

## **Rotor Concepts for the Counter Flow Heat Recovery Fan**

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**Abstract :** Decentralized ventilation systems should combine a small and economical design with high aerodynamic and thermal efficiency. The Counter Flow Heat Recovery Fan (CHRF) provides the ability to meet these requirements by using only one cross flow fan with a large number of blades to generate both airflows and which simultaneously acts as a regenerative counter flow heat exchanger. The successful development of the first laboratory prototype has shown the potential of this ventilation system. Occurring condensate on the surfaces of the fan blades during the cold and dry season can be recovered through the characteristic mode of operation. Hence the CHRF provides the possibility to avoid the need for frost protection and condensate drain. Through the implementation of system-specific solutions for flow balancing and summer bypass the required functionality is assured. The scalability of the CHRF concept allows the use in renovation as well as in new buildings from single-room devices through to systems for office buildings. High aerodynamic and thermal efficiency and the lower number of required mechatronic components should enable a reduction in investment as well as operating costs. The rotor is the key component of the system, the requirements and possible implementation variants are presented.

**Keywords :** CHRF, counter flow heat recovery fan, decentralized ventilation system, renovation

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