MRXBOX

Hybrid Cooling Systems

Sustainable Ventilation Solutions



PROUD TO BUILD BRITISH

UK MADE

We've been pioneers in new air technology since 1966. Our heritage is in the design and manufacture of fans and ventilation systems. We put our energy into efficient ventilation so you don't waste yours.

Pioneering
We lead the way in product innovation with a stream of ground-breaking products over decades.

Trusted
We have a reputation for our build quality. We establish long-term relationships and are always transparent with our test data.

Agile
We're one of the UK's leading manufacturers, covering both residential and commerical air quality. We offer innovative advice and provide flexible solutions.

Expert
Our team is made up of over 600 people, 50 of which have over 25 years' experience. We have the skills and knowledge to help find the best solution for our customers.

Attentive
We're expert listeners, rising to any challenge and going the extra mile for our customers. We add value by solving problems. We sell solutions, not fans.

Personal
We work closely with our customers and can provide bespoke solutions to meet their specific project needs. Many of our product ranges were developed this way.

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Nuaire

"Our expertise, experience and innovation are what makes us stand out from the rest of the market."

For help with selecting a unit, speak to us on **029 2085 8500** or email: **residential.enquiries@nuaire.co.uk**

UNDERSTANDING OVERHEATING

The tendency for new-build dwellings, especially apartments, to reach uncomfortable internal temperatures during summer is an increasing problem in need of a solution.

Daytime internal heat build-up leads to night-time temperatures too high for comfortable sleep, adding to heat stress and increasing the risk to health. Single-aspect dwellings with large glazing are particularly susceptible.

The move to ever higher levels of thermal insulation and airtightness, coupled with external factors such as environmental and noise pollution, make it difficult to control internal temperatures by natural means.

Overheating in apartments presents a challenge to developers and causes misery for occupants. As global temperatures rise, the problem will only get worse.



MRXBOX HYBRID COOLING SYSTEM

Internal temperatures targeted year-round by conventional MVHR, even those with summer bypass, can contribute to internal heat build-up in summer.

Nuaire's MRXBOX Hybrid Cooling System combines year-round high levels of indoor air quality with the added benefit of summer cooling to mitigate overheating.

This added cooling significantly lowers the temperature of fresh air supplied into the dwelling, helping maintain comfortable internal temperature levels even in city centre apartments on the hottest days of summer.

Product Benefits

All-in-One Solution
Unit that combines mechanical ventilation with heat recovery and cooling

Compliant with Industry Regulations
SAP recognised and meets Part F & L Building Regulations

Comfortable Living Environment
Improves indoor air quality and helps prevent condensation by keeping moisture levels low

Heat Exchanger
Heat exchanger is up to 95% efficient, resulting in low SPFs and a high SAP score

Summer Cooling
Significantly lowers the temperature of fresh air supplied into the dwelling



The continued drive towards highly insulated and better sealed homes with large areas of glazing has given rise to overheating in homes.

"This added cooling significantly lowers the temperature of fresh air supplied into the dwelling."

Facts & Figures

The continuing problem of overheating is well known throughout the industry. MRXBOX hybrid cooling helps provide a simple solution.

HOW NUAIRE'S MRXBOX HYBRID COOLING SYSTEM CAN HELP

The selection tables below provide typical cooling data based on sample conditions. For project specific information, contact one of our Estimators on **029 2085 8500** or email **residential.enquiries@nuaire.co.uk**.

29°C > External Air Temperature

Conditions	Cooling (kW) / Airflow Rates (l/s)	50	60	70	80	90	100	110	120
23°C Internal	Combined kW	0.88	1.03	1.17	1.29	1.40	1.49	1.57	1.62
	Supply air °C	14.3	14.8	15.2	15.7	16.2	16.7	17.2	17.8
24°C Internal	Combined kW	0.82	0.98	1.12	1.24	1.34	1.43	1.49	1.53
	Supply air °C	15.0	15.4	15.9	16.3	16.8	17.3	17.8	18.4
25°C Internal	Combined kW	0.80	0.95	1.07	1.18	1.27	1.34	1.39	1.43
	Supply air °C	15.5	15.9	16.4	16.9	17.4	18.0	18.5	19.1
26°C Internal	Combined kW	0.78	0.91	1.02	1.11	1.19	1.25	1.30	1.33
	Supply air °C	15.9	16.4	17.0	17.5	18.1	18.6	19.2	19.8

32°C > External Air Temperature

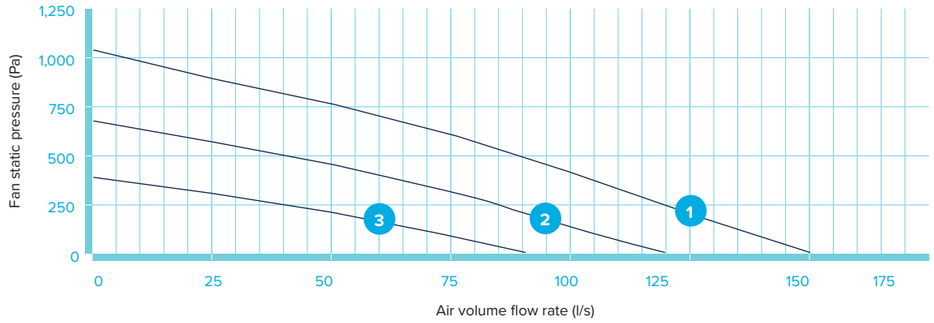
Conditions	Cooling (kW) / Airflow Rates (l/s)	50	60	70	80	90	100	110	120
23°C Internal	Combined kW	1.03	1.21	1.37	1.51	1.63	1.73	1.82	1.88
	Supply air °C	15.0	15.3	15.8	16.3	17.0	17.7	18.4	19.1
24°C Internal	Combined kW	0.98	1.14	1.29	1.42	1.54	1.65	1.74	1.82
	Supply air °C	16.0	16.4	16.8	17.2	17.8	18.3	18.9	19.6
25°C Internal	Combined kW	0.93	1.09	1.24	1.37	1.49	1.60	1.69	1.77
	Supply air °C	16.6	17.0	17.4	17.9	18.3	18.8	19.3	19.9
26°C Internal	Combined kW	0.88	1.04	1.19	1.32	1.44	1.55	1.64	1.72
	Supply air °C	17.3	17.7	18.1	18.5	18.9	19.3	19.7	20.2

34°C > External Air Temperature

Conditions	Cooling (kW) / Airflow Rates (l/s)	50	60	70	80	90	100	110	120
23°C Internal	Combined kW	1.13	1.31	1.49	1.65	1.80	1.94	2.08	2.20
	Supply air °C	15.4	15.9	16.4	16.9	17.4	17.9	18.4	18.9
24°C Internal	Combined kW	1.11	1.27	1.43	1.59	1.73	1.87	2.00	2.12
	Supply air °C	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5
25°C Internal	Combined kW	1.04	1.21	1.37	1.52	1.65	1.77	1.89	1.99
	Supply air °C	16.9	17.4	17.9	18.4	18.9	19.4	19.9	20.4
26°C Internal	Combined kW	0.97	1.15	1.31	1.45	1.57	1.68	1.77	1.85
	Supply air °C	17.8	18.3	18.8	19.3	19.7	20.2	20.7	21.2

Note: Typical External Ambient temperatures stated above are Dry Bulb. Combined kW = Combined Coolth recovery and sensible cooling. No allowance has been made for latent losses at supply air temperatures below the dew point. Consult Nuaire for cooling output data at your assumed external design conditions. A supply air temperature of 16°C or above is recommended for good air distribution.

Performance



Electrical and Sound Data

Cooling On

MRXBOXAB-ECO5-AECV WITH **MR-ECO-COOL-V**

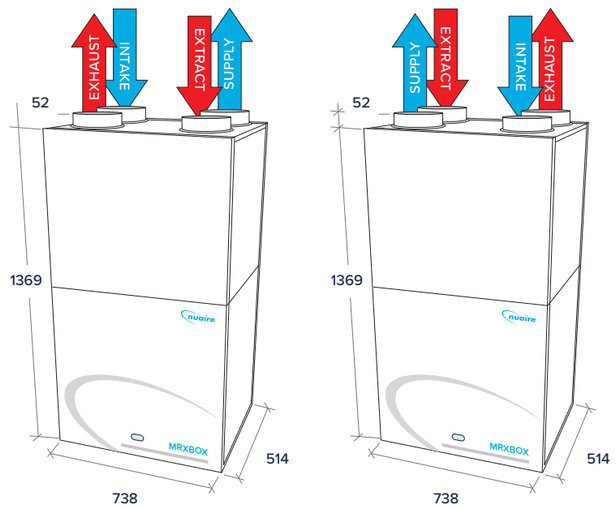
Curve	MVHR Power Consumption (Watts)		Sound Power Levels dB re 1pW (Frequency Hz) 63	125	250	500	1k	2k	4k	8k	Hemispherical dBA@3m
1	319	Breakout	66	65	56	52	39	35	29	21	36
		Open Inlet	58	58	58	53	49	38	30	24	
		Open Outlet	58	61	61	71	60	52	49	44	
2	167	Breakout	66	65	54	49	37	34	26	18	34
		Open Inlet	56	58	58	53	47	37	26	19	
		Open Outlet	58	61	61	71	59	52	48	43	
3	77	Breakout	65	65	54	45	34	30	22	<16	33
		Open Inlet	56	56	55	49	45	32	21	<16	
		Open Outlet	56	59	62	66	54	50	41	41	

Cooling module motor input power 650W. The above data refers to vertical units. Please contact Nuaire for performance data on the in-line version. The breakout case-radiated dBA values are given for Hemispherical free field radiation at 3m - to obtain the Spherical radiated data, subtract 3 dBA. Please note: Sound data is provided at a particular duty point, with the cooling module running at approximately 60%, 80% and 100%. For accurate sound data specific duty, please use Nuaire fan selector or call the office on 029 2085 8500.

Dimensions (mm)

SPIGOT CONFIGURATION SHOWN IS VALID FOR THE STANDARD HANDED UNIT

VERTICAL MRXBOX HYBRID COOLING SYSTEM



SPIGOT CONFIGURATION SHOWN IS VALID FOR THE OPPOSITE HANDED UNIT

MR-ECO-COOL-V
(Not handed. Rotated 180° depending on the handing of MVHR.)

Opposite hand MVHR
MRXBOXAB-ECO5-AEOHCV

Standard hand MVHR
MRXBOXAB-ECO5-AECV

Combined MRXBOXAB-ECO5-AECV and MR-ECO-COOL-V weight 118KG.

MRXBOX HYBRID COOLING SYSTEM CONSULTANT SPECIFICATION

The MVHR unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi-plate counter flow high-efficiency heat exchanger block, with a thermal efficiency of up to 95%.

▸ Specification

The heat exchanger shall be protected by filters on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance.

The unit shall have low energy, high efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C.

The unit shall be supplied complete with a condensate drip tray and 21.5mm drain connection.

The unit shall be suitable for 150mm circular ducting. The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.

The unit shall be provided within a white pre-painted or coated steel acoustic enclosure lined with a minimum of 20mm class ‘O’ acoustic foam insulation to reduce breakout noise.

Flexible duct connections shall be within the enclosure, pre-fitted between the MVHR unit and the connection spigots on the top face of the enclosure.

(Removing the need for flexible duct connectors outside of the unit which may cause breakout).

The MVHR unit shall be retained within the enclosure on a metal tray supported on turret type anti-vibration mounts of suitable deflection to ensure that vibration is not transmitted to the supporting structure.

All operational components of the MVHR unit shall be accessible via the front panel of the enclosure.

Bypass operation can be manually overridden via an external switch in colder months so the unit continually recovers heat.

The MVHR unit shall be offered with 2 years’ parts and labour from the date of delivery. The product warranty applies to the UK mainland in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

The Cooling module shall mount directly on-top-of, and operate in conjunction with, the MVHR unit. On/Off control of cooling and room temperature set-point shall be by adjustable wall-mounted cooling-stat. Control links between MVHR and cooling module shall activate a higher airflow when cooling is enabled and inhibit operation of the cooling module in the event of fan failure.

The maximum coolth-recovery and sensible cooling of the MVHR and cooling module, combined, shall be in excess of 2kW.

The Cooling module shall incorporate a sealed-for-life R134a cooling circuit and a double-skinned casing with class ‘O’ fire rated acoustic foam lining to minimize noise breakout.

Inner panels shall be thermally insulated to prevent condensation. The module shall have 150mm diameter circular duct connections.

The cooling module shall include an integral condensate tray and drain with a 15mm connection pipe. Condenser and evaporator coils shall be accessible for cleaning from the front of the unit, irrespective of orientation.

All maintainable components shall be accessible in situ. It shall not be necessary to remove or withdraw cooling components from the casing for cleaning.

The cooling module shall include a factory-fitted foam base gasket to effect an airtight seal between module and matching MVHR. The module shall be supplied with mounting brackets, to ensure that it is mechanically fixed to the MVHR and an upper restraining bracket to be fitted between the module and the wall.

The MVHR and Cooling module assembly shall be supported on a unit-specific floor-mounting stand, unit-specific prefabricated steel cantilever brackets or other suitable fabricated steel supporting frame.

The Cooling module shall be supplied with 2 years parts from date of delivery.

The product warranty applies to the UK mainland and in accordance with Clause 14 of our Conditions of Sale. Customers purchasing from outside of the UK should contact Nuaire International Sales office for further details.

NOTES

MRXBOX
INLINE CHILLED WATER COIL

The MRXBOX inline chilled water coil has been specially designed to complement the MRXBOX-ECO “SC” range of MVHR units and provide additional cooling to the supply airstream. The unit casing is manufactured from galvanized steel with thermal insulation lining. The unit is unhanded and unidirectional for the airflow, with bottom access for cleaning and maintenance.

- **Low Profile / High Output**
  Designed to deliver sufficient cooling to mitigate overheating on the hottest days of summer, whilst being shallow enough to fit in congested ceiling voids with other services.
- **Adaptable**
  One casing size with 3 variants of coil configuration cover a wide range of operating duties and chilled water temperatures. Performance is shown for typical airflows for overheating mitigation.



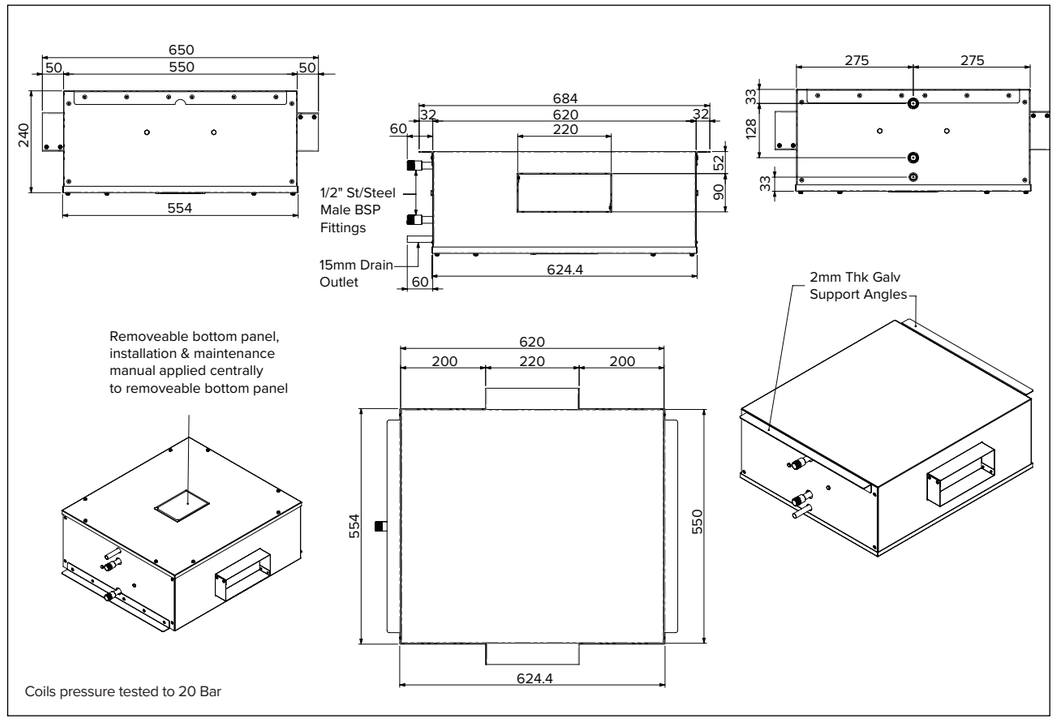
COOLING FIGURES

	Air L/S	Air Side			Water Side				Weight		Coil Model Reference
		Air Off DB°C	Air Off WB°C	Air Resistance Pa	Water L/S	Water PD kPa	Total Cooling kW	Internal volume L	Dry kG	Operating kG	
Centralised chilled water - Cascade heat pumps		15	14.03	23	0.076	7	1.92	0.96	19	20	MR-ECO-COOL-CHW1
	100	14	13.23	23	0.086	9	2.17	0.96	19	20	MR-ECO-COOL-CHW1
		13	12.38	23	0.096	11	2.43	0.96	19	20	MR-ECO-COOL-CHW1
		15	14.03	19	0.069	5	1.73	0.96	19	20	MR-ECO-COOL-CHW1
	90	14	13.23	19	0.078	7	1.95	0.96	19	20	MR-ECO-COOL-CHW1
		13	12.38	19	0.087	9	2.18	0.96	19	20	MR-ECO-COOL-CHW1
		15	14.03	16	0.061	4	1.54	0.96	19	20	MR-ECO-COOL-CHW1
	80	14	13.23	16	0.069	6	1.74	0.96	19	20	MR-ECO-COOL-CHW1
		13	12.38	16	0.077	7	1.94	0.96	19	20	MR-ECO-COOL-CHW1
		15	14.03	13	0.053	3	1.35	0.96	19	20	MR-ECO-COOL-CHW1
	70	14	13.23	13	0.06	5	1.52	0.96	19	20	MR-ECO-COOL-CHW1
		13	12.38	13	0.067	6	1.7	0.96	19	20	MR-ECO-COOL-CHW1
		15	14.03	10	0.046	3	1.15	0.96	19	20	MR-ECO-COOL-CHW1
	60	14	13.23	10	0.052	4	1.3	0.96	19	20	MR-ECO-COOL-CHW1
		13	12.38	10	0.058	5	1.46	0.96	19	20	MR-ECO-COOL-CHW1

Based on CHW 6/12°C on/off coil -Suitable for 7/13 or 8/14 with adjustment in water-side flow rate

	Air L/S	Air Side			Water Side				Weight		Coil Model Reference
		Air Off DB°C	Air Off WB°C	Air Resistance Pa	Water L/S	Water PD kPa	Total Cooling kW	Internal volume L	Dry kG	Operating kG	
Ambient loop systems - Localised heat pumps		15	14.28	28	0.088	11	1.84	0.96	19	20	MR-ECO-COOL-CHW1
	100	14	13.48	35	0.1	14	2.09	1.19	20	21.2	MR-ECO-COOL-CHW2
		13	12.62	35	0.112	20	2.35	1.43	21	22.5	MR-ECO-COOL-CHW3
		15	14.28	18	0.079	7	1.66	0.96	19	20	MR-ECO-COOL-CHW1
	90	14	13.48	29	0.09	12	1.88	1.19	20	21.2	MR-ECO-COOL-CHW2
		13	12.62	29	0.101	17	2.12	1.43	21	22.5	MR-ECO-COOL-CHW3
		15	14.28	15	0.07	6	1.47	0.96	19	20	MR-ECO-COOL-CHW1
	80	14	13.48	24	0.08	9	1.67	1.19	20	21.2	MR-ECO-COOL-CHW2
		13	12.62	24	0.09	14	1.88	1.43	21	22.5	MR-ECO-COOL-CHW3
		15	14.28	12	0.062	5	1.29	0.96	19	20	MR-ECO-COOL-CHW1
	70	14	13.48	16	0.07	7	1.47	1.19	20	21.2	MR-ECO-COOL-CHW2
		13	12.62	16	0.079	10	1.65	1.43	21	22.5	MR-ECO-COOL-CHW3
		15	14.28	9	0.053	4	1.11	0.96	19	20	MR-ECO-COOL-CHW1
	60	14	13.48	12	0.06	6	1.26	1.19	20	21.2	MR-ECO-COOL-CHW2
		13	12.62	12	0.067	7	1.41	1.19	20	22.2	MR-ECO-COOL-CHW2

Based on CHW 10/15°C on/off coil - For supply air temp <13 °C reduced water temp. req'd e.g. 9/14
N.B. On Coil conditions assume Circa 32°C external and a level of coolth recovery from MVHR giving On Coil Air Condition 27°C DB / 50%RH



INLINE CHILLED WATER COIL CONSULTANT SPECIFICATION

▸ Specification

The chilled water coil shall have an insulated casing manufactured from 1.2mm galvanised steel with 2mm galvanised steel support angles and integral condensate tray. It shall be lined with Flexitec-PN1/FR PVC nitrile Class O insulated foam. Cased coil shall measure maximum 240mm (H) x 684mm (W) x 624mm (L).

Flow and return connections shall be ½" BSP male threaded stainless steel fittings. Condensate drain connection shall be 15mm diameter. The casing shall incorporate 220x90mm rectangular spigots for connections to proprietary ductwork. The coil shall be factory tested to a pressure 20 Bar.

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