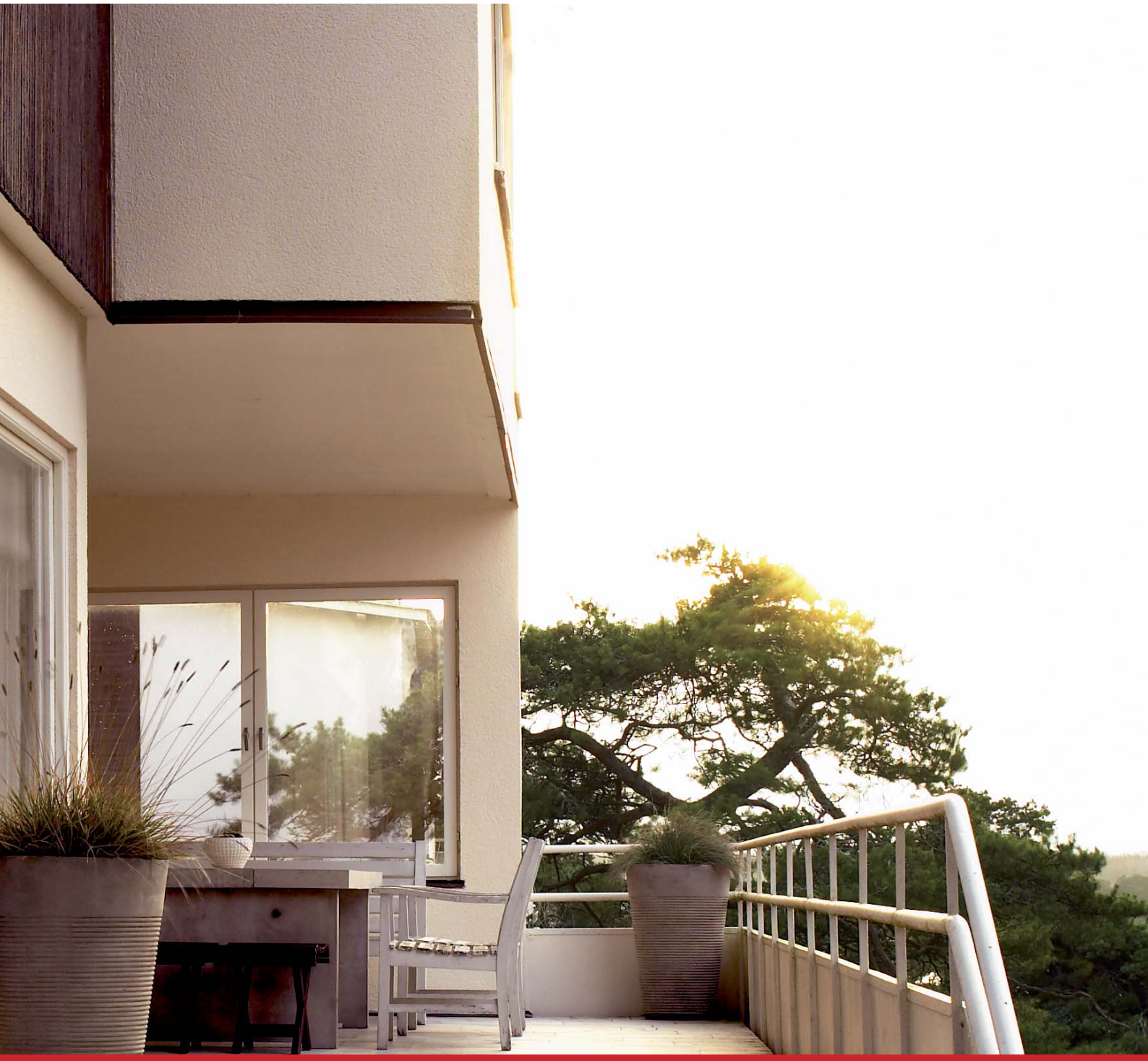
NIBE

Air/water Heat pumps



MADE IN SWEDEN

Installation of a NIBE air/water heat pump can lead to your energy consumption for heating being reduced by up to 50%, in comparison to conventional heating systems.

Areas of Use

You should choose a NIBE air/water heat pump if is not possible to drill in a ground probe or install a surface absorber on the property. This converts the energy of the outside air into heat and creates a comfortable temperature inside the house.

Although none of the air/water heat pumps that are available on the market can cover the heating requirements all year round, this type of heat pump does offer economic benefits. In bivalent operation it covers the majority of the heating requirements in a very economical manner, therefore the existing heating system only needs to cover the peak periods. In mono-energetic operation, i.e. air/water heat pump in combination with an immersion heater, the heat pump should cover heating by itself and the immersion heater is only activated during extreme peak periods.

Our product range

FIGHTER 2005 and 2020 utilises the energy of the outside air. Therefore, neither a ground probe nor a surface collector is required.

In comparison to traditional air/water - heat pumps, FIGHTER 2005 and 2020 with its two-stage ventilator achieve much greater economy.

FIGHTER 2005 is available in sizes 8 and 11 for single phase 230V. FIGHTER 2020 is available in sizes 8, 10 and 14 kW for three phase 400V and 230V.

We claim that the FIGHTER 2005 and 2020 can transform an existing radiator system into an excellent, complete heating system.

Together with NIBE's VVM 300, FIGHTER 2005 or 2020 creates a complete heating and hot water unit.


FELIX&FELIX

NIBE FIGHTER 2005

Air/water heat pump developed for the climate of Northern Europe

NIBE FIGHTER 2005 is an air/water heat pump which has been specifically developed for the climate of Northern Europe. Due to the fact that the heat pump utilises the energy of the outside air, neither a borehole nor an earth collector are required.

FIGHTER 2005 is equipped with automatic, two-stage capacity control for the ventilator. Furthermore, the FIGHTER 2005 has been fitted with an electronic control, which controls those functions that are necessary for heat pump operation.

FIGHTER 2005 has been specifically developed for operation with radiator heating systems and is therefore particularly suited for use with most heating systems. An advanced control system for optimal control of the heat pump has been incorporated. The FIGHTER 2005 is activated via a starting signal from another control, a return sensor or a thermostat.

FIGHTER 2005 can also be controlled by a specially developed control unit, the SMO 10. This activates the additional heating and monitors the switch between heating operation and hot water production.

FIGHTER 2005 can also heat up hot water at high outside temperatures effectively, just as it can deliver high performance to the heating system at low outside temperatures.

FIGHTER 2005 is ideally docked to the indoor unit VVM 300 (accessory). This contains controls and consists of a hot water heater and additional heater in the form of an electric boiler. FIGHTER 2005 and VVM 300 together make up a complete heating plant. VVM 300 is equipped with a control box that currently makes it the most economical operator, regarding both for the integrated immersion heaters (max 13.5 kW) and compressor operation in FIGHTER 2005.

If the outside temperature sinks below the level of the set cut-off temperature, heating must be provided by an external additional heating.

FIGHTER 2005 is available in sizes 8 and 11 for single phase 230V. The materials used in manufacture have been selected with regard to long service life and consideration of the best possible ruggedness for the weather conditions encountered in Northern Europe.

FIGHTER 2005 must be placed in the open on a solid base, ideally on a concrete foundation. It should not be positioned near walls which are sensitive to noise, such as close to bedrooms.

Defrosting, max./min. cut-off temperature, heat activation for both the compressor crank tub as well as the condensation tub are controlled and furthermore the motor protection and the overpressure switch are monitored.

Additionally, the start amount and the length of the respective operation times can be read off.

The built-in control is set up during installation and can then be used as a reference for future maintenance. Otherwise there is no need for the system operator to check the control under normal operating conditions.

FIGHTER 2005 is equipped with an electronic return temperature sensor, which limits the temperature of the return. Flow and return sensors are fitted during installation.

FIGHTER 2005 can be switched on and off by a signal from a different control unit or via a thermostat, for instance via an SMO 10 (accessory).

FIGHTER 2005 is suitable for a wide range of applications, because it allows alternative integrations.

Accessories

SMO 10

SMO 10 is an intelligent control module that, together with, FIGHTER 2005 and existing heating and hot water equipment, creates a complete unit. SMO 10 manages compressor operation in FIGHTER 2005 and, if necessary, the additional power from any type of existing equipment that may be required.
SMO 10 also manages automatic by-passes, load guards, circulation pumps, three way valves and sensors. With SMO10, pool heating is possible as well as an extra shunt group, i.e. two heating systems with different flow temperatures.

Hot water control VST 11, VST 20

This accessory allows the heat pump FIGHTER 2020 to prioritise hot water charging on systems with floating condensing. This also requires a hot water accumulator, for example, NIBE VPA as well as a thermostat. When the hot water sensor for hot water temperature is connected, the control system is automatically activated for the charging functions. When there is a demand for hot water, the heat pump gives this priority and devotes its entire output to water heating. No room heat is produced in this mode.

NIBE VVM 300 (see page 8)

Technical data

		Single Phase FIGHTER 2005-8	Single Phase FIGHTER 2005-11
Heat capacity/receptivity* at A2/W35 °C **	(kW)	6,9/1,9	9,3/2,6
Heat capacity/receptivity* at A7/W35 °C **	(kW)	7,5/1,9	10,6/2,6
Heat capacity/receptivity* at A-7/W45 °C **	(kW)	5,3/2,2	6,9/2,8
Heat capacity/receptivity* at A0/W45 °C **	(kW)	6,3/2,2	8,5/3,0
Heat capacity/receptivity* at A7/W45 °C **	(kW)	7,7/2,3	10,5/3,1
Heat capacity/receptivity* at A-7/W50 °C **	(kW)	5,1/2,3	6,9/3,1
Heat capacity/receptivity* at A2/W50 °C **	(kW)	6,8/2,5	9,1/3,3
Heat capacity/receptivity* at A7/W50 °C **	(kW)	7,5/2,4	10,4/3,4
Heat capacity/receptivity* at A15/W50 °C **	(kW)	9,4/2,5	12,6/3,5
Start current	(A)	24	33
Motor protection setting	(A)	15	21,5
Soft start relays		are standard	
Operating voltage		230V + N + PE 50 Hz	
Compressor		Scroll compressor	
Nominal heating circuit flow	(l/s)	0,17	0,24
Internal pressure drop at nominal heating circuit flow	(kPa)	1,1	2,0
Air flow	(m3/h)	1320/1750	1320/1750
Nominal ventilator output	(W)	155/185	155/185
Protection class		IP 24	
Maximum exit temperature to the heating circuit	(°C)	58	
Refrigerant amount (R407C)	(kg)	2,1	2,1
Connection heat transfer fluid ext	Ø	DN 25	
External thread of heating circuit connection	Ø	DN 25	
Defrosting system		Hot gas defrosting	
High pressure switch interruption	(bar)	27	
Low pressure switch interruption	(bar)	0,5	
Differential gap for high pressure switch	(bar)	-7	
Differential gap for low pressure switch	(bar)	+1,0	
Height with adjustable feet	(mm)	1045	
Width	(mm)	1200	
Depth	(mm)	500	
Net weight	(kg)	150	160

* for compressor, ventilator and control. The relation between "heating capacity and receptivity" must be reduced by approx. 10% during defrosting.

** Outside air temperature/flow temperature

NIBE FIGHTER 2020

Outside: – 20 °C
Inside: Warm and comfortable

NIBE FIGHTER 2020 is an air/water heat pump, specially designed for the Nordic climate. FIGHTER 2020 utilises the outside air so there is no need for bore holes or coils in the ground. FIGHTER 2020 is designed to be docked to water based heating systems.

- New efficient scroll compressor that operates at temperatures down to – 20 °C.
- Automatic 2-step capacity regulator for the fan.
- Manufactured in three sizes: 8, 10 and 14 kW.
- Integrated intelligent control for optimum control of the heat pump. FIGHTER 2020 is started by a start signal from another unit, return sensor or thermostat.
- FIGHTER 2020-8 and -10 are ideally docked to the indoor unit VVM 300 (accessory). This contains controls and consists of a hot water heater and additional heater in the form of an electric boiler. FIGHTER 2020 and VVM 300 together make up a complete heating plant.
- FIGHTER 2020 can also be used together with most electric boilers, oil boilers or similar.
- FIGHTER 2020 can be controlled from a specially designed control unit, SMO 10. This connects and disconnects additional heat and controls the changeover from room heating to domestic hot water heating.
- The material has a long service life and is designed to withstand the Nordic outdoor conditions.
- If the outdoor temperature drops to a level below the stop temperature all heating must then occur with external additional heat.

Accessories

SMO 10

SMO 10 is an intelligent control module that, together with, FIGHTER 2020 and existing heating and hot water equipment, creates a complete unit. SMO 10 manages compressor operation in FIGHTER 2020 and, if necessary, the additional power from any type of existing equipment that may be required.
SMO 10 also manages automatic by-passes, load guards, circulation pumps, three way valves and sensors. With SMO10, pool heating is possible as well as an extra shunt group, i.e. two heating systems with different flow temperatures.

Hot water control VST 11, VST 20

This accessory allows the heat pump FIGHTER 2020 to prioritise hot water charging on systems with floating condensing. This also requires a hot water accumulator, for example, NIBE VPA as well as a thermostat. When the hot water sensor for hot water temperature is connected, the control system is automatically activated for the charging functions. When there is a demand for hot water, the heat pump gives this priority and devotes its entire output to water heating. No room heat is produced in this mode.

NIBE VVM 300 (see page 8)

Technical data

		FIGHTER 2020-8	FIGHTER 2020-10	FIGHTER 2020-14
Delivered/supplied power* at 2/35 °C **	(kW)	7,6/2,1	9,4/2,5	12,7/3,5
Delivered/supplied power* at 7/35 °C **	(kW)	8,7/2,1	10,7/2,7	14,5/3,7
Delivered/supplied power* at -7/45 °C **	(kW)	5,7/2,2	7,1/2,8	9,6/3,8
Delivered/supplied power* at 0/45 °C **	(kW)	7,0/2,3	8,6/2,9	11,7/4,0
Delivered/supplied power* at 7/45 °C **	(kW)	8,4/2,4	10,3/3,1	14,1/4,3
Delivered/supplied power* at -7/50 °C **	(kW)	5,6/2,5	7,0/3,1	9,5/4,2
Delivered/supplied power* at 2/50 °C **	(kW)	7,2/2,6	8,8/3,2	12,2/4,5
Delivered/supplied power* at 7/50 °C **	(kW)	8,2/2,6	10,0/3,3	13,9/4,6
Delivered/supplied power* at 15/50 °C **	(kW)	9,9/2,7	12,2/3,5	16,6/4,8
Starting current	(A)		26	
Motor protection setting	(A)	7	9	11
Soft-start relay			are standard	
Operating voltage			3 x 400 V + N + PE 50 Hz	
Compressor			Scroll compressor	
Nominal flow heating medium	(l/s)	0,20	0,25	0,34
Internal pressure drop at nominal flow	(kPa)	1,5	2,0	2,4
Min/max pressure, heating medium side	(bar)		0,5/2,5	
Air flow	(m^3/h)	1320/1750	1320/1750	2250/3050
Nominal output fan	(W)	155/185	155/185	175/190
Fuse	(A)	10	16	16
Enclosure class			IP 24	
Max outgoing heating medium temperature	(°C)		58	
Refrigerant quantity (R404A)	(kg)	2,0	2,0	2,4
Connection heating medium male	Ø		G1 (Ø 28 mm)	
Defrosting system			Hot gas defrosting	
Cut-out value pressostat HP	(Bar)		29	
Cut-out value pressostat LP	(Bar)		0,5	
Difference pressostat HP	(Bar)		-7	
Difference pressostat LP	(Bar)		+1,0	
Height with stand	(mm)		1045	
Width	(mm)		1200	
Depth	(mm)		500	
Weight	(kg)	126	132	140
Lowest operational point, outdoor air/flow line	(°C)		-20/50 (-7/58)	
Highest operational point, outdoor air/flow line	(°C)		35/58	
Part no.		064 008	064 009	064 010

* Compressor, fan and control. Defrosting reduces the relationship between input/output by about 10%.

** Outside temperature/Flow temperature

NIBE VVM 300

- The immersion heater has a maximum output of 13.5 kW, with the possibility of lower settings.
- Water volume 280 litres, of which 155 litres is hot tap water.
- The hot water heater has a copper lining to protect against corrosion.
- Climate controlled automatic bypass that takes the outdoor temperature into consideration.
- Unique control system for maximum energy optimisation.
- Self regulating speed controlled charge pump.
- Load monitor as standard.
- Prepared for pool heating.
- Prepared for control of two heating systems.

NIBE VVM 300 is an electric boiler designed for houses with water borne heating. It consists of a double jacketed pressure vessel, two immersion heaters and intelligent controls. VVM 300 is designed for connection and communication with outdoor heat pump FIGHTER 2005 and FIGHTER 2020 of 8 kW and 10 kW.

VVM 300, together with FIGHTER 2005/2020, creates a complete heating and hot water unit. VVM 300 is equipped with a control box that currently makes it the most economical operator, regarding both for the integrated immersion heaters (max 13.5 kW) and compressor operation in FIGHTER 2005/2020.

VVM 300 comes complete with an automatic by-pass, three way valve, circulation pumps, and safety equipment. VVM is designed for simple connection to FIGHTER 2005/2020.

VVM 300 controls FIGHTER 2005/2020, which runs with floating condensation towards the heating system.

If FIGHTER 2005/2020 cannot meet the heating requirement, additional heat is shunted in from VVM 300. When the outside temperature drops below the set stop temperature VVM 300 engages and takes over the heating.

VVM 300 is easy to install. All pipe connections are easily accessible. This is especially useful for the replacement market.

VVM 300 is equipped with a complete set of valves, consisting of a drain valve, filling valve, vacuum valve, non-return valve, and safety valve for the water heater section. The boiler section is equipped with a drain valve, filler valve and safety valve. In addition, the unit is equipped with climate controlled automatic bypasses with outdoor and flow sensors, shunt valve, circulation pump and expansion vessel.

VVM 300 is equipped with an intelligent control. This makes for easy operation at the same time as always enabling the electric boiler to run as efficiently as possible. The control also manages the automatic bypass and circulation pumps. Current temperatures and set values can be shown on the display.

The insulation consists of moulded, freon-free polyurethane which is equivalent to approximately 70 mm mineral wool.

The outer casing is of white powder coated steel plate. The upper and lower front covers are attached by catches to facilitate removal.

Technical data

		Single Phase VVM 300	Three Phase VVM 300
Height (excl. foot 15 – 40 mm)	(mm)	1 880	1 880
Required ceiling height	(mm)	200	200
Width	(mm)	600	600
Depth	(mm)	615	615
Weight	(kg)	160	160
Volume total	(liter)	280	280
Volume double jacket	(liter)	125	125
Volume, hot water heater	(liter)	155	155
Volume, expansion vessel	(liter)	12	12
Supply voltage		1x230 V + N + PE 50 Hz	3x400 V + N+ PE 50 Hz
Output immersion heater		6 kW	13,5 kW
Rated output, circulation pump	(W)	45/75/110	45/75/110
Enclosure class		IP 21	IP 21
Design pressure, hot water heater	MPa (10bar)	1,0	1,0
Cut.off pressure, hot water heater	MPa (9 bar)	0,9	0,9
Max permitted pressure in double jacket volume	MPa (2,5 bar)	0,25	0,25
Design pressure in double jacket volume	MPa (2,5 bar)	0,25	0,25
Pre-pressure expansion vessel	bar (5 mWs)	0,5	0,5
Adjustable max boiler temperature	(°C)	55 – 80	55 – 80
Corrosion protection		Copper	Copper, Stainless steel, Enamel

VPA

Accumulator tank optimally prepared for connection to heat pump

VPA is a range of water heaters intended primarily to be connected to heat pumps. They are also suitable for use with other heat sources. VPA is manufactured in three sizes, 200/70, 300/200 and 450/300.

The water heater is made up of a hot water tank, encased by a double jacket of sheet steel. The hot water tank is fitted with copper or enamel corrosion protection on the inside. See table.

The water heaters are designed and approved to meet current pressure vessel standards.

Due to the polyurethane foam insulation the water heater provides excellent thermal insulation.

If necessary VPA enables the use of an immersion heater for sensor controlled hot water heating.

The cold water supply line must be fitted with safety equipment in accordance with current standards.

If the water heaters are heated to more than 65 °C, a mixing valve must be fitted. The highest permitted temperature is 100 °C.

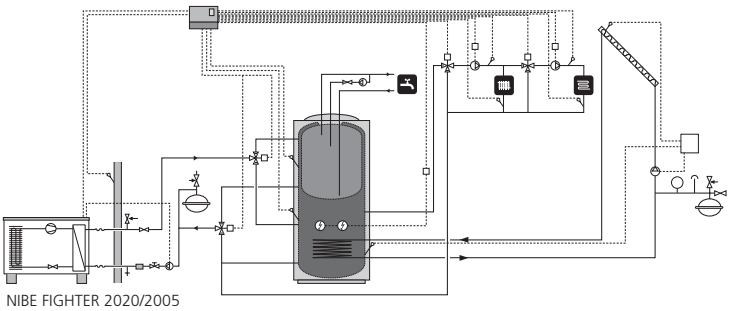
Technical data

Size		200/70	300/200	450/300
Hot water tank capacity	litres	205	300	450
Double-jacket tank volume	litres	66	190	285
Net weight	kg	150	208	285
Height	mm	1540	1725	2000
Width x Depth/Diameter	mm	600 x 610	Ø 725	Ø 850
Heat exchange (55/45 – 10/45 °C)	kW	8.2	10.0	14.5
Heat content at 50 °C	kWh	11.9	17.4	26.1
Corresponding hot water amount (40 °C)	litres	260	370	550
Maximum cartridge heater length	mm	540	650	750
Max. pressure in the double jacket	MPa	0,25	0,3	0,25
Max. pressure in hot water tank	MPa	1	1	1
Corrosion protection*		Cu	Cu + E	Cu + E

* Cu = Copper, E = Enamel

NIBE VPAS 300/450

Accumulator tank optimally prepared for connection to heat pump in combination with solar panels



NIBE FIGHTER 2020/2005

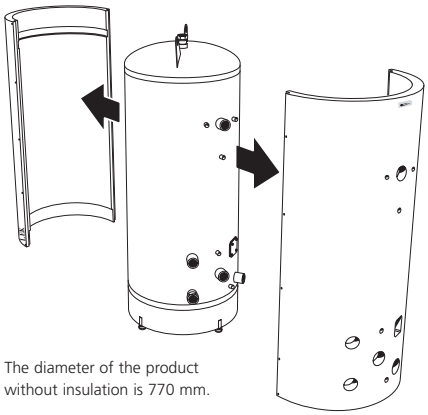
NIBE VPAS is an accumulator tank that is primarily designed for connection to heat pumps in combination with solar panels.

NIBE VPAS consists of a hot water tank and a surrounding, double walled sheet steel jacket. The hot water tank is lined with copper or enamel to prevent corrosion. The insulation is polyurethane, which provides excellent heat insulation.

NIBE VPAS is equipped with immersion heater connections for the possibility of electrical addition and pocket tubes for temperature sensors to control water heating.

The insulation on NIBE VPAS can be removed, to facilitate work in confined spaces.

NIBE VPAS has four height adjustable feet.



The diameter of the product without insulation is 770 mm.

Technical data

VPAS 300/450		CU	E
Corrosion protection		Copper	Enamel
Volume, hot water heater	l	300	300
Volume, double-shelled	l	450	450
Net weight	kg	315	300
Height (excl. feet 20 – 55 mm)	mm	2015	2015
Required ceiling height	mm	2120	2120
Diameter	mm	860	860
Heat content at 50°C	kWh	17,4	17,4
Equivalent amount of hot water (40°C)*	l	370	370
Max. immersion heater length	mm	750	750
Max. cut-off pressure in hot water tank	bar	10	10
Max. operating pressure in double jacket	bar	3	3
Highest permitted temperature	°C	95	95
Part No		087720	087710

Solar coil: ø 22 mm, length 9.4 m, surface 2.3 m^2

* With an incoming temperature of 10 °C and hot water usage of 12 l/min

Subject to design and dimension changes.

Made in Sweden.

NIBE Heating, with its Head Office in Markaryd, Sweden, is one of Europe's leading companies in the domestic heating field. Products such as water heaters, heat pumps and several types of boiler are the basis of NIBE's current product range.
NIBE Heating is one of three business areas of NIBE Industrier AB, a company listed on the Swedish Stock Exchange.

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GKB GB 0707-3 FIGHTER Air/water heat pumps 639205