Exhaust air heat pump
NIBE F470

NIBE F470 is an all-in-one exhaust and supply air heat pump which provides heating, ventilation, heat recovery and hot water efficiently, simply and economically. With its attractive, stylish design and compact size, the heat pump is easy to accommodate and install.

With its built-in hot water tank, immersion heater, circulation pump, fans and control system, the heat pump provides a reliable and economical source of heat.

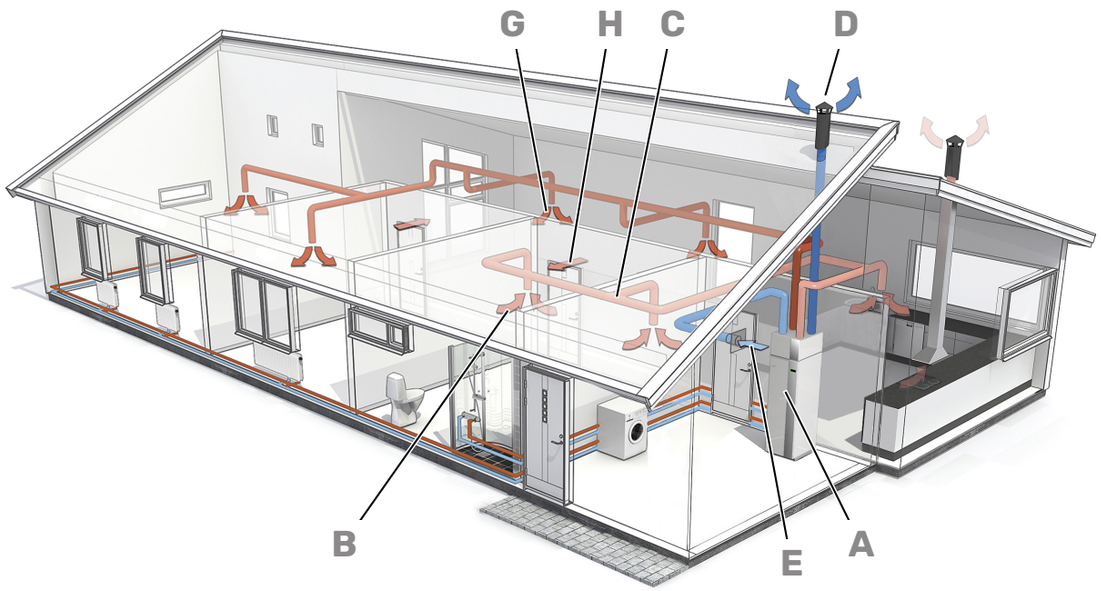
The heat pump can be connected to any low-temperature distribution system, e.g. radiators, convectors or underfloor heating.

Thanks to smart technology, the product gives you control over your energy consumption and will be a key part of your connected home. The efficient control system automatically adjusts the indoor climate for maximum comfort, and you do nature a favour at the same time.

- **Heating, hot water, supply air, ventilation and heat recovery.**
- **Cost and space-efficient solution for various types of residences.**
- **Connected home with smart technology for an easier way of life.**

This is how F470 works

Principle



F470 is an exhaust air heat pump with supply air coil, integrated fans and a water heater that is provided with corrosion protection in the form of copper or stainless steel. In addition, it has an integrated immersion heater.

Energy is recovered from the ventilation air and supplied to the heat pump, which significantly reduces the energy costs. The device ventilates the house, supplies heat and produces domestic hot water.

F470 is intended for low-temperature dimensioned radiator circuits and/or underfloor heating, and is suitable for replacement in houses or equivalent.

Using accessories, F470 can be docked with other heat sources.

A F470 ventilates the house and supplies it with both heating and hot water.

B The warm room air is drawn into the air duct system.

C The warm room air is fed to F470.

D The air is released when it has passed F470. The air temperature has then dropped since F470 has extracted the energy in the air.

E Outdoor air is drawn into F470 and heated if necessary.

G Heated air is blown out into rooms with supply air valves.

H Air is transferred from rooms with supply air valves to rooms with exhaust air valves.

Design

Control of F470 is designed to ensure easy operation while always enabling the heat pump to run as efficiently as possible. F470 decides on the best operation mode. The display shows the current temperatures and set values in plain text.

The design of the air treatment section provides a high ventilation capacity. Moreover, the steplessly adjustable fans can easily be increased or reduced via the display unit or an external signal.

F470 gives great savings thanks to an efficient compressor, which, by means of intelligent control, works with the most favourable temperature conditions at the time.

The outer casing is of white powder-coated steel plate. The front door is easy to remove for easy access when installing and for servicing.

F470 has a maximum immersion heater output of 10.3 kW. The power is easy to adjust via the display, and the heat pump can be blocked.

Principle of operation, cooling circuit

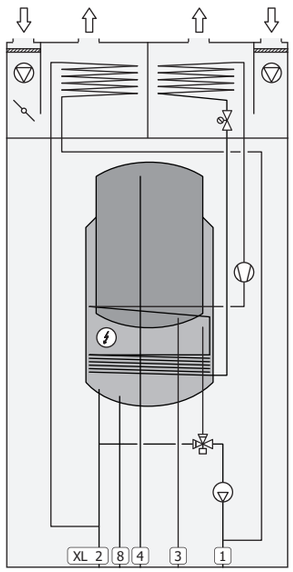
When the exhaust air at room temperature passes through the evaporator, the refrigerant evaporates because of its low boiling point. As a result, the air releases energy to the refrigerant.

The refrigerant is then compressed in the compressor, causing the temperature to rise considerably.

The warm refrigerant is led to the condenser. Here, the refrigerant gives off its energy to the climate system's water, whereupon the refrigerant changes state from gas to liquid.

The refrigerant then goes via filters to the expansion valve, where the pressure and temperature are reduced.

The refrigerant has now completed its circulation and returns to the evaporator.



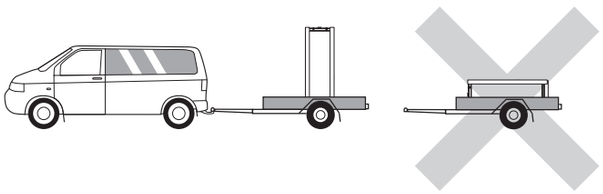
XL1	Connection, heating medium flow
XL2	Connection, heating medium return
XL3	Cold water connection
XL4	Hot water connection
XL8	Docking connection, supply

Good to know about F470

Transport and storage

F470 should be transported and stored vertically in a dry place.

Ensure that the heat pump cannot fall over during transport.



However, the F470 can be carefully laid on its back when being moved into the building.

Supplied components

Local differences in the enclosed kit may occur. See relevant installer manual for more information.

Outdoor temperature sensor

Room sensor

Earth cabling (4 pcs)

Current sensor

LOCATION

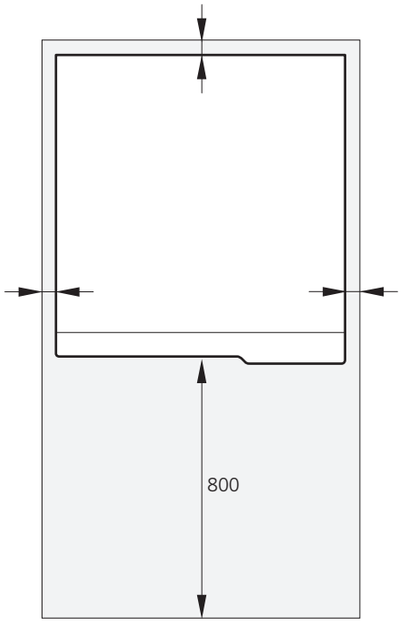
The kit of supplied items is placed on top of the product.

Installation and positioning

- Position F470 on a solid foundation indoors that withstands water and the weight of the product.
- Since water comes from F470, the area where F470 is located must be equipped with floor drainage.
- Because water comes from F470, the floor coating is important. A waterproof floor or floor membrane is recommended.
- Install with its back to an outside wall, ideally in a room where noise does not matter, in order to eliminate noise problems. If this is not possible, avoid placing it against a wall behind a bedroom or other room where noise may be a problem.
- Wherever the unit is located, walls to sound sensitive rooms should be fitted with sound insulation.
- The installation area always has to have a temperature of at least 10 °C and max. 30 °C.

INSTALLATION AREA

Leave a free space of 800 mm in front of the product. Leave free space between F470 and wall/other machinery/fittings/cables/pipes etc. It is recommended that a space of at least 10 mm is left to reduce the risk of noise and of any vibrations being propagated.



Ensure that there is sufficient space (300 mm) above F470 for connecting ventilation ducts.

Installation

Equipment

F470 is equipped with a climate-controlled heating control system with outdoor temperature, room temperature and supply temperature sensors, circulation pump, load monitor and expansion vessel. For the heating section, F470, copper and stainless steel, is equipped with a filling and a safety valve. The hot water section in F470 copper and stainless steel is equipped with a set of valves comprising filling, mixing, non-return and safety valves.

Maximum boiler and radiator volumes

F470 is equipped with an expansion vessel.

The volume of the expansion vessel is 10 litres and it is pre-pressurised as standard to 0.5 bar. As a result, the maximum permitted height between the expansion vessel and the highest radiator is 5 metres. There is a valve on the expansion vessel for any pre-pressure adjustment.

The maximum system volume, excluding F470, is 219 litres at the above-mentioned pre-pressure.

Inspection

F470 is equipped with a closed expansion vessel as standard. National standards can assert that the boiler installation must be inspected before it is taken into use. This inspection may only be performed by persons with the necessary expertise.

National regulations can assert that the function of the ventilation system must be checked. This check may only be carried out by an authorised person.

Pipe installation

Pipe installation must be carried out in accordance with current norms and directives.

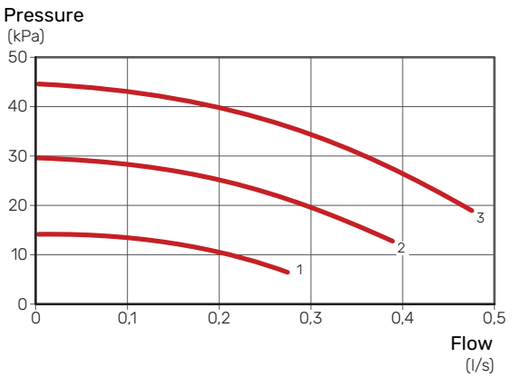
Pipe connections for cold and hot water as well as supply and return lines are fitted with 22 mm compression ring couplings.

CONNECTING THE HEATING SYSTEM

When the circulation pump is operating, the flow in the heating system must not be stopped completely, i.e. at least one of the heating system's radiators/underfloor heating coils must be fully open.

AVAILABLE EXTERNAL PRESSURE, HEATING SYSTEM

Capacity, circulation pump (CP)



Installation alternative

EXTRA HOT WATER HEATERS

The system should be supplemented with an extra water heater, if a large bath tub or other significant consumer of hot water is installed.

Water heater with immersion heater

In a water heater with an immersion heater, the water is initially heated by the heat pump. The immersion heater in the water heater is used for keeping warm and when the heat pump does not have sufficient power.

The water heater's flow is connected after F470.

Ventilation

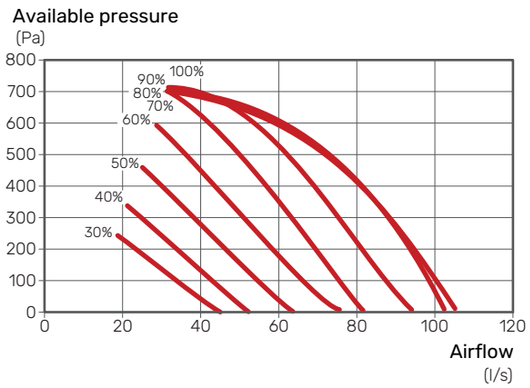
Connect F470 so that all the exhaust air, except kitchen duct air (kitchen fan), passes through the evaporator in the heat pump.

- The ventilation flow must comply with the applicable national standards.
- For optimum heat pump performance, the ventilation flow must not be less than 28 l/s (100 m³/h) at an exhaust air temperature of at least 20 °C. When the exhaust air temperature is lower than 20 °C (for example at start-up and when there is nobody at home), the minimum value is 31 l/s (110 m³/h).
- The supply air flow must be lower than the exhaust air flow to prevent over pressure in the house.
- The heat pump's installation area must be ventilated to at least 5 l/s (18 m³/h)
- If the exhaust air temperature falls below 16 °C, the compressor is blocked and electric additional heat is permitted. No energy is recovered from the exhaust air when the compressor is blocked.
- Provision must be made for inspection and cleaning of the duct.
- The air duct system must be a minimum of air tightness class B.
- To prevent fan noise being transferred to the ventilation devices, install silencers in suitable locations in the duct system.
- Because the extract air and outdoor air temperature is/becomes cold, the extract air and outdoor air duct must be insulated using diffusion-proof material along its entire length.
- Exhaust and supply air ducts that are routed in cold areas must be insulated.
- All joins in the ducting must be sealed to prevent leakage.
- The air must be routed to the outdoor air duct through an outer wall grille in the facade. The outer wall grille must be installed so that it is protected from the weather and must be designed so that no rainwater and/or snow can penetrate the facade or follow the air into the duct.
- When positioning the outdoor air and extract air hood/grille, bear in mind that the two air flows must not short circuit to prevent the extract air from being drawn into F470 again.
- The extract air duct must be a maximum of 20 m long with a maximum of six bends.
- Because the heat pump contains a flammable refrigerant, the air ducting system must be earthed. This is done by making a good electrical connection to the air ducts using the enclosed earth cables (4).
- A duct in a masonry chimney stack must not be used for extract air or outdoor air.
- If a stove or similar is installed, it must have airtight doors and take combustion air from outside.
- Incorrect adjustment of the ventilation may lead to reduced installation efficiency and thus poorer operating economy, a poorer indoor climate and moisture damage in the building.

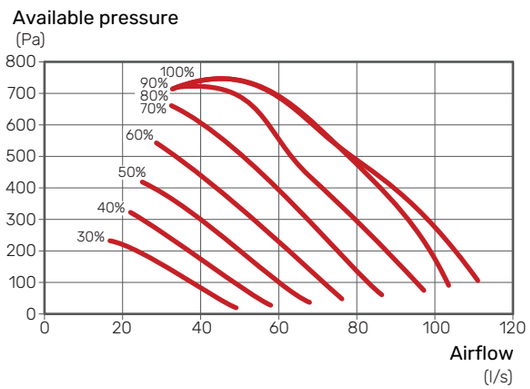
SETTING THE FAN CAPACITY

Select the ventilation capacity steplessly in the display.

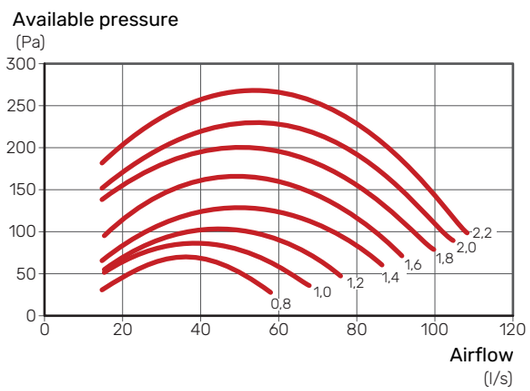
Ventilation capacity, supply air



Ventilation capacity, exhaust air

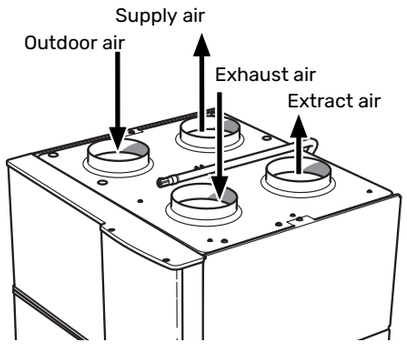


Specific fan power



The diagram shows the SFP rating with both the fans' power consumption ($^{W}/_{(l/s)}$).

VENTILATION CONNECTIONS



Functions

Control, general

The indoor temperature depends on several different factors. Sunlight and heat emissions from people and household machines are normally sufficient to keep the house warm during the warm seasons. When it gets colder outside, the climate system needs to help heat the house. The colder it is outside, the warmer radiators and underfloor heating systems have to be.

Control of the heat production is performed based on the "floating condensing" principle, which means that the temperature level needed for heating at a specific outdoor temperature is produced based on collected values from the outdoor and supply temperature sensors. The room sensor can also be used to compensate the deviation in room temperature.

Heat production

The supply of heat to the house is regulated in accordance with the heating curve selected setting. After adjustment, the correct quantity of heat for the current outdoor temperature is supplied.

OWN CURVE

F470 has pre-programmed non-linear heating curves. It is also possible to create your own defined curve. This is an individual linear curve with a number of break points. You select break points and the associated temperatures.

Hot water production

Hot water charging starts when the temperature has fallen to the set start temperature. Hot water charging stops when the hot water temperature at the hot water sensor has been reached.

For temporary higher hot water demand, there is a function that allows the temperature to be raised temporarily for up to 12 hours or by a one time increase (can be selected in the menu system).

It is also possible to set F470 in holiday mode, which means that the lowest possible temperature is achieved without the risk of freezing.

Additional heat only

F470 can be used with only additional heat (electric boiler) to produce heating and hot water, for example, before the ventilation system is complete.

Alarm indications

The status lamp lights red in the event of an alarm and the display shows detailed information depending on the fault. An alarm log is created with each alarm containing a number of temperatures, times and operating status.

The display

F470 is controlled using a clear and easy to use display.

Instructions, settings and operational information are shown on the display. You can easily navigate between the different menus and options to set the comfort or obtain the information you require.

The display unit is equipped with a USB socket that can be used to update the software and save logged information in F470.

Visit myuplink.com and click the "Software" tab to download the latest software for your installation.

myUplink

With myUplink you can control the installation – where and when you want. In the event of any malfunction, you receive an alarm directly to your e-mail or a push notification to the myUplink app, which allows you to take prompt action.

Visit https://myuplink.com for more information.

SPECIFICATION

You need the following in order for myUplink to be able to communicate with your F470:

- network cable
- Internet connection
- account on https://myuplink.com

We recommend our mobile apps for myUplink.

RANGE OF SERVICES

myUplink gives you access to various levels of service. The base level is included and, apart from this, you can choose two premium services for a fixed annual fee (the fee varies depending on the functions selected).

Service level	Basic	Premium service, History	Premium service, Change settings
Viewer	X	X	X
Alarm	X	X	X
History	X	X	X
Extended history	-	X	-
Manage	-	-	X

MOBILE APPS FOR MYUPLINK

The mobile apps can be downloaded free of charge from where you usually download your mobile apps. Logging into the mobile app is performed using the same account details as on myuplink.com.

MYUPLINK PRO

myUplink PRO is a complete tool for offering service agreements to the end customer and for always having the latest information about the installation, as well as the option to adjust settings remotely.

With myUplink PRO, you can provide your connected customers with rapid status and remote diagnostics.

Visit pro.myuplink.com for information about what else you can do using the mobile app and online.

NIBE SMART PRICE ADAPTION™

Smart Price Adaption is not available in all countries. Contact your NIBE dealer for more information.

Smart Price Adaption adjusts the system's consumption according to the time of day when electricity prices are lowest. This allows for savings, provided that an hourly rate subscription has been signed with the electricity supplier.

The function is based on hourly rates for the coming day being downloaded via myUplink. To use the function, an Internet connection and account on myUplink are necessary.

SMART HOME

When you have a smart home system that can communicate with myUplink, you can control the installation via an app by activating the "smart home" function.

By allowing connected units to communicate with myUplink, your heating system becomes a natural part of your homesmart home and gives you the opportunity to optimise the operation.

Remember that the "smart home" function requires myUplink in order to work.

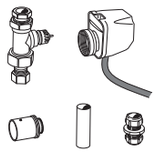
Accessories

Detailed information about the accessories and complete accessories list available at nibe.eu.

Not all accessories are available on all markets.

BLOCKING OF SUPPLY AIR HEATING BSA 10

BSA 10 used to block supply air heating in F470 at the same time as some heat production is required in all or parts of the waterborne heating system.



EXTRA SHUNT GROUP ECS

This accessory is used when F470 is installed in houses with two or more different climate systems that require different supply temperatures.

ECS 40
Max 80 m²

ECS 41
Approx. 80-250 m²

ROOM UNIT RMU 40

The room unit is an accessory with a built-in room sensor, which allows the control and monitoring of F470 to be carried out in a different part of your home to where it is located.

SOLAR PACKAGE NIBE PV

NIBE PV is a modular system comprising solar panels, assembly parts and inverters, which is used to produce your own electricity.

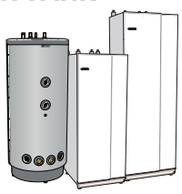
ACCESSORY BOARD AXC 20

Accessory board for hot water circulation, BSA 10, damper for anti-freeze and/or external heating medium pump.

WATER HEATER/ACCUMULATOR TANK

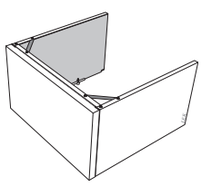
For information regarding suitable water heaters, see nibe.eu.

Some models of water heater require a docking kit.



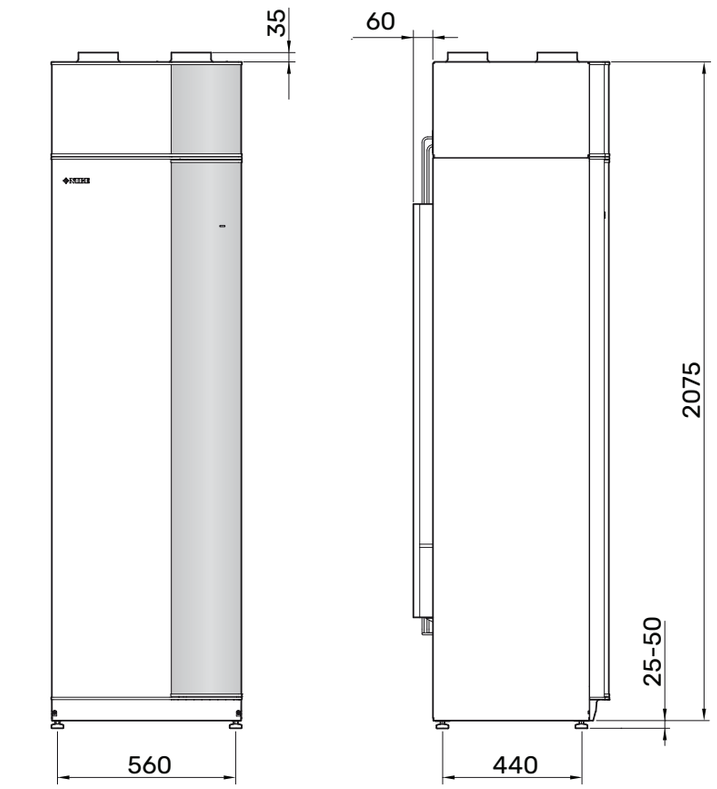
TOP CABINET TOC 30

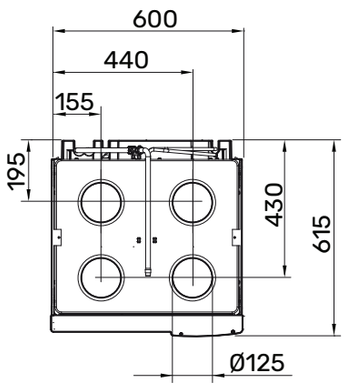
Top cabinet, which conceals any pipes/ventilation ducts.

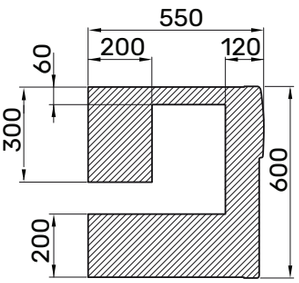


Technical data

Dimensions

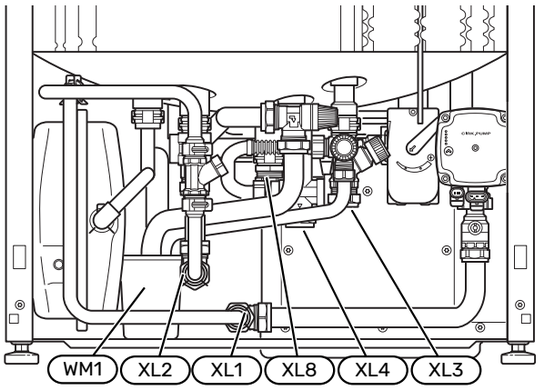




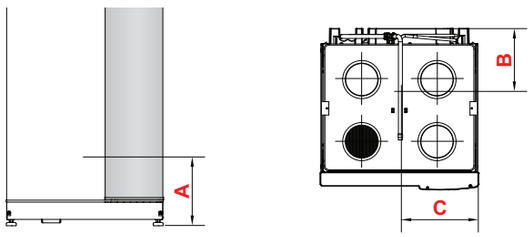


Avoid routing pipes through the marked area

Pipe connections



SETTING OUT DIMENSIONS



Connection		A	B	C
XL1 Heating medium supply	(mm)	45	420	335
XL2 Heating medium return	(mm)	95	415	380
XL3 Cold water	(mm)	200	455	215
XL4 Hot water	(mm)	180	405	265
XL8 Docking	(mm)	220	290	300
WM1 Overflow cup	(mm)	95	205	435

PIPE DIMENSIONS

Connection		
XL1-XL2 Heating medium ext Ø	(mm)	22
XL3 Cold water ext Ø	(mm)	22
XL4 Hot water ext Ø	(mm)	22
XL8 Docking ext. Ø	(mm)	22
WM2 Overflow water discharge	(mm)	32

Technical specifications

Type		Stainless
Output data according to EN 14 511		
Heating capacity (P_H)/COP [1]	kW/-	2.18 / 3.93
Heating capacity (P_H)/COP [2]	kW/-	2.03 / 3.24
Heating capacity (P_H)/COP [3]	kW/-	1.88 / 2.74
Rated heating output ($P_{designh}$)	kW	3
SCOP cold climate, 35°C / 55 °C		3.70 / 3.08
SCOP average climate, 35 °C / 55 °C		3.58 / 2.98
Additional power		
Max power, immersion heater (factory setting)	kW	10.3 (5.6)
Energy rating, average climate		
The product's efficiency class room heating, average climate 35 / 55 °C [4]		A+ / A+
The system's efficiency class room heating, average climate 35 / 55 °C [5]		A+ / A+
Declared tap profile/efficiency class hot water heating [6]		L / A
Electrical data		
Rated voltage	V	400 V 3N ~ 50 Hz
Enclosure class		IP 21
Equipment Compliant with IEC 61000-3-12		
For Connection Design Purposes, Compliant with IEC 61000-3-3 technical requirements		
Refrigerant circuit		
Type of refrigerant		R290
GWP refrigerant		0.02
Filling amount	kg	0.44
CO_2 equivalent	ton	0.0000088
Heating medium circuit		
Opening pressure, safety valve	MPa/bar	0.25 / 2.5
Max temperature, supply line (factory setting)	°C	70 (60)
Ventilation		
Min. air flow at exhaust air temperature at least 20°C	l/s	28
Min. air flow at exhaust air temperature below 20°C	l/s	31
Noise		
Sound effect level according to EN 12 102 ($L_{W(A)}$) [7]	dB(A)	51-55
Sound pressure level in the installation room ($L_{P(A)}$) [8]	dB(A)	47-51
Water heater and heating section		
Volume heating section	litre	70
Volume, hot water heater	litre	170
Max pressure in hot water heater	MPa/bar	1.0 / 10.0
Capacity hot water heating [9]		
Tap volume 40°C according to EN 16 147($V_{max.}$)	litre	217/248
Miscellaneous		
Required ceiling height	mm	2,170
Weight	kg	204
Part No.		066 228

1 A20(12)W35, exhaust air flow 56 l/s (200 m^3/h)

2 A20(12)W45, exhaust air flow 42 l/s (150 m^3/h)

3 A20(12)W55, exhaust air flow 31 l/s (110 m^3/h)

4 Scale for the product's efficiency class room heating: A+++ to D.

5 Scale for the system's efficiency class room heating: A+++ to G. Reported efficiency for the system takes the product's temperature regulator into account.

6 Scale for efficiency class hot water: A+ to F.

7 The value varies with the selected fan curve. For more detailed sound data, including sound to channels, visit nibe.eu.

8 The value can vary with the room's damping capacity. These values apply at a damping of 4 dB.

9 A20(12) exhaust air flow 42 l/s (150 m^3/h). Comfort mode normal/large

Sustainable energy solutions since 1952

NIBE has since 1952 been manufacturing energy-efficient and sustainable climate solutions for your home. It all began in Markaryd, in the southern Swedish province of Småland, and we recognise our Nordic heritage by utilising the power of nature. We combine renewable energy with smart technology to offer efficient solutions, allowing us to work together to create a more sustainable future.

Regardless of whether it is a chilly winter's day or a warm afternoon in the summer sun, we need a balanced indoor climate that allows us to enjoy a comfortable life, whatever the weather. Our extensive range of products supply your home with cooling, heating, ventilation and hot water, making it possible for you to create a pleasant indoor climate with little impact on the environment.

NIBE Energy Systems
Box 14, SE-285 21 Markaryd
nibe.eu

PBD EN 2503-6 M12251