

HEATING WHEN YOU NEED IT
COOLING WHEN YOU DON'T

NIBE™ **SPLIT** AIR/WATER HEAT PUMP

- NIBE SPLIT is a system for heating, cooling and producing hot water for variety of house sizes
- It gives you an optimal annual heating factor thanks to the inverter controlled compressor
 - Heating 3-12 kW
 - Cooling 3-12 kW
- Heating with floating condensation
- Active cooling with floating evaporation
- Instant docking with existing solar, gas, oil or wood boiler is possible
- Refrigerant piping between indoor and outdoor unit
- Enhanced, multi-language controller



FOR HEATING ,COOLING AND HOT WATER

NIBE SPLIT is as close to plug & play as you will ever get. It combines a well-designed high quality outdoor unit AMS10 with the indoor unit ACVM270 with NIBE's cutting edge technology to produce a unique efficient and environmentally-friendly system for heating, cooling and domestic hot water.

Complete system for heating, cooling & hot sanitary water, with instant docking.

NIBE SPLIT consists of the outdoor unit AMS10 and the indoor unit ACVM270. These are connected with refrigerant pipes. A compressor, evaporator and expansion valves are the main components in AMS10. The condenser is found in ACVM270.

Water for domestic use is heated in a coil positioned in the 270l high grade insulated accumulator tank. Fresh water enters the bottom of the coil and is gradually heated. A 9 kW immersion heater is installed in the tank.

In the upper part of the cabinet you find the controller and an openable insulated box with high quality electrical ball valves to handle the different operation modes. In the box there is also a low energy DC circulation pump for the building's climate system. With the SPLIT concept no circulation pump is needed between the two units.

Tube connections for domestic water, heating and refrigerant piping are found at the top of ACVM270. If directly connecting an external unit (for additional energy) to the accumulator tank in ACVM 270, the tube connection can be located either to the right or left.

Since a NIBE SPLIT can be used to produce both heating and cooling, we refer to it as the "climate system" of a building.

Indoor unit

NIBE SPLIT is prepared to handle a maximum of two separate heating systems. For example, radiators and floor heating. Each system is handled individually by the controller. For cooling for example, fan coils can be used. When in cooling mode it is possible to activate only a part of the climate system. To customise the climate system for individual needs, choose from the accessory list.

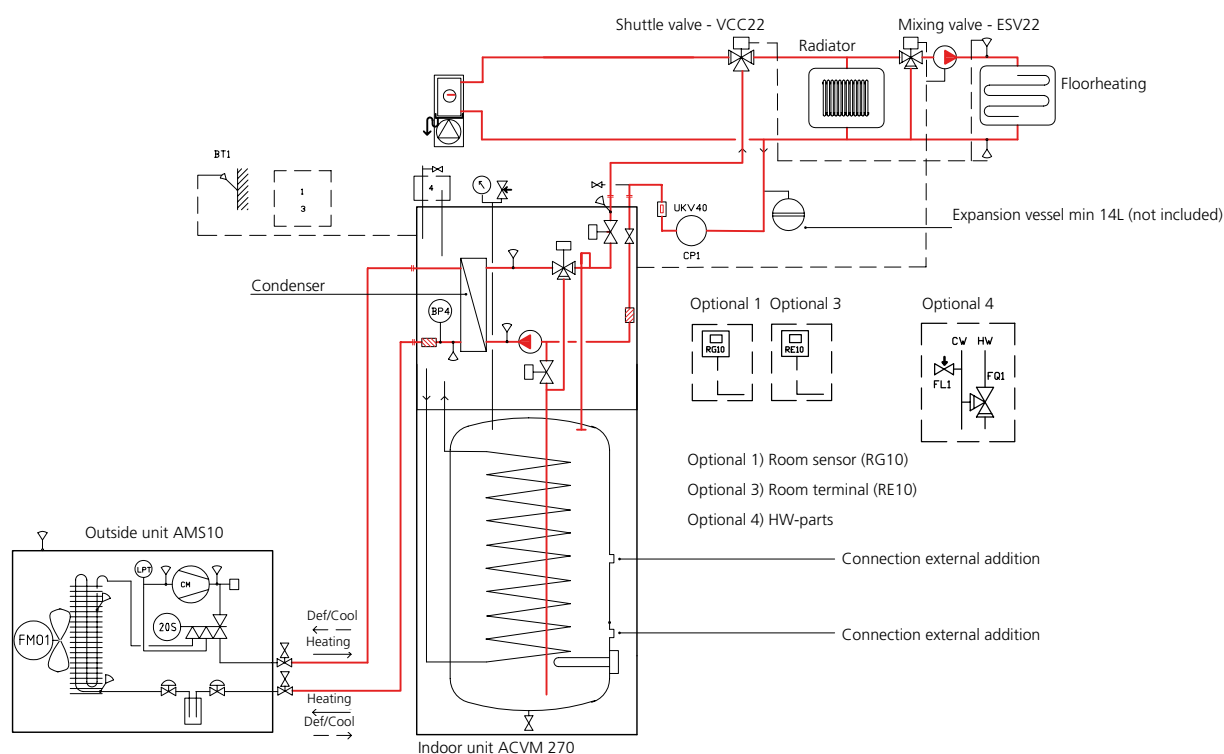
Outdoor unit

The outdoor unit AMS 10 is preloaded with 2,9 kg (R410A) refrigerant fluid. The outdoor unit is connected electrically to the inner unit which means that both machines are connected to one house fuse. The fuse size can be as low as 16A for 3 x 400V. NIBE SPLIT has got a maximum current controller and will adapt the power input.

Advanced climate control

NIBE SPLIT features an advanced multi language climate controller which offers:

- control of two separate heating systems
- control of one cooling system
- full text display
- scheduling of individual demands



WHAT MAKES NIBE™ SPLIT SUCH A HIGH PERFORMER?

Below, we've highlighted some of the key features which make NIBE SPLIT such an efficient, high performing heat pump. Working on the principle of demand-based operation, it combines high-tech components with an advanced control system to deliver the heat or the cooling you need, at the required level, exactly when you need it.

1 Twin-Rotary compressor with inverter controls

LOW WASTE - HEAT SUPPLY VARIED ACCORDING TO NEED

The compressor can run between 30% and 100% capacity. Thanks to inverter controls, the speed varies automatically according to the household's energy requirements. It is designed to perform efficiently even at a low outside temperature, when home owners experience the greatest need for heat.

2 Compressor control

HIGH EFFICIENCY AT LOW AMBIENT TEMPERATURES

The compressor is operated and controlled in such a way as to be efficient even at low ambient temperatures.

3 Expansion valves

GREATER PRECISION IN THE REFRIGERANT CIRCUIT

The expansion valves used in NIBE SPLIT was chosen for the precision it allows. The result is high efficiency and capacity control for both cooling and heating.

4 Cabinet coating

FOR DURABLE GOOD LOOKS

With two layers of epoxy-paint on the outdoor unit, its good looks will last a long time.

5 Finned coil design (evaporator)

HIGH PERFORMANCE AND DURABILITY

The finned coil absorbs or rejects energy from the ambient air, for heating and cooling respectively. A polymer coating makes it especially durable, while the coil's enhanced surface improves heat transfer from the air.

6 Low starting current

PREVENTS INTERFERENCE WITH OTHER ELECTRONIC DEVICES

NIBE SPLIT has an inverter driven compressor which gives a low starting current. By starting slowly and moving gradually up to required capacity, the system does not interfere with other electronic devices in the building.

7 Fan (motor and blade)

CONSERVES ENERGY

Driven by an energy-saving motor, the fan's speed varies so only the required amount of air is utilised. The blades are specially designed to move as much air as possible at the lowest noise level.

8 Control display panel

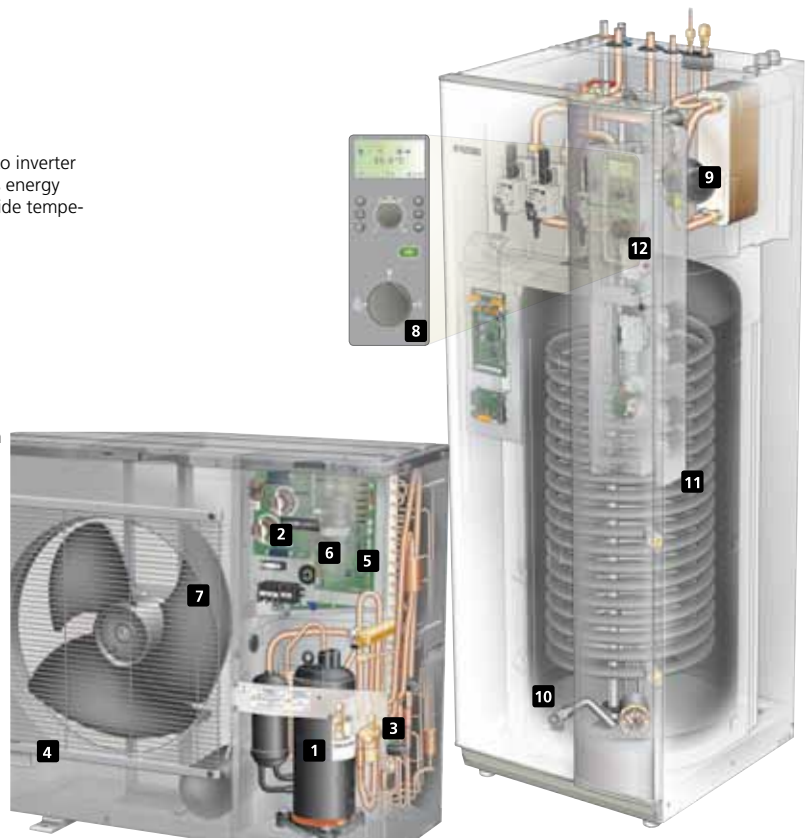
EASY TO OPERATE

Designed to manage both indoor and outdoor unit, this user-friendly interface means everyone can enjoy the full benefits of the NIBE SPLIT system: a uniquely efficient installation that adapts in response to the household's fluctuating needs.

9 Circulation water pump

SIMPLE SYSTEM FOR ON-DEMAND HEATING

Driven by an energy-saving motor, the pump's speed varies so only the required amount of water is moved.



10 Insulation material and thickness

RETAINS HEAT AND PREVENTS DRIPPING

Energy losses are limited by an integrated, hermetically sealed insulating layer on the components. This also prevents condensation on pipes and dripping when in cooling mode. Insulation of the water tank minimises heat loss and saves money.

11 Integrated heat exchanger

DOMESTIC HOT WATER WHEN YOU NEED IT

The heat exchanger is integrated into the domestic hot water tank, it is corrosion resistant and its surface is enhanced for better heat transfer. This leads to higher capacity and greater reliability.

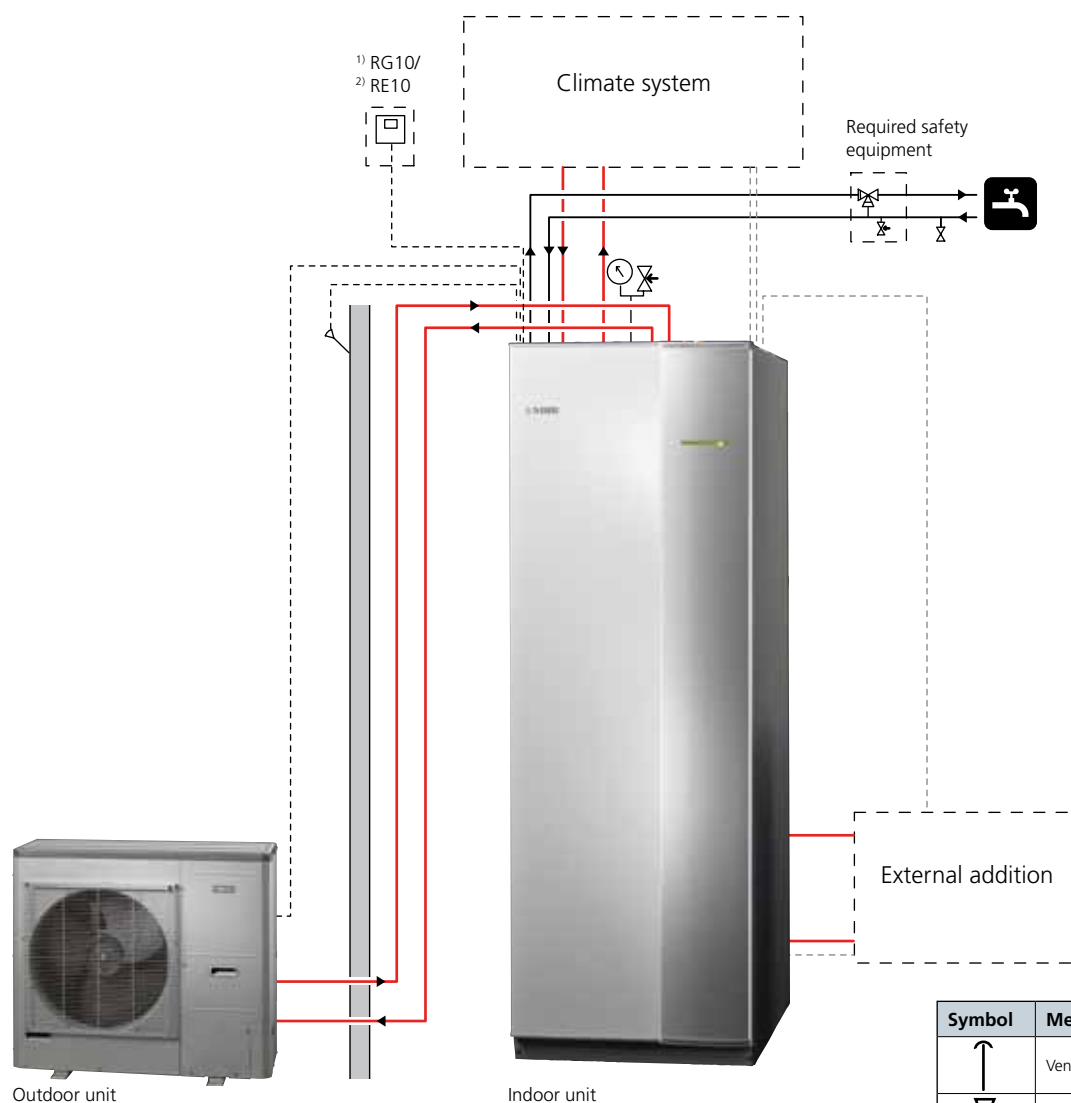
12 Control system

MANAGES ENERGY USE IN YOUR HOME

The control system senses the characteristics of the building and accommodates its many variables. It monitors and manages the outdoor unit, its compressor speed, fan speed and defrosting needs. The result is a dynamic, variable supply of heating/cooling and temperature level.

NIBE SPLIT WITH CLIMATE SYSTEM AND EXTERNAL ADDITION

NIBE SPLIT can be connected in several different ways , some of which are shown on the following pages. For more detailed docking descriptions, see www.nibe.eu.

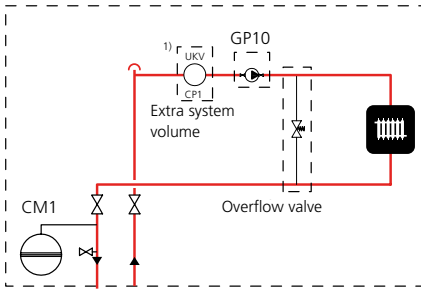


Symbol	Meaning
	Venting valve
	Shut-off valve
	Non-return valve
	Control valve
	Safety valve
	Temperature sensor
	Expansion vessel
	Pressure gauge
	Circulation pump
	Shunt / shuttle valve
	Fan

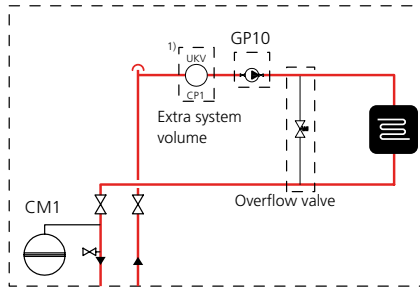
1) NIBE accessories RG 10 Room sensor, see page 11
 2) NIBE accessories RE 10 Room unit, see page 11

Climate system

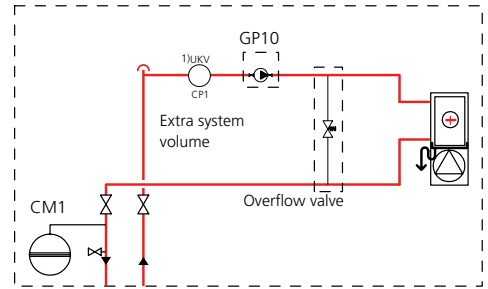
Radiator system



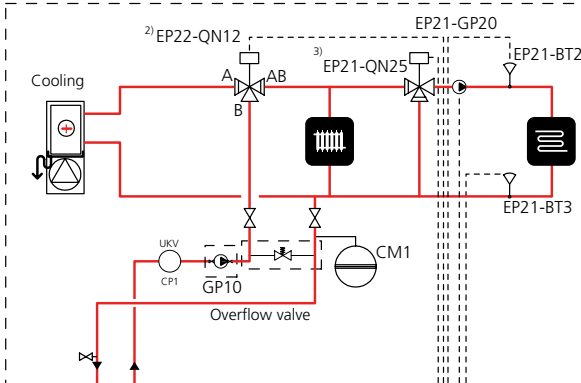
Under floor heating system



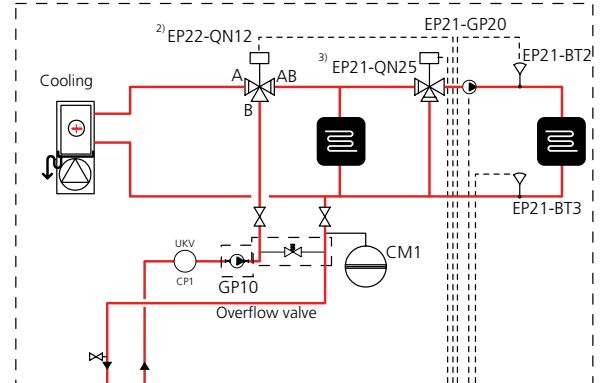
Fan convector system



Radiator and under floor heating for heating as well as fan convector system for cooling

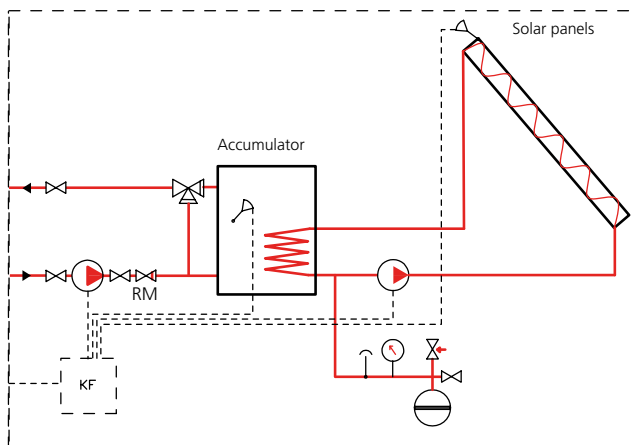


Double under floor heating system for heating and fan convector for cooling

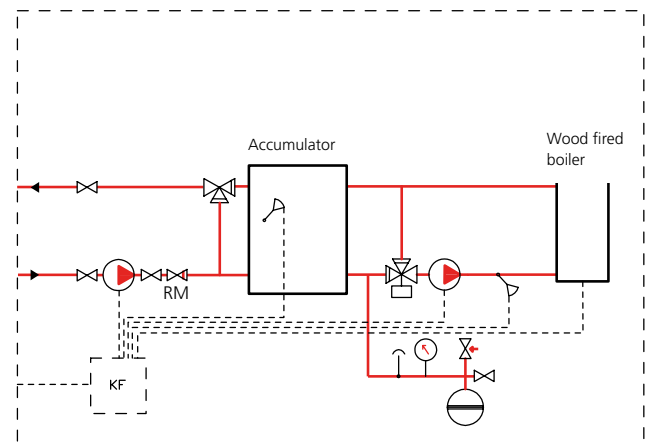


External addition

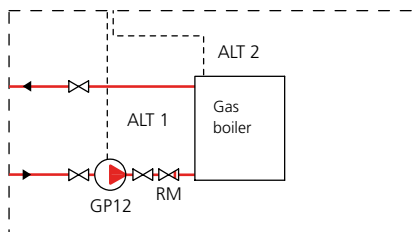
Solar panels



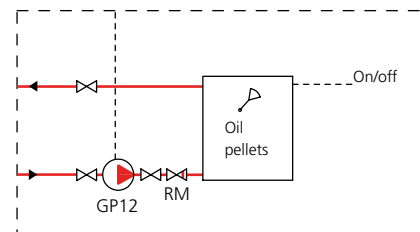
Wood boiler with accumulator



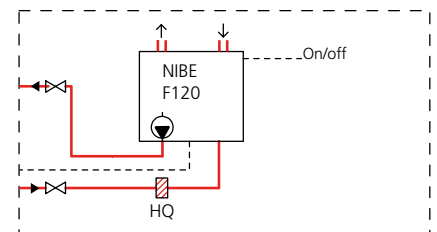
Gas boiler



Oil/pellet boiler



Exhaust air heat pump



Explanation

BT1 Temperature sensor, outdoor

BT2 Temperature sensor, supply line 2

BT3 Temperature sensor, return 2

CM1 Expansion vessel

CP1 Buffer vessel UKV

EP21 Shunt group 2

EP22 Cooling/heating

GP10 Circulation pump

GP12 Circulation pump

KF External control

QN12 Shuttle valve

QN25 Shunt valve

RM Non-return valve

HQ Strainer

NIBE accessories, see page 11

1) UKV 40/102 Buffer vessel

2) VCC22 Shuttle valve

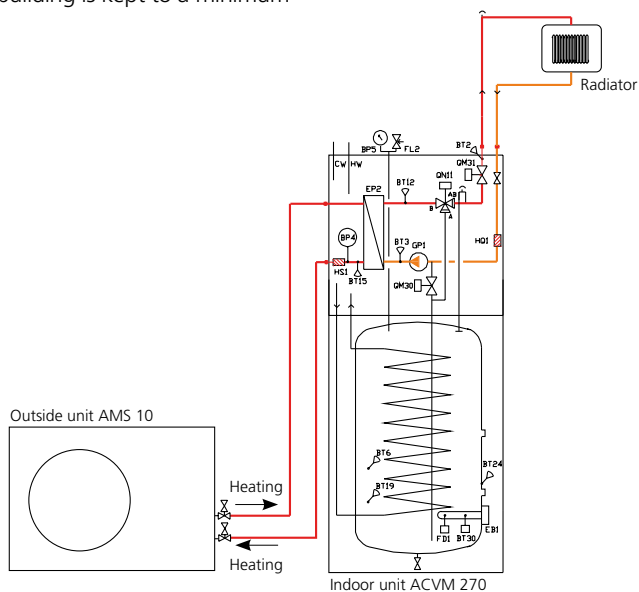
3) ESV22 Extra mixing valve

THE HYDRO-UNIT HYDRAULIC PRINCIPLES

For better understanding the possible working modes are described below.

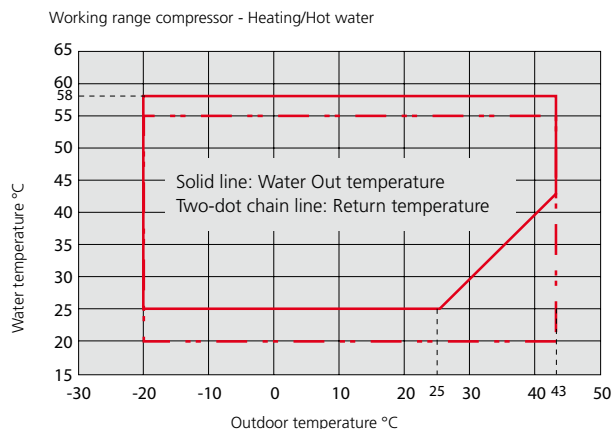
Heat generated from compressor with floating condensation

With the inverter controlled compressor, variable heating power are fed directly into the climate system. This way exactly the level of energy needed is produced. Not more; not less. Floating condensation means that the compressor work with the lowest possible temperature difference to secure full condensation in the condensor. This way the energy needed to heat the building is kept to a minimum



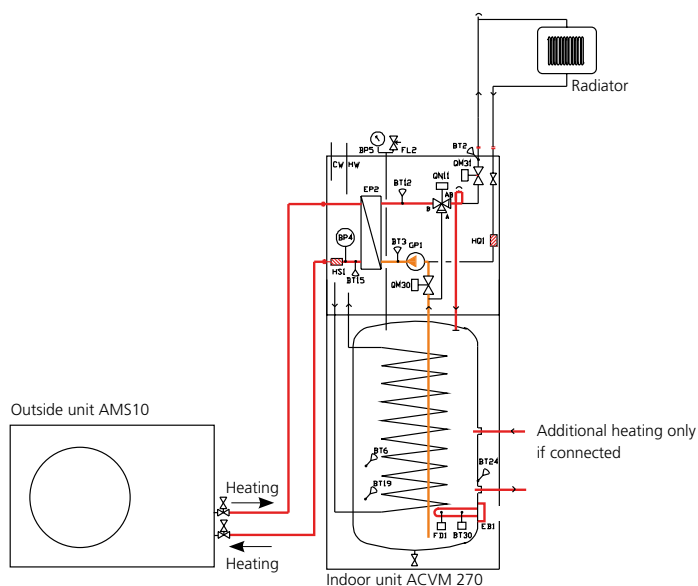
Working range compressor in heat mode.

The chart below show the working range for the compressor in heating mode. NIBE SPLIT can produce 58°C water within the full temperature range -20 to +43°C. With additional energy 65°C. The additional energy could be provided by the built-in immersion heater or another connected external energy source such as gas, oil, or wood. At return temp higher than 55°C the compressor is shut off.



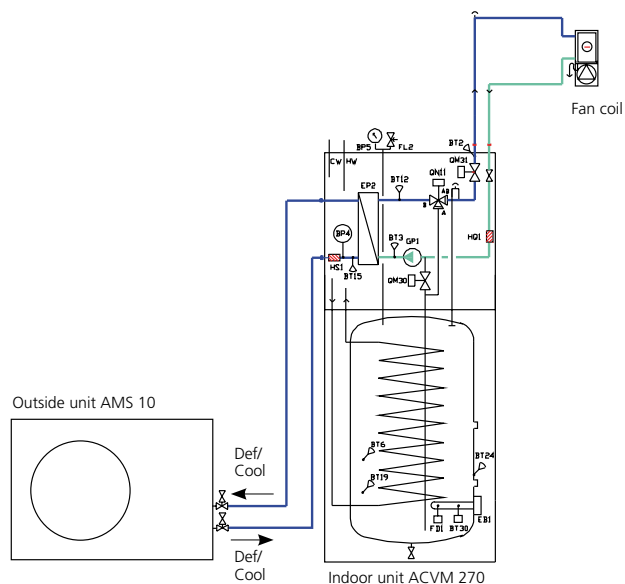
Hot water production

Domestic hot water is produced with optimal delta water temperatures in order to optimise the energy usage of the compressor. This is achieved by adapting the speed of the circulation pump. NIBE SPLIT can deliver 58°C hot water from the compressor across a full outdoor temperature range from -20°C to +43°C. Should the compressor need back-up, additional heating energy can be produced by the built in immersion heater or an existing connected energy source such as oil, gas or wood boiler. It is possible to dock an existing boiler to the 270 liter accumulator tank directly. Another solution could be to connect solar panels and let the sun produce hot water during the summer months. NIBE SPLIT is engineered to handle a maximum temperature of 65°C to the heating system (compressor and additional energy). For optimal savings it is recommended to dimension the heating system and comfort setting of hot water to max 58°C. Hot water is then produced by the compressor.



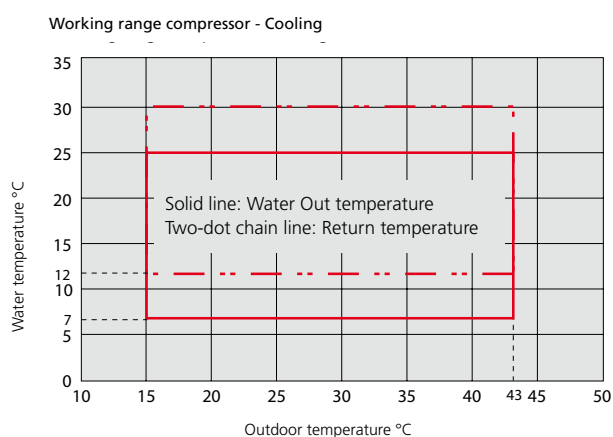
Active cooling with floating evaporation produced by the compressor.

Thanks to the inverter-controlled compressor variable cooling power is fed directly into the climate system. Floating evaporation means that the compressor works with the lowest possible temperature difference, and thus gives maximum savings.



Working range compressor in cooling mode

The chart below show the working range for the compressor in cooling mode. The compressor can produce water temperatures from 7°C to 25°C at an outdoor temperature ranging from 15°C to 43°C. The compressor will switch itself off at water in temperatures below 12°C.

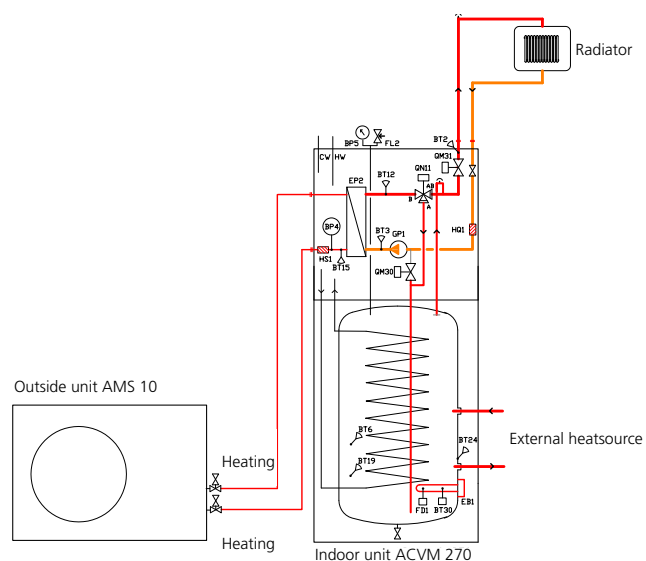


Heating with additional energy

If the compressor cannot produce enough energy, an additional heat source may be required. This extra energy can come from the built-in immersion heater (9kW) or an existing oil, gas or wood boiler. In this case, you set up which additional heating source you want to use in the controller. It is also possible to connect* solar panels and use the sun heat to heat the building**. The controller allows you to customise your system settings by e.g. prioritising a particular energy source. should be prioritized.

* Connect a solar package

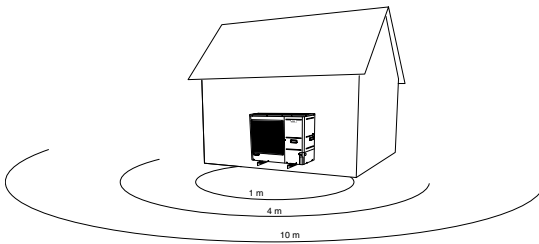
** and domestic water



GOOD TO KNOW ABOUT NIBE™ SPLIT

Sound pressure levels

AMS 10 is usually placed beside an external wall of the house, which means that some sound is heard in the immediate environment. Accordingly, you should always attempt to find a placement on the side that faces the least sound sensitive neighbouring area. The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore only be seen as guide values.



Noise		Min	Nominal	Max
Sound power $L_{w(A)}$ level at heating 7/45 (EN 14511)	dB(A)	*	64,5	65,5
Sound pressure level at 10 m free standing.	dB(A)	*	32,5	33,5

Noise (normal installation)		1 m	2 m	10 m	16 m
Sound pressure level at max compressor, heating 7/45.	dB(A))	59,5	47,5	39,5	35

* Data not available when printed.

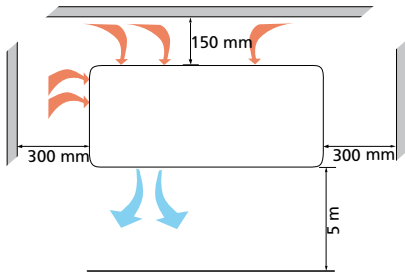
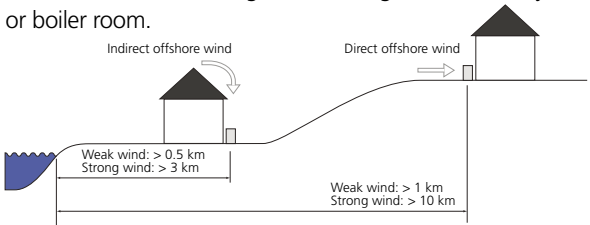
Assembly

Position the AMS 10 outdoors secured to a firm surface, preferably concrete foundation on ground stand or wall mounting. The distance between the ground and AMS 10 must be at least 200 mm. To avoid vibration a ground stand is recommended.

Bear in mind that large quantities of condensation and melt water from defrosting can be produced.

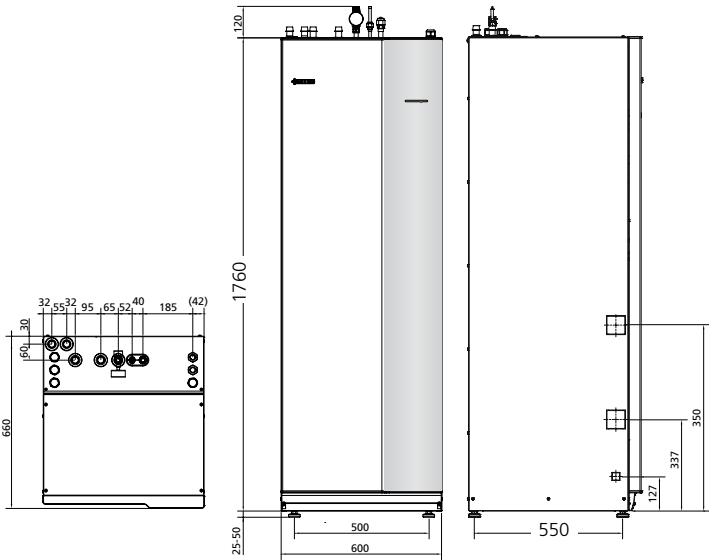
The distance between the AMS 10 and the house wall must be at least 150 mm. Ensure that there is at least one metre of free space above the AMS 10. Avoid placing it in such a way as to allow the recirculation of outdoor air. Nor should it be placed in a windy location since this causes lower output and impairs efficiency.

It is recommended that the indoor module ACVM 270 should be installed in a room with existing floor drainage, most suitably in a utility or boiler room.

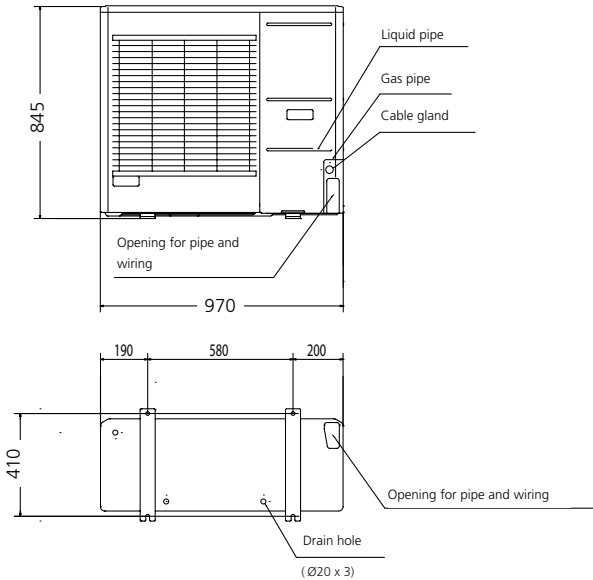


Dimensions

Indoor unit



Outdoor unit



GOOD TO KNOW ABOUT NIBE™ SPLIT

Installation requirements		
Max pressure, climate system	(2.5 Bar)	0.25 MPa
Max temperature, climate system		+65 °C
Max temperature in ACVM 270		+65 °C
Max temperature from external heat source		+65 °C
Max supply temperature with compressor at outdoor temp -20°C)		+58 °C
Min supply temperature cooling		+7 °C
Max supply temp. cooling		+25 °C
Min volume, climate system during heating, cooling*		50 l
Min volume, climate system during under floor cooling*		100 l
Max flow, climate system		0.57 l/s
Min flow, climate system		0.15 l/s
Nominal** system flow radiators		0.22 l/s
Nominal** system flow under floor heating		0.44 l/s
Nominal*** system flow fan convectors		0.22 l/s
Nominal*** system flow cooling		0.44 l/s

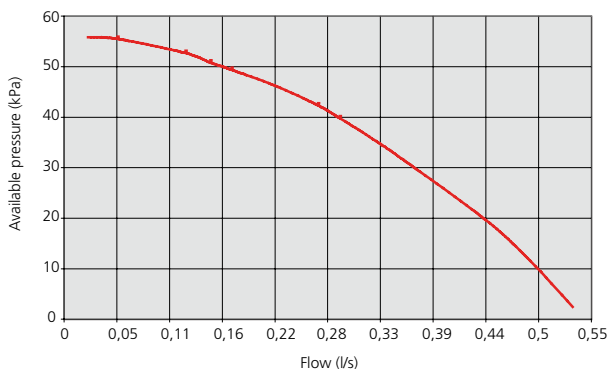
* Regards circulating volume

** 7/45 °C, 9 kW

*** 7/12 °C, 9 kW

Pump capacity

The built in circulation pump for the climate system has characteristics according to the chart below. An external circulation pump must be used when the pressure drop in the system is greater than the available pressure. In such cases, a bypass line with non-return valve must be installed. Use an overflow valve if system flow cannot be guaranteed.



Dimensions of the expansion vessel

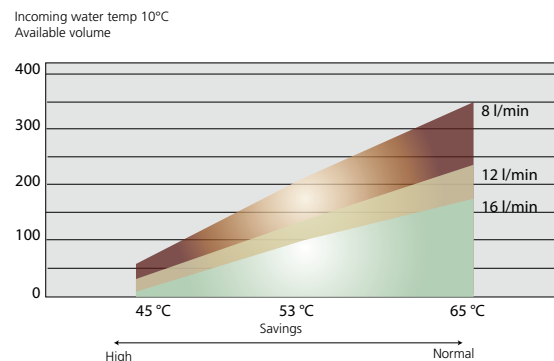
ACVM 270 needs to be equipped with an expansion vessel. The internal water volume of the ACVM 270 for calculating the expansion vessel is 280 l. The expansion vessel's volume must be at least 5% of the total system volume.

Total Volume (l)	Volume Expansion vessel (l)
320	16
360	18

Volume = 280 liter + circulating volume in climate system.

Comfort setting hot water

Domestic tap water is heated in a coil. During periods of "normal" consumption it is enough to run the heat pump's compressor to supply the different tapping points of the house with hot water. The intelligent hot water controller ensures customised comfort demands are met, see diagram below.



Domestic hot water volume at different water flows, 40 °C (litre).

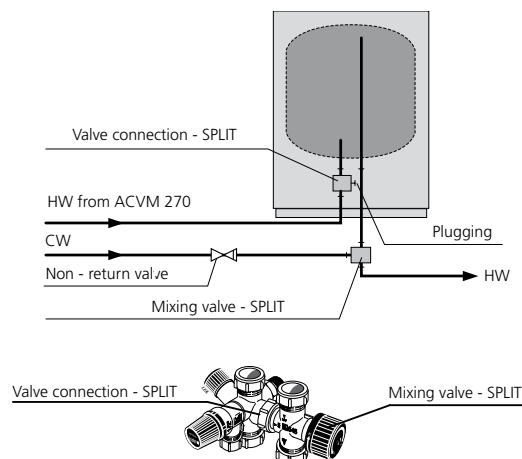
Connecting of the domestic hot water

If the temperature exceeds 60 °C, there should be a mixing valve. The safety valve must have a maximum opening pressure of 10 bar and be installed on the incoming domestic water line. The entire length of the overflow water pipe from the safety valves must be frost-proof and tilted along its entire length to prevent water pockets.

Extra electric hot water heater

In the case of higher tap water flows or more available volume than recommended in the diagram, an additional water boiler would be needed.

The valve part is integrated but must be separated (as illustrated) if the water heater is used as an additional water heater.



ELECTRIC INSTALLATION

General

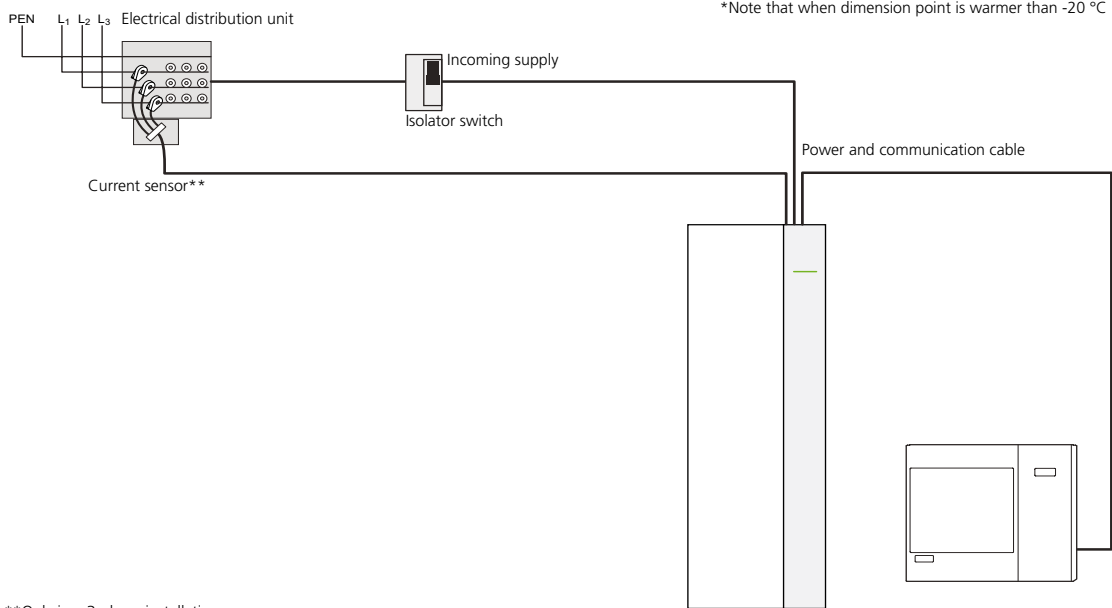
The ACVM 270 must be installed via an isolator switch with a minimum breaking gap of 3mm.

Other electrical equipment, except the outdoor sensors, current sensors and the outdoor module AMS 10 module is already connected at the factory.

- Disconnect the indoor module ACVM 270 and outdoor module AMS 10 before insulation testing the house wiring.
- For fuse ratings, see technical data, "Fuse protection". If the building is equipped with an earth-fault breaker, the ACVM 270 should be equipped with a separate one.
- Be sure to get the permission of the electricity supplier and carry out the connection under the supervision of a qualified electrician.
- 5x2.5 mm² cable must be used for the connection between the ACVM 270 and AMS 10.

Electrical connection

The AMS 10 is equipped with a single phase compressor. This means that L3 is loaded with up to 16 A during compressor operation. For L2 and L1 the internal immersion heater is connected with about 3kW on each. This means a maximum current of 15 A on L1 and 13 A on L2. It is recommended to keep L3 free from other power load sources, if possible divide the load between L1 and L2 other wise upgrade the fuse. This way the house fuse can be kept as small as possible



**Only in a 3-phase installation.

NIBE SPLIT has a built in power guard that can supervise the power load of the building. For L2 and L1 the internal immersion heater are connected with about 3kW on each. For L3 the compressor will reduce the speed and for L1 and L2 the immersion heater will be shut off if needed.

Table for better understanding what house fuse to use.

Design outdoor temperature at -20 °C or colder.
Immersion heater (9 kW)

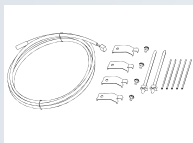
Max heating power needed for specific building (kW)	Max load (A)		
	L1	L2	L3
5	11	9	9
6	11	9	9
7	15	13	13
8	15	13	13
9	15	13	13
10	-	-	-
11	-	-	-

Design outdoor temperature at -20 °C*.
Immersion heater (6 kW) + Compressor (L3)

Max heating power needed for specific building (kW)	Max load (A)		
	L1	L2	L3
5	2	0	16
6	6,5	4,5	16
7	6,5	4,5	16
8	11	9	16
9	11	9	16
10	15	13	16
11	15	13	16

*Note that when dimension point is warmer than -20 °C lower load is required.

ACCESSORIES



DPH10

Drain pan heater. Compulsory if outdoor temperature colder than 0°C. See separate table. Part.no 518 325



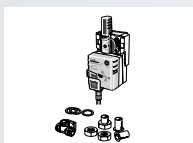
HR 10

Auxiliary relay. If extra circulation pump >50W needed. Part.no 089 423



ESV 22

Extra mixing valve group. For example if both floor/radiator with different flow/ temp is needed. Part.no 067 047



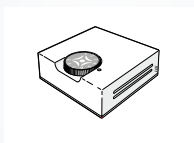
VCC22

Shuttle valve. For example separate cooling and heating systems. Part.no 067 048



RE 10

Room unit with room sensor. If controller display is required in a separate room. Part.no 067 004



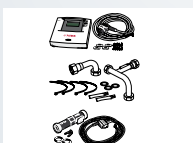
RG 10

Room sensor. Max one sensor can be connected. Part.no 018 433



ACK22

Cable kit for ESV 22/ VCC22. Needed for either ESV 22 or VCC22. If both are used only one ACK22 needs. Part.no 067 049



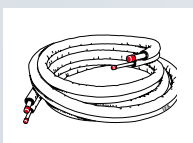
EMK 270

Energy measurement kit. Makes it possible to measure COP over a period. Part.no 067 050



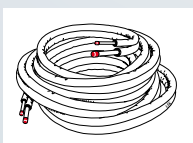
UKV 40 & 102

Buffer vessel 40 or 102 l. If extra circulating water system volume is needed. See table page 9. UKV 40 Part.no 088 470 UKV 102 Part.no 088 207



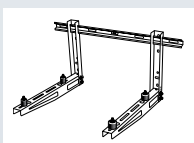
Refrigerant piping

5 m piping with insulation. Part.no 067 031



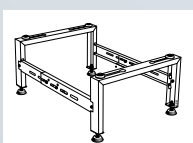
Refrigerant piping

12 m piping with insulation. Part.no 067 032



Wallbracket

For the AMS 10 Part.no 067 034



Groundbracket

For the AMS 10 Part.no 067 033

Drain pan heater kit (DPH10)

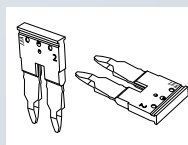
Country	Compulsory	Option	Not needed
Austria	X		
Belarus	X		
Belgium		X*	
Bosnia Herzegovina	X		
Bulgaria		X*	
Croatia		X*	
Cyprus			X
Czech Rep.	X		
Denmark	X		
Estonia	X		
Finland	X		
France		X*	
Germany	X		
Greece		X*	
Hungary		X	
Iceland	X		
Ireland			X
Italy		X*	
Latvia	X		
Lithuania	X		
Luxembourg	X		
Malta			X
Netherlands		X	
Norway	X		
Poland	X		
Portugal			X
Romania		X*	
Russia	X		
Serbia	X		
Slovakia	X		
Slovenia	X		
Spain		X*	
Sweden	X		
Switzerland	X		
Turkey			X
UK		X	
Ukraine	X		

* If design outdoor temperature colder than 0°C it is compulsory to install the DPH10.

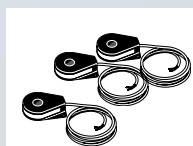
SUPPLIED COMPONENTS



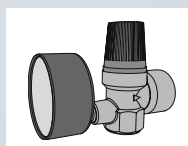
Outside sensor



Straps for 1 phase connections



Current sensor, 3 phase



Safety valve with manometer

The enclosed kit is located behind the front service cover in ACVM 270.

TECHNICAL SPECIFICATIONS

NIBE SPLIT	1 x 230 V	3 x 400 V
Working range during heating with compressor (outdoor temperature)	-20 – +43 °C	
Working range during cooling (outdoor temperature)	+15 – +43 °C	
Max temperature flow line	65 °C	
Max temperature flow line, only compressor	58 °C	
Max temperature return line*	65 °C	
Min temperature flow line during heating with compressor and continuous operation	25 °C	
Min temperature flow line during cooling	7 °C	
Maximum temperature supply during cooling and continuous operation	25 °C	
Max. current	44 A	16 A
Recommended fuse rating	50 A	16 A
Starting current	5 A	5 A
Incoming supply, deviation	-15 – +10 %	
Refrigerant quantity (R410A)	2.9 kg (included in AMS 10)	
Max. length, refrigerant pipe, one way	12 m	
Max height difference, refrigerant pipe	7 m	
Dimensions, refrigerant pipe	Gas pipe: OD15.88 (5/8") Liquid pipe: OD9.52 (3/8")	
Pipe connections	Flare	

* max temperature return line compressor 55°C

ACVM 270 - Indoor unit	
Immersion heater	Max 9 kW
Possible electrical step	4 (2, 4, 6, 9 kW)
Circulation pump, output	9–80 W (variable speed)
Circulation pump, max available pressure	57 kPa (external)
Circulation pump, max flow	0.54 l/s
Circulation pump, flow at 20 kPa external pressure drop	0.45 l/s
Min/max system flow	0.15 /0.57 l/s
Emergency mode thermostat	35–45 °C (factory setting 35 °C)
Temperature limiter	98 (-8) °C
Safety valve, climate system	0.25 MPa
Enclosure class	IP 21
Volume, total	270 l ±5 %
Volume, hot water coil	14 l
Material, hot water coil	Stainless steel (AISI316L/AISI316 DIN 1.4404/1.4401)
Max pressure, vessel	0.25 MPa (2.5 Bar)
Max pressure, hot water coil	1.0 MPa (10 Bar)
Max pressure, cooling system	4.5 MPa
The water quality, domestic hot water and climate system	≤ EU directive no. 98/83/EF
Max operating temperature, vessel	65 °C
Ambient temperature, indoor module	5–35 °C, max relative humidity 95 %
Connection, cold water	Compression ring 22 mm
Connection, domestic hot water	Compression ring 22 mm
Connection, docking	ISO 228/1 G1 internal
Height	1760 mm (+20–55 mm, adjustable feet)
Required ceiling height	2050 mm
Width	600 mm
Depth	660 mm
Weight	140 kg
Electrical connections	230 V 1AC 50 Hz or 400 V 3NAC 50 Hz
Part no. (ACVM 270)	069 023
Part no. (ACVM 270-EM, with energy measurement**)	069 001

** Available in autumn 2009.

AMS 10 - Outdoor unit	12
Compressor	Twin Rotary
Speed, heating	25–85 Hz (rps)
Speed, cooling	20–80 Hz (rps)
Fan flow (heating, nominal)	4380 m3/h
Fan rating	86 W
Defrosting	Reversing
Breaking value high pressure	4.15 MPa
Cut-out value low pressure (15 s)	0.079 MPa
Height	845 mm
Width	970 mm
Depth	370 mm (+ 80 mm with foot rail)
Weight	74 kg
Colour (two coats powder coating)	Dark gray
Power and communication connection from indoor module	5-core 2.5 mm2
Pipe connection option	Bottom / right-hand side / rear side
Part no.	064 030

Performance

Heating	Temp. in/out	Min	Nominal	Max
EN14511 TSK Input/output	7/35 °C (floor)	3.54/0.86	9.27/2.12	10.41/2.77
(kW)	2/35 °C (floor)	3.11/0.82	7.21/1.99	8.95/2.71
	-7/35 °C (floor)	3.29/1.07	6.24/2.07	8.38/2.97
	-15/35 °C (floor)	3.23/1.32	4.51/1.89	6.67/2.86
	7/45 °C	3.45/0.96	9.08/2.58	11.57/3.56
	2/45 °C	3.11/1.03	7.05/2.43	8.85/3.18
	-7/45 °C	3.14/1.40	5.84/2.42	7.94/3.43
	-15/45 °C	3.19/1.72	4.24/2.19	6.03/3.25
	7/55 °C	4.45/1.64	8.41/3.08	9.50/3.56
	-7/55 °C	3.50/1.99	4.93/2.80	6.60/3.59
COP EN14511 (as above)	7/35 °C	4.14	4.40	3.81
	2/35 °C (floor)	3.83	3.66	3.35
	-7/35 °C (floor)	3.09	3.05	2.86
	-15/35 °C (floor)	2.47	2.42	2.38
	7/45 °C	3.61	3.55	3.28
	2/45 °C	3.04	2.93	2.82
	-7/45 °C	2.25	2.44	2.35
	-15/45 °C	1.86	1.96	1.89
	7/55 °C	2.72	2.75	2.70
	-7/55 °C	1.77	1.78	1.87

Cooling	Temp. in/out	Min	Nominal	Max
EN14511 TSK	35/7 °C	***	***	***
Delivered power (kW)	35/18 °C	3.30/***	***	12.00
EER (as above)	35/7 °C	***	2.81	***
	35/18 °C	***	3.70	***

*** Data not available when printed.

NIBE is ISO-certified:
SS-EN ISO 9001:2000
SS-EN ISO 14001:2004

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NIBE AB – HEATING
Box 14
285 21 Markaryd
SWEDEN
Tel. +46 433 - 73 000
www.nibe.eu