

**KAESER**  
**COMPRESSORS**

*Built for a lifetime.™*



# **Heat Recovery from Compressed Air Systems**

# Heat Recovery

## Why recover heat?

*The rise in energy prices is an unwelcome reality in today's manufacturing and business environment. Energy cost reduction strategies are vital to staying competitive. Facility engineers are challenged to optimize energy efficiency and extract as much productivity out of every unit of energy paid for. Harnessing the heat from compressed air systems can greatly increase operational efficiencies and help reduce a plant's carbon footprint.*

## Compressed air as an energy source

The heat generated by compressed air systems can be an excellent source of energy savings. In fact, 100% of the electrical energy used by industrial air compressors is converted into heat. Up to 96% of this heat can be recovered and put to use, significantly lowering a facility's energy costs. For example, a 50 hp compressor running 8000 hours per year with \$36,000 in annual energy costs could save \$6175 for natural gas and \$24,300 for heating oil by utilizing heat recovery strategies.

## Warm air applications

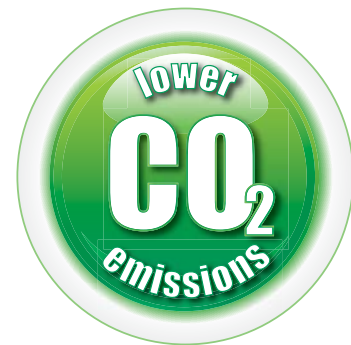
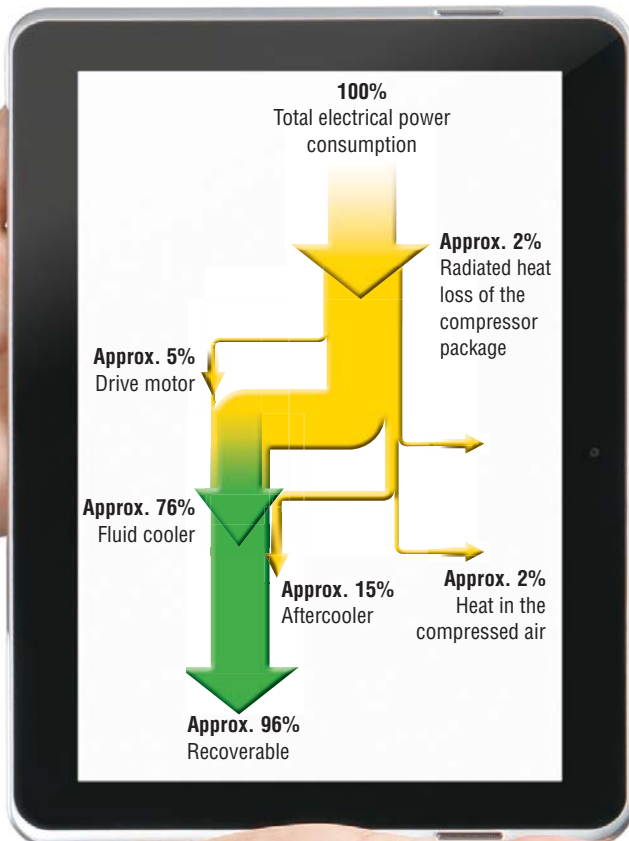
By integrating standard HVAC duct work and controls, warm air from compressors can be harnessed for many purposes. The warm air is captured by simply ducting the air from the compressor to an adjacent room needing heating.

## Water and fluid heating

Compressors can also be connected directly to a continuous process heating application, giving year-round energy savings.

## Leaner and greener operations

Beyond energy savings, an important argument can be made for the environmental benefits that heat recovery can bring. By implementing a heat recovery strategy, plants can help significantly reduce their carbon footprint.





*Three standard, air-cooled 50 hp compressors provide both warming air and process fluid heating for savings of \$36,500 annually.*

# Air Heating

## Capture waste heat in exhaust air

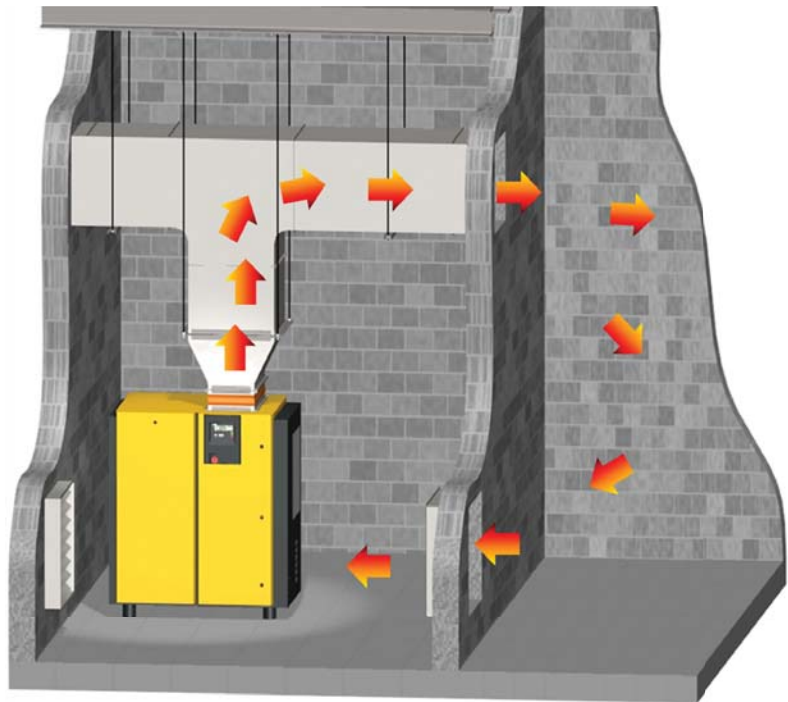
Warmed compressor cooling air can be ducted to provide highly effective space heating. The ducting simply feeds the warmed cooling air to where it is needed, such as adjacent facilities, warehouses, workshops, or even the compressor room.

## Space heating with warm exhaust air

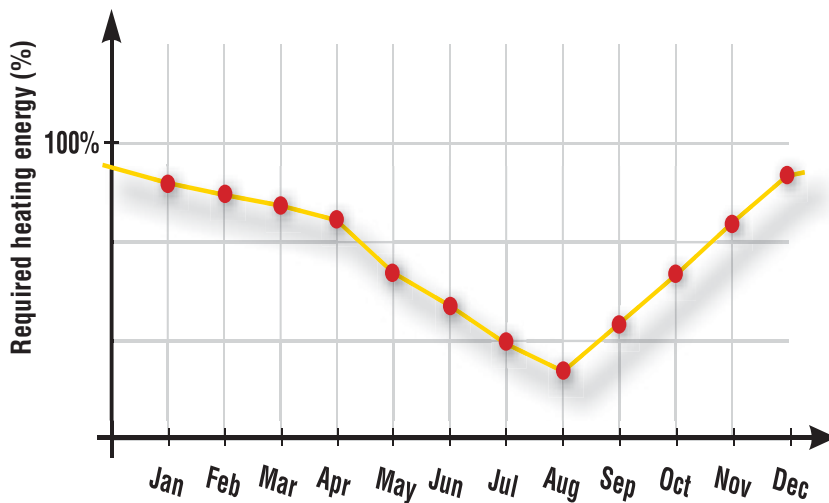
The recoverable warm air can easily be ducted away to areas requiring heating. By also installing thermostatically controlled louvers, you can precisely maintain the desired room temperature throughout the year.

## Heat recovery ready

All Kaeser rotary screw compressors have top exhaust and can easily be fitted with exhaust ducting. Kaeser's AS compressors and larger are equipped with a radial fan with high residual thrust.



Required heating energy over the course of a year



## Heat is not only needed in winter

Many people think of heating only being needed a few months of the year, but it is actually needed for significant periods of time throughout the year. While heating needs vary by climate, many portions of the United States also require heating during the fall and spring.

# Fluid Heating

## Capture waste heat for fluids

*The key to effective heat recovery with water-cooled compressors is obtaining a thermal match between the heat being recovered and the heat that is needed for the process. Kaeser can help engineer a customized solution to tap into these significant savings.*



### Heating water and process fluids

Fluid-to-fluid heat exchanger systems can provide on-demand heating and service water heated to temperatures up to 160°F or even 195°F depending on requirement. This significantly reduces the energy required for purposes such as:

- Boiler makeup water,
- Heating process fluids,
- Heating food and beverage products, and
- Hot water for showers.

### Easy integration

Kaeser compressors are easily adapted for fluid heat exchangers. In fact, many models offer built-in fluid-to-fluid heat exchangers as an option to recover up to 76% of the original input energy.





# Equipment Options

## Fluid-to-fluid heat exchangers



### Plate type

Rotary screw compressors from the SM series (from 7.5 hp) and up can be equipped with plate type heat exchanger systems. On some models, they are integrated within the unit or installed externally. Applications:

- Boiler heating systems
- Industrial laundry
- Electroplating
- General process heating



### Shell and tube

In water-cooled systems, integrated shell and tube-type heat exchangers are available, depending on the available water quality. Our compressed air specialists can advise you which design is right for your particular application. Applications:

- Non-potable water heating steam heating
- Oil refineries
- Large chemical processes



### Fail-safe

Some Kaeser models can be equipped with fail-safe heat exchanger systems for applications requiring absolute protection from contamination. SWT heat exchangers are always installed externally. Applications:

- Food processing
- Tap water heating
- Chemical and Pharmaceutical industries
- Commercial kitchens

## Additional Resources

Visit [www.kaeser.com/whitepapers](http://www.kaeser.com/whitepapers) to download a complimentary copy of our whitepaper, "Turning Air Compressors into an Energy Source" for more information on how to use heat recovery in your plant.



# The world is our home

As one of the world's largest compressed air systems providers and compressor manufacturers, Kaeser Compressors is represented throughout the world by a comprehensive network of branches, subsidiary companies and factory trained partners.

With innovative products and services, Kaeser Compressors' experienced consultants and engineers help customers to enhance their competitive edge by working in close partnership to develop progressive system concepts that continuously push the boundaries of performance and compressed air efficiency. Every Kaeser customer benefits from the decades of knowledge and experience gained from hundreds of thousands of installations worldwide and over ten thousand formal compressed air system audits.

These advantages, coupled with Kaeser's worldwide service organization, ensure that our compressed air products and system deliver superior performance with maximum uptime.



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