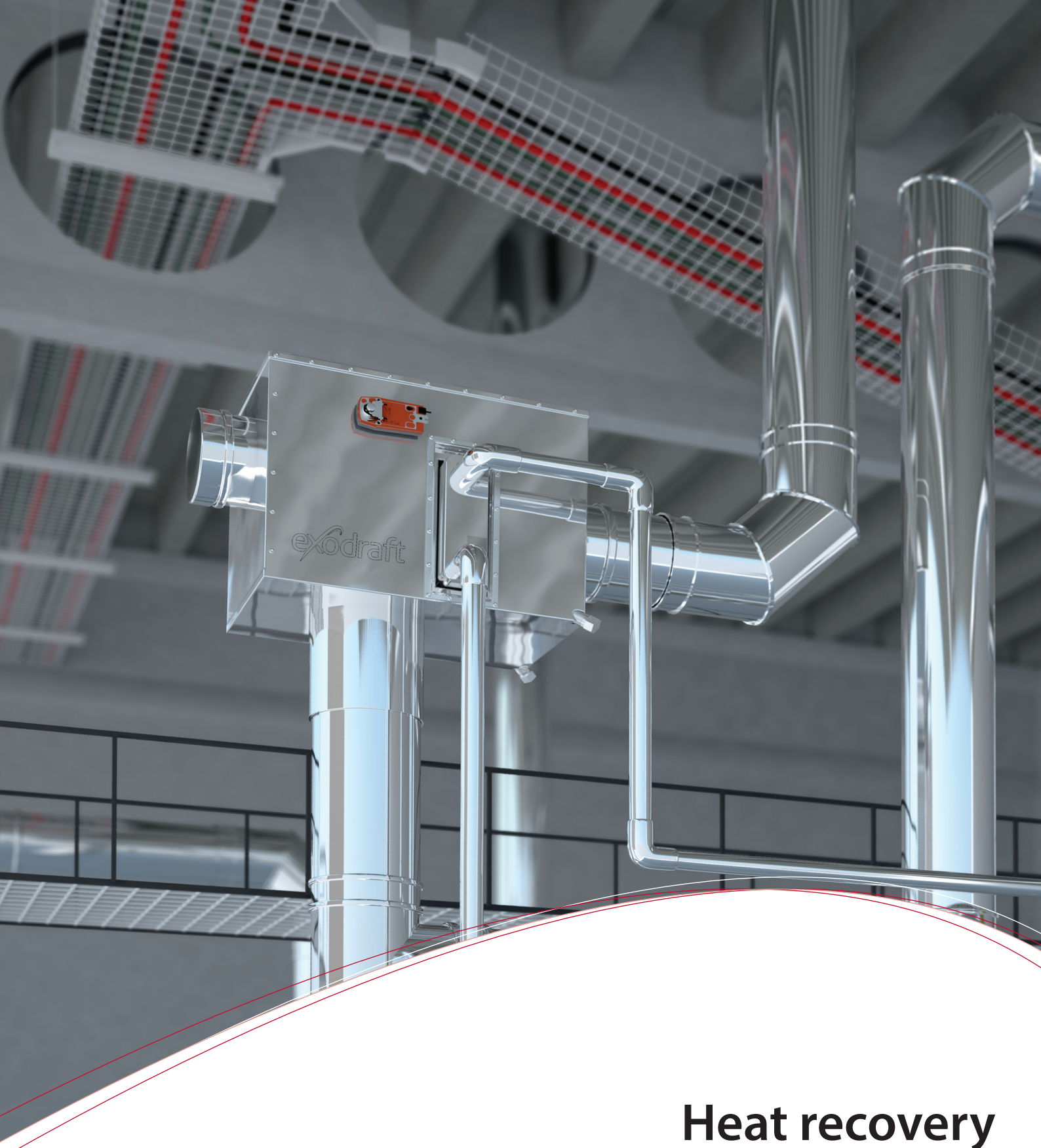


Heat recovery

Flue gas, steam and process heat that benefits the bottom line

exodraft

exodraft makes being environmentally friendly economical

In a market with ever increasing energy prices there is a focus on effective use of resources and restrictive CO_2 gases emission requirements, it therefore makes good sense to exploit the considerable amount of energy found in flue gas, steam and other process heat exhaust and extraction systems.

Heat recovery will often be a good idea in connection with processes producing heat that would otherwise go straight up a chimney or flue system to atmosphere. At **exodraft** we are experts when it comes to helping companies recover heat from flue gas, process heat and steam.

The recovered heat can be used to heat buildings, utility water, be used in production areas or where possible sold back to the district heating network.

Energy recovery levels

The energy loss from flue gas or other process heat is usually around 15-20 %. With an **exodraft** heat recovery solution, as much as 80 % of this heat can be recovered. In other words there is a potential of a 12-16 % reduction in fuel usage and an equivalent reduction in CO_2 emmissions.

The effective use of the recovered energy, combined with a competitive price, means that the investment in an **exodraft** heat recovery solution will often have a very attractive pay-back period.

Specific calculations for your company

With our simulation software **exodraft OptiCalc HR™** we can offer specific calculations of how much energy your company can save by investing in a heat recovery solution from **exodraft**.

exodraft OptiCalc HR™ also provides information on the reduced CO_2 emission as a result of the heat recovery system.

ISO 9001
Management System Certification
BUREAU VERITAS
Certification Denmark A/S

Competence, insight and experience

exodraft is the world's leading supplier of integrated solutions for the recovery of flue gas and process heat. An important prerequisite for effective recovery of flue gas heat is an understanding of how crucial chimney draught is to efficient combustion.
Our products are based on more than 50 years of experience in chimney draught technology and comprehensive knowledge of the relationship between combustion and chimney draught.

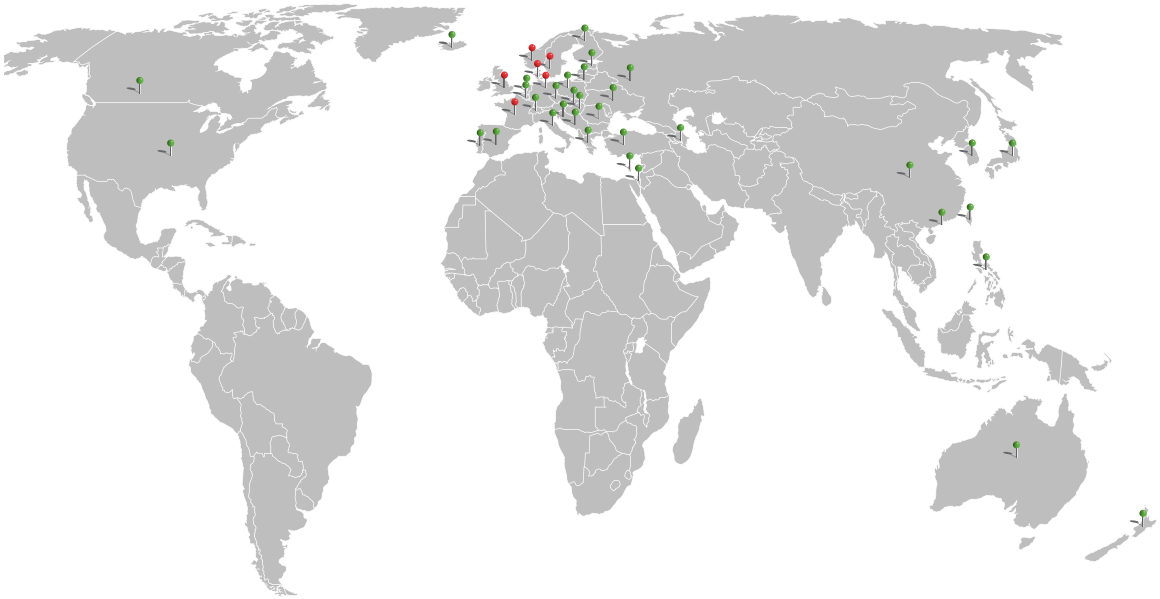
The widest range of products on the market

exodraft offers the widest range of products on the market when it comes to chimney fans, control systems and other components for the control of chimney draught - in short, complete chimney draught systems for all types of combustion units.
In combination with the market's most effective heat recovery solution, **exodraft** offers a unique concept that provides optimum energy utilisation - to the benefit of both the environment and the economy of your company.

Uncompromising quality

Our solutions are manufactured in accordance with ISO 9001 and developed with a focus on maximum safety, efficiency and uncompromising quality.
exodraft's market-leading solutions set the standard for the requirements that chimney fans and heat recovery systems must meet.

exodraft's products are sold in more than 40 countries the world over and are approved in accordance with both national and international standards.



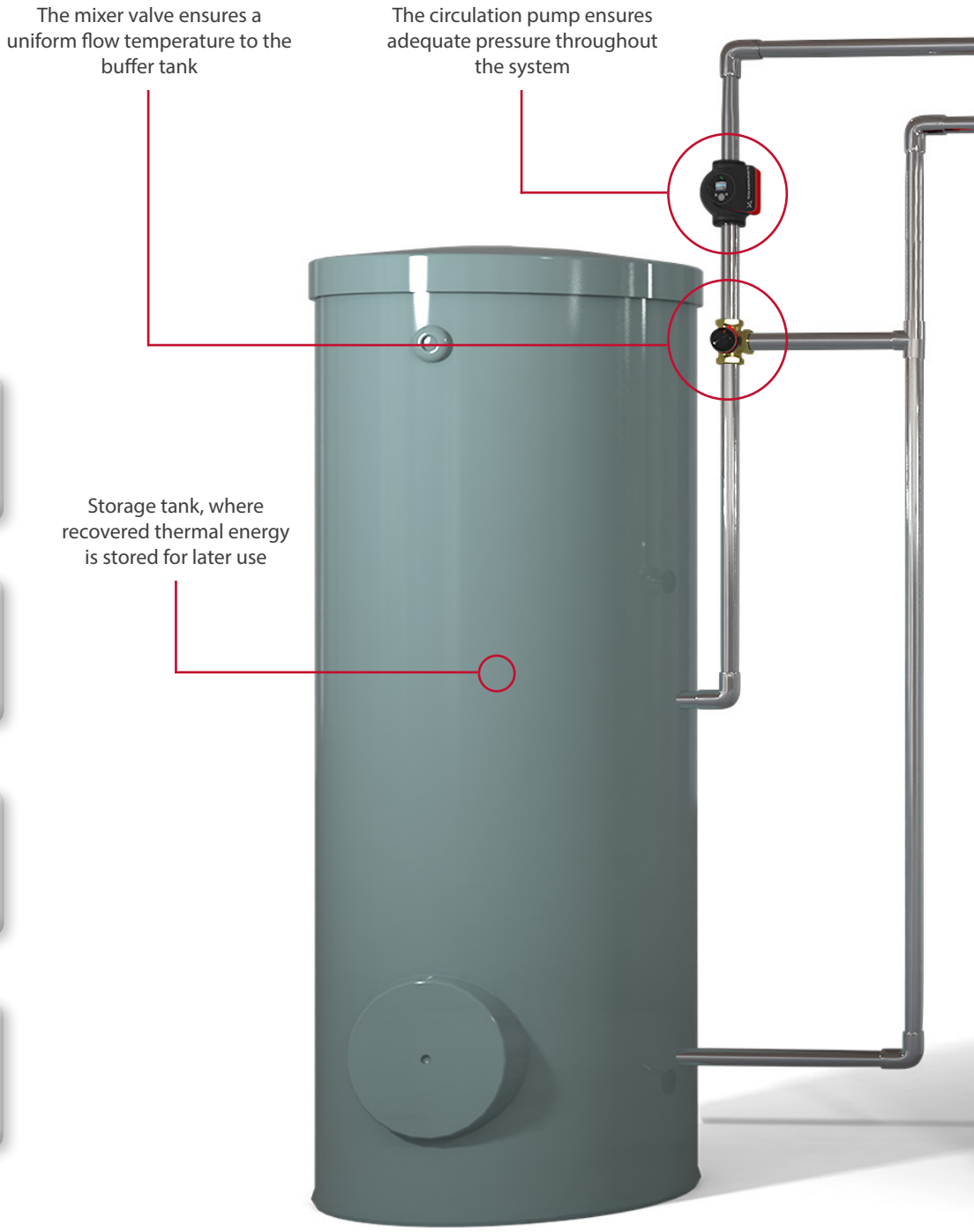
exodraft system overview

exodraft heat recovery makes good sense wherever hot flue gas or steam would otherwise exit through the chimney.
Below is an example of an **exodraft** heat recovery system where heat from the flue gas is recovered and transferred to the storage tank.

Responsibility from start to finish

Every installation is of course unique but our consultants ensure that you will have a system that is specifically designed to exploit the energy in your processes.

At **exodraft** we deliver not just products but ready-made solutions. Therefore we always offer to be on site when new **exodraft** heat recovery installations are commissioned. This is your guarantee for a productive, safe and effective system.



Bakery ovens and food cooking equipment

Heat treatment and hardening installations

Drying plants

Industrial boilers

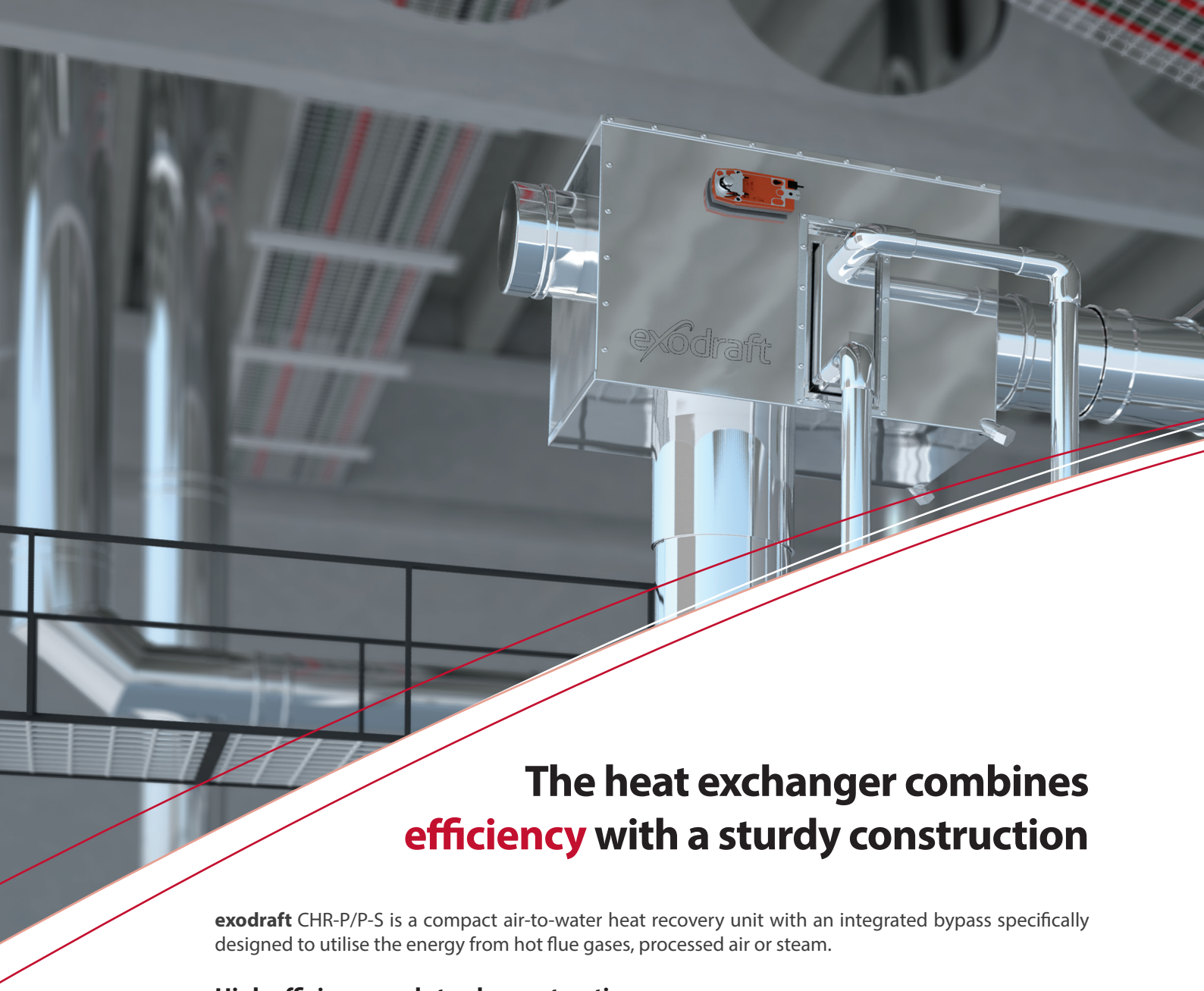
exodraft chimney fans ensure optimum draught in the chimney (read more on page 7)

exodraft CHR-P/CHR-P-S heat recovery unit (read more on page 6)

The EBC20 ensures that the chimney fan always produces the required negative pressure regardless of external factors like atmospheric pressure and internal pressure changes

EHC20 controls and monitors the bypass damper, mixer valve and pump. (Read more on page 8)

Process unit emitting flue gas, steam or process heat

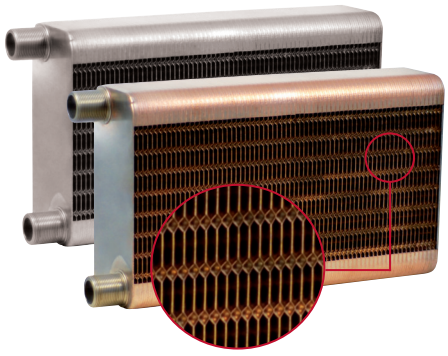


The heat exchanger combines efficiency with a sturdy construction

exodraft CHR-P/P-S is a compact air-to-water heat recovery unit with an integrated bypass specifically designed to utilise the energy from hot flue gases, processed air or steam.

High efficiency and sturdy construction

The heart of the unit is the heat exchanger itself which is made from stainless steel and copper brazing to combine sturdiness with efficient heat transmission.
The unique patented design ensures an extremely high degree of efficiency and is especially useful in connection with condensing applications.
For use in acidic and alkaline environments the heat exchanger can also be supplied in a combination of stainless steel and nickel brazing.



The heat exchanger's sturdy construction makes it easy to clean using a pressure washer (up to 200 Bar). If you wish to avoid a shutdown in connection with cleaning you can order an extra heat exchanger that can be inserted while the primary exchanger is being cleaned.

Space-saving design with inbuilt safety

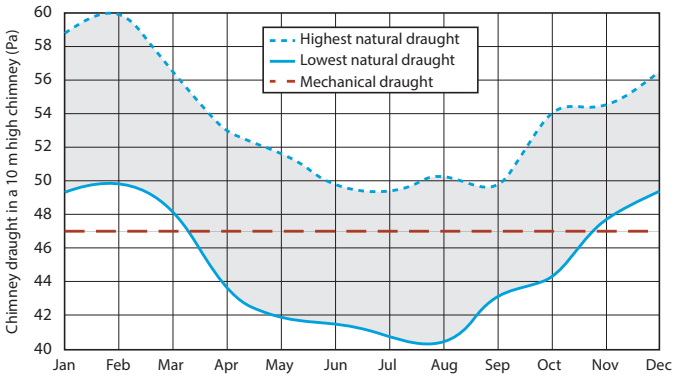
The heat exchanger is mounted in a stainless steel casing with an integrated bypass feature. In the event of overheating of the system or if the desired temperature in the buffer tank has been reached, the bypass feature is activated and the hot process air/steam will be redirected around the heat exchanger and straight into the chimney.

The compact design of the **exodraft** CHR-P/P-S means that it takes up a minimum of space and can be installed in close proximity to the heat producing unit.

The correct draught in the chimney is crucial

Modern, optimised production processes require full control of all factors. A chimney with either inadequate or exaggerated draught can have a negative impact on the entire production process.

The natural draught in a chimney is neither constant nor controllable and is affected by factors such as indoor and outdoor temperature, barometric pressure changes and wind conditions.



When an **exodraft** heat exchanger is installed the flue resistance will increase.

To compensate for this and to create fully controllable draught conditions an **exodraft** chimney fan must be fitted to the installation in connection with CHR-P/P-S.

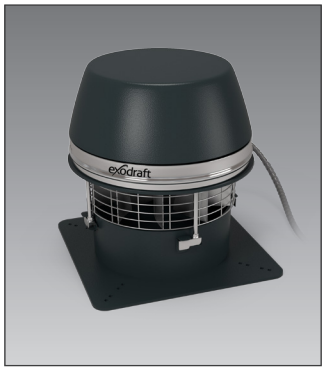
An **exodraft** chimney fan system ensures that the necessary draught is available in the chimney at all times.

This will help to ensure energy-efficient, uniform production results every day and all year round, regardless of any external influences.

A choice of powerful alternatives

exodraft offers the widest range of chimney fans on the market, whether you need a chimney fan mounted to the top of the chimney or inside the chimney flue:

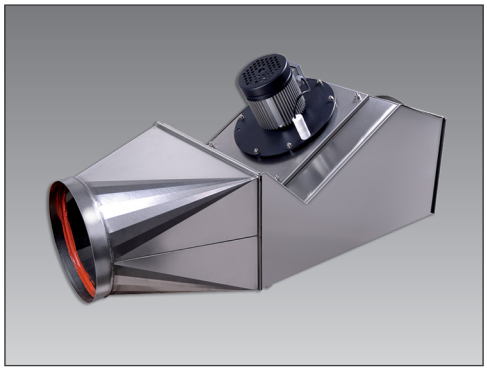
For mounting on top of a chimney flue:



exodraft RSHT

exodraft RSV

For mounting in a chimney flue (in-line):



exodraft CFI

Full control and safety with the EHC20 controller unit

We put safety first at **exodraft**. The EHC20 controller unit is used to prevent the system from overheating and to ensure effective utilisation of surplus heat. The system provides full control of both safety and operational functions.

Control of the bypass damper and mixer valve

EHC20 provides intelligent control of your heat recovery solution. If the temperature on the water side exceeds the desired level, EHC20 will open the bypass damper in the heat recovery unit and lead the flue gas/steam straight into the chimney. This avoids overheating and ensures safe operation.

EHC20 also controls a 3-way mixer valve, which will ensure that circulation to the storage tank only occurs when the water has reached the desired temperature. If the water has not reached the desired temperature it is recirculated through the heat exchanger until the desired temperature has been reached.

Get an overall view of your energy savings

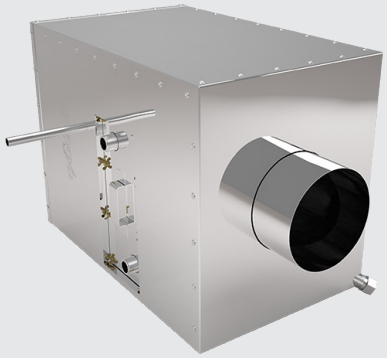
You can routinely read off how much energy is being recovered by the heat exchanger and will thus be able to see exactly how your investment is paying off. If the heat exchanger is not able to generate the desired temperature in the storage tank, the EHC20 can control a supplementary heat source which will be switched on/off as required.

Get started easily with the Setup Wizard

EHC20 is fitted with an intuitive interface for reading off and controlling your heat recovery system. To ensure quick and easy start-up, the EHC20 has a Setup Wizard that allows you to adjust the basic functions as well as choose between 8 predefined system set-ups.

Heat recovery units:

CHR-P (for dry flue gas and process air)

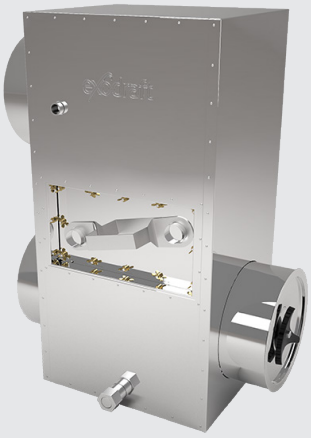


- For use in connection with dry process air and flue gas
- Available with and without a bypass feature
- Available with and without insulation
- Stainless steel casing
- With inspection hatch and drain
- Available in 9 standard sizes (60-1,000 kW)
- Can be used indoors with fuel oil, gas or electric heating units, but *cannot* be used in connection with solid fuel heating (wood, coal, biomass, etc.)

	CHR-P 60	CHR-P 80	CHR-P 120	CHR-P 250	CHR-P 300	CHR-P 400	CHR-P 500	CHR-P 750	CHR-P 1000
Burner output (kw)	60	80	120	250	300	400	500	750	1000
Max. flue gas temperature (oC)*	350	350	350	350	350	350	350	350	350
Connector diameter (mm)	150	180	225	250	250	300	350	400	500
Number of exchangers	1	1	1	1	2	2	2	4	4

All data applies to heat exchangers with insulation.
*Peak temperatures of up to 400 oC

CHR-P-S (for steam)



- For use in connection with steam or flue gas containing steam
- Available with and without a bypass feature
- Available with and without insulation
- Stainless steel casing
- With inspection hatch and drain
- Available in 4 standard sizes

	CHR-P-S 60	CHR-P-S 80	CHR-P-S 120	CHR-P-S 140
Max. flue gas temperature (oC)	120	120	120	120
Connector diameter (mm)	150	250	300	350
Number of exchangers	1	1	1	1

All data applies to heat exchangers with insulation.

Chimney fans:

For mounting on top of a chimney

exodraft RSV

- Compact, sturdy design
- Vertical discharge
- High-efficiency aluminium centrifugal impeller
- Cast aluminium casing
- Variable speed, direct drive
- Max. flue gas temperature 250°C

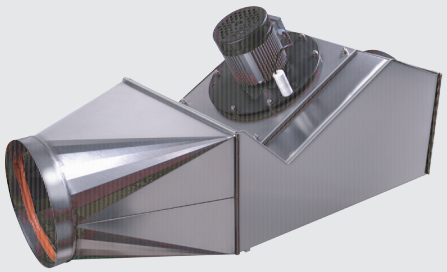
exodraft RSHT

- High temperature chimney fan; can withstand temperatures of up to 500°C
- Horizontal discharge
- Casing made of stainless steel and aluminium
- Patented cooling impeller
- Variable speed

	RSV 200	RSV 250	RSV 315	RSV 400	RSV 450	RSHT 009	RSHT 012	RSHT 014	RSHT 016
Supply voltage (V)	1 x 230			3 x400		1 x 230			
Amps (Amp)	0.4	0.8	1.8	3.5	6.5	0.4	0.6	1.2	1.8
Motor output, kW	0.07	0.16	0.37	0.75	1.5	0.09	0.13	0.29	0.37
R.P.M.	1,400			1,720		1,400			
Weight, kg	18	27	37	52	58	12	15	19	22
Max. capacity (m3/h)	1,250	1,500	3,000	4,900	7,500	350	720	1,300	2,350

For mounting in a chimney flue (in-line)

exodraft CFI



- Compact design flue ventilator
- High-efficiency aluminium centrifugal impeller
- Made from 316L for indoor and outdoor installation
- Variable speed
- Max. flue gas temperature 300°C

	CFI 300	CFI 350	CFI 400	CFI 500
Supply voltage (V)	1 x 230		3 x 208-230/3 x 440-480*	
Amperes (Amps)	1.8	2.3	5.5 / 2.9	7.8 / 4.1
Motor output, kW	0.27	0.45	1.4	2.56
R.P.M.	1,350	1,300	1,680	1,730
Weight, kg	34	42.5	58	82.5
Connector size, input, mm	301	351	401	501
Connector size, output, mm	303	353	403	503
Max. capacity (m3/h)	1,850	3,050	6,375	9,150

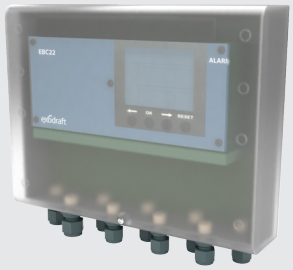
Controllers:

EBC20 constant pressure regulator

- For the automatic control of one or more heat sources
- Monitors and maintains a predefined, fixed negative pressure in the chimney by regulating the speed of the chimney fan
- Used together with an XTP sensor

Supply voltage (V)	230 AC ± 10 %, 50 Hz ± 1 %
Max. load	475 W / 3.7 Amp
Dimensions, mm (H x W x D)	204 x 240 x 77
Application temperature (°C)	-20 to +60
Field of application (Pa)	-500 to +500
IP class	54
Weight (kg)	1.62

EBC22 constant pressure regulator (GASTECH approved)



- For the automatic control of one or more heat sources
- Monitors and maintains a predefined, fixed negative pressure in the chimney by regulating the speed of the chimney fan
- Used together with an XTP sensor
- Approved by Kiwa GASTECH; may be used in connection with gas applications

Supply voltage (V)	230 AC ± 10 %, 50 Hz ± 1 %
Max. load	475 W / 3.7 Amp
Dimensions, mm (H x W x D)	204 x 240 x 77
Application temperature (°C)	-20 to +60
Field of application (Pa)	-500 to +500
IP class	54
Weight (kg)	1.62

EHC20 controller unit

- Automatic control of bypass damper on heat exchanger
- Automatic control of 3-way mixer valve to ensure desired flow temperature to buffer tank
- Recovered energy indicated on display (optional)

Supply voltage (V)	100-240 AC
Power consumption (W)	0.3-3
Dimensions, mm (H x W x D)	228 x 180 x 53
Application temperature (°C)	0-40
IP class	40

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