



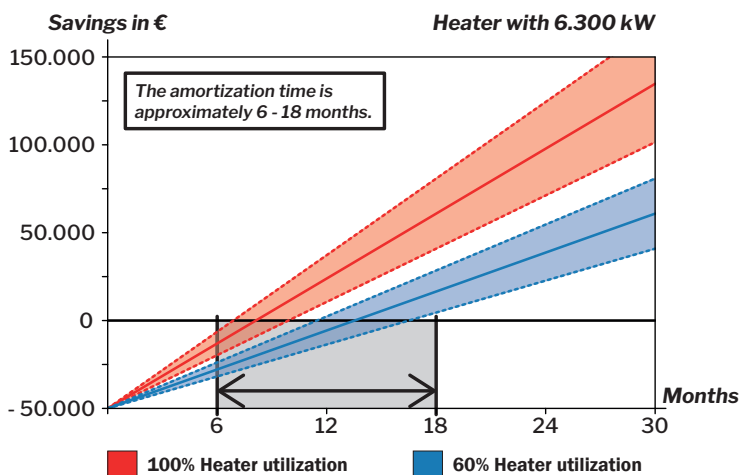
NESS Combustion air pre-heater (Luvo)

More efficient use of existing resources

A sustainable option for your plant is heat recovery through a combustion air pre-heater (Luvo). The energy from the hot flue gases can be used at the outlet of the heater, in order to save fuel and energy costs! In addition, you also reduce the CO₂ emissions of your system.

Your advantages at a glance

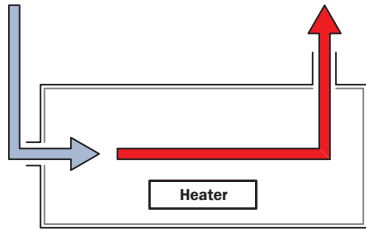
- Increased efficiency
- Quick amortization
- Sustainability
- Cost reduction



German Federal Statistical Office 2017, industrial customer price natural gas (0,0255 €/kWh + -15%)

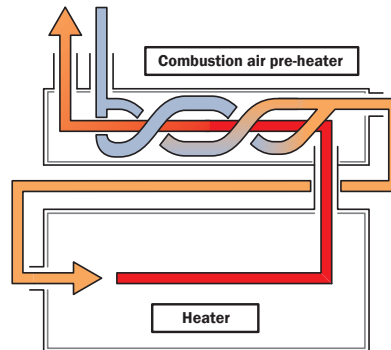


Heater with installed combustion air pre-heater (Luvo)

Heater without Luvo

In order to bring the heat transfer medium to the required temperature, the flue gas temperature must be higher than the medium temperature.

The standard heater discharges this hot exhaust without further use of thermal energy.

Heater with Luvo

The combustion air pre-heater uses a large part of the remaining energy in the flue gas, to preheat the combustion air and thus save fuel.

#1

Increasing efficiency by using the energy of the flue gas

#2

Saves fuel through preheated air

Combustion air pre-heater: Examples of cost savings

Heater with 6300 kW / Fuel: Natural gas (0.0255 €/kWh) / Electricity price (0.115 €/kWh)¹

	Case 1: Without Combustion air pre-heater	Case 2: With Combustion air pre-heater
Flue gas temperature	320 °C	180 °C
O ₂ -Content in the exhaust gas	3%	3%
Flue gas loss	14%	8.0%
Thermal efficiency	86%	92.0%
Heat input	7325 kW	6850 kW
Heat recovery	0 kW	475 kW
Additional power consumption	0 kW	25 kW

Average heater utilization	Savings with combustion air pre-heater ²
20%	14,780 € / a
40%	29,560 € / a
60%	44,340 € / a
80%	59,120 € / a
100%	73,900 € / a

¹ Energy prices for industrial customers in Germany 2017

² Assumption: 100% corresponds to 8000 hours / a production time