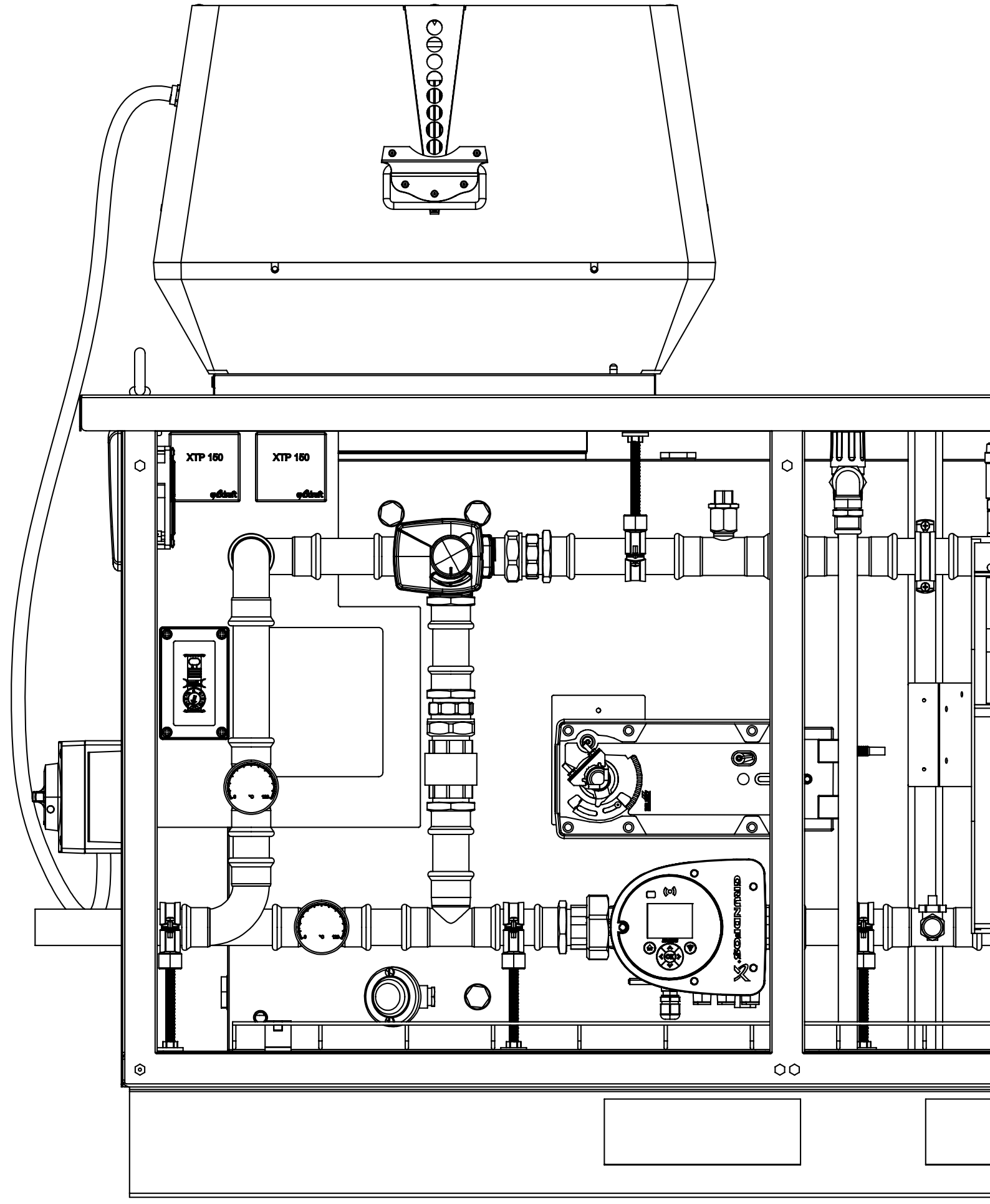
Heat Recovery

IHXU

UK | Read and save these instructions!

exodraft
Your energy. **Optimized.**


XTP 150
XTP 150

Heat Recovery | IHXU

Content

How to use this manual

This manual has been prepared based on the specific product and contains relevant technical information and installation guides.

Accessories and spare parts are not covered by this manual. Please refer to the individual manuals of these components.

This installation manual does not contain any system design documentation.

Failure to observe instructions marked with a danger symbol may result in personal injury and/or damage to the product.

Errors and omissions excepted.

Disposal

Electrical and electronic equipment (EEE) often contain materials, components and substances that may harm the environment or be hazardous to your health. Products (WEEE) marked with the 'crossed-out wheeled bin' symbol should be disposed of separately from other waste at the end of its life. Though legislation may differ from country to country we strongly advise that electrical and electronic waste is separated from other waste and disposed of according to national legislation to protect the environment and personnel that may come into contact with waste.

Symbols

The following symbols may be used in the manual to draw attention to danger or risk of personal injury or damage to the product.

General prohibition

Failure to observe instructions marked with the prohibited symbol may result in extreme danger or serious personal injury.

General attention

Marks a dangerous situation that, in the worst-case scenario, can cause serious personal injury or significant damage to the product.

General warning

Failure to observe instructions marked with a danger symbol may result in personal injury and/or damage to the product.

Electricity hazard/High Voltage

Marks a situation in which caution is advised due to the risk of high voltage electric shock which can cause serious personal injury or significant damage to the product.

Connect an earth terminal to the ground

Failure to observe instructions marked with a danger symbol may result in personal injury and/or damage to the product.

Permitted and approved

Permitted and approved method of installation.

Prohibited and not approved

Prohibited and not approved method of installation.

Warning

To minimise the risk of fire, electric shock, personal injury and/or damage to the product please observe the following:

- Please always read the manual and only use the product in accordance with the manufacturer's instructions. If in doubt, contact one of the Exodraft specialized dealers.
- All installations must be carried out by properly qualified personnel in accordance with local and national legislation and regulations.
- Prior to servicing the product, the heat source must be shut off and cooled, according to the procedure mentioned in this manual.
- Please ensure that the heat source is not turned back on inadvertently.
- This product must be grounded. Get assistance from a qualified electrician if in doubt.
- In order to avoid chimney fires, ensure that the chimney has been swept before mounting the IHXU.
- Exodraft recommends that the IHXU is switched on at least once every three months, to avoid longer periods of stagnation as this may have a negative effect on the mechanical parts.
- Prior to servicing the product, disconnect the power and ensure that it cannot accidentally be reconnected.
- Note! Heat exchangers serving heat sources with high content of particles must be cleaned more often due to extensive residue soot building. It is essential that a regular inspection and cleaning schedule is implemented, especially in the early days of usage, to experience how often regular inspections and cleaning should be carried out.

Product Information

An Exodraft Integrated HeatX Unit (IHXU) is a plug and play heat recovery unit that offers a quick and effective way to recover waste heat from high temperature process gas that would otherwise be wasted.

IHXU is used primarily in smaller commercial plants with long operating hours and high exit temperatures (max 250°C) in flue pipes and chimneys.

Due to the use of Exodraft Safe Plate heat exchanger, IHXU is easy and fast to maintain and clean. Typically, it is used in bakeries, the food processing industry, and in metal processing.

The IHXU consists of a complete PLC controlled system with heat exchanger, pump, mixing valve, pressure and temperature sensors and STB thermostat. All the plumbing has been fitted.
A fan is necessary to create the correct draft and must be purchased separately.

To get the unit operational, only the connection to the water source and the electrical power must be connected. To monitor the unit, an ethernet cable must be connected to the HMI.

The recovered and stored energy may be used for things like production, utility water, water for heating, cleaning, or process absorption cooling.

The included Safe Plate heat exchanger comes with an integrated safety and operative bypass damper and is prepared for easy installation along with standard Exodraft automation.

IHXU can be used in heated process air, flue gas from combustion processes based on gas or oil* for heated heat sources.

*Bad combustion quality may result in shorter cleaning intervals.

Exodraft Integrated HeatX Unit limitations

- Range of operation: 80-500 kW (nominal burner power input)
- Max. temperature 250°C
- Process air or flue gas must not clog the exchanges quickly
- Directions for standard use must be followed

To find out more about heat recovery visit **www.exodraft.com**

Scope of supply

- Integrated HeatX Unit (IHXU)
- HMI control cabinet
- Installation manual and user instructions
- Pallet*
- Straps*

*For transportation only. Be aware these parts must be removed before installation.

Spare parts

The table below shows the spare parts available for the IHXU models.

Spare part units	Spare parts for the Exodraft units*
**Chimney fan	Motors
	Impellers
	Mineral wool mats
	SVD-RS - Vibration dampers
	Capacitors
	Flanges
	Cover Plates
	Rainshield
Heat Recovery	Heat exchanger gasket
	Exchangers (Copper brazed casettes)
	Damper Actuator
	Flexible hose/tubing 5/4” 90° to 90° soft bend
	Flexible hose/tubing 5/4” straight connection for 90° bend
PLC control system	Preprogrammed Wago PLC controller
Other spare parts	XTP sensor
	Circulator pump
	Temperature sensor
	Mixing valve
	Mixing valve actuator
	Exhaust fan SpeedControl
	Thermostat for ventilator
	STB Safety Thermostat
	Temperature Dials
	Air Vent Valve (Bleeder)
	Pressure Relief Valve (Overpressure safety)

*This manual does not describe the specific use of spare parts. We refer to the separate manuals for such components.
For more details contact your Exodraft dealer.

**The IHXU is delivered without a fan, and needs to be ordered separately from the IHXU unit.

Warranty

All Exodraft products are covered by a 2-year guarantee as per European consumer rights legislation. For some countries an extended period of guarantee may apply depending on either national legislation or other clearly stipulated conditions. Customer complaints must be handled by a specialised dealer or wholesaler (preferably where the Exodraft product has been bought originally). An updated list of Exodraft specialised dealers can be found on our website for the country in question.

Exodraft products must always be installed by properly qualified personnel. Exodraft reserves the right to change these guidelines without prior notice.

The warranty and liability does not cover instances regarding personal injury or damage to property or the product that can be ascribed to one or more of the following causes:

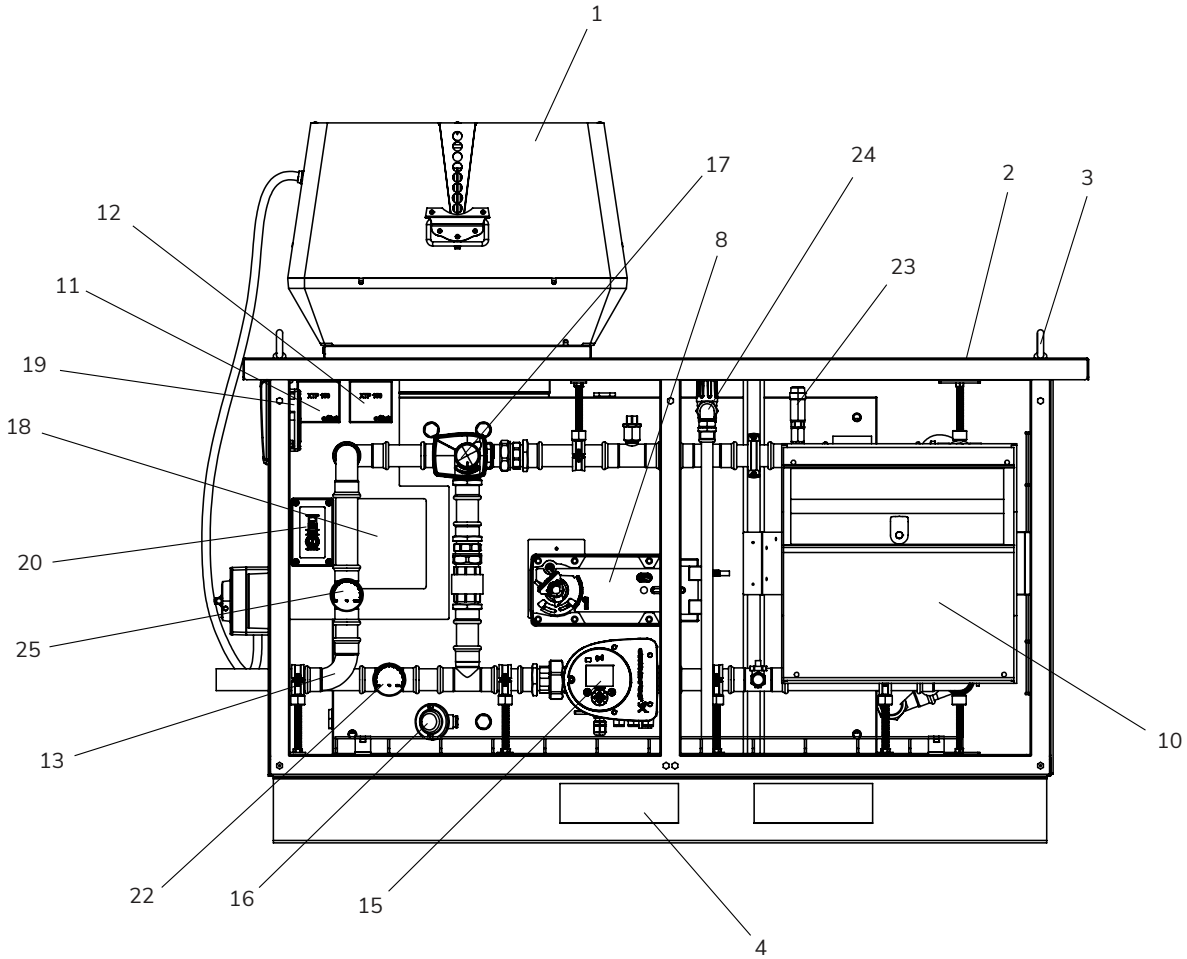
- Failure to follow this installation and operation manual
- Incorrect installation, start-up, maintenance or servicing
- Improper repairs
- Unauthorised structural modifications made to the product
- Installation of additional components that have not been tested/approved with the product
- Any damage resulting from continued use of the product despite an evident defect
- Failure to use original spareparts and accessories
- Failure to use the product as intended
- Exceeding or failure to meet the limit values in the technical data
- Force majeure

Technical Specifications

Construction and Components

1	Fan *(need to be ordered separately)*
2	Housing
3	Lifting eye (x4)
4	Forklift points
5	Heat Recovery unit
6	Heat exhanger inlet
7	Heat exhanger outlet
8	Damper Actuator
9	Exchangers (Copper brazed casettes)
10	PLC control system
11	XTP sensor for chimney draft
12	XTP sensor for exhanger pressure loss
13	Plumbing
14	Flexible hoses/tubing
15	Grundfos Circulation pump
16	Temperature sensor - Exchanger intake
17	Mixing valve with actuator
18	Exhaust fan TRIAC control
19	Ventilator
20	Thermostat for ventilator
21	STB Safety Thermostat
22	Inlet flow temperature
23	Air Vent Valve (Bleeder)
24	Pressure Relief Valve (Overpressure afety valve)
25	Forward flow temperature
26	Drain for condensate

*All the components can be seen on the next page and can be identified by the numbering.
**This manual does not describe the specific parts. We refer to the separate manuals for the components.
For more details contact your Exodraft representative.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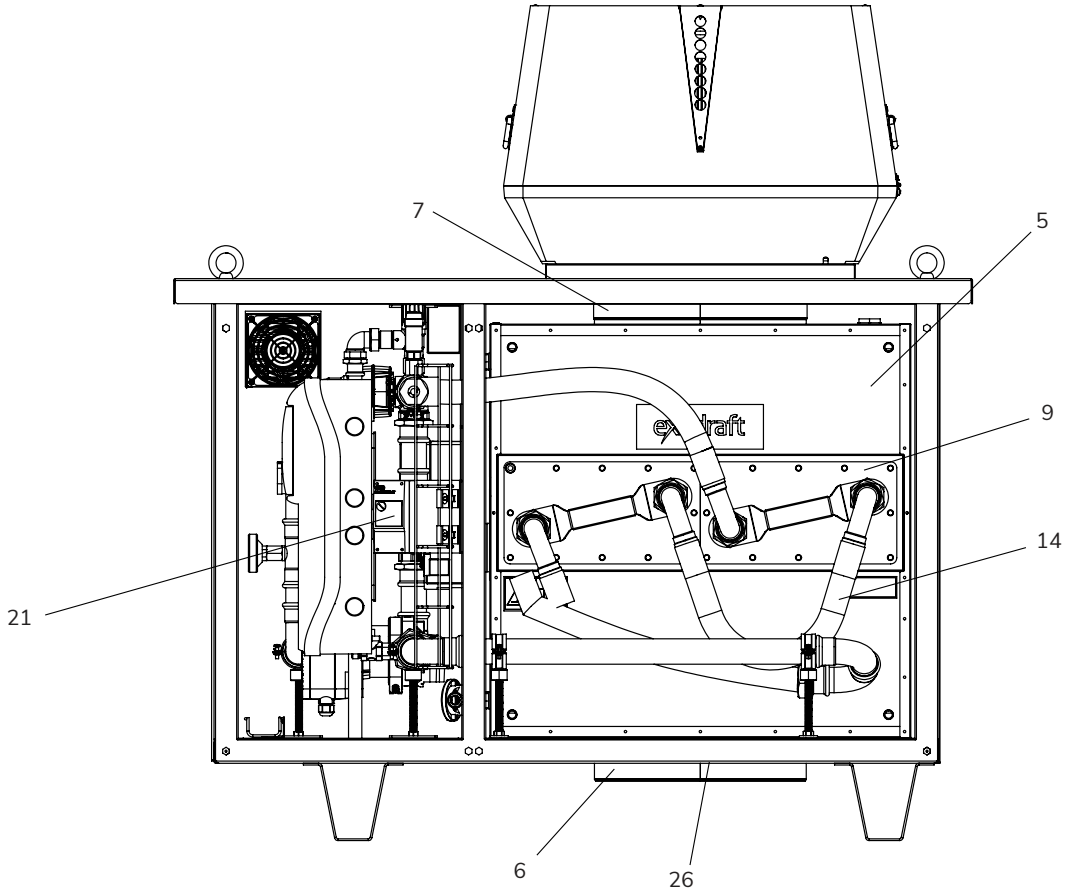
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Heat Recovery Units

Exodraft item number	Type	Description	Chimney System Ø [mm]	Maximum connection power	Number of exhangers
8001200	SP120	Integrated bypass GLX30 exchanger, copper brazed Standard pipe connection dimensions Max. 250°C	200	120 kW	1
8001300	SP250	Integrated bypass GLX30 exchanger, copper brazed Standard pipe connection dimensions Max. 250°C	250	250 kW	1
8001400	SP375	Integrated bypass GLX30 exchanger, copper brazed Standard pipe connection dimensions Max. 250°C	300	375 kW	2
8001500	SP500	Integrated bypass GLX30 exchanger, copper brazed Standard pipe connection dimensions Max. 250°C	350	500 kW	2

PLC Control System

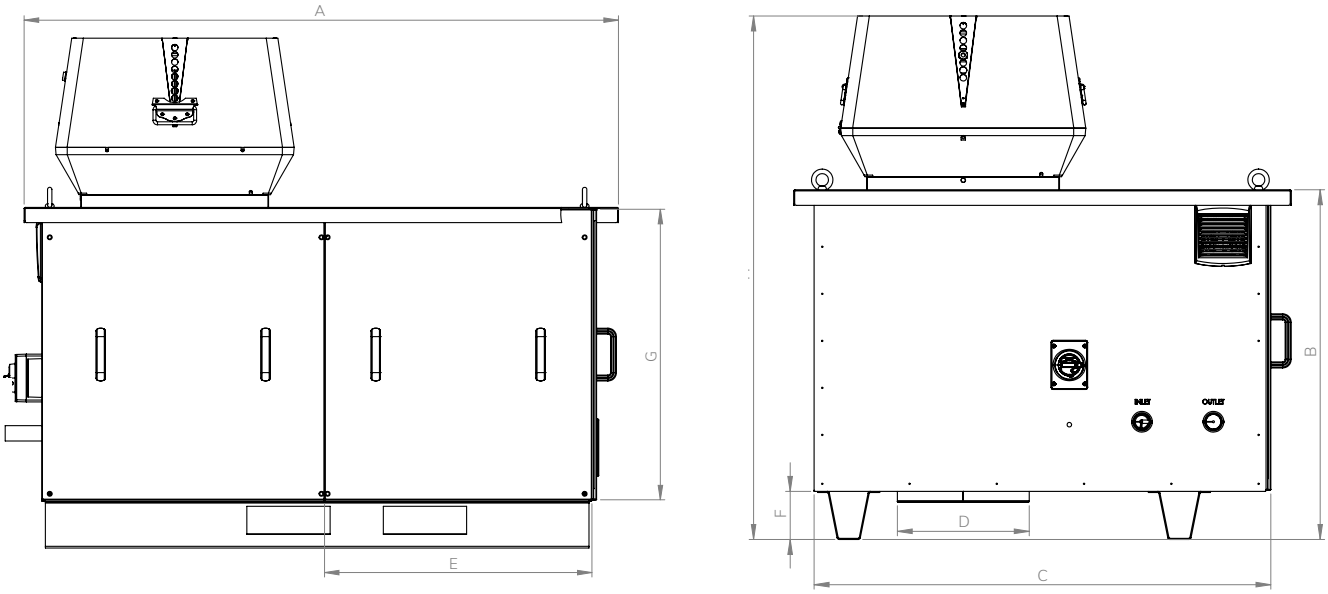
Exodraft item number	Type	Description	Supply	Maximum Rated Current	Phase
5240017	PLC control system	PLC control cabinet for IHXU	1 x 230 VAC	7 A	Single

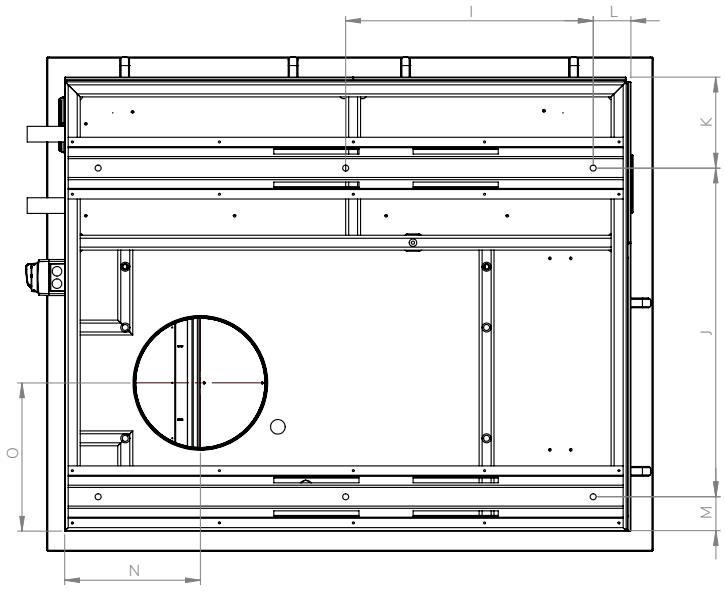
Fans

Exodraft item number	Type	Description	Motor [rpm - V]	Motor [Amp - kW]	Impeller type
5111011	RSV250-41	Chimney Fan RSV25041	1400 - 1 x 230	0.80 - 0.16	Cast aluminium
5111013	RSV315-41	Chimney Fan RSV31541	1400 - 1 x 230	1.80 - 0.37	Cast aluminium
5111017	RSV400-41	Chimney Fan RSV40041	1400 - 1 x 230	2.60 - 0.40	Cast aluminium
5111018	RSV40042-001	Chimney Fan RSV40042-001	1720 - 3 x 400	1.65 - 0.75	Cast aluminium

Technical Data

Model	Dimensions [mm]														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
IHXU	1622	930	1214		730	128	801		662	879	243	101	92	363	395
SP120				200,5											
SP250				250,5											
SP375				300,5											
SP500				350,5											
RSV250-41								1300							
RSV315-41								1345							
RSV400-41								1395							
RSV40042-001								1425							
RSV45042-001								1555							





Mechanical Installation

Exodraft products must always be installed by properly qualified personnel.

These instructions, applicable standards and relevant safety procedures from the manufacturer must be followed and at the same time the official provisions in force in the country, where the product is installed, must be observed.

CAUTION! If the Exodraft Integrated HeatX Unit is not installed, maintained, and/or operated in compliance with the manufacturer's instructions, conditions may arise which could lead to personal injury or material damage.

Placement and Orientation

The IHXU is development to be placed and installed outdoors. Alternatively the IHXU can be placed inside, and the chimney fan can be mounted outside on a chimney section. If the IHXU is placed on a roof construction, Exodraft disclaims all responsibility for static calculations for the construction on which the installation is made. It is entirely the customer's responsibility to ensure that the necessary static calculations are made prior to installation.

DANGER! Observe national regulations regarding distance from flammable materials.

The IHXU should always be oriented and placed on the to forklifts legs.

Lifting of the IHXU

The weight must be distributed on all four lifting points/eyes during installation. The lifting points/eyes are only intended to carry the weight in the installation situation. The lifting points/eyes are not built to carry the weight of the complete system after the installation is complete.

DANGER! Max. load per mounting corners is 110 kg.

Exodraft item number	Type (IHXU)	Chimney fan	Weight [kg]
8005100	IHXU120-28-EU	RSV25041	380
8005110	IHXU250-28-EU	RSV25041	385
		RSV31541	395
8005120	IHXU250-42-EU	RSV25041	390
		RSV31541	400
8005130	IHXU375-42-EU	RSV31541	420
		RSV40041	425
8005140	IHXU500-42-EU	RSV31541	430
		RSV40041	440
		RSV40042-001	440

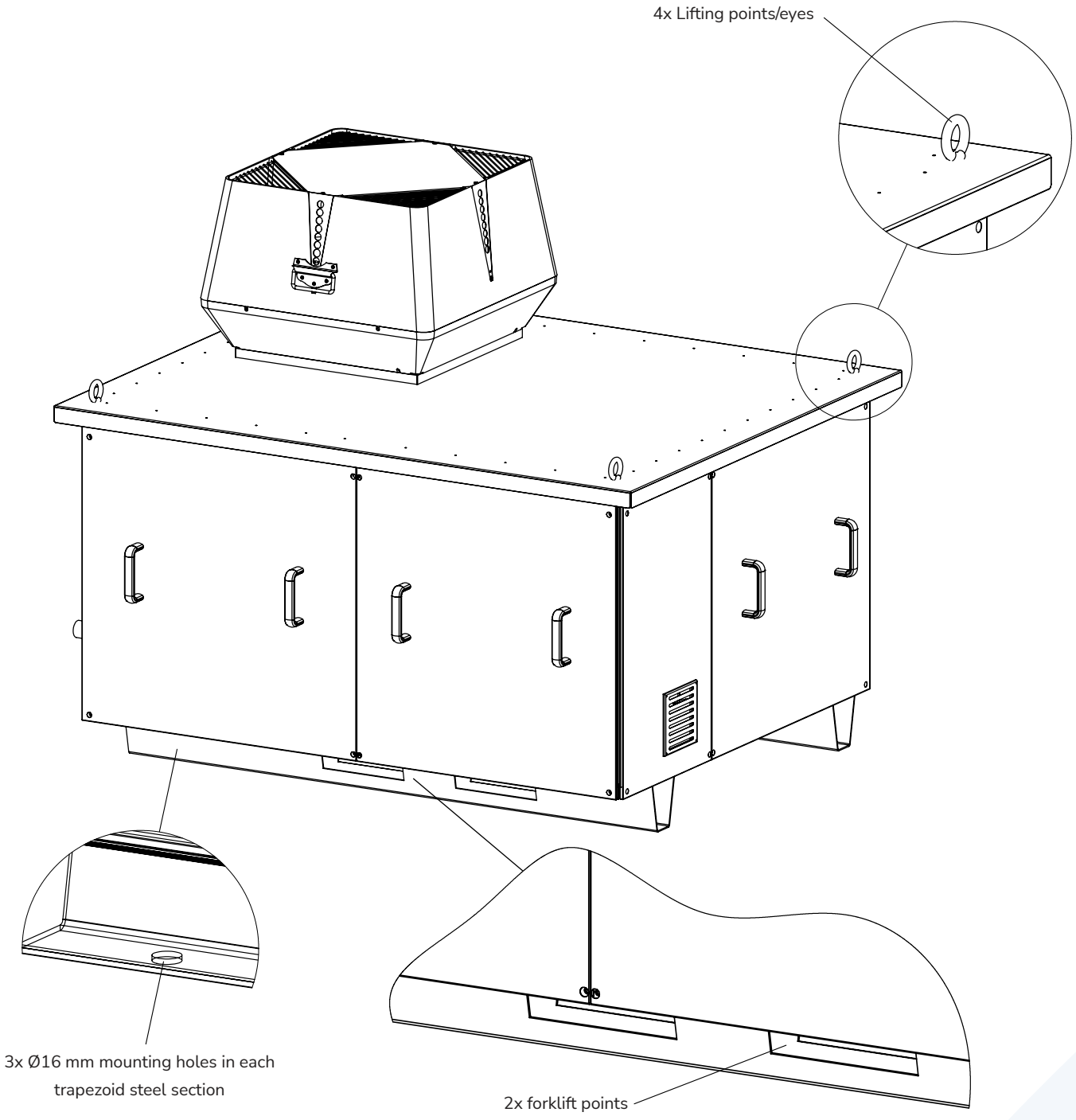
Forklift Points

When moving and lifting the IHXU System with a forklift, the unit should always be lifted using the forklift points installed on the product.

Mounting

When mounting the Exodraft Integrated HeatX Unit, you must use all the mounting holes in the two trapezoid steel sections. Make sure that the Exodraft Integrated HeatX Unit is bolted correctly so that it is installed securely.

The position and dimensions for the holes are shown in the section of *Technical data*.



Chimney Stack Installation

Exodraft products must always be installed by properly qualified personnel.

These instructions, applicable standards and relevant safety procedures from the manufacturer must be followed and at the same time the official provisions in force in the country, where the product is installed, must be observed.

⚠ **CAUTION! In order to operate safely, be sure to seal the connection between the stack and heat exchanger correctly.**

1. Remove a sufficient part of the chimney stack to allow the IHXU to be installed.
2. Fit an adapter if necessary - Could be relevant if the chimney diameter is different in relation to the IHXU units inlet.
3. Make sure to use the fittings parts supplied by the manufacturer, to ensure a proper fit.
4. Lift the IHXU unit in the lifting points or in the forklift points, and place the unit over the chimney section.
5. Secure the IHXU unit to the base, as mentioned in the previous section, by attaching via the 3x Ø16 mm mounting holes in each trapezoid steel section.

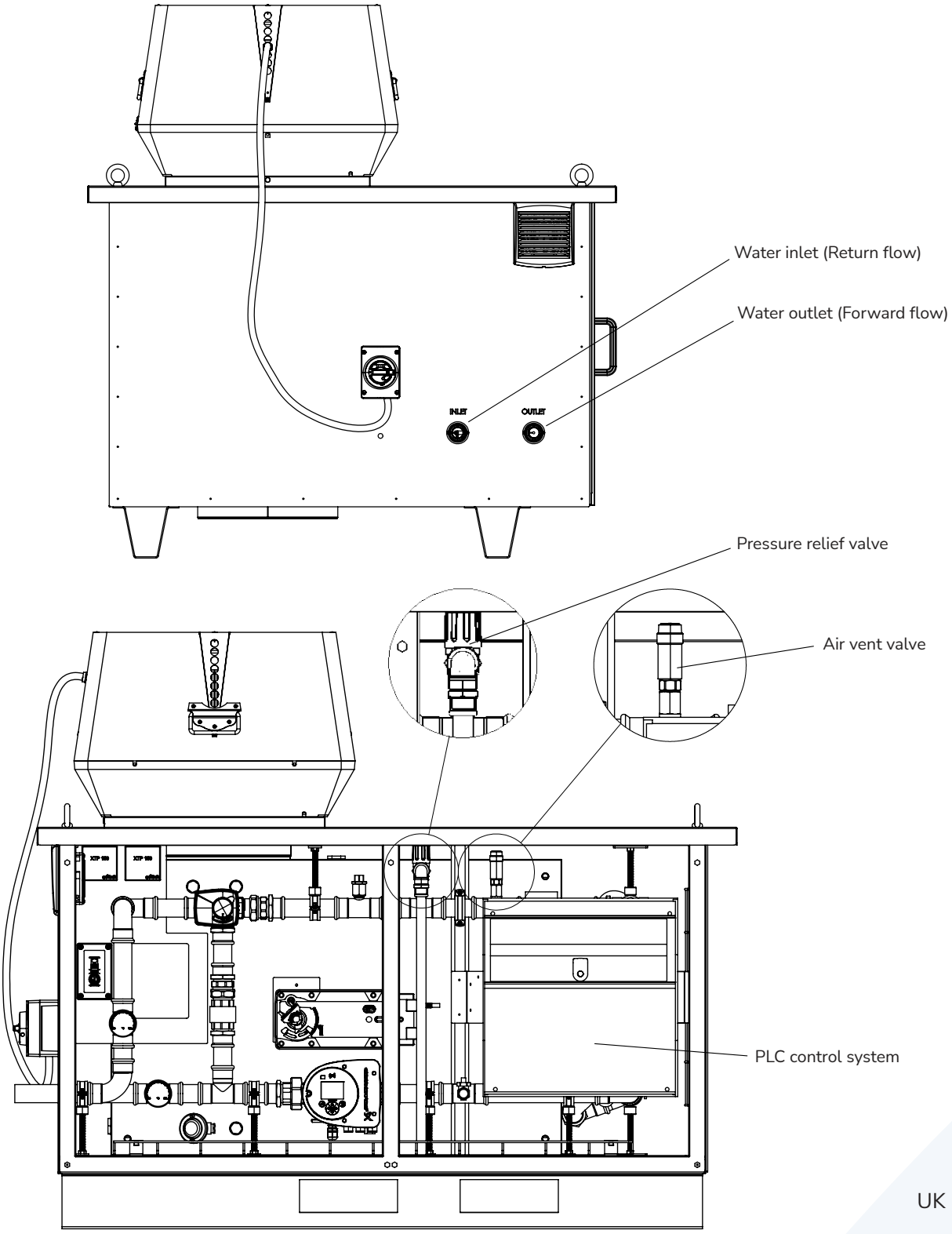
Hydraulic Installation

The IHXU comes with 1-1/4” BSP threads on the inlet and outlet pipes.

To ease the process of filling water into the hydraulic system of the IHXU, a air vent valve is installed on the highest pipe. The pressure relief valve opens above 10 bar.

Exodraft recommends installing ball valves at water inlet and outlet pipes.

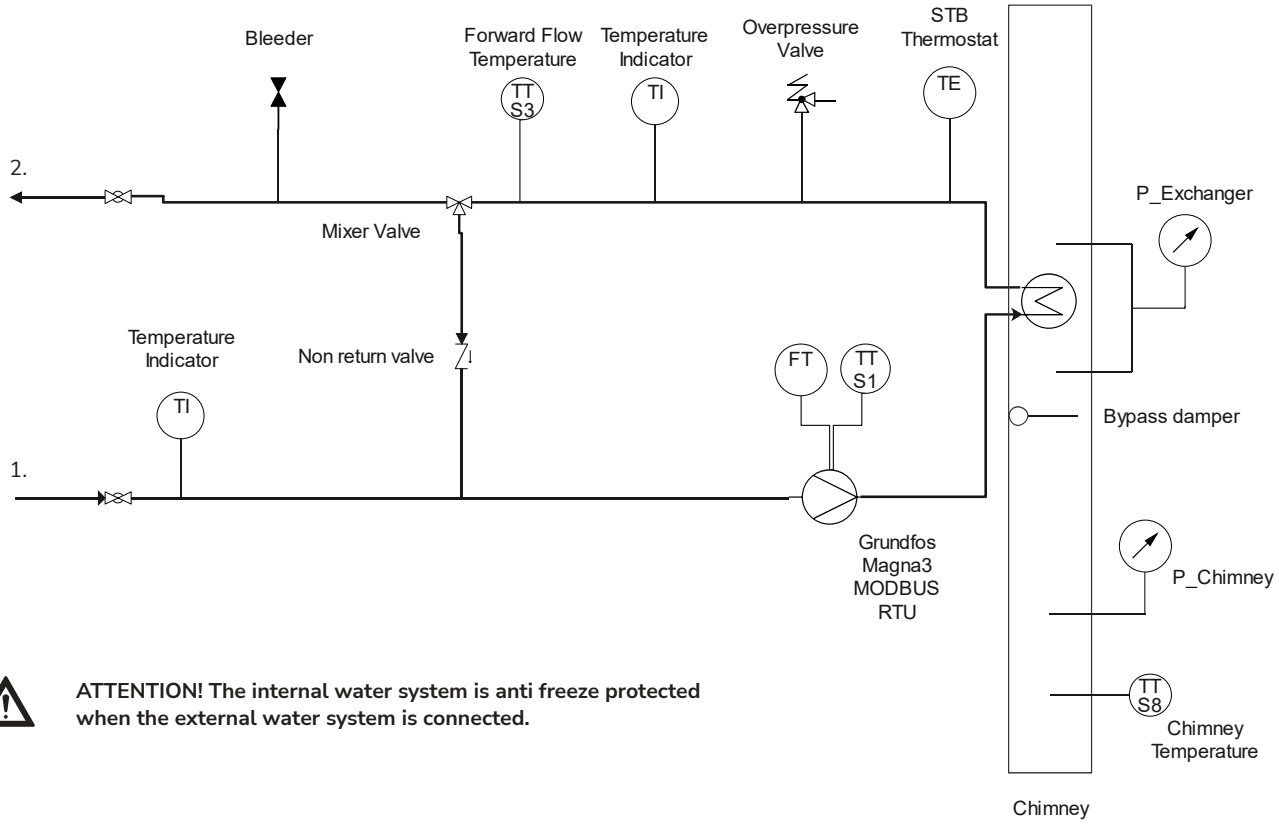
CAUTION! Max allowed water pressure for the IHXU = 10 bar.



Water System and Pump Pressure

The system is equipped with a shunt pump. Exodraft recommends a working static pressure in the heat recovery water system from minimum 1.5 bar to a maximum of 10 bar.
The pressure must be equal on both the inlet and outlet of the water system.

CAUTION! Differential pressure must be equal in connection point 1. and point 2.
Or a higher pressure must be present in connection point 1. than point 2.



ATTENTION! The internal water system is anti freeze protected when the external water system is connected.

Water Quality at the System

Water quality for the IHXU unit should be as the following:

Water Quality	Limits
pH	7,5-10,0
Total hardness	50-200 mb/L (2,8-11,2°hD)
Conductivity	<100µs
Dissolved O_2	<0,1 mg/l
Chlorides	<10 mg/l
Glycol	< 60 % vol
Sulphates	<50 mg/l

Operating Conditions

Primary-/Flue Gas Side

- Max. flue gas temperature: 250°C
- Max. working pressure: 0 Pa
- Min. working pressure: -5000 Pa
- Max. temperature on surface of heat exchanger: 190°C
- Flue gas quality: check that the flue gas is not corrosive for exchanger (if the flue gas is corrosive it's important that condensate is drained).
- The chemical composition and pH of the condensate shall be checked before disposal. All disposal of condensate needs to be according to local regulations.

Secondary-/Liquid Side

- Max. working pressure: up to 10 bar
- Min. working pressure: down to 1.5 bar
- Recommended system overpressure: See under section about system pressure
- Max. temperature on surface of heat exchanger: 190°C
- Max. media temperature is dependent on the surface temperature and the used media

Electrical Installation

The IHXU is fully assembled by the manufacturer Exodraft, and only the chimney fan needs to be mounted and installed. The flexible conduit with the three wire cable from the fan, fits directly into the isolation switch on the IHXU.

The IHXU must be connected to 230VAC (L+N+PE) for the control system and optional 3 x 400V AC for an inverter to power a three phase fan.

To power the HMI control panel, a cable must be connected between the HMI and the PLC control system. This also applies to the ethernet network that enables the communication between the PLC and the HMI. The maximum distance between the HMI and PLC Control Panel is 100 m. Use minimum Cat 5E UTP cable.

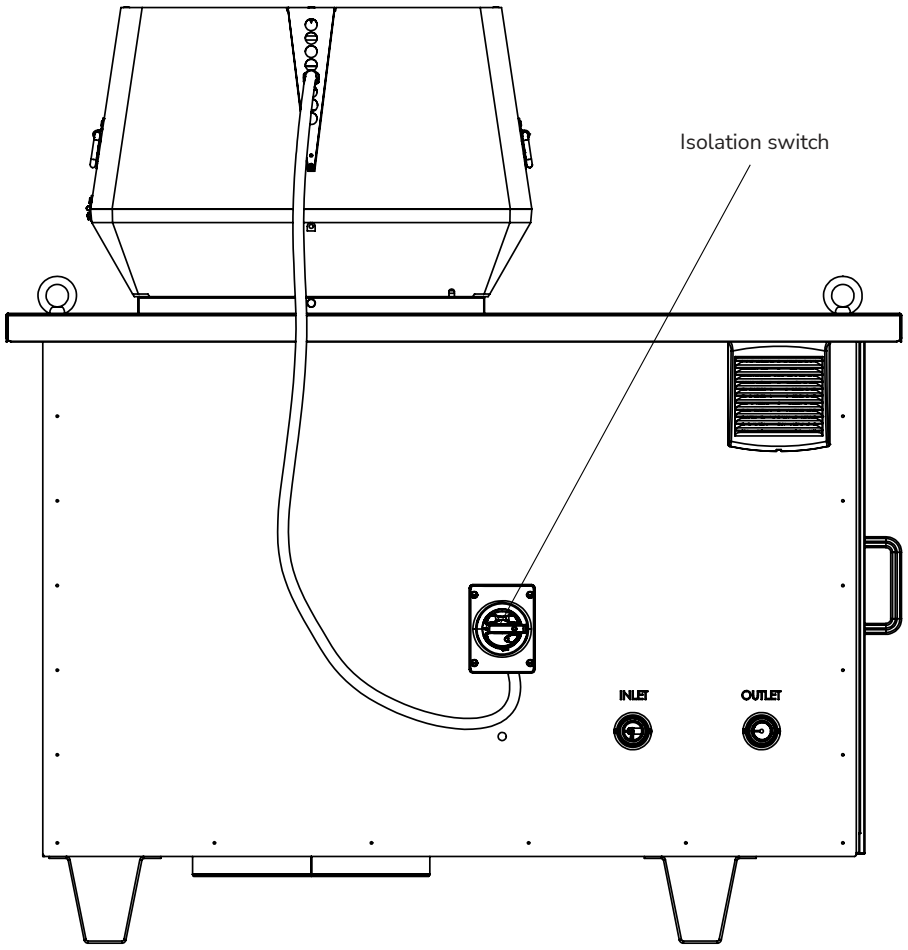
To start the heat recovery use the manual start/stop button on the HMI (to start the the recovery from the appliance, the burner input in the control panel can be used).

The burner can be interlocked with the burner output, to have maximum security.

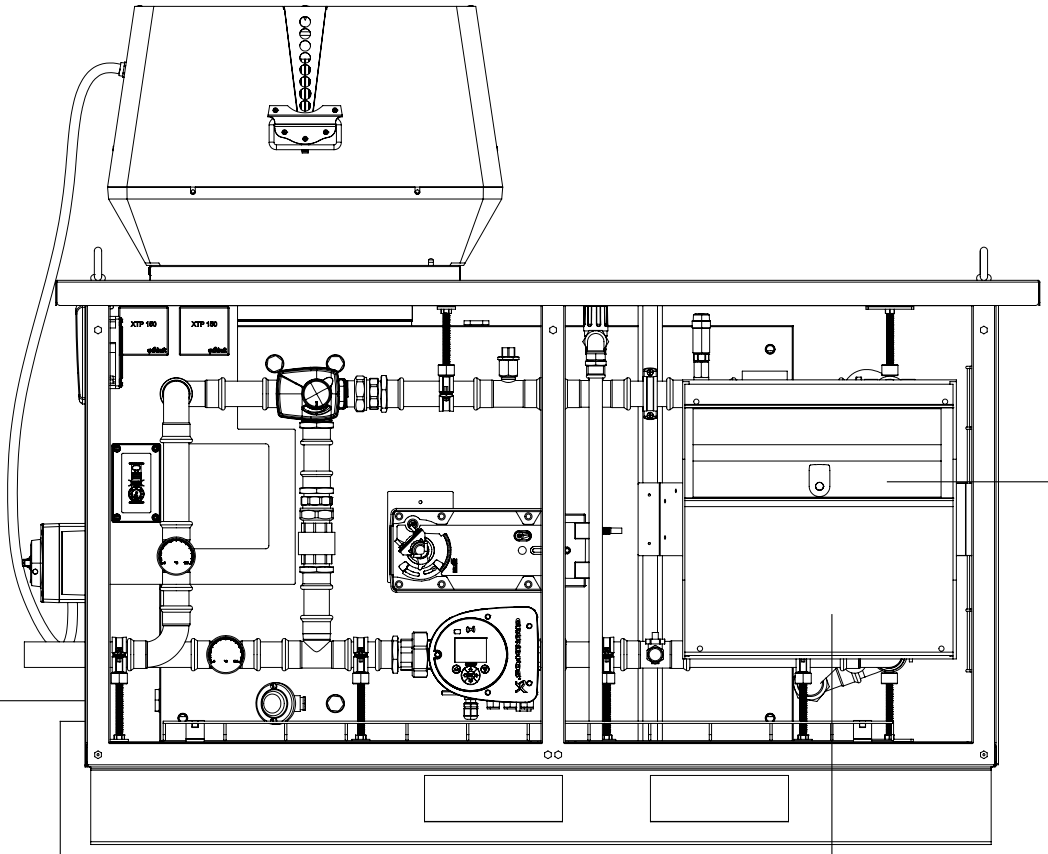
DANGER! Always turn off the power before working on the unit. Contact with live wires can cause electric shock or death!

CAUTION! If it becomes necessary to replace any of the original wiring that was delivered with the system, you need to use the same type of cable with the same temperature classification. If not, the insulation can melt or erode, exposing the actual wire.

All wiring must be completed in accordance with national regulations.



Electrical Block Diagram



+24V DC supply
and ethernet

Internet Router
Ethernet

Optional Dataforwarder
for data logging

Mains
230 V AC supply

Mains
3 x 400 V AC supply
(RSV400 fan 3-phase)

Electrical Diagram

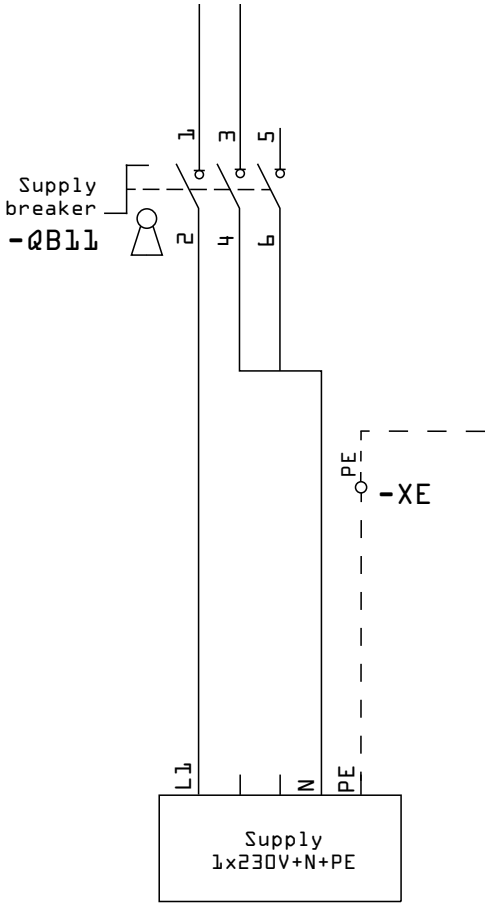
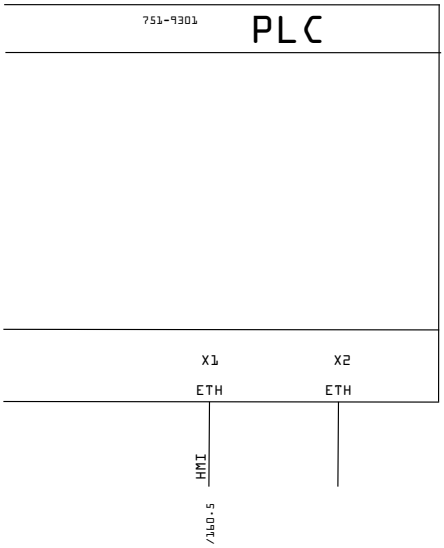


Diagram for Ethernet Connection of the IHXU



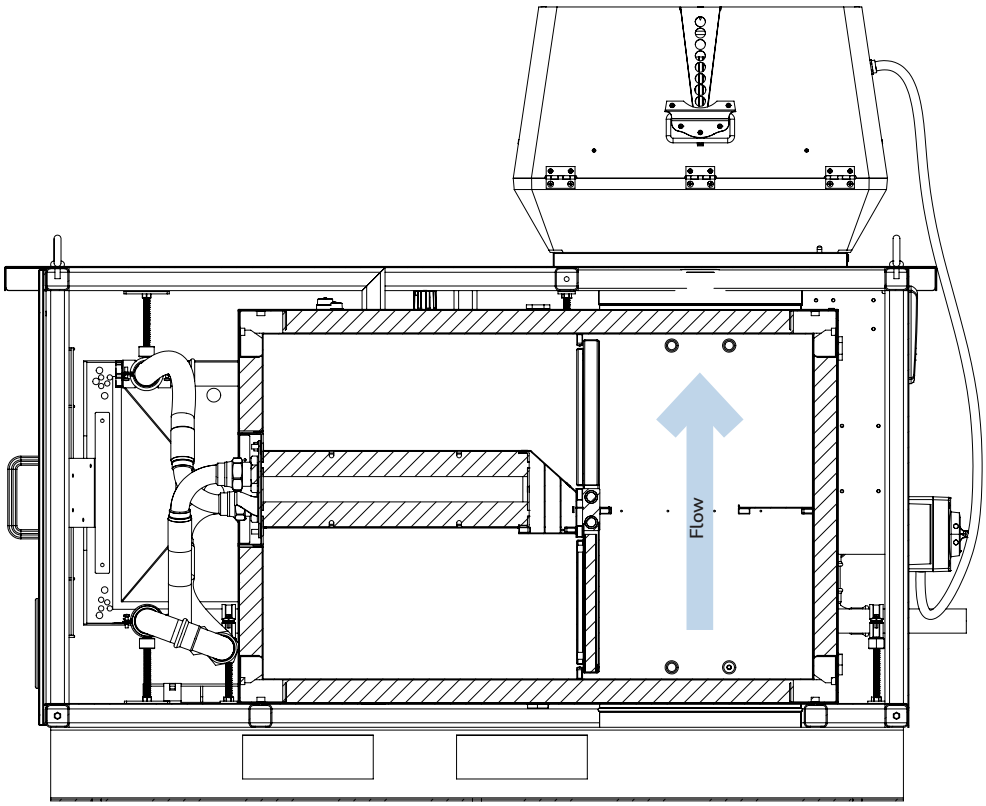
Startup and Configuration

The purpose of this IHXU unit is to recover surplus energy from flue gasses and process air.

System Startup

CAUTION! The IHXU should not be put into operation before being properly installed.
Danger of contact with hot components.

1. Before connecting the electric power, make sure that the plumbing has been installed correctly, and fill the water system of the IHXU with water. Bleed the system using the air vent valve. (A counter clockwise turn on the red cap will bleed it. Remember to tighten the cap after bleeding).
2. After the electric power has been switched on, go to the Exhaust page on the HMI and press ***Bypass*** (see section on the next pages).
3. If condensation is a possibility, and this is not drained onto a roof, connect the drain to an appropriate outlet, according to local regulations.
4. Activate the circulation pump using the manual mode on the settings page and check that it's running.
5. Go to the settings page of the HMI and activate mixer manual mode. Adjust the mixer manual mode setpoint to 50 %, and rebleed the system.
6. Check that system pressure on the water page of the HMI is consistent with system pressure tables in section about *System pressure*.
7. Press the ***Start/Stop*** button and Bypass button on the Exhaust page on the HMI to put the IHXU into operation. This will put the IHXU in operation mode and heat recovery will start when the system parameters are met.
8. After heating up the system, please activate the manual bypass and let the water circuit cool down, after it has cooled down, check joint and connections for any leaking.



Description of the User Interface

Below are just examples of some of the solutions available.

The start screen on the HMI panel shows the status of the heat exchanger systems. Pressing on the systems leads to the sub page.

Start Page

On the first screen of the IHXU user interface the status of the IHXU systems can be seen. If no alarms are present, the bar on the top left side will be green with an ***OK***. If an alarm is present, the bar will switch to red. If the bar is red, pressing the bar will lead the user to the alarm page for the system.

Pressing the shown IHXU system, will lead the user to the Exhaust page for the IHXU system.

Exhaust Page

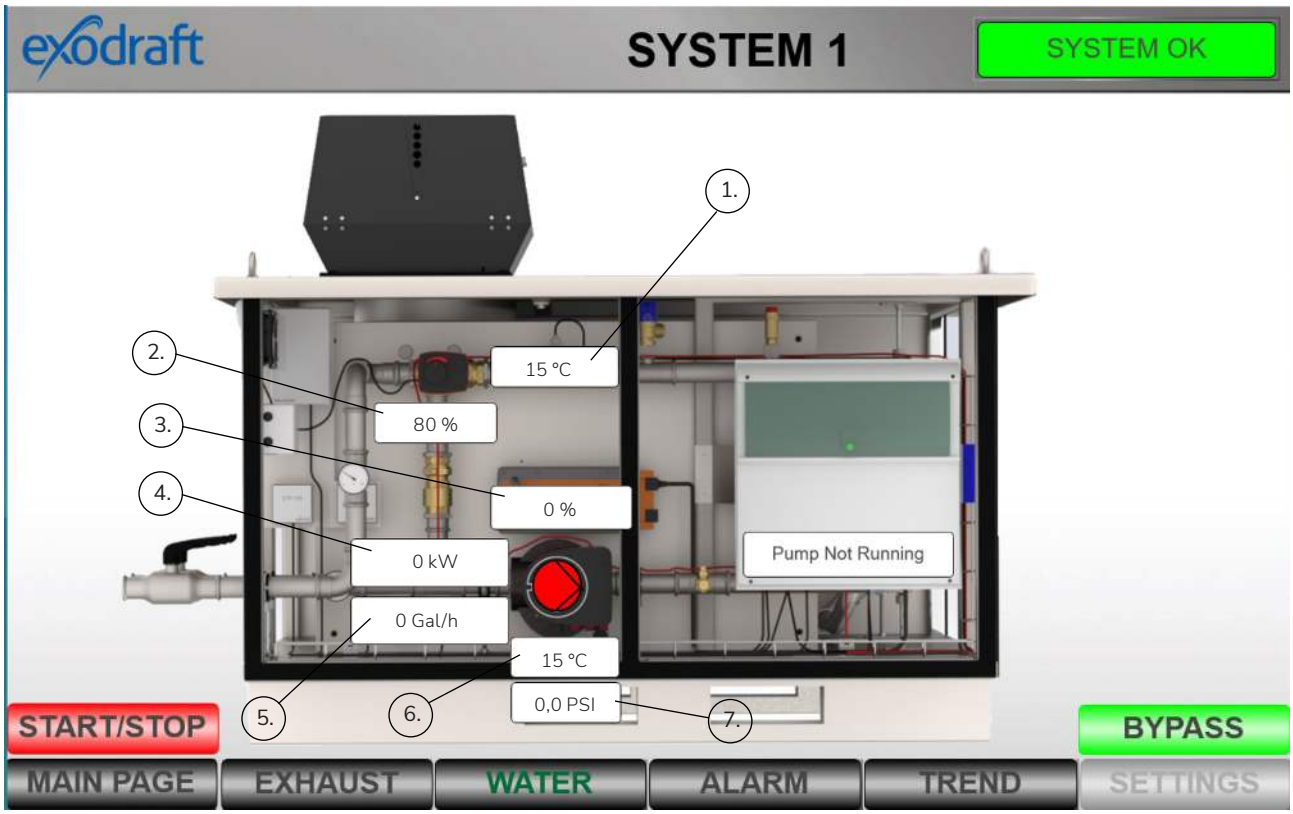
Pressing on the *EXHAUST* button leads the user to the page where the values related to the Exhaust / flue are located.

Starting from the top, these values can be seen:

1. The speed of the fan (0 % = stopped and 15-100 % = in operation)
2. The pressure loss measured between the inlet and outlet of the exchanger
3. The temperature of the flue gas entering the exchanger
4. The underpressure of the flue measured in the inlet of the exchanger

If the system is working normally the operation of the bypass damper is done automatically, but the user has the option to press bypass, which will force the bypass damper to open/close.

Water Page



Pressing the *WATER* button leads the user to the page where the values related to the internally installed water system are located.

Starting from the top, these values can be seen:

1. The forward flow temperature
2. The mixer valve position (0 % = fully closed and 100 % = full opening to the outlet)
3. The speed of the pump
4. The performance of the heat exchanger (Calculated value)
5. The water flow through the pump (Approx value)
6. The temperature of the liquid in the circulating pump
7. The pump head pressure

If the system is working normally (If no alarm are present and all process values are within the limits) the operation of the bypass damper is carried out automatically, the user has the option to press bypass, which will force the bypass damper to close. The pump and mixing valve will stay active if the flue gas temperature is above the start setpoint.

If the setpoint of the anti freeze function has been reached, the text box will show: ”Pump Running - Anti Freeze”. If Mixer or Pump Manual Mode has been selected, the text box will show ”Pump Running - Manual Mode”.

NB! The shown performance in kW, that the IHXU is producing, is a approximate value. If excact values are needed regarding power and the total amount of produced heat, an additional heat meter is needed.

Alarm Page

Pressing on the *ALARM* button leads the user to the page where the actual alarms can be seen.

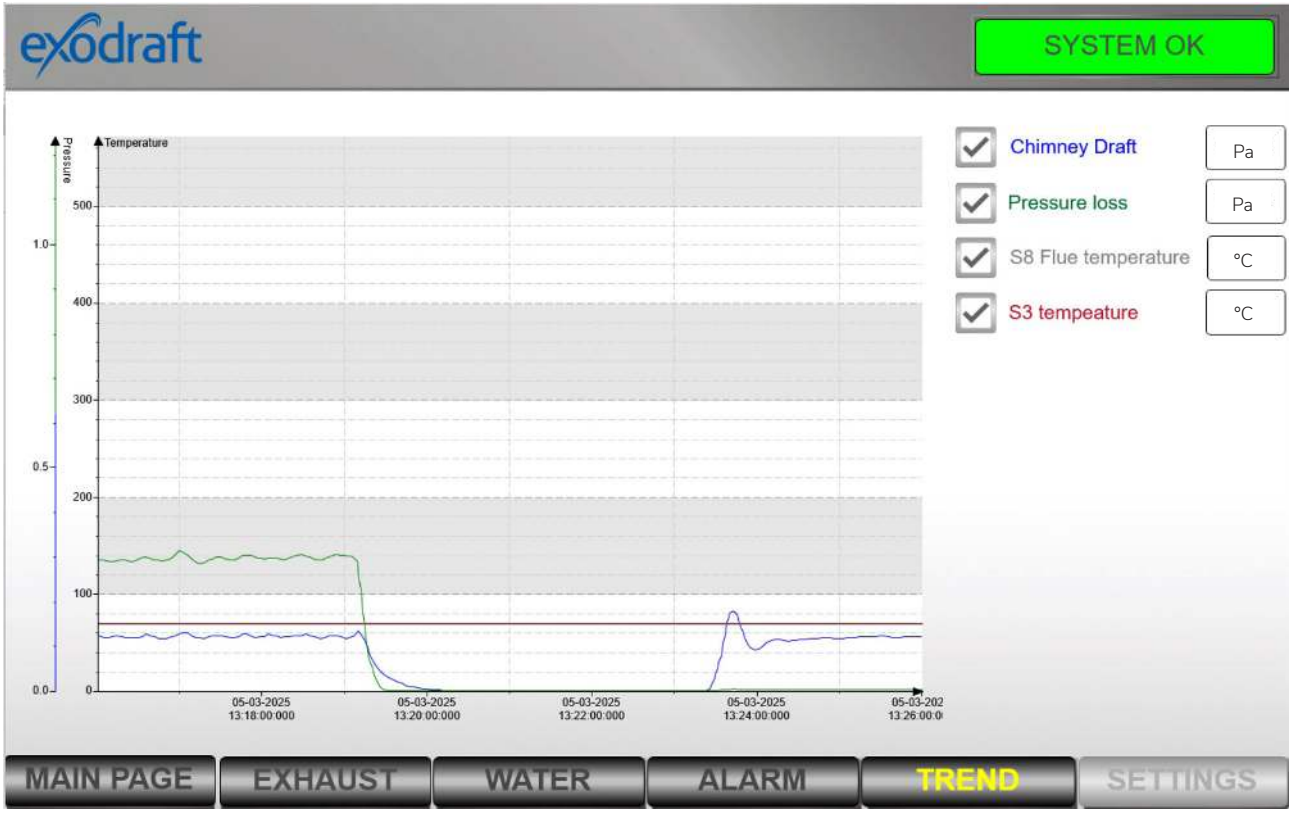
These alarms can occur:

- Return temperature alarm
- Forward Flow temperature sensor error
- Flue temperature sensor error
- STB Water temperature thermostat alarm
- Max exchanger pressure loss alarm
- Chimney draft alarm
- Pump communication alarm
- Pump alarm

If an alarm has occured, the system can be reset with a tap on the ***Reset Alarm*** button.

*See more in the section **Alarms**; about which alarm types exist, what they mean and how to resolve them.*

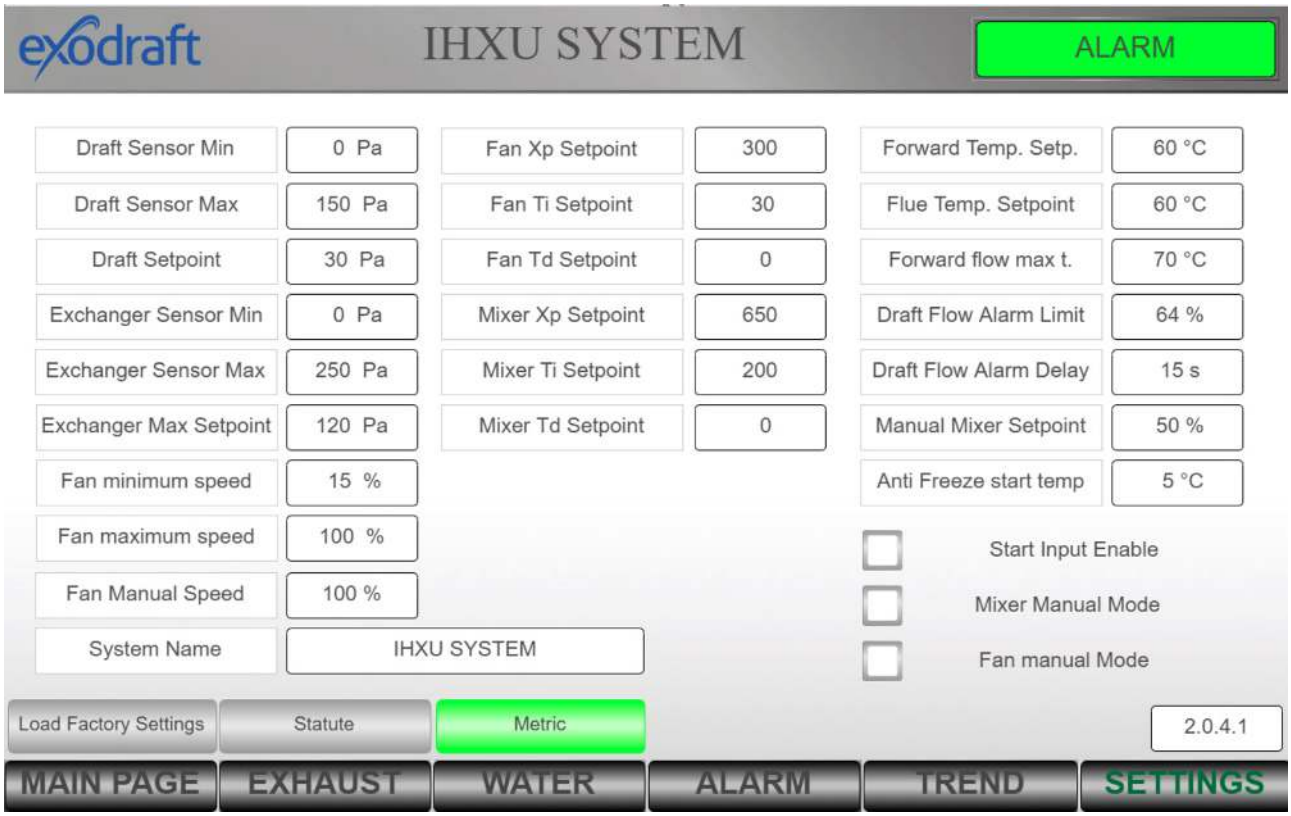
Trend Curve Page



Pressing on the *TREND* button leads the user to the page where a total of four trend curves can be seen. The last 10 minutes can be seen.

1. Chimney Draft
2. Heat exchanger pressure loss
3. Flue temperature
4. Forward flow temperature

Settings Page



Pressing on the *SETTINGS* button leads the user to the page where all settings of the system can be modified.

The values seen above are all the factory settings of the IHXU. They can be loaded using the ***Factory Defaults*** button.

See more about the consequences of changing values in the Settings overview section.

Settings Overview

Setting	Comment	Factory Setting
Chimney Sensor Min.	The minimum pressure of the chimney flue XTP sensor	0 Pa
Chimney Sensor Max.	The maximum pressure of the chimney flue XTP sensor	150 Pa
Chimney Draft Setpoint	The set point of the underpressure in the chimney flue	30 Pa
Exchanger Sensor Min.	The minimum pressure of the exchanger loss XTP sensor	0 Pa
Exchanger Sensor Max.	The maximum pressure of the exchanger loss XTP sensor	250 Pa
Exchanger Max Setpoint	The maximum pressure loss in the exchanger before an alarm	120 Pa
Fan Minimum Speed	Minimum speed of the chimney fan	15 %
Fan Maximum Speed	Maximum speed of the chimney fan	100 %
Fan Manual Speed	Sets the speed of the fan if ”Fan Manual Mode” is enabled	100 %
Fan PID Xp	The P part of the PID controller for the Chimney Fan	300
Fan PID Ti	The I part of the PID controller for the Chimney Fan	30
Fan PID Td	The D part of the PID controller for the Chimney Fan	0
Mixer PID Xp	The P part of the PID controller for the Mixer	650
Mixer PID Ti	The I part of the PID controller for the Mixer	200
Mixer PID Td	The D part of the PID controller for the mixer	0
Forward Temp. Setp.	The setpoint for the forward flow temperature	60°C
Flue Temp. Setpoint.	The start flue temperature setpoint of the system.	60°C
Temperature Max	The maximum return temperature	85C°
Draft Flow Alarm Limit	The alarm limit of the flow alarm. Range 50-100 %	64 %
Draft Flow Alarm Delay	The delay before an alarm occurs. Range 15-360 s.	15 s
Manual Mixer Setpoint	Sets the position of the mixer if ”Mixer Manual Mode” is enabled	50 %
Anti Freeze start temp.	The setpoint of the Anti Freeze function	5 C°

Adjusting the PID Controller parameters of the fan or mixer

The factory settings of both the fan and water mixer controller will work under most conditions.

If however, the system response is too slow or the system is unstable, changing the parameters might be necessary.

Fan PID Controller

Under normal conditions, the values for the fan does not hjave to be modified. If needed, the same approach as the steps below can be used.

Mixer PID Xp

Xp value

If the value is too high, it can cause instability and if too low the reponse might lead to temperature overshoot. This can lead to trip of the Safety Temperature Limiter. To achieve better response increase the value using small steps, and observe the behavior of the regulator. Use steps of approx. 50, before in/decreasing values.

Ti value

To achieve a optimal balance between fast response and a stable regulator, adjust this to match the connected appliance. Too low a value result in a fast response, and too high in a unstable system. Use steps of approx. 50, before in/decreasing values.

Td value

Under normal conditions this does not have to be adjusted.

In general small steps must be used to achieve a stable system. Observe closely and with patiance after each step. To get a better understanding of the system, use the *TREND* page of the HMI.

Maintenance and Troubleshooting

Care and Cleaning

CAUTION! Exodraft Integrated HeatX Unit should be cleaned at regular intervals depending of the level of particles or contaminates in the passing air. The unit should be checked for leaks, corrosion, and wear at least once a year.

Cleaning Heat Recovery

To ensure maximum flow through the exchanger cassettes, it is important to clean them.

The cleaning interval will depend on how much particles or contaminates the unit is exposed to.

The cleaning or replacing of the exchanger cassettes can be done when they are cooled down to water temperature, and the attached appliance is in bypass.

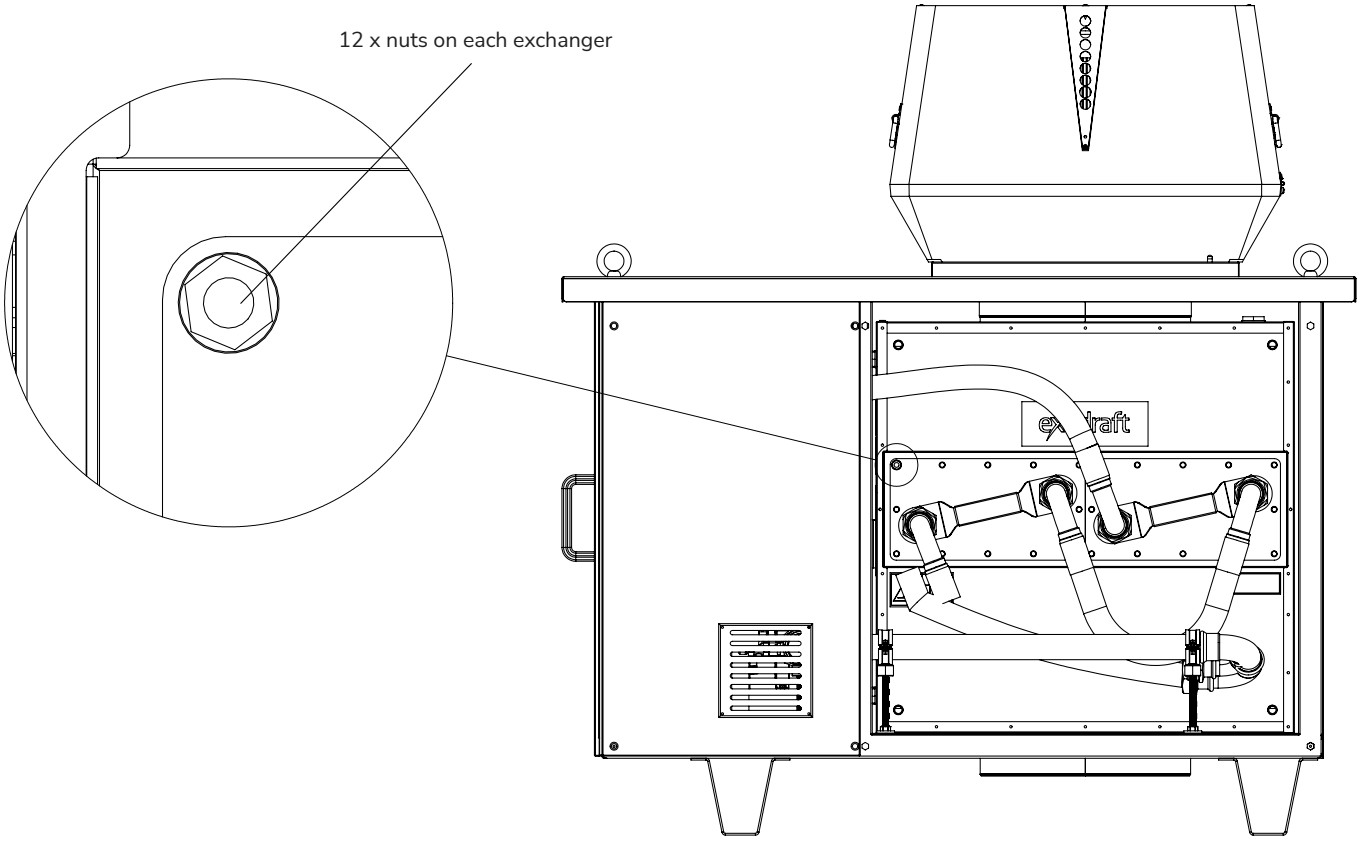
Heat recovery type	Exchanger product number	Number of exchangers	Weight per exchanger [kg]
SP120	3200987	1	13
SP250	3200989	1	17,5
SP375	3200987	2	13
SP500	3200989	2	17,5

CAUTION! Do not open the housing for the IHXU unless the power has been disconnected from the power supply.

Cleaning of Exchanger

1. Unplug the connector to the bypass damper actuator.
   This is done to prevent the system to go into operation during the process.
2. Remove the access panel on heat exchanger side of unit.
3. Close the water isolation valve at the inlet and outlet pipes, and the drain valve.
4. Detach hose/pipe connections to exchanger.
5. Loosen all nuts on the exchanger and pull the exchanger out by the handle (see picture below).
6. When cleaning the exchanger, you can use compressed air, soaking, or pressure washing.
7. Inspect the exchanger housing for deposits and clean if needed.
   Check the condensation can flow freely out of the outlet.
8. After cleaning, the exchanger is refitted. (Note that as a rule, the gasket can only be used once).
9. Nuts on the exchanger should be tightened crosswise to 20 Nm.
10. Reattach hose/pipe connections to exchanger.
11. Follow directions from the point about Secondary/Liquid Side as far as restarting the system
    - see page 23.

CAUTION! Use gloves and protective glasses when cleaning the exchanger.
Note: The exchangers are heavy – see weight table below.

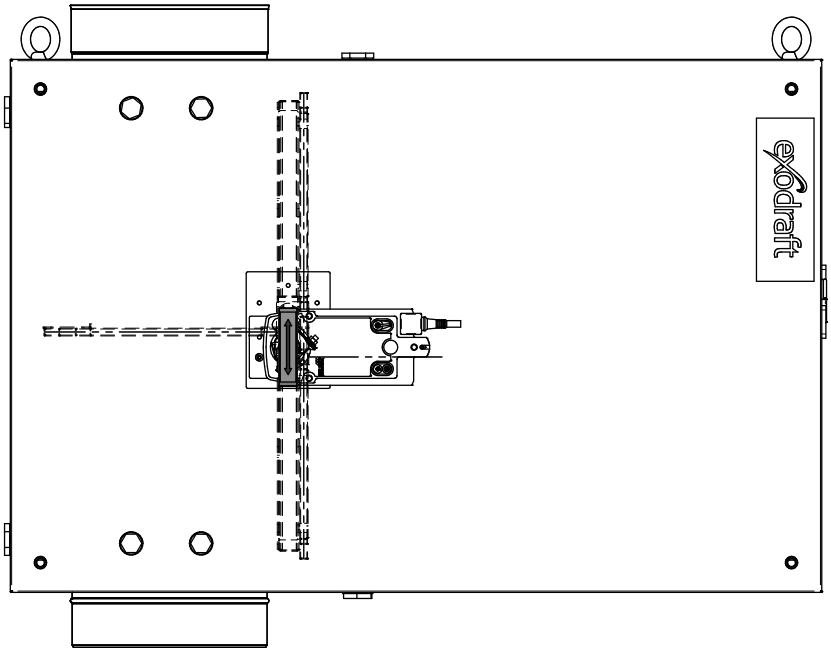


Damper Direction

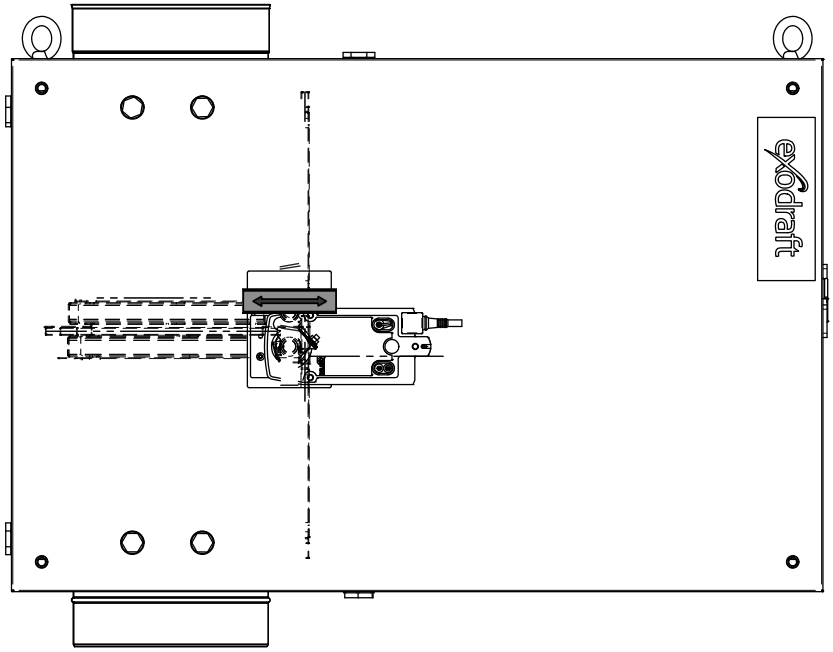
To ensure which direction the damper faces when the unit is mounted, a damper indicator is mounted at the end of the shaft. The arrow points the direction of the damper. See examples below.

As a safety precaution, the default factory setting of the damper is bypass as shown in the first image below. Damper position ”open for heat exchanger” can only be obtained manually by turning the handle on the actuator or by applying power to the actuator.

Vertical damper direction and vertical flue gas direction (Bypass)
- Dampers are closed for heat exchanger

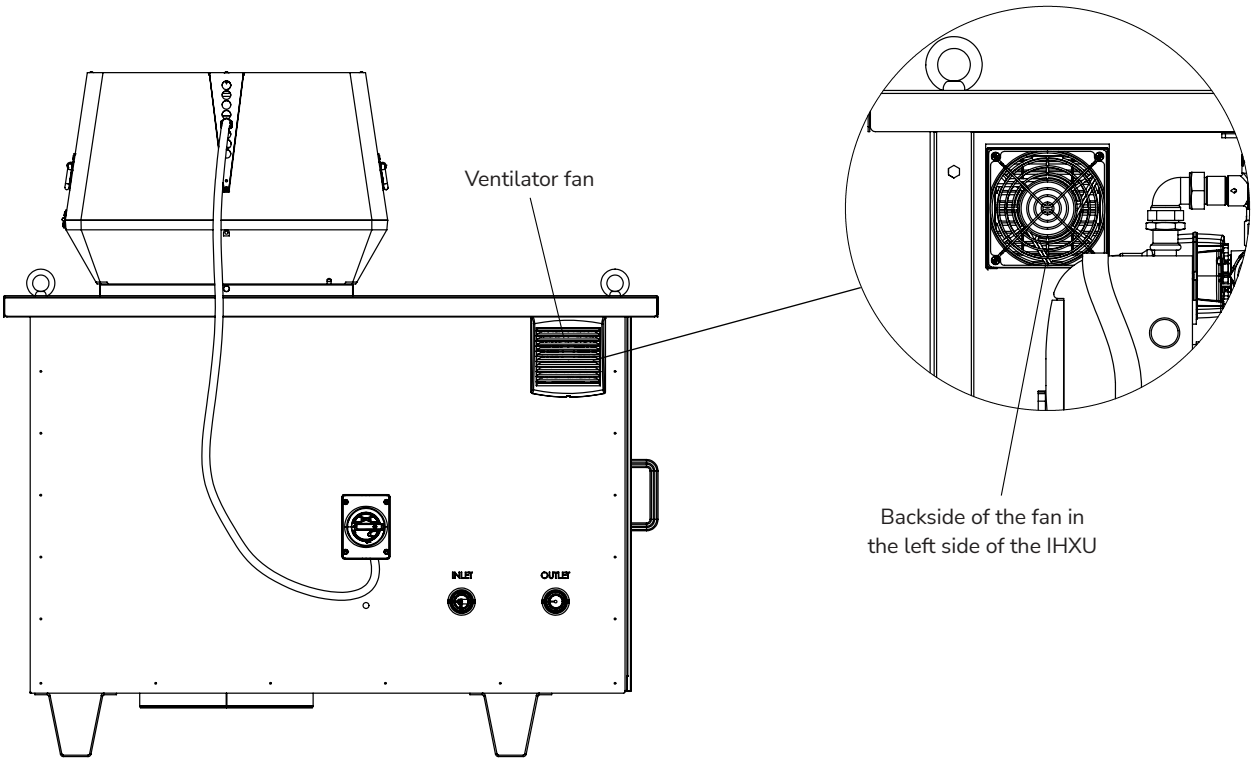


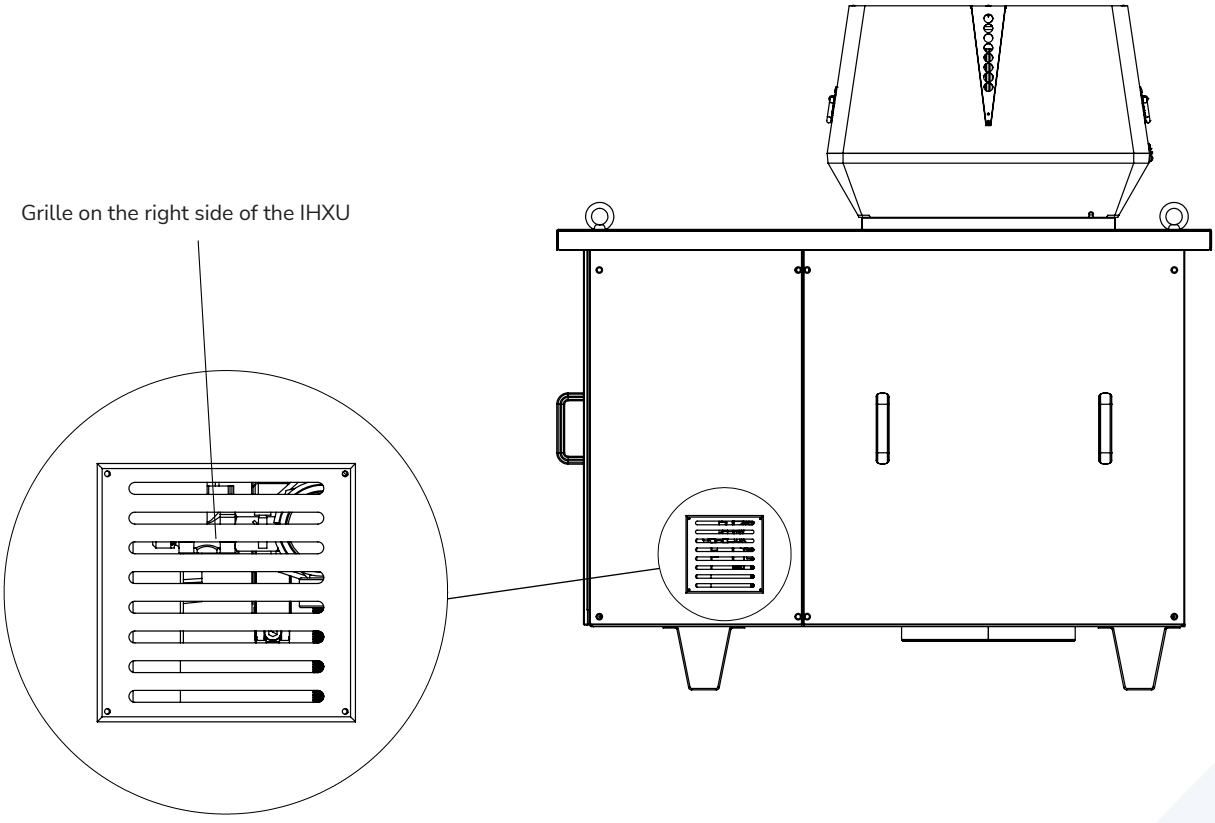
Horizontal damper direction and vertical flue gas direction
- Dampers are open for heat exchanger



Cleaning Ventilator and -Grille

Remember to check the Ventilator fan and - grille for dust, so that there is free passage and ventilation is intact. Use a soft bristle brush to brush away dirt and dust.





Cleaning Chimney Fan

It is extremely important to keep the flue clean from creosote and deposits as soot is the major cause of chimney fires. The top of the fan is hinged and can be opened to ensure easy cleaning of the fan.

The heating appliance must always be turned off prior to servicing of the chimney fan.

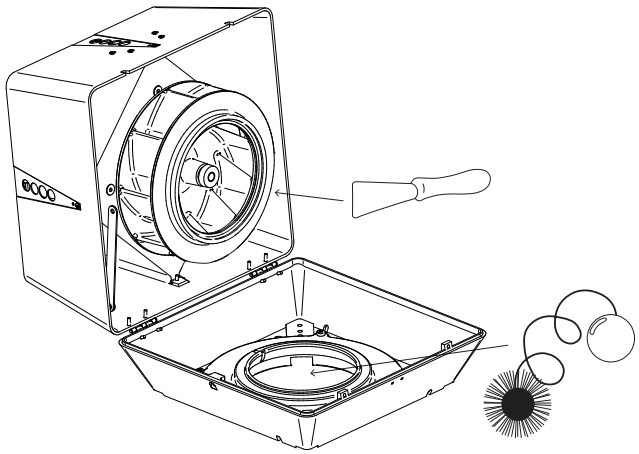
Cleaning intervals depend on the use of the appliance. The more the appliance is used, the more often the chimney flue must be cleaned.

No matter how often the fan is used, the fan must be inspected and cleaned at least once a year.
The chimney should always be cleaned by a trained professional chimney sweep.

Note!
The motor in the fan has ball bearings that are sealed, lifetime-lubricated and maintenance-free.
Should replacement of the bearings be required, this should be carried out by properly qualified personnel only.

Cleaning Procedure

Step	Action
1	Use the isolation switch to switch off the power to the fan and make sure the fan doesn't rotate.
2	Loosen the screw and open the top section of the fan so that it hangs on its hinges and the safety wire.
3	Using a scraper or brush, carefully clean the impeller.
4	Check the path taken by the smoke through the top and bottom sections of the fan for soot deposits, and clean where necessary with a scraper or brush.
5	While the fan is open, it is also possible for the chimney sweep to sweep the chimney.
6	Make sure that no weights on the centrifugal impeller are removed as this could impair the balance of the impeller.



WARNING! Do not open the motor housing unless the power to the chimney fan has been disconnected!

Troubleshooting

Observation	Problem	Solution
The outlet water temperature is low	There is air in the water system	Bleed the system
	The circulation pump is not operating correctly	Check the operation of the circulation pump
	The water flow is too fast	Check the operation of the circulation pump and mixing loop
	The mixing valve is not operating correctly	Check the operation of the controller
	The unit is in bypass mode	Check the motor voltage and connection
	The water connections have been switched	Correctly connect the supply and return sides (see section about connection)
	The exchanger cassette is blocked by debris	Clean the unit and check that the drain is working
	The damper is jammed	Clean the unit and check that the damper can move
	The safety thermostat is disengaged	Check the safety thermostat setting
The heat recovery is disabled at high water temperatures	There is air in the water system	The system needs to be bled
	The circulation pump is not operating correctly	Check the operation of the circulation pump
	The mixing valve is not operating correctly	Check the operation of the controller
	The unit isn't switching to bypass	Check voltage and connection of motor Check that the damper can turn freely
	The burner is operating at excessively high power	A larger Safe Plate is needed or the burner power must be reduced
	The damper is jammed	Clean the unit and check that the damper can move
	The isolation valves are closed	Open the valves
Poor chimney draft	The exchanger cassette is dirty	Clean the unit and check that the drain is working
	The damper is jammed	Clean the unit and check that the damper can move
	The fan is not running	See the other points regarding the fan

There is no power to the fan	The isolation switch may be on off	Check isolation switch
	The system is not started	Turn the system on using the HMI
	Loose electrical connection	Check wiring and correct problem
There is power to the fan but it is not working	Loose electrical connections	Check wiring and correct problems with connections. Pay special attention to the wiring in the junction box
There is power to the fan but it hums and does not turn	The capacitor may be worn out	Check capacitor and replace if necessary
	Soot makes the axial vane/impeller stick	Clean the fan
The fan seems to work fine, but there is not enough draft	The fan may be undersized	Replace with a larger fan
	The capacitor may be worn out	Check capacitor and replace if necessary
	The flue is damaged/blocked	Check the flue (chimney sweep)
	The exchanger(s) is clogged	Clean the exchanger(s)
The fan vibrates	The motor shaft may be bent	Replace motor
	The fan needs cleaning	Clean the fan
	Incorrect installation	Check installation guide in this manual
Mechanical noise can be heard	Soot or tar may impair the axial vane/impeller	Clean the axial vane/impeller
	Motor bearings may be worn out/over-heated	Replace bearings
	Incorrect installation	Check installation guide in this manual

Alarms

If an alarm should occur, the green bar in the upper right corner will change to red.
Pressing the bar or the ”ALARM” tab, will display the alarm tab.

Alarm types	Problem	Solution
Return temperature alarm	The temperature of the return has reached the setpoint and the heat exchanger goes into bypass	Increase the setpoint or increase the usage of hot water in the installation
Forward Flow temperature sensor error	The sensor input on the PLC has a short curcuit or the sensor is not connected. The reason can also be a bad connection between the wire and the terninal / broken sensor	Check the sensor and the connection between terminal and the wires
Flue temperature sensor error	The sensor input on the PLC has a short curcuit or the sensor is not connected. The reason can also be a bad connection between the wire and the terninal / broken sensor	Check the sensor and the connection between terminal and the wires
STB Water temperature thermostat alarm	The STB thermostat has been triggered by a too high temperature in the water system	Reset the STB thermostat. Make sure that the S3 Forward temperature setpoint is not too close to the STB trigger temperature. Make sure that the pump is running and functioning, the mixing valve is regulating and engaged with the actuator and that the isolation valves are open
Max exchanger pressure loss alarm	The exchanger(s) can be too clogged up with contaminates or the appliance connected to the IHXU can produce an excessive amount of flue gas	Clean the exchanger cassette(s) and/or lower the performance of the appliance. Adjust the setpoint to accepted level
Chimney draft alarm	The exchanger cassette(s) can be too clogged up with contaminates or the appliance connected to the IHXU can produce an excessive amount of flue gas. The fan can have a malfunction, either in the motor or the motordrive	Clean the exchanger cassette(s) and/or lower the performance of the appliance. Check that the fuse -FC301 is on. Have an electrician check the motor drive and motor for defects. Check if the performance of the installed fan is too small
Pump communication alarm	The pump is not turned on	Check that the fuse -FC317 is on. Have an electrician check the pump and the electrical connection to it
Pump alarm	The pump has an internal alarm	Check the display of the pump to see the exact error

Maximum Operating Time in Bypass

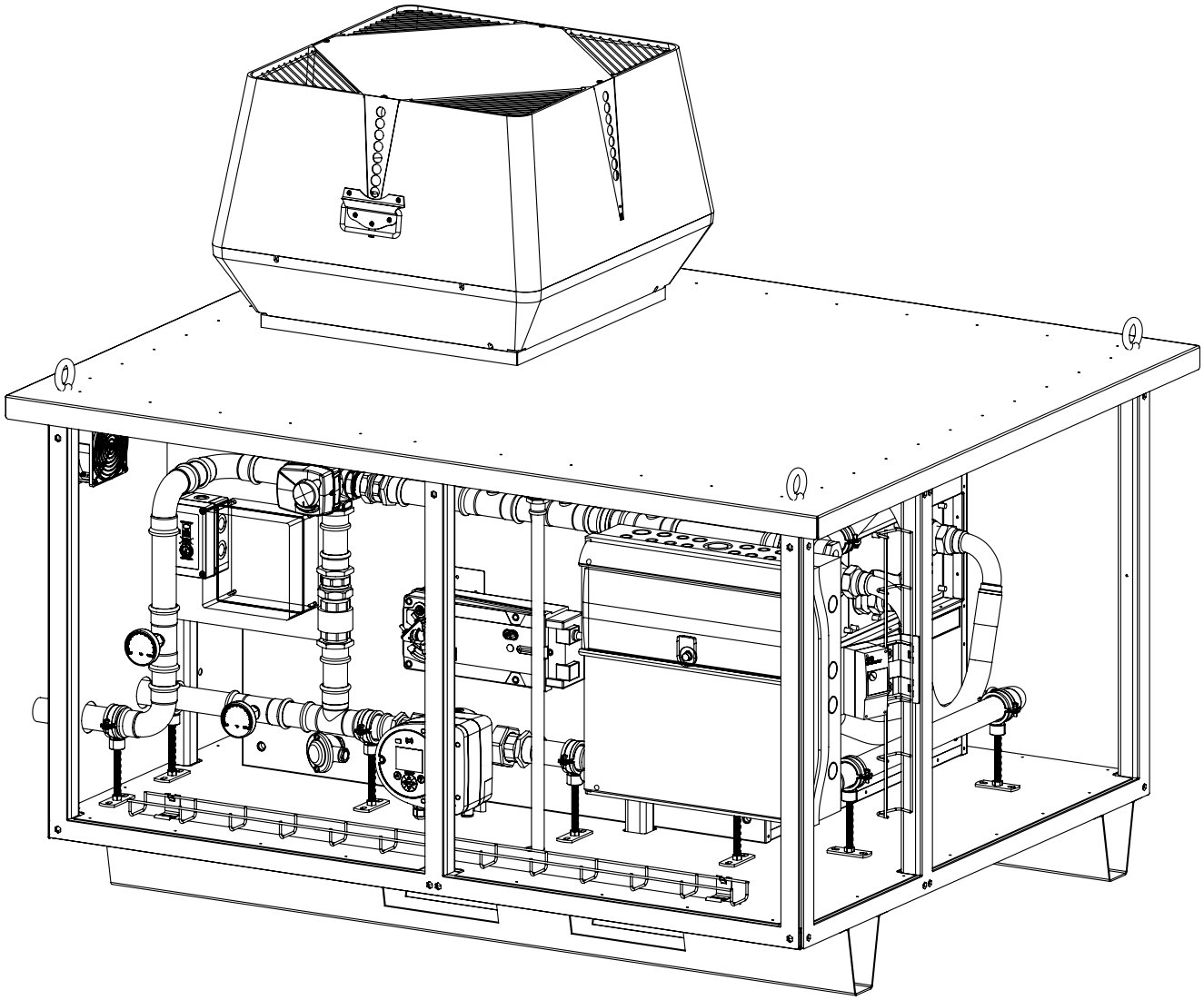
Importance of Temperature

The temperature through the system is significant for how long you can stay in bypass operation without risking excessive heating during normal circumstances the water inside the coil will not start boiling if the flue gas temperature is below the max allowed temperature and the system water pressure are equal to or above the minimum allowed pressure.

As an extra safety, the pump and the mixing valve will always be active when the system is powered up and the flue gas temperature is above start temperature. even when the damper is in bypass.

In the tables of the following sections you will find indications as to how many hours it is possible to operate in bypass without water circulation before the water temperature exceeds 105˚C (measured at the heat exchanger).
In both tables, the water temperature starts at 60˚C.

The Exodraft Integrated HeatX Unit should always be orientated horizontally as illustrated below.



System Pressure

System pressure is tested according to these standards:
2014/68/EU Fluid Group: 1 & 2 201, 2006/42/EF and 2014/35/EU

System pressure SP120

Minimum system pressure [bar_a]

		Exhaust temperature [°C]				Exhaust temperature [°C]	
Water sample temperature	**Δt**	**200**	**300**	Water sample temperature	**Δt**	**200**	**300**
	10	1,5	1,5		**10**	1,5	1,5
	20	1,5	1,5		**20**	1,5	1,5
60°C	**30**	1,5	1,5	80°C	**30**	1,5	2
	40	1,5	2		**40**	1,5	3
	50	1,5	2,5		**50**	2	3,5

Water sample temperature	**Δt**	**200**	**300**	Water sample temperature	**Δt**	**200**	**300**
	10	1,5	1,5		**10**	1,5	2
	20	1,5	2		**20**	2	3
80°C	**30**	2	3	90°C	**30**	3	4
	40	2,5	4		**40**	3,5	5
	50	2,5	4,5		**50**	3,5	6

Water sample temperature	**Δt**	**200**	**300**
	10	2	2,5
	20	3	3,5
100°C	**30**	3,5	5
	40	4	6,5
	50	5	7

System pressure SP250

Minimum system pressure [bar_a]

		Exhaust temperature [°C]				Exhaust temperature [°C]	
Water sample temperature	**Δt**	**200**	**300**	Water sample temperature	**Δt**	**200**	**300**
	10	1,5	1,5		**10**	1,5	1,5
	20	1,5	1,5		**20**	1,5	1,5
60°C	**30**	1,5	1,5	80°C	**30**	1,5	2
	40	1,5	2		**40**	1,5	2,5
	50	1,5	2,5		**50**	2	3

Water sample temperature	**Δt**	**200**	**300**	Water sample temperature	**Δt**	**200**	**300**
	10	1,5	1,5		**10**	1,5	2
	20	1,5	2		**20**	2	2,5
80°C	**30**	2	3	90°C	**30**	2,5	4
	40	2,5	3,5		**40**	3	5
	50	2,5	4,5		**50**	3,5	5,5

Water sample temperature	**Δt**	**200**	**300**
	10	2	2,5
	20	2,5	3,5
100°C	**30**	3,5	4,5
	40	4	6
	50	5	7

System pressure SP375

Minimum system pressure [bar_a]

Water sample temperature	Δt	Exhaust temperature [°C] 200	300	Water sample temperature	Δt	Exhaust temperature [°C] 200	300
60°C	**10**	1,5	1,5	80°C	**10**	1,5	1,5
	20	1,5	1,5		**20**	1,5	1,5
	30	1,5	1,5		**30**	1,5	1,5
	40	1,5	1,5		**40**	1,5	1,5
	50	1,5	1,5		**50**	1,5	1,5

Water sample temperature	Δt	200	300	Water sample temperature	Δt	200	300
80°C	**10**	1,5	1,5	90°C	**10**	1,5	1,5
	20	1,5	1,5		**20**	1,5	2
	30	1,5	1,5		**30**	1,5	2
	40	1,5	2		**40**	2	2,5
	50	1,5	2,5		**50**	2	3

Water sample temperature	Δt	200	300
100°C	**10**	1,5	2
	20	2	2,5
	30	2,5	3
	40	2,5	3,5
	50	3	4

System pressure SP500

Minimum system pressure [bar_a]

Water sample temperature	Δt	Exhaust temperature [°C] 200	300	Water sample temperature	Δt	Exhaust temperature [°C] 200	300
	10	1,5	1,5		**10**	1,5	1,5
	20	1,5	1,5		**20**	1,5	1,5
60°C	**30**	1,5	1,5	80°C	**30**	1,5	1,5
	40	1,5	1,5		**40**	1,5	1,5
	50	1,5	1,5		**50**	1,5	1,5

Water sample temperature	Δt	200	300	Water sample temperature	Δt	200	300
	10	1,5	1,5		**10**	1,5	1,5
	20	1,5	1,5		**20**	1,5	2
80°C	**30**	1,5	1,5	90°C	**30**	2	2
	40	1,5	2		**40**	2	2,5
	50	2	2,5		**50**	2	3

Water sample temperature	Δt	200	300
	10	1,5	2
	20	2	2,5
100°C	**30**	2,5	3
	40	2,5	3,5
	50	3	4

UK Conformity Assessed

Exodraft a/s
Industrivej 10
DK-5550 Langeskov

Hereby declares that the following products:

8005100, 8005110, 8005120, 8005130, 8005140

Were manufactured in conformity with the provisions of the following regulations:

The Supply of Machinery (Safety) Regulations 2008

Electrical Equipment (Safety) Regulations 2016

Electromagnetic Compatibility Regulations 2016

Langeskov, 15-01-2025
Managing Director
Anders Haugaard

CE

Declaration of Conformity

DK:	EU-Overensstemmelseserklæring	NL:	EU-Conformiteits verklaring
GB:	Declaration of Conformity	SE:	EU-Överensstämmelsedeklaration
DE:	EU-Konformitätserklärung	FI:	EU-Vaatimustenmukaisuusvakuutus
FR:	Déclaration de conformité de l'Union Européenne	IS:	ESS-Samræmisstaðfesting
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Exodraft a/s
Industrivej 10
DK-5550 Langeskov

Erklærer på eget ansvar, at følgende produkter: Hereby declares that the following products: Erklärt hierdurch auf eigene Verantwortung, daß folgende Produkte: Déclare, sous sa propre responsabilité, que les produits suivants: Erklærer på eget ansvar at følgende produkter: Niniejszym oświadcza, że następujące produkty:	Veklaart dat onderstaande producten: Deklarerar på eget ansvar, att följande produkter: Vastaa siltä, että seuraava tuote: Staðfesti à eigin àbyrgð, að eftirfarandi vörur: Dichiara con la presente che i seguenti prodotti:

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Som er omfattet af denne erklæring, er i overensstemmelse med følgende standarder: Were manufactured in conformity with the provisions of the following standards: Die von dieser Erklärung umfaßt sind, den folgenden Normen: Auxquels s'applique cette déclaration sont en conformité avec les normes ci-contre: Som er omfattet av denne erklæring, er i samsvar med følgende standarder: Zostały wyprodukowane zgodnie z warunkami określonymi w następujących normach:	Zijn vervaardigd in overeenstemming met de voorschriften uit de hieronder genoemde normen en standaards: Som omfattas av denna deklaration, överensstämmer med följande standarder: Jota tämä selvitys koskee, on seuraavien standardien mukainen: Sem eru meðtalin i staðfestingu Pessari, eru i fullu samræmi við eftirtalda staðla: Sono stati fabbricati in conformità con le norme degli standard seguenti:

EN 60335-1, EN 60335-2-80, DS/EN ISO 12100: 2011

I.h.t bestemmelser i direktiv: In accordance with Entsprechen gemäß den Bestimmungen der folgenden Richtlinien: Suivant les dispositions prévues aux directives: I.h.t bestemmelser i direktiv: Zgodnie z:	En voldoen aan de volgende richtlijnen: Enligt bestämmelserna i följande direktiv: Seuraavien direktiivien määräysten mukaan: Med tilvisun til àkvarðana eftirlits: In conformità con le direttive:
Maskindirektivet: The Machinery Directive: Richtlinie Maschinen: Directive Machines: Maskindirektivet: Dyrektywą maszynową:	De machinerichtlijn: Maskindirektivet Konedirektiivi: Vèlaeftirlitið: Direttiva Macchinari:

2006/42/EF/-EEC/-EWG/-CEE

Lavspændingsdirektiv: The Low Voltage Directive: Niederspannungsrichtlinie: Directive Basse Tension: Lavspenningsdirektivet: Dyrektywą Niskonapięciową	De laagspanningsrichtlijn: Lågspänningsdirektivet: Pienjännitedirektiivi: Småspennueftirlitið: Direttiva Basso Voltaggio:

2014/35/EC

EMC-direktivet: And the EMC Directive: EMV-Richtlinie: Directive Compatibilité Electromagnétique: EMC-direktivet: Dyrektywą EMC – kompatybilności elektromagnetycznej	En de EMC richtlijn: EMC-direktivet: EMC-direktiivi: EMC-eftirlitið: Direttiva Compatibilità Elettromagnetica:

2014/30/EC

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