



# Calculation example

## Capacity

### Air flow:

The capacity lines are based on an average value of the air flow of supply and extract air in a unit.

## Total energy consumption

For both fans and control.

The calculation example applies to a house of 180 m<sup>2</sup>: the required air flow is:

$$0.35 \text{ l/s/m}^2 \text{ or } 1.26 \text{ m}^3/\text{h/m}^2 = 180 \times 1.26 = 388 \text{ m}^3/\text{h}$$

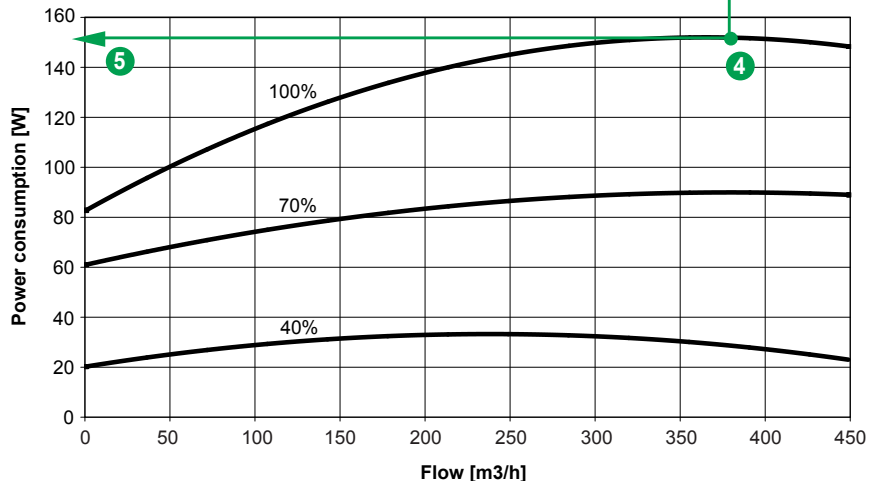
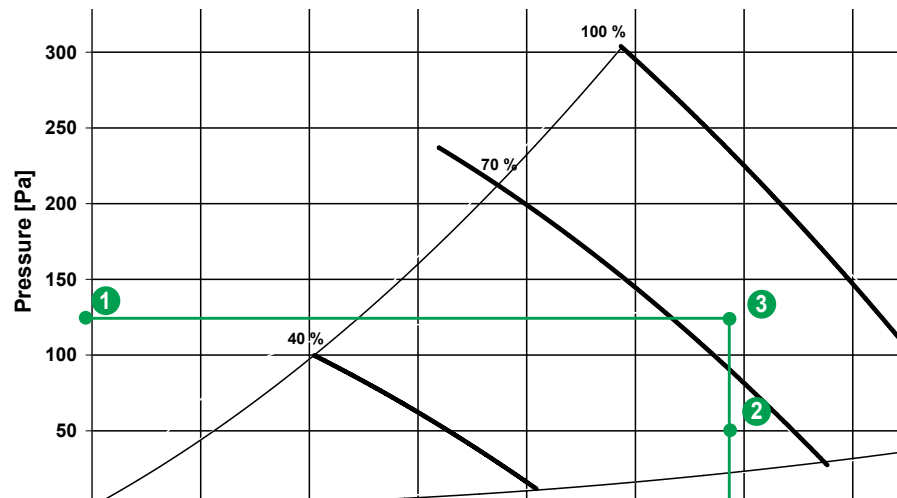
The external pressure loss (ducts) is known from the dimensioning of the ducts (for a single-family dwelling the value will typically be 75-100 Pa).

- Find the point of intersection **3** in the capacity scheme for:
  - the external pressure loss in the unit (100 Pa in the example)
  - the required air flow (388 m<sup>3</sup>/h in the example)
- On the basis of the capacity lines, determine the operating point in % (in the example the point is between 70 % and 40 %, and therefore we choose 60 %)
- In the scheme of the total energy consumption the point from 2 (between 70 % and 40 %) is determined for the air flow 388 m<sup>3</sup>/h
- From point **4** draw a horizontal line to the left axis, where you can read the total energy consumption at the operating point **5** (in the example ~ 60 W).

$$\text{SFP} = \frac{\text{total energy consumption (W)} \times 3600}{\text{Required air flow (m}^3/\text{h)}}$$

$$\text{SFP} = \frac{150\text{W} \times 3600}{388 \text{ m}^3/\text{h}} = 1391 \text{ J/m}^3/\text{h}$$

- This means that the SFP value at the operating point 388 m<sup>3</sup>/h, 100 Pa is 1.391 kJ/m<sup>3</sup>/h.



## Heat recovery rate

The temperature efficiency factor,

the air flow  $V_{\text{supply}} = V_{\text{extract}}$

A possible glaciation of the heat exchanger at low outdoor temperatures has not been considered.

- graph = temperature: -12 °C RF: 50 %
- graph = temperature: 4 °C RF: 50 %

The temperature of the extract air is in both examples 20 °C

- Draw a vertical line at the current air flow. **1**
- If you want to know the heat recovery rate at e.g. -12 °C mark the point of intersection at the upper line. **2**  
At other temperatures you will have to interpolate between the two lines.
- From this point you draw one horizontal line to the left axis to read the dry heat recovery rate. Here approx. 91 %. **3**
- If you prefer one average dry heat recovery rate it will typically lie between the two graphs indicated, however, closest to the lower graph. For this reason choose a point at the drawn vertical line between the two graphs, however, closest to the lower (appr. 1/3 above the 2. curve). **4**
- From this point draw one horizontal line to the left axis to read the dry heat recovery rate. Here approx. 84 %. **5**

