Information Update

PVCTI21 - Issue 1 - August 2018

Email: projects@passivent.com
Web: www.passivent.com
Tel: +44 (0)1732 850770

iC8000 CONTROLLER SPECIFICATION DOCUMENT

Product Specification:

The *i*C8000 is Passivent's top of the range control system for complete control of Natural Ventilation systems. The controller is supplied with preloaded software developed by Passivent. Night cooling and external temperature monitoring are supplied as standard.

The controller has been developed in a modular nature for simplicity of installation on site, saving hard wiring. It can be used as a standalone controller or part of a BMS system via the standard in-built native BACnet communications. The controller is typically supplied with a Portable Interface Display to allow a selection of set points to be altered with the appropriate pass codes.

Removing the room sensor from the local room override allows the override to be more compact and located in a discreet location.

Wiring diagrams, specification documents, installation guide and set point information are supplied by Passivent for the manufacture approval of this product. Passivent will undertake the commissioning process on site to ensure the system is operating as intended.

The controller has 2 outputs per zone to allow high and low level control, or louvre and window actuator control. This allows window actuators to be removed from the night cooling strategy for security reasons.

Table to show Product Information:

Model Number	*i*C8000
Description	BACnet Enabled Multizone Controller
BACnet Compatible (MS/TP RS485)	Yes (router by others)
Zonal Control	Up to 40 zones (on 1 Master)
Heating Interlock	Yes
Fire Alarm Interlock	Yes
Boost Fan Control[+]	Yes
Air Con Enable (Heating & Cooling)[+]	Yes (in place of fan boost output)
Portable Interface Display to adjust set points	Yes
3rd Party Fan Control (0-10V)	Yes (in place of another output)
Window Actuator Control*	Yes (with iWAC controller)
Window Actuator Disable during Night Cooling	Yes
Max Louvre actuators per Zone	5 (for 4 zone module) / 10 (for 2 zone module)
Power supply size VA	100VA for Panel Modules (20 Louvre actuators) 60VA for iWAC-24v 24VA for Louvre/iWAC Integrator (5 Louvre actuators)
Override Timed Auto Return	30-180 mins
Averaging Temp Sensors	Optional
External Temp Sensor	Yes
Rain Sensor	Optional
Weather station	Optional
In built calendar and time clock	Yes
Holiday Mode	Yes
Password Protected Screens (multilevel)	Yes

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***Passivent *i*WAC (window actuator controller) is to operate window actuators.**
⁺**Passivent relay is required to operate boost fan or Air Conditioning enable. The Air Conditioning unit will have its own temperature control once enabled.**

SPECIFICATION NOTES:
- Modular design controller requires up to 70% less wiring than a central based control panel system, reducing the wiring costs.
- Portable Interface Display, allows settings to be altered on site by the maintenance team. The portable unit is plugged into the bottom of the panel from the outside of the unit. This means that the panel does not need to be opened and expose the power supply, improving safety. As the interface display is kept by the maintenance team the control system can not be tampered with.
- Standard Passivent program software is loaded onto the system. Set points and the controller configuration is agreed with the client during order processing (prior to commissioning).
- Local room overrides with Close / Auto / Open positions allow the occupant to manually override the unit, which returns to auto after a preset time, to save energy.
- Night cooling (as standard) enables operation of louvres to purge excess heat from the building at night.
- Fire Alarm Interlock signals close all ventilators as standard. It can be configured to open on fire, by request.
- Heating Interlock changes the control regime to CO_2 only (where CO_2 control present), otherwise to a maximum louvre opening position.
- External Temperature Sensor monitors outdoor temperature levels to provide suitable ventilation control.
- The internal temperature has a compensation adjustment profile based on both the internal and external Summer and Winter set points, to maximize occupant comfort.
- The holiday mode closes all products when selected.
- Window actuators can be enabled/disabled for night cooling.
- Automatic staged control of window actuators when the *i*WAC controller is also used to reduce possible noise disturbance and reducing operating time.
- BACnet Enabled, allowing communication with the site BMS controller using MS/TP protocol. Connections to the BMS systems requires a MSTP/IP Router (for Native BACnet), by others.
- Optional weather station with rain sensor (or separate rain sensor) is available to modulate louvres in adverse weather conditions.
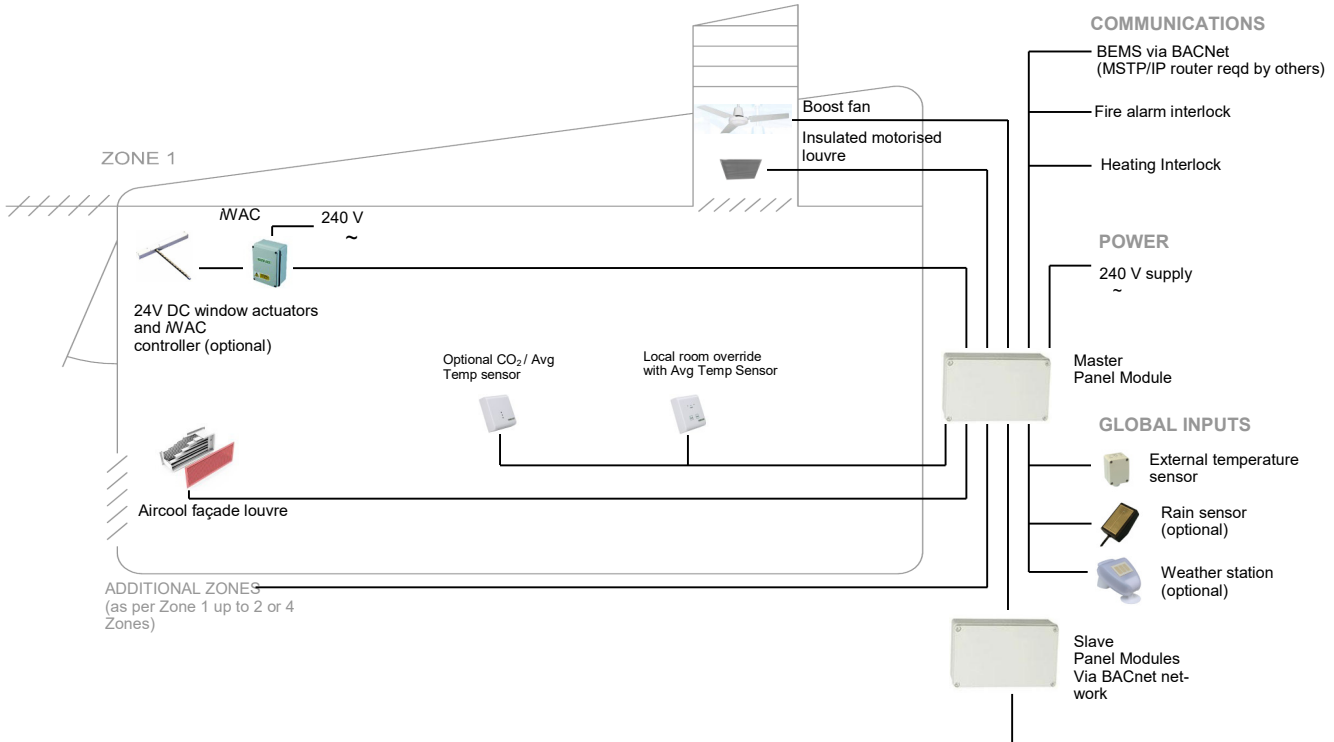
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Typical Room Schematic (not for wiring purposes)
Showing Avg Temp and CO_2 control, and a Master Panel

COMMUNICATIONS

BEMS via BACNet
(MSTP/IP router reqd by others)

Fire alarm interlock

Heating Interlock

ZONE 1

Boost fan

Insulated motorised louvre

iWAC

240 V
~

24V DC window actuators
and iWAC
controller (optional)

Optional CO_2 / Avg
Temp sensor

Local room override
with Avg Temp Sensor

POWER

240 V supply
~

Master
Panel Module

GLOBAL INPUTS

External temperature
sensor

Rain sensor
(optional)

Weather station
(optional)

Aircool façade louvre

ADDITIONAL ZONES
(as per Zone 1 up to 2 or 4
Zones)

Slave
Panel Modules
Via BACnet net-
work

Typical Sports Hall / Corridor Schematic (not for wiring purposes)
Showing Avg Temp and CO_2 control, with the override in a remote location, and a Slave Panel
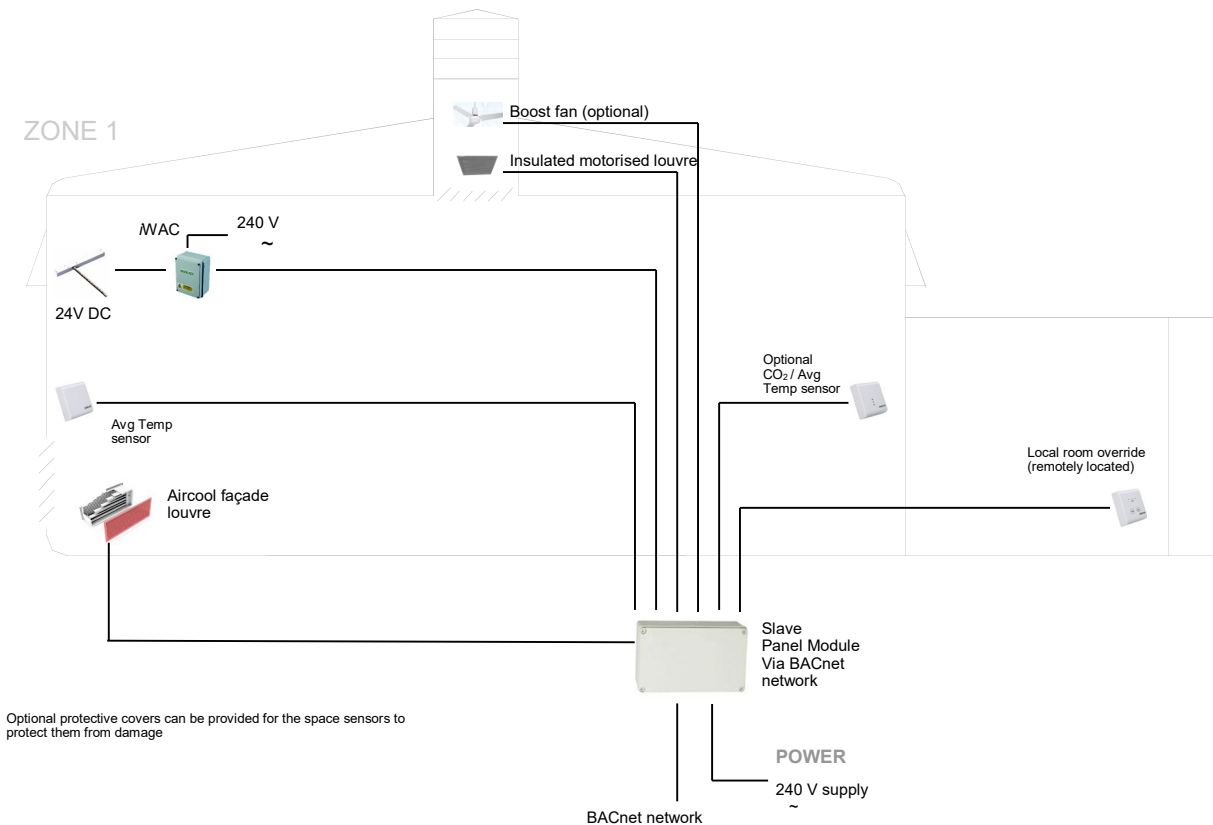
ZONE 1

Boost fan (optional)

Insulated motorised louvre

iWAC

240 V
~

24V DC

Optional
CO_2 / Avg
Temp sensor

Avg Temp
sensor

Local room override
(remotely located)

Aircool façade
louvre

Optional protective covers can be provided for the space sensors to
protect them from damage

Slave
Panel Module
Via BACnet
network

POWER

240 V supply
~

BACnet network

Local Room Overrides (including sensor)

Product Description
The Local Room Override are available as a Surface mounted or Flush mounted unit.
The Surface mounted unit provides a combined temperature sensor and override unit. This can monitor internal temperature in each zone and send the readings to the *i*C8000 controller. This allows the unit to provide averaging temperature control when combined with another averaging room sensor.

The Override function is simple to use, with occupant override touch sensitive buttons (open or close) and a preset timed return to automatic control. The return to automatic control is after a pre-determined time (between 30 minutes and 3 hours), settable on commissioning. This is usually set to 1 hour.

Installation
The Surface mounted override unit, with temperature sensor, should be positioned and located as a normal room temperature sensor (between 1.5m to 1.7m above FFL) and away from any draughts or direct heat sources.
In sports hall applications only the override can be placed outside of the hall to provide easier access, without protective covers, or located at a higher level.

Options
Surface or Flush mounted units.
Standard Temperature or Averaging Temperature units available.
Can be remotely mounted for easier access.

Size
Surface Mounted – 80(w) x 90(h) x 29(d) mm
Flush Mounted – 80(w) x 80(h) x 10(d) mm
Surface mounted unit fits onto a standard circular conduit box or directly onto the wall.
Flush mounted unit fits to standard single electrical back box, at least 25mm deep.
Colour finish White.

Surface mounted override

Flush mounted override

Room Sensors

Product Description
The Room Sensors are available as Temperature only or as Combined Temperature and CO_2 with LEDs indicator, surface mounted units. They monitor internal temperature or CO_2 conditions in each zone and send the readings to the *i*C8000 controller.

The CO_2 based LED indicators display Green on or below 800ppm, display Amber from 800ppm to 1500ppm, and Red above 1500ppm.

The CO_2 sensor employs Automatic Background Calibration (ABC Logic) to continuously adjust the calibration base to correct for changes in the background concentration levels and sensor drift. It continuously adjusts the sensor calibration over the life time accuracy of the product, which is expected to be 15 years.

Installation
The Surface mounted override unit, with temperature sensor, should be positioned and located as a normal room temperature sensor (between 1.5m to 1.7m above FFL) and away from any draughts and direct heat sources.
In sports halls only, to meet guidance the sensors can be mounted above 2.2m FFL.

Options
Temperature only or Averaging temperature only sensors available.
Temperature and CO_2, or Averaging Temperature and CO_2 units available with LEDs.

Size
Surface Mounted – 80(w) x 90(h) x 29(d) mm
Wall mountable unit fits onto a standard circular conduit box or directly onto the wall.
Colour finish White.

Combined Temp
and CO_2 sensor

Temp only sensor

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Portable Interface Display (PID)

Product Description
A Portable Interface Display is provided with each *i*C8000 controller as Standard at the time of commissioning. It is plugged into the bottom of each panel module to allow settings to be altered on site by the maintenance team. This means that the Panel Module does not need to be opened and expose the power supply, improving safety. As the interface display is kept by the maintenance team the control system can not be tampered with by occupants. Occupants have a local room override to allow them to manually override the system without the need to access the settings menus.

There are 3 different security levels accessible via the PID, being Maintenance, Set-up and Configuration. Each level has its own pass code to improve security.
All buttons are touch sensitive, and the backlit display changes colour when different security levels are accessed.
A 1m cable is supplied as standard with the PID for connection to the Panel Modules RJ11 socket.

Size
Unit size 145(w) x 90(h) x 28(d) mm
Display size 50(w) x 30(h) mm

Panel Modules

Product Description
The Panel Modules are supplied in 2 or 4 zone variants, in Standard, Hybrid Plus Airstract or Weather Station configurations. They are supplied as standard with 2 outputs per zone, plus a boost fan / AC enable output. They are supplied complete with power supply (240V to 24V), bottom mounted power supply access cable gland, internally mounted terminal strip for ease of wiring on site, DIN mounted network sockets, and top mounted cables glands. Plugs are located on the bottom of the panel for connecting the Portable Interface Display, without the need for accessing the internals of the panel.
A single panel is allocated as the Master on networked systems, and connected to it are the commons; Fire and Heating interlocks, External Temperature, optional Rain or Weather Station, and BMS communications, as applicable. The Master is programmed to share the common information with the other Slave panels on the network.

Installation
A 240V 5 Amp fused spur is required adjacent to each Panel Module.
Suggested control panel locations are in positions such as plant room, store room, cleaners cupboard, etc. Easy access is required for wiring, commissioning / maintenance and adjustment of temperature set points by the client.
Mount the Panel Module with the back vertically to the wall and do not mount horizontally in a ceiling void.
Fasten the Panel Module to the wall through the recessed front cover screw holes using 1 ½" long No.8 Screws, or similar.

Options
2 and 4 Zone Panel Modules
Standard, Hybrid Plus2 Aircool, Hybrid Plus Airstract and Weather Station configurations available
2 and 4 Zone Add-on Panels for the Hybrid Plus Airstract Panels to operate low level façade louvers.

Size
2 Zone Panel Module Size 380(w) x 300(h) x 120(d) mm
4 Zone Panel Module Size 460(w) x 380(h) x 120(d) mm
Colour finish Grey (similar to RAL7035)

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External Temperature Sensor

Product Description
The External Temperature Sensor is provided as standard with the controller. This reading is used by the *i*C8000 software regimes to operate the natural ventilation and mixed mode profiles.
The sensor element is encapsulated to prevent the influence of condensation in low temperature conditions.

Installation
External sensor to be mounted on a North face of the building, where it is not influenced by direct sunlight.

Size
65(w) x 60(h) x 36(d) mm

Optional Rain Sensor

Product Description
The Rain Sensor is optional with the controller, and is often used when windows actuators are used on site.
The surface of the detector is heated to avoid false detection alarms resulting from dew forming.

Installation
Position the rain sensor so that it will be exposed to the weather elements, generally horizontally mounted on the roof with a slope of 5 to 10° to allow rain to drain off.

Size
65(w) x 60(h) x 36(d) mm

Optional Weather Station (Wind & Rain)

Product Description
The Weather Station sensor is optional with the controller, and is often used for exposed locations or where window actuators are used on site.
It measures both Wind Speed and Rain and replaces the need for a Rain sensor.
The weather station must be connected to a Weather Station configured master Panel module to allow communication.
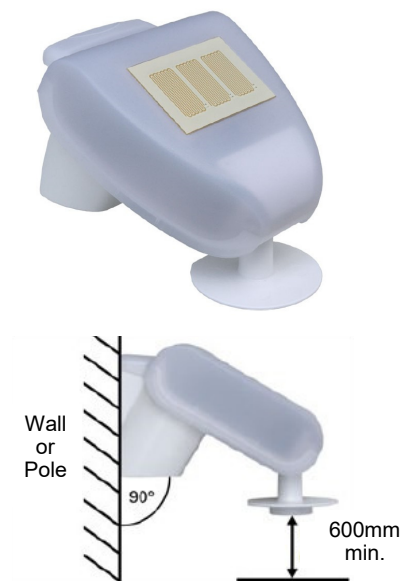
Installation
The weather station is supplied with a combination wall / pole mount. The mount can be fastened vertically onto a wall or pole. There should be at least 600 mm of free space under the weather station to allow it to measure the wind correctly and to prevent it from being snowed in when it snows. The sensor should be mounted in an exposed location above the roof level, and on a pole as standard.
The unit can be façade mounted when used for measuring wind speed on the building façade, but multiple units (with multiple Master Panel Modules) would be required for this application.

Size
Approx. 96(w) x 77(h) x 118(d) mm
The Weather Station is supplied with an AC/DC converter, to allow it to connect with the Master Panel. The size of associated converter enclosure is 150(w) x 110(h) x 70 (d) mm.

Wall or Pole

90°

600mm min.

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Optional Ancillary Items

There are a range of ancillary items that allow the *i*C8000 controller to be an extremely flexible system, some of these are listed below. Some items require a local fused spur.

*i*WAC (intelligent Window Actuator Controller)
The *i*WAC is used for controlling 24V and 240V window actuators when they form part of the Natural Ventilation System. Each *i*WAC controller can operate up to 3 No. windows in a single zone, multiple *i*WAC controllers are used to operate additional windows in the same zone, depending on current load. The control is always by a 2-wire supply with reverse polarity. The control signal runs for a timed period to alter the position of the window actuator.
The controller uses a staged operation regime to reduce the operating time and reduce background noise disturbance from the actuators. The special sequencing nature of the *i*WAC also reduces the local power usage, keeping the unit very compact. *i*WAC 24V controllers are supplied with an 24V DC internal power supply. The control output run time is 10-90 seconds.

Installation
The *i*WAC controller requires a local 240V 5 Amp fused spur. It is typically mounted in a convenient position to the window actuators.

Size
*i*WAC 24V size 320(w) x 230(h) x 130(d) mm
*i*WAC 240V size 190(w) x 140(h) x 90(d) mm

Fan / Air Conditioning Active Relay Enclosure
The Fan / AC Active Relay Enclosures are used to enable individual fans or Air-conditioning units. These are separated from the Panel Module by use of a volt free relay and operated via a signal to allow all field wiring to remain as low voltage. As standard the Panel Module are supplied with the capability to control Fans and AC units, the auxiliary terminals are allocated within the control panel to allow this flexibility.

Installation
The Fan / AC Relay requires a local 240V 5 Amp fused spur. It is typically mounted near the device being enabled, and one enclosure is required per fan or AC unit.

Size
Fan / AC Relay Enclosure size 150(w) x 110(h) x 70(d) mm

Integrator for Ancillary Equipment
The Louvre / *i*WAC Integrator Enclosure is used where a louvre or window actuated exhaust is controlled from more than a single room or zone. It is used to connect signals from multiple zones to provide a priority signal (highest signal takes priority) for up to a maximum of 8 zones. The highest 0-10V signal from any zone connected to the integrator modulates the louvre position.
A local *i*WAC controller is still required when used with this integrator.

The Fan Integrator Enclosure is used where a boost fan forms part of a mixed mode scheme, and again is controlled from more than a single room or zone. As above it prioritises the highest signal. A single 24V signal from any zone connected to the integrator enables the fan.

Installation
The Louvre and *i*WAC 240V Integrator Enclosure is supplied with a 24VA (5 standard actuator limit) power supply and requires a local 240V 5 Amp fused spur. The *i*WAC 24V Integrator Enclosure is not supplied with a power supply and does not require a fused spur. The enclosures are typically mounted near the device being controlled.
The Fan Integrator Enclosure requires a local 240V 5 Amp fused spur. It is typically mounted near the device being enabled, and one enclosure is required per fan. The integrator will supply the power supply to the fan and does not require an additional Fan Relay.

Size
Integrator for Louvre and *i*WAC Enclosure size   240(w) x 190(h) x 90(d) mm for 240V version (without power supply)
  150(w) x 110(h) x 70(d) mm for 24V version (with power supply)
Integrator for Fan Enclosure size   240(w) x 190(h) x 90(d) mm (with power supply)

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Optional Ancillary Items contd:

Booster Power Supply (with internal signal generator) Enclosure

The Booster Power Supply is used in larger applications with a high number of motorised louvers to control, beyond the limits of the power supply within the Panel Modules. It is supplied with a 100VA Power Supply that can control up to 32 standard Passivent actuators on motorised louvers and ensures that the 0-10V modulating control signal is also maintained throughout.

Installation
Requires a 240V 5 Amp local fused spur power supply.

Size
Enclosure size 320(w) x 230(h) x 130(d) mm

Manual Indicator Plate (MIP) for the Hybrid Plus Airstract

The Manual Indicator Plate (MIP) is a wall mounted indicator showing if windows should be manually opened or closed. The indicator plate shows in winter conditions that windows can be closed, whilst the Hybrid Plus Airstract ventilation system will provide both supply fresh air and exhaust. In warmer conditions the windows are opened to provide the make up air inlet and a cooling effect within the space.
The flush mounted indicator plate uses an LED to shows either a 'Close Windows' or 'Open Windows' position.

Installation
The MIP is connected directly to the local room panel to provide signals for the two indicator positions.

Size
Plate size 80(w) x 80(h) x 10(d) mm. Fits a standard single switch electrical box, 25mm deep.
Colour finish white.

SoundScoop *i*AT Fan Controller

The SoundScoop *i*AT Fan controller is used where fan control is required, to increase the rooms flow rate. This controller allows the operation of two fans.

Installation
Requires a 240V 5 Amp local fused spur power supply and is connected to the local room panel fan outputs.

Size
Enclosure size 150(w) x 110(h) x 70(d) mm

Hybrid Plus Airstract Terminal Fan Controller

This controller is used with the Hybrid Plus Airstract roof terminal product to control the 4 operating modes. It allows the fan to operate in either direction to meet the Hybrid Plus product requirement for Winter time mixing of supply and exhaust air, natural mode, boost supply and boost exhaust.

Installation
Requires a 240V 5 Amp local fused spur power supply and is connected to the local room panel fan outputs.

Size
Enclosure size 190(w) x 140(h) x 90(d) mm

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