Breathing Buildings NVHR™ FX

Natural Ventilation with Heat Recovery (NVHR™) is the latest product from Breathing Buildings. The units are designed for offices and school classrooms, and are changing the way the industry thinks about Natural Ventilation.

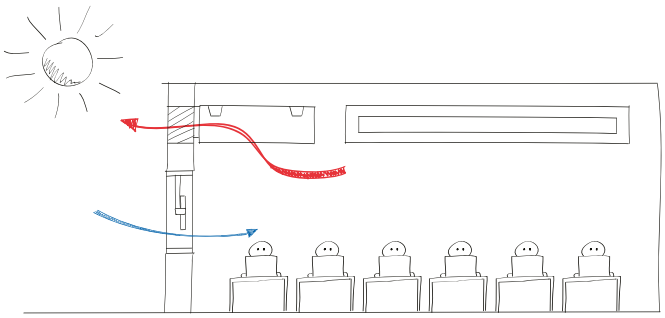
The patented mixing ventilation allows single sided, natural ventilation in deep plan spaces whilst making the most of internal heat gains to deliver superb thermal comfort. It is designed to meet the Department for Education “Guidance on ventilation, thermal comfort and indoor air quality in schools” and the Facilities Output Specification for the Priority Schools Building Programme. The unit is available in two variants with different fresh air flow rates.

- Can work individually or as multiples (typically a pair for a standard school classroom).
- System is ducted to the back of the space to provide a cross-flow system.
- Mounted horizontally or vertically.
- Manual control with 4-position switch or fully automatic with override.
- BMS interface option to report T/CO2 or allow set-point changes and enable / disable.
- Automatic units switch between winter mixing, natural and summer boost modes and include night cooling.
- Integrates with manual windows when it is above 16°C outside (see indicator light on illustration of user interface) or can control actuators on windows or dampers.
- In winter the units are using internal gains to temper incoming ventilation air, rather than a dedicated pre-heater, which will have significant impact in reducing heating sizing and energy consumption.
- In a modern, well insulated, building be it a classroom or well-occupied office environment, there is an abundance of heat when ventilation demand is at its highest, and these units capitalise on this.
- Can be used on noisy sites – a standard unit provides 26dB D_{new} attenuation as independently verified by SRL.
- Units can be exposed in a room or installed in a ceiling void.

Air Flow Strategies

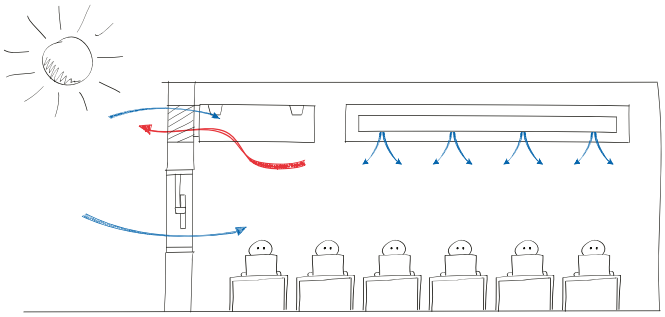
Natural mode

- Damper opens
- Single sided ventilation
- Works with other openings in the space



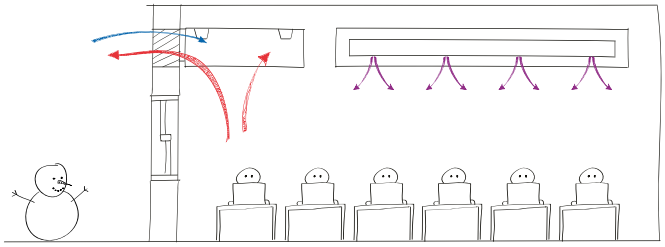
Summer Boost

- Damper opens fully
- Air delivered to rear of the space
- Natural exhaust through the unit
- Night cooling



Winter Mixing

- Draught mitigation strategy
- Mixes warm room air with fresh external air
- Natural exhaust through the unit



NVHR FX

Product Information

Features

- Lightweight, recycled plastic construction
- Low energy mixing fans to mitigate against cold draughts in winter
- Summer boost mode
- Night cooling mode
- Room temperature sensor with integrated CO_2 sensor
- Internal mixed air temperature sensor
- External temperature sensor
- Ready fitted mounting brackets
- Key switch for automatic operation; time override; long term off; test

Options

- Manual or auto control
- Integral control responds to environmental conditions
- Ceiling or wall mountable
- Weather louvre
- Additional sound attenuation for noisy sites through combination of acoustic louvres and internal baffles depending on site specific requirements
- Control signal for automated actuation of low level windows or dampers
- Traffic light indicator panel for window opening
- Modbus link for integration into wider Building Management Systems (BMS)
- Range of fresh air flow rates available

Installation and Control:

Ducting:

To meet the requirements of the Facilities Output Specification (FOS) for Priority School Building Programme (PSBP) we recommend units are fitted with fabric ducting or a diffuser grille arrangement to lower the air velocity. The unit is provided with a standard 250mm spigot for ease of installation.

Figure 1: Fabric sock ducting arrangement

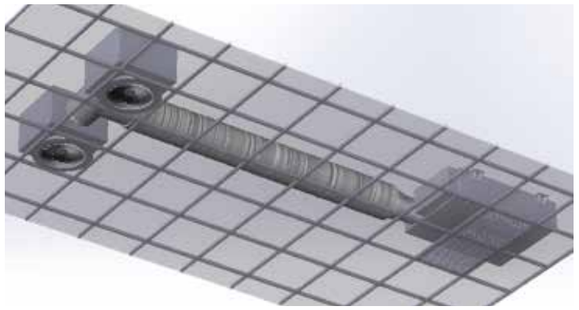
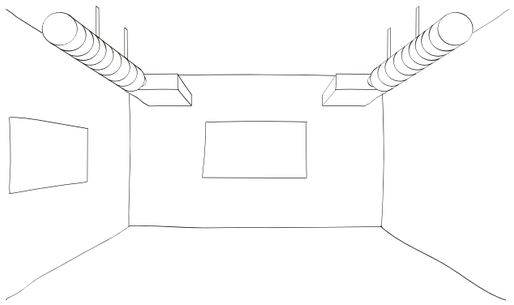


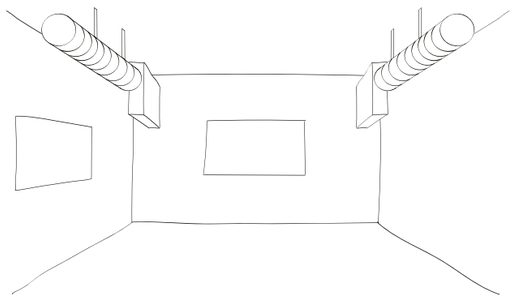
Figure 2: Typical diffuser grille arrangement above a suspended ceiling

In Room Operation:

In school classrooms units typically operate in pairs to provide 160 to 260 litres of fresh air per space and are installed in the façade of the building with ducting to the rear of the room:



The units can also be wall mounted:



Control Options:

The unit comes as standard with manual control which is operated by a 4 position switch provided with the system. For automatic control the system includes an in room temperature and CO_2 sensor and will respond automatically to the internal conditions using our NV Smart control system with additional functionality available through our NV Smart+ and NV Smart Connected controllers.

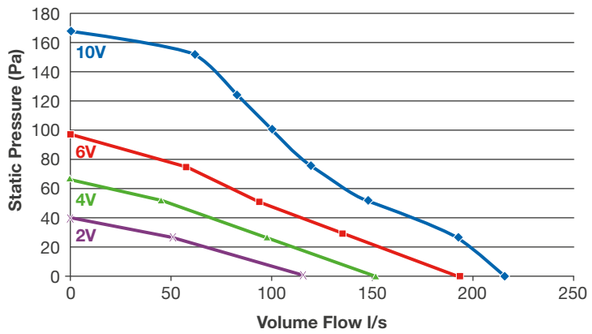
NV Manual	4 Position key switch operation	Winter Mixing and draught mitigation	
NV Smart	Room temperature / CO_2 sensor External temperature sensor	Secure night cool Summer boost	Winter Mixing and draught mitigation
NV Smart+	As above plus: Heating interlock functionality	Window signal LED Heating Control *	Purge *
NV Smart Connected	As above plus: BMS Interface		

*Additional charges

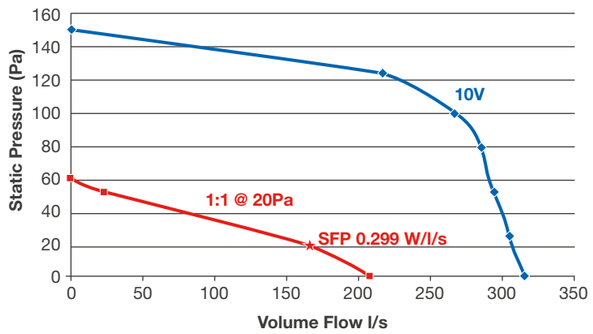
Technical Information:

Fan Pressure Curve for NVHR80

Summer



Winter

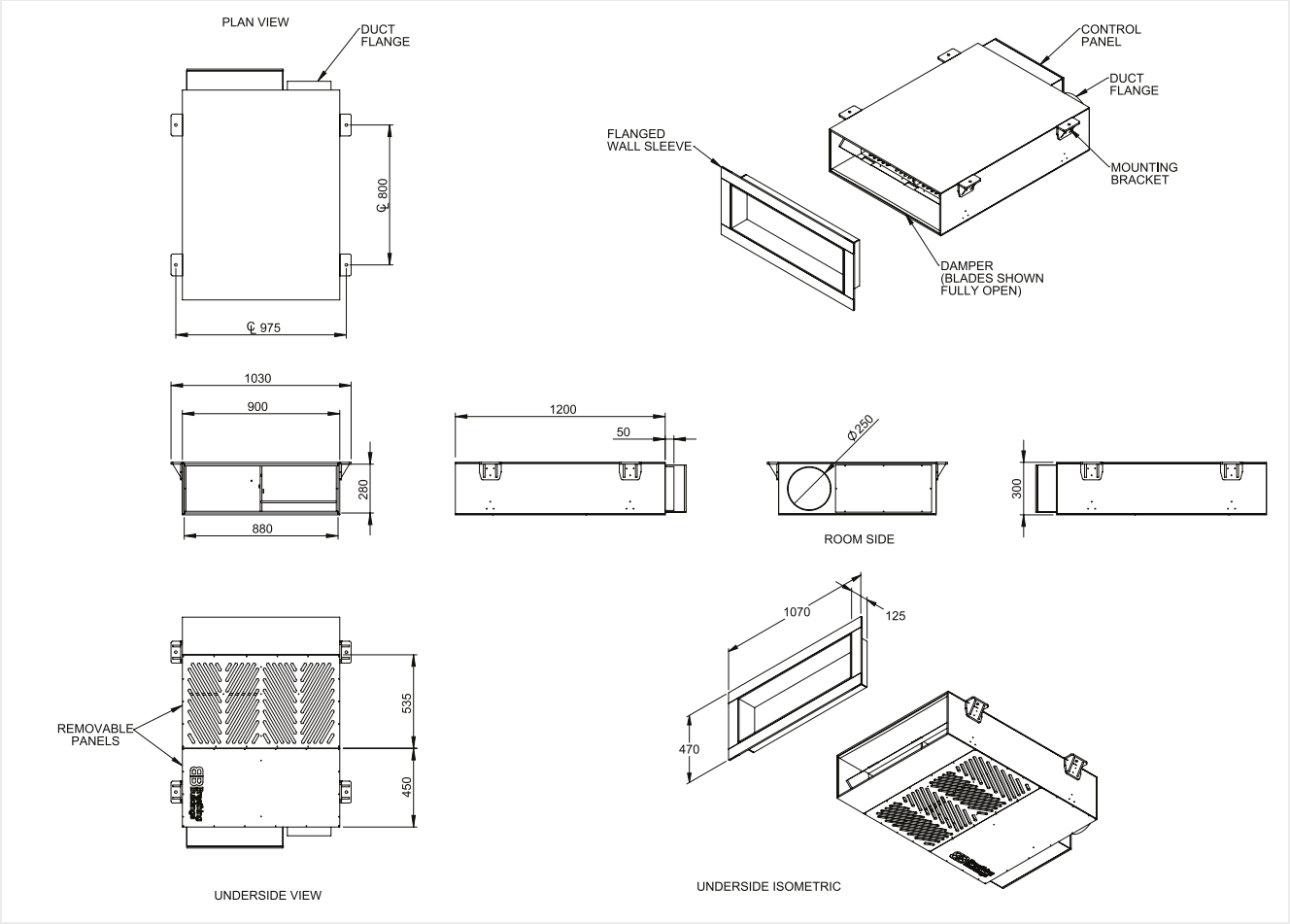


Electrical, Acoustic & Flow Rates

Unit	Mode	Fresh Air	Recirculation	Total Flow		Sound Power Levels dB								Free field dBA	Weight
		l/s	l/s	l/s		63	125	250	500	1k	2k	4k	8k	@3m	kg
NVHR 80	Summer	95	0	95	Breakout	42	44	34	27	21	19	17	20	14	45
					Duct discharge	43	44	41	36	24	20	20	23	19	-
NVHR 80	Winter	80	80	160	Breakout	47	47	38	34	26	22	18	20	18	45
					Duct discharge	46	47	44	38	27	22	23	23	21	-
NVHR 130	Summer	130	0	130	Breakout	58	57	49	38	37	29	23	22	27	45
					Duct discharge	47	52	49	41	35	31	29	26	27	-
NVHR 130	Winter	130	130	260	Breakout	58	57	49	38	37	29	23	22	27	45
					Duct discharge	54	55	51	43	41	34	32	27	29	-
Sound reduction through unit		26dB D_{new}													

Acoustic data obtained from Sound Research Laboratories

NVHR – FX Dimensioned Drawing



Dimensions	
H	300 mm
D	1,200 mm
W	900 mm
Weight	45 Kg

Figure 1:
Room interface

Illustrative System Schematic and Wiring