Martin Lishman

Barn Owl Fan Controller

Installation and Operating Instructions

IMPORTANT! READ THESE INSTRUCTIONS BEFORE USE

Static Installation Components

If you have purchased a controller for permanent static installation in the store, you should receive the following components:

Barn Owl Controller with power supply lead fitted with 13A plug and control output lead fitted with connector

Combined Air temperature and humidity sensor and 10m extension lead.

2m rigid crop temperature sensor with 20m extension lead (Two supplied with Dual unit)

Additional or alternative components that may be included if you have ordered them:

- **Automatic fan start-er/thermal overload unit (for the first fan)**
- **Automatic starter with time delay and connecting lead (one for each fan after the first one)**

Important: **Check to ensure that each fan starter is of the correct phase and overload range for the fans being controlled**

Alternatives: Crop sensors - 3m rigid or flexible cable (at specified length)
Sensor extension leads - 30m or longer (as specified)

Portable Board-Mounted Components

If you have purchased a portable board-mounted controller, you should receive the following components:

Board Mounted Barn Owl Controller with power supply plug and socket set and output plugs and sockets for up to 4 fans

Important: **Check to ensure the input and output sockets are of the correct phase for the fans being controlled**

Combined Air temperature and humidity sensor and 10m extension lead.

2m rigid crop temperature sensor with 20m extension lead (Two supplied with Dual unit)

Additional or alternative components that may be included if you have ordered them:

- **Crop sensors - 3m rigid or flexible cable (at specified length)**
- **Sensor extension leads - 30m or longer (as specified)**

Introduction

The Barn Owl Fan Controller assists with crop temperature and moisture reduction during ventilation of stored crops. It can work with a range of fan sizes in different storage applications. It operates by measuring the temperature and humidity of the air and the temperature of the crop and turning fans on or off according to pre-set or user-set cooling or drying programs. The programs use the measured temperature and humidity levels to ensure that the fans only turn on when air is available that is likely to benefit the stored crop by cooling or drying it according to the chosen program.

There is an override for manual fan operation. The Barn Owl controller can operate more than one fan. The first fan is operated using a fan starter. Additional fans are operated using a starter with a timer delay.

The Barn Owl Controller also acts as a crop store monitoring device, with alternating crop temperature and air temperature and air humidity displayed on the unit.

The Barn Owl Controller can also be purchased as a Dual controller which allows the temperature to be controlled independently in 2 separate zones. This includes an additional crop sensor and 20m extension lead as standard.

The Equipment

Static Unit

The basic static unit comprises the controller, combined air temperature and humidity sensor with 10m extension cable and a 2m rigid crop sensor with 20m extension cable. Fan starter/contactor units may also be supplied (see pictures above).

Portable Board-Mounted Unit

The basic board unit comprises the controller, combined air temperature and humidity sensor with 10m extension cable and 2m rigid crop sensor, with 20m extension cable. Up to 4 fan starter/contactor units to suit either 1 phase or 3 phase supply are fitted to the board. Each controller has an input connector complete with plug supplied, normally of 32Amp rating, and each starter has its own output connector of 16Amp rating complete with plug.

***Important:** Do not attempt to open the container that houses the digital humidity sensor. There are no user serviceable components inside this unit. If this unit is opened there is a very high risk that the sensor will be permanently damaged. The unit warranty will be void if the container housing is opened.*

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Barn Owl Controller Instructions

Installation

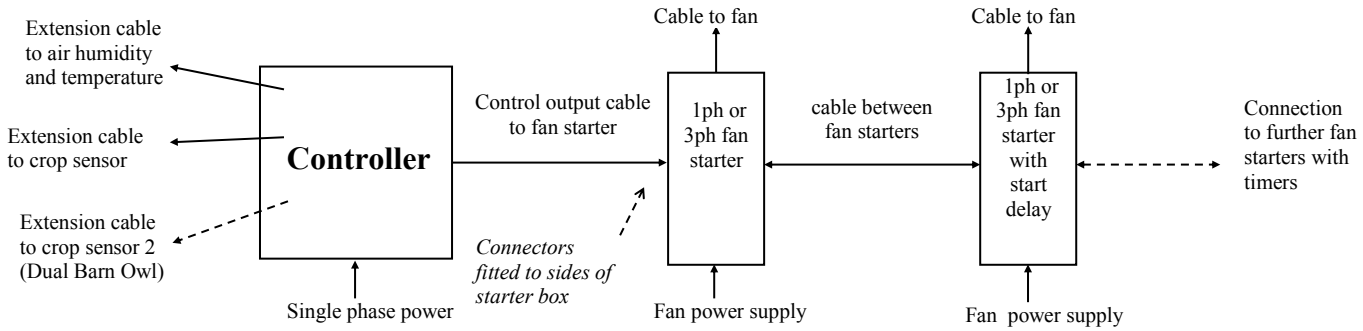
Important:

- **This unit must be installed in compliance with the 17th IEE regulations.**
- **It is the purchaser's responsibility to ensure that there is an adequately rated power supply to the controller and suitable electrical connections available on site.**
- **It is the user's responsibility to ensure that all appropriate safety precautions are followed during the installation and use of the controller.**
- **A qualified electrician must install and check the controller and fan starters before use.**
- **The power supply to the fan(s) and to the controller must be disconnected before any connections or alterations are made.**
- **Appropriate safety signs should be fixed onto each fan being controlled. For example: "Warning. Automatic Control. Motor may start unexpectedly. Disconnect power supply before working on any part of the system."**
- **The Electricity at Work Regulations 1989 require that any electrical equipment that has the potential to cause injury is maintained in a safe condition.**
- ***Please Note: This unit has an IP rating of 44 and is unsuitable for installation outdoors.***

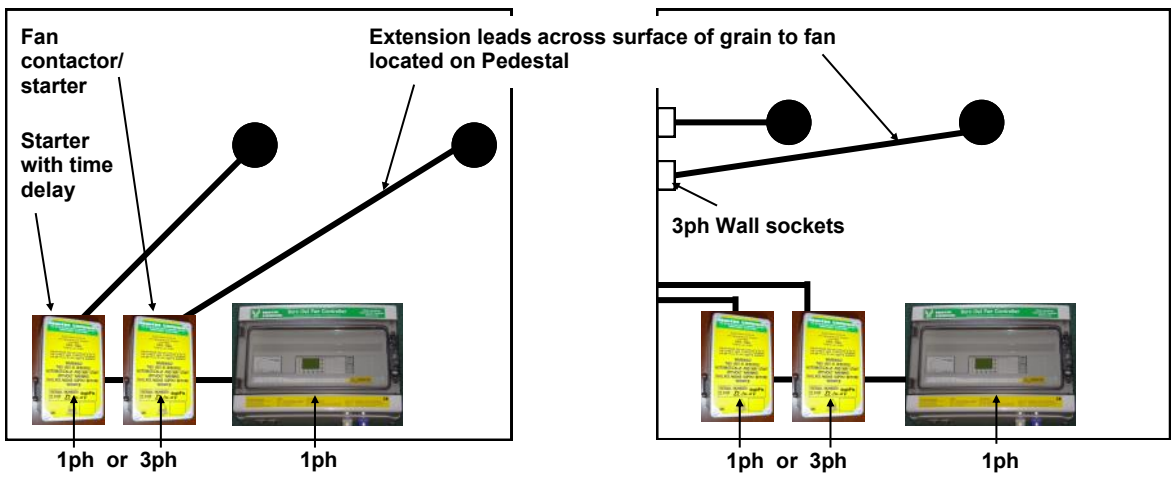
Electrical Installation of Static Unit

- Wall mounting points are located inside each starter and the controller enclosure.
- The static Barn Owl controller requires a single phase 13 amp mains power supply to operate.
- Connect the power supply to each fan starter and fan as per the diagram inside the starter enclosure. An earth and neutral connection is provided inside the single phase unit; an earth connection is provided inside the three phase unit. All entry points to the unit must be made in accordance with the regulations, using appropriate glands.
- Before connecting any power supply, ensure the overload in each starter has been set to the correct rating for the fan.
- Locate the controller output lead into the left hand side socket of the first starter. Use the connector leads supplied to link the additional starters for each fan after the first one.
- After testing switch the controller to manual and ensure the fan impellers are spinning anti-clockwise when viewed from above.

The basic configuration of the installation of the Barn Owl controller and the fan starters is as follows:



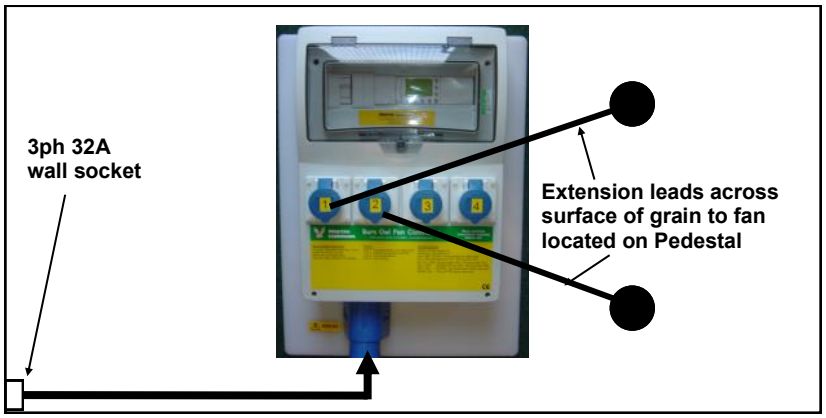
The actual location and arrangement of the components will depend on the existing electrical set-up in the building, and should be agreed between the purchaser and an electrician. Some typical arrangements are as follows:



Electrical Installation of Portable Board-Mounted Unit

- Position the unit where desired
- Connect the unit to a suitable power supply using the plug supplied and suitable cable.
- Connect the fans to the plugs supplied using suitable cable.
- Plug the fans into the sockets on the board.
- Before connecting any power supply, ensure the overload in each starter is set to the correct rating for the fan.
- After testing switch the controller to manual and ensure the fan impellers are spinning anti-clockwise when viewed from above.

The typical arrangement after connection is as follows:



Recommended electrical and socket requirements for connection of a board-mounted controller to Pile-Dry Pedestal Fans is as follows:

Product Code	Phase	Fans	Socket
FCBM01	1	1 x F2 (1.1kW) or 1 x F3 (1.5kW)	13A or 16A (blue round pin)
FCBM02	1	2 x F2 (1.1kW)	16A (blue round pin)
		2 x F3 (1.5kW)	32A (blue round pin)
FCBM03	1	3 x F2 (1.1kW) or 3 x F3 (1.5kW)	32A (blue round pin)
FCBM04	1	4 x F2 (1.1kW)	32A (blue round pin) (not suitable for four F3 1ph fans)
FCBM301	3	1 x F2 (1.1kW) or 1 x F3 (2.2kW)	16A (red round 5 pin)
FCBM302	3	2 x F2 (1.1kW) or 2 x F3 (2.2kW)	16A (red round 5 pin)
FCBM303	3	3 x F2 (1.1kW) or 3 x F3 (2.2kW)	16A (red round 5 pin)
FCBM304	3	4 x F2 (1.1kW)	16A (red round 5 pin)
		4 x F3 (2.2kW)	32A (red round 5 pin)

Please ensure that all power supplies are correctly fused for your system

Installation of sensors for static and portable units

- Position the combined air humidity and temperature sensor out of the wet and away from direct sunlight. The sensor must be under cover in a position where it can receive average ventilation. This means not too close to ventilation fans or high velocity airstreams from the exterior of the crop store or fan house, so that the air temperature and humidity measured is representative of the air being used to ventilate the crop.
- Using the 10m extension cable supplied, plug the combined humidity and air temperature sensor into the Barn Owl Controller where indicated.
- Place the crop sensor in a position in the crop that is likely to receive average ventilation. This means pushing it vertically into grain, as far as it will go, approximately midway between ventilation columns or ducts, so that the grain temperature measured is representative of the bulk being ventilated.
- Using the 20m extension cable supplied, plug the crop temperature sensor into the Barn Owl Controller where indicated.
- If a Dual Barn Owl system is being used repeat the process above with the second crop sensor located in the second crop zone.

Storage of the Barn Owl controller

The unit should be stored in a dry warm place when not in use and the humidity bulb should be covered. This ensures the bulb does not get saturated or blocked and cuts down on acclimatisation time when it is reused.

Using the Barn Owl Controller

Barn Owl Standard (single zone type)
When the Barn Owl Controller is switched on the display will show the current operating mode at the top of the display.
The second line of the display shows the ambient air temperature and relative humidity.
The third line shows crop temperature only.
In the event of a humidity sensor reading below 10% or a temperature reading below –10°C, an error is shown on the bottom line of the display and the fan is stopped. This is in case of damage to sensors or cabling.

Select the required operating mode using the [<] and [>] buttons.
The operating modes are as follows:

Always off	No Fans will start
Always on	All Fans will start
Cool, diff=	Cooling Mode using temperature differential - runs fans when air temperature is below crop temperature by the set difference (default 5 degrees)
Dry <16%	Drying Mode - dries grain below 16%, using air with a humidity of less than 62%
Dry 16-18%	Drying Mode - dries grain below 18%, using air with a humidity of less than 72%
Dry >18%	Drying Mode - dries grain down to 18%, using air with a humidity of less than 82%
AirT<sp	Fans run when the air temperature is below the set point entered by the user
AirRH<sp	Fans run when the air relative humidity is below the set point entered by the user

In Always On mode the fans are delayed by 30 seconds before starting.
In other modes the fans are delayed by 20 minutes (default setting) before starting.
This is essential to prevent the fans turning on and off too frequently and is indicated by a “Wait” message on the bottom line of the display, followed by the minutes remaining to fans turning on.
Pressing OK will show the total lifetime fan running hours since the controller was purchased.

Changing the operating mode settings.
To change a setting first select the operating mode required on the controller (see above).
The relevant setting for that mode can then be changed by holding [ESC] and pressing [+] or [-].
The set difference is then shown at the bottom of the screen.
Once set, return to operating mode required.

Mode	Setting	Range of values	Default value
Always off	Fan Start delay	2-20 minutes	20 minutes
Cooling mode	Temperature differential	0-20°C	5.0°C
Drying modes	Maximum operating RH	20-99%	99%
Air T <set point	Temperature set point	0-40°C	0°C
Air RH<set point	Relative Humidity set point	0-99%	0%

Barn Owl Dual (two zone type)
The dual type controller can individually control two separate zones in the store.
Both zones use the same combined air humidity and temp sensor.
Zone A crop sensor controls output to fan A.
Zone B crop sensor controls output to fan B.
To cycle between zone A and zone B operating modes use the [▲] and [▼] buttons.

Warranty
The Barn Owl Controller is guaranteed for 12 months from the date of purchase against any defect or malfunction caused by faulty parts or workmanship. To claim under warranty, the complete unit or part should be returned, at the claimant’s expense, to Martin Lishman Ltd with a written explanation of the problem. Should there prove to be a defect or malfunction caused by faulty parts or workmanship, it will be repaired or replaced and returned to the claimant without charge. If a warranty claim is rejected, the cost of replacement or repair will be notified to the claimant before any work is carried out.
Any warranty claim will automatically be invalidated if the unit has been modified or internally tampered with in any way. The manufacturers will not cover under warranty damage or faults occurring to the unit which have been caused by inappropriate use or by use not in accordance with the installation and operating instructions for the unit or the fan being used with the unit.
It is the responsibility of the user to ensure that all electrical equipment has been installed in accordance with the relevant regulations, that all appropriate safety checks have been carried out before use and that regular on-going maintenance and safety checks are undertaken.
Under no circumstances will Martin Lishman Ltd re-imburse any costs associated with a warranty claim if these costs have been incurred without agreement in advance.
Under the terms of warranty for the unit under no circumstances will liability exceed the cost of replacement or repair. The manufacturers and Martin Lishman Ltd will not be liable for any consequential or indirect loss suffered by purchasers or users of the unit, whether this loss arises from correct or incorrect use, defect or malfunction caused by faulty parts or workmanship or in any other way. Non-exhaustive illustrations of consequential or indirect loss are loss of profits, loss of contracts and damage to property.