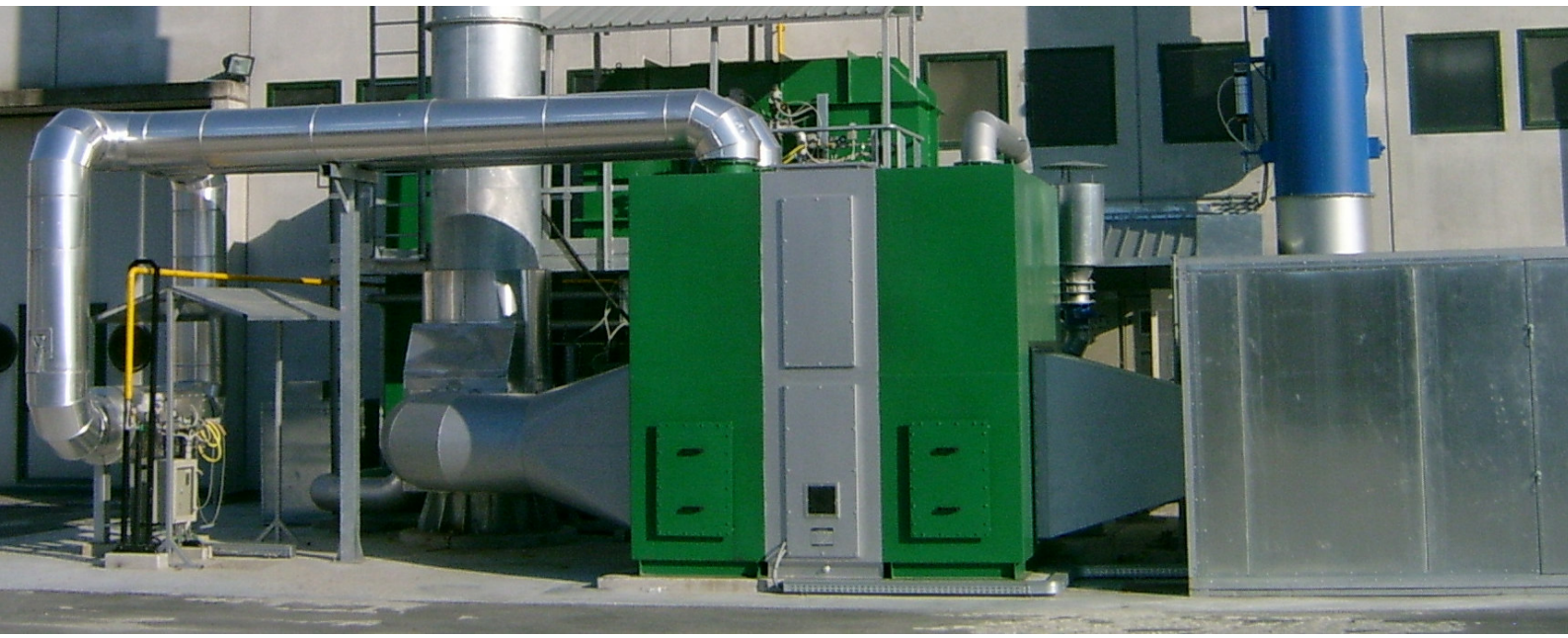
airprotech srl
air protection technology



Zeolite RC

Zeolite rotoconcentrator

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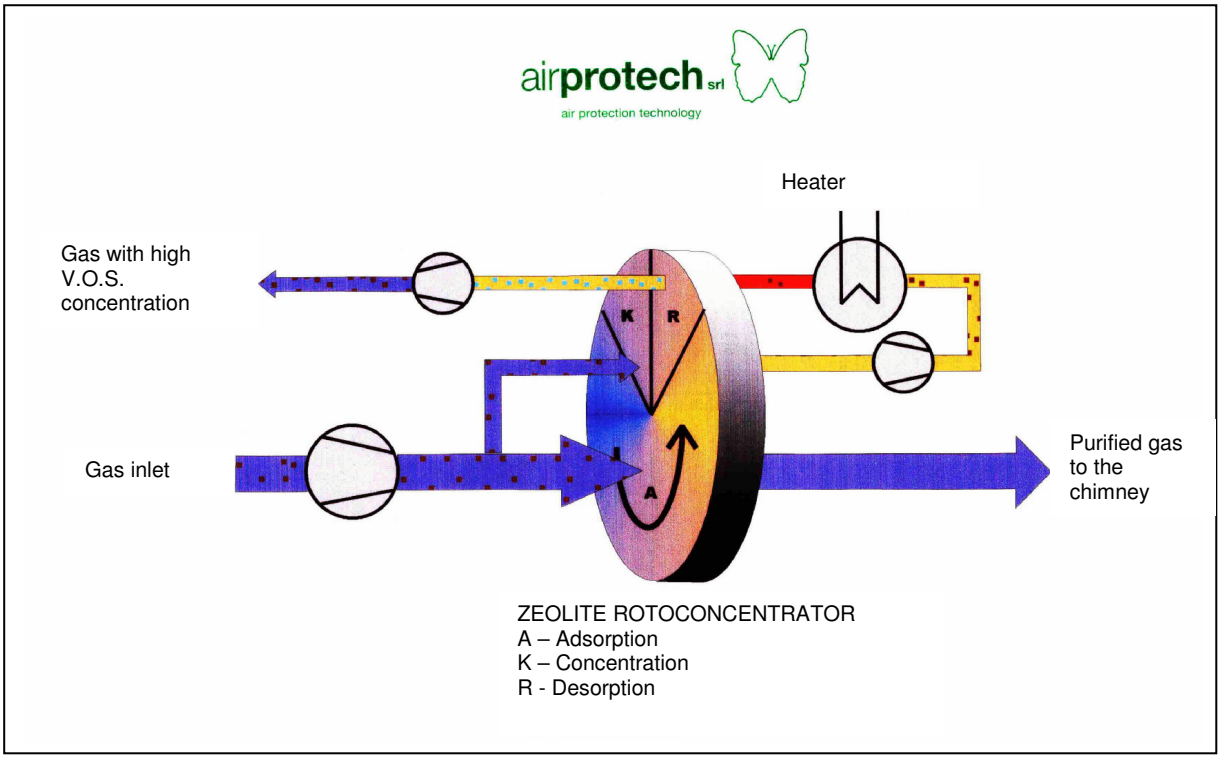
Application field

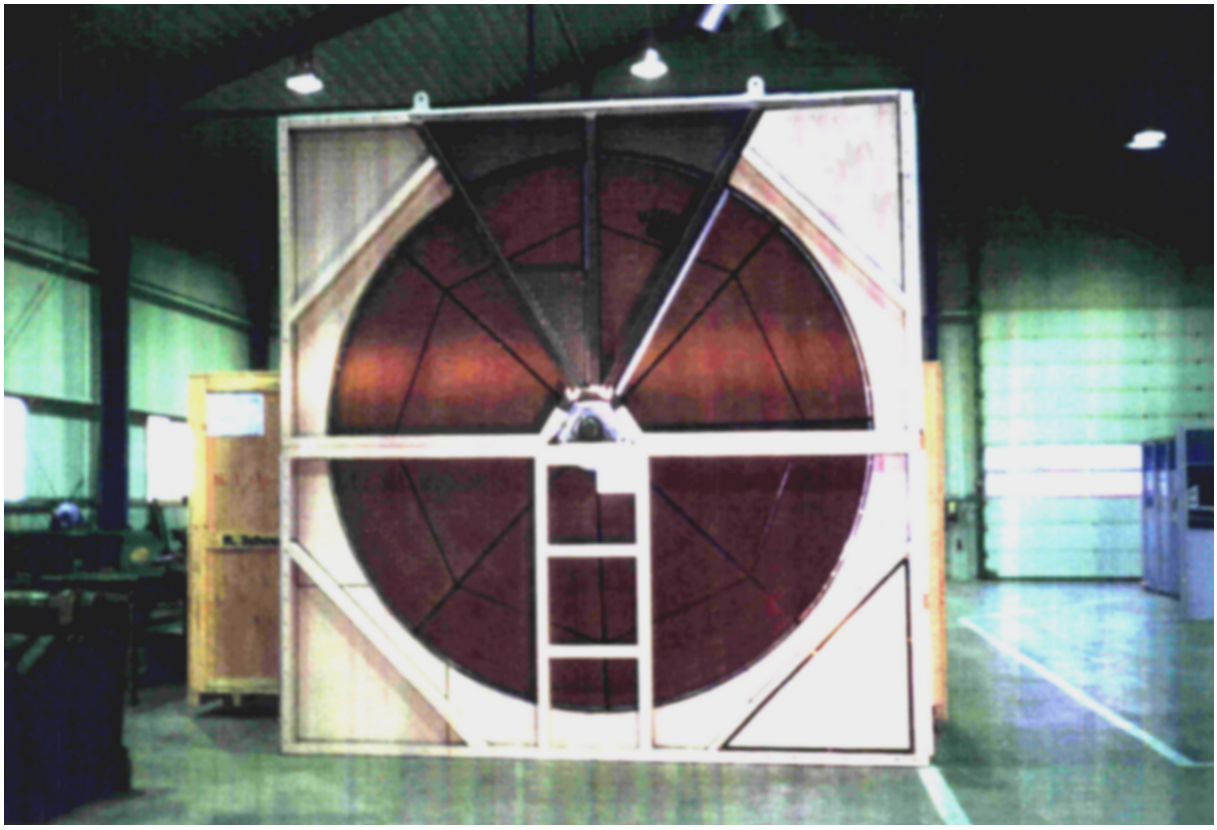
Ideal solution for the treatment of big air flows containing low concentrations of polluting substances. In these project conditions, the traditional combustion plants would have big size and high handling and investment costs. On the contrary, the zeolite concentration technology is characterised by very low handling costs and reliability during time.

Operating principle

The air stream to be treated, with a low concentration of V.O.S. (Volatile Organic Substances), is purified in the adsorption section of the concentrator (area A) and released into the atmosphere in compliance with the regulations (20 mgCOT/Nm3). In the zeolite regeneration air flow (pre-heating – Section K, and regeneration – Section R), which is up to 15 times lower than the flow going into the plant, the V.O.S. concentration is increased up to 15 times.
The advantage of this process derives from the fact that it is possible to oxidise the organic substance in a small post-oxidiser (limited capacity of the regeneration stream) with consequent low handling costs (high V.O.S. concentration, self-thermal adjustment of the combustion system, oxidiser off).



The concentration process is performed in a **ZEOLITE** rotor. This rotor is made of a ceramic-based structured support highly soaked in a mixture of hydrophobic zeolites, on which the solvent is adsorbed.



The zeolite regeneration air is withdrawn from the process gas upstream the concentrator and firstly goes through the rotor, thus cooling the just cooled zeolite sector (Sector K), and then, after being heated up to a pre-established temperature, is sent in counter-current to the regeneration area (Section R). The high-concentration desorption flow going out of the rotor is then sent to the thermal combustion unit (regenerative, catalytic or recuperative), where it is completely purified by the solvent.
The zeolite, which represents the evolution of the adsorbent materials technology, has the following main features:

- it is not organic and, therefore, it does not burn;
- it is selective to water and, therefore, the steam is not retained in the micro-pores;
- it maintains its features during time and, therefore, the adsorption efficacy is not reduced.

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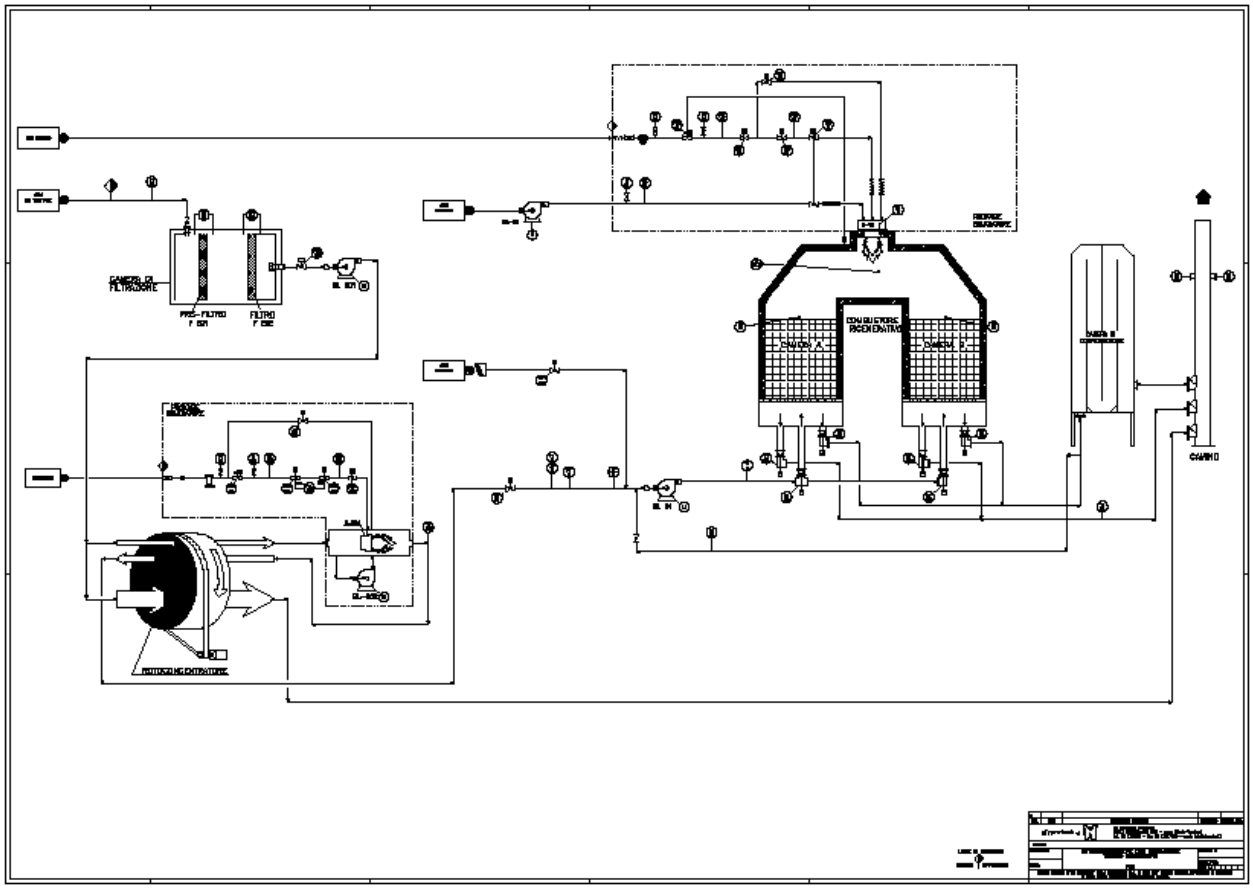
P&I diagram



Applicability range of the system

Parameter	Applicability range	u.m.
Capacity	≥ 10,000	Nm3/h
Optimal incoming V.O.S. concentration	0.1 ÷ 0.7	g/Nm3
Max. incoming V.O.S. concentration	1 ÷ 1.5	g/Nm4

Typical applications

Type of production	Process	V.O.S. treated
Automotive	Painting cabins	Toluene, xylene, esters, alcohols
Furniture production	Painting cabins	Toluene, xylene, esters, alcohols
Production of plastic objects	Painting cabins	Toluene, xylene, esters, alcohols
Printing	Drying	Toluene, xylene, esters, alcohols
Adhesive tapes – Magnetic tapes	Cleaning unit of the coating process	Ketones (MEK, cyclohexanone, methylisobutylketone)
Chemistry	Refineries, reactors	Aromatic hydrocarbons, organic acids, aldehydes, alcohols
Adhesives for synthetic resins	Plastic coating, production of plywood	Styrene, aldehydes, esters
Production of fibreglass boats	Gel coating, spreading process of styrene resins	Styrene, acetone, toluene
Production of paints and resins	Reactors, mixers, test cabins	Various non-chlorinated VOCs
Semi-conductors	Washing unit	Alcohols, ketones, amines
Pharmaceutical industry	Synthesis	Ethanol, acetone, MEK
Production of synthetic marbles	Mixers, drying process	Styrene, acetone, toluene
Micro-electronics	Production	Various non-chlorinated VOCs

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