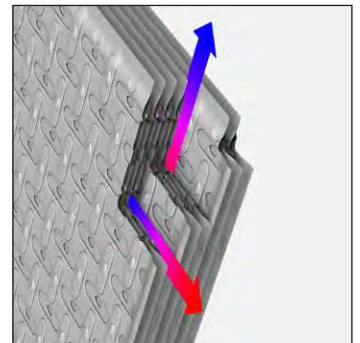


# ProTERM – Thermal Energy-Recovery Module



**Take advantage of heat energy from process exhaust air and save on heating costs**

ProTERM reduces the heat requirement by up to 95% compared to systems without heat recovery.



The heat energy produced by the process exhaust air is directly transferred to the incoming outside air. A separate supply-air unit is no longer required.



# Filtration technology and Air Conditioning technology all in one

## Take advantage of heat energy

Ideally, the cleaned process exhaust air is returned into the workplace. However, air recirculation is often not feasible and the heated exhaust air from the machine has to be vented outdoors. A supply-air unit then provides supply air for optimal air balance.

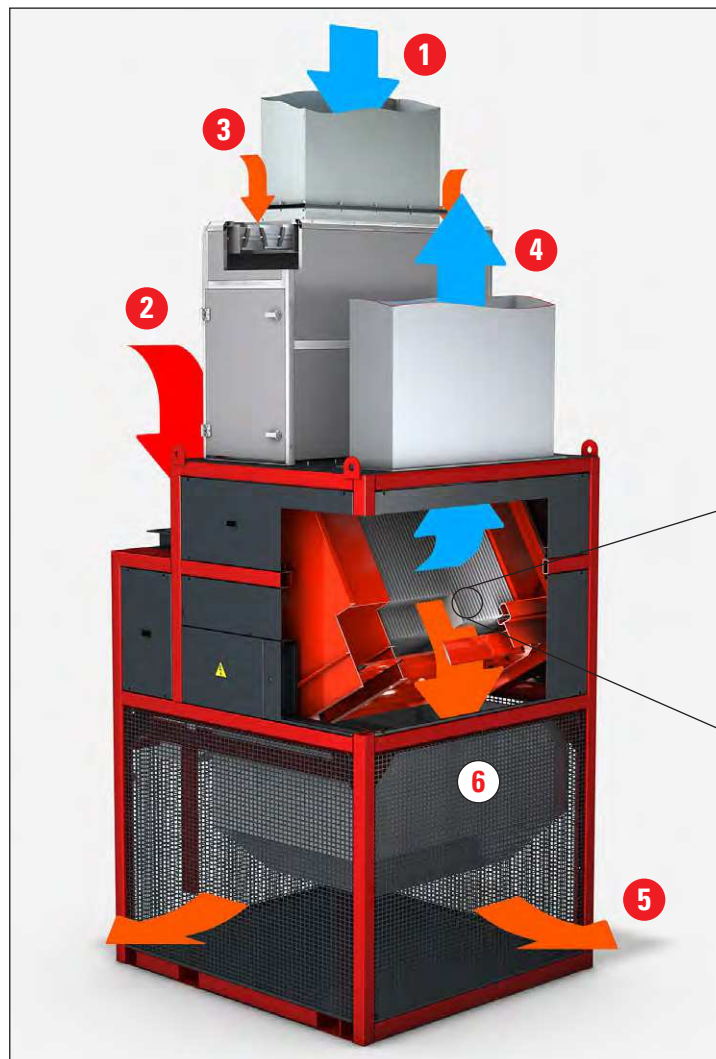
ProTERM combines filtration technology with air conditioning technology in industrial plants and takes advantage of heat energy from the process exhaust air to heat the outside air. A specially developed control system ensures optimal interface among components.

ProTERM can be applied in combination with wet, dry and aerosol separators.

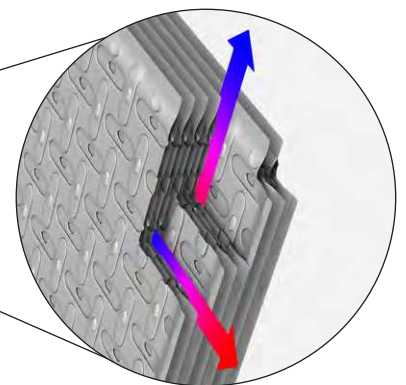
## Heat transfer by plate heat exchangers

Process exhaust air and cool outside air are directed past each other in the cross-flow heat exchanger. Because of its two separate air currents in separate channels, the fresh air supply

cannot become contaminant. The exhaust air is then released through the roof. Heat transfer is highly efficient.



- 1 Outside air
- 2 Process exhaust air
- 3 Recirculating air (upon request)
- 4 Exhaust air (through the roof)
- 5 Supply air distribution into the workplace
- 6 Heating/Cooling battery (as an option)



The heated process exhaust air and the cool outside air are directed past each other in the cross-flow plate heat exchanger and the heat energy is transferred.

Sectional diagram ProTERM

## Normal operation or dual operation with air recirculation

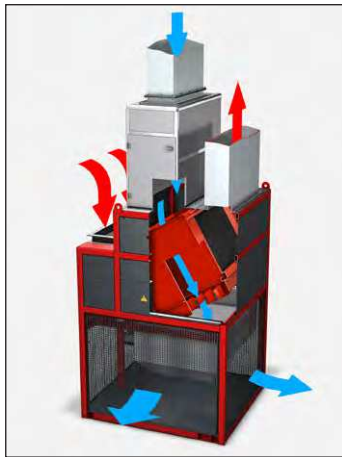


During normal operation, exhaust air is heated by process exhaust air. In dual operation, the circulating air from the plant can be heated additionally, if required.

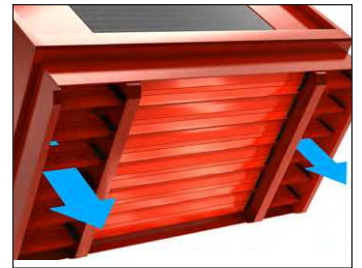


Cross-flow plate heat exchanger is active in normal and in dual operation mode.

## Cooling effect in the summer, heating in the winter



The outside air is directed past the heat exchanger via a bypass in the summer to avoid additional heat. Air can be cooled as well with an additional cooling battery for plant air-conditioning. The outside air can be heated by a heating battery for very cold days.



Outside air is directed past the heat exchange unit by means of a bypass.

## Clean air recirculation operation



To heat up the plant at the start of the work shift, it can be switched to air recirculation. In this mode, only the air from the plant is extracted, heated up by the heating battery and then distributed into the area.

## Air distribution options in the plant

- 1 Via supply air channels, connection on the left or back.
- 2 Via air outlet around the system. For this energy-saving concept according to VDI, adequate space for optimal air distribution around the system should be available.



# ProTERM – Thermal Energy-Recovery Module



## Process-proof and oil proof construction

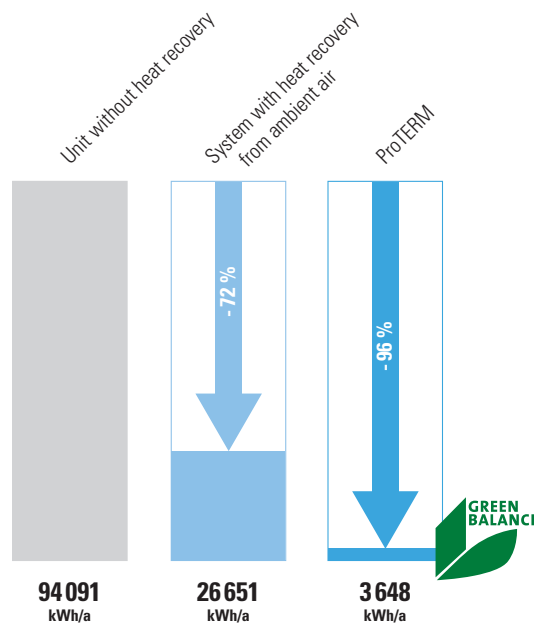
The heat exchanger is produced as **oil-proof** to avoid a material exchange between discharged and fed air. The corrosion-protected aluminum construction ensures high heat conductivity and therefore optimal head transfer.

## Technical data

ProTERM	
Airflow	8 000 – 12 500 m <sup>3</sup> /h
Cooling efficiency	max. 124 kW
Heating efficiency	max. 191 kW
Length	2 000 mm
Width	2 005 mm
Height	4 339 mm
Weight	2 100 kg

## Environmental protection that pays off

The sizable savings become apparent in a comparison of the annual heated air requirement.



Do you desire an individual amortization calculation?  
Please get in touch with us!

## ProTERM

- **Economic**  
Amortises investment costs in short time
- **Environmentally-friendly**  
Creates excellent emission values
- **Smart**  
Decentralized and flexible
- **Comfortable**  
Easy to set-up, integrate, enlarge and retrofit

## Government Aid

Under certain circumstances, government aid in terms of non-refundable subsidies are possible.

## Reference:

Room exhaust air temperature	20 °C
Process exhaust air temperature	26 °C
Ambient room temperature	18 °C
Airflow	10 000 m <sup>3</sup> /h
Location	Germany
Operating time	12 hours per day

**Keller Lufttechnik GmbH + Co. KG**  
Neue Weilheimer Str. 30  
73230 Kirchheim unter Teck  
Fon +49 7021 574-0 · Fax 52430  
info@keller-lufttechnik.de  
[www.keller-lufttechnik.de](http://www.keller-lufttechnik.de)