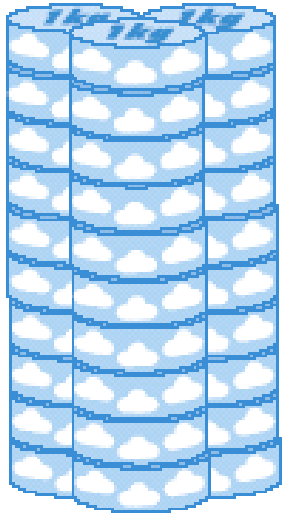
Balance ventilation in a good economic way
Ashrae Meeting May 2014,
Robert Johansson, product area director AHU

- **Everybody's right to clean indoor air**

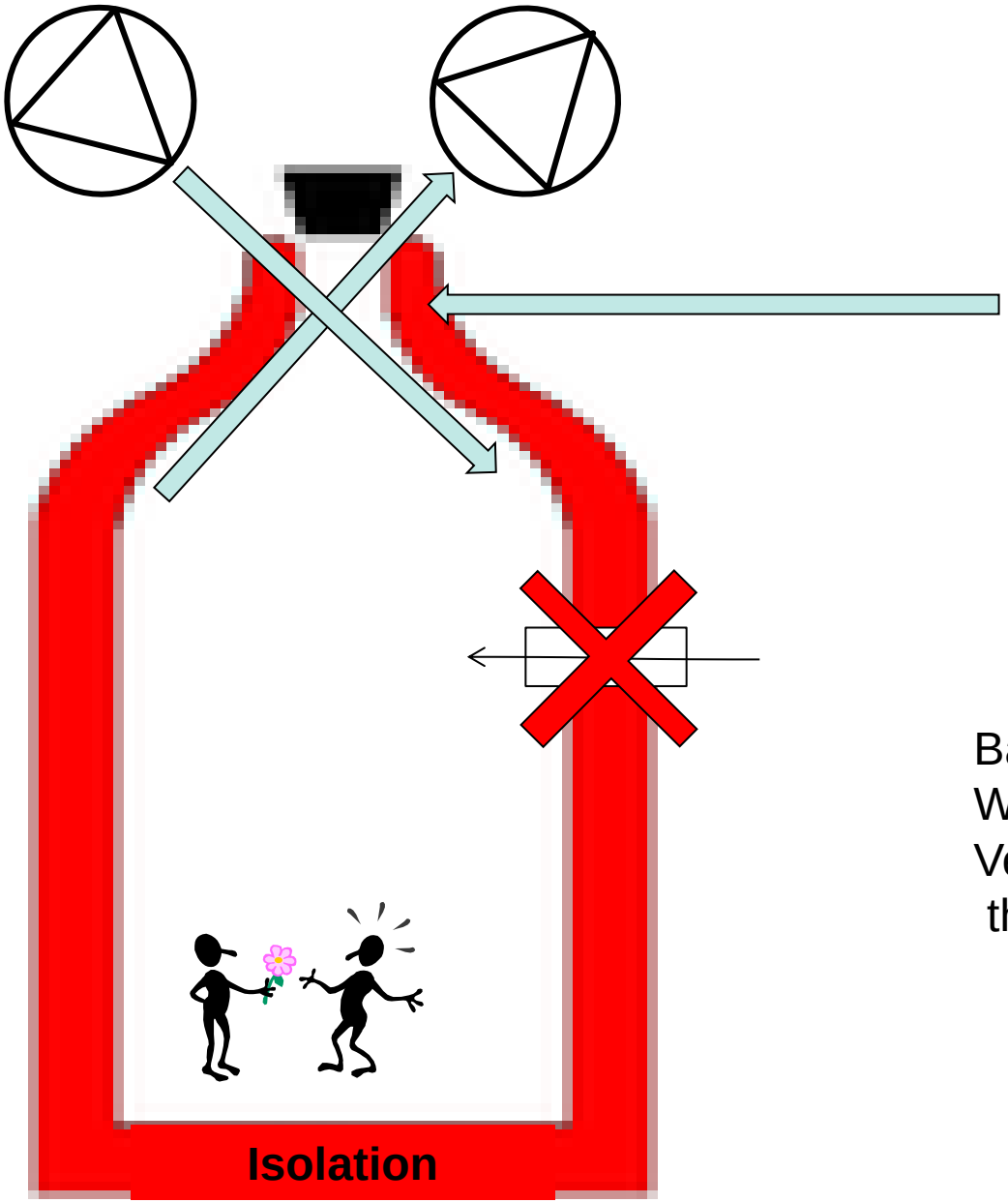
Balance Ventialtion – Health business!!

Life

- We eat 1 kg per day
- We drink 3 kg per day
- We breathe 30 kg of air per day, which is about 25,000 litres!



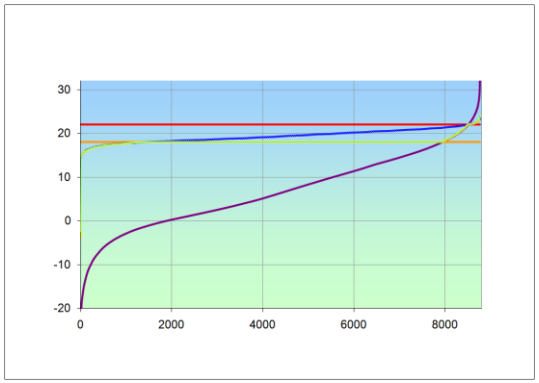
90% of our time is spent indoors -
90% of the air we breathe is therefore indoor air

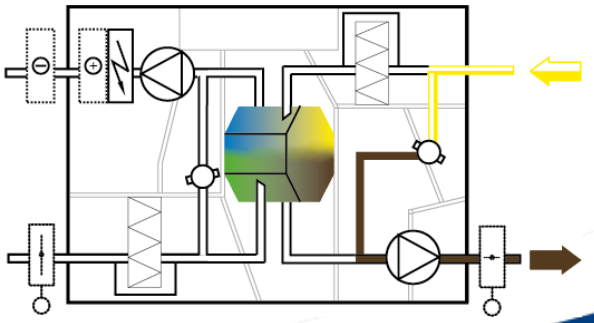


Balance Ventilation Supply/Exhaust
With heatrecovery –
Ventilation of people and all over
the house!

Good balance ventilation with, cross flow heatrecovery

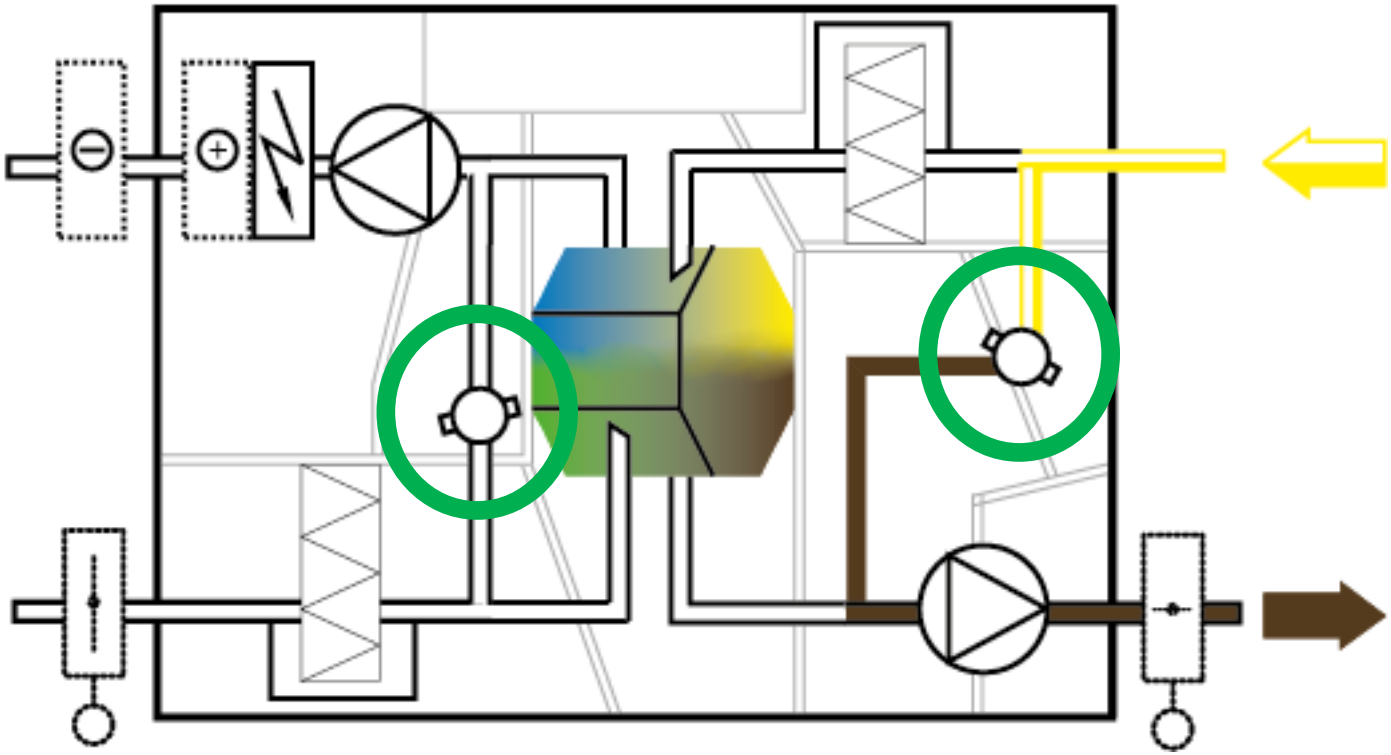
- 90%
- Split exhaust and Supply air, No smell!
- EC-fan technology
- Low SFP
- Dubble By-Pass dampers

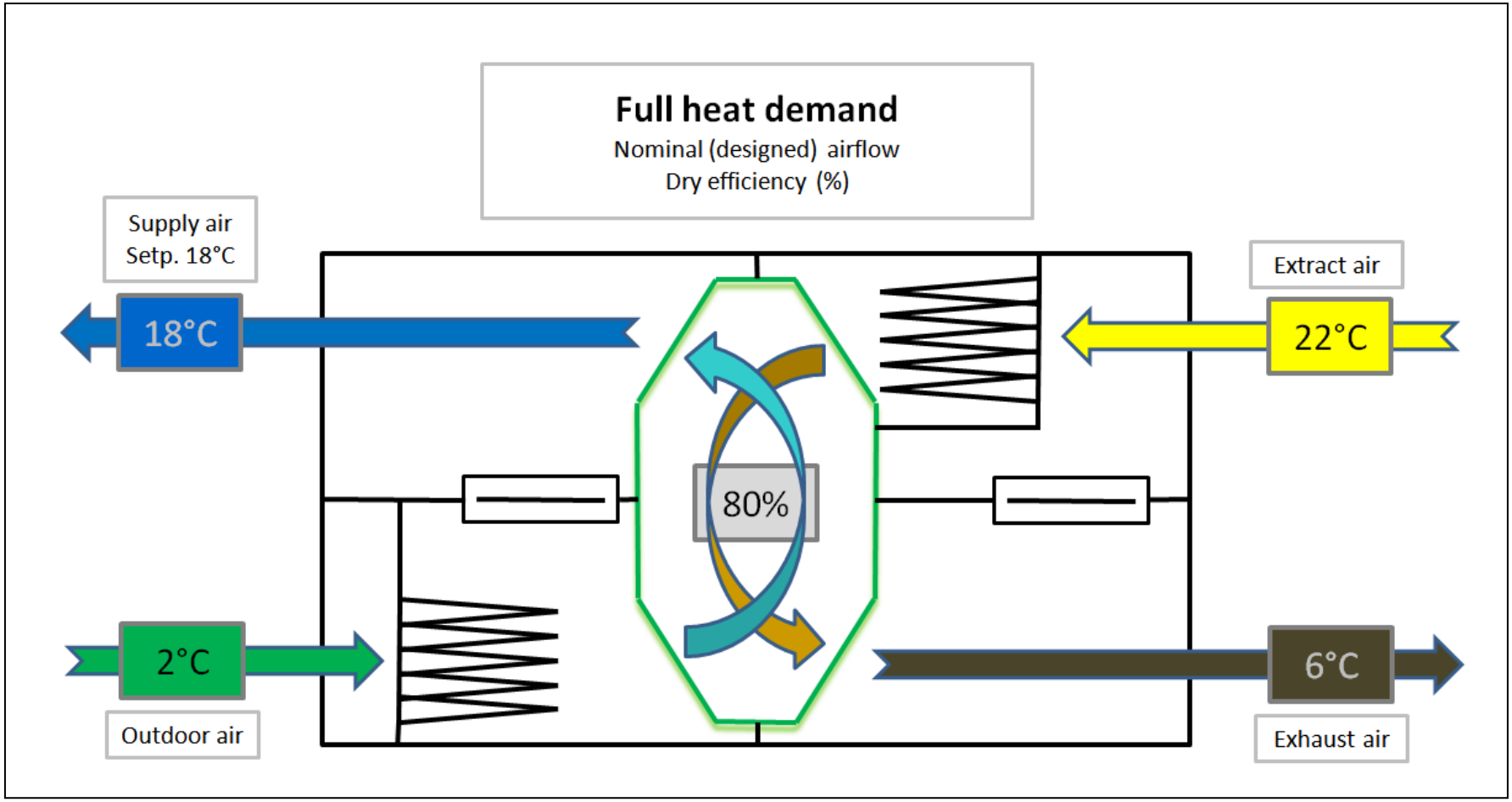




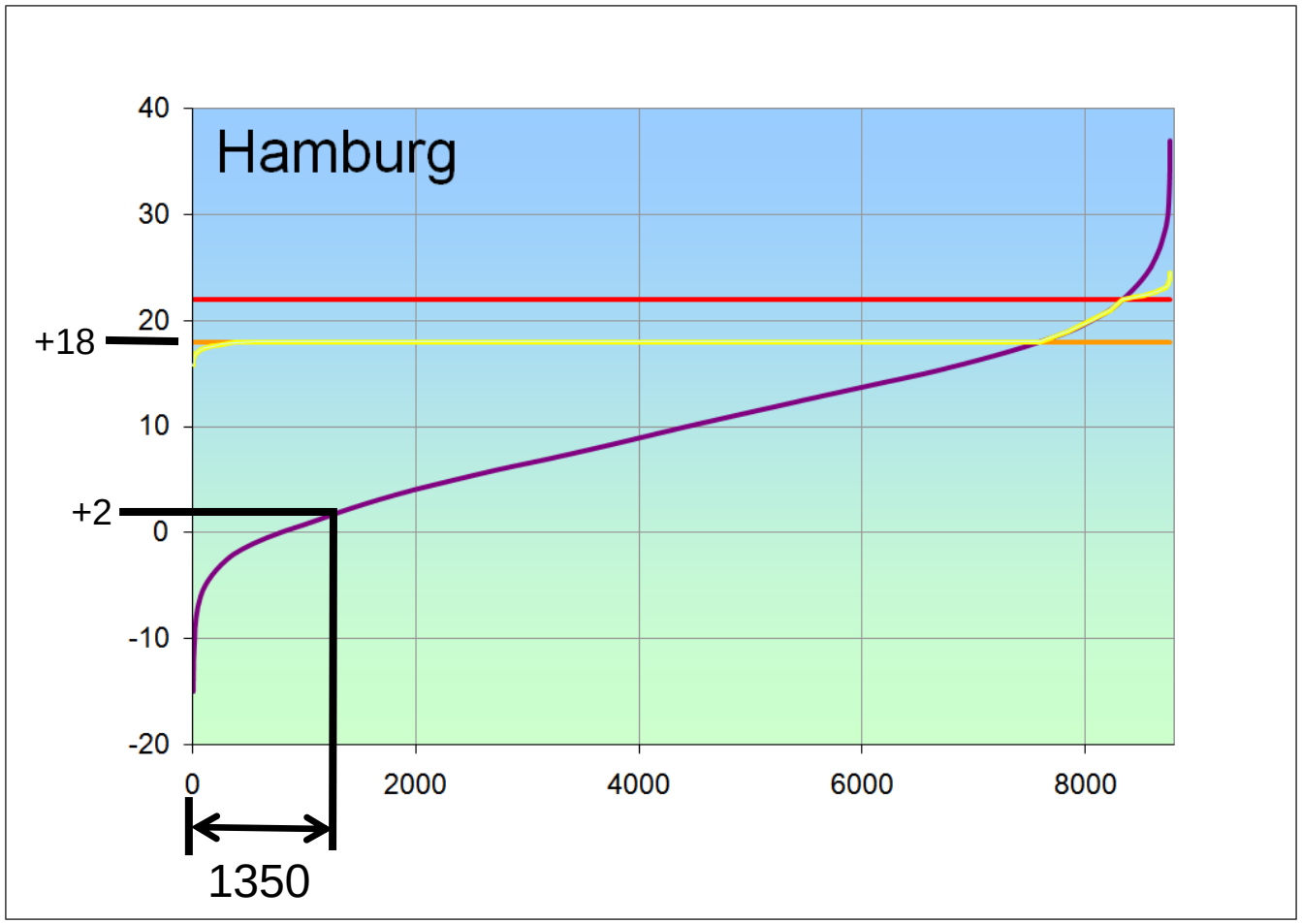
Example School in Hamburg

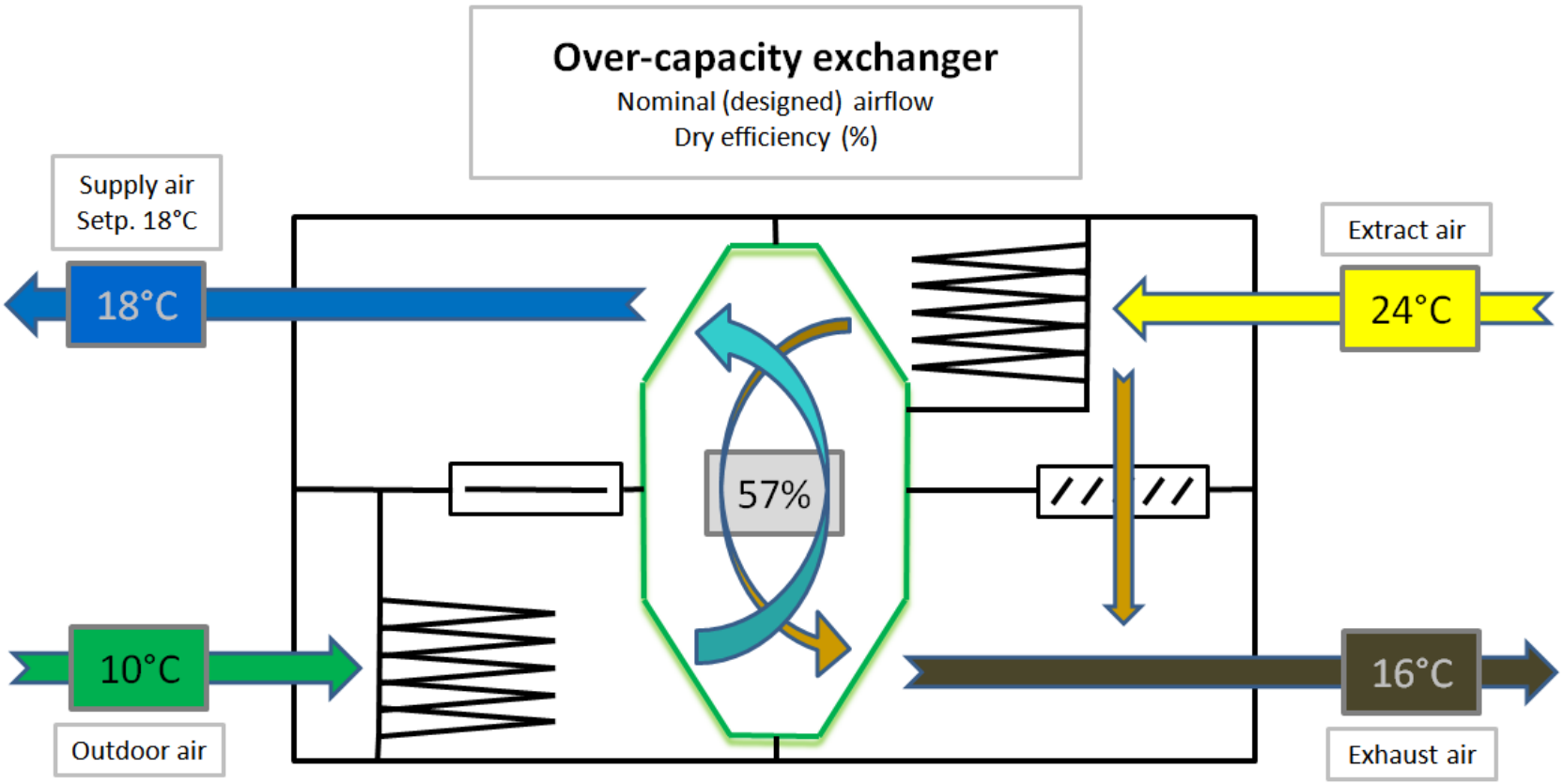
Dubble By-Pass dampers




Full heat demand
Nominal (designed) airflow
Dry efficiency (%)
Supply air
Setp. 18°C
18°C
Extract air
22°C
80%
2°C
Outdoor air
6°C
Exhaust air

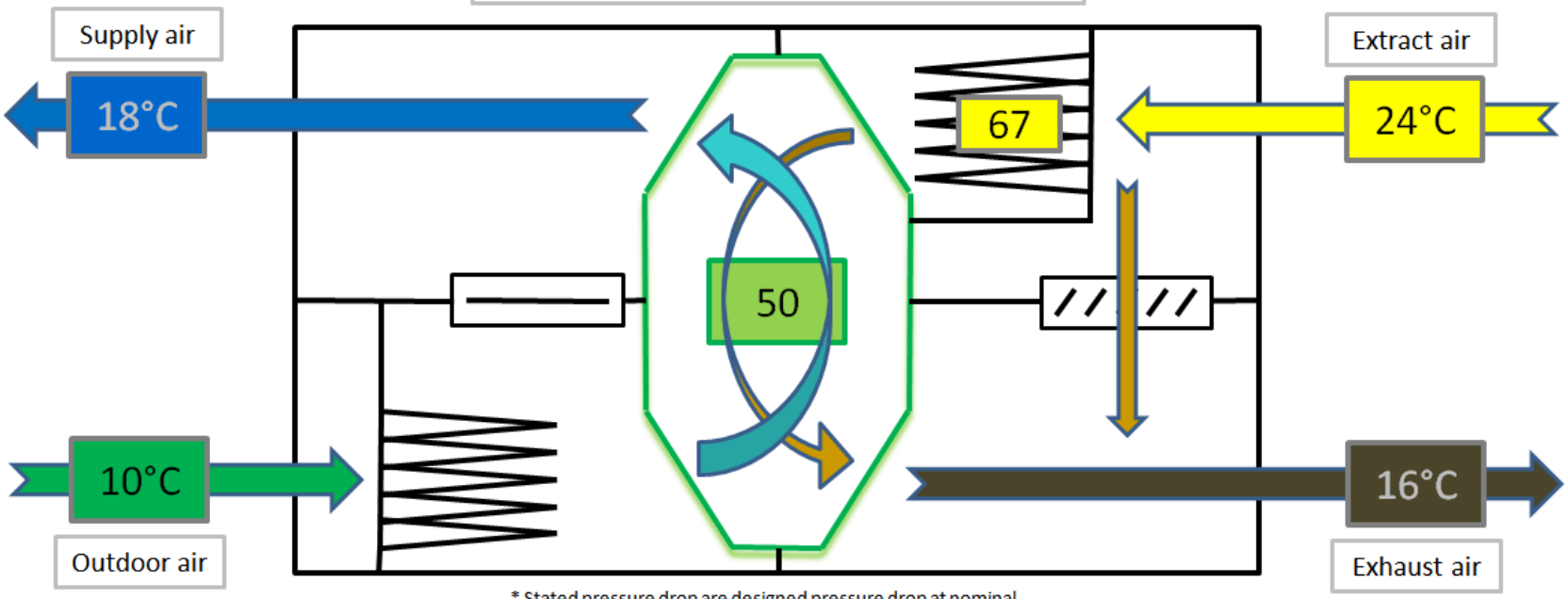
Full heat demand




Over-capacity exchanger
Nominal (designed) airflow
Dry efficiency (%)
Supply air
Setp. 18°C
18°C
Extract air
24°C
57%
10°C
Outdoor air
16°C
Exhaust air

Over-capacity - operating

Nominal (designed) airflow
Means pressure drop (Pa)*
Extract filter F5 "Half dirty"

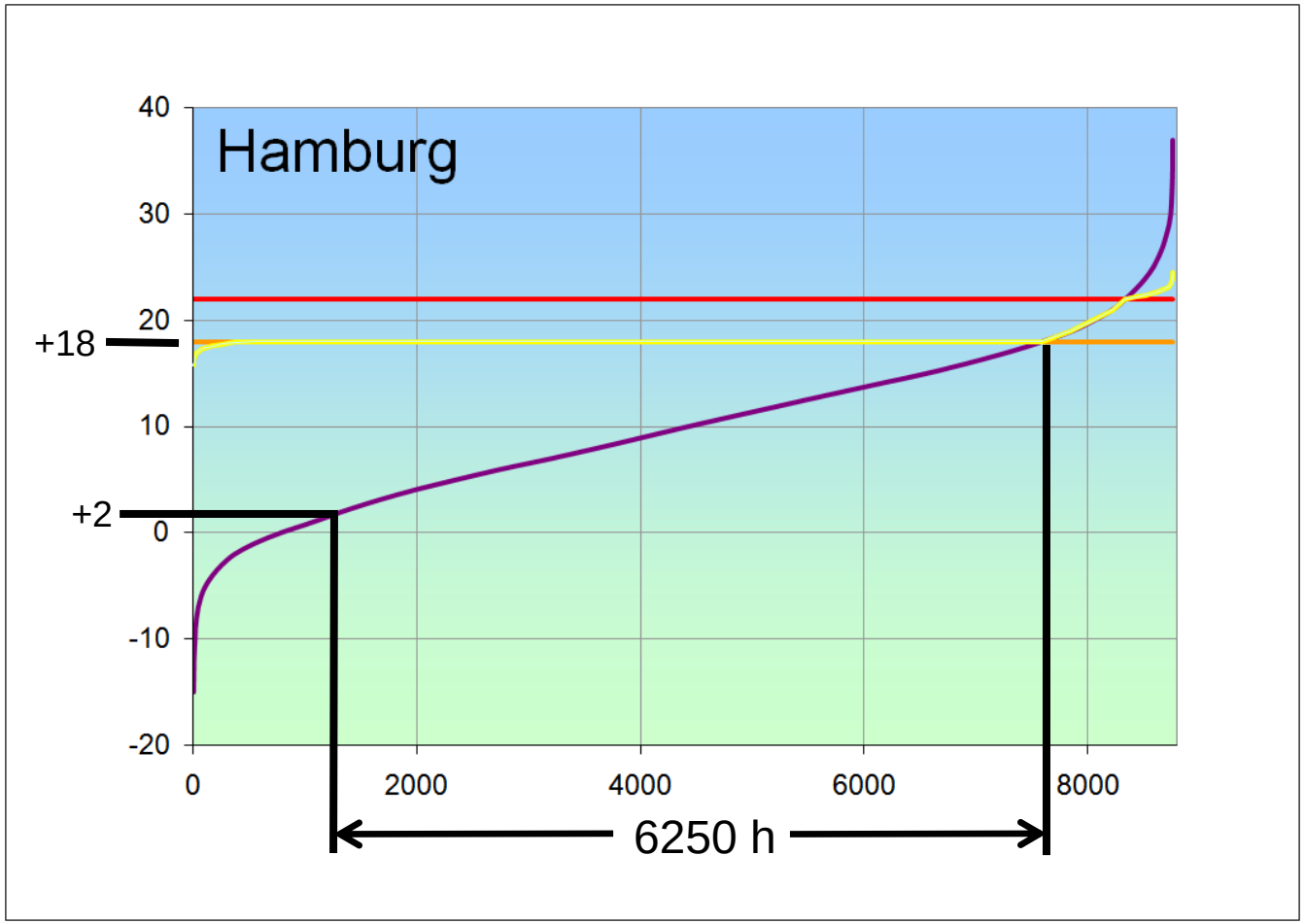


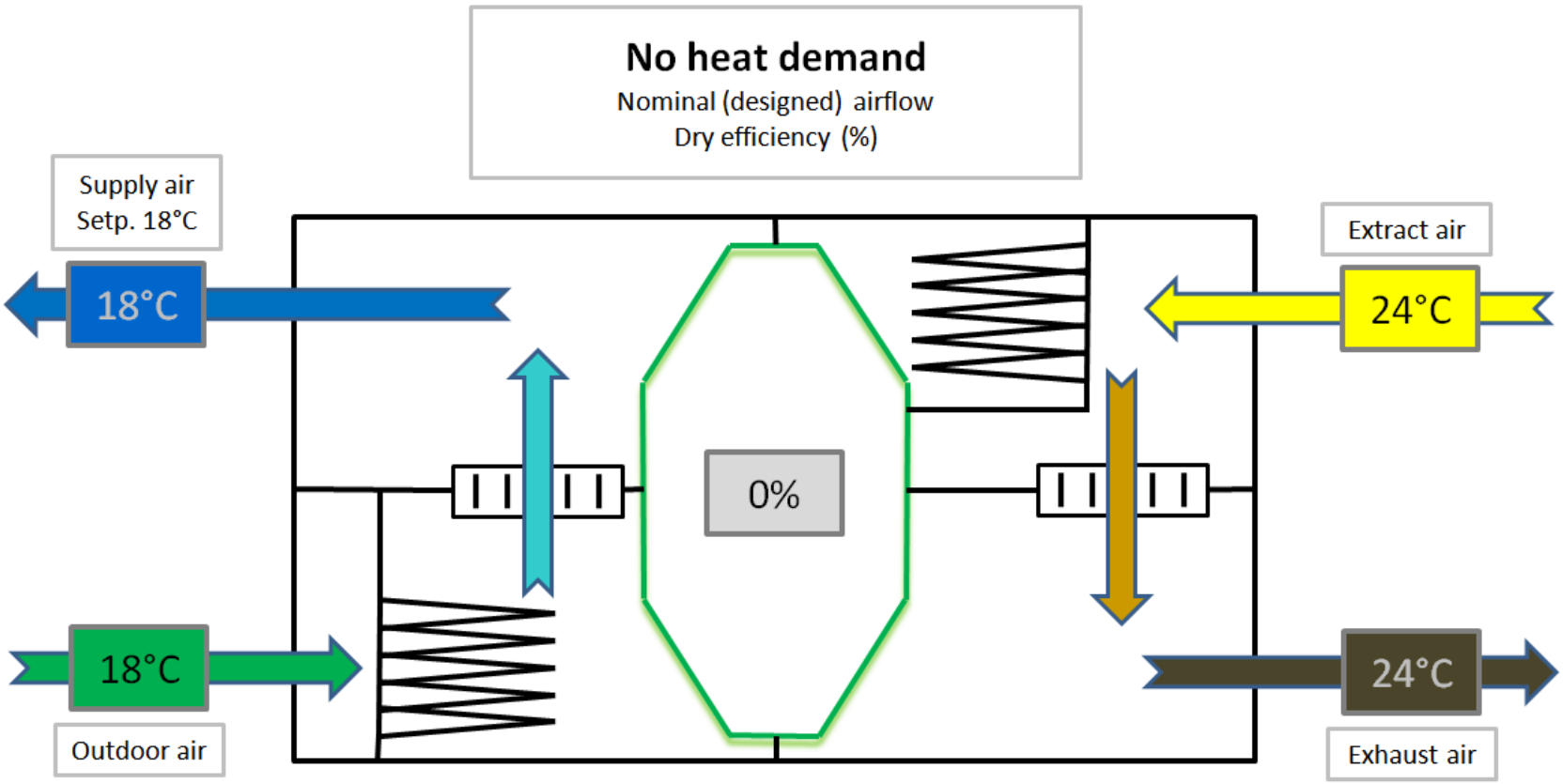
* Stated pressure drop are designed pressure drop at nominal airflow and applies on all Topvex SC sizes.

In this situation you will save

117Pa with lower pressure drop

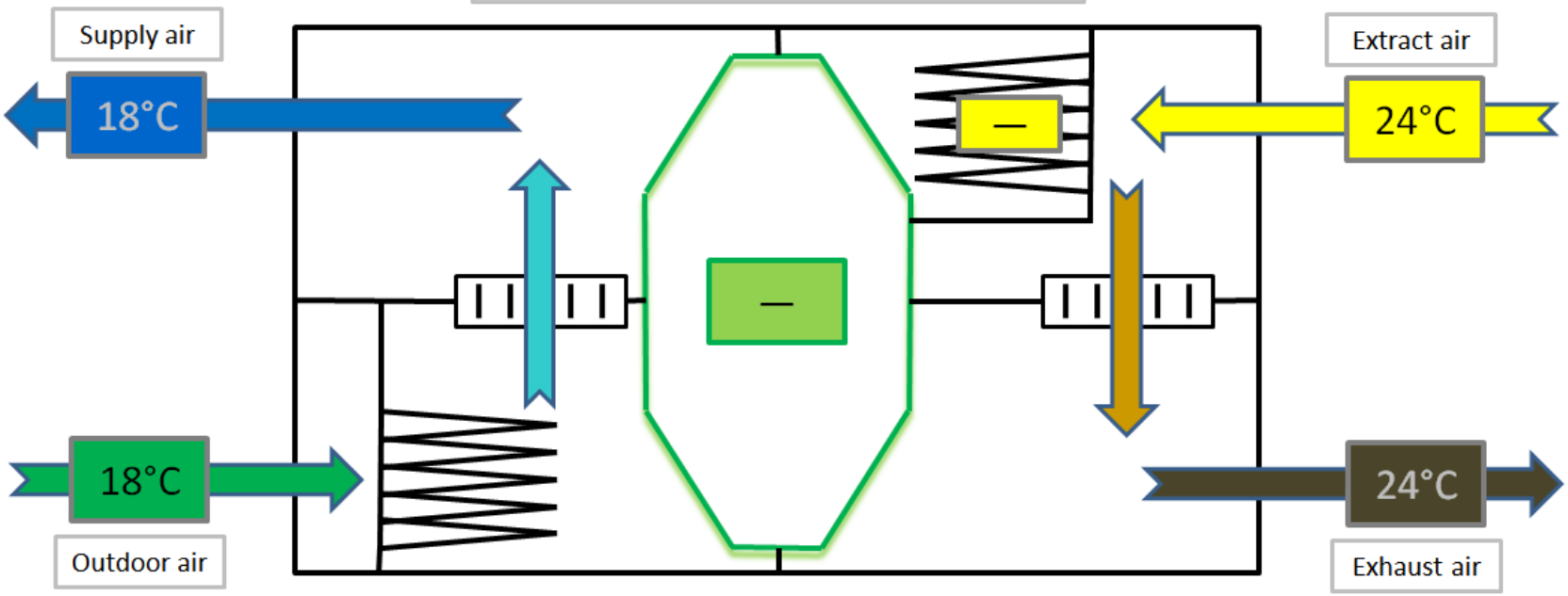
Over-capacity heat recovery efficiency




No heat demand
Nominal (designed) airflow
Dry efficiency (%)
Supply air
Setp. 18°C
18°C
Extract air
24°C
0%
18°C
Outdoor air
24°C
Exhaust air

No heat demand - operating

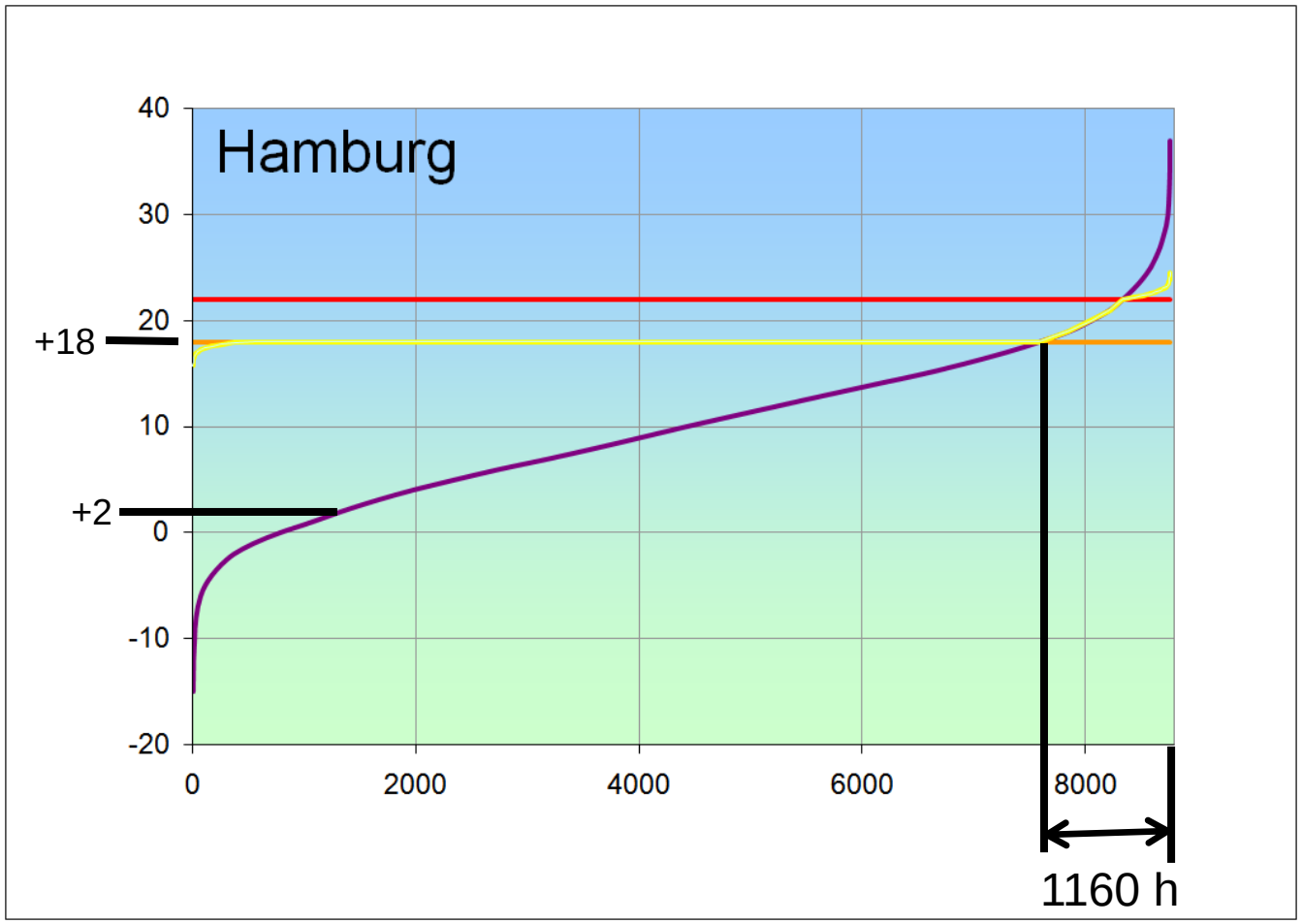
Nominal (designed) airflow
Pressure drop (Pa)
Extract filter F5 "Half dirty"



In this situation you will save

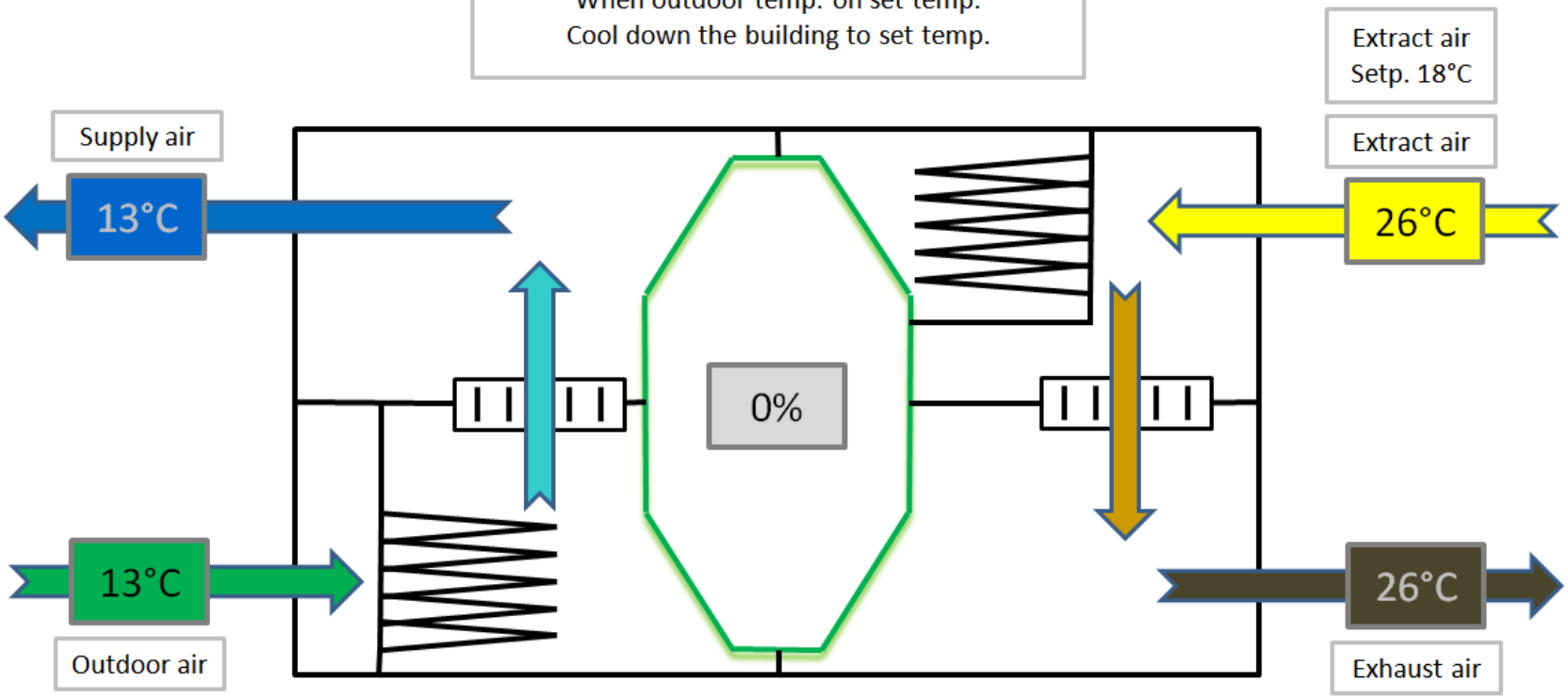
235Pa with lower pressure drop

No heat demand



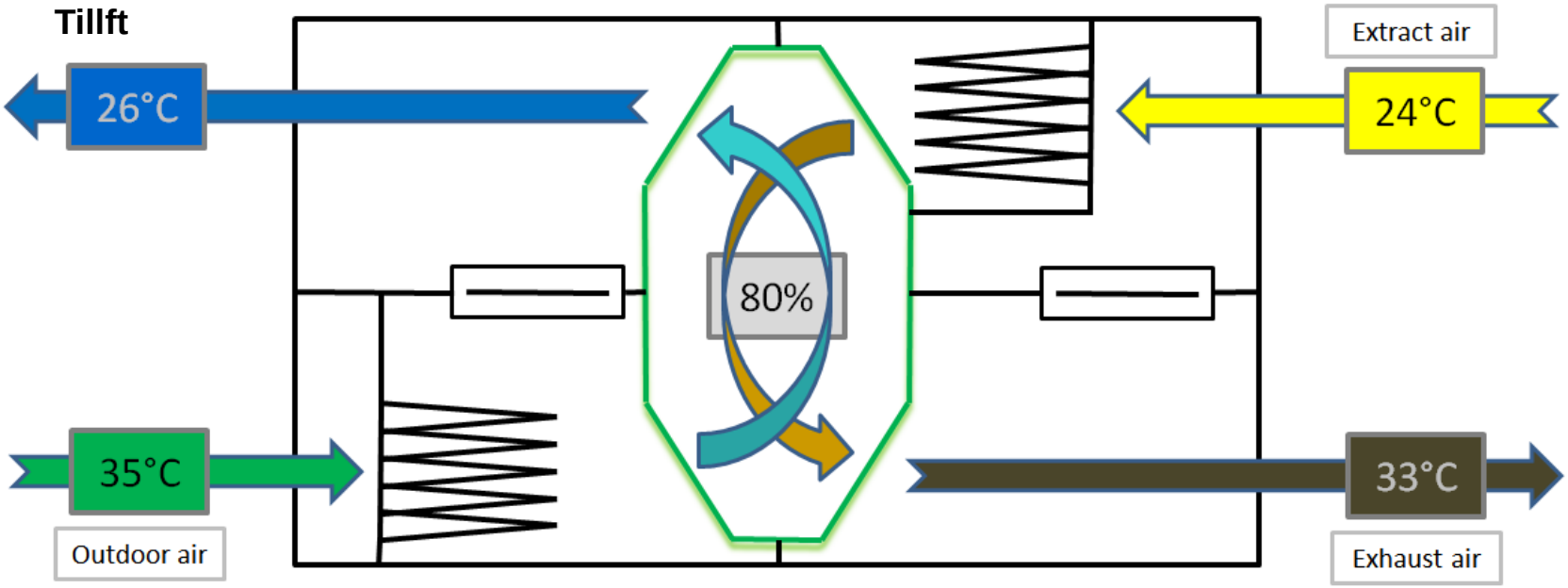
Free/Night cooling

Start Fans on set airflow (%)
When outdoor temp. on set temp.
Cool down the building to set temp.



Cool recovering

Closing dampers when indoor temp is a set value below outdoor temp.
Nominal (designed) airflow
Dry efficiency (%)



Conclusions

In this case: School in Hamburg

Air handling unit, 2160m3/h, 300Pa externt pressure

- Full heat demand: Totally SFP 2.00
- Partly heat-demand: Exhaust-fan -117Pa = Totally SFP 1,78
- No heat-demand: Exhaust-fan -235Pa, Supplyfan-100Pa = Totally SFP 1,45

Mean annual SFP with by-pass dampers:

(1350/8760*2,0)+(6250/8760*1,78)+(1160/8760*1,45) = 1,77

Energy saving:

Total SFP 2,0-1,77 = 0,23

0,23 kWh * 0,6 m3/s * 24 h * 365 days = 1209 kWh/year

Conclusions

Average SFP with by-pass dampers will be much lower than a unit without the by-pass function

- **Energy saving!**
- **Three times less changes of exhaust filters**
- **Very good control of the supply temperature**

Use balanced Ventilation and do it in a good economic way!!

There exist a lot of solutions!!

Thanks for listing!!