

FLUE GAS ECONOMIZERS

PRODUCT OVERVIEW

ENEVA Flue Gas Economizers are high-efficiency heat recovery systems designed to capture waste heat from exhaust gases and convert it into useful thermal energy without additional fuel consumption.

By utilizing the thermal energy of flue gas streams, economizers significantly improve overall system efficiency, reduce fuel consumption and lower emissions. They are widely used in boilers, process systems and energy generation facilities where energy optimization is critical.

Each ENEVA economizer is custom engineered to match process conditions, ensuring reliable operation, optimized heat transfer and long-term performance in demanding industrial environments.

DESIGN AND WORKING PRINCIPLE

ENEVA economizers operate based on indirect heat transfer between flue gas and the process fluid without mixing the two media.

Even a 15–20°C reduction in flue gas temperature can provide approximately 1% fuel savings, making economizers a key component in energy efficiency strategies.

In condensing type economizers, additional latent heat recovery further increases system efficiency beyond conventional limits.

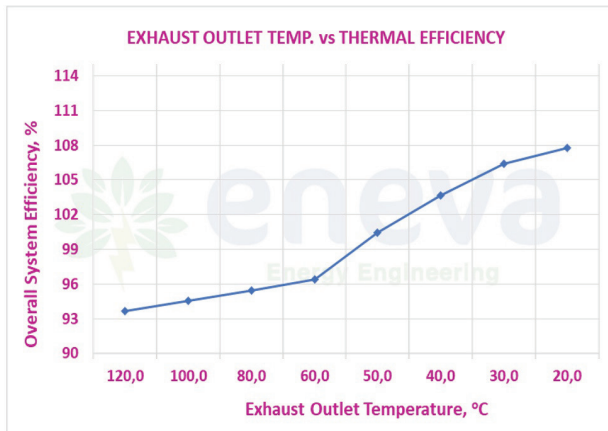
The system works as follows:

- Hot flue gas passes over heat transfer surfaces (tubes)
- The process fluid (such as boiler feedwater) flows inside the tubes
- Heat is transferred through the tube walls
- The fluid temperature increases while flue gas temperature decreases

TECHNICAL SPECIFICATIONS (TYPICAL)

Construction Types	Water tube, finned tube or smoke tube
Design Type	Conventional or condensing (stainless steel)
Orientation	Vertical or horizontal (custom design)
Thermal Capacity	Up to approx. 10 MW
Design Pressure	Up to 50 barg
Materials	Carbon steel, stainless steel or special materials
Design Standard	EN 12952 / PED (optional)
Heat Transfer Surface	Optimized for compact design and efficiency
Maintenance	Easy access for cleaning and inspection
Optional Systems	Automatic soot blowers





Each economizer is designed based on detailed process analysis including flue gas temperature, flow rate, chemical composition and required heat duty.

Key design considerations include:

- Optimized heat transfer surface area
- Controlled back pressure to protect upstream equipment
- Fouling and corrosion resistance
- Thermal expansion management
- Compact and maintainable structure

Optional integrations such as bypass dampers and soot blowing systems ensure operational flexibility and long-term performance.

MAIN ADVANTAGES

- Efficient recovery of waste heat from flue gas streams
- Reduced fuel consumption and operating costs
- Increased overall system efficiency
- Lower carbon emissions and environmental impact
- Preheating of feedwater or process fluids
- Improved boiler performance and thermal stability
- Prevention of thermal shocks and extended equipment life
- Custom engineered design for each application



TYPICAL APPLICATIONS

- Steam, hot water and thermal oil boilers
- Process stacks (drying, heating, combustion systems)
- Cogeneration and trigeneration systems
- Gas engines and gas turbines
- Cement, gypsum and metallurgical plants
- Biomass and thermal power plants
- Marine engines and generator systems

DELIVERY OPTIONS

- Armatures and instrumentation in accordance with EN 12952
- Bypass damper with electric or pneumatic actuator
- Access doors with thermal insulation
- Manual damper lever and lifting lugs
- Soot blowers (optional)

WHY ENEVA?

- Project-specific thermal and mechanical design
- Strong know-how in waste heat recovery systems
- Compliance with international standards
- High manufacturing quality and reliability
- Proven solutions for energy efficiency improvement

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