Selection and sizing of purge chambers for rotors

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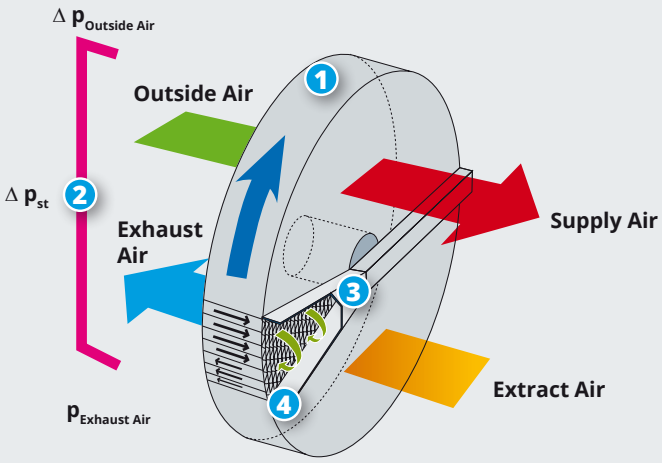
KLINGENBURG
energy recovery our passion

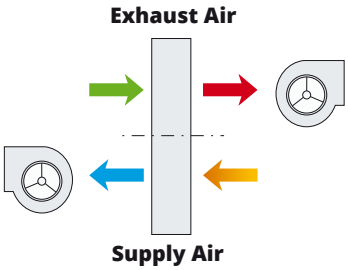
Complete separation between air volume flows is not guaranteed with rotary heat exchangers 1. To avoid leakage via the sealing system in the direction of the supply air, a design with the outside air/supply air line in positive pressure 2 is recommended. In order to minimise the rotation-related entry of extract air components into the supply air, a so-called purge chamber 3 can be used. Depending on the pressure gradient between the outside air and the exhaust air 2, the proportion of outside air or fresh air routed through the purge chamber displaces used extract air 4 and thus contributes to a low EATR (Exhaust Air Transfer Ratio) value.



The table below lists guideline values for possible use of a purge chamber. Since the purge pressure in [Pa] plays an important role and the purge air volume must always be higher than the extract air volume transferred via rotation, use of the Klingenburg design software is recommended to determine whether a purge chamber is effective and if so, which size.

Differential pressure between outside and exhaust air Δ p_{st} $\Delta p_{st} = p_{Outside\ Air} - p_{Exhaust\ Air}$	**Type of purge chamber**	
< 0 Pa	Differential pressure insufficient	No purge chamber
0 - 200 Pa	Effect of the purge chamber questionable	No purge chamber
200 - 500 Pa	Large purge chamber	10°
500 - 800 Pa	Small purge chamber	5°
> 800 Pa	Observe the purge air volume!	No purge chamber
> 1500 Pa	High differential pressure	Double seal airflow separation (depending on model)

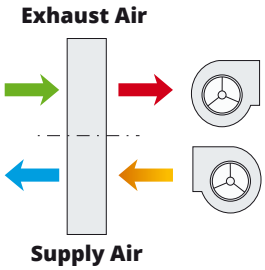
The arrangement of the fans allows conclusions to be drawn about the expected differential pressure. Klingenburg recommends using the design software to understand the effects of the pressures prevailing in the rotary heat exchanger in order to select the correct purge chamber, if necessary.



Exhaust air draw through
Supply air draw through

This arrangement should be preferred. The pressure potential of the outside air is expected to be higher than that of the exhaust air.

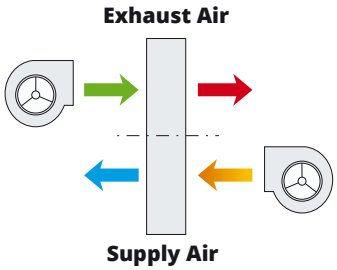
Purge chamber: 10°



Exhaust air draw through
Supply air blow through

The air volume flowing through the purge chamber increases due to the presumably very different pressure potentials.

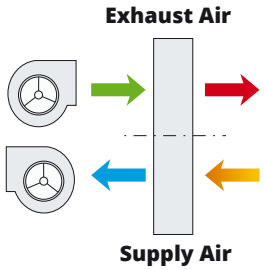
Purge chamber: 5°



Exhaust air blow through
Supply air blow through

The pressure potential of the outside air is expected to be higher than that of the exhaust air.

Purge chamber: 10°



Exhaust air blow through
Supply air draw through

An overflow of exhaust air into the outside air is probable. This arrangement should be selected when air recirculation is permitted.

Purge chamber: none

Auswahl und Dimensionierung von Spülkammer 0322 de en Rev 2