MI-4000

Heat recovery from waste water systems

UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim

T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59

www.uhsgmbh.de
info@uhsgmbh.de

Heat recovery from waste water systems for washer extractors and small laundries

The problem…

when it comes to saving energy from the waste water of washer extractors (WSM) is not always that simple.

Usually, the waste water is always generated, when no fresh water is required.

Fresh water is not filled in at the same time, when the warm waste water is discharged. Matters prove to be particularly difficult, when several consumers are to be supplied with warm fresh water from one heat recovery system that runs on waste water.

This means in practice that waste water is always available at times, when no (warm) fresh water is required and vice versa.

This fact makes it difficult to recover energy in an efficient way.

A project like that can usually not be implemented without extensive building measures in the company.

The solution…

is the **MI-4000** heat recovery system for recovering heat from waste water in the most effective way, which can be installed in your company without costly and extensive building measures.

This standard system for waste water has been specifically developed for consumers of fresh water with volumes ranging between 16.7 and 333.3 l/min.

The waste water‘s heat energy will be used to preheat the fresh water, so that the heat energy can be recovered.

The enclosed diagrams provide an overview over

- the performance – diagram 1,
- the temperature curve – diagram 2 and
- the annual savings - diagram 3

in a laundry with 2 100 machine running hours p.a., depending on the energy prices on the basis of the following key data:

1. waste water: 50°C
2. fresh water: 12°C
3. the performance (in kW) refers to the heat exchanger
4. work/energy: kWh
5. energy costs: €/kWh
6. savings related to 2 100 hrs. p.a.
7. runtime of the system: 60 %

Please note:

The performance parameters and ratings as well as the savings stated in the diagrams depend on the actual conditions of the rinsing and washing processes, so that the values may be more or less favorable.

UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim
T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59
www.uhsgmbh.de
info@uhsgmbh.de

MI-4000 models

There are 8 different models of the **MI-4000** available:

01. MI-4000-500-1-D = continuous heating, 1 heat exchanger, 750 l waste water tank
02. MI-4000-500-2-D = continuous heating, 2 heat exchangers, 750 l waste water tank
03. MI-4000-500-1-U = circulation heating, 1 heat exchanger, 750 l waste water tank, 1 circulation pump
04. MI-4000-500-2-U = circulation heating, 2 heat exchangers, 750 l waste water tank, 1 circulation pump
05. MI-4000-750-1-D = continuous heating, 1 heat exchanger, 1 125 l waste water tank
06. MI-4000-750-2-D = continuous heating, 2 heat exchangers, 1 125 l waste water tank
07. MI-4000-750-1-U = circulation heating, 1 heat exchanger, 1 125 l waste water tank, 1 circulation pump
08. MI-4000-750-2-U = circulation heating, 2 heat exchangers, 1 125 l waste water tank, 1 circulation pump

As an option, the **UHS** program offers 2 buffer storage tanks:

1 000 l drinking water storage tank, max. 6.0 bar at 90.0°C; material: W 1.4571/1.4404, insulation: 50 mm polyurethane foam, 2.0 mm polypropylene coating, connections: 4 x G 2", 1 x G 1/2"

2.000 l drinking water storage tank, max. 6.0 bar at 90.0°C; material: W 1.4571/1.4404, insulation: 50 mm polyurethane foam, 2.0 mm polypropylene coating, connections: 3 x DN65, 1 x DN25, 1 x R 2"

The MI-4000 for continuous heating or circulation heating

MI-4000 with continuous heating

The **MI-4000** with continuous heating uses the waste water tank as heat storage tank.

A flow rate measuring sensor has been installed in the fresh water pipe upstream of the heat exchanger and monitors the fresh water flow.

As soon as a flow is measured and there is waste water in the waste water tank, the system starts operating and the waste water pump will pump the waste water through the counter-current heat exchanger.

Depending on the quantity of fresh water, the waste water will be more or less cooled down, as shown in diagram 2, and be pumped either back into the waste water tank or to the overflow.

If there is no waste water left or if no fresh water flow is measured any more, the system will stop the waste water pump.

MI-4000 with circulation heating

The **MI-4000** with circulation heating uses a fresh water buffer tank as heat storage tank in addition to the waste water tank.

The fresh water continues to flow through the heat exchanger into a fresh water buffer tank, from where it will be channeled to the machines.

As soon as the fresh water has stopped flowing, the circulation pump continues pumping the fresh water in the circuit, until there is no waste water left or the default value has been reached in the fresh water buffer tank.

The circulation heating will achieve an even higher heat recovery rate than the continuous heating, thus making the MI-4000 even more efficient.

UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim
T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59
www.uhsgmbh.de
info@uhsgmbh.de

MI-4000

Heat recovery from waste water systems

The heat exchanger

The **MI-4000** heat recovery system from waste water consists largely of 5 components:

1. 1 or 2 heat exchanger/s
2. the waste water pump
3. the waste water tank, 2 sizes
4. a two-way ball valve and
5. a small controller, Siemens Logo,

with the heat exchanger being the main item of the system.

The waste water flows through seven 22-mm tubes located inside this multi-tube heat exchanger of the **P-Tube** series with its rifled tubes that will cause turbulent flow conditions for the waste water, so that

a. no depositions can accumulate or no blockages can occur and

b. the heat transfer coefficient will be improved by up to 30 % as compared with other systems.

The waste water pump

The waste water pump of the CM series is a compact multi-step rotary pump that is directly driven by a high-efficiency motor and that is ideal for pumping contaminated and particle-containing liquids.

All parts in contact with the media, such as shaft, impeller and chambers, are made of stainless steel W 1.4301 (AISI 304).

The pump itself is connected with the tube by CC clamps to make the maintenance easy.

In addition to that, the pump is protected by a lint trap, a perforated plate with 10 mm holes, that is installed in the waste water tank.

The pump pumps 8.0 m³ of waste water per hour at a back pressure of 15.0 mWs, or 20.0 m³/h against a back pressure of 9.5 mWs.

Motor data

Motor power rating	: P1 = 1.2 kW
Frequency	: 50 Hz
Rated voltage	: 3 x 220-240D/380-415Y V
Rated current	: 4.6-5.2 / 2.6-3.0 A

UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim

T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59

www.uhsgmbh.de
info@uhsgmbh.de

The waste water valve

The two-way ball valve with its pneumatic drive regulates the waste water temperature and can thus be used, in this simple way, as a temperature control without cost-intensive electronic equipment. If the waste water temperature turns out to be too high downstream of the heat exchanger, the ball valve re-directs the waste water to the waste water tank. In other words, the waste water will be used a second time. As soon as the waste water level has reached the upper floating switch in the waste water tank, the ball valve will be closed and the waste water will be channeled to the overflow.

The waste water tank

The **MI-4000** waste water tank is available in 2 sizes with a gross volume of either 750 l or 1 125 l.

It is made of 2.0 mm stainless steel sheeting W 1.4301, the lid of 12.0 mm gray plates of polypropylene (PP).

The waste water can reach a level of approx. 450 mm inside the waste water tank, with the damming height being continuously adjustable via the overflow.

There is a lint trap in the center of the waste water tank, a perforated plate with 10 mm holes, which protects the waste water pump against contamination; it can be pulled out upwards for cleaning purposes.

There is a DN50 drain with a ball valve at the bottom of the waste water tank to empty it.

The switching cabinet

The small **MI-4000** switching cabinet houses a Siemens Logo mini-controller which does not only monitor and control the system, it also allows some settings to be made.

From here,

- 2 floating switches,
- 1 flow,
- 4 temperature values,
- the two-way ball valves and
- the waste water pump

are monitored, controlled and actuated.

UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim
T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59
www.uhsgmbh.de
info@uhsgmbh.de

MI-4000

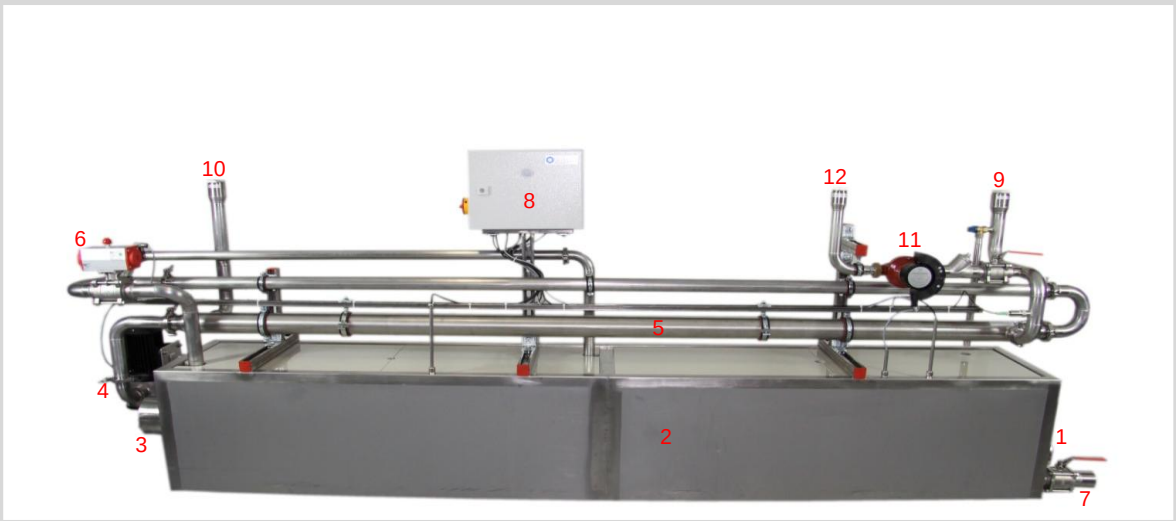
Heat recovery from waste water systems

MI-4000 „End of pipe solution“ – high performance requiring little space

Specification

Item	Designation	Description and function
1	waste water inlet	DN150, adapter 150-165 mm
2	waste water tank	l x w x h 3 000 x 500 x 500 mm, approx. 750 l gross volume, l x w x h 3 000 x 750 x 500 mm, approx. 1 125 l gross volume
3	waste water outlet	DN150, adapter 150-165 mm
4	waste water pump	connection R 2“ iG fitted on CC clamp connection
5	heat exchanger	waste water / fresh water, CC clamp connection
6	two-way ball valve	DN50 with pneumatic drive
7	ball valve	DN50 auf 51 mm hose nozzle, drain
8	switching cabinet	with Siemens Logo control
9	fresh water inlet	R 2“ iG
10	fresh water outlet	R 2“ iG
11	circulation pump	optional
12	circulation connection	optional, R 2“ iG

The MI-4000 requires a footprint of merely 3 600 x 500 / 750 mm



The figure shows an **MI-4000-500-1-D**, UHS article No. 4002

At a height of only 1 300 mm

The **MI-4000** heat recovery from waste water systems is a turn-key solution for your company and can be integrated into your company’s internal systems by any installer in virtually no time.

UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim

T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59

www.uhsgmbh.de
info@uhsgmbh.de

MI-4000

Heat recovery from waste water systems

Dimensions and weights

Overall length	3 600	mm
Overall height	1 300	mm
Overall width optional	520 750	mm mm
Weight, empty	250 / 350	Kg
Tank volume, approx.	750 / 1 125	l
Floor loading, filled	667	kg/m²

Dimensions and weight of the **MI-4000** may vary, depending on the model.

The table shows the major dimensions and weights.

More detailed information on request.

Please note:

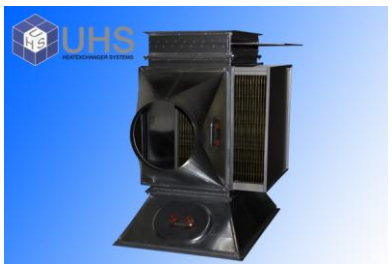
In view of its continuous product developments, UHS GmbH reserves the right to modify the product design and to adjust the prices without prior notice.

Our General Terms of Sale and Delivery shall apply.

Further UHS products to save energy

UHS M-tube

Tube-in-tube heat exchanger to recover heat from heavily contaminated media, such as waste water, for low and high flow rates.

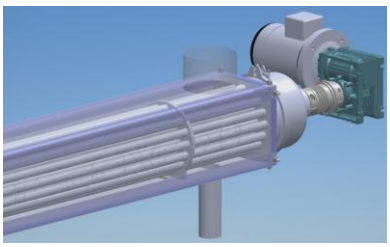


UHS V-plate

Air/air plate heat exchanger to recover heat from exhaust air, e.g. from laundry driers.

UHS P-tube

Heat exchanger with rifled tubes to recover heat from gas, e.g. exhaust air generated from mangling



UHS X-tube

Self-cleaning heat exchanger to recover heat from heavily contaminated exhaust gas or exhaust air.

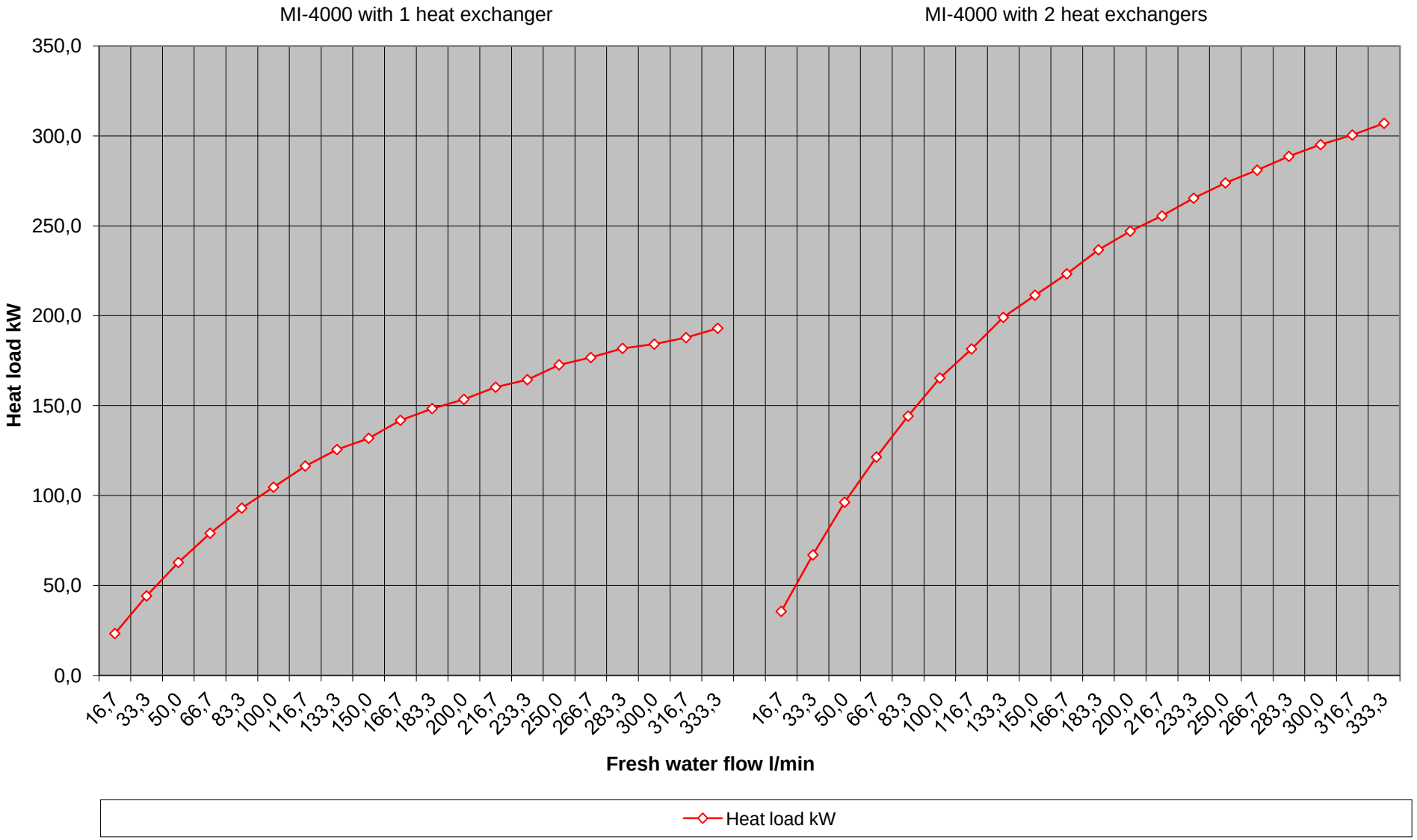
UHS United Heatexchanger Solution GmbH
Feldstraße 18, D-31141 Hildesheim

T: +49 (0) 5121 17 638 + 30
F: +49 (0) 5121 17 638 + 59

www.uhsgmbh.de
info@uhsgmbh.de

Diagramm 1 EN

Heat load at waste water In = 50°C, Fresh water In = 12°C



UHS United Heatexchanger Solution GmbH

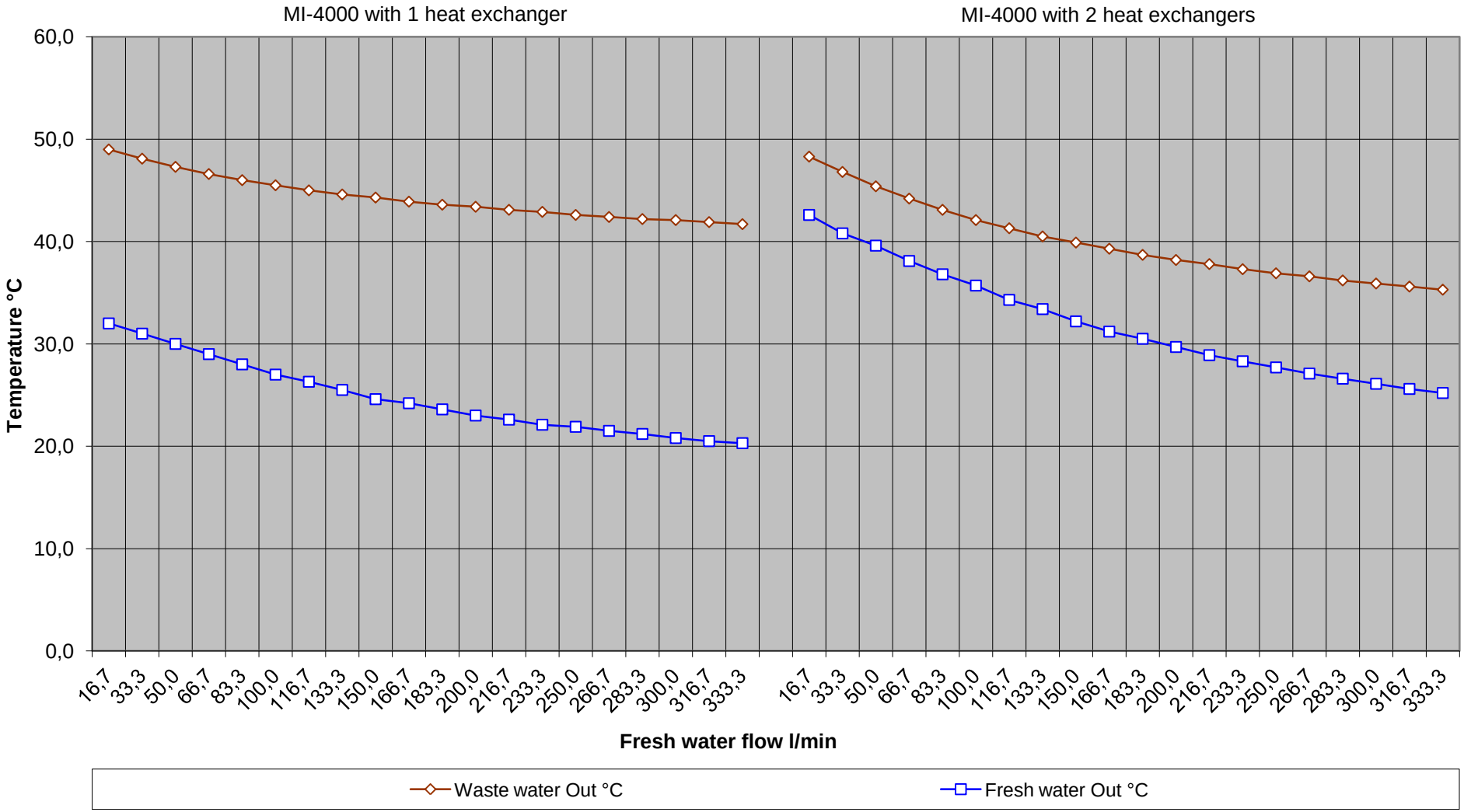
Feldstr. 18 / D-31141Hildesheim

T: +49 (5121) 17 638 30 / F: +49 (5121) 17 638 59

Email: info@uhsgmbh.de / www.uhsgmbh.de

Diagramm 2 EN

Temperature curve at waste water In = 50°C, Fresh water In = 12°C



UHS United Heatexchanger Solution GmbH

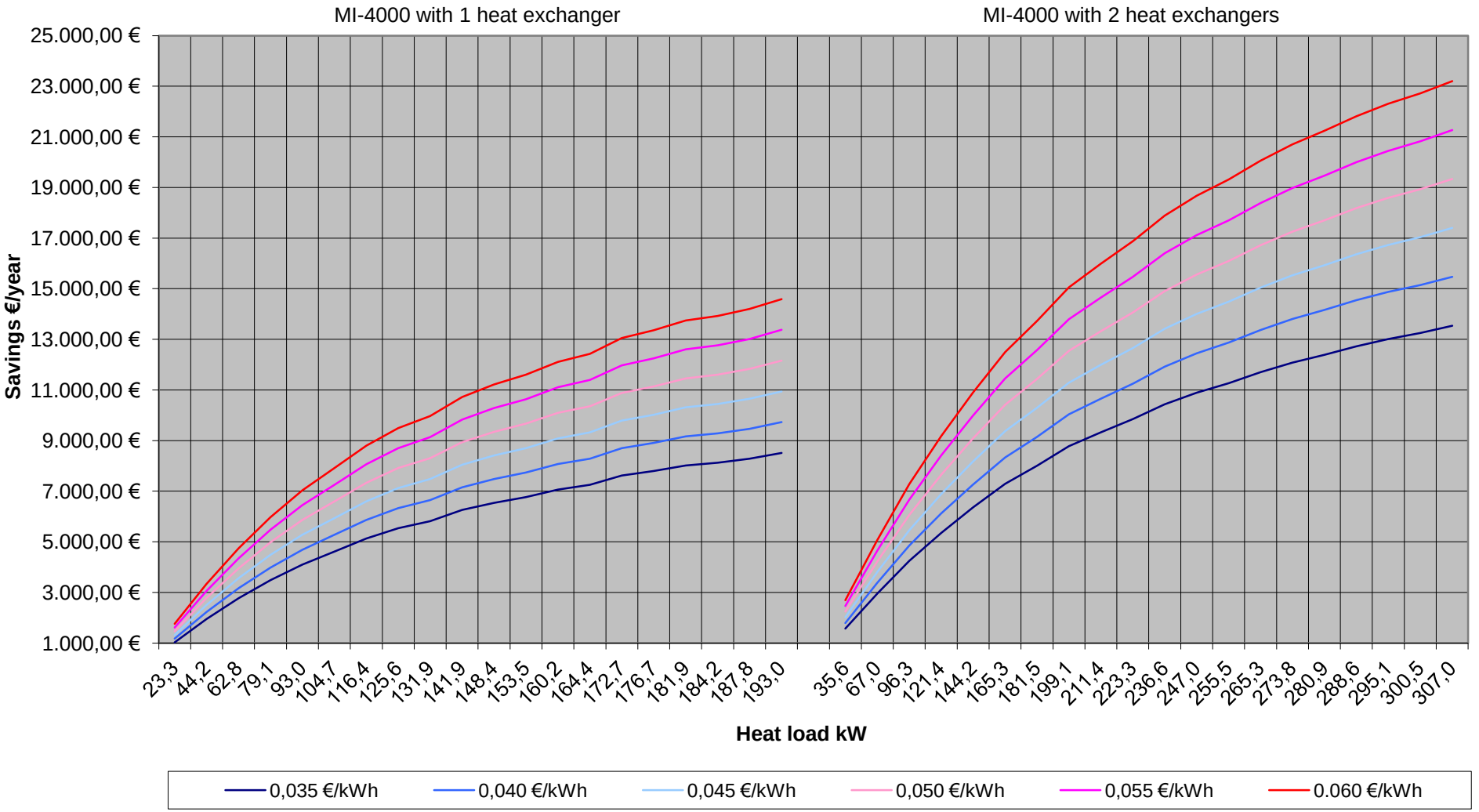
Feldstr. 18 / D-31141 Hildesheim

T: +49 (5121) 17 638 30 / F: +49 (5121) 17 638 59

Email: info@uhsgmbh.de / www.uhsgmbh.de

Diagramm 3 EN

Savings per year, energy price €/kWh, 2.100 working hours, turn on time of system 60 %/h



UHS United Heatexchanger Solution GmbH

Feldstr. 18 / D-31141 Hildesheim

T: +49 (5121) 17 638 30 / F: +49 (5121) 17 638 59

Email: info@uhsgmbh.de / www.uhsgmbh.de