

BPS-ECO-HP
AHU WITH
INTEGRATED
HEAT PUMP
USING R32
REFRIGERANT

CONTENTS

3	ABOUT BOXER AHU RANGE
4	ABOUT BPS-ECO-HP
5	R32 REFRIGERANT
6	HIGH CLASSIFICATION LEVELS
8	FEATURES AND BENEFITS
10	INTEGRAL HEAT PUMP
11	HEAT PUMP CONTROLS
12	TECHNICAL SPECIFICATION
26	CONSULTANT SPECIFICATION

PROUD TO BUILD BRITISH

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 commercial 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.



For help with selecting a unit, speak to us on **029 2085 8200** or email: enquiries@nuaire.co.uk

ABOUT BOXER AHU RANGE

Nuaire has been at the forefront of packaged AHUs for decades, designing and manufacturing market-leading ranges.

When launched in 2000, Ecosmart Boxer revolutionised the industry by providing the best solution for performance and energy-efficiency; enhancing it further with Ecosmart 'plug and play' controls.

Our AHUs are manufactured in the UK and in state-of-the-art production facilities, then tested to ensure the high-quality standard and guaranteed on-site performance you'd expect from Nuaire.

BOXER BESPOKE



Cost-effective, tailor-made AHUs. Specifically designed around your project requirements by our dedicated team of engineers.

BOXER NEPTUNE



High-efficiency, mid-specification AHUs. Designed for projects where performance and efficiency are important, but cost is also a key driver.

BOXER BPS



Premium-packaged AHUs with high classification levels. Available in many configurations and with various controls platforms to suit all project types.



All Boxer units are manufactured in the UK.

ABOUT BPS-ECO-HP

BPS-ECO-HP is Nuair's range of packaged air handling units with an integral heat pump.

Integrating the heat pump into the BPS unit eliminates on-site refrigerant installation works, creating a system that is quicker to specify and install, and easier to maintain.

BPS-ECO-HP contributes towards net zero targets with its high efficiency and high specification levels. Choose BPS-ECO-HP to future proof your design.

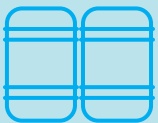
CODING B 07 T HP / CO - L C4

B 07 T HP / CO - L C4
 1 2 3 4 5 6 7

SAMPLE CODING

1. Boxer BPS
2. Unit Size (07, 12, or 17)
3. Thermal wheel heat exchanger*
4. HP - Heat pump only
EBU - Heat pump with electric back-up heater
5. Ecosmart Connect controls
6. L - Left-handed unit
R - Right-handed unit
7. Coastal application (optional)

*Please note: BPS-ECO-HP units are available with thermal wheel heat exchanger and Connect controls only.



DUAL COMPRESSORS

All BPS-ECO-HP units feature a dual compressor system.



SKID SYSTEM

Slide out for simple maintenance and commissioning checks.



ECOSMART CONNECT CONTROLS

Supplied as standard controlling supply and extract systems.



HIGH CLASSIFICATION LEVELS

Premium option with market-leading classification levels.

R32 REFRIGERANT

Nuaire’s goal when designing the BPS-ECO-HP range was to create a system with lower environmental impact. To help achieve this, we opted to use **R32 refrigerant**.

Each type of refrigerant has a Global Warming Potential (GWP) – a figure which allows us to compare the global warming impacts of different gases. The base is carbon, which has a GWP of 1.

As an example, R410A has a GWP of 2088. This means that if one kilogram is released into the atmosphere it would have 2088 times the harmful effect of one kilogram of carbon. By comparison, R32 has a GWP of only 675, making it much less harmful to the environment.

R32 is also a hydrofluorocarbon (HFC) refrigerant, which is part of a range of refrigerant gases developed to be more environmentally friendly compared to CFC and HCFC gases. As a result, R32 has an ozone depletion potential (ODP) of zero.

R32 provides a GWP three times lower than R410a



LOW GWP

GWP value of 675.



FUTURE PROOF

Ideal for the next generation of equipment.



COMPLIANT

F-Gas phasedown compliant.



EFFICIENT

Requires less refrigerant volume per kW.



SINGLE COMPONENT REFRIGERANT

Easier to reuse and recycle, inexpensive to produce.



SAFER

Low toxicity, classified A2L mildly flammable. Required monitoring fitted as standard.

Industry standards have moved towards acceptance of environmentally preferable flammable refrigerants. R32 as used in our BPS-ECO-HP range is classified as ‘mildly flammable’ with A2L designation. The stringent criteria imposed by BS EN 60335-2-40:2003+A13:2012 Household and similar electrical appliances. Safety. Particular requirements for electric heat pumps, air-conditioners and dehumidifiers have been fully implemented in the design and construction of this range.

HIGH CLASSIFICATION LEVELS

BS EN 1886:2007 'Ventilation for buildings — Air handling units — Mechanical performance' sets out the measurement and classification standard for AHUs.

The key criteria are:

- Air leakage [L]
- Thermal bridging [TB]
- Mechanical strength or deflection [D]
- Thermal transmittance [T]

All of these are measured and rated against tabulated values to give a grade, 1 being the highest in each classification.

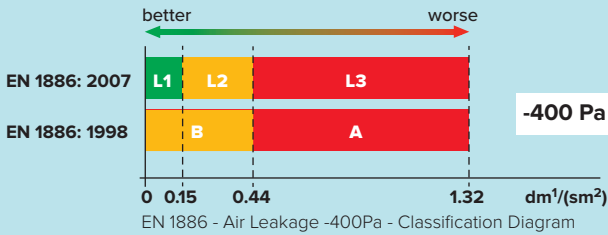


L1 CASING AIR LEAKAGE CLASS [L]

Our construction has passed positive and negative pressure tests, confirming L1 classification. L1 means that the unit shall not leak more than 0.22 l/s per m² of outer face area of positive pressure section and 0.15 l/s per m² of outer face area of negative pressure section, under test conditions. **BPS has a classification of L1.**

TB1 THERMAL BRIDGING OF CASING CLASS [TB]

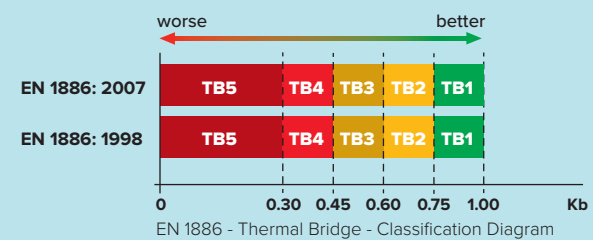
A high thermal bridging factor is achieved by separation of the conductive metallic internal and external surfaces, with an insulating material. This will provide a unit with the lowest 'condensation forming potential' and minimise the damage/hazards this may cause. **BPS has a classification of TB1.**



CASING AIR LEAKAGE @ -400 PA

Class	Max leakage rate (f_{700}) (l/s·xm ²)	Filter Class (EN 779)
L3	1.32	G1 to F7
L2	0.44	F8 to F9
L1	0.15	Superior to F9

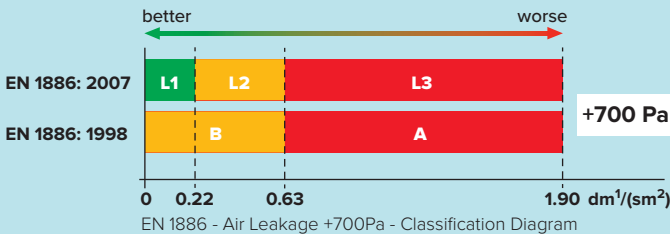
EN 1886 - Casing Air Leakage Classifications at Negative Pressure



THERMAL BRIDGING FACTOR

Class	Thermal Bridging Factor (k_b)
TB1	$0.75 < k_b < 1$
TB2	$0.6 < k_b \leq 0.75$
TB3	$0.45 < k_b \leq 0.6$
TB4	$0.3 < k_b \leq 0.45$
TB5	No requirements

EN 1886 - Thermal Bridge - Classifications



CASING AIR LEAKAGE @ +700 PA

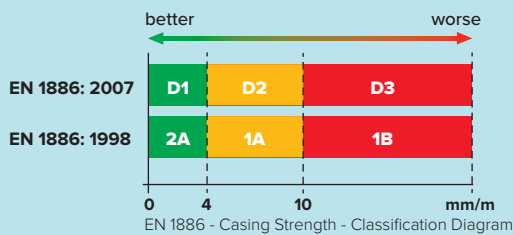
Class	Max leakage rate (f_{400}) (l/s·xm ²)	Filter Class (EN 779)
L3	1.9	G1 to F7
L2	0.63	F8 to F9
L1	0.22	Superior to F9

EN 1886 - Casing Air Leakage Classifications at Negative Pressure



D1 MECHANICAL STRENGTH OF CASING DEFLECTION [D]

The case strength of an AHU is important for product safety and longevity. If the case were unable to withstand the stresses applied to it in normal operation, air would eventually leak out, water may leak in, the unit aesthetic would suffer and damage may lead to malfunction or injury. D1 means the case shall not deflect more than 4mm per meter under test conditions. **BPS has a classification of D1.**



CASING STRENGTH

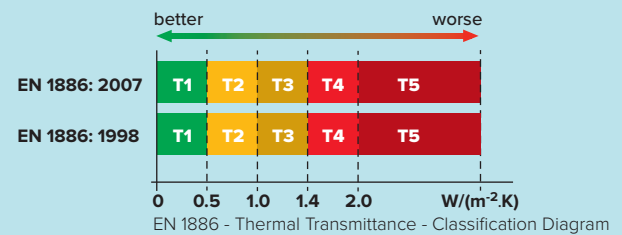
Class	Maximum relative deflection (mm x m ⁻¹)
D3	Exceeding 10
D2	10
D1	4

EN 1886 - Casing Strength - Classification Table



T2 THERMAL TRANSMITTANCE [T]

Minimising heat loss (or unwanted gain) requires insulation within panels and ductwork etc. Insulation choice is a balance of thermal transmittance, sound absorption, weight, cost and ease of manufacture. Thermal transmittance is rated as a 'U value' of W/m²/K and we have achieved T2 where this U value is below 1. **BPS has a classification of T2.**



THERMAL TRANSMITTANCE

Class	Thermal Transmittance (U) (W x m-2 x K-1)
T1	U < 0.5
T2	0.5 < U ≤ 1
T3	1 < U ≤ 1.4
T4	1.4 < U ≤ 2
T5	No requirements

EN 1886 - Thermal Transmittance - Classifications

APPROXIMATE CORRELATION BETWEEN EN779:2012 AND EN ISO 16890-1:2016

EN 779:2012	EN ISO 16890 - RANGE OF ACTUAL MEASURED AVERAGE EFFICIENCIES		
	Filter Class	ePM ₁	ePM _{2,5}
M5	5% - 35%	10% - 45%	40% - 70%
M6	10% - 40%	20% - 50%	60% - 80%
F7	40% - 65%	65% - 75%	80% - 90%
F8	65% - 90%	75% - 95%	90% - 100%
F9	90% - 90%	85% - 95%	90% - 100%

The BPS-ECO-HP range comes fitted with a coarse 65% (G4) pre-filter and ePM1 50% (F7) main filter on the supply, as well as a single bag filter ePM10 60% (M5) present on the extract side as standard.

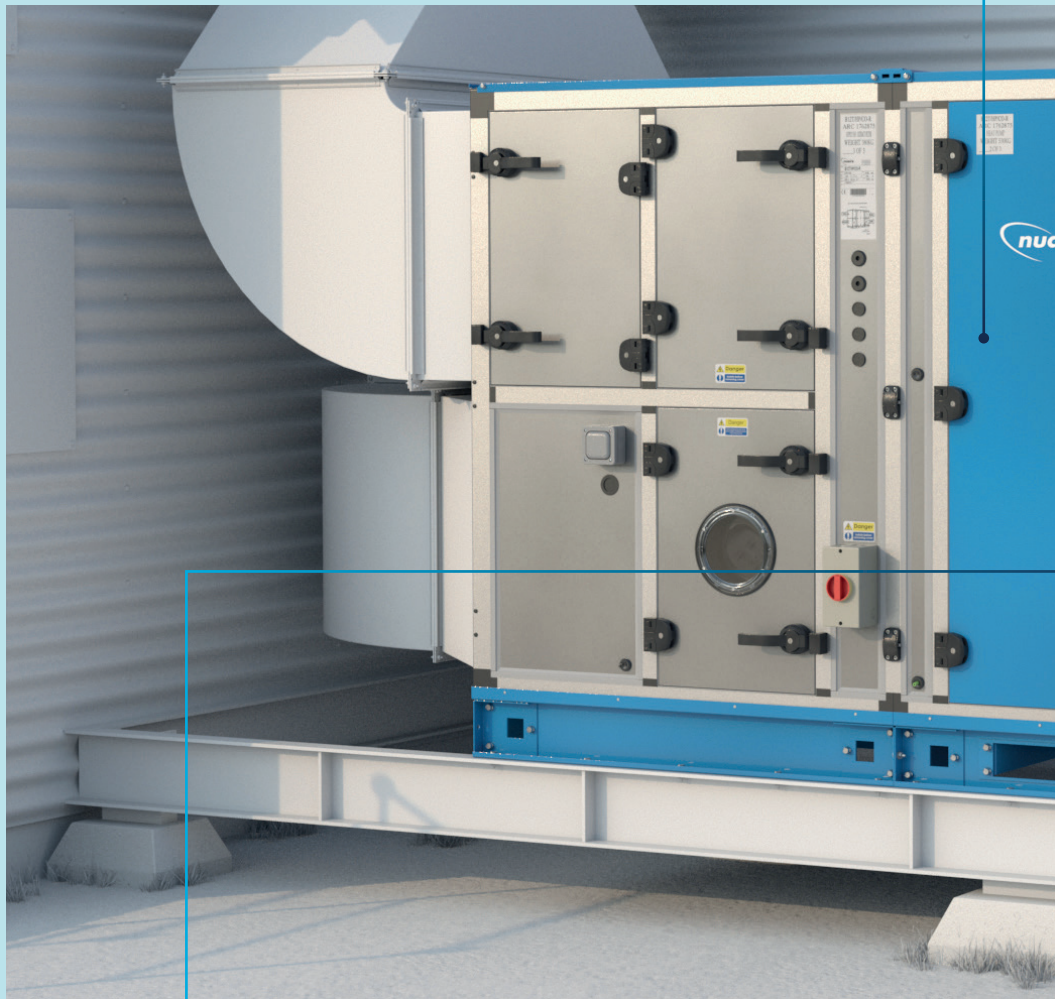
COMPRESSORS FEATURES



- **DUAL COMPRESSOR SYSTEM**
All BPS-ECO-HP units, from the smallest to the largest, feature a dual compressor system.
- **LOWER ENERGY CONSUMPTION**
A dual compressor system uses less energy than one large single system.
- **AUTOMATIC DEFROST CONTROL STRATEGY**
when the build-up of frost in the exhaust coil reaches a limit, the system will automatically warm to remove frost and ensure continuous ventilation.
- **LONGER LIFE SYSTEMS**
Duty share will prolong the working life of components.

REFRIGERANT FEATURES

- **R32 REFRIGERANT**
Only integral heat pump unit using R32 refrigerant for ultra-low SCOPs.
- **FUTURE PROOF**
Newest and most efficient refrigerant makes specifications future-proof.
- **GAS LEAK DETECTORS**
Units come with built-in gas leak detectors for added safety, requiring less inspection intervals.
- Assemblies are certified acc. to Modul A2 by **TÜV SUD BABT UNLIMITED** – Approved Body No. 0168 acc. to the UK Pressure Equipment (Safety) Regulation 2016 and by TÜV SÜD Industrie Service GmbH – Notified Body No. 0036 acc. to the European Pressure Equipment Directive 2014/68/EU.

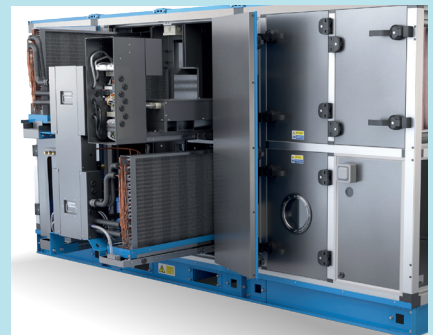


CONTROLS FEATURES

- **BUILT-IN ECOSMART CONNECT CONTROLS**
Provided as standard controlling the supply and extract system.
- **CAREL CONTROLS**
Heat pump controlled by Carel c.pCO controller.
- **INDEPENDENT SYSTEM CONTROLS**
Each system has its own independent PLC.



CONSTRUCTION FEATURES



CLASSIFICATION LEVELS

➤ **GUARANTEED HEAT RECOVERY**

Provides a failsafe should one compressor fail.

➤ **INCREASED CONTROL RANGE**

Provides improved turndown ratio and increased controllability as a result.



➤ **2018 ERP COMPLIANT**

➤ **L1 LEAKAGE**

➤ **TB1 THERMAL BRIDGING**

➤ **D1 DEFLECTION**

➤ **T2 THERMAL TRANSMITTANCE**



➤ **SKIDS**

Internal components mounted on skids for simple maintenance and commissioning checks, helping meet Part F.

➤ **PORT HOLE**

Allows for quick viewing of the fans from outside the unit without opening the door.

➤ **COMPACT SIZE**

Heat pump units are no bigger than standard BPS units.*

➤ **UNIFORM WARRANTY**

Enclosed system means all components come under a standard 5-year warranty.

➤ **CONDENSATE**

Units feature a built-in condensate drain.

➤ **THERMAL WHEEL**

Features a high-efficiency thermal wheel.

➤ **COASTAL**

Available as a standard option.

*With the exception of the size 7 BPS-ECO-HP which has a minor length increase when compared to a standard BPS unit.

INTEGRAL HEAT PUMP

An integrated heat pump within the heat recovery unit creates a sealed, simple solution with high performance and efficiency levels.



Each integral heat pump system is designed to recover and utilise heat from the exhaust air DX coil of the BPS-ECO-HP unit and transfer this heat energy via the refrigeration cycle to the supply air DX coil in heating mode.

Units are also reverse cycle, providing options for both heating and cooling. The heat pump system is installed between the thermal wheel. This design allows for improved efficiency.



LOW GWP

GWP value of 675.



FUTURE PROOF

Ideal for the next generation of equipment.



COMPLIANT

F-Gas phasedown compliant.



EFFICIENT

Requires less refrigerant volume per kW.



SINGLE COMPONENT REFRIGERANT

Easier to reuse and recycle, inexpensive to produce.



SAFER

Low toxicity, classified A2L mildly flammable. Required monitoring fitted as standard.

HEAT PUMP CONTROLS

CAREL

BPS-ECO-HP heat recovery inverter-driven heat pump systems use high efficiency Carel c.pCO controls.

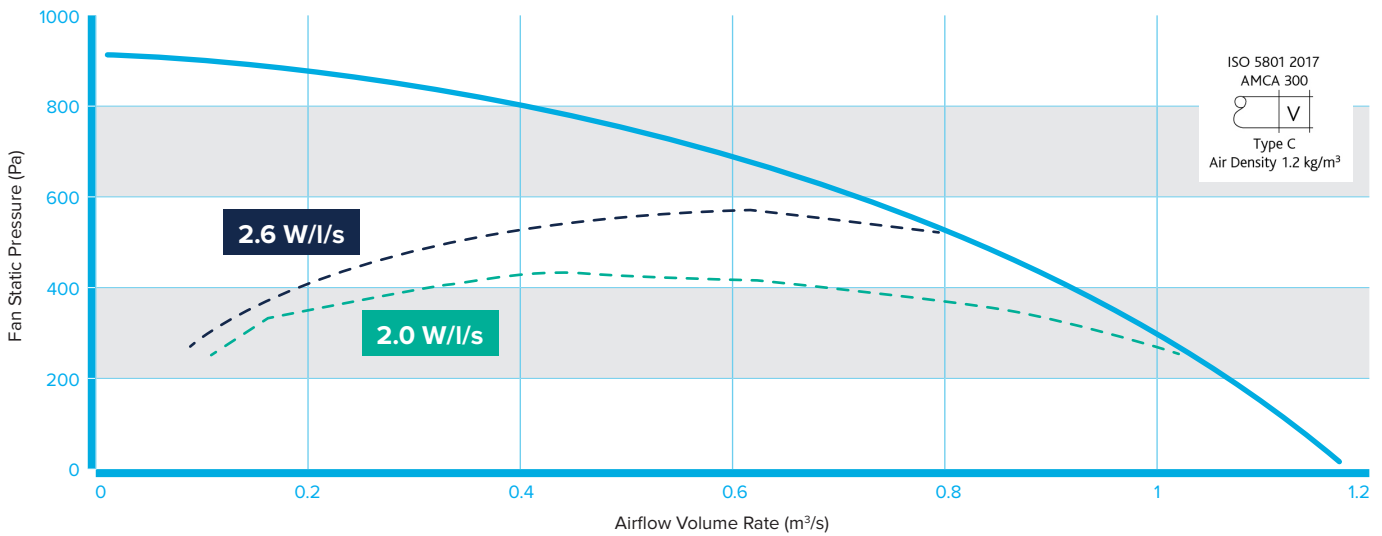
- ⌚ Embedded ExV energy-saving algorithms and driving smart devices.
- ⌚ Simple usability.
- ⌚ LCD with icons, languages options, customisable user interface, and easy wiring.
- ⌚ Third-party system interoperability.
- ⌚ Standard protocols (e.g. CAN, BACnet™).
- ⌚ Energy efficient providing improved cost savings.
- ⌚ I/O optimisation through universal channels and fast programmability during maintenance.



BPS-ECO-HP SIZE 07

PERFORMANCE, TECHNICAL INFORMATION & DIMENSIONS

PERFORMANCE



SOUND DATA

UNIT SIZE	TYPE	FREQUENCY (Hz)								dBA@3m (Casing Radiated)
		63	125	250	500	1000	2000	4000	8000	
Size 07	Open Discharge	68	66	73	75	80	79	76	73	41
	Open Intake	65	64	73	72	70	72	70	68	
	Open Supply	68	66	73	75	80	79	76	73	
	Open Extract	65	64	73	72	70	72	70	68	
	Breakout	68	57	63	56	53	45	39	28	

dBA-hemispherical free field radiation at a distance of 3m.

DIMENSIONS (mm)

UNIT SIZE	INTAKE/EXHAUST MODULE			HEAT PUMP/THERMAL WHEEL MODULE			SUPPLY/EXTRACT MODULE			OVERALL		
	L	W	H	L	W	H	L	W	H	L	W	H
Size 07	800	1330	1492	1350	1330	1492	1200	1330	1492	3350	1330	1492



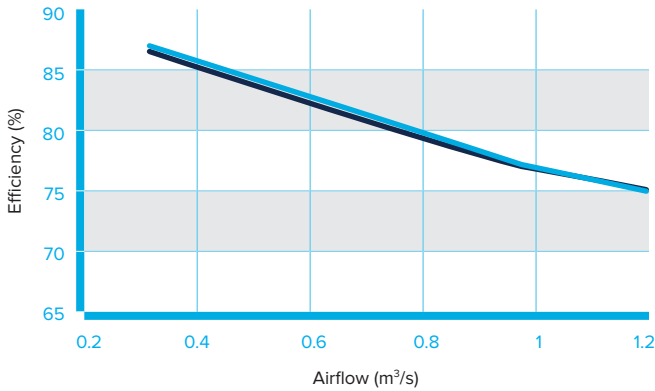
TECHNICAL INFORMATION

UNIT CODE	VOLT (V)	PHASE	FREQ (Hz)	FAN FLC (A)	HEAT PUMP FLC (A)	TOTAL UNIT FLC (A)	BACK-UP HEATER FLC (A) WITH INDEPENDENT ISOLATOR	MAX OPERATING TEMP (°C)	FAN SPEED (rpm)	UNIT WEIGHT (kg)	PACKAGED WEIGHT (kg)		
											INTAKE/ EXHAUST MODULE	HEAT PUMP/ THERMAL WHEEL MODULE	SUPPLY/ EXHAUST MODULE
B07T/HP/CO-L	400	3	50	4.3	29.6	33.9	N/A	40	2580	1060	205	570	285
B07T/HP/CO-R	400	3	50	4.3	29.6	33.9	N/A	40	2580	1060	205	570	285
B07T/EHP/CO-L	400	3	50	4.3	29.6	33.9	9	40	2580	1095	205	570	320
B07T/EHP/CO-R	400	3	50	4.3	29.6	33.9	9	40	2580	1095	205	570	320

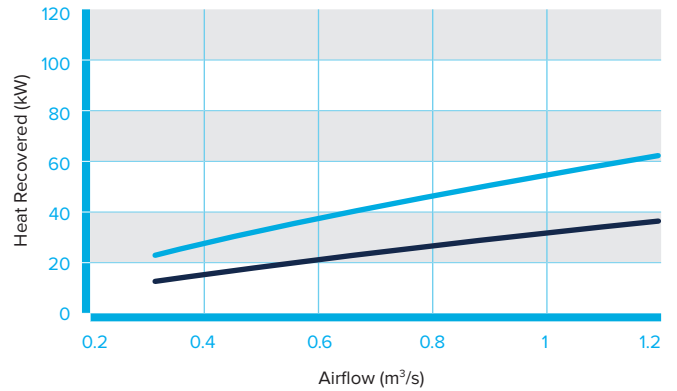
An electric 'back-up' heater is available as an optional ancillary for BPS-ECO-HP units for retrofitting on site (by others) code B07T-EBU-L or R (6kW electric heater).

THERMAL WHEEL EFFICIENCY

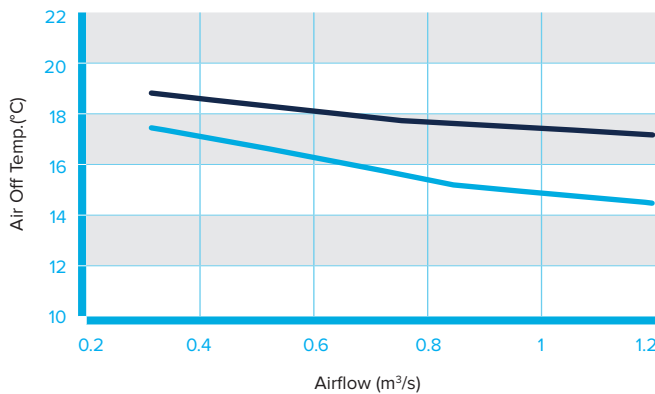
SIZE 07 THERMAL WHEEL EFFICIENCY



SIZE 07 THERMAL WHEEL HEAT RECOVERY



SIZE 07 THERMAL WHEEL AIR-OFF TEMPERATURES



KEY:

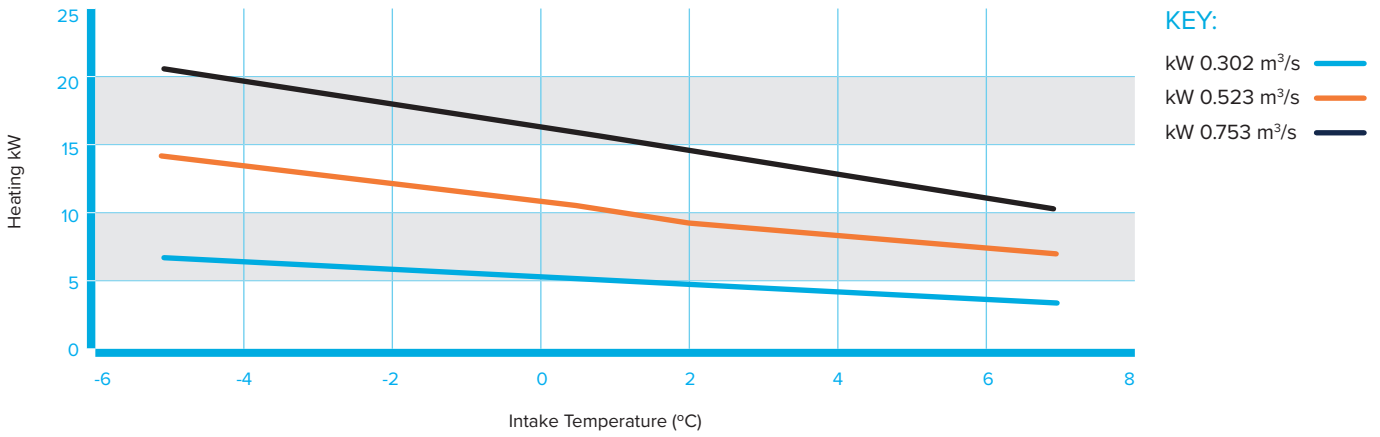
- Size 07 @ 6°C Inlet — (black line)
- Size 07 @ -5°C Inlet — (blue line)

BPS-ECO-HP SIZE 07

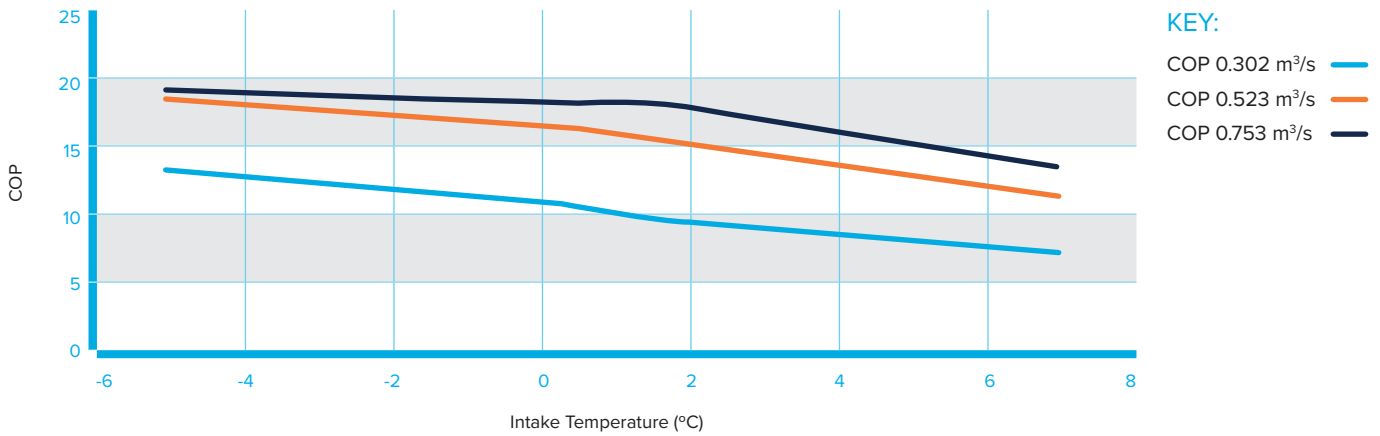


WINTER PRE-HEATING MODE

SIZE 07 PRE-HEATING MODE KW OUTPUT AT 20°C EXTRACT



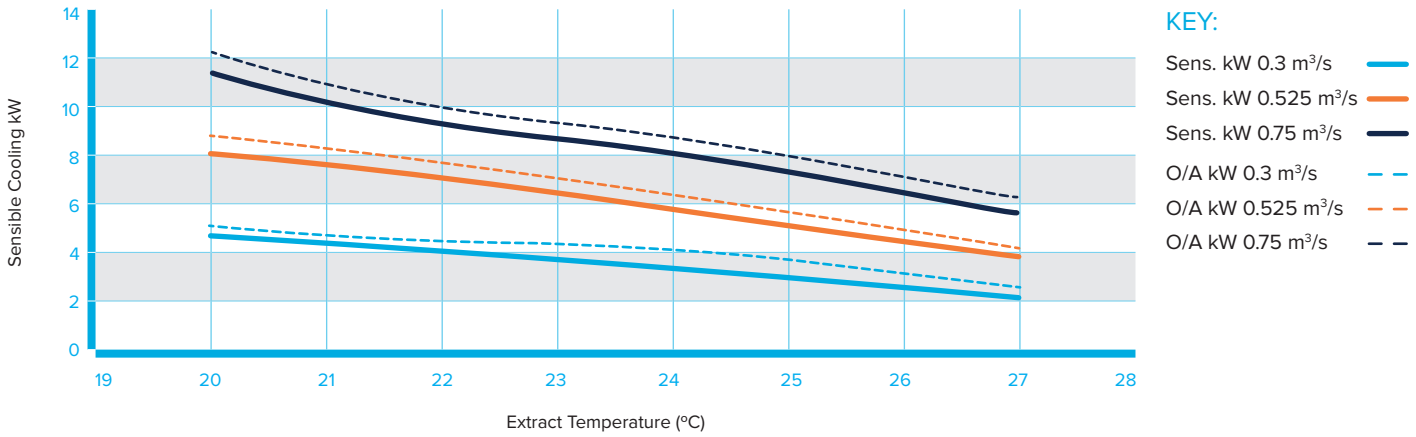
SIZE 07 PRE-HEATING MODE COP AT 20°C EXTRACT



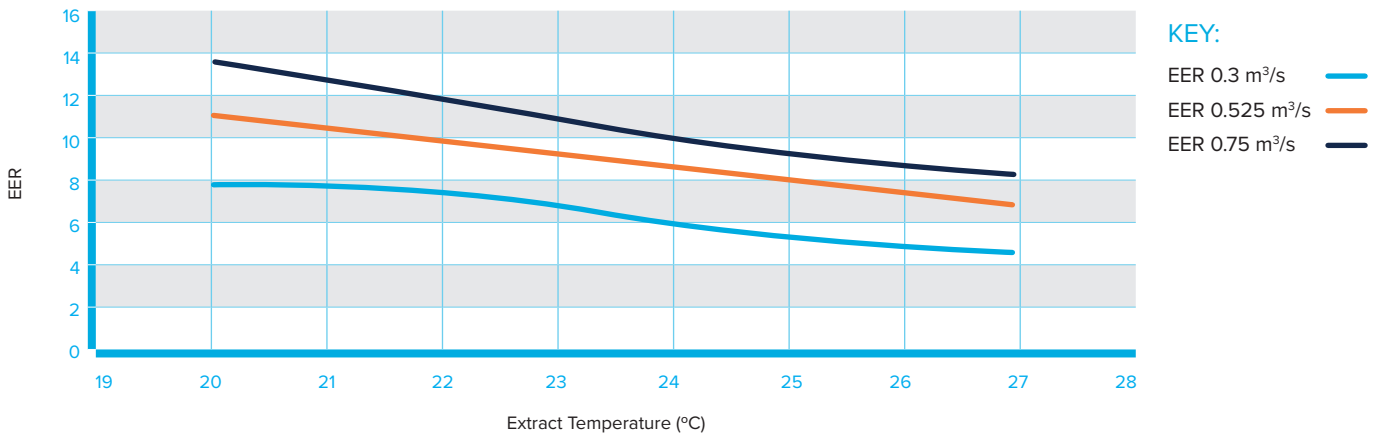


SUMMER PRE-COOLING MODE

SIZE 07 PRE-COOLING MODE SENSIBLE/OVERALL KW OUTPUT AT 35°C INTAKE



SIZE 07 PRE-COOLING MODE EER AT 35°C INTAKE



All performance data based on indoor condition: 21°C @ 50% RH.

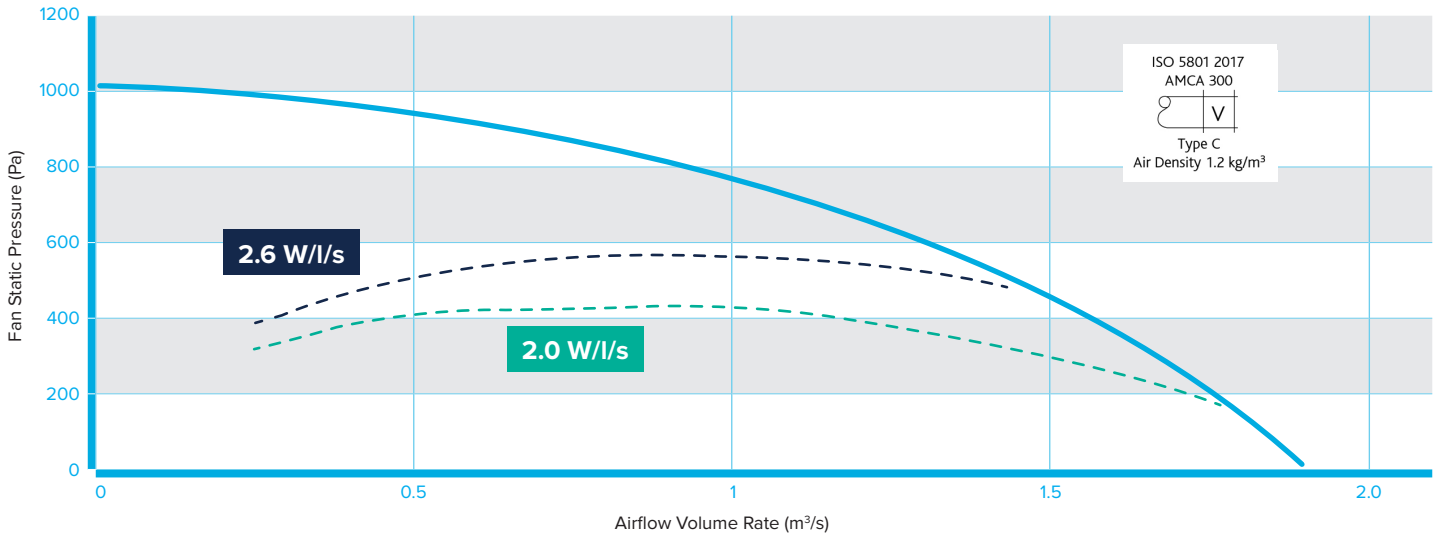
The unit uses an optimised combination of passive heat recovery (using the thermal wheel), and active heat recovery (using the heat pump). This ensures that the unit can handle the entire ventilation related heating or cooling load within the operational limits shown.

The unit thermal performance data is therefore based on supplying air at the same temperature as that being extracted.

BPS-ECO-HP SIZE 12

PERFORMANCE, TECHNICAL INFORMATION & DIMENSIONS

PERFORMANCE



SOUND DATA

UNIT SIZE	TYPE	FREQUENCY (Hz)								dBA@3m (Casing Radiated)
		63	125	250	500	1000	2000	4000	8000	
Size 12	Open Discharge	73	71	81	81	83	81	75	71	47
	Open Intake	69	69	82	77	74	75	70	67	
	Open Supply	73	71	81	81	83	81	75	71	
	Open Extract	69	69	82	77	74	75	70	67	
	Breakout	73	61	72	62	55	47	37	26	

dBA-hemispherical free field radiation at a distance of 3m.

DIMENSIONS (mm)

UNIT SIZE	INTAKE/EXHAUST MODULE			HEAT PUMP/THERMAL WHEEL MODULE			SUPPLY/EXTRACT MODULE			OVERALL		
	L	W	H	L	W	H	L	W	H	L	W	H
Size 12	800	1530	1695	1355	1530	1695	1200	1530	1695	3355	1530	1695



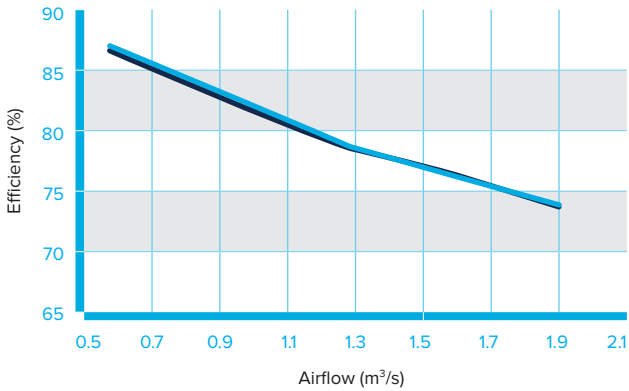
TECHNICAL INFORMATION

UNIT CODE	VOLT (V)	PHASE	FREQ (Hz)	FAN FLC (A)	HEAT PUMP FLC (A)	TOTAL UNIT FLC (A)	BACK-UP HEATER FLC (A) WITH INDEPENDENT ISOLATOR	MAX OPERATING TEMP (°C)	FAN SPEED (rpm)	UNIT WEIGHT (kg)	PACKAGED WEIGHT (kg)		
											INTAKE/ EXHAUST MODULE	HEAT PUMP/ THERMAL WHEEL MODULE	SUPPLY/ EXHAUST MODULE
B12T/HP/ CO-L	400	3	50	6.8	29.6	36.4	N/A	40	2180	1305	245	680	380
B12T/HP/ CO-R	400	3	50	6.8	29.6	36.4	N/A	40	2180	1305	245	680	380
B12T/EHP/ CO-L	400	3	50	6.8	29.6	36.4	12	40	2180	1335	245	680	410
B12T/EHP/ CO-R	400	3	50	6.8	29.6	36.4	12	40	2180	1335	245	680	410

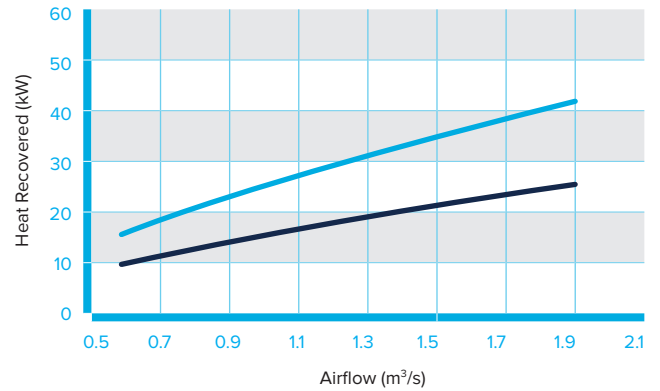
An electric 'back-up' heater is available as an optional ancillary for BPS-ECO-HP units for retrofitting on site (by others) code B12T-EBU-L or R (9kW electric heater).

THERMAL WHEEL EFFICIENCY

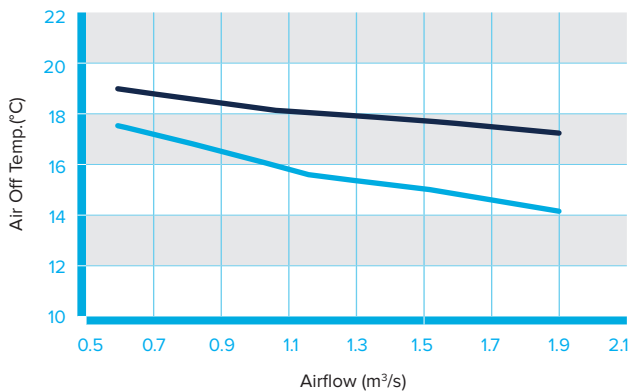
SIZE 12 THERMAL WHEEL EFFICIENCY



SIZE 12 THERMAL WHEEL HEAT RECOVERY



SIZE 12 THERMAL WHEEL AIR-OFF TEMPERATURES



KEY:

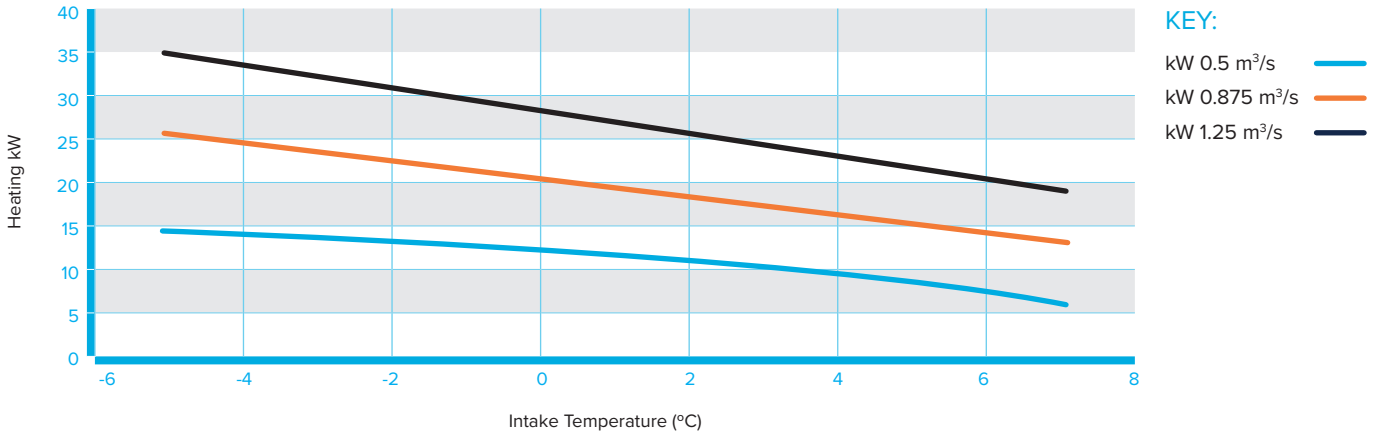
- Size 12 @ 6°C Inlet — (black line)
- Size 12 @ -5°C Inlet — (blue line)

BPS-ECO-HP SIZE 12

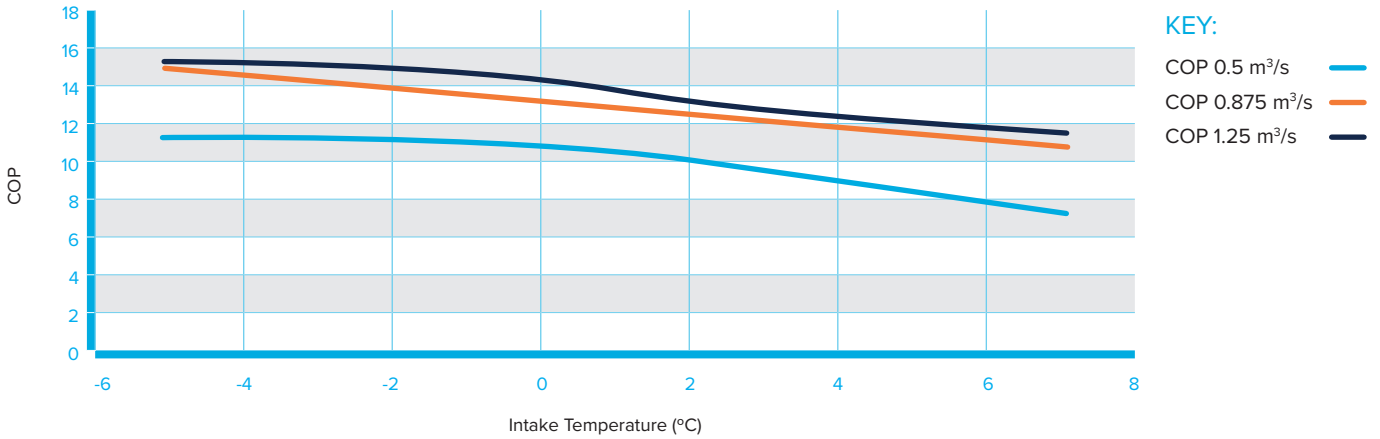


WINTER PRE-HEATING MODE

SIZE 12 PRE-HEATING MODE KW OUTPUT AT 20°C EXTRACT



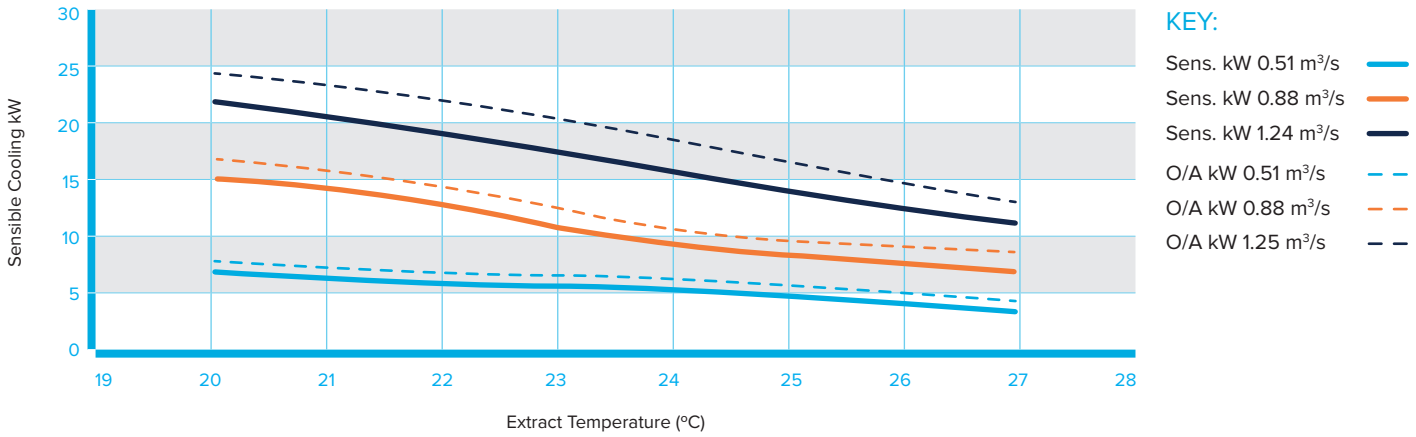
SIZE 12 PRE-HEATING MODE COP AT 20°C EXTRACT



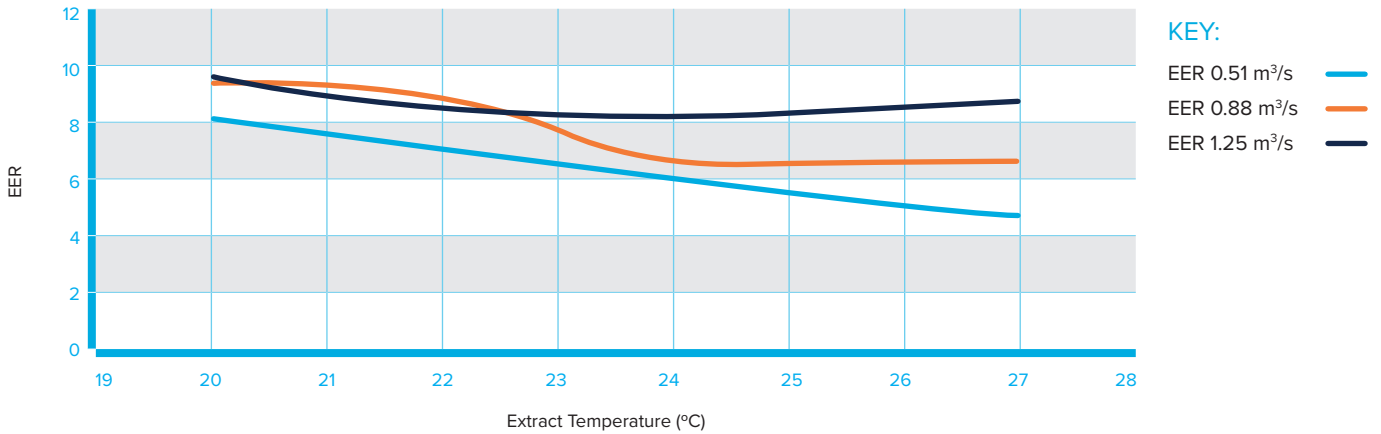


SUMMER PRE-COOLING MODE

SIZE 12 PRE-COOLING MODE SENSIBLE/OVERALL KW OUTPUT AT 35°C INTAKE



SIZE 12 PRE-COOLING MODE EER AT 35°C INTAKE



All performance data based on indoor condition: 21°C @ 50% RH.

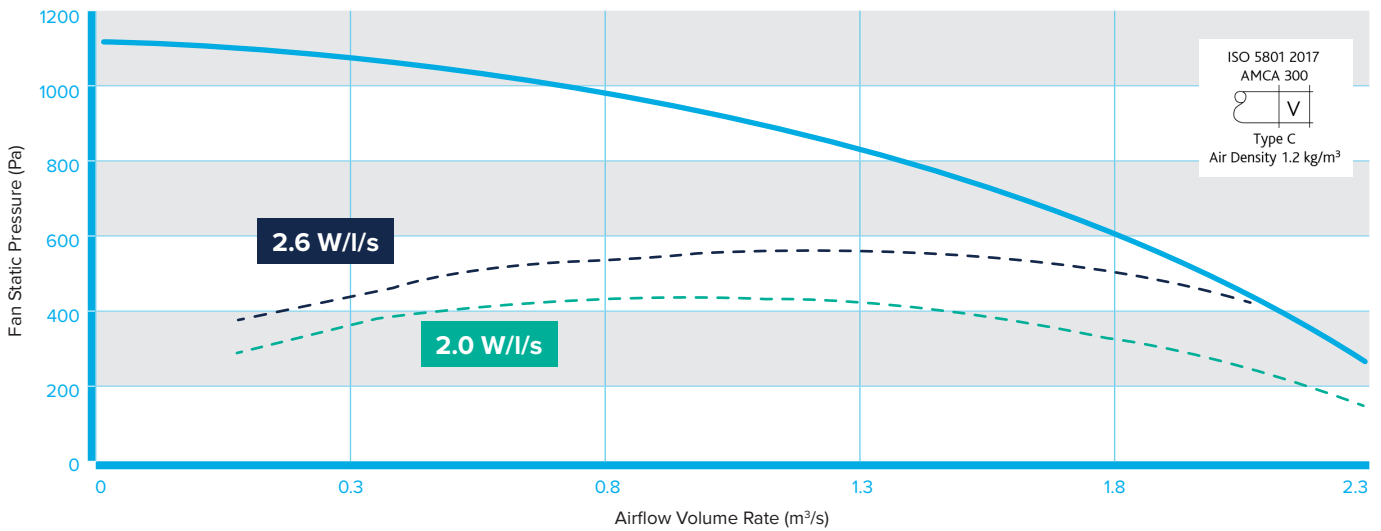
The unit uses an optimised combination of passive heat recovery (using the thermal wheel), and active heat recovery (using the heat pump). This ensures that the unit can handle the entire ventilation related heating or cooling load within the operational limits shown.

The unit thermal performance data is therefore based on supplying air at the same temperature as that being extracted.

BPS-ECO-HP SIZE 17

PERFORMANCE, TECHNICAL INFORMATION & DIMENSIONS

PERFORMANCE



SOUND DATA

UNIT SIZE	TYPE	FREQUENCY (Hz)								dBA@3m (Casing Radiated)
		63	125	250	500	1000	2000	4000	8000	
Size 17	Open Discharge	73	72	82	86	85	81	77	75	49
	Open Intake	69	70	81	80	76	74	73	74	
	Open Supply	73	72	82	86	85	81	77	75	
	Open Extract	69	70	81	80	76	74	73	74	
	Breakout	72	62	71	66	57	46	40	30	

dBA-hemispherical free field radiation at a distance of 3m.

DIMENSIONS (mm)

UNIT SIZE	INTAKE/EXHAUST MODULE			HEAT PUMP/THERMAL WHEEL MODULE			SUPPLY/EXTRACT MODULE			OVERALL		
	L	W	H	L	W	H	L	W	H	L	W	H
Size 17	800	1750	1912	1540	1750	1912	1200	1750	1912	3540	1750	1912



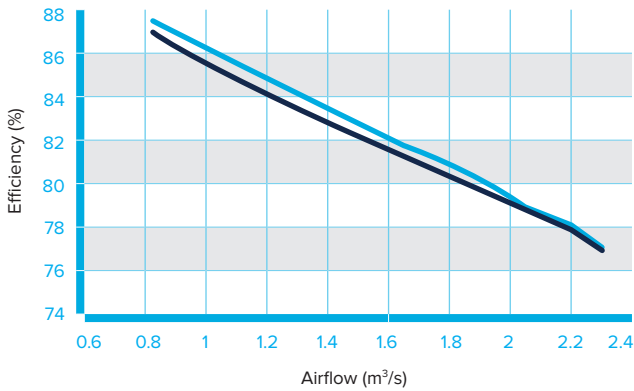
TECHNICAL INFORMATION

UNIT CODE	VOLT (V)	PHASE	FREQ (Hz)	FAN FLC (A)	HEAT PUMP FLC (A)	TOTAL UNIT FLC (A)	BACK-UP HEATER FLC (A) WITH INDEPENDENT ISOLATOR	MAX OPERATING TEMP (°C)	FAN SPEED (rpm)	UNIT WEIGHT (kg)	PACKAGED WEIGHT (kg)		
											INTAKE/ EXHAUST MODULE	HEAT PUMP/ THERMAL WHEEL MODULE	SUPPLY/ EXHAUST MODULE
B17T/HP/CO-L	400	3	50	14.6	36	50.6	N/A	40	2044	1470	305	795	370
B17T/HP/CO-R	400	3	50	14.6	36	50.6	N/A	40	2044	1470	305	795	370
B17T/EHP/CO-L	400	3	50	14.6	36	50.6	17.5	40	2044	1505	305	795	405
B17T/EHP/CO-R	400	3	50	14.6	36	50.6	17.5	40	2044	1505	305	795	405

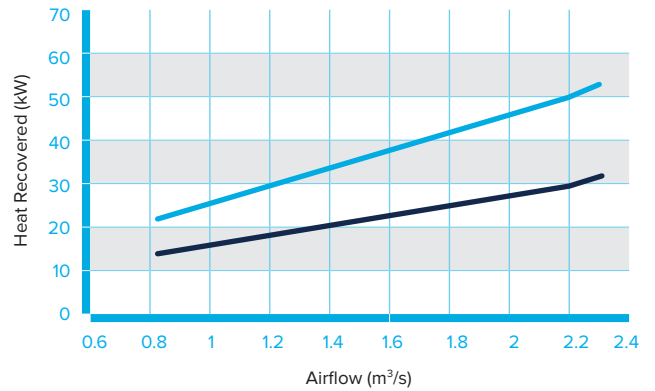
An electric 'back-up' heater is available as an optional ancillary for BPS-ECO-HP units for retrofitting on site (by others) code B17T-EBU-L or R (12kW electric heater).

THERMAL WHEEL EFFICIENCY

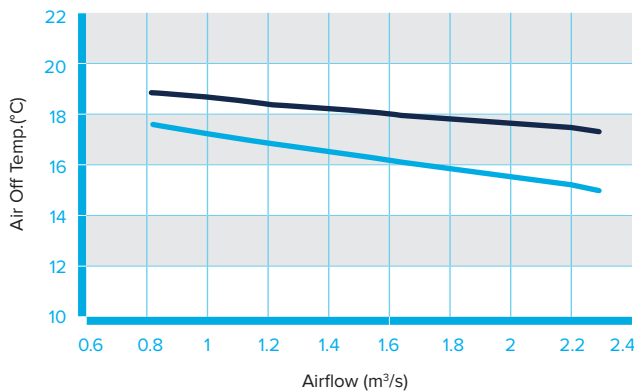
SIZE 17 THERMAL WHEEL EFFICIENCY



SIZE 17 THERMAL WHEEL HEAT RECOVERY



SIZE 17 THERMAL WHEEL AIR-OFF TEMPERATURES



KEY:

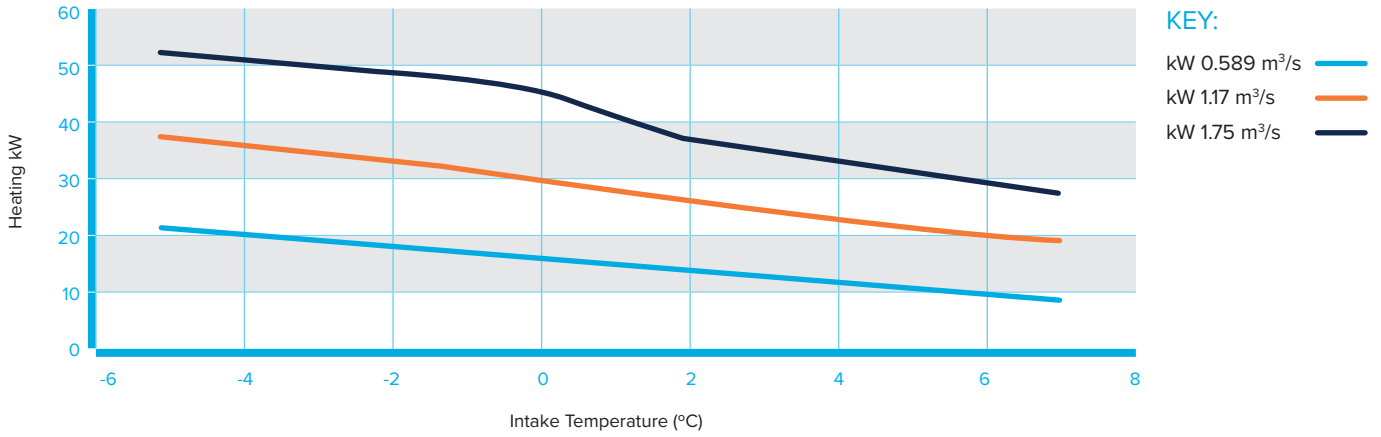
- Size 17 @ 6°C Inlet — (black line)
- Size 17 @ -5°C Inlet — (blue line)

BPS-ECO-HP SIZE 17

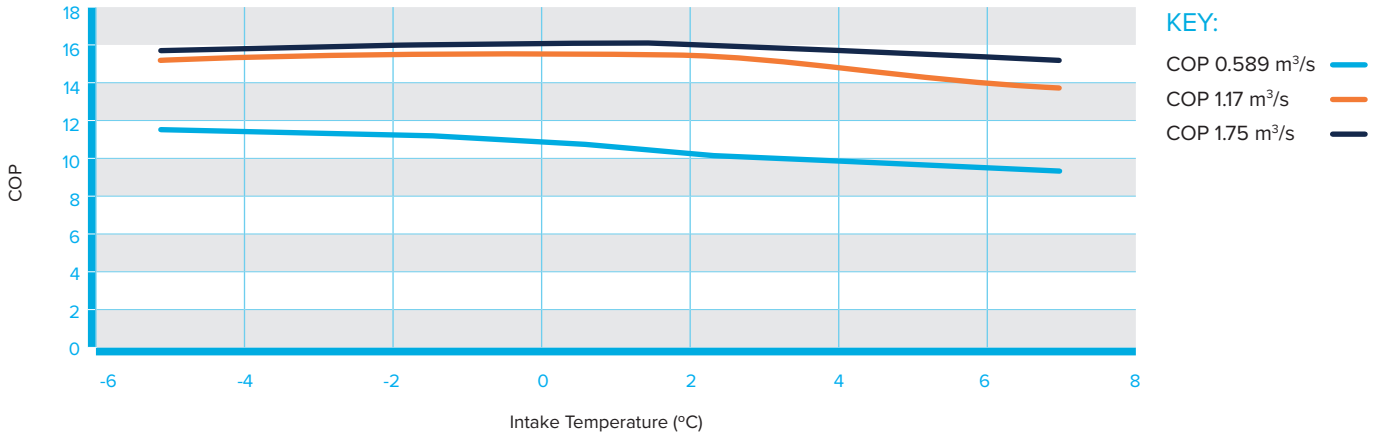


WINTER PRE-HEATING MODE

SIZE 17 PRE-HEATING MODE KW OUTPUT AT 20°C EXTRACT



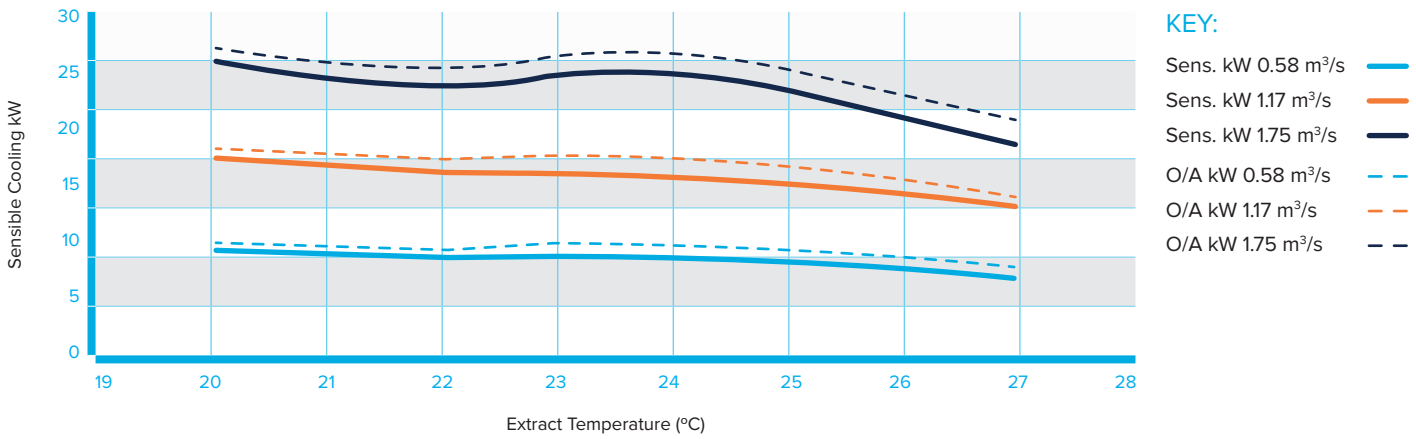
SIZE 17 PRE-HEATING MODE COP AT 20°C EXTRACT



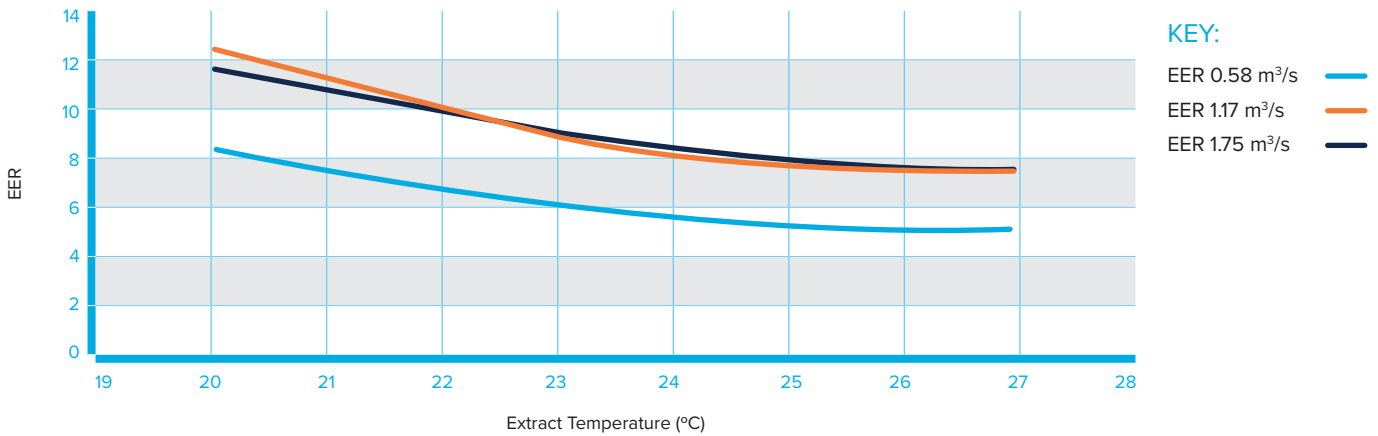


SUMMER PRE-COOLING MODE

SIZE 17 PRE-COOLING MODE SENSIBLE/OVERALL KW OUTPUT AT 35°C INTAKE



SIZE 17 PRE-COOLING MODE EER AT 35°C INTAKE



All performance data based on indoor condition: 21°C @ 50% RH.

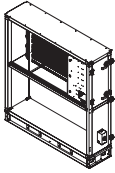
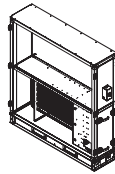
The unit uses an optimised combination of passive heat recovery (using the thermal wheel), and active heat recovery (using the heat pump). This ensures that the unit can handle the entire ventilation related heating or cooling load within the operational limits shown.

The unit thermal performance data is therefore based on supplying air at the same temperature as that being extracted.

FROST COILS

ANCILLARY DETAILS & DIMENSIONS

BPS BOXER PACKAGED AHUS - VERTICAL ANCILLARY DETAILS & DIMENSIONS (mm)

BPS ANCILLARY	DESCRIPTION		PART NUMBER	WIDTH	HEIGHT	LENGTH	WEIGHT (KG)	Z FACTOR
FROST COIL (ELECTRIC) 	BPS size ** frost coil electric. Right handed. For vertical PHX units.	12kW	B07AV/FE-R	1330	1492	450	130	12.24
		24kW	B12AV/FE-R	1530	1695	450	153	3.84
		36kW	B17AV/FE-R	1750	1900	450	160	0.816
	BPS size ** frost coil electric. Left handed. For vertical PHX units.	12kW	B07AV/FE-L	1330	1492	450	130	12.24
		24kW	B12AV/FE-L	1530	1695	450	153	3.84
		36kW	B17AV/FE-L	1750	1900	450	160	0.816
	BPS size ** frost coil electric. Right handed. For vertical PHX units.	12kW	B07AT/FE-R	1330	1492	450	130	12.24
		24kW	B12AT/FE-R	1530	1695	450	153	3.84
		36kW	B17AT/FE-R	1750	1900	450	160	0.816
	BPS size ** frost coil electric. Left handed. For vertical PHX units.	12kW	B07AT/FE-L	1330	1492	450	130	12.24
		24kW	B12AT/FE-L	1530	1695	450	153	3.84
		36kW	B17AT/FE-L	1750	1900	450	160	0.816
FROST COIL (LPHW) 	BPS size ** frost coil LPHW. Right handed. For vertical PHX units.	-	B07AV/FL-R	1330	1492	450	139	28.57
		-	B12AV/FL-R	1530	1695	450	160	8.96
		-	B17AV/FL-R	1750	1900	450	160	2.122
	BPS size ** frost coil LPHW. Left handed. For vertical PHX units.	-	B07AV/FL-L	1330	1492	450	139	28.57
		-	B12AV/FL-L	1530	1695	450	160	8.96
		-	B17AV/FL-L	1750	1900	450	160	2.122
	BPS size ** frost coil LPHW. Right handed. For vertical PHX units.	-	B07AT/FL-R	1330	1492	450	139	28.57
		-	B12AT/FL-R	1530	1695	450	160	8.96
		-	B17AT/FL-R	1750	1900	450	160	2.122
	BPS size ** frost coil LPHW. Left handed. For vertical PHX units.	-	B07AT/FL-L	1330	1492	450	139	28.57
		-	B12AT/FL-L	1530	1695	450	160	8.96
		-	B17AT/FL-L	1750	1900	450	160	2.122

FROST COIL DATA @ 100% SPEED

PART NUMBER	AIRFLOW (m³/s)	WATER PARAMETERS			AIR CONDITION DRY BULB (°C)			COIL DUTY (kW)	WATER FLOW (l/s)	COIL Δp (kPa)
		INLET TEMP. (°C)	INLET TEMP. (°C)	ETHEYL GLYCOL %	ENTERING COIL	AFTER COIL				
B7AV/FL-*	1	82	71	0	-10	5	20.16	0.449	29.3	
	1	80	60	0	-10	5	20.16	0.249	10	
	1	60	40	0	-10	5	20.16	0.244	10	
B12AV/FL-*	1.7	82	71	0	-10	5	34.27	0.763	12.1	
	1.7	80	60	0	-10	5	34.27	0.418	3.8	
	1.7	60	40	0	-7	5	27.17	0.329	2.4	
B17AV/FL-*	2	82	71	0	-10	5	40.3	0.897	23.6	
	2	80	60	0	-10	5	40.3	0.492	7.6	
	2	60	40	0	-9.6	5	39.4	0.478	7.4	

FROST COIL DATA @ 75% SPEED

B7AV/FL-*	0.75	82	71	0	-10	5	15.12	0.336	17.9
	0.75	80	60	0	-10	5	15.12	0.185	6
	0.75	60	40	0	-10	5	15.12	0.183	6.2
B12AV/FL-*	1.275	82	71	0	-10	5	25.7	0.572	7
	1.275	80	60	0	-10	5	25.7	0.314	2.2
	1.275	60	40	0	-8	5	22.1	0.268	1.7
B17AV/FL-*	1.5	82	71	0	-10	5	30.2	0.673	13.6
	1.5	80	60	0	-10	5	30.2	0.369	4.4
	1.5	60	40	0	-10	5	30.2	0.367	4.5

FROST COIL DATA @ 50% SPEED

B7AV/FL-*	0.5	82	71	0	-10	5	10.08	0.224	8.4
	0.5	80	60	0	-10	5	10.08	0.123	2.9
	0.5	60	40	0	-10	5	10.08	0.122	3
B12AV/FL-*	0.85	82	71	0	-10	5	17.14	0.381	3.2
	0.85	80	60	0	-10	5	17.14	0.209	1
	0.85	60	40	0	-7.5	5	14.14	0.171	0.7
B17AV/FL-*	1	82	71	0	-10	5	20.2	0.449	6.3
	1	80	60	0	-10	5	20.2	0.246	2.1
	1	60	40	0	-10	5	20.2	0.244	2.1

BPS-ECO-HP CONSULTANT SPECIFICATION

OPERATION

The packaged supply and extract unit shall be manufactured from Magnelis corrosion resistant steel, with 50mm double skinned panels and anodized aluminium frame. All external fittings and fixings shall be stainless steel, aluminium or non-metallic. All panels and frames will be of a totally thermally broken design, complying with the following specification in accordance with BS EN 1886: Mechanical strength, D1; Leakage class, L1; Thermal transmittance, T2; Thermal bridging, TB1. Panels and frames will be sealed without the use of silicon, mastic, or another liquid gasket.

The unit shall include the following items: Thermal Wheel HX: A high efficiency, ERP compliant heat exchanger with automatic bypass, complete with a condensate tray. G4 pre-filter and F7 main supply filters shall be fitted with a single M5 bank present on the extract side. Slides for alternative panel and bag options shall be present and pressure drop monitoring for maintenance notification will be included.

Performance optimised backward curved impellers and IP54 EC motors shall be used to provide low specific fan powers and stepless speed control without tonal noise generation. Fan pressure transducers shall be fitted for constant pressure/flow control and energy monitoring. Internal lighting and inspection portholes shall be present on all fan modules.

All hinged access panels shall be lockable and removable (with a common key for all) allowing full maintenance access from the side. The unit has left (and right option) hand arrangement in direction of supply air flow.

- A LPHW heater battery shall be fitted (on LPHW units).
- An electric heater module shall be present (on Electric heater units), complete with power controller to allow output modulation from the unit control.
- A fail-safe auto-reset safety device shall be present.
- A chilled water-cooling coil shall be fitted (on chilled water units).
- Internally installed Heat recovery ASHP with dual compressor operation.

Each Eco heat pump system is charged with R32 refrigerant gas and is controlled via Carel C.pco plc controllers, each heat pump system will operate to control the supply air temperature (set temperature by the BPS Eco smart control) each system will recover and utilise heat from the exhaust air DX coil of the BPS unit and transfer this heat/energy efficiently via the refrigeration cycle to the supply air DX coil in heating mode. Each system will also offer precooling of the supply air (set temperature by BPS Eco smart controller).

The heat pump recovery coils envelop the thermal wheel for maximum energy utilisation.

Dual compressor system provides:

Automatic defrost control strategy – when the build-up of frost in the exhaust coil reaches a limit the dual system will automatically respond and start warming up the second system (on completion of system that is in defrost, it will not start when the defrost is active) to ensure the unit provides continuous ventilation.

In very cold conditions a 'back-up' electric heater is installed in the supply air reducing any risk of cold air being supplied to the building, this heater can also be used as back-up in case of a heat pump system failure.

The defrost cycle is activated by monitoring the temperature after the thermal wheel in the extract/exhaust air path. The defrost cycle will start when the temperature reaches the lower limit.

During the cycle, the reversing valve is activated for a short period, and hot gas transferred to the evaporator coil to clear the frosting, reverting to normal operation after a short period. Simultaneously, (if previously inactive), the second compressor system will start to boost supply temperature recovery.

If both systems are running when a defrost is activated, they will defrost at the same time, and both will restart after the defrost has been terminated.

Lower energy consumption – A dual compressor system uses less energy than one large single system providing the opportunity to make energy savings whilst ensuring the total energy consumed is minimized.

Greater longevity – A dual system with duty share will prolong the working life of the components.

- Guaranteed heat recovery 24/7 – A dual system will still provide 50% ventilation to the building if the one system fails.
- Increased control range – A dual system provides improved 'turndown ratio' and therefore increased controllability.

Structural base frames shall be fitted, powder coated with covered forklift slots and 50mm square lifting bar holes for site manoeuvrability. Three axis alignment clamps shall be fitted externally.

All modules and ancillaries shall be individual weatherproofed with nanotech hydrophobic roofing, providing unparalleled corrosion resistance and aesthetic longevity.

An IP66/67 lockable isolator shall be present for power connection on main and electric heater modules. Sealing grommets will be present for control cable access to the unit internals without the need for drilling on site. Module electrical interconnection shall be made using pre-fitted plug and socket arrangements.

Modules shall be provided with identification labelling to aid assembly and QR coded badges to simplify document retrieval via portable devices.

Autodesk REVIT files shall be provided for Building Information Modelling and all units shall be based on performance testing carried out within an AMCA certified test laboratory.

**ECOSMART CONNECT OPTION –
ENHANCED DEMAND CONTROLLED VENTILATION**

A comprehensive unit control specification - The control assembly is mounted internally, factory fitted and tested to provide guaranteed operation from a single supplier – one who will take responsibility.

The unit integrated Ecosmart Connect system provides the facility for operational efficiency and energy saving by allowing a comprehensive range of unitary control functions and / or full BMS integration (by others) via standard BACnet (MS/TP). The system incorporates a web access enabled controller and is augmented by application specific unit interface and diagnostic circuits.

Controller software is optimised and pre-configured, and each unit / control assembly is fully functionally tested at works (Refer to technical documentation for full controller functional specification).

UNITS FITTED HAVE A 5 YEAR WARRANTY



COMMERCIAL

WWW.NUAIRE.CO.UK/COMMERCIAL

RESIDENTIAL

WWW.NUAIRE.CO.UK/RESIDENTIAL

INTERNATIONAL

WWW.NUAIRE.CO.UK/INTERNATIONAL



WESTERN INDUSTRIAL ESTATE | CAERPHILLY | CF83 1NA
T 029 2085 8200 **F** 029 2085 8300 **E** INFO@NUAIRE.CO.UK
WWW.NUAIRE.CO.UK