at >6V to switch 1mA). Wetting current 0.5mA.

## Available user outputs

- 10v dc reference signal (for remote potentiometer speed adjustment), max current of 1mA
- 2A, 230Vac OR 24Vac output (for powering ancillary devices)

# Instruction manual – EVO3 Fan Unit

## Terminal Designations

|                 | Terminal      | Description               | Connection notes  |
|-----------------|---------------|---------------------------|---|
| Mains Power     | L (T5)        | 230v supply live          | Incoming supply   |
|                 | N (T6)        | 230v supply neutral       |   |
|                 | L             | 230v output               | Either pre-wired to optional transformer, or for connection to 230Vac powered accessories |
|                 | N             | 230v output               |   |
| Fan Connections | L             | 230v supply live          | Factory wired to Fan  |
|                 | N             | 230v supply neutral       |   |
|                 | R             | 0v relay (when available) |   |
|                 | T/R           | Tachometer/relay          |   |
|                 | 10v           | +10v dc                   |   |
|                 | CTRL          | 0-10v drive signal        |   |
|                 | 0v            | 0v – common for fan       |   |
|                 | R             | 0v relay (when available) | Not connected (reserved for status diagnostics)   |
|                 | T/R           | Tachometer/relay          |   |
| Ancillary Power | 24Vac out     | 24V supply                | For connection to 24Vac powered accessories   |
|                 | 0v            | 0v                        |   |
| Boost           | Boost         | Volt-free contact         | For connection to boost speed activation  |
|                 | Boost         | Volt-free contact         |   |
| Remote speed    | 0v            | 0v                        | 0v connection for BMS or remote potentiometer   |
|                 | 10v           | 10v dc output             | Use with nominal 10kΩ potentiometer (if required)   |
|                 | 0-10v         | 0-10v dc input            | Fan speed control from BMS or remote potentiometer  |
| Remote on/off   | Remote on/off | Volt-free contact         | For connection to unit enable signal  |
|                 | Remote on/off | Volt-free contact         |   |

# Instruction manual – EVO3 Fan Unit

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## Jumper switches

- Jumper H1 (speed) – used to set primary speed control input. Set to “local control” for speed control via on-board local control potentiometer adjustment. Set to “remote” when speed setting via another device is required.
- Jumper H2 (remote on/off) – used to set status of remote on/off contacts. Set to “Disable” when remote on/off facility is not used. Set to “Enable” when remote on/off facility is required.

## Terminal connection blocks

This controller is provided with connection blocks incorporating rising clamp terminals.

## EC fan speed control voltages

EC fan motors operate from a permanent mains power supply, however their speed is controlled by application of a variable 0-10v dc input control signal to the electronics which are integrated within the fan motors themselves. This allows a simple and effective means of attaining VAV (variable air volume) operation.

From a standstill, EC fan motors will reliably start to operate when the control voltage input to the motor is 1.5v or more. It is therefore recommended that the control voltage input is not less than 2v for any specific continuous duty point. An input control voltage of 10v would provide the highest airflow for any particular system.

From any operational duty point, EC fan motors will stop running when the control voltage input to the motor reduces to a level of approximately 1v or below. For a reliable fan stop condition, the input signal should always be reduced to 0v.

## Mode of Operation

This controller provides a simple interface for the operation and speed control of EC fans. The features of this controller are:

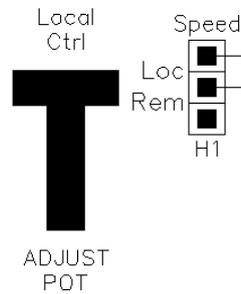
- Fixed speed control via the local (on-board) speed setting potentiometer.
- Remote speed control using a 0-10v signal from a BMS.
- Remote speed control using a 0-10v signal from another external control device (e.g. wall mounted potentiometer). A 10v reference signal for this purpose is available from the controller.
- Remote enable using a volt-free contact (e.g. wall switch, occupancy sensor).
- Boost speed activation using a volt-free contact.

The installer should utilise the most appropriate features according to the required control strategy and the control equipment available.

# Instruction manual – EVO3 Fan Unit

## Setting up for Local Speed Control

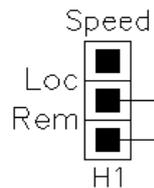
Where the fan is required to run at a single fixed speed, the local speed control function can be used. To enable the fan speed to be set in this way, the speed control jumper H1 should be set to the “Loc” position as shown:



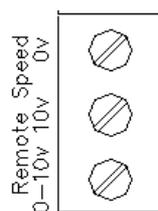
Fan speed will be controlled by the position of the Local Control adjustment potentiometer. The precise set-point can be attained by measuring the dc voltage across the adjacent test connector (or alternatively across the “0v” and “CTRL” terminals of the Fan Connections).

## Setting up for Remote Speed Control

Where fan speed is to be controlled by a remote device, the speed control jumper H1 should be set to the “Rem” position as shown:



With jumper H1 set to the “Rem” position, the local control adjust potentiometer will be disabled. Fan speed will then be controlled by a variable 0-10v dc input signal applied across the appropriate terminals of the remote speed input:



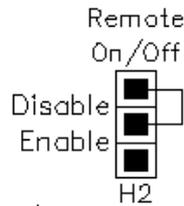
The “10v” terminal does not need to be connected, however it may be used if required to provide a 10v dc reference signal for use with a potentiometer device.

# Instruction manual – EVO3 Fan Unit

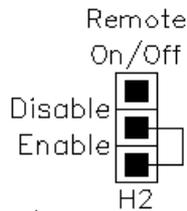
## Setting up for fan enabling

The method of fan enabling will vary according to the setting of the remote on/off jumper H2.

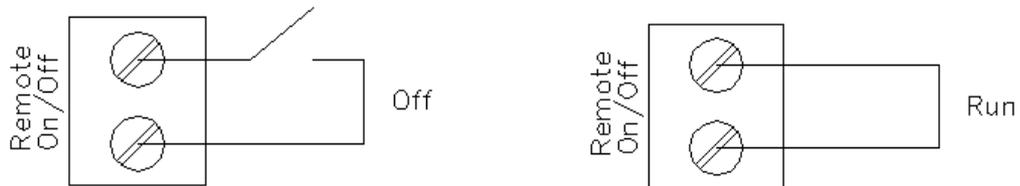
With the jumper in the “disable” position, the remote on/off function is disabled. The fans will therefore always be “enabled” and will operate on application of the mains power supply and the appropriate fan speed input setting.



Where the operation of the fans is to be controlled via an enable signal, jumper H2 should be set to the “enable” position as shown below:



A volt-free contact should then be connected across the remote on/off input terminals. The fans will be enabled and will run at the set speed when the contacts are closed.

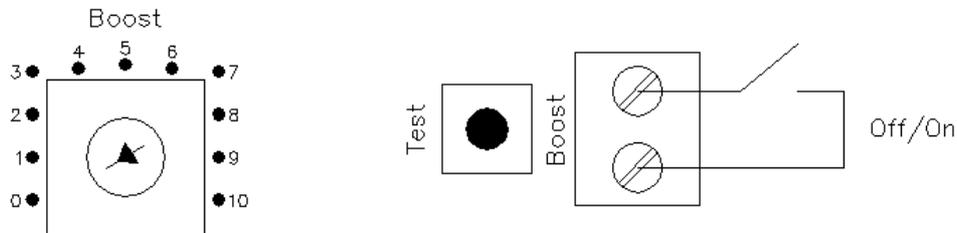


# Instruction manual – EVO3 Fan Unit

## Setting up the Boost speed

The controller provides a boost speed facility, which may be used to operate a second fan speed.

A volt-free contact should be connected across the boost input terminals. When the contacts are closed, the fan will run at a speed determined by the boost potentiometer.



The boost facility will override any other speed setting, irrespective of whether the fan is running under “local” or “remote” speed control.

**However, if the boost speed setting is lower than the speed setting of either the local or the remote speed input (as applicable), then the speed will not be boosted, but will be reduced.**

**The boost speed should therefore be used to establish a higher speed control setting than for normal speed.**

The operation of the boost setting can be tested by depressing the “Test” button adjacent to the boost contacts. This will temporarily operate the boost speed as if the input contacts were closed.

# Instruction manual – EVO3 Fan Unit

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## Current switch (Optional)

The controller may optionally be fitted with a supplementary current switch. This device provides for a contact which closes when the monitored current exceeds the trip value.

The power led will indicate circuit power whenever there is sufficient current flowing in the conductor to operate the device circuitry.

Due to the variable speed nature of EC fans, the current switch will need to be adjusted to operate at a current which corresponds to that being drawn at the lowest anticipated speed setting. There is a jumper setting and multi-turn screw which are used to adjust the trip value to the desired level.

Adjustment of the switch may be performed as follows:

- Ensure that the power supply live wire connecting the PCB to the fans is looped four times through the core of the current switch,
- The current switch has three selectable operating ranges. The lowest range should be selected by completely removing the toggle jumper.
- With the fan set and operating at its lowest speed setting for the particular application, the adjuster screw should be turned until the red “On” light is switched off.
- The adjuster screw should then be turned in the reverse direction until the red “On” light is illuminated. Add one further turn of the adjuster screw.
- Switch off the fan. The red “On” light should extinguish.
- Switch on the fan at its lowest speed setting. The red “On” light should illuminate.

## Transformer (Optional)

The controller may optionally be fitted with a transformer to provide a 24vAC power supply for connection of ancillaries with a maximum load of 2A.

## APPENDIX 2-2

### Guide to EC Fan Auto-changeover

# Instruction manual – EVO3 Fan Unit

## Controller Identification

Caice EC Fan Auto-changeover

## Application

Caice EVO3 fan unit range twin-fan auto-changeover (models AT, BT, CT, DT only)

## Picture



# Instruction manual – EVO3 Fan Unit

---

## Warning

It is important that the content of this document is read in full (in conjunction with the appropriate wiring diagrams) before attempting to connect to or operate this controller. This work should not be undertaken by anyone other than suitably qualified personnel, as incorrect connection may damage the controller and invalidate the warranty.

In the event of any query, please contact the Caice technical department.

## Technical Summary

### PCB

- Power supply: 230V AC single phase, 50Hz
- Maximum load: 5A (5A per fan)
- Primary fuse: 20mm, 250V 5A anti-surge type (providing protection for the PCB and both fans)
- Secondary fuse: 20mm 250V 315mA anti-surge type (providing protection for on-board transformer)
- Relays: 4-off (Fan 1 Run, Fan 1 Fail, Fan 2 Run, Fan 2 Fail).
- Connections: All 2-piece connectors using rising clamp screw terminals
- Fan compatibility: see below
- Usage: Internal use only
- Enclosure: Metal de-mountable enclosure to IP20
- Ambient temperature: 0°C to 40°C

### Fan compatibility

- Suitable fan types: EC only with either tachometer output or status relay output
- Power supply: 230V AC, single phase, 50Hz
- Maximum current: 5A
- Speed control: via application of 0-10V dc signal
- Fan tachometer output: 1 pulse per revolution, square wave
- Fan relay output: Open contact to signal alarm

### Required user inputs

- Mains power connection: Live Neutral and Earth connections from fused spur with local isolator switch

### Optional user inputs

- Fan speed control input: 0-10V dc (10V maximum, 0.5mA load), from BMS, or from set-point potentiometer
- Fan on/off control input enable signal (voltage free contact, rated at >6V to switch 1mA)
- Fan boost speed input enable signal (voltage free contact, rated at >6V to switch 1mA)

# Instruction manual – EVO3 Fan Unit

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## Available user outputs

- 10V dc reference signal (for remote potentiometer speed adjustment)
- Fan 1 Run relay
- Fan 1 Fail relay
- Fan 2 Run relay
- Fan 2 Fail relay
- Communication link to Remote Indication Panel

## Relays

- Contact rating: 250Vac 5A max resistive load. Recommended minimum switching >12V at 10mA.

## Remote Indication Panel

- Mounting: Internal mounting only using standard single-gang electrical back box
- Wiring requirement: Standard 3-core or equivalent
- Wiring length: Maximum length of 50m permissible

# Instruction manual – EVO3 Fan Unit

## Terminal Designations

|                            | Terminal | Description                 | Connection notes   |
|----------------------------|----------|-----------------------------|--|
| Fan Signal                 | 1        | 10v dc output               | Use with nominal 50kΩ potentiometer (if required)              |
|                            | 2        | 0-10v input                 | Fan speed control from BMS or remote potentiometer             |
|                            | 3        | 0v                          | 0v connection for BMS or remote potentiometer                  |
| Comms                      | 4        | Communications link +       | For connection to optional remote display board                |
|                            | 5        | Communications link         |  |
|                            | 6        | Communications link – 0v    |  |
| Enablers                   | 7        | Remote on/off switch        | Volt free contact for connection to unit enable signal         |
|                            | 8        | Remote on/off switch        |  |
|                            | 9        | Boost switch                | Volt free contact for connection to boost speed activation     |
|                            | 10       | Boost switch                |  |
| Relay switching and status | 11       | Fan 1 Run monitor relay     | Volt free signal output for user status indication connections |
|                            | 12       | Fan 1 Run monitor relay     |  |
|                            | 13       | Fan 1 Fail monitor relay    |  |
|                            | 14       | Fan 1 Fail monitor relay    |  |
|                            | 15       | Fan 2 Run monitor relay     |  |
|                            | 16       | Fan 2 Run monitor relay     |  |
|                            | 17       | Fan 2 Fail monitor relay    |  |
|                            | 18       | Fan 2 Fail monitor relay    |  |
| Mains power                | 19       | 230v supply live            | Incoming supply (from switched, fused spur)                    |
|                            | 20       | 230v supply neutral         |  |
|                            | 21       | 230v supply live            | Factory wired to Fan 2   |
|                            | 22       | 230v supply neutral         |  |
|                            | 23       | 230v supply live            | Factory wired to Fan 1   |
|                            | 24       | 230v supply neutral         |  |
| Fan 2                      | 25       | Spare (for fan +10v dc out) | Factory wired to Fan 2   |
|                            | 26       | 0v – common for fan         |  |
|                            | 27       | 0v – relay (when available) |  |
|                            | 28       | Tachometer/relay            |  |
|                            | 29       | 0-10v drive signal          |  |
| Fan 1                      | 30       | Spare (for fan +10v dc out) | Factory wired to Fan 1   |
|                            | 31       | 0v – common for fan         |  |
|                            | 32       | 0v – relay (when available) |  |
|                            | 33       | Tachometer/relay            |  |
|                            | 34       | 0-10v drive signal          |  |

# Instruction manual – EVO3 Fan Unit

## Select switches

| Switch | Function       | Position | Configuration notes   |
|--------|----------------|----------|---|
| 1      | 1 hour run-on  | DOWN (1) | Function inactive   |
|        |                | UP (ON)  | 1 hour accumulative time period   |
| 2      | 2 hour run-on  | DOWN (2) | Function inactive   |
|        |                | UP (ON)  | 2 hour accumulative time period   |
| 3      | 4 hour run-on  | DOWN (3) | Function inactive   |
|        |                | UP (ON)  | 4 hour accumulative time period   |
| 4      | 8 hour run-on  | DOWN (4) | Function inactive   |
|        |                | UP (ON)  | 8 hour accumulative time period   |
| 5      | 16 hour run-on | DOWN (5) | Function inactive   |
|        |                | UP (ON)  | 16 hour accumulative time period  |
| 6      | Fan enabling   | DOWN (6) | “Remote” position – when remote on/off input is in use (i.e. controller configured to allow fans to be switched on/off via the remote switch) |
|        |                | UP (ON)  | “Local on” position – when remote on/off input is not in use (fans always enabled)  |

## Jumper switches

- Jumper J1 – used to set speed control input. Set to “local control” for speed control via on-board potentiometer adjustment. Set to “remote” when speed setting via another device is required.
- Jumper J2 – set to suit fan type. Set to “T” position when using tachometer style fans. Set to “R” position when using relay style fans.

## Terminal connection blocks

This controller is provided with 2-piece style connection blocks incorporating rising clamp terminals.

The connectors can be separated from their respective receptacles by carefully releasing the retaining clips and simultaneously lifting the blocks vertically away from the PCB. Excessive lateral force may cause the receptacle to become detached from the PCB board.

This controller is designed for a permanent mains power supply.

# Instruction manual – EVO3 Fan Unit

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## EC fan speed control voltages

EC fan motors operate from a permanent mains power supply, however their speed is controlled by application of a variable 0-10v dc input control signal to the electronics which are integrated within the fan motors themselves. This allows a simple and effective means of attaining VAV (variable air volume) operation.

From a standstill, EC fan motors will reliably start to operate when the control voltage input to the motor is 1.5v or more. It is therefore recommended that the control voltage input is not less than 2v for any specific continuous duty point. An input control voltage of 10v would provide the highest airflow for any particular system.

From any operational duty point, EC fan motors will stop running when the control voltage input to the motor reduces to a level of approximately 1v or below. For a reliable fan stop condition, the input signal should always be reduced to 0v.

## Mode of Operation

This controller provides the capability for automatic changeover (duty rotation) of two fans. The changeover can be set to operate after selectable time periods of up to 31 hours. The unit stores the run-time of the duty fan (and also which fan is the duty fan) in non-volatile memory, such that in the event of power failure the duty rotation can continue correctly.

In the event of a fan failure, the duty fan will automatically switch to the standby fan, and energise the appropriate fan fail relay. Fan changeover is then disabled until the PCB is reset (by switching off and on the mains power supply). Two additional relays provide monitoring when either fan is running.

This controller provides additional features of:

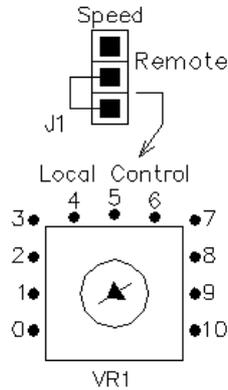
- Fixed speed control via the local (on-board) speed setting potentiometer.
- Remote speed control using a 0-10v signal from a BMS.
- Remote speed control using a 0-10v signal from another external control device (e.g. wall mounted potentiometer). A 10v reference signal for this purpose is available from the controller.
- Remote enable using a volt-free contact (e.g. wall switch, occupancy sensor).
- Boost speed activation using a volt-free contact.
- Run-on timer of 0-15 minutes.
- Remote display/alarm panel (optional).

The installer should utilise the most appropriate features according to the required control strategy and the control equipment available.

# Instruction manual – EVO3 Fan Unit

## Setting up for Local Speed Control

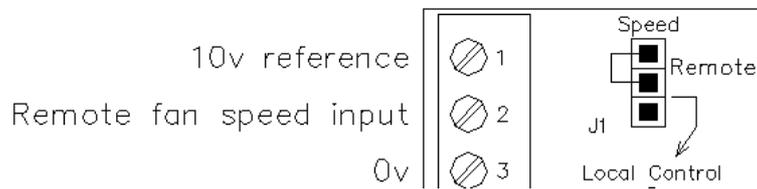
Where the fan is required to run at a single fixed speed, the local speed control function can be used. To enable the fan speed to be set in this way, the speed control jumper J1 should be set to the “Local Control” position as shown:



Fan speed will be controlled by the position of the Local Control potentiometer VR1. The precise set-point can be attained by measuring the dc voltage across the terminals of the duty fan (i.e. terminals 31 & 34 for Fan 1, or terminals 26 & 29 for Fan 2).

## Setting up for Remote Speed Control

Where fan speed is to be controlled by a remote device, the speed control jumper J1 should be set to the “Remote” position as shown:



With jumper J1 set to the “Remote” position, potentiometer VR1 will be disabled. Fan speed will then be controlled by a variable 0-10v dc input signal applied across terminals 2 & 3.

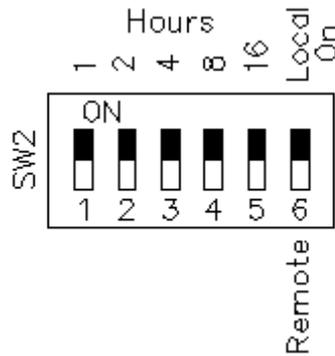
Terminal 1 will provide a 10v dc reference signal for use with a potentiometer device.

# Instruction manual – EVO3 Fan Unit

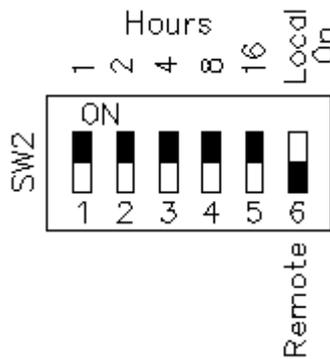
## Setting up for fan enabling

The method of fan enabling will vary according to the setting of select DIP switch number 6.

With DIP switch 6 in the “Local On” position (i.e. pushed upwards towards the ON script), the fans are always “enabled” and will operate on application of the mains power supply and the appropriate fan speed input setting.



Where the operation of the fans is to be controlled via an enable signal, the position of dip switch number 6 should be changed to the “Remote” position as shown below:



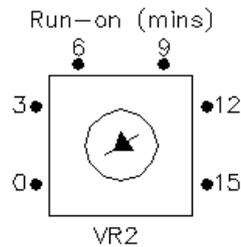
A volt-free contact should then be connected across terminals 7 & 8. The fans will be enabled and will run at the set speed when the contacts are closed.



# Instruction manual – EVO3 Fan Unit

## Setting up the Run-on timer

The run-on potentiometer is used to control the fan run-on time period after the fans have been switched off by the remote enable facility. The duty fan will remain operational at its set speed for upto 15 minutes, according to the setting of potentiometer VR2, which can be adjusted to suit individual requirements. If no run-on is required, set the run-on potentiometer to zero (fully anticlockwise):

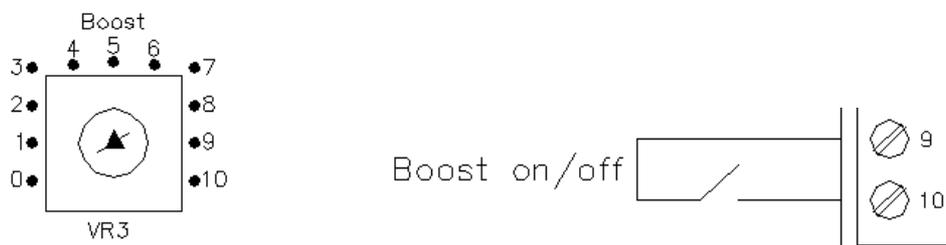


## Setting up the Boost speed

The controller provides a boost speed facility, which may be used to operate a second fan speed.

A volt-free contact should be connected across terminals 9 & 10. When the contacts are closed, the fan will run at a speed determined by the boost potentiometer VR3.

**However, if the boost speed setting is lower than the speed setting of either the local or the remote speed input (as applicable), then the speed will not be boosted.**



Boost only operates when the fan is running (i.e. "Local On" enable, or "Remote" enable with closed contacts).

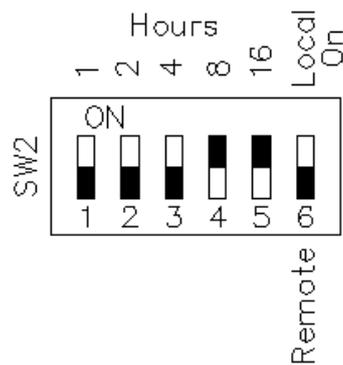
Boost operates during the run-on time, but the fan will stop at the end of the run-on time even if the boost contacts are still closed.

# Instruction manual – EVO3 Fan Unit

## Setting up the Auto-changeover period

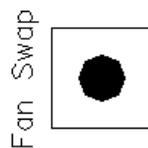
The fan changeover time is selectable between 1-31 hours according to the setting of select DIP switch numbers 1 – 5.

The switches should be moved up (towards the ON position) to activate the corresponding time function. These times are cumulative. In the example below, switches 4 & 5 are set towards the ON position. As these correspond to 8 hour and 16 hour changeover settings, the fans would automatically change over after a cumulative time period of 24 hours:



If none of the switches are set towards the ON position, there will be no automatic changeover of the fans.

At any time the “Fan swap” button may be pushed to force a changeover of the duty and standby fans. This may be useful during commissioning or fault finding operations.



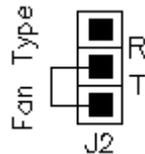
# Instruction manual – EVO3 Fan Unit

## Fan Type Selection

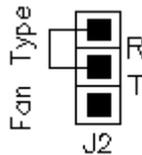
The fan type selection jumper must be set for the fan types being used. It is the responsibility of the installer to ensure that the fan type selection jumper is set correctly.

If the jumper is incorrectly set, the fans will operate normally for a short period of time. However as the controller will not receive the correct status signals, both fan fail relays will be activated sequentially and the fans will stop.

For fan units with primary model code of HAT, HBT or HCT, the jumper should be connected across the “T” position:



For fan units with primary model code of HDT, the jumper should be connected across the “R” position:



## Fan Relays

The controller incorporates 4 status relays (Fan 1 Run, Fan 1 Fail, Fan 2 Run, Fan 2 Fail). A red LED adjacent to each individual relay will illuminate when that particular relay is energised.

The fan fail relays will energise when:

- For tachometer output fans – when the fan tachometer output falls below 200rpm
- For relay output fans – when the fan alarm internal contact is open

To reset any alarm/failure indication that may have occurred, it is necessary to remove the mains power from the board.

## Remote Indication Panel (optional)

If using the optional remote indication panel, this should be connected according to the wiring diagram. The length of any interconnecting cabling should not exceed 50m, and should not be run in the same conduit/trunking as any mains power cables.

The panel contains a sounder which will become audible when either fan fail relay is activated. The sounder can be silenced by pressing the mute button on the remote display, however the alarm will only be fully cleared once the fault has been removed and the power to the unit has been re-set.

## APPENDIX 3 - Declaration of Conformity

## EC Declaration of Conformity

**Declaration No: EVO3-01**

**We, the undersigned:**

Calce Acoustic Air Movement Ltd  
3 Winnersh Fields, Gazelle Close  
Winnersh, Berkshire RG41 5QS  
United Kingdom

**declare, under our sole responsibility, that the following apparatus:**

Product description: Fan Unit  
Model/type: HA1, HA2, HA3, HAT, HB1, HB2, HBT, HC1, HC2, HCT, HD1, HD2, HDT  
Brand name: EVO3

**is in conformity with the following relevant EC legislation (directives):**

EMC Directive 2004/108/EC  
Machinery Directive 2006/42/EC  
RoHS Directive 2011/65/EU

**based on the following harmonised standards:**

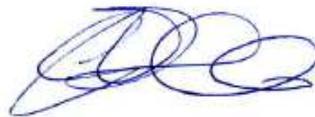
EN55014-1:2006 +A1:2009  
EN55014-2:1997 +A1:2001 +A2:2008  
BS EN ISO 12100:2010

**and therefore complies with the essential requirements of those directives.**

**Additional information:**

For indoor use only where dry conditions can be guaranteed  
For ambient operating temperature range of 0°C – 40 °C  
For connection to air distribution ductwork  
Not for installation at altitudes exceeding 500m above sea level

**Signature:**



Name: F Zeolla  
Position: Technical Director  
Date of issue: 24-01-2014



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