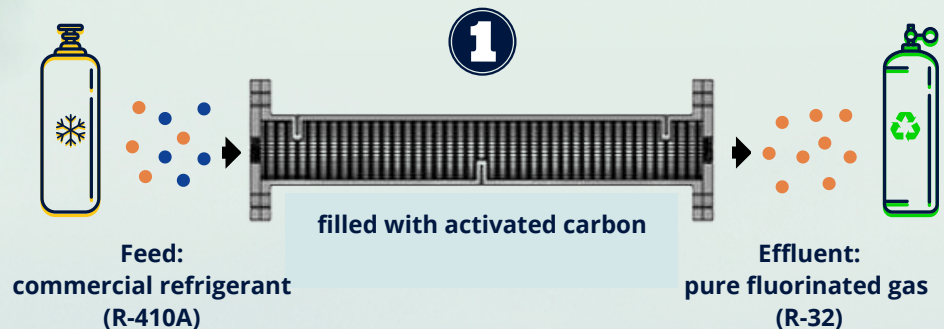
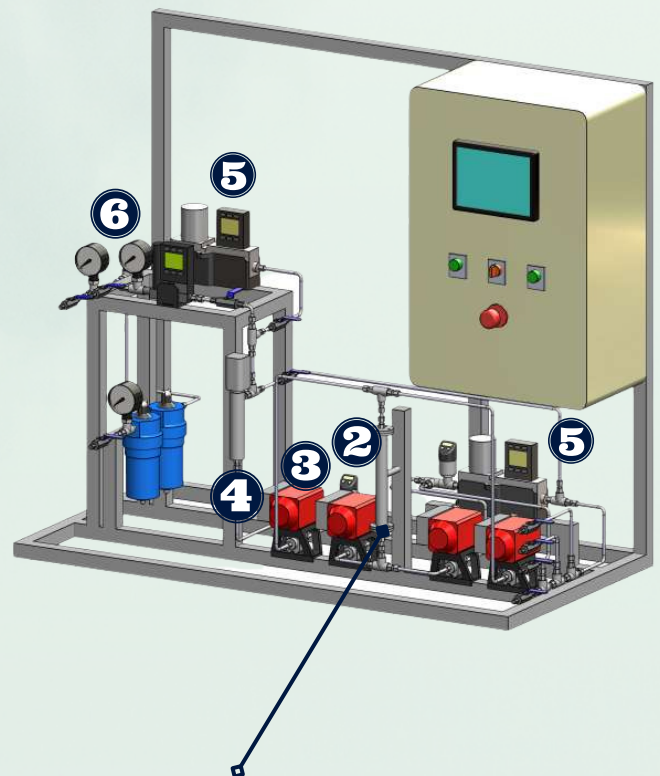


Adsorption Prototype

One of the advanced separation processes applied in KET4F-Gas uses solid porous materials to recover value-added HFCs (such as R-32) contained in high-GWP refrigerant blends (e.g., R-410A). the NOVA University of Lisbon developed a novel prototype comprising **an adsorption column (1) filled with activated carbon** and several technical components supporting the system (2-6).

Constant temperature is ensured thanks to heating resistance (4). The pressure is controlled by visual gauges (6) and registered by pressure transducers (2). Three mass flow controllers (5) and four pneumatically valves (3) placed on programmable timers allow the correct management of the adsorption column. Moreover, an online monitoring system for the main operational variables permits prototype automation.

In the adsorption process, one of the mixture's components is adsorbed into the porous material, while the remaining leaves the adsorption column. Then, the adsorption column is regenerated to recover the selectively adsorbed compound.



This prototype is highly efficient for the separation of R-410A, with high performance in the selective recovery of high purity R-32. With simple adjustments, it could be applied to other F-gases. It has low energy and maintenance requirements, and it is easy to apply in a waste management facility due to the small amount of space required, and due to its modularity and scalability.