

Certificate

Certified Passive House Component

For cool, temperate climates, valid until 31 December 2017

Passive House Institute
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Category: **Heat recovery unit**
Manufacturer: **Glen Dimplex Deutschland GmbH**
D-95326 Kulmbach, GERMANY
Product name: **DL 50 WH2**

This certificate was awarded based on the following criteria:

Thermal comfort	$\theta_{\text{supply air}} \geq 16.5 \text{ °C}$ at $\theta_{\text{outdoor air}} = -10 \text{ °C}$
Effective heat recovery rate	$\eta_{\text{HR,eff}} \geq 75 \%$
Electric power consumption	$P_{\text{el}} \leq 0.45 \text{ Wh/m}^3$
Airtightness	Interior and exterior air leakage rates of 3 % of nominal air flow rate met
Balancing and adjustability	Air flow balancing possible: yes Automated air flow balancing: no
Sound insulation	Sound pressure level in functional rooms $\leq 30 \text{ db(A)}$
Indoor air quality	Outdoor air filter F7 Extract air filter G4
Frost protection	Frost protection for the heat exchanger with continuous fresh air supply down to $\theta_{\text{outdoor air}} = -15 \text{ °C}$

1) The required sound pressure level in the installation room can be exceeded in on-demand operation mode.

Further information can be found in the appendix of this certificate.

Certified for air flow rates of

15 - 20 m³/h
(continuous operation)

15 - 45 m³/h¹⁾
(on-demand operation)

$\eta_{\text{HR,eff}}$
83 %

Electric power consumption
0.31 Wh/m³



CERTIFIED COMPONENT

Passive House Institute

Appendix Glen Dimplex Deutschland GmbH, DL 50 WH2

Manufacturer: Glen Dimplex Deutschland GmbH
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Passive House comfort criterion

A minimum supply air temperature of 16.5 °C is maintained at an outdoor air temperature of -15 °C. Therefore, it is assumed that a supply air temperature of more than 16.5 °C is maintained also at -10 °C outdoor air temperature.

Efficiency criterion (heat recovery rate)

The effective dry heat recovery rate is measured at the test facility using balanced mass flows on the outdoor air/extract air side. The boundary conditions for the measurement should be taken from the documents relating to the testing procedure.

$$\eta_{\text{WRG,eff}} = \frac{(\varrho_{\text{Ab}} - \varrho_{\text{Fo}}) + \frac{P_{\text{el}}}{\dot{m} \cdot c_p}}{(\varrho_{\text{Ab}} - \varrho_{\text{Au}})}$$

The (dry) ventilation heating load (the house is the system boundary) can be calculated using $\eta_{\text{HR,eff}}$ based on the formula $\dot{V}_{\text{supply_air}} * (1 - \eta_{\text{HR,eff}}) * 0.34 * \Delta\vartheta$ (multiplied by the infiltration rate). The rates of heat recovery are usually greater if condensation occurs in the heat exchanger. Initially, this will not be taken into account on purpose.

For this device:

$$\eta_{\text{HR,eff}} = 83 \%$$

Efficiency criterion (power consumption)

The unit was examined with the following conditions, which are according to a standard installation situation of the unit: Outdoor air and exhaust air free air intake and discharge, extract air and supply air free air intake and discharge.

For this device: **0.31 Wh/m³**

Air tightness and insulation

Before starting the thermodynamic test, the device was tested respecting internal and external leakages. The leakage air flows must not be greater than 3 % of the average air flow volume of the operating range of the ventilation device.

The following result was obtained for the device:

Internal leakage: 3.0 %

External leakage: 2.93 %

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Adjustability

It must be possible to adjust the balance between the exhaust air flow rate and the outdoor air flow rate for all units.

- This unit is certified for air flow rates of **15 - 20 m³/h** (continuous operation) or **15 - 45 m³/h** (on-demand operation)
- Balancing the air flow rates of the unit is possible
- The device being tested here has a standby power consumption of **1,5 W** and therefore does not comply with the target value of 1 W. The device should be equipped with an additional external switch to separate the device from the electric circuit if required.
- After a power failure the device automatically continues to operate in the mode that was set before the power failure.

Acoustical testing

- Since it can be assumed that the unit will be installed in a functional or secondary room the sound pressure level should be restricted to 30 db(A).
- The following sound levels for the unit (without second room connection) have been determined depending on the air flow rate:

Air flow rate [m ³ /h]	10	14	20	28	35
Sound level unit Lw [dB(A)]	23,7	25,7	31,8	40,3	44,8

Note: In practice, different (as well lower) sound levels may occur depending on e.g. furnishings and room surfaces.

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The criteria for the sound pressure level (30 dB(A)) in the specific installation room with an equivalent room absorption area of 10 m² are met for the unit with second room connection up to an air flow rate of 20 m³/h (continuous operation).

Note: In practice, different (as well lower) sound levels may occur depending on e.g. furnishings and room surfaces.

Indoor air hygiene

The unit is equipped with following filter qualities:

- ✓ Outdoor Air filter G7
- ✓ Extract Air filter G4

As standard the unit is equipped with G4 filter at the extract and G7 filter at the supply air side.

Filters should be regularly interchanged!

Frost protection

Appropriate measures should be taken to ensure prevention of icing over of the heat exchanger and freezing up of hydraulic post-heater coils during extreme winter temperatures (-15 °C). The regular functioning of the device should be permanently ensured during uninterrupted operation of the frost protection circuit (the interruption of the outdoor air flow is no adequate frost protection strategy for passive houses, as the heating loads caused by the forced infiltration would become too high).

- Frost protection circuit for the heat exchanger:

The frost protection strategy for the heat exchanger is regulated by means of a permanently installed electrical preheater depending at the outside air temperature. During the measurement, the preheating coil was activated for the first time at +2.3 °C. The volume flow balance of the supply / exhaust air is maintained. The frost protection circuit is suitable to protect the heat exchanger from permanent icing.

Abbreviations

- ODA = Outdoor air
- EHA = Exhaust air
- SUP = Supply air
- ETA = Extract air