

The logo for 'itho' is a blue diamond shape with a white circle above the letter 'i'. The text 'itho' is written in white lowercase letters inside the diamond.

**itho**

## **HRU ECO 4**

*System 4*

*Continuous Mechanical Supply and Extract  
Ventilation with Heat Recovery*

**Appendix Q Eligible**





### Application

This high efficiency MVHR unit is ideal for all new build dwellings – especially those being built to a higher standard of air-tightness.

### Description

The HRU ECO 4 is a high efficiency heat recovery unit. It has a sophisticated counter-flow heat exchanger which can recover up to 91% of the heat from the discharge air. This recovered heat is used to pre-heat the fresh air being brought in from outside.

### Models

The table below lists the models available

### Housing

The units for houses and apartments

have the same design. The only differences are in the layout of the duct connections and motor modules. With units for houses, the air supply is situated at the lower part of the unit. In units for apartments the air supply is situated at the upper part. The motor module seals the opposite connection.

The connections on both the lower part of the unit and the upper part can be used for air extract. Unused connections are sealed with a cap.

Because of the unique patented clamp construction of the HRU ECO 4, the sealing of the different parts will be optimised. Therefore, there will be no internal or external leakage.

The unit can be easily reversed when dwelling designs are mirrored.

### Weight

As a result of the unique clamping construction in combination with the plastic/synthetic elements, the weight of the heat recovery unit HRU ECO 4 is only 25 kg.

### Exhaust and Supply Connections

All exhaust and supply connections have an internal diameter of 150 mm and external 180 mm. The connections can be used to attach modular plastic and metal ducts accessories directly. Each connection is stamped with an embossed indicator which shows both the direction and source of the air.

### Counter Flow Heat Exchanger

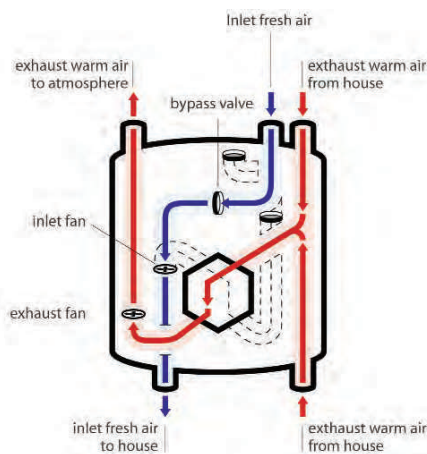
The unique heat exchanger is based on the principle of counter flow. One of the characteristics of this heat exchanger is that the incoming and outgoing air is moving via triangular canals. Thus each canal is surrounded by canals in which the airflow is opposite. This creates an enormous surface area to exchange heat. This special construction is one of the reasons why up to 91% thermal efficiency can be reached.

Table 1

Type	Appliance	Connections to the dwelling		Connections to atmosphere		Inlet and exhaust capacity		
		Exhaust	Inlet	Exhaust	Inlet	Standard	Max	Pressure
HRU ECO 4	(House) 5 Core Cable	bottom + upper side	bottom	upper side	upper side	225 m <sup>3</sup> /h	325 m <sup>3</sup> /h	150Pa
HRU ECO 4	(House) RF	bottom + upper side	bottom	upper side	upper side	225 m <sup>3</sup> /h	325 m <sup>3</sup> /h	150Pa
HRU ECO 4	(Apartment) 5 Core Cable	upper side	upper side	upper side	upper side	225 m <sup>3</sup> /h	325 m <sup>3</sup> /h	150Pa
HRU ECO 4	(Apartment) RF	upper side	upper side	upper side	upper side	225 m <sup>3</sup> /h	325 m <sup>3</sup> /h	150Pa

### 100% Summer Bypass Valve

The heat recovery unit has a Summer bypass valve, which is completely integrated in the unit. The bypass valve diverts the air supply completely around the heat exchanger. This means the exit air from the dwelling does not heat this fresh air.



Especially during summer nights this bypass valve is desirable because the outside temperature is often lower than the temperature inside.

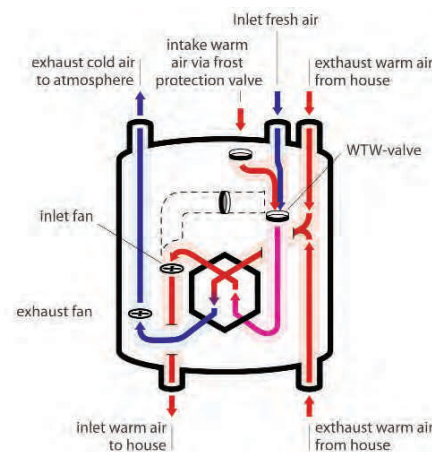
The fully automatic temperature controller makes sure the bypass valve being opened when:

- The inside temperature is higher than required (not adjustable)
- The inside temperature is higher than the outside temperature
- The outside temperature is for a longer period > 19° C (period depends on the exact temperature)

Both the inside and the outside temperature is measured inside the HRU ECO 4 by two integral sensors.

### Frost Protection Device

To prevent the heat exchanger from freezing, a unique mechanism is standard in the HRU ECO 4. This mechanism consists of a valve, integrated on the upper part of the unit.



The automatic frost protection device works as follows:

- The valve is open (modulating) and extracts some air from the area in which it is installed. The air is mixed with the fresh air
- At the same time the supply fan will increase fan speed to keep the fresh air volume at the same level
- When the temperature drops the supply fan will decrease fan speed variably until a minimum is reached

- Whilst the temperature is still decreasing the exhaust fan will speed up and the supply fan will slow down

- With extreme low temperatures the supply fan is turned off, the frost protection device will be closed, but the exhaust fan will keep on working

After approx. 1.5 hours, the air supply fan will start at a minimum speed and the frost protection valve will be opened to check whether the danger of freezing is gone. When the temperature rises, all above mentioned steps will be carried out in reverse order.

All the above procedures will be carried out automatically.



Removing the Heat Exchanger

### Motors

The HRU ECO 4 is provided with two energy efficient DC motors. The impellers have backward curved blades which help to keep it clean – maximising the capacity of the supply and extract fans.



#### Capacity Setting

In the connection unit of the HRU ECO 4 are two potentiometers which allow for adjustment of both the low speed and high speed. The mid position is an automatically calculated value between low and high. The factory setting for high position is 225 m<sup>3</sup>/h. To ensure the best energy efficiency this potentiometer should not be touched unless the required volumes cannot be reached when room grilles are set in their fully open position.

#### Filters

The HRU ECO 4 has as standard two G3 filters. One of the filters is placed between the exhaust duct from the house and the heat exchanger. The filter ensures that dust and grease are

absorbed and the heat exchanger will become less dirty.

The other filter is situated between the fresh air inlet and the heat exchanger. This filter ensures that fresh air is filtered before it is supplied into the dwelling. It also prevents the heat exchanger from becoming dirty. Both filters can be easily removed, cleaned and replaced by the occupant without the need to remove the front cover.

#### Appendix Q Eligible

The HRU has been tested at BRE and is certified as being an Appendix Q Eligible product. This means that the test results which are available on [www.sap-appendixq.org.uk](http://www.sap-appendixq.org.uk) can be used to help improve SAP rating.



### Installing

The heat recovery unit HRU ECO 4 is designed to be installed in different types of dwellings, from small apartments to larger houses. The unit can be placed in different places in the dwelling, like:

- In the loft, in a closed room
- In a closed storage room
- In an airing cupboard

### Mounting

The unit must be fixed, with the mounting bracket, to a wall with a mass of no less than 200 kg/m<sup>2</sup>.

### Points of Attention

To ensure a good installation please pay attention to:

- Moisture resistant insulated exhaust duct to outside (min. internal diam. 150 mm)
- Damp proof thermal isolated fresh air inlet duct from outside (min. internal diam. 150 mm)
- Air inlet duct to dwelling min. internal diam. 150 mm, which can be split up in two ducts internal diam. 150 mm

- Exhaust duct from the dwelling min. internal diam. 150 mm
- Apply the provided sound insulating flexible pipe (type FGD 180-50, D=180mm L=500mm) between the air supply to the dwelling and the unit
- Condense drain with water seal, replenishable, for a water block between the unit and the place where the unit is mounted and the waste pipe
- Mains supply must be 230V AC

### Access to the Unit

The unit should be located so that it can be easily accessed for servicing. To enable easy servicing of the filters and heat exchanger there must be a space of not less than 50 cm in front of the unit.

### Important

Make sure that nothing is placed on top of the automatic frost protection valve. As, when the valve opens a foreign object falling in would prevent the mechanism from working.

### Installation and User Manual

The installation and user manual are delivered with the unit. Make sure to read these manuals before installing or using the unit. If required the installation manual can be obtained from Itho Ventilation Limited prior to delivery of the unit.



Easy access