ENERGY SAVING CONTROLS

THE MOST FLEXIBLE ENERGY SAVING VENTILATION CONTROL SYSTEM ON THE MARKET WITH FULL BMS INTERFACE.

Touch screen user control.

ES-PIR2 sensor.

ES-CO2RM.

ecosmart

BENEFITS

SIMPLE TO INSTALL

All controls are pre-assembled, configured and installed directly into the fan or air handling unit, this includes 3-port motorised valves and actuators, pipework, off coil thermostats and sensors, frost protection, etc. Site time kept to a minimum, quality and efficiency maintained.

SIMPLER SYSTEMS

No need for main VCD, no wasted energy or noise generation because the air volume can be precisely set via the integrated speed control, minimum and maximum speeds easily adjusted via Ecosmart commissioning panel.

SIMPLE, PRECISE COMMISSIONING

As recommended in Part L, Ecosmart enables the system to be accurately commissioned via an integrated speed control, minimum and maximum speeds easily adjusted via commissioning panel integral to the control.

QUIETER SYSTEMS

With Ecosmart your system is only at maximum design duty when absolutely necessary. The noise levels within your systems are lower because the fans or air handling units are rarely at full speed.

IMPROVED LIFECYCLE

Ecosmart enables the fan or air handling unit to be run at lower speeds. This reduces the maximum load and wear and therefore increases the overall working life of the units.

DEMAND VENTILATION

Only ventilates the area when you want it to - why fully ventilate a room when it's not occupied - maximum savings possible achieved.

HEALTHY ATMOSPHERE

Ecosmart has a trickle function as standard which when activated, via a simple switch, enables you to set a background ventilation rate, keeping the rooms fresh when unoccupied, whilst still saving energy. System will boost or ramp to maximum design duty when triggered by an Ecosmart or other external device.

PLUG IN CONTROLS

Simple low voltage sensors complete with pre-plugged cable means that any control function is easily achieved. You decide which conditions to monitor and the system will operate at the optimum speed.

BMS INTERFACE

Integrated BMS features enable any central system to control and monitor the fan or air handling unit via 0-10V signal. This enables full speed control and heating or cooling enable if installed and volt free status indication as standard.
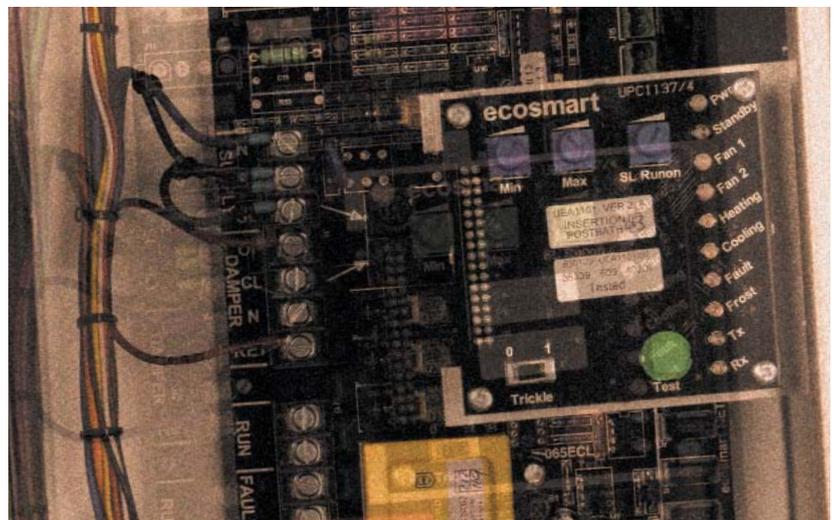
PEACE OF MIND

Ecosmart has a 5 year warranty. 1st year Parts and Labour with remaining years parts only.
For further details contact Nuaire.

PLUG IN SYSTEM
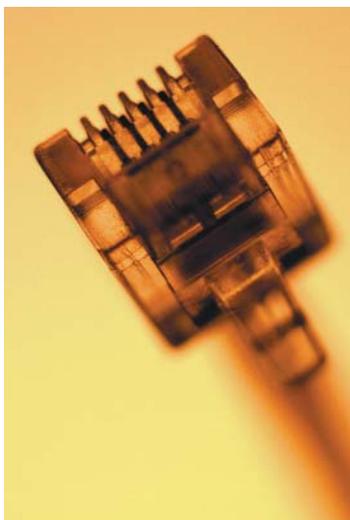
ECOSMART CONTROL EXAMPLE

ECOSMART INCLUDES A WIDE RANGE OF OPTIONS

Simple SELV wired, plug-in 'enablers' start and stop the fan, when activated from either start-up or trickle ventilation mode. These 'enablers' include time clocks, infra-red detectors, switch live contacts, humidistats, thermostats and BMS contacts.

All systems must include at least one enabler. (NB. When used, BMS control and time clocks take over all other enablers).

Integrated speed control (inverter or electronic) is included with all Ecosmart controlled fans and air handlers. ES-ISC are external to some fans and need to be hard wired eg. SQF, Airmover.

Once the fan is activated the sensor takes over. They will maintain comfort/ design conditions by automatically adjusting fan speed up and down and power or flows through elements or heating/ cooling coils. The sensors include temperature, relative humidity, CO2 or as determined by the BMS.

Stylish and simple to operate user control facilitates manual operation where desired.

BMS
0-10V dc signal to activate the system and modulate fan speed. Select/Deselect H&C.
Note: this will override any other devices (eg. ES-UCF) fitted (except in Constant Pressure fans).

ECOSMART ENABLERS & DETECTORS

Simple Plug-in System

ES-PIR2 (Passive Infra-Red)
Detects movement and activates system. Incorporates a system status LED, overrun timer and timer adjustment.

ES-LCD
Touch screen user control in white incorporating time clock facility. This can control the function of the fan by manual setting or using a set of timed programs.

ES-HUMIDISTAT2
Activates the system when the RH level is above set point. Incorporates two system status LEDs (Green = OK, Red = Failure) and RH set point level adjustment.

ES-THERMOSTAT2
Activates the system when the temperature is above set point. Incorporates two system status LEDs (Green = OK, Red = Failure) and temperature set point level adjustment.

ES-AVI2
When fan failure occurs the AVI will flash a warning. Supplied with pre-plugged 10m length of communication cable.

ES-CO2RM
ES-CO2RMPP
Surface mounted room carbon dioxide (CO_2) sensors which incorporate a temperature sensor. RM = SELV option, RMPP complete with SELV AC powers supply.

ES-HTCSIG
Signal conditioning circuit for humidity, temperature and CO2 sensors.

ECOSMART SPEED CONTROLLING SENSORS

ES-TEMP2 Temperature Sensor
Modulate fan speed based on room temperature. Incorporates two system status LEDs (Green = OK, Red = Failure) and temperature set point level adjustment.

ES-RH2 Relative Humidity Sensor
Modulate fan speed based on RH level. Incorporates two system status LEDs (Green = OK, Red = Failure) and RH set point level adjustment.

ES-UCF Manual user control
Manual 'on' and 'off' system user/speed control. Incorporates two system status LEDs (Green = OK, Red = Failure).

ES-CI Semi-automatic user control
Fan, heating & cooling selected by external volt free switch, speed selected by 0-10V signal.

ES-JB Junction box
Designed to be compatible with Ecosmart System this unit is supplied with a pre-plugged 10 metre length of communications cable and has 8 further ports.

ES-CO2 Sensor
Duct mounted sensor to modulate fan speed based on CO_2 levels. Connect to fan directly. Pre-wired with 2m cable (not adjustable).

Switched Live by others
Any mains voltage signal connected to the switched live terminal (S/L) in the unit. This affects the connected fan only.

ECOSMART, BMS AND COMMISSIONING CONTROL OPTIONS

Nuaire fans and Air Handling Units can be provided with the following pre-selected control options, simply and easily by adding letters to the end of the fan code, there is no need to select or specify the controls individually if one of these options are chosen :

ES Ecosmart controls

The compact Ecosmart control module comes complete with a factory fitted Ecosmart PCB which will control the fan unit within the desired design parameters and provide the interface between all external control devices detailed on these pages.

The Ecosmart control module has the following energy saving components integrally mounted, pre-wired to interface with the purpose made PCB, all components pre-wired, configured and factory fitted by the manufacturer: (Not pre-wired to eg. SQF, Airmover).

- Integral Frequency inverter/speed controller.
- Integral maximum and minimum speed adjustment for commissioning.
- Integral adjustable run on timer.
- Integral BMS interfaces - 0- 10V speed adjustment.
- Integral BMS interfaces - Volt free failure and status indication.
- Integral background ventilation switch (trickle switch).
- Multiple IDC sockets for interconnection of sensors or fans using pre-plugged 4-core low voltage cable.
- Pre-programmed with soft start function

Ecosmart Control Device

240V 1 ph 50Hz

Switch live signal 100-230V
Damper Open 230V 1A
Close 230V 1A
Neutral
Return 230V signal

Contacts Volt Free
Run & Fail

0V = No BMS
0.25V = Off or Trickle
0.5V = Speed 1
0.75V = Speed 1 & Cooling
1V = Speed 1 & Heating
Heat & cool signal via NET to ES-VF

Important: The Fan will not control external Heating/cooling equipment, will only provide ON/OFF Signal

*Not included as standard.

SET UP/COMMISSIONING BOX

MIN = Minimum speed adjustment

MAX = Maximum speed adjustment

SL Run on = Switched Live Run-On Timer adjustment

TRICKLE = Selects trickle running: 0 = off, 1 = selected

TEST = Test button

The Ecosmart control module has the following two options fitted as standard.
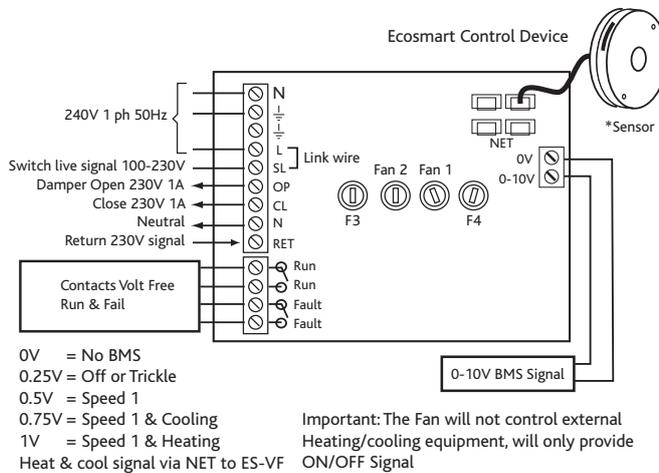
BMS interfaces

The Ecosmart control module can be pre-configured to provide the following integrated BMS interfaces.

- 0 - 10 volt input to provide a full BMS interface. This will enable the following functions:-
  Switch the unit ON/OFF.
  Switch heating or cooling ON/OFF (AHUS with relevant coils).
  Switch from low speed to high speed - variable.
  Switch from low speed to high speed - trickle and boost principle.
  Full speed control facility.

- 2 No. Volt free contacts to provide fan run and failure indication to provide system status.

- An integrated commissioning/speed control to accurately commission the system, with minimum and maximum speeds easily adjusted via a miniature dial, as recommended in Part L. This will enable the unit to be configured to run between set parameters thus saving motor power and limiting noise.

- Pre-programmed with soft start function.

COMMISSIONING SET UP

The Ecosmart control module can be pre-configured to provide the following integrated commissioning features only.

- Integrated commissioning/speed control to accurately commission the system, as recommended in Part L, This will enable the unit to be configured to run between set parameters thus saving motor power and limiting noise.

- Minimum and max speeds easily adjusted via miniature dial. The commissioning set up facility directly controls the integrated speed control/frequency inverter.

- Pre-programmed with soft start function
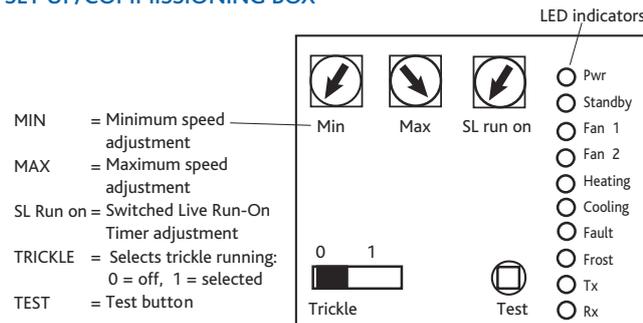
ENABLING SENSOR

ES-PIR2 Sensor

The sensor operates with Safe Extra Low Voltage (SELV) with power supplied from the fan unit via the communications cable. The ES-PIR sensor will activate the system when movement is detected. An adjustable 1-60 minute timer is incorporated to provide a run on facility. Up to 10m directly in front of lens and up to 2m at 40° to the lens axis.

When adjustments are made to the sensor, the LED light on the sensor front will flash on and off to show the set point. First, green flashes will indicate the set point in TENS, then red flashes will indicate UNITS. For example 1 green flash and 5 red flashes show you that the PIR timer is set to fifteen minutes.

ES-Thermostat2

The ES-Thermostat will enable the fan when the ambient temperature is 1°C above the set point and will stop the fan when the temperature is at or below set point. The sensor operates with Safe Extra Low Voltage (SELV) with power supplied from the fan unit via the communications cable. Adjusting the sensor set points. Adjustable temperature setting 10 - 35°C.

After adjustments are made to the sensor, the LED light on the sensor front will flash on and off to show the set point. First, green flashes will indicate the set point in TENS, then red flashes will indicate UNITS. For example 2 green flashes and 3 red flashes show a temperature set point of 23°C.

ES-Humidistat2

The ES-Humidistat will enable the Ecosmart fan when the measured humidity level is 2% above the set point and will stop the fan when the humidity is at or below set point. The sensor operates with Safe Extra Low Voltage (SELV) with power supplied from the fan unit via the communications cable. Adjusting the sensor set points - Adjustable RH setting 65 - 85%.

After adjustments are made to the sensor, the LED light on the sensor will flash indicating via a small aperture on the side of the sensor the set point. First, green flashes will indicate the set point in TENS, then red flashes will indicate UNITS. For example 7 green flashes and 3 red flashes show a RH set point of 73%.

SPEED CONTROLLING DEVICES

ES-RH2 Humidity Sensor

The ES-RH Sensor will vary the ventilation rate automatically according to the measured humidity. Voltage (SELV) with power supplied from the fan unit via the communications cable. The sensor has an adjustable 65-85% RH set point.

After adjustments are made to the sensor, the LED light on the sensor front will flash on and off to show the set point. First, green flashes will indicate the set point in TENS, then red flashes will indicate UNITS. For example 7 green flashes and 5 red flashes show a set point of 75% RH. **Note: fan speed = 0 (i.e. off) at or below the set point.**

ES-TEMP2

This will modulate fan speed based on room temperature. The sensor operates with Safe Extra Low Voltage (SELV) with power supplied from the fan unit via the communications cable.

After adjustments are made to the sensor, the LED light on the sensor front will flash on and off to show the set point. First, green flashes will indicate the set point in TENS, then red flashes will indicate UNITS. For example 2 green flashes and 3 red flashes show a temperature set point of 23°C. **Note: fan speed = 0 (i.e. off) at or below the set point.**

Example: —19
Set point set to 19°C
Deadband
Room temperature (degree C)
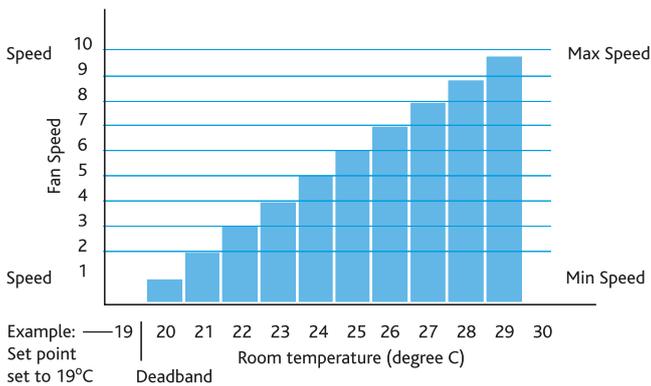
Sensor Response - Normal operation (Proportional band over ten 10°C steps)

When temperature RISES, the fans will increase speed. **(See above)** which shows a set point at 19°C. For single phase fans, the speed steps are approximate and actual running speeds will be dictated by the operating pressure of the system and the type of impeller used in the blower. Fan is switched off at set point unless the trickle switch is selected.

ES-CO2 Carbon Dioxide Sensor - Operation

The CO_2 Sensor will adjust the fan speed in response to the CO_2 concentration in the airflow. The fan speed is divided into 10 steps from minimum (step 1) to maximum (step 10). See table below for response details.

| Speed	1	2	3	4	5	6	7	8	9	10
CO_2 PPM	502	580	659	737	834	902	980	1059	1137	1215

ES-LCD (Time clock included)

The ES-LCD Time clock will switch the system on and off at pre-determined times set by the user. This digital time clock will override the user control for effective on/off operation or any other enabling device eg. PIR. The time clock operates on Safe Extra Low Voltage and is powered from the fan control module. The connection is made into any 'NET' socket on the fans integral control module. See I&M for further details.
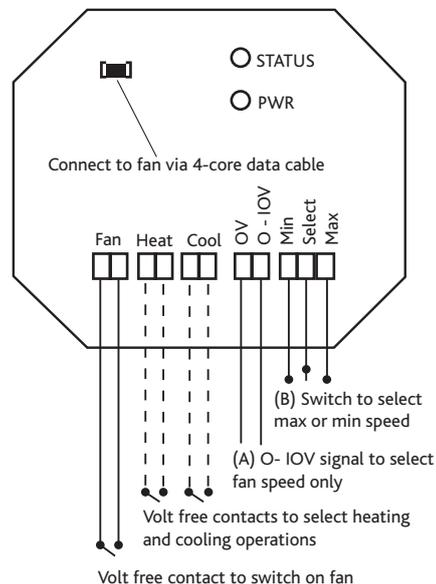

ES-LCD includes:

Ventilation, Automatic Heating & Cooling Enable/Disable. Temperature is set at main control of unit.
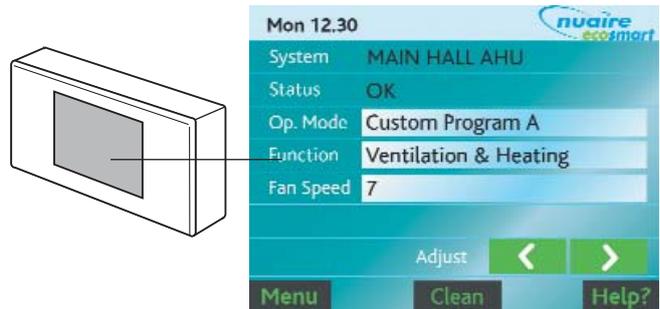
ES-CI (Ecosmart control interface)

Enables any Ecosmart unit to be controlled via any remote non Ecosmart switching device or item of plant.

ES-CO2RM AND ES-CO2RMPP CO_2 SENSOR

ES-CO2RM

CO_2 and temperature sensor requires SELV power supply by other.

ES-CO2RMPP

CO_2 and temperature sensor supplied with SELV AC power supply.

The sensor will monitor the carbon dioxide (CO_2) and temperature (see note 1) within the room. If either reading reaches the low threshold values (i.e. C1 & T1) see opposite, then a signal will be sent to start running the fan at minimum speed.

As the room CO_2 and temperature rises, the fan speed will progressively increase in steps until the upper threshold values are reached. When both CO_2 and temperature readings are in operation, whichever reading that results in higher fan speed will be used by the fan unit.

The threshold values and other operations can be adjusted by setting DIL switches on the PCB to different positions.

Note 1: As supplied; the default operation of the sensor will be based on carbon dioxide reading. If operation with both carbon dioxide and temperature is desirable then change position of switch 7 to 'ON'.

Note 2: use switch 8 to change the off state (see table opposite).

TEMPERATURE THRESHOLD SWITCHES 1-9

Switch settings	3	2	1	Threshold temperatures	
				T1 (°C)	T2 (°C)
	Off	Off	Off	25	28
	Off	Off	On	24	28
	Off	On	Off	23	28
	Off	On	On	22	28
	On	Off	Off	25	30
	On	Off	On	24	30
	On	On	Off	23	30
	On	On	On	22	30

The lower and upper threshold values can be adjusted as shown in the following tables below and overleaf.
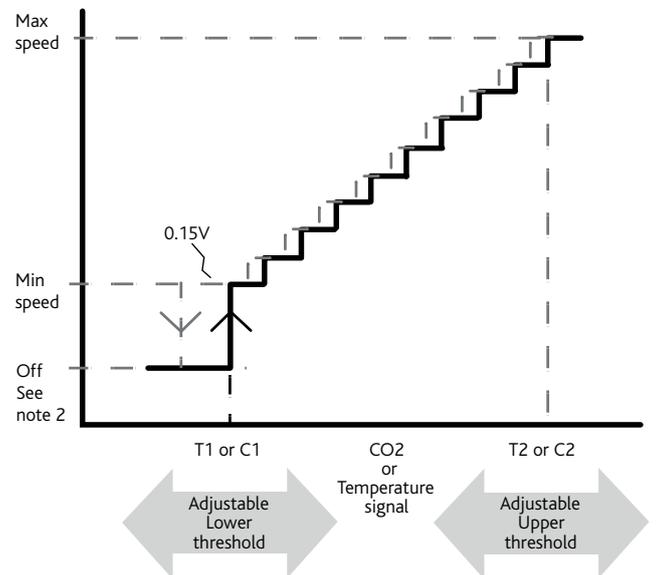
Note: Default operation is CO_2 only. To select temperature option as well please refer to I&M.

CONTROL CHECKLIST - WHAT'S INCLUDED

The controls indicated in the checklist are incorporated in the units as standard, enabling you to co-ordinate your controls to avoid duplication and reduce costs.

Please refer to this when checking the controls specification.

www.nuairegroup.com/specifications

Fan Code	Fan Type	BMS compatible	Commissioning control	Run/Fail signal (volt free)	Inverter control (3 phase)	Speed control (single phase)	Pre-piped coil (c/w DRV)	Motorised control valve (c/w actuator)	Air off Temp stat	Frost protection	Heat dissipation run on	Plug in sensors (see overleaf)	Trickle and Boost switch	Automatic Bypass
Ecosmart Boxer LPHW	Air Handling	●	●	●	●	●			●	●	●	●	●	
Ecosmart Boxer Electric	Air Handling	●	●	●	●	●			●			●	●	
Ecosmart Squrbo	Supply Unit	●	●	●		●	●	●	●	●	●	●	●	
Ecosmart Squrbo Extract	Inline Single fan	●	●	●		●						●	●	
Quietscroll EST	Twin Fan	●	●	●	●	●						●	●	
Constant Pressure	Twin/Single Fan	●	●	●	●							●	●	
Extractor ESX	Inline Single fan	●	●	●								●	●	
Ecosmart Airmover ESAM*	Inline Single fan	●	●	●	●	●						●	●	
Ecosmart Squif*	Inline Single fan**	●	●	●	●	●						●	●	
Ecosmart Twin Squif*	Inline Twin fan**	●	●	●	●	●						●	●	
Ecosmart Axus*	Inline Single fan	●	●	●	●	●						●	●	
XBOXER Plate heat exchanger	Heat Recovery	●	●	●	●	●	●	●	●	●	●	●	●	●
XBOXER Thermal wheel (size 4 to 6)	Heat Recovery	●	●	●	●	●	****	****	●	●	●	●	●	●
XBOXER Thermal wheel (size 1 to 3)	Heat Recovery	●	●	●	●	●	●	●	●	●	●	●	●	●
XBOXER Run around coil	Heat Recovery	●	●	●	●	●	●	●	●	●	●	●	●	●
ES-OPUS (Not compatible with ES-LCD)	Inline/surface/recessed	●	●	●		●						●	●	

*   ESAM, Squif, Twin Squif and Axus have a separate Ecosmart control pack that needs to be hard wired.
**   Motor out of airstream.
***   Does not apply to 'NC' (no control) XBOXER units.
**** Supplied by others.

Ecosmart fans and Air Handling Units are pre-programmed and use simple plug and go control interfaces reducing the need for complicated controls.

Ecosmart enables multiple fans to be interconnected & controlled by the same sensors.

Fully BMS compatible using 0-10V interfaces and volt free contacts, simplifying all your control requirements.

Ecosmart ES-OPUS. For units with heating/cooling coils provided with Ecosmart control. An enable signal needs to be provided for heating/cooling to operate ie. ES-LCD, BMS 0-10V and ES-CI.

ES-ISC ECOSMART INVERTER SPEED CONTROL

DIMENSIONS
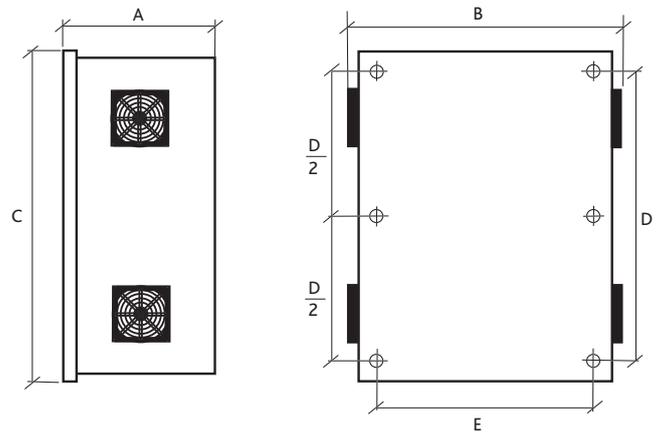
The Ecosmart Energy Saving Speed Control is designed to control selected Nuaire fans and to match the range of integrated Ecosmart control systems. The control is only available for three phase electrical supply.

The case material is of Aluzinc corrosion resistant steel, incorporates a frequency inverter, Ecosmart control board and is directly compatible with the Ecosmart range of user controls, time clocks, 'stats and sensors.

Internal mounting

Please note:

- Select a control by matching the unit full load current with the control code i.e. control code ES-ISC3.3A is suitable for a fan with a maximum full load current of 3.3A. The Inverter overload is pre-set at the rating plate value, if a lower setting is required fit an appropriately sized overload relay or adjust inverter settings.

- The mains power supply to the controller must be appropriately sized and installed via a local isolation switch (by others).
  The isolator must also accommodate the 230V switched live (if used). The mains supply from the Ecosmart controller to the fan must be appropriately sized, not exceeding 30 metres and must be a screened power cable, earthed at both ends.
  A four point glanding plate is formed from the base of the control and in order to main EMC compliance, EMC glanding kit is supplied.

- Not suitable for contra rotating/run and standby axial units. (Requires 2 inverters - 1 for each fan).

- All integrated sensors plug directly into the control panel.

- Refer to product datasheet No. 671432 for further information.

DIMENSIONS (mm) & WEIGHTS

Fan code	A	B	C	Weight Kg	Drill D mm	Pattern E mm
ES-ISC1.2A	230	325	410	6	340	298
ES-ISC2.4A	230	325	410	6	340	298
ES-ISC3.3A	230	325	410	6	340	298
ES-ISC4.1A	230	325	410	6	340	298
ES-ISC5.6A	290	390	455	14	470	373
ES-ISC7.3A	290	390	455	14	470	373
ES-ISC8.8A	290	390	455	14	470	373
ES-ISC12.5A	290	390	455	20	470	373
ES-ISC15.6A	290	390	455	20	470	373
ES-ISC23.1A	290	390	455	20	470	373
ES-ISC38.0A	355	525	805	40	710	510

Code descriptions

ES - ISC 2.4A
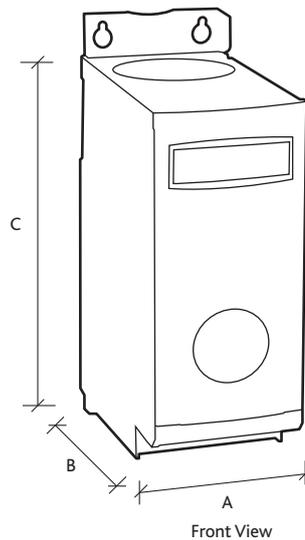
| | | |
| 1 | 2 | 3 |

1. ES = Ecosmart
2. Inverter Speed Control
3. Output Current Rating

INVERTER SPEED CONTROL

DIMENSIONS (MM)

Front View

These are a range of frequency inverters for controlling the speed of 3 phase AC motors. Standard range are 400V 3 phase input units covering motor rating from 0.75kW to kW. Higher ratings and single phase input models are available upon request.

The inverters are microprocessor controlled and use state of the art Insulated Gate Bipolar Transistor (IGBT) technology. This makes them reliable and versatile. A special pulse-width modulation method with selectable pulse frequency permits quiet motor operation.

Comprehensive protective functions provide excellent inverter and motor protection.

The inverters default factory settings, is ideal for a large range of simple motor control applications. The inverters can also be used for more advanced motor control applications via its comprehensive parameter lists. The inverters can be used in both 'stand alone' applications as well as being integrated into 'Automation systems'.

Fan code	Motor Kw	A	B	C	Weight Kg
3ISC1.2A	0.37	70	142	280	1.5
3ISC1.9A	0.35	70	142	280	1.5
3ISC2.4A	0.75	70	142	280	1.7
3ISC3.3A	1.1	70	142	280	1.7
3ISC4.1A	1.5	70	142	280	1.7
3ISC5.6A	2.2	70	142	280	1.7
3ISC7.3A	3	70	142	280	1.7
3ISC8.8A	4	70	142	280	1.7
3ISC12.5A	5.5	169	177	299	3.5
3ISC15.6A	7.5	169	177	299	3.5
3ISC23.1A	11	169	177	299	3.5
3ISC31.0A	15	260	177	320	5
3ISC38.0A	18.5	260	177	320	5
3ISC44.0A	22	260	177	320	5
3ISC59.0A	30	260	177	320	24
3ISC72.0A	37	260	177	320	24
3ISC87.0A	45	260	177	320	24

Code descriptions

3 ISC 1.2A
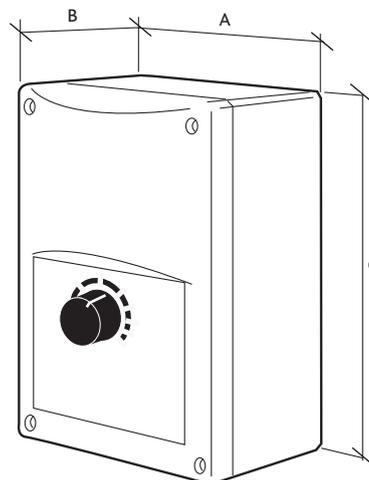
| | | |
1   2   3

1. 3 Phase supply
2. Inverter Speed Control
3. Output Current Rating

nuaire

ELECTRONIC SPEED CONTROL

DIMENSIONS

The electronic speed controllers provide infinitely variable speed control from preset minimum to maximum. All models feature a boost start function, which applies maximum power to the motor for 10 seconds to prevent motor stalling before returning to selected speed.

Wiring to the motor can be either 2-wires or 3-wires control depending on the motor design.

The enclosures for NSC1-3A and NSC1-6A are rated to IP45 with the NSC1-10A rated at IP54. All controllers meet LVD and EMC directives for safety and electromagnetic compatibility.

DIMENSIONS (mm) & WEIGHTS

Dimensions (mm)

Unit Code	A	B	C	Weight kg
NSC1-3A	83	88	180	0.5
NSC1-6A	115	95	195	0.7
NSC1-10A	115	95	195	0.7

Note: Dimension B includes the dial on the front of the unit.
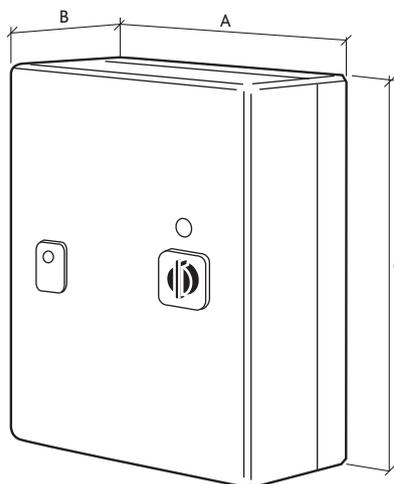
Code descriptions

NSC1 - 3A

| |
1   2

1. Electronic Control Range Code, Single phase
2. Current Rating

SPCON AUTO TRANSFORMER SPEED CONTROL

DIMENSIONS

The SPCON transformer speed controllers provide either 3-step or 5-step speed control depending on the model.

Auto-transformers having class 'F' insulation are used to provide discrete voltage steps.

The 3-step models feature a power indicator, an on/off switch and a separate 3-position rocker switch as speed selector. On the 5-step models, a single rotary switch provides the on/off and speed selection function.

All models are fitted with suitable fuses for short circuit protection. The controller casing is manufactured from plastic pre-coated stell or impact resistant polycarbonate.

All models are suitable for indoor installation only. All controllers meet LVD and EMC directives for safety and electromagnetic compatibility.

Transformer speed controls produce a pure sine wave output resulting in quiet motor operation. Transformer controls are therefore preferred for noise sensitive applications.

DIMENSIONS (mm) & WEIGHTS

Fan code Single Phase	A	B	C	Weight kg
SPCON1.5	115	85	180	1.7
SPCON3.5	200	140	280	3.6
SPCON7.5	200	140	280	6.0

Code descriptions

SP CON 3.5

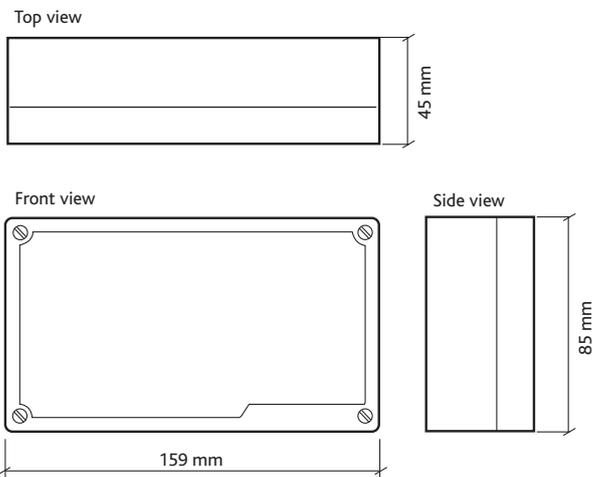|		
1	2	3

1. Single Phase
2. Transformer Speed Control
3. Current Rating

AIREMISER - TEMPERATURE/CURRENT SENSING CONTROL

Nuaire AIREMISER-CM automatic fan controller comprise of a main controller with the optional choice of either or both current and temperature sensors which detects when a cooker or shower is in use. This enables the AIREMISER-CM to automatically turn on an extract fan or boost a central ventilation system.

For electric showers and cookers a current sensor is used to detect the flow of current. For conventional showers (fed from a hot water system) a temperature sensor is used to detect the presence of hot water in the hot water pipe to the shower mixer. Sensors are supplied with a 12 metre cable length as standard.

DIMENSIONS (MM)

Top view

45 mm

Front view

Side view

85 mm

159 mm

Product	Product code	Installation area
Main fan control	Airemiser-CM	Kitchen
Current sensor	Airemiser-CS12	Kitchen/bathroom
Temperature sensor	Airemiser-TS12	Bathroom

Code descriptions

AIREMISER - CM

1. Range Name
2. Control Mains Box

1   2

230 - RTIM RUN ON TIMER

DIMENSIONS (MM)

7 X 25mm dia. cable entry grommets

110

110

25
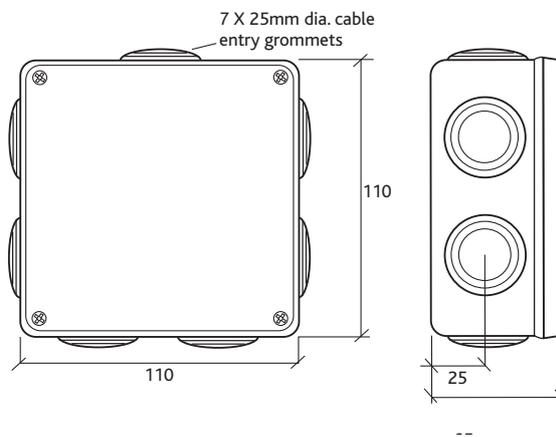
The 230-RTIM run on timer is a low cost unit designed for installation anywhere, and it's simple to install, and use.

The box is manufactured in high impact light grey polypropylene with seven side entry grommets and a base suitable for screw fixing to any flat surface. The timer is easily adjusted to provide between 5 and 30 minutes run on. To adjust the timer, remove the lid (held by four slotted screws) and turn the spindle to suit your run-on requirement.

The 230-RTIM run on timer is easy to wire. Simply pass a permanent 230V 1 phase 'live' and 'neutral' through the SUPPLY MOTOR timer to the fan unit and provide a switched live to operate the timer circuit. Switched live can be from any source eg. light switch, movement sensor etc. When the switched live is 'ON' the timer circuit is energised and the fan runs.
When 'OFF' it provides power to the fan unit for the predetermined 'run on' period and then switches off the fan.

Code descriptions

230 - RTIM

| | |
1 2

1. Voltage Rating
2. Electronic Control Range Code

230 - P.I.R. MOVEMENT DETECTOR

The Passive Infra Red (P.I.R.) movement detector works by detecting the warmth of moving bodies walking through the area.

When the P.I.R. is triggered it will signal the fan or light to run. The 'timer' will run on for the time set. The focusing of the unit is made up of a number of smaller lenses known as facets or zones. Each zone is focussed on a different spot to give a wide area of coverage.

The P.I.R. is triggered when walking from one zone to the next, therefore for optimum detection sensitivity it will operate best when walking across the zone patterns.

360 Degree P.I.R Performance

DIMENSIONS (MM)

86mm square

16mm
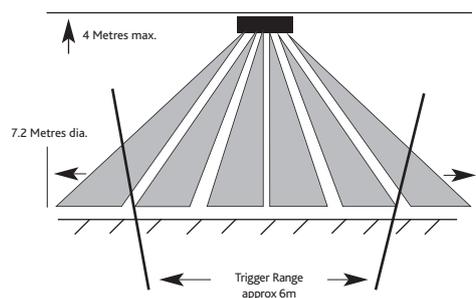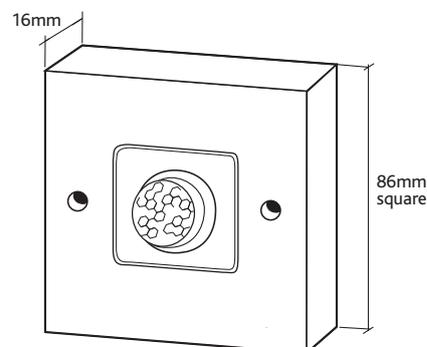
Code descriptions

230 - PIR - NT

| | | |
|1|2|3|

1. Voltage Rating
2. Electronic Control Range Code
3. No timer version (without NT would be with timer)

CARBON DIOXIDE SENSORS (C0$_2$)

Specifications

Current consumption	Typically 10mA plus pulses of 0.3A for) .3s (every 15s)
Warm up time	5 minutes
Sensing range	0-2000ppm CO_2 and 0-50°C
Output	0-10V dc proportional output maximum load
Installed environment	0-50°C and up to 90% RH non-condensing adjacent to fan
Maintenance	Does not require routine 6 monthly intervals
Availability	Next day
Warranty	3 years

DIMENSIONS (MM)

26mm

100mm

85mm
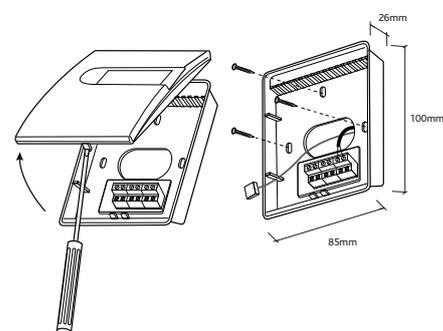
Code descriptions

CO2RM

SELV power supply (by others) must have output of 24V ac (+/-20%) or 15-35V dc.

CO2RMPP

Mains supply to power must be 230V 1-50Hz.