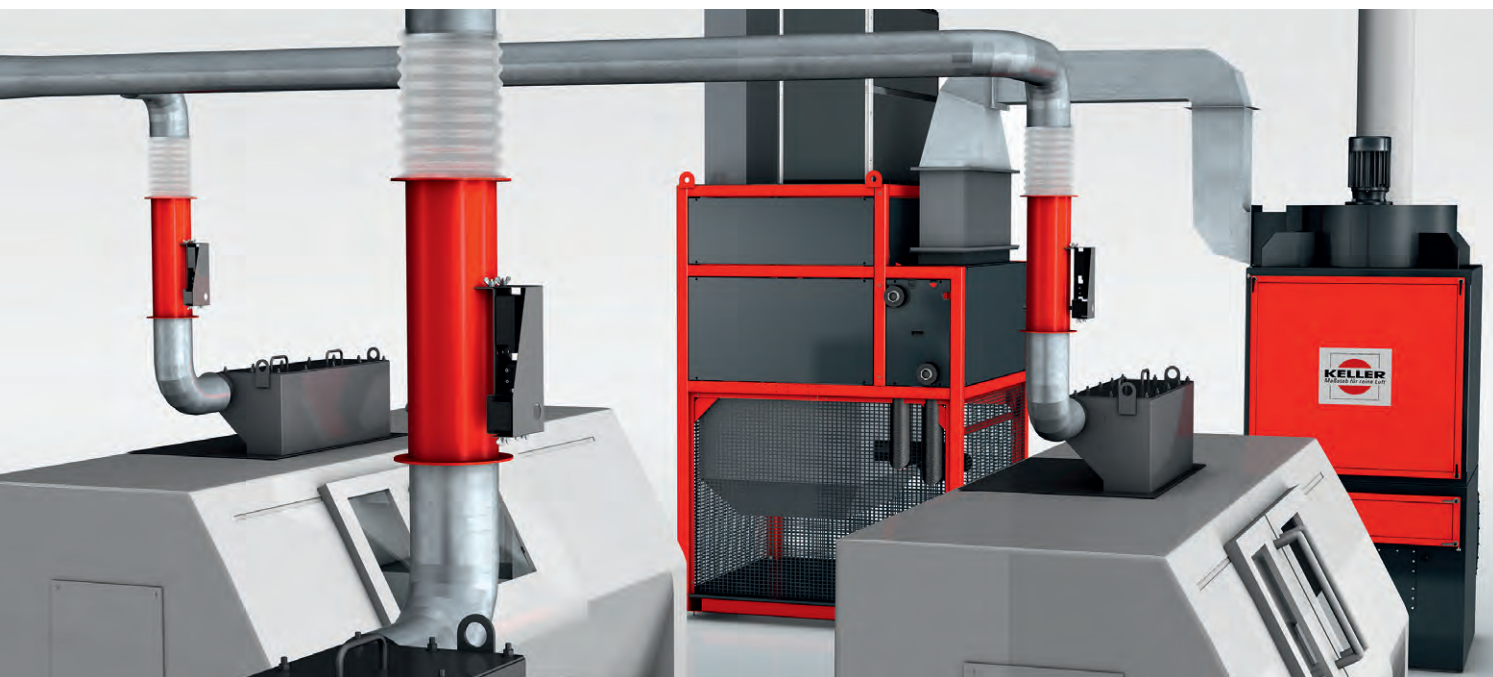


Efficient use of energy –
efficiency optimization



**We offer energy-saving solutions for maintaining
clean air inside production plants, and for
additional process heat recovery (ENEG 2013)**

A lifecycle cost analysis of air pollution control systems indicated that energy-optimized components and processes are substantial cost reducers for new systems as well as for retrofits.

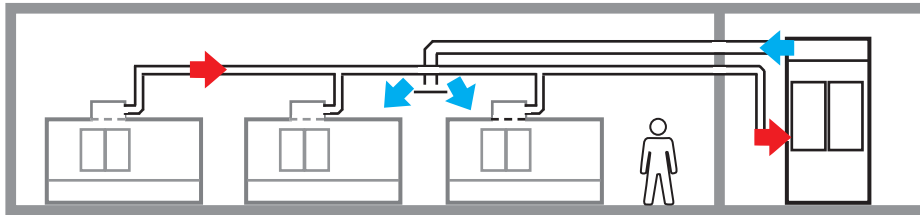


ProTerm, the thermal energy recovery module, utilizes heat from process exhaust air to create ideal indoor temperatures.



Keeping indoor air free of dust, energy-efficiently

Process dust emissions from the manufacturing area are separated and filtered



Example: Central VARIO eco dry separator with energy-saving clean air recirculation according to VDI 2262-3

A prerequisite for the efficient cleaning of ambient air surrounding enclosed production machinery is direct extraction inside the work space.

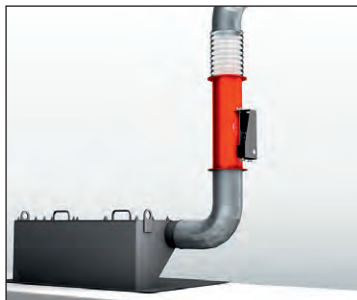
Various filtration technologies which ensure recirculation can be utilized, depending on the different processes involved.

Clean air recirculation conforming to VDI 2262-3 is permissible, provided that the residual dust content in the clean air is max. 1/5 of the occupational dust exposure limit value.

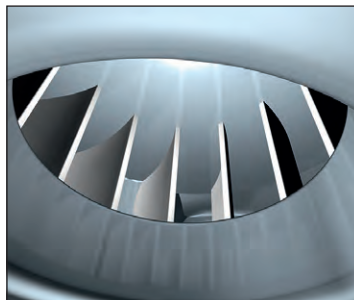
Saving energy with intelligent systems

Air flow regulation provides potentially significant savings with the fast, automatic adjustment of the fan's efficiency. Without this type of control, the air flow for the separation of enclosed machines or process systems is typically set for the maximum required value, which ensures that, eg. while

opening a housing door, the air flow is uninterrupted. With ProFix, the air flow requirement of each system is automatically controlled according to its specific need. The fan itself creates the actual required air flow. Once adjusted, the ProFix operates automatically.



Separation of process dust emissions with ProChip. The essential air flow requirement is provided automatically with the ProFix air flow controller.



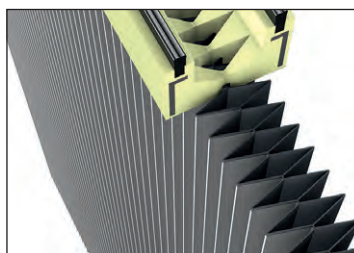
Flow optimized fans of all Keller separation systems can also be equipped with an energy-saving IE3 motor.



The new generation VARIO eco dry separator effectively takes advantage of all the energy efficient features of ProBran® filters.

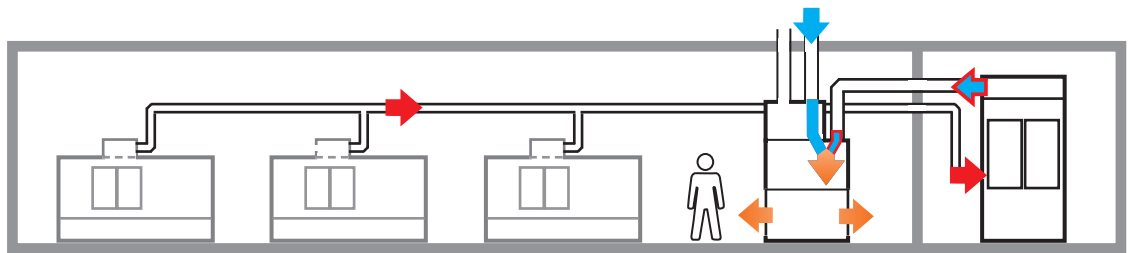
New energy saving filtration technologies

Because of the quality of the ProBran® filters, only one filter stage is required for numerous applications. Omitting the fine filter stage facilitates additional energy savings.



ProBran® filter with high separation efficiency for energy-saving air recirculation.

Using ProTERM ensures energy-saving use of heat from process exhaust air



During the separation of dust emissions, part of the process heat is withdrawn from the manufacturing area with the separated air. Following filtration of the process

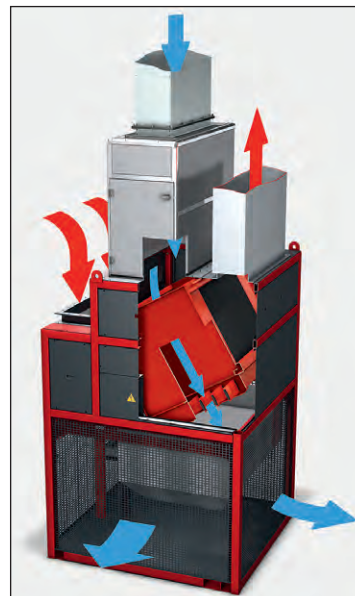
exhaust air, additional clean, outdoor air is brought in and directed to the ProTERM thermal energy recovery module where it is combined with the ambient air and can

be heated on demand. Consequently, we can heat during Winter and cool in the Summer.

The utilization of process heat with ProTERM is the fundamental concept in energy saving climate control



Example A: The cleaned process exhaust air and outdoor air are heated on demand and combined with ambient air inside the plant.



Example B: Outdoor supply air and process exhaust air are cooled by an optional air-conditioner during high outdoor temperatures.

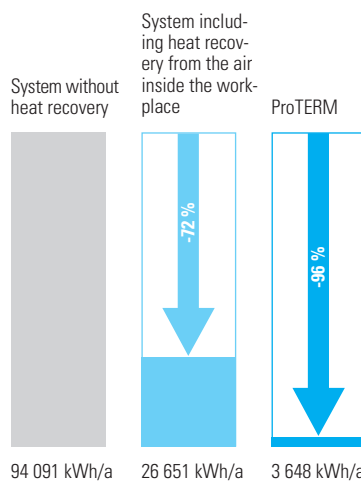


Example C: Air circulation inside the plant can be modulated with an integrated heater following longer pauses in production.

Keller's energy-saving technology has been proven in practice to be a cost reducing factor.

These types of protective measures for operators and the environment pay off quickly. The scope of energy-savings can be seen in the illustrated example of ventilation heat demand within one year.

Sample reference calculation (at right):
 Exhaust air temperature room 20° C
 Exhaust air temperature process 26° C
 Space temperature 18° C
 Air flow 10 000 m³/h
 Location Germany
 12 hours of operation per day



Please take into consideration the German energy-saving regulations (ENEV)

The Energy Saving Ordinance 2014 (ENEV) and Energy Conservation Act 2013 established mandatory regulations concerning the usage of heat recovery systems for the new installation of ventilation systems with an air volume starting with 4000 m³/h air flow. We will be pleased to perform detailed amortization calculations or offer comprehensive measures for individual companies.

Individual amortization calculation

Would you like a personalized amortization calculation? Please get in touch with us!

Integrated project consulting

Air pollution control for machining processes in connection with energy-savings according to the German ENEC, as well as the use of energy from process exhaust air are highly complex subjects when taking into consideration all the

existing standards and regulations. Keller will support your plans and projects with our extensive knowledge. We also offer the installation of company-specific energy monitoring which assists you in strategically enhancing

your energy management efforts. If you require total air conditioning included in the overall design concept, Keller will arrange a working collaboration with qualified partners.

Collaboration with a local certified energy adviser

The German Federal Office for Economic Affairs and Export Control (BAFA) subsidizes energy efficient investments considering various conditions which must be discussed and checked in advance. Our external partner, a nationwide and certified expert is pleased to

inform you on further development funds and country-specific regulations. Detailed information can be located at:
www.energieeffizienz-online.info

Benefit from the information on our products and processes

This brochure gives you a brief overview of Keller's capabilities in integrating energy efficiency with air pollution control for industrial processes. No doubt that will be a continuous improvement process. You can locate

detailed information and documentation on the above-mentioned products on our homepage:
www.keller-lufttechnik.de



With GREEN BALANCE Keller Lufttechnik GmbH + Co. KG commits to reliable, far-sighted treatment of all resources – to bring into line technological progress, operational issues and social targets in order to protect the environment.

Keller Lufttechnik GmbH + Co. KG
Neue Weilheimer Straße 30
73230 Kirchheim unter Teck
Fon +49 7021 574-0
Fax +49 7021 52430
info@keller-lufttechnik.de
www.keller-lufttechnik.de