

Technical Submittal Sheet

Project No Belle Vue Academy
Project No _____
Directed to: Sir Robert McAlpine



Form 49 (29.03.04)

Plant Item: Mondraught Natural Ventilation Units
Integral Ref: 009433-IUL-XX-ZZ-SB-M-TS1 - Monodraught

Date: 07.09.2021
Revision: C01
Status: S4

Information "Issued for Approval"

Please find attached technical information for the Monodraught Ventilation Units for the classrooms and sports hall:-

Print Name : P Thompson - Operations Manager

Approval required By: 14/09/2021

Response:

Signed: _____

For: _____

Print Name : _____

Date _____

SCHEDULE NO. 11 – HYBRID VENTILATION UNITS

Ref	Location	Type
Level 0		
HVU/0/01	Lo.42 Workshop	HTMF-H
HVU/0/02	Lo.42 Workshop	HTMF
HVU/0/03	Lo.43 Multi Mat Prep Room	HTMF-H
HVU/0/04	Lo.38 Food Science	HTMF
HVU/0/05	Lo.38 Food Science	HTMF-H
HVU/0/06	Lo.46 Design Studio	HTMF
HVU/0/07	Lo.46 Design Studio	HTMF-H
HVU/0/08	Lo.37 General Art	HTMF-FT
HVU/0/09	Lo.37 General Art	HTMF-H
HVU/0/10	Lo.47 General Art	HTMF
HVU/0/11	Lo.47 General Art	HTMF-H
HVU/0/12	Lo.30 Extensive Music	HTMF-H
HVU/0/13	Lo.06 Library Community Hub	HTMF-H
HVU/0/14	Lo.06 Library Community Hub	HTMF
Level 1		
HVU/1/01	L1.50 Classroom Eng 01	HTMF-H
HVU/1/02	L1.52 Classroom Eng 02	HTMF-H
HVU/1/03	L1.53 Classroom Eng 03	HTMF-H
HVU/1/04	L1.54 Classroom Eng 04	HTMF-H
HVU/1/05	L1.42 Classroom Eng 05	HTMF-H
HVU/1/06	L1.55 Classroom Eng 06	HTMF-H
HVU/1/07	L1.41 Classroom Eng 07	HTMF-H
HVU/1/08	L1.56 Classroom Eng 08	HTMF-H
HVU/1/09	L1.40 Classroom Eng 09	HTMF-H
HVU/1/10	L1.57 Classroom Eng 10	HTMF-H
HVU/1/11	L1.59 Class Seminar Hum 04	HTMF-H
HVU/1/12	L1.60 Classroom Hum 05	HTMF-H
HVU/1/13	L1.61 Seminar Isolation	HTMF-H
HVU/1/14	L1.34 Classroom Hum 03	HTMF-H
HVU/1/15	L1.33 Classroom Hum 02	HTMF-H
HVU/1/16	L1.32 Classroom Hum 01	HTMF-H
HVU/1/17	L1.28 Classroom MFL 01	HTMF-H
HVU/1/18	L1.27 Classroom MFL 02	HTMF-H
HVU/1/19	L1.26 Classroom MFL 03	HTMF-H
HVU/1/20	L1.25 Classroom MFL 04	HTMF-H
HVU/1/21	L1.24 Classroom MFL 05	HTMF-H
Level 2		
HVU/2/01	L2.34 Classroom Maths 01	HTMF-H

HVU/2/02	L2.36 Classroom Maths 02	HTMF-H
HVU/2/03	L2.37 Classroom Maths 03	HTMF-H
HVU/2/04	L2.38 Classroom Maths 04	HTMF-H
HVU/2/05	L2.26 Classroom Maths 05	HTMF-H
HVU/2/06	L2.39 Classroom Maths 07	HTMF-H
HVU/2/07	L2.25 Classroom Maths 06	HTMF-H
HVU/2/08	L2.40 Classroom Maths 09	HTMF-H
HVU/2/09	L2.24 Classroom Maths 08	HTMF-H
HVU/2/10	L2.41 Classroom Maths 10	HTMF-H
HVU/2/11	L2.43 Classroom Float 02	HTMF-H
HVU/2/12	L2.46 Classroom Hum 06	HTMF-H
HVU/2/13	L2.47 Classroom Hum 07	HTMF-H
HVU/2/14	L2.48 Classroom Hum 08	HTMF-H
HVU/2/15	L2.02 Classroom Hum 09	HTMF-H
HVU/2/16	L2.03 Classroom Hum 10	HTMF-H
HVU/2/17	L2.04 Science Studio 4	HTMF-H
HVU/2/18	L2.05 Science Lab 5	HTMF
HVU/2/19	L2.05 Science Lab 5	HTMF-H
HVU/2/20	L2.06 Science Studio 3	HTMF-H
HVU/2/21	L2.07 Science Lab 4	HTMF-H
HVU/2/22	L2.09 Science Class 1	HTMF-H
HVU/2/23	L2.10 Science Lab 3	HTMF
HVU/2/24	L2.10 Science Lab 3	HTMF-H
HVU/2/25	L2.13 Science Studio 2	HTMF-H
HVU/2/26	L2.13 Science Studio 2	HTMF
HVU/2/27	L2.14 Science Lab 2	HTMF-H
HVU/2/28	L2.14 Science Lab 2	HTMF
HVU/2/29	L2.15 Science Lab 1	HTMF-H
HVU/2/30	L2.15 Science Lab 1	HTMF
HVU/2/31	L2.16 Science Studio 1	HTMF-H

Notes:

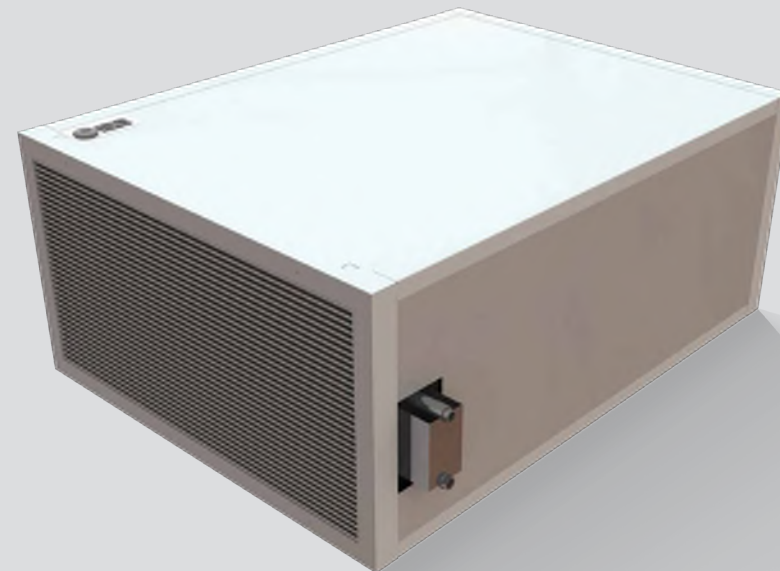
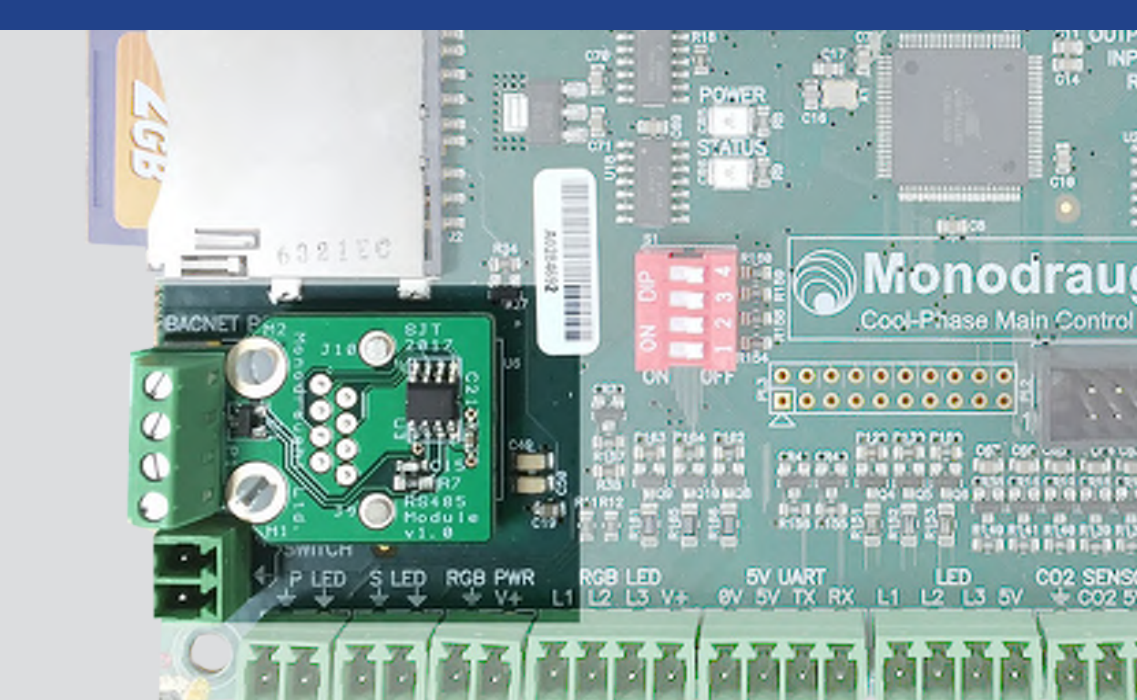
- Each unit is to be supplied complete with a fully automatic intelligent control system with seasonal control, external and internal temperature, SD card Data logger and a wall mounted controller, which includes inbuilt CO₂ sensors for indoor air quality monitoring, user override buttons and traffic light indicator for guidance on window operation. Units to be linked to the BMS via modbus.
- Louvre manufacturer / provider to provide insect mesh.

SCHEDULE NO. 12 – ROOF MOUNTED VENTILATION UNITS

Manufacturer:	To be confirmed by Integral (Monodraught Units used for Co-ordination)
Location:	Sports Hall Roof
Quantity:	4 No as indicated on Architect Roof Plan
Model Ref:	X-Air 200

Notes:

1. Each unit is to be supplied complete with a fully automatic intelligent control system with seasonal control, external and internal temperature, SD card Data logger and a wall mounted controller, which includes inbuilt CO₂ sensors for indoor air quality monitoring, user override buttons and traffic light indicator for guidance on window operation. Units to be linked to the BMS via modbus.
2. Internal grille to be provided as part of unit.



HTM F-H Optional MODBUS Module

General Description

The Hybrid Thermal Mixing (HTM) system is designed to provide natural ventilation, hybrid ventilation (incorporating mixed tempered air for winter periods), secure night time cooling and boosted levels of ventilation during summer. The systems are designed to work in conjunction with natural ventilation and can be used in single sided and cross flow ventilation strategies. With the addition of an internal LTHW coil, the HTM F-H is able provide the primary heat source within the space removing the requirement for additional radiators.

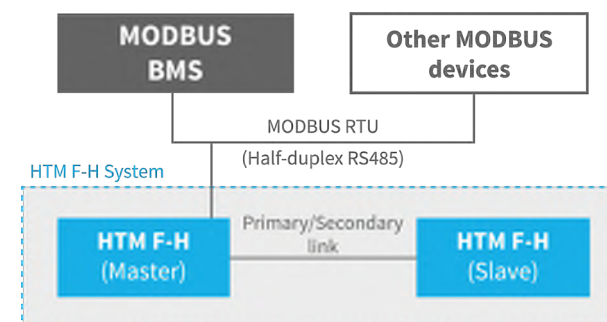
The MODBUS module allows a HTM F-H system to be installed on to a MODBUS RTU network and make visible a number of system variables to the master MODBUS device. These variables include the supply water temperature for coil and room temperature.

Technical Details

The MODBUS module for HTM F-H plugs into the Control Board and interfaces with the on board microcontroller to provide MODBUS RTU visibility of the HTM F-H system over a half-duplex RS485 link.

Each HTM F-H system has its own unique MODBUS number allocated 1 to 247 within the configuration header of the HTM F-H. HTM F-H units are usually linked in a Master/Slave configuration to form one system. In this instance the master unit will be the only system connected to the MODBUS network.

The MODBUS module requires a 1.5 or 2 pair shielded cable daisy chained between each of the Modbus modules located in the Master units. Cable is to be supplied and installed by others.



HTM F-H Optional MODBUS Module

MODBUS DETAILS

Wiring Requirements

MODBUS RTU over RS485 (Half-Duplex) connection wiring as follows:

- A 1.5 or 2 pair shielded cable (nominal characteristic impedance – 120Ω, such as a Belden 9842 cable or Alpha Wire 6413) daisy chained between each of the modbus modules located in the master units . Cable to be supplied and installed by others.
- Shield to only be terminated at one end
- Use spare conductors for GND reference connection, as long as there will be low ground currents. For high ground differentials, please use an isolator.
- Units at the ends of the daisy-chain to have 120Ω terminators (this can be enabled on the module using the DIP switches).

Input Registers

Address #	Description	Units
0	Serial number high word	N/A
1	Serial number low word	N/A
2	Year	Years
3	Month	Months
4	Day	Days
5	Hour	Hours
6	Minute	Minutes
7	Operating mode	N/A (See #)
8	Fan speed	N/A
9	Room temperature	° C
10	Room CO ₂	ppm
11	System code indicating specific faults present	N/A (See †)
12	Wall Louvre feedback	N/A
13	LTHW temperature	° C
14	Volt Free Contact Enable	N/A

(#) OPERATING MODE Object Values Descriptions

Value	Description
0	Unknown
1	Off
2	Idle
3	Nat Vent Mode
4	Nat Vent Windows Mode
5	Boost Mode
6	Mixed Mode
7	Seasonal Night Cooling Mode
8	Slave Mode
9	Acoustic Test Mode
10	Self-Test Mode
11	Control Mode
12	Workshop Exhaust
13	Gas Guard Mode
14	Preheat Mode
15	Heating Mode
16	Shut-down Mode



HTM F-H Optional MODBUS Module

MODBUS DETAILS

(†) FAULT_CODE Object Values Description

The FAULT_CODE object is a numeric value that indicates any fault present on the system. Each fault has a unique code allocated to it (2(n-1) where n is the fault number) which are added together to form the FAULT_CODE. So if there was a fault with the SD card, Header and UI, the fault code would be 7 (1 + 2 + 4).

Fault Number	Hex Code	Decimal Code	Fault
1	0x0001	1	SD card
2	0x0002	2	Header file
3	0x0004	4	User interface
4	0x0008	8	Fan
5	0x0010	16	T5 (external air temperature sensor)
6	0x0020	32	T6 (recirculated air temperature sensor)
7	0x0040	64	T7 (mixed air temperature sensor)
8	0x0080	128	Servo 1 (external air intake damper)
9	0x0100	256	Servo 2 (recirculated air intake damper)
10	0x0200	512	Servo 3 (additional damper A)
11	0x0400	1024	Servo 4 (additional damper B)
12	0x0800	2048	Servo 5 (exhaust air damper)
13	0x1000	4096	Heater
14	0x2000	8192	Airflow
15	0x4000	16384	Master/Slave

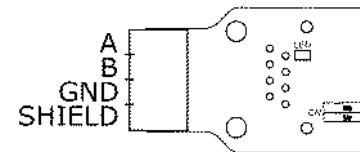
Coils

Address #	Function	Description
0	Enable	Setting this to 0 turns off the unit



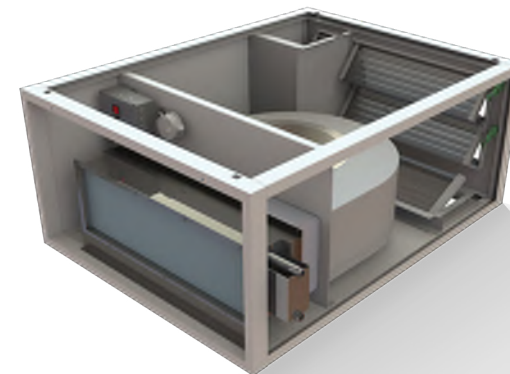
Connection Settings

- **Baud Rate:** 19200
- **Framing:** 8-bits, Even Parity, 1 Stop bit
- **Note:** Other settings may be available on request.



DIP Switches

1	2	Effect
Off	Off	No Terminator
On	Off	RC Terminator
On	On	120Ω Terminator





Halifax House, High Wycombe
Buckinghamshire, HP12 3SE



+44 (0) 1494 897700



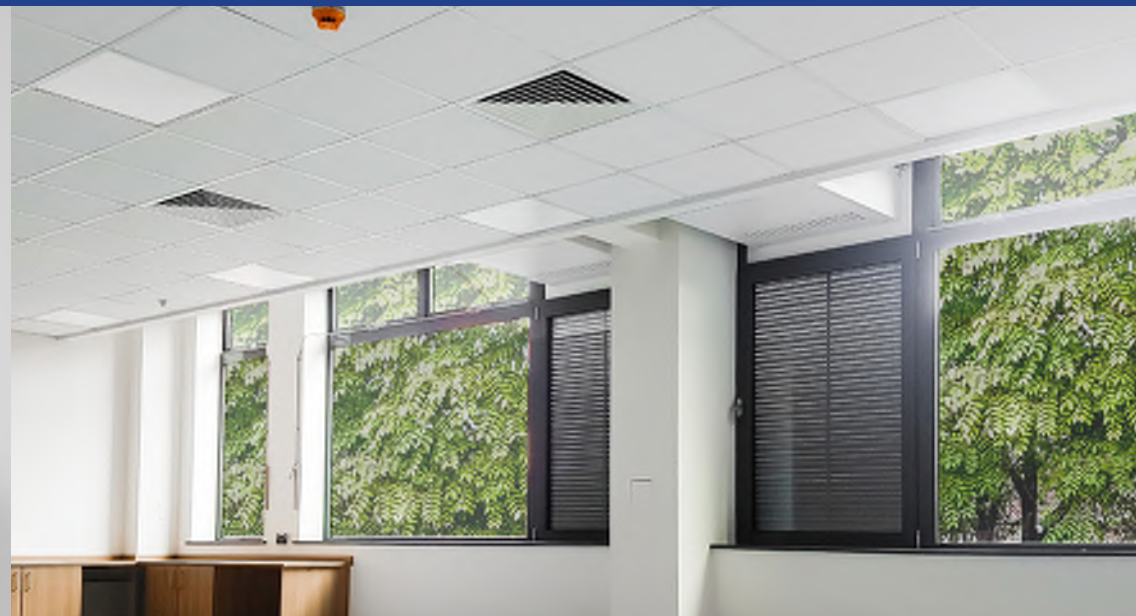
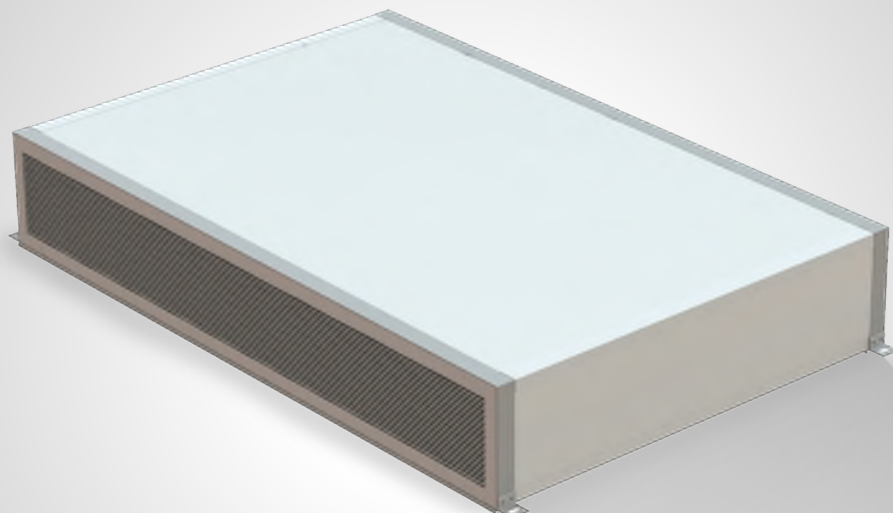
www.monodraught.com



info@monodraught.com

Follow us on:





HTM FT

The Hybrid Thermal Mixing (HTM) system from Monodraught is designed to provide natural ventilation, hybrid ventilation (incorporating mixed tempered air for winter periods), secure night time cooling and boosted levels of ventilation during summer.

The HTM systems are designed to work in conjunction with natural ventilation and can be used in single sided and cross flow ventilation strategies. Each HTM is comprised of an intelligent and fully automatic control system coupled with a low energy ventilation system. The unit switches between operational modes dependant on season, external/internal temperature conditions and indoor air quality (IAQ).

Performance

- Monodraught's HTM systems are the most technologically advanced hybrid ventilation systems, and are supplied complete with an integrated intelligent and fully automatic control system.
- Able to provide 355 l/s (SFP 0.15) of daytime ventilation and 510 l/s (SFP 0.24) for night purge ventilation when required.
- The system is supplied as standard with full data logging facility, temperature and CO₂ controls. With an optional BACnet or Modbus module, each unit has the ability to output key performance data to a central BMS.
- A composite panel body provides high levels of acoustic attenuation.
- Available as an exposed unit with white fascia panel or as ducted system with 2No. plenum boxes and 4-way diffuser.
- An integrated exhaust path within the system's body removes the need for additional exhaust paths, therefore reducing the required number of façade openings.

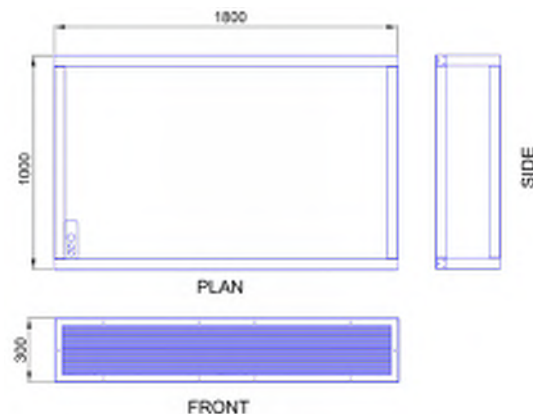


Environment

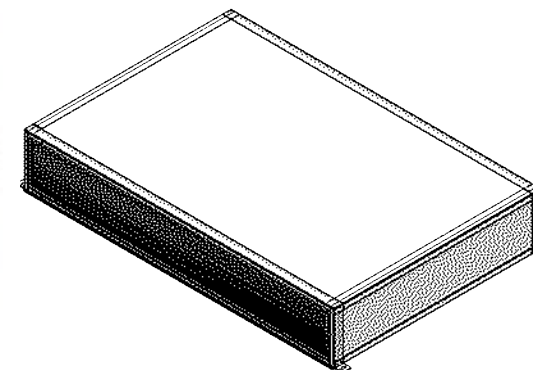
- The HTM FT has been specially designed to meet and exceed BB93, PSBP and Annex F facility output specification requirements.
- The HTM is designed to provide single sided and cross flow ventilation strategies, bringing fresh air into the room and reducing the CO₂ level to create an ideal environment for school classrooms/areas.
- The system is designed to provide mixed tempered air during winter, boosted levels of ventilation during summer and secure night time cooling.
- The system works in conjunction with natural ventilation provided by manual or automatic windows and VENTS AIR louvres.



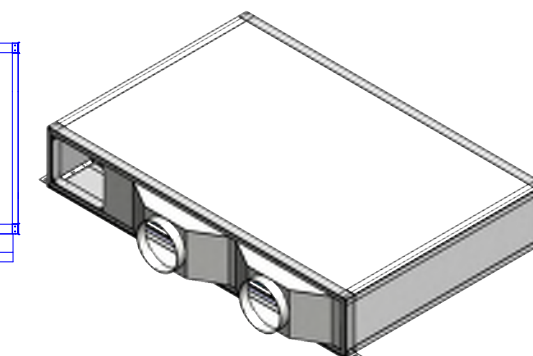
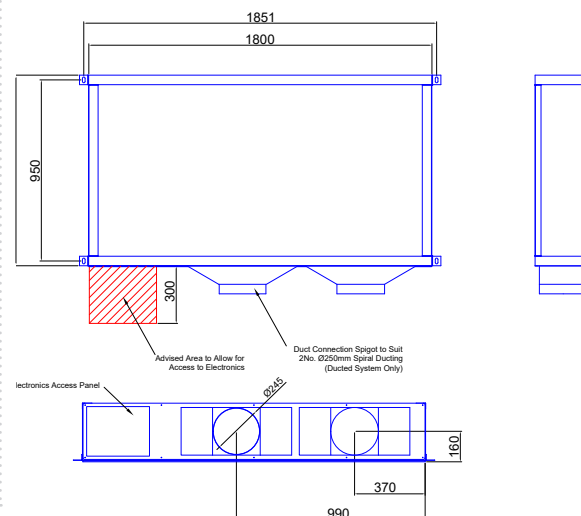
Materials	Powder coated mild steel frame	Dimensions	1800(w) x 300(h) x 1000 (l)
	Specialist acoustic panels		
	ABS low maintenance panels	Weight	
			78kg
Installation	Units supported via a minimum of 4 No. fixings		
	Minimum ceiling void of 350mm - if required		
System Requirements	External weather louvre with minimum free area of 0.28m ²		
	Louvre panel to be supplied-fitted with anti-bird mesh		
Electrical Requirement	230V AC mains with switched fused 3A Spur		
Guarantee	5 year warranty		
	Mechanical and electrical components have a 1 year warranty		
Flowrates/SFP	Max Day - 355 l/s - SFP: 0.15		
	Max Night - 510 l/s - SFP: 0.24		
Sensors	External temp. sensor -20 °C to +90 °C		
	Recirculation temp. sensor -20 °C to +90 °C		
	Mixed air supply temp. sensor -20 °C to +90 °C		
	Room temp. sensor within wall controller -20 °C to +90 °C		
	Room CO ₂ sensor within wall controller 0-2000 ppm		
Data Monitoring	Data logging functionality as standard: all system operations, sensor readings and damper positions logged every 1 minute		
Additional Functions	Self-Test Mode via wall controller		
	Integrated exhaust path		
Options	BACnet / Modbus		
	Filter module EU-G4 bag filter		
	Filter module EU-F7 bag filter		
	Attenuation module		
Optional Electrical Connections	System enable input - NC volt-free contact to activate and deactivate the system		
	Fault output - NC relay output for fault indication		
	CAT5e Slave Connection - 2-4 No. HTM units synchronised to work in a Master/Slave configuration in a single zone		
	VENTSAIR systems acting as automatic natural ventilation opening		



Fascia/Below Ceiling



Ducted/Above Ceiling

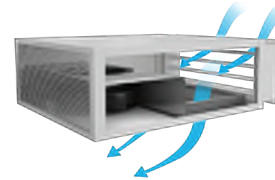


Controls Strategy

- The HTM incorporates a fully automatic control system based on seasonal control strategy which is determined by the systems internal time, date and weather compensation algorithm to pick up unseasonal conditions.
- The system provides natural ventilation as the default method of ventilation indicating when manual windows or automatically opening dampers should be utilised to maximise the IAQ and maintain the comfort levels.
- The control system incorporates a number of temperature sensors integral to the unit to monitor external temperature, mixed air temperature and supply air temperature.
- In addition, a wall mounted controller fitted with an internal temperature, CO₂ sensor and user override controls are included as standard.
- Data is stored per minute on an integral data card for data analysis and compliance requirements.

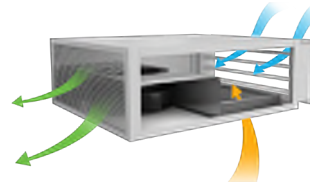
Season		Spring	Summer	Autumn	Winter	CO ₂
Start Date		01 Mar	01 May	01 Oct	01 Dec	
Finish Date		30 Apr	31 Sept	30 Nov	End of Feb	
Occupied hours 08:00 - 17:00	Nat Vent	21 °C	18 °C	21 °C	22 °C	900 ppm
	Nat Vent + Windows	23 °C	20 °C	23 °C	24 °C	1000 ppm
	Boost	24 °C	22 °C	24 °C	25 °C	1100 ppm
	Mixed Mode	23 °C	22 °C	23 °C	24 °C	900 ppm
Night time cooling 22:00 - 07:00		N/A	18 °C	N/A	N/A	N/A

SYSTEM OPERATION



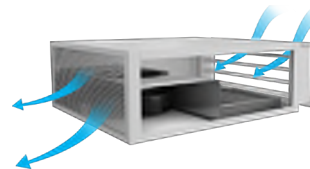
Natural Ventilation

The systems primary function is to provide natural ventilation in conjunction with openable windows. In Natural Ventilation mode the system operates by opening both the external and internal dampers allowing fresh air to pass into the space.



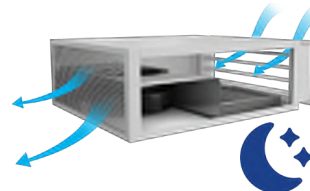
Mixed Mode

If the external temperature drops too low and fresh air is required, the system will operate in Mixed Mode. In this mode, the system will modulate the external and internal dampers and by utilising the fan, it will mix warm internal air with fresh external air to create a fresh and tempered indoor environment.



Boost Mode

If the internal temperature or CO₂ level rise too high, the system will operate in Boost Mode. In this mode, the system will open the external damper and blow air into the room until levels drop to acceptable levels.



Night Time Cooling

During the summer period, when the building is unoccupied and internal temperature is too high, the system will provide peak ventilation until the internal temperature reduces, removing warm air from the space and cooling the fabric of the building.

Operation

- HTM systems have eight operational fan speeds, at which a minimum air flow rate is supplied if installed in accordance with Monodraught recommendations.
- During normal occupied operation, the system will automatically operate between Fan Speeds 1-5 to provide fresh air ventilation and cooling (if conditions permit). The system is limited to a maximum of Fan Speed 5 (maximum AUTO daytime).
- The user is able to Boost the system's level of ventilation via the wall controller, increasing the system's operating fan speed by two fan speeds and in doing so the user is allowing the system to operate at an increased sound level.
- The system will time out and revert to its automatic operating fan speed after a default time period of 60 minutes. This time out is set via the wall controller with options of 20, 60 or 180 minutes.
- Fan speed 8 is reserved for night time cooling. During summer periods, when the building is unoccupied and when the internal temperature is above 18°C the system will provide peak ventilation.

Acoustic Information

The system was tested with a standard 50mm external louvre arrangement.

Sound Power Level at 350 l/s							
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
53.8	56.9	54.8	49	42	33.7	23.3	25.3
Sound Reduction Index Rw (C:Ctr) = 30 dB							

Controls and User Interface

Monodraught offer three wall controller options, each dependant on the room design, layout and the user's requirements. One wall controller is required to be mounted within each room and will give the user certain functionality over the systems.

Self-test Mode

All Monodraught's HTM systems have the ability to perform a Self-test operation which is operated via the system's wall controller. The HTM runs an automatic diagnostics test, operating and monitoring each element to search for any faults. If any faults are found, they will be indicated to the user by the wall controller. This test can be initiated by either a Monodraught engineer or a facility manager.

Openable Window Option

Allows the user to control the fan speed but will also indicate when they need to open windows to aid the system in providing ventilation.

- 1. Boost mode:** Will provide a boosted level of ventilation.
- 2. Auto mode:** Allows the HTM system to operate within its 3 automatic modes.
- 3. Off mode:** Closes the high level exhaust damper and stops the fan from operating.
- 4. LED:** Illuminates to notify users when it is necessary to open a window.

Left hand side provides control and indication of the current operation mode of the HTM system.

Right hand side provides indication for the openable windows.



Louvre Override Option

Allows the user to not only control the fan speed of the units, but also regulate the amount that the VENTS AIR Façade system opens by if fitted.

- 1. Louvre LED's:** No LED = Closed / 1 LED = 10% open / 2 LED = 25% / 3 LED = 60% / 4 LED = Fully open.
- 2. Louvre Plus:** Opens the Ventsair louvre by 1 setting.
- 3. Louvre Minus:** Closes the Ventsair louvre by 1 setting.
- 4. Sensor:** Temperature and air quality sensor.

Left hand side provides control and indication of the current operation mode of the HTM system.

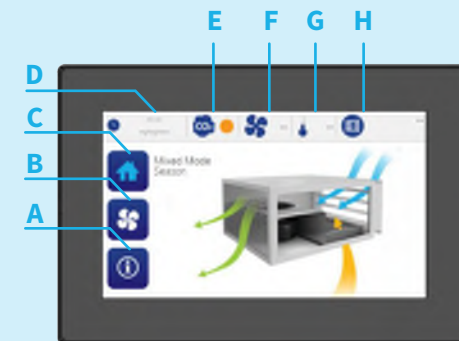
Right hand side provides control and indication for the opening level of the Ventsair wall louvres.



Smart Screen Option

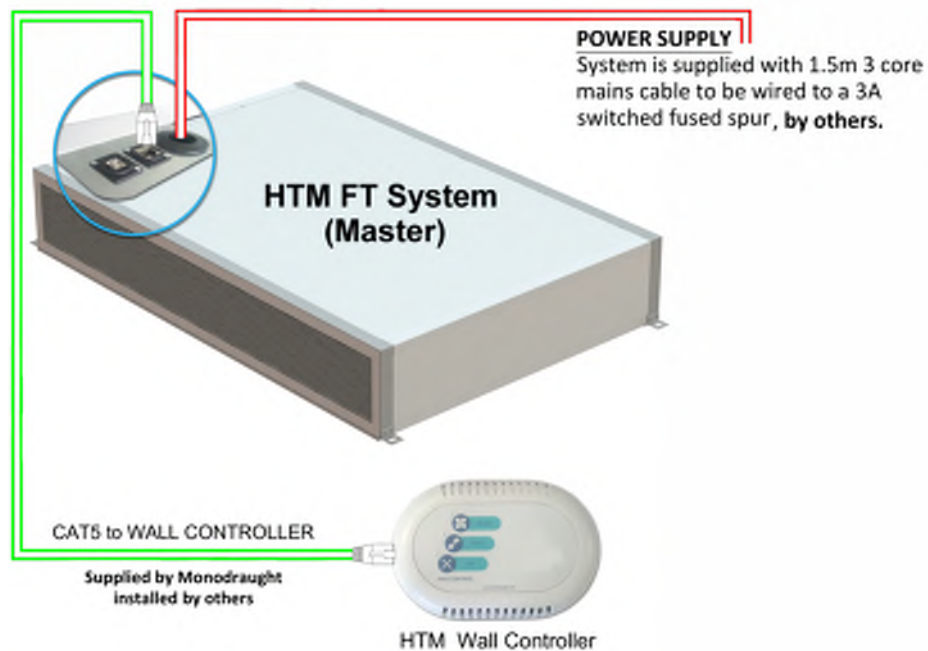
The controller displays the room temperature, air quality (IAQ) and fan speed via a 4.3" capacitive touch LCD screen. The user is also able to explore how the system work and adjust the settings in order to maintain a comfortable environment with minimal energy usage.

- View system information
- Change fan speed
- Return to Home Page
- Time and date
- CO₂ level indicator
Red: High / Yellow: Medium / Green: Low
- Current fan speed
- Room temperature
- If additional ventilation is required, it will display the "windows opening" icon.



HTM FT

Typical Schematic



WIRING DETAILS

Ventsair

Monodraught's HTM is designed to work with and control a range of Ventsair Façade Ventilation systems (VAF) which are often used in lieu of a manual window. These systems typically comprise of an external aluminium louvre, a high specification volume control damper and an internal grille, and are used to provide controlled fresh air during the day and secure night time cooling via cross flow and stack ventilation principles.

Depending on their location within a room, they can assist in stack, cross flow and single sided flow ventilation. The HTM will automatically control these additional vents and the vents can also be opened and closed manually via the system's control panel.

The system can be specified to suit glazed frames or fitted with a flange to suit wall openings.



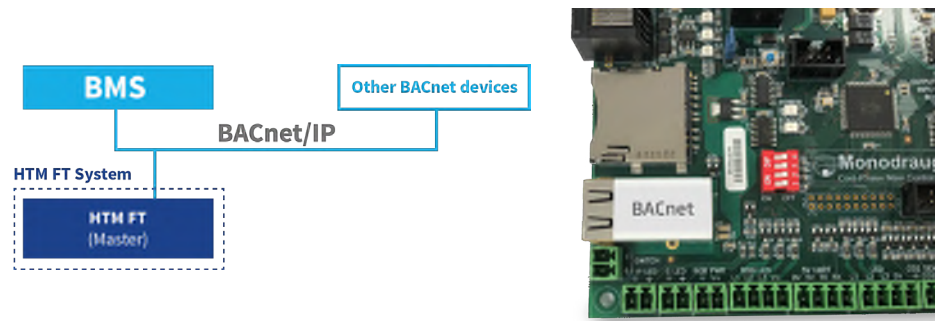


BACnet

Monodraught's HTM FT system is available with an additional BACnet module that allows the system to be installed on to a BACnet/IP network and display a number of systems variables.

The BACnet module plugs into the Control Board and interfaces with the on-board micro-controller to provide BACnet visibility of the HTM FT system.

The BACnet module requires an RJ45 Ethernet connection (by others) from the BACnet/ IP network to each Primary HTM FT unit.

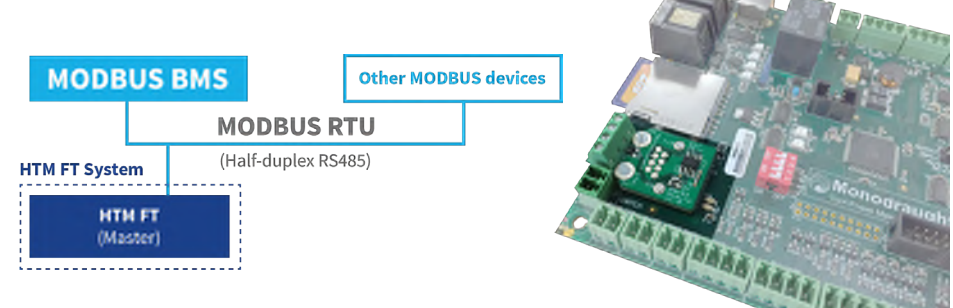



Modbus

The MODBUS module allows an HTM FT system to be installed on to a MODBUS RTU network and make visible a number of system variables to the master MODBUS device.

Each system has its own unique MODBUS number allocated 1 to 247 within the configuration header of the HTM FT.

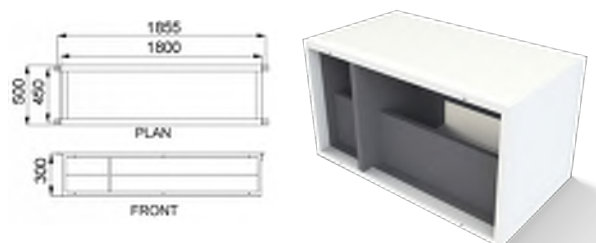
The MODBUS module requires a 1.5 or 2 pair shielded cable daisy chained between each of the Modbus modules located in the Master units. Cable is to be supplied and installed by others.



Attenuation Module

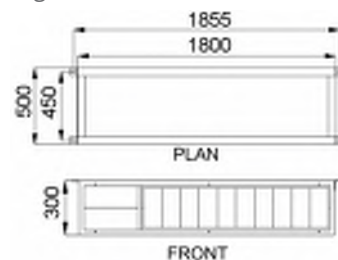
HTM systems are available with an additional Attenuation module. The module is installed between the HTM system and the external façade to reduce noise break-in and noise break-out. This is especially useful when installing a system to a façade close to a very busy road or in a residential area.

2 Internal Splitters							
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
6	5.8	8.7	14.7	21.8	23.5	27.1	29.3
Weighted Sound Reduction Index R_w (C:Ctr) = 19dB							



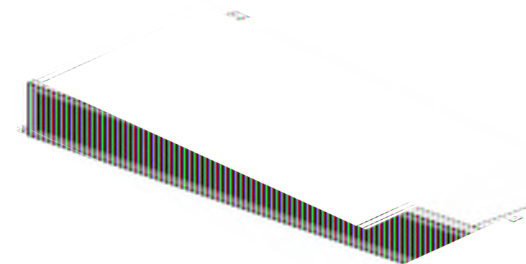
Filter Module

Monodraught's HTM FT system is available with an additional Filter module. The module is installed between the HTM system and the external façade. The filter module is available with either an EU-G4 or EU-F7 bag filter. It is constructed from a powder coated mild steel frame and specialist acoustic panelling.

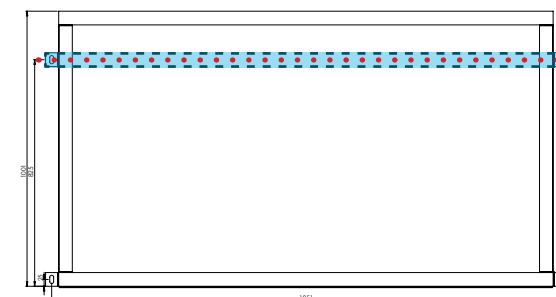


ADDITIONAL MODULES & FIXING METHOD

Fixing Rail



Note: Fixing rail to be located no less than 700mm from the front face.



We are
Pioneering British Greentech



www.monodraught.com
info@monodraught.com





Halifax House, High Wycombe
Buckinghamshire, HP12 3SE



+44 (0) 1494 897700



www.monodraught.com



info@monodraught.com

Follow us on:





Controls by Monodraught

iNvent 2 - Optional BACnet Module

The Monodraught iNvent 2 system is a Natural Ventilation management system for up to 4 zones. It utilises seasonally adjusted proportional control based on internal temperature and CO₂. With configurable sensor, strategy and actuator mapping via USB, as well as built in data logging, the iNvent 2 system can control Natural Ventilation systems to suit any building application.

The BACnet module allows an iNvent 2 system to be installed on to a BACnet/IP network and make visible all the inputs and outputs of the control panel.

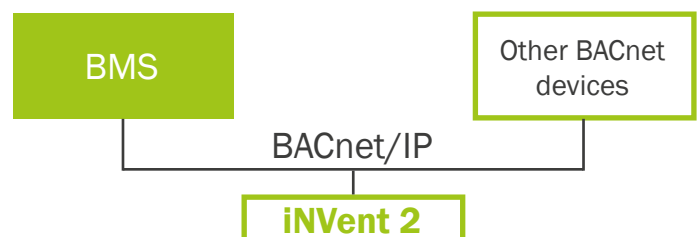


Technical Details

The BACnet module for iNvent 2 is a Cimetrics EasyBAC module based on a Lantronix XPort device. This module plugs into the iNvent 2 Control Panel and interfaces with the on-board micro-controller to provide BACnet visibility of iNvent 2.

Each iNvent 2 system has its own unique IP address on the BACnet/IP network.

The BACnet module requires an RJ45 Ethernet connection (by others) from the BACnet/IP network to the iNvent 2 Control Panel.



Wiring Requirements

10/100BaseT Ethernet connection (RJ45 Terminated, Cat5 or better rated cable)

BACnet Details

Device Objects

Object Name	Value
Vendor Name	Cimetrics
Vendor ID	14
Model Name	iNVent 2
Instance Number	<serial number of unit*>
Firmware Revision	<various>
Application Software Version	<various>
Database Revision	<various>
*Unless otherwise explicitly requested when providing IP details	

Binary Inputs

Object Name	Instance #	Description
Fire_SW_Open	49	Fire Switch Open
Fire_SW_Close	50	Fire Switch Close
Comp_SW_Open	51	Competition Switch Open
Comp_SW_Close	52	Competition Switch Close
Smoke	53	Smoke
Fire	54	Fire Alarm
Rain	55	Rain
Heat	56	Heating Interlock

Analogue Inputs

Object Name	Instance #	Description	Units
ID	1	Panel Serial Number	N/A
Year	2	Year	Years
Month	3	Month	Months
Day	4	Day	Days
Hours	5	Hour	Hours
Minutes	6	Minutes	Minutes
Global_Status	7	Global Status	N/A
Ext_Temp	8	External Temperature	°C
ZonaA_Status	9	Local Status Zone A	N/A
ZoneA_Temp_Avg	10	Temp. Average Zone A	°C
ZoneB_Status	14	Local Status Zone B	N/A
ZoneB_Temp_Avg	15	Temp. Average Zone B	°C
ZoneC_Status	19	Local Status Zone C	N/A
ZoneC_Temp_Avg	20	Temp. Average Zone C	°C
ZoneD_Status	24	Local Status Zone D	N/A
ZoneD_Temp_Avg	25	Temp. Average Zone D	°C
ZoneE_Status	29	Local Status Zone E	N/A
ZoneE_TempAvg	30	Temp. Average Zone E	°C
ZoneF_Status	34	Local Status Zone F	N/A
ZoneF_Temp_Avg	35	Temp. Average Zone F	°C
ZoneG_Status	39	Local Status Zone G	N/A
ZoneG_Temp_Avg	40	Temp. Average Zone G	°C
ZoneH_Status	44	Local Status Zone H	N/A
ZoneH_Temp_Avg	45	Temp. Average Zone H	°C

Analogue Outputs

Object Name	Instance #	Description	Units
ZoneA_Damper	11	Damper zone A	%
ZoneA_Louvre	12	Louvre zone A	%
ZoneA_Wall_Actuator	13	Wall Actuator zone A	%
ZoneB_Damper	16	Damper zone B	%
ZoneB_Louvre	17	Louvre zone B	%
ZoneB_Wall_Actuator	18	Wall Actuator zone B	%
ZoneC_Damper	21	Damper zone C	%
ZoneC_Louvre	22	Louvre zone C	%
ZoneC_Wall_Actuator	23	Wall Actuator zone C	%
ZoneD_Damper	26	Damper zone D	%
ZoneD_Louvre	27	Louvre zone D	%
ZoneD_Wall_Actuator	28	Wall Actuator zone D	%
ZoneE_Damper	31	Damper zone E	%
ZoneE_Louvre	32	Louvre zone E	%
ZoneE_Wall_Actuator	33	Wall Actuator zone E	%
ZoneF_Damper	36	Damper zone F	%
ZoneF_Louvre	37	Louvre zone F	%
ZoneF_Wall_Actuator	38	Wall Actuator zone F	%
ZoneG_Damper	41	Damper zone G	%
ZoneG_Louvre	42	Louvre zone G	%
ZoneG_Wall_Actuator	43	Wall Actuator zone G	%
ZoneH_Damper	46	Damper zone H	%
ZoneH_Louvre	47	Louvre zone H	%
ZoneH_Wall_Actuator	48	Wall Actuator zone H	%
Fault	57	Fault signal	N/A

Information Required – Static IP Address

We require a fixed IP address to pre-programme into the BACnet module prior to delivery, specifically the IP address, sub-net mask and default gateway of each system in IPv4 format.

This must be provided to Monodraught two weeks prior to delivery.

If an IP address is not provided by the client, the default range of 192.168.0.100 – 192.168.0.200 will be used, with a subnet mask of 255.255.255.0. The default gateway will also be set to 192.168.0.1.



Halifax House, High Wycombe
Buckinghamshire, HP12 3SE



+44 01494 897700



+44 01494 532465



www.monodraught.com



info@monodraught.com



Monodraught Ltd



@MonodraughtLtd @cool_phase



Monodraught Ltd



Established in
1974

HTM
HYBRID • THERMAL • MIXING • SYSTEM



Hybrid Thermal Mixing System (HTM)

Wiring Detail – Oval Wall Controller, Master, with LTHW Coil Module

**Halifax House, Cressex Road, High Wycombe,
Buckinghamshire, HP12 3SE**

Tel: +44 (0)1494 897700

Fax: +44 (0)1494 532465

Email: info@monodraught.com

Web: www.monodraught.com



HTM- Hybrid Thermal Mixing system

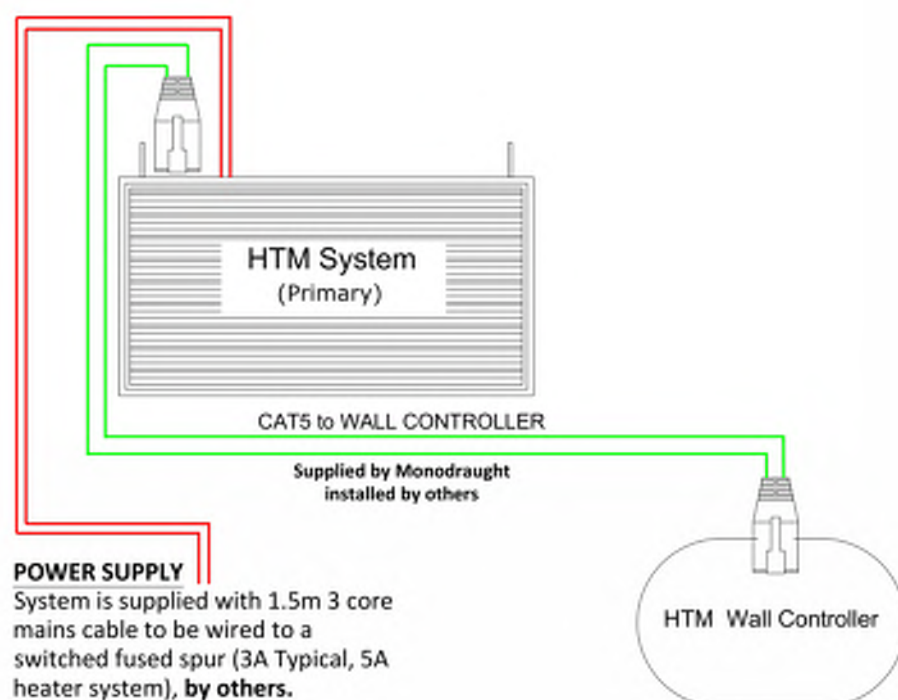
The **Hybrid Thermal Mixing (HTM)** system from Monodraught is designed to provide natural ventilation, hybrid ventilation incorporating mixed tempered air for winter periods with the ability to provide secure night time cooling and boosted levels of ventilation during summer. The system is designed to work in conjunction with natural ventilation provided by openable windows and can be used in single sided or cross flow ventilation strategies. The system comprises of an intelligent and fully automatic control system coupled with a low energy ventilation system which switches between operational modes dependant on season, external/internal temperature conditions and indoor air quality (IAQ).

The system has a 1.5m 3 core mains cable installed at manufacturing which is required to be wired to a 230V 3A (5A for heater version) wall socket or switched spur, by others. It also has an internal fuse and power switch (supplied in ON position). As standard the system will be supplied with a wall mounted controller featuring override controls, temperature and CO2 sensors, a CAT5 cable (for connection to the wall controller) and a 4 core cable for exhaust connections, where required. The system's auxiliary connections are terminated on the internal PCB and consist of (see page 2 for further details):

- System Enable Input - Normally closed volt-free contact required to activate normal operation
- Fault Output – Normally closed relay output for fault indication
- CAT5e Slave Connection – 2No. HTM units synchronised to work as a pair in a Master/Slave configuration in a single zone (15m CAT5e cable supplied by Monodraught)
- BACnet – Communications to BMS or similar – (optional, must be specified at order stage)

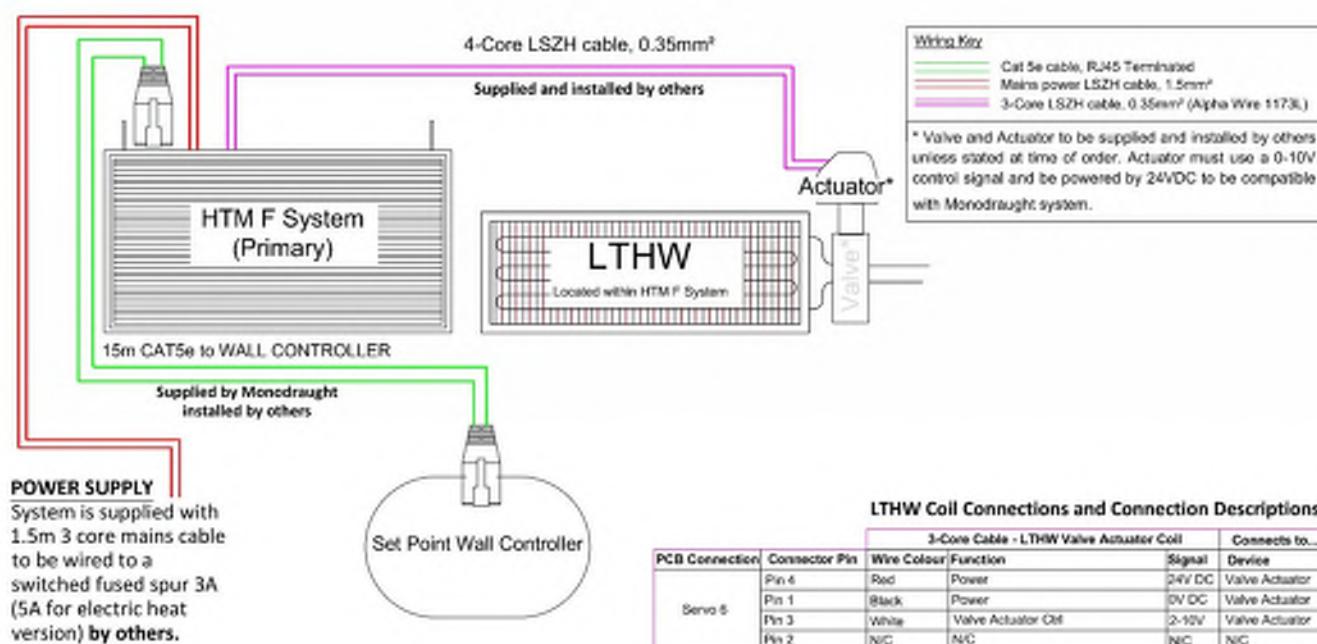
Please Note: All connections detailed within this document are to be carried out by others unless otherwise stated.

HTM Standard System Connections



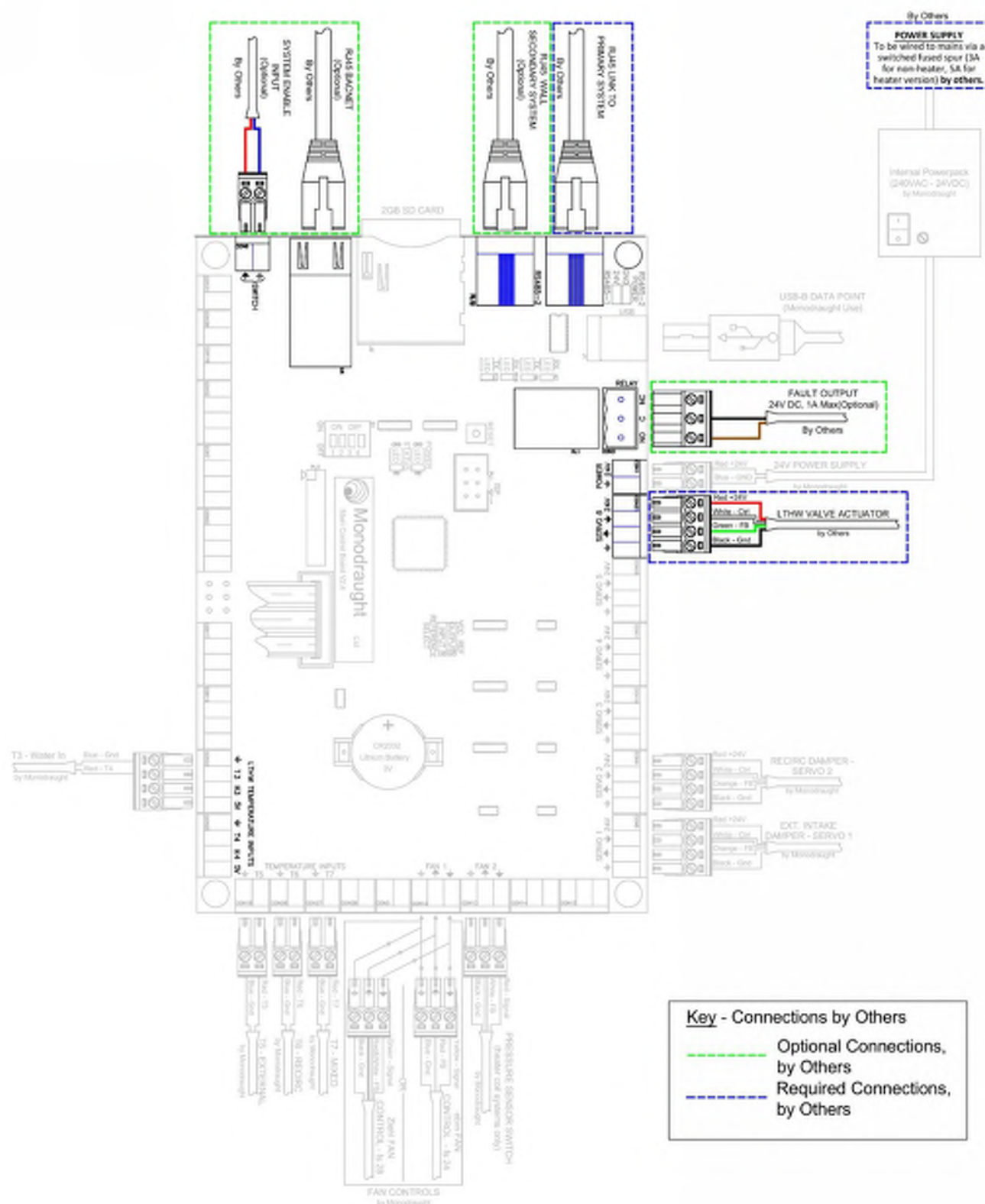
LTHW Coil Connections

(2 or 3-Way Valve 24VDC with 0-10V control required)



Auxiliary Connections

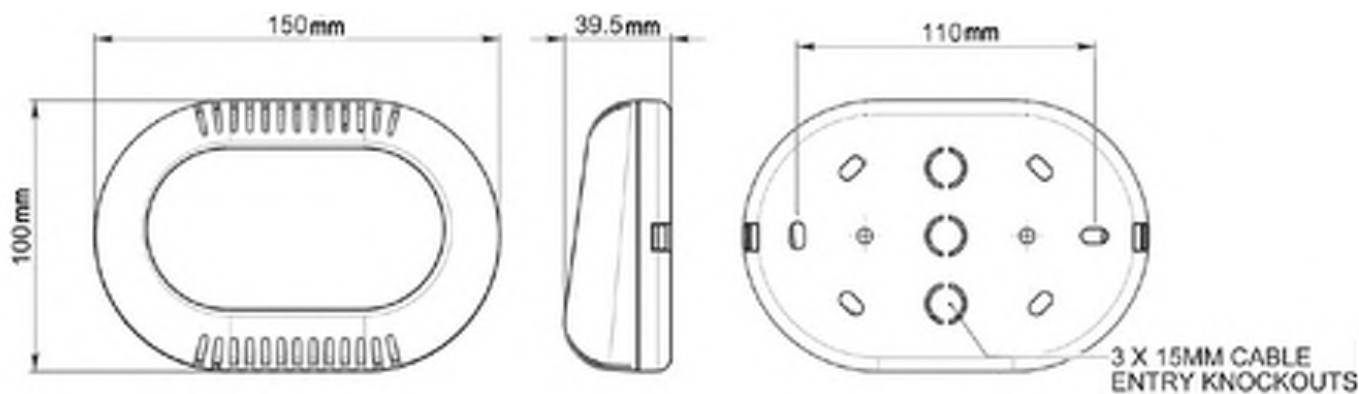
(to access PCB, remove HTM front grill and access panel)



Mounting Wall Controllers

HTM wall controllers are designed to be mounted within a zone and control up to 2 HTM units. Two version of the HTM wall controller are available, the Louvre Override and the Openable Window controller. Both wall controllers house a temperature and CO2 sensor allowing them to monitor the room conditions. They are to be installed and connected by others and are both installed in the same way, as follows:

1. Separate the two part casing by pressing the side clips in.
2. Screw the base plate to the wall ensuring that the Top arrow is pointing to the top.
3. Secure to the wall using a minimum of two fixings which should be horizontal and a distance of approximately 110mm apart.
4. Use the two screws supplied with the correct wall plug for the type of wall construction.
5. The controller should be mounted between 1.2 and 2.1m above floor level.
6. The controller contains a temperature sensor and care should be taken with the location to ensure that it is not mounted above a heat source, in direct sunlight or in an area where draughts may occur.
7. Connect the CAT5 cable, the cable can be routed through the back of the case.



Temperature Set Point Controller



Halifax House, High Wycombe
Buckinghamshire, HP12 3SE



+44 01494 897700



+44 01494 532465



www.monodraught.com
www.cool-phase.net



info@monodraught.com



Monodraught®
engineering delivered. naturally.

Follow us on:





HTM F with LTHW Heating Coil

General Description

The HTM LTHW Heating Coil is an innovative development to the HTM system. The low temperature hot water (LTHW) coil is encased with the HTMs casing and is installed directly over the supply opening of the system providing the primary heat source within the space removing the requirement for additional radiators. The system is designed to preheat the room before the occupied periods keeping noise to a minimum. The space is actively heated by recirculating room air through the HTM system which is then blown across the LTHW coil. The system is also able to directly heat fresh air and therefore actively ventilate the indoor space keeping CO2 levels to within a range of specific set points without chilling the occupants.

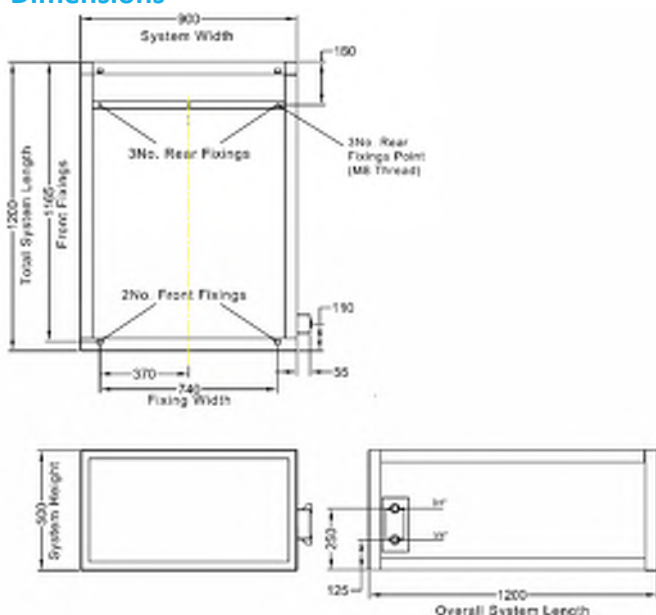
The system is designed to intelligently control an actuated valve (an actuated valve with 24DC (0-10V modulation) must be used) to ensure the space is not over heated and is programmed with active learning. The user is allowed control over the temperature (+/- 2°C from set point) and fan speed within the space via the Wall Controller. The system is easily connected into the buildings heating system via the two male connections (3/4" BSPT).

Specification

HTMF LTHW Fan Speed	Airflow (l/s)	Output (kW)	Air Off Temp (°C)	Max. Water Flow (m³/h)	Recommended. Water Flow (m³/h)	Coil ΔP (kPa)	Pipe Connection	Valve Type
3	188	6.3	45*	1.03	0.69	34.7	3/4"	2 Port
4	222	6.1	40*					
5	266	6.1	36*					
6	291	6.0	35*					
7	341	6.3	32*					
8	430	6.0	28*					

*Based upon 16°C air supply to system and 50°C water supply to coil.

Dimensions



Controls



Wall Controllers:

HTM LTHW heating systems must be used in conjunction with Monodraught Smart Screen or Oval Temperature Offset wall controllers. These controllers both allow the user to adjust settings such as fan speed and temperature in order to maintain a comfortable environment with minimal energy use.

The Smart Screen interface has the additional function of displaying the Room Temperature, Air Quality and Fan Speed.



Halifax House, High Wycombe
Buckinghamshire, HP12 3SE



+44 01494 897700



+44 01494 532465



www.monodraught.com



info@monodraught.com



Monodraught®
engineering delivered. naturally.

Follow us on:





Monodraught



WINDCATCHER®



NATURAL VENTILATION

Sustainable, low energy building ventilation



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2018



We are Pioneering British Greentech

We are pioneers in the design and manufacture of advanced sustainable ventilation, cooling, heating and lighting solutions for new and refurbished commercial buildings. We deliver outstanding temperature-control and indoor air quality whilst minimising the consumption of both electricity and refrigerants so as to reduce our carbon footprint. Monodraught have over 45 years' experience and our products have saved the equivalent of nearly 390,000 tonnes CO₂ over the last two decades, which is equivalent to over 3,534 million miles in a small car*.

Monodraught believe that every business has a responsibility to invest in local communities. We purchase over 85% of our materials from suppliers within a 100-mile radius and recycle where possible. Our caring team supports many charitable causes, and Monodraught are proud partners of the local mental health charity, Buckinghamshire Mind.



DESIGNED &
MANUFACTURED
IN BRITAIN

* Based on 110g CO₂ per mile emitted from a typical a small family car.

CONTENTS

Our challenge	3
About natural ventilation	4
Product range	5
Why choose natural ventilation?	7
Product features	8
Working every season	13
Key features	14
System options	15
Ventsair	16
No-leak guarantee	17
Case studies	18
Our sustainable product range	22
Monodraught: with you all the way	23

Awards & Accreditations

Trading for over 45 years, we are proud to be recognised with many awards.



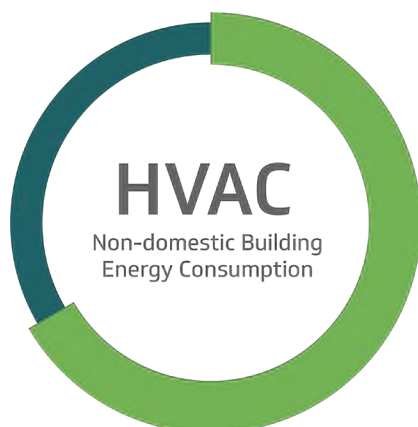
THE CLIMATE CHANGE REALITY

Greenhouse gas emissions continue to drive global warming and the five-year period to 2018 was the hottest ever recorded. The world is nearly one degree warmer than it was before widespread industrialisation, and the 20 warmest years on record have been in the past 22 years according to the World Meteorological Organization (WMO).

According to the Committee on Climate Change if the global temperatures rise by 2°C, around 2.6 million people in the UK will be impacted by the significant risk of flooding.

OUR CHALLENGE

The UK government has now legislated for net zero carbon by 2050. Here at Monodraught, we are fully committed to playing our part and live by our green principles.



Achieving net zero by 2050 will mean virtually eliminating emissions from the UK's building stock. According to BEIS, two thirds of the energy consumption from the 1.8 million non-domestic buildings in England and Wales was used to provide building services (heating, ventilation, cooling, hot water and lighting).*

Higher standards in design and construction are crucial to drive down carbon emissions. We must urgently transition to low energy ventilation, heating, cooling solutions and Monodraught are here to help.

*Source: BEES Executive Summary BUILDING ENERGY Nov 2016



ABOUT NATURAL VENTILATION

Natural ventilation supplies fresh air to a building or room by utilising the passive effects of wind speed or differences in internal and external air pressure. It is a sustainable, low carbon ventilation system that does not use fans or pumps making it extremely cheap to run whilst providing a comfortable and healthy indoor environment.

Monodraught first launched Windcatcher in 1991 and have been constantly innovating our concept for modern applications. In the last two decades nearly 27,000 Monodraught Windcatcher units have been successfully sold and installed in UK, France, USA and New Zealand.

WINDCATCHER SOLVES PROBLEMS

Early naturally ventilated buildings relied purely on a passive stack that acted like a “chimney stack” to exchange indoor and outdoor air. However, its effect was limited especially on peak summer days because the temperature in the passive stack has to be some 10°C above the room temperature, and often led to overheating.

Windcatcher is more than just a passive stack. Its unique design incorporates wind driven air intakes to generate a positive pressure in the room below, which together with temperature differences, assist the passive stack to exhaust the stale room air.

Best in class, Monodraught Windcatcher have an enviable reputation having performed consistently, effectively and reliably over the last 2 decades.



Windcatcher applications

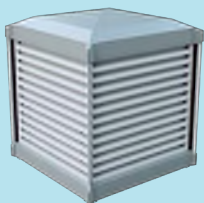
Windcatcher is the perfect solution for new or refurbished buildings that require the benefits of sustainable, low carbon and secure natural ventilation.

- School classrooms, dining rooms, science rooms
- Lecture halls and libraries
- Sports halls
- Offices and reception areas
- Visitor centres and restaurants
- Prisons



OUR NATURAL VENTILATION PRODUCT RANGE

X-Air



Windcatcher X-Air

Features our patented Activlouvre modulating aerofoil louvres. Also available with Ventsair cowl. Available in square only. Backed by a 10-year no leak guarantee*



Sola-boost X-Air

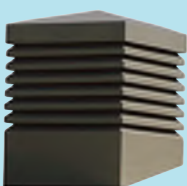
Enhanced with solar panels within the capping that power a fan within the central core.



Windcatcher Zero

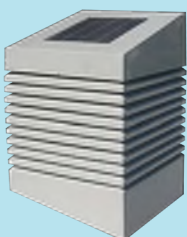
Incorporates an integrated 'Air to Air' core mounted heat exchanger technology and PV panels that power a boost ventilation fan. Similar in appearance to Sola-Boost X-Air.

Classic



Windcatcher Classic

The original sustainable natural ventilation system with motorised volume control damper and without mechanical fans. Internal dividers optimise the stack effect. Shapes: square, oval, rectangular, circular, heritage and bespoke. Backed by a 10-year guarantee*



Sola-boost Classic

The Windcatcher Classic is enhanced with solar panels within the capping that power a fan within the central core. The fan can be used both as boost ventilation or as an extract fan.

* T&C's apply

OUR VENTSAIR PRODUCT RANGE

Ventsair systems are mainly used to encourage cross flow ventilation within a room, usually where the aspect is too deep for openable windows or other wall openings to work efficiently.



Ventsair Façade (VAF)

Designed for façade installation. Comprised of an external aluminium louvre, a volume control damper and an internal grille.



Acoustic air transfer system

An internal wall mounted system that promotes cross flow ventilation within rooms to reduce heat build-up.



Roof Mounted Terminal

With similar external appearance to the Windcatcher Classic, the internal configuration has no internal dividers and simply acts as an intake or exhaust system. Available in square shape only.

WHY CHOOSE NATURAL VENTILATION

Advantages for Specifiers



Proven track record

Based on principles original used by the Persians and Arabians, Monodraught's Windcatchers have been in operation in buildings for over 20 years



Enhances your energy and carbon saving credentials

Ventilation with extremely low power consumption



Extremely quiet in operation

Since there are no fans and only small motors for the dampers, noise is not an issue



Easy to integrate

A wide range of enhanced types to suit every application

Advantages for Building Owners



Contributes towards sustainability targets

Low energy ventilation helps to achieve Regulations, BREEAM ratings and funding criteria



No running costs

Once installed, there are extremely low running costs over the life of the building (electrical consumption for controls and dampers only on certain models)



Easy to maintain

Since there are no moving parts, there is nothing to wear out or break down



Fast payback

Low energy costs with minimal maintenance requirements and long service life give an impressive payback which releases capital for other projects

Advantages for Contractors



Enhances your energy and carbon saving credentials

Low carbon ventilation with extremely low / zero energy consumption



Easy preparation

Simplified wiring



Robust and easy to install

Powder coated steel frame



Easy preparation

230V AC mains with switched fused is all that is needed for our commissioning team

Advantages for Occupants



Healthy indoor environment

Natural ventilation brings a steady supply of fresh air into the building, topping up oxygen levels, whilst at the same time expelling stale air



Quiet with no noise disruption

Minimum mechanical operation together with acoustic panels minimise daytime noise levels



Sustainable energy

Natural ventilation harnesses the wind and minimises impact on the environment



Easy to use

Simple control options provides occupant autonomy

WINDCATCHER X-AIR

Monodraught's patented Activlouvre® modulating aerofoil louvre technology combines a static external louvre and a modulating internal louvre. They work together to vary the opening and free area. Maximum ventilation rates are achieved when the louvres are fully open. Weather resistance is increased when they are partially modulated. Alternatively, they can be closed to prevent the ingress of precipitation.

External air catchment fins provide greater area at the louvre which improves performance in relation to wind speed. Pressure release vanes at the fins reduce face pressure during high winds.

With over 5,300 systems successfully installed, the Windcatcher X-Air is backed-up by our 10-year no leak guarantee*.

How does it work?

It doesn't matter which way the wind blows, the louvres always encapsulate the prevailing wind. The internal dividers split the system into four quadrants and turn the air movement down through 90 degrees. Stack effect is achieved as a result of the difference between the air temperature inside and outside of a building - and the subsequent imbalance effect on air density and pressure gradient of the internal and external air masses results in the warm air rising up through the quadrants, dispersing to the atmosphere.

* T&C's apply

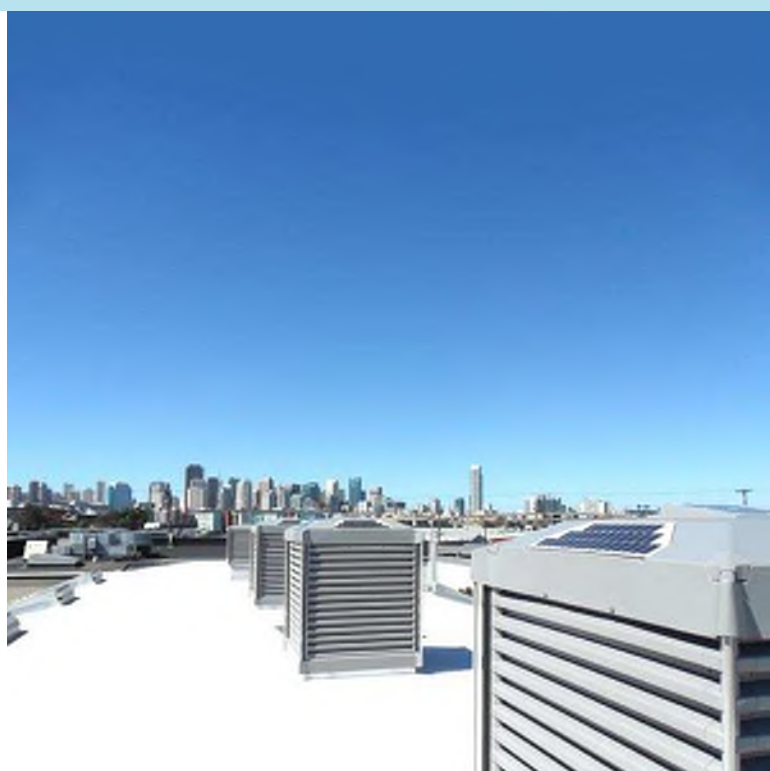


SOLA-BOOST X-AIR

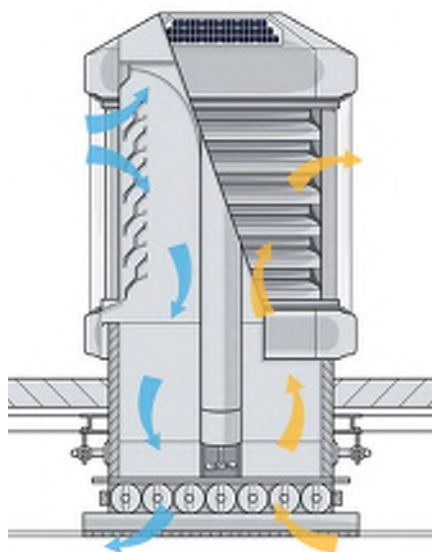
Solar-boost X-Air has an integrated DC solar powered fan and offers enhanced energy and carbon savings over Windcatcher X-Air with Monodraught's patented Activlouvre® aerofoil technology as standard.

During normal weather conditions, natural ventilation is provided without any energy consumption. During sunny conditions, a 40W solar PV module situated within the system capping powers the fan. Our patented LINC PowerTrack system delivers a smooth current to maximise the performance of the solar powered fan and increases the fan speed by up to 250%. Other features include external air catchment fins, pressure release vanes and optional solar powered architectural lighting.

Maximum efficiency can be achieved by ensuring the solar panel is installed south facing.



WINDCATCHER X-AIR & SOLA-BOOST X-AIR OPERATION MODES



Natural Ventilation

External temp $>15^{\circ}\text{C}$ and internal temp $>21^{\circ}\text{C}$ or $\text{CO}_2 >1000\text{ppm}$

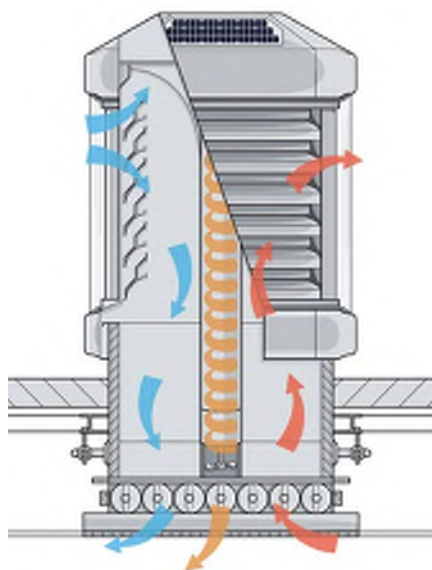
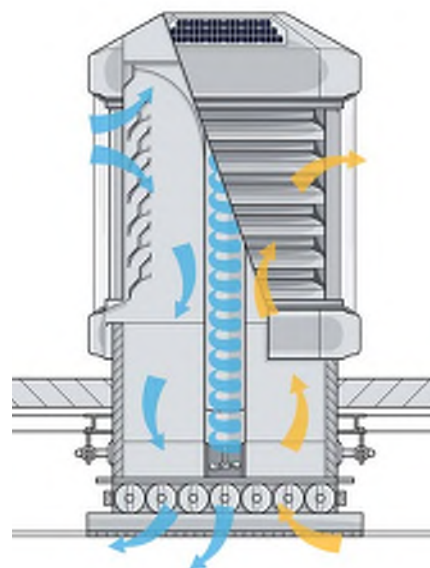
The X-Air Thermal Mixing Unit can provide natural ventilation through the buoyancy of the internal air and wind pressures exerted upon the system at roof level. Warm air is extracted through the leeward side of the system due to the negative pressure upon the roof terminal. Fresh air is entrained in the windward side.

Boost Fan

External temp $>15^{\circ}\text{C}$ and internal temp $>26^{\circ}\text{C}$ or $\text{CO}_2 >1400\text{ppm}$

The X-Air Thermal Mixing unit can supply boosted ventilation during daytime conditions, when the internal temperature is greater than 26°C to supplement natural ventilation and to ensure good internal air quality.

Additionally during summer time periods supplemented night time cooling can be provided.



Hybrid Thermal Mixing

External temp $<15^{\circ}\text{C}$ and internal temp $>22^{\circ}\text{C}$ or $\text{CO}_2 >1200\text{ppm}$

When the external air temperature is below the set point the X-Air Thermal Mixing Unit switches to thermal mixing operation. The hybrid fan is used to mix room air with ventilation air to provide tempered fresh air. Within the X-Air system louvres modulate restricting the level of natural ventilation with the resulting pressure differential forcing room air to mix within the central fan core.

WINDCATCHER ZERO

Our latest natural ventilation product provides exceptional comfort and energy consumption through a range of optimised heat recovery modes.

The new Windcatcher Zero provides natural ventilation with heat recovery technology using an integrated counterflow heat exchanger and a robust intelligent control strategy. The adaptive controls sense air quality in real time and seamlessly switch between energy efficient modes: natural, mechanical, and heat recovery ventilation.

The 60W solar PV panels run boost ventilation fans, and even during very low wind speed periods, ventilation requirements are achieved efficiently without consuming electricity. A volume control damper, inlet air filters and datalogging are provided as standard.

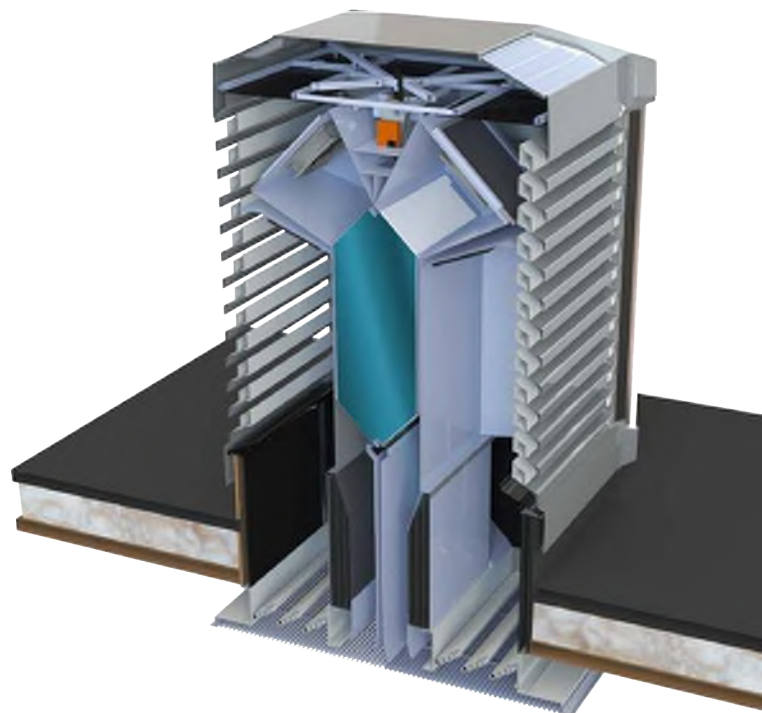
With Windcatcher Zero smaller and fewer heat emitters are necessary within the occupied spaces thereby reducing the size of the heat emitters required, reducing overall boiler loads, providing a net benefit in Part L calculations against conventional natural ventilation and minimising heating running costs.



How does it work?

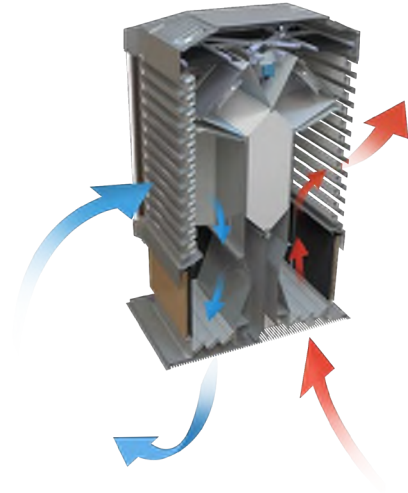
Windcatcher Zero utilises an integrated 'Air to Air' core mounted heat exchanger within the natural ventilation system and automatically varies between natural ventilation and heat recovery modes, or a combination as necessary.

During very hot summer periods, natural ventilation provides night time cooling to the internal spaces. During the following day, if the external inlet air temperature is higher than the indoor room temperature, the unique Windcatcher Zero heat recovery core is automatically activated to deliver cooler ventilation air and minimise the summer time room temperatures.



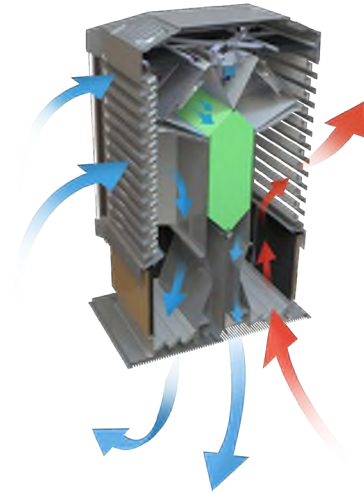
Patent Pending - 1917112.3

WINDCATCHER ZERO OPERATION MODES



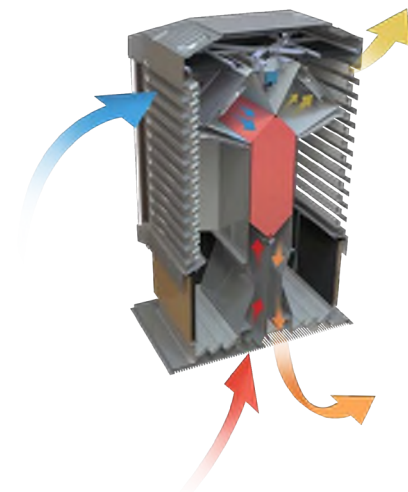
Natural Ventilation

The Windcatcher system encapsulates the prevailing wind, and turns that wind movement through 90° in to the space. Fresh air is brought into the room and stale air is expelled using the negative pressure on the leeward side of the Windcatcher as well as the buoyancy and stack effect of warmer air rising within the space.



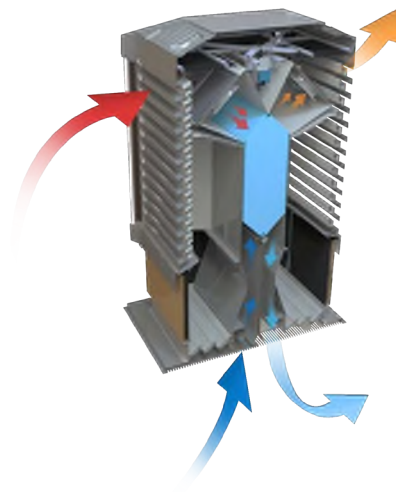
Boost Fan

Utilising the PV panels the Windcatcher Zero can provide a boosted ventilation rate without the use of grid power. This ensures that even when there are periods of very low wind speed the ventilation rates required are met.



Heat Recovery

To avoid cold draughts, when the temperature of the outside air is lower than the internal, the Windcatcher Zero can deliver tempered air via the 'Air to Air' heat recovery core. The counter flow core enables efficient exchange of heat from the stale exhaust air through an ultra-thin aluminium membrane. The high efficiency core and low power fans automatically minimises the heating requirements whilst optimising air quality.



Cool Recovery

The Windcatcher Zero can maintain a greater level of comfort conditions compared to conventional natural ventilation systems. To keep an internal space cooler during hot periods The Windcatcher Zero can cool the incoming fresh air by utilising the 'Air to Air' heat recovery core. The efficient recovery of cold from the exhausted air reduces room temperatures when compared to natural ventilation or reduces demand on auxiliary cooling systems.

WINDCATCHER

The original, sustainable natural ventilation system is a simple and effective design that provides fresh air during the day as well as night-time cooling.

It combines the benefits of both top-down and passive stack ventilation with very low electrical consumption by means of very low energy motorised volume control dampers.

The prevailing wind is encapsulated and turned down through 90°. Fresh air is brought into the room and stale air is expelled using the natural energy of buoyancy and stack effect common to all natural ventilation systems.

Available in a wide range of standard square sizes, as well as bespoke shapes to suit any project.

When enhanced with Monodraught's iNVent 2 control system and managed by our proven control strategy, it achieves temperature and CO₂ demand-controlled ventilation. External louvres are protected internally by Trilayer® Weather Protection.



SOLA-BOOST

This sustainable natural ventilation system is based on the original Windcatcher Classic. It uses no electrical energy and combines the benefits of both top-down and passive stack ventilation with a DC solar powered fan.

The unit is divided internally into four quadrants. The simple and effective design provides fresh air during the daytime as well as secure night time cooling.

The 40W PV solar module powers the fan can either bring fresh air from the outside or expel the stale air from the room. Our LINC PowerTrack control system delivers a steady current to maximise the performance of the solar powered fan.

This flexible system can be tailored to suit the needs of almost any application and has been proven in schools, colleges, healthcare environments and commercial properties.



WORKING IN EVERY SEASON



Natural Ventilation

Fresh air is brought into the room and stale air is expelled using the negative pressure on the leeward side of the Windcatcher as well as the buoyancy and stack effect of warmer air rising within the space.



Night-time and Mid-season operation

The Windcatcher will continue to operate during mid-seasons, in the evenings or at weekends, when the building is unoccupied, providing all the benefits of this “free air conditioning”.

In night-time cooling mode the system utilises cooler night-time air to remove heat from the fabric of the building and cool the room ready for the next day. Volume control dampers at the base of the system precisely control the amount of airflow through the system. If the internal temperature falls below 15°C the dampers automatically close to prevent over cooling.



Summer operation

In the summer months, warm air naturally rises to the ceiling and out of the system. At the same time, any prevailing wind carries a supply of fresh air down into the room below, slightly pressurising the building and increasing the outward flow of stale air.

Perimeter windows can be utilised to aid cross flow ventilation and provide fresh air coming on the windward side of the building. Stale air is exhausted through the passive stack element of the Windcatcher / Windcatcher X-Air.



Winter operation

Controls are essential to minimise ventilation heat loss. Insulated, fully modulating dampers together with the fully-automatic iNvent 2 control system linked to internal and external temperature and CO₂ sensors manage the internal heat gains and losses. This allows the system to continuously meet occupant loading without over ventilating an area, maintaining CO₂ levels in the 1000ppm to 1500ppm range.

To help ensure that the building structure is airtight, the Monodraught damper has a very low leakage rates of 2.76m³/hr/m² at 50Pa static pressure.

RANGE FEATURES LINE-UP

	Windcatcher X-Air	Sola-boost X-Air	Windcatcher Zero	Windcatcher Classic	Sola-boost Classic
Airflow Performance					
Natural Ventilation Mode	✓	✓	✓	✓	✓
Boost Ventilation Mode	X	✓	✓	X	✓
Heat Recovery Mode	X	X	✓	X	X
Cool Recovery Mode	X	X	✓	X	X
Acoustic Performance (Break through)					
Basic	✓	✓	n/a	✓	✓
25mm	✓	✓	n/a	✓	✓
50mm	✓	✓	✓	✓	✓
Features					
Activlouvres	✓	✓	✓	X	X
Supply Fan	X	✓	✓	X	✓
Extract Fan	X	X	✓	X	X
Automatic Fan Control	X	✓	✓	X	✓
Tri-Layer Protection	X	X	✓	✓	✓
Swept Dividers	✓	✓	✓	X	X
Heat Exchanger	X	X	✓	X	X
Composite Upstand	✓	✓	✓	X	X
Recyclable	✓	✓	✓	X	X
10-years No Leak Warranty	✓	✓	✓	X	X

Key features explained

- **Tri-Layer Weather Protection:** consists of the external louvre bank, rain trap louvre and internal fibre mesh that together protect against extreme conditions, such as snow.
- **Activlouvre:** weather resistant double-step louvre profile provides 25% more ventilation than a classic louvre profile. The modulating aerofoil louvre combines a static external louvre and a modulating internal louvre which varies the opening and free area. Provides maximum ventilation rates when fully open. Provides increasing weather resistance when partially modulated. Closes to prevent the ingress of precipitation. Comes with our unique no leak guarantee.
- **INVent 2:** A bespoke natural ventilation management system designed by Monodraught for up to 4 zones of terminals. Utilises our seasonally adjusted proportional control based on temperature and CO₂ levels.

SYSTEM OPTIONS

Shape Options

		Windcatcher X-Air	Sola-boost X-Air	Windcatcher Zero	Windcatcher Classic	Sola-boost Classic
Shape	Square	✓	✓	✓	✓	✓
	Circular/Oval	X	X	X	✓	✓
	Rectangular	X	X	X	✓	✓
Colour	Medium Grey (RAL 7037)	✓	✓	✓	✓	✓
	Light Grey (RAL 7038)	✓	✓	✓	✓	✓
	Any RAL or BS non-metallic	n/a	n/a	n/a	✓	✓
	Capping Colour	Any RAL or BS non-metallic				
Sizes		110, 140, 170, 200	140, 170, 200	170, 200	95, 125, 155, 185	95, 125, 155, 185

Control Options



Automatic: Provided as standard. These panels are controlled by either temperature and CO₂ sensors, depending upon requirements of each specific application.



Semi-Automatic: As automatic and also allows the end user to control the opening or closing the dampers using the push button overrides.



Manual: Allows the user to operate the manual dampers by a lever at veiling diffuser level.

Installation Details

	Windcatcher X-Air	Sola-boost X-Air	Windcatcher Zero	Windcatcher Classic*	Sola-boost Classic*
Terminal Weight	110 = 120kg 140 = 150kg 170 = 183kg 200 = 215kg	140 = 160kg 170 = 195kg 200 = 230kg	170 = 235kg 200 = 265kg	95 = 70kg 125 = 100kg 155 = 130kg 185 = 170kg	95 = 80kg 125 = 115kg 155 = 150kg 185 = 190kg
Maximum Pitch Roof	35°	35°	10°	60°	60°
Inspection and clean	Annual	Annual	Annual	Annual	Annual
Filter Inspection	n/a	n/a	6-Months	n/a	n/a
External Maintenance Checks	5 years	5 years	5 years	5 years	5 years

*Weights may vary depending on the roof construction and pitch.

VENTSAIR

Ventsair Façade ventilation system (VAF)

Is a high specification louvre system designed for commercial applications and comprises of an external aluminium louvre, a volume control damper and an internal grille. Two options are available.

- **VA38 External Weather Louvre** - a small format design used extensively in education and health facilities, and retail schemes. Designed to suit a variety of different building façades. Provides controlled fresh air during the day and secure night time cooling. The external weather louvre catches any prevailing wind, whilst still ensuring there is no weather ingress. The amount of air let into the room is determined by the motorised volume control dampers that ensure an appropriate level of room ventilation.
- **VA150/VA300 Sound Attenuating Louvre** - supplied in panel format, they can be powder coated in any BS or RAL colour. Suitable for acoustically sensitive applications, they have a deeper louvre profile specially designed to reduce noise entering the room. Manufactured from 2mm aluminium sheet with 120mm acoustic infill material.



Ventsair Acoustic Air Transfer system (ATS)

A patented internal wall-mounted attenuating air transfer system that promotes cross flow ventilation within rooms to reduce heat build-up and provide fresh air. Designed to maximise air flow and minimise sound transfer. Meets the requirements of both BB93 and BB101. Options include intumescent fire damper and volume control dampers.



Ventsair Roof Mounted system

This is simply an intake or exhaust system. Whilst it's appearance is similar to the Windcatcher Classic, it does not have internal dividers. Mainly used to encourage cross flow ventilation within a room particularly where the aspect is too deep for openable windows or other wall openings. The roof mounted terminal is usually located at the far end of the room to draw the air through the room and allow warm stale air to be exhausted via the passive stack method.



NO-LEAK GUARANTEE

Monodraught's patented Windcatcher X-Air natural ventilation systems benefits from a 10 year no-leak guarantee which applies to the following products:-

- Windcatcher X-Air
- Sola-Boost X-Air
- Windcatcher Zero

This unrivalled level of weather protection for a roof mounted ventilation system guarantees that Windcatcher X-Air units will not leak for ten years thanks to three unique layers of Activlouvre weather protection.

1. Monodraught's patented modulating louvre technology allows the weather resistance of the external louvre blade to be increased dependent on weather conditions, even when closed at roof level to prevent snow being blown through its open louvre arrangement.
2. The weather resistant double-step louvre profile provides 25% more ventilation than a conventional classic louvre profile.
3. A computer designed, profiled internal rain trap louvre is fitted as standard.

The Monodraught Windcatcher X-Air systems carry a 10-year installation guarantee and the systems' control actuators are guaranteed for five years. Full T&C's are available separately.



CASE STUDY

BOBBY MOORE ACADEMY



EDUCATION



NEW BUILD



Year of installation
2018

Location
Queen Elizabeth Olympic
Park, London

Architect
Penoyre and Prasad

Consultant
MZA Consulting

Main Contractor
Halsion

Installed Systems

Natural Ventilation
Windcatcher X-Air
Ventsair façade

Hybrid Ventilation
HTM F

Control Systems
iNVent 2

Greentech ventilation systems for innovative Secondary Academy

Opened in December 2018 next to the Olympic Park in London, this new Academy provides comprehensive education for 1,000 pupils.

The building was recently shortlisted for an Education Estates award in the “Project of the Year – School” category and was also highly commended in the “Civic Building of the Year – Education New Build” category at the SPACES award ceremony in 2019.

Sustainability was a core requirement of the construction project and designed to achieve a BREEAM Excellent certification. Alongside our low carbon natural ventilation solutions, other Green features included an in-situ frame

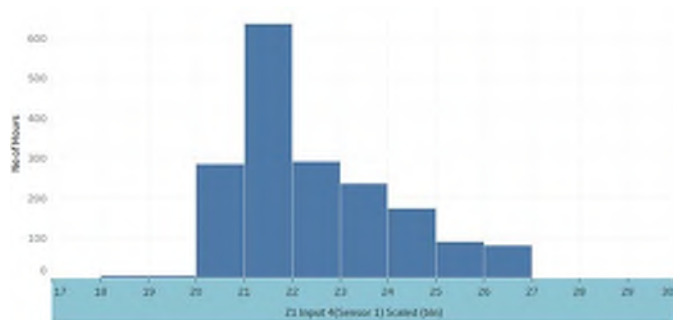
and flat slab containing 25% recycled materials that provides thermal mass to facilitates night time cooling.

Monodraught were specified due to being market leaders of hybrid ventilation systems. The school had natural ventilation systems installed from Monodraught; our Windcatcher X-Air natural ventilation systems as well as our hybrid ventilation HTM F systems which are in use in teaching spaces.

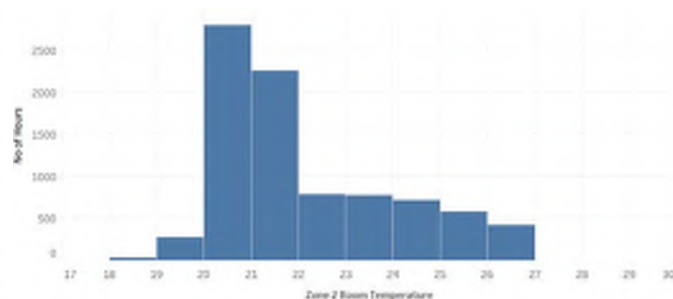
Temperature Overview

Temperature monitoring demonstrates how the natural ventilation system controls indoor air temperature.

Zone 1 Temperature Profile



Zone 2 Temperature Profile



Average Monthly Temperatures

January	February	March	April	May	June	July	August	September	October	November	December
21.11	21.72	20.79	21.94	22.09	23.44	24.87	24.65	23.81	21.77	21.05	21.72



CASE STUDY

LODDISWELL PRIMARY SCHOOL



EDUCATION



NEW BUILD



Year of installation
2019

Location
Kingsbridge, Devon

End User
Devon County Council

Architects
NPS Group South West

Construction
Midas Group

Installed Systems

Natural Ventilation
Windcatcher X-Air
Ventsair façade

Control Systems
iNVent 2

Award winning, innovative, zero-carbon primary school

Loddiswell Primary opened to staff and pupils in April 2018 after a re-build from an old site which no longer met the needs of the staff and pupils. The building thermal envelope was designed to be highly sustainable and the project included many sustainable elements, such as air source heat pumps, solar panels, natural daylight and Monodraught's natural ventilation systems.

Monodraught Windcatcher X-Air natural ventilation was specified as the best solution for this sustainable new school build. Our in-house design team modelled the building and selected the most energy efficient equipment to maximise comfort and minimise running costs.

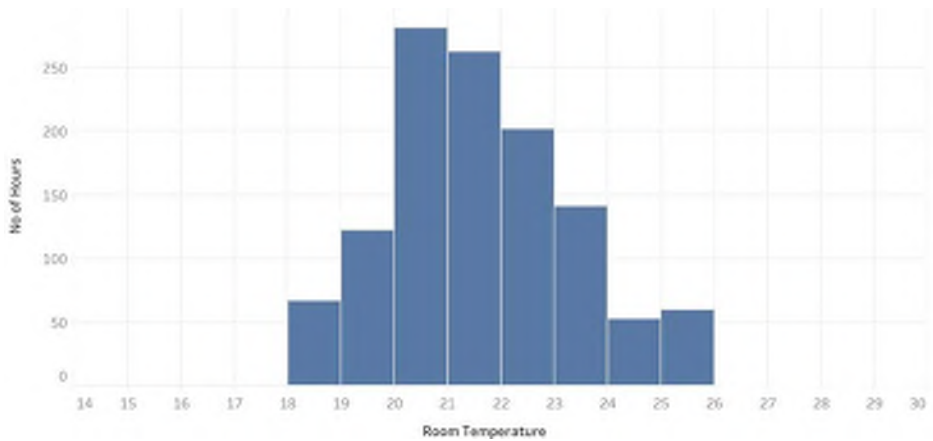
By installing our X-Air systems, the school benefits from natural fresh air and means staff and pupils enjoy a fresh environment throughout the day and avoid the typical afternoon attention

slumps when a room gets too “stuffy” or oxygen levels fall. We provide simple, user operated controls, optional data monitoring and low maintenance, minimising additional costs and unnecessary disruption in the school.

Sustainable features include PV panels which, together with the provision of air source heat pumps and fabric first approach mean that the building achieved an energy rating of A+ with a performance rating of -1. This indicates that the building has net zero carbon emissions and would usually export 1% of its total energy consumption to back to the grid. The unique design and sustainable features ensured that the building was a winner in the innovation category for The Society for Public Architecture, Construction, Engineering and Surveying (SPACES) award in 2019, after already being recognised with a gold award by the Devon Building Control Partnership.

Temperature Overview

Temperature monitoring demonstrates how the natural ventilation system controls indoor air temperature.



Average Monthly Temperatures

May	June	July	August	Septemb..	October	November	December	January	February
23.07	22.83	23.94	21.27	21.39	18.76	20.73	20.75	20.86	21.85



OUR SUSTAINABLE PRODUCT RANGE

Commercial buildings are utilised in many unique ways and it is essential to design ventilation and cooling strategies that match requirements. Choosing natural ventilation, hybrid ventilation and natural cooling low-carbon solutions and minimising the use of air conditioning is the logical way to meet environmental, sustainability and energy reduction goals. For applications requiring rapid indoor temperature control, sometimes air conditioning will be the most suitable option. By cleverly combining it with the Monodraught low carbon range, it is possible to achieve a balanced approach. Regardless which products are finally selected, Monodraught engineers can provide dynamic modelling and post occupancy monitoring to ensure that indoor comfort is achieved with minimal environmental impact.



A sustainable, low carbon ventilation system that supplies fresh air to a building or room by utilising the passive effects of wind. It does not use fans or pumps making it extremely cheap to run.

Natural Ventilation

Windcatcher®



Combines the benefits of natural ventilation with a traditional mechanical ventilation system to provide low carbon natural ventilation without pumps.

Hybrid Ventilation

HTM®



An innovative low-energy ventilation and cooling system that uses Phase Change Material (PCM) as a thermal energy store. Uses up to 90% less energy than equivalent conventional cooling systems, does not use refrigerants and has no compressors.

Natural Cooling

Cool-phase®
Cool-phase® Hybrid



Optimised climate control for sensitive applications. We are proud to be approved installers for Daikin, Mitsubishi Electric and Kaysun and these reliable systems are backed up with extended warranties.

Mechanical Cooling

Air Conditioning



Simultaneously supplies tempered fresh air whilst expelling stale air and recovering heat energy to temper incoming air. We provide the Mitsubishi Lossnay heat exchanger core which can be installed in exposed or concealed locations.

Mechanical Ventilation Heat Recovery

MVHR



Channels daylight to indoor areas for a more productive environment whilst reducing electrical lighting costs and carbon footprint. Uses a patented high impact Diamond Dome and a Super-Silver® mirror finished aluminium tube. Available in standard and bespoke.

Natural Lighting

Sunpipe®

Monodraught

WITH YOU ALL THE WAY

One home

Our Head Office in High Wycombe is home to our Sales, Design, R&D and factory teams, and is where our products are manufactured. Being located close together means our teams support you efficiently throughout your project.

Sales team

Our team works closely to support consultants, specifiers and contractors through the design and procurement process.

Building simulation

Monodraught and IES, have developed Performance Components which accurately model our products for heating and IAQ performance, as well as Part L and BREEAM compliance. Our in-house Project Design Engineers use advanced building modelling to propose the most energy efficient and low carbon solutions.

R&D and Manufacturing

Our teams continuously challenge boundaries and develops award winning products that deliver best in class solutions for our customers. By integrating advanced controls, our products deliver outstanding comfort with lowest possible running costs and highest possible carbon savings. We are accredited to ISO9001 quality management system and ISO 14001 environmental management system.

Turnkey installation and Commissioning

Our unique installation service is aligned to your construction programme and delivers over 85% of all Monodraught projects. Having received your order, our dedicated contract managers will coordinate with your programme. Our team of installers across England and Wales, and our partners in Scotland, Ireland and worldwide, visit your site ahead of installation to ensure smooth delivery. Pre-occupancy commissioning and Post Occupancy Evaluation (POE) monitoring ensure trouble-free operation.

After Sales

Our range of enhanced service and maintenance packages give peace of mind and ensure continuous operation. Through data monitoring, we can also provide ongoing analysis and assistance to optimise system performance for many years.





We are pioneers in the design and manufacture of advanced sustainable ventilation, cooling, heating and lighting solutions for new and refurbished commercial buildings. We deliver outstanding temperature-control and indoor air quality whilst minimising the consumption of both electricity and refrigerants so as to reduce our carbon footprint. Monodraught have over 45 years' experience and our products have saved the equivalent of nearly 390,000 tonnes CO₂ over the last two decades.

Monodraught Ltd.

www.monodraught.com
info@monodraught.com
01494 897700

Halifax House, Halifax Road, High Wycombe,
Buckinghamshire, HP12 3SE, United Kingdom

NVPB/06.2020



This publication provides information only and does not constitute an offer binding upon Monodraught Ltd.
The content of this publication has been compiled to the best of Monodraught's knowledge. No express or implied warranty is given for the completeness, accuracy, reliability or fitness for particular purpose of its content and the products and services presented therein. Specifications are subject to change without prior notice. Monodraught Ltd. explicitly rejects any liability for any direct or indirect damage, in the broadest sense, arising from or related to the use and/or interpretation of this publication.
All content is copyrighted by Monodraught Ltd.



No Leak Guarantee



WINDCATCHER X-AIR

Natural Ventilation

We promise **your WINDCATCHER X-Air natural ventilation system will not leak for 10 years from the date of commissioning.** Monodraught backs up this promise with a **full 10-year product guarantee.** These patented systems offer unrivalled levels of weather protection.

The WINDCATCHER X-Air has unique layers of weather protection:

1. ACTIVLOUVRE® modulating louvre technology allows the weather resistance of the external louvre blade to be increased dependent on weather conditions and even closed at roof level to prevent snow being blown through an open louvre arrangement.
2. ACTIVLOUVRE uses a weather resistant double step louvre profile whilst **providing 25% greater levels of ventilation** than a conventional Classic louvre profile.
3. Computer generated design of profiled internal rain trap louvre is fitted as standard.

Monodraught is certified under **ISO 9001** quality standards and **ISO 14001** environment standards, and the WINDCATCHER X-Air systems carry a 10 year-product guarantee and a 5 year guarantee on control actuators.

This Guarantee is in addition to your statutory rights and is transferrable to any future owner of your building provided that you have paid for the systems.

Please see overleaf for details of our guarantee conditions.



Monodraught

No Leak Guarantee

WINDCATCHER® X-Air - Natural Ventilation

Terms & Conditions

The 10 year Guarantee period becomes effective from the date commissioning is completed.

Monodraught shall not be liable if the control system or associated controls strategy employed have not been either supplied or approved by Monodraught. In any event Monodraught will not accept any liability in any form arising from failure of any control system not provided by Monodraught.

Commissioning must be carried out by Monodraught or an approved agent of Monodraught. In instances where the controls system and associated strategy are provided by others, joint commissioning is required.

The Guarantee is subject to the WINDCATCHER X-Air systems and associated controls being serviced and maintained in accordance with Monodraught's operating and maintenance instructions, which must be performed within the specified timescales.

Original commissioning reports and subsequent service records are required to validate this guarantee.

This Guarantee does not apply to any failure or defect caused by accidental damage, neglect, abuse, misuse, alteration, shipping damage, unauthorized repair or modification, or causes external to the product such as, but not limited to, power failure, power surges, or natural disaster.

The Guarantee is applicable to WINDCATCHER X-Air installations carried out by Monodraught Ltd, or an approved agent of Monodraught Ltd.