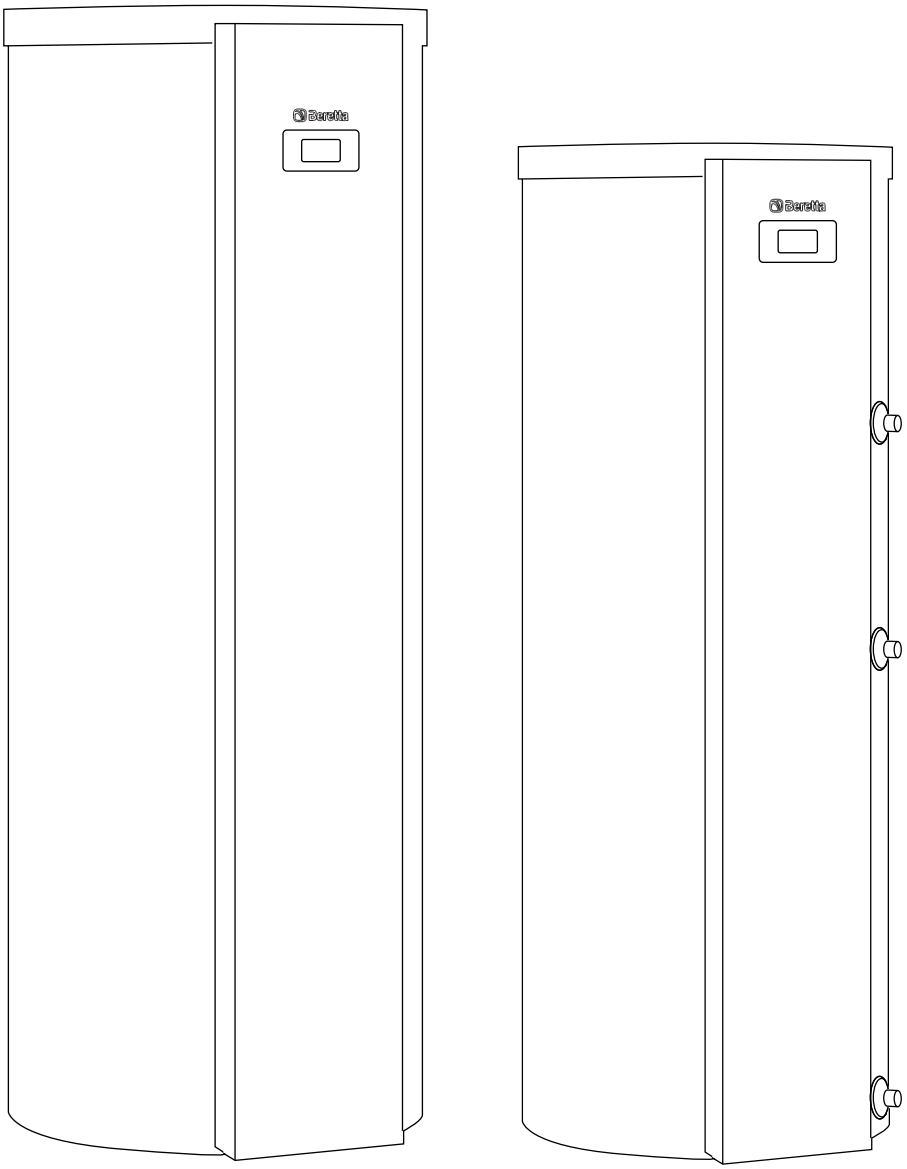
Technical Data Sheet

HP-N ACS

Domestic hot water heat pumps



A Carrier Company

Summary

General introduction

HP-N ACS

HP-N ACS is the heat pump for domestic hot water designed by Beretta for residential applications.
The unit consists of a heat pump and a boiler. The heat pump, housed directly in the upper part of the boiler, uses the thermal energy of the air to heat the domestic water.
The air is sucked in by a centrifugal fan that allows recirculation operation or through a duct that allows the air to be taken externally.
The recovered energy is transferred to the water by an exchanger located outside the boiler, avoiding maintenance costs.
The high efficiency of HP-N ACS is linked to the use of a R1234-ze refrigeration circuit, which uses a high-efficiency compressor, a thermostatic expansion valve and a hot gas by-pass valve to allow HP-N ACS to operate down to -5°C.
The 180 and 250 litre boilers are vitrified.
For both sizes, the 1,5 kW electric resistance is standard (accessory for the 250 lt version with additional coil) to ensure heating support, anti-freeze protection and anti-legionella function.
The entire system is controlled and regulated via a command that uses intelligent management of the individual components.

- DHW production with temperatures up to 62°C.
- High efficiency coefficient.
- 1,5 kW support electric resistance as standard (for versions without coil).
- HP-N 250 ACS S model can be combined with an additional heat source (solar or boiler).
- Possibility of connecting the machine to a photovoltaic system via Smart Grid connection (supplied as an accessory).
- Corrosion protection thanks to the magnesium anode and the enamelled tank.
- Working range -5°C/+35°C.
- Highest efficiency energy class: A+ (energy class range F→A+)*.
- Hermetically sealed unit.

The range

The new range of floor-standing heat pump water heaters consists of three models:

- HP-N 180 ACS with integrated 178-liter boiler.
- HP-N 250 ACS, with integrated 254-liter boiler.
- HP-N 250 S ACS, with integrated 251-liter boiler and coil, for connection to solar thermal collectors or boiler.

The technology

The new range of floor-standing heat pump water heaters consists of three models:

1. High efficiency refrigeration circuit.
2. Acoustically optimised fan.
3. Evaporator with high exchange surface.
4. Control panel.
5. Enamelled steel sanitary tank.
6. Additional electrical resistance (available as an accessory for S ACS version) and magnesium anode as standard.
7. Wound condenser with high exchange surface.
8. Coil for connection to solar thermal system or boiler.

HP-N 250 ACS

HP-N 250 S ACS

** The energy efficiency class range of this product category is from F up to A+.*

Technical data

Technical data

DESCRIPTION		HP-N 180 ACS	
WITHDRAWAL PROFILE		**M**	**L(*)**
Performance data for external air operation according to EN 16147:2011 for A7/W10-53 (air inlet temperature 7°C/room temperature 20°C)			
Coefficient of performance ε (COPdhw)		2,86	2,92
Cooling-up time	h:min	07:02	06:30
Standby loss (Pes)	W	25	29
Maximum useful quantity (40°C)	l	228	253
Reference hot water temperature	°C	52,9	52,9
Energy efficiency hot water production (ηwh)	%	113	121
Nominal heating capacity (P-rated)	kW	1,23	1,23
Annual energy consumption (AEC)	kWh	462	846
Performance data for recirculated air operation and recirculated air operation with air outlet to the outside according to EN 16147: 2011 for A20/W10-53 (air inlet temperature 20°C/room temperature 20°C)			
Coefficient of performance ε (COPdhw)		3,21	3,39
Cooling-up time	h:min	06:16	05:47
Standby loss (Pes)	W	24,8	29
Maximum useful quantity (40°C)	l	228	253
Reference hot water temperature	°C	52,9	52,9
Energy efficiency hot water production (εwh)	%	122	145
Nominal heating capacity (P-rated)	kW	1,42	1,42
Annual energy consumption (AEC)	kWh	422	707
Use limits (air inlet temperature)	°C	da –5 a +35	da –5 a +35
ELECTRICAL VALUES			
Max. electrical power consumption	kW	2,25	2,25
Electrical power consumption of the heat pump	kW	0,425	0,425
Electrical power consumption of the EHT electric resistance	kW	1,5	1,5
Mains connection (with and without EHT electric resistance)		1/N/PE 230 V/50 Hz	1/N/PE 230 V/50 Hz
Nominal current	A	9,8	9,8
Protection fuse	A	16	16
REFRIGERATOR CIRCUIT			
Working fluid		R1234ze	R1234ze
Refrigerant type (Hermetically sealed unit)		HFO (Hydro-Fluoro-Olefins)	HFO (Hydro-Fluoro-Olefins)
Filling volume	kg	1,15	1,15
Global warming potential (GWP)		7	7
CO_2 equivalent	kg	8	8
Safety group		A2L	A2L
Max. operating pressure	bar	25	25
	MPa	2,5	2,5
INTEGRATED KETTLE			
Material		Enamelled steel	Enamelled steel
Capacity	l	178	178
Maximum permissible domestic hot water temperature	°C	65	65
Max. operating pressure	bar	8	8
	MPa	0,8	0,8

General introduction

DESCRIPTION		HP-N 180 ACS	
WITHDRAWAL PROFILE		**M**	**L(*)**
Fan Volume flow			
Speed 1 (slow - recirculated air operation only)	m³/h	250	250
Speed 2 (fast - recirculated air and outside air operation)	m³/h	320	320
Minimum room volume for recirculated air operation	m³	20	20
Max. pressure drop in the air duct system for recirculated air operation with air outlet to the outside and outside air operation	mbar	1	1
	kPa	0,1	0,1
OVERALL DIMENSIONS			
Width	mm	661	661
Diameter	mm	584	584
Height	mm	1559	1559
Weight	kg	95	95
Connections (male thread)			
Cold water, hot water	R	¾	¾
Domestic water recirculation	R	¾	¾
Condensate drain (Ø)	mm	20	20
Sound power level LW in recirculated air operation and recirculated air operation with air outlet to the outside (measured according to EN 12102/EN ISO 9614-2, accuracy class 2)			
Max. A-weighted sound power spectrum in the installation room	dB(A)	59	59
Noise level LW in recirculated air operation and recirculated air operation with air outlet to the outside (with directivity Q = 2 and distance 3 m)	dB(A)	41	41
Sound power level LW in external air operation (with 4 m air duct) (measured according to EN 12102/EN ISO 9614-2, accuracy class 2) Max. A-weighted sound power spectrum in the installation room			
Inside	dB(A)	53	53
Outside	dB(A)	64	64
Noise level LW operation with external air (with directivity Q = 2 and distance 3 m)			
Inside	dB(A)	35	35
Outside	dB(A)	46	46
Energy class according to EU regulation n. 813/2013 Domestic hot water production (energy class range F→A+) (**)		A+	A+

(*) Self-declared values
(**) The energy efficiency class range of this product category is from F up to A+

General introduction

DESCRIPTION		HP-N 250 ACS		HP-N 250 ACS S	
WITHDRAWAL PROFILE		**L**	**XL(*)**	**L**	**XL(*)**
Performance data for external air operation according to EN 16147:2011 for A7/W10-53 (air inlet temperature 7°C/room temperature 20°C)					
Coefficient of performance ε (COPdhw)		3,23	3,37	3.22	3,37
Cooling-up time	h:min	10:00	10:00	10:00	10:00
Stand-by heat loss (Pes)	W	23	25	23	25
Maximum useful quantity (40°C)	l	329,5	351,0	329,5	351,0
Nominal heating capacity (P-rated)	kW	1,17	1,17	1,17	1,17
Performance data for recirculated air operation and recirculated air operation with air outlet to the outside according to EN 16147: 2011 for A20/W10-53 (air inlet temperature 7°C/room temperature 7°C)					
Coefficient of performance ε (COPdhw)		2,88	3,00	2,88	3,00
Cooling-up time	h:min	11:00	11:35	11:00	11:35
Standby loss (Pes)	W	33	35	33	35
Maximum useful quantity (40°C)	l	324,5	355,0	324,5	355,0
Performance data for recirculated air operation and recirculated air operation with air outlet to the outside according to EN 16147: 2011 for A20/W10-53 (air inlet temperature 15°C/room temperature 15°C)					
Coefficient of performance ε (COPdhw)		3,33	3,50	3,33	3,50
Cooling-up time	h:min	07:39	08:15	07:39	08:15
Dispersion in stand-by (Pes)	W	22	24	22	24
Max. useful flow rate (40°C)	l	335,0	362,0	335,0	362,0
Limits of use (air inlet temperature)	°C	da –5 a +35	da –5 a +35	da –5 a +35	da –5 a +35
Continuous output with domestic hot water production from 10 to 45°C in combination with an external heat generator with relative power and a heating water flow rate of 3.0 m³/h					
Heating water flow temperature 90°C	kW	-	-	40	40
	l/h	-	-	982	982
Heating water flow temperature 80°C	kW	-	-	32	32
	l/h	-	-	786	786
Heating water flow temperature 70°C	kW	-	-	25	25
	l/h	-	-	614	614
Heating water flow temperature 60°C	kW	-	-	17	17
	l/h	-	-	417	417
Heating water flow temperature 50°C	kW	-	-	9	9
	l/h	-	-	221	221
ELECTRICAL VALUES					
Max. absorbed electrical power					
With EHT electric resistance (accessory for HP-N 250 ACS S, included in the scope of delivery for HP-N 250 ACS)	kW	2,25	2,25	2,25	2,25
Without EHT electric resistance	kW	-	-	0,75	0,75
Electrical power consumption of the heat pump	kW	0,425	0,425	0,425	0,425
Electrical power consumption of the EHT electric resistance (as an accessory for the HP-N 250 ACS S, included in the scope of delivery for the HP-N 250 ACS)					
Nominal voltage (with and without EHT electrical resistance)			1/N/PE 230 V/50 Hz		
RATED CURRENT					
With electric resistance	A	9,8	9,8	9,8	9,8
Without electric resistance EHT	A	1,84	1,84	1,84	1,84
Protection fuse	A	16	16	16	16
REFRIGERATION CIRCUIT					
Working fluid			R1234-ze (E)		
Refrigerant Type (Hermetically Sealed Unit)			HFO (Hydro-Fluoro-Olefins)		
Filling volume	kg	1,35	1,35	1,25	1,25
Global warming potential (GWP)		7	7	7	7
CO_2 equivalent	kg	9,45	9,45	8,75	8,75
Safety group		A2L	A2L	A2L	A2L
Max. operating pressure	bar	25	25	25	25
	MPa	2,5	2,5	2,5	2,5
Fan Volume flow					
Speed 1 (slow - recirculated air operation only)	m³/h	331	331	331	331
Speed 2 (fast - recirculated air and outside air operation)	m³/h	375	375	375	375
Minimum room volume for recirculated air operation	m³	20	20	20	20
Max. pressure drop in the air duct system for recirculated air operation with air outlet to the outside and outside air operation	mbar	1	1	1	1
	kPa	0,1	0,1	0,1	0,1

General introduction

DESCRIPTION		HP-N 250 ACS		HP-N 250 ACS S	
WITHDRAWAL PROFILE		**L**	**XL(*)**	**L**	**XL(*)**
Integrated kettle					
Material			Enamelled steel		
Capacity	l	254	254	251	251
Lower coil capacity	l	-	-	6,5	6,5
Maximum permissible domestic hot water temperature	°C	65	65	65	65
Maximum permissible domestic hot water temperature with EHT electric resistance	°C	65	65	65	65
Maximum achievable domestic hot water temperature in combination with a photovoltaic system	°C	62	62	62	62
Max. operating pressure	bar	8	8	8	8
	MPa	0,8	0,8	0,8	0,8
HEAT EXCHANGER					
Heat exchange surface	m²	-	-	1	1
Lower coil capacity	l	-	-	6,5	6,5
Max. operating pressure	bar	-	-	6	6
	MPa	-	-	0,6	0,6
Max. connectable opening surface of flat solar collectors	m²	-	-	4,6	4,6
Max. connectable opening surface of tube solar collectors	m²	-	-	3	3
OVERALL DIMENSIONS					
Width	mm	734	734	734	734
Diameter	mm	634	634	634	634
Height	mm	1780	1780	1780	1780
Weight	kg	110	110	125	125
CONNECTIONS (MALE THREAD)					
Cold water, hot water	R	¾	¾	¾	¾
Domestic water recirculation	R	¾	¾	¾	¾
External heat generator/solar collector flow/return	G	-	-	1	1
Condensate drain (Ø)	mm	20	20	20	20
Sound power level LW in recirculated air operation and recirculated air operation with air outlet to the outside (measured according to EN 12102/EN ISO 9614-2, accuracy class 2)					
Max. A-weighted sound power spectrum in the installation room	dB(A)	56	56	56	56
Noise level LW in recirculated air operation and recirculated air operation with air outlet to the outside (with directivity Q = 2 and distance 3 m)	dB(A)	38	38	38	38
Sound power level LW in external air operation (with 4 m air duct) (measured according to EN 12102/EN ISO 9614-2, accuracy class 2) Max. A-weighted sound power spectrum in the installation room					
Inside	dB(A)	50	50	50	50
Outside	dB(A)	64	64	64	64
Noise level LW operation with external air (with directivity Q = 2 and distance 3 m)					
Inside	dB(A)	32	32	32	32
Outside	dB(A)	46	46	46	46
Energy class according to EU regulation n. 813/2013 Domestic hot water production (energy class range F→A+) (**)		A+	A+	A+	A+

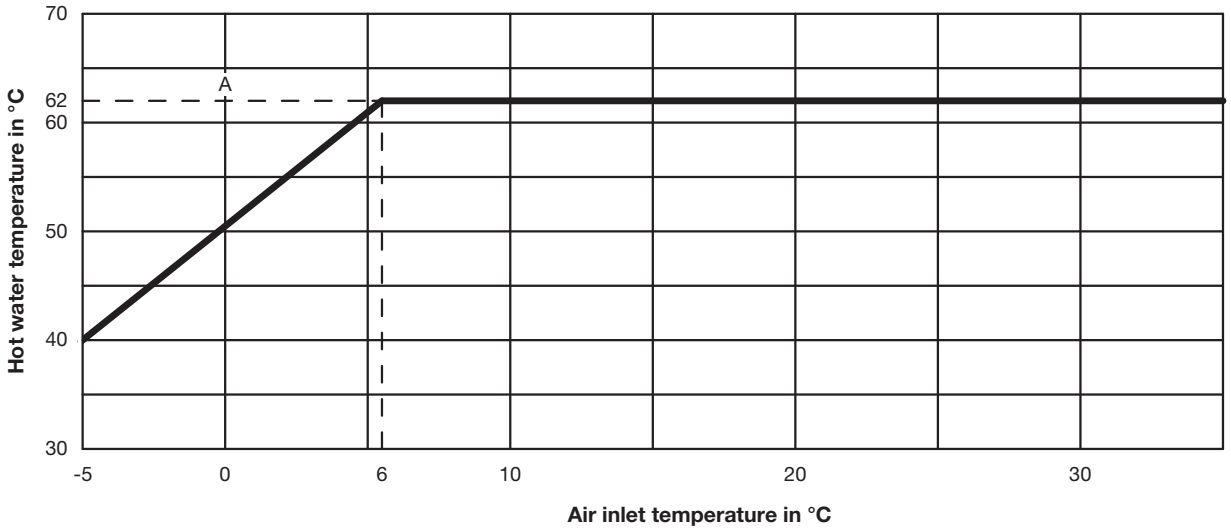
(*) Self-declared values
(**) The energy efficiency class range of this product category is from F up to A+

Warning on continuous output of the coil
For design based on the indicated or measured continuous output, provide an adequate circulation pump.

General introduction

External temperature limits

ATTENTION - *The hot water temperature obtainable by the heat pump depends on the outside temperature. It is a maximum of 62°C.*



Maximum hot water temperature achievable by the heat pump: 62°C.

Permissible air inlet temperatures

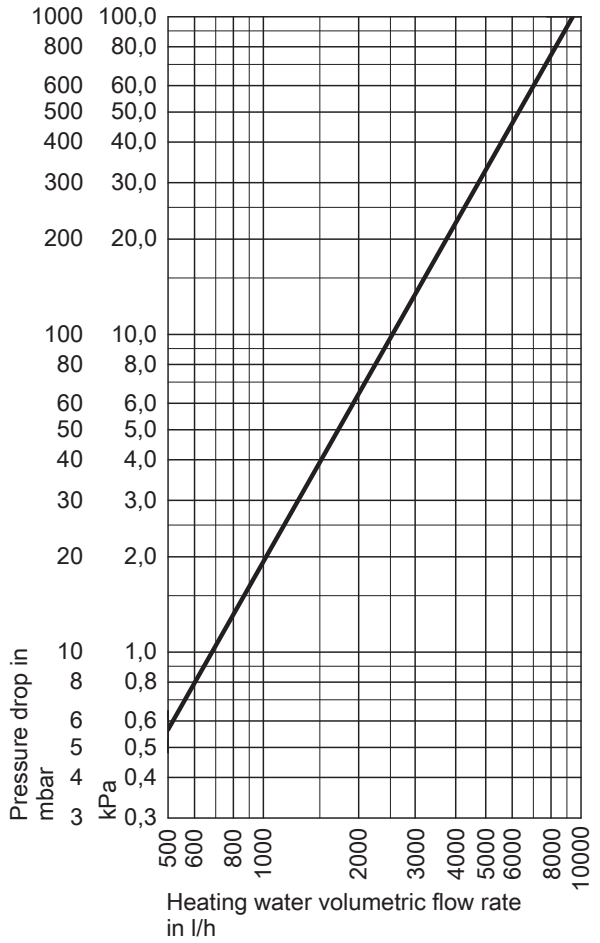
The air heat pump for domestic hot water production switches off when the permissible air inlet temperatures are outside the permissible range. It will be possible to heat the domestic hot water in combination with an electric resistance (accessory in some operating programs even when the air inlet temperatures are outside the permissible range. An external heat generator can be connected to the HP-N 250 ACS S. Permissible air inlet temperatures:

- For hot water production in recirculated air operation and in recirculated air operation with air outlet to the outside (temperature in the installation room): From 3°C to 35°C.
- For hot water production in external air operation (outside temperature): From -5°C to 35°C.

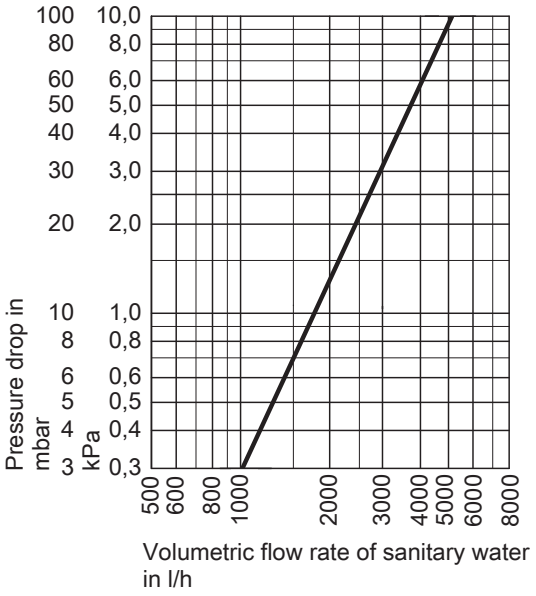
General introduction

Pressure drops

Heating side pressure drop for auxiliary heat source coil (only type HP-N 250 ACS S)



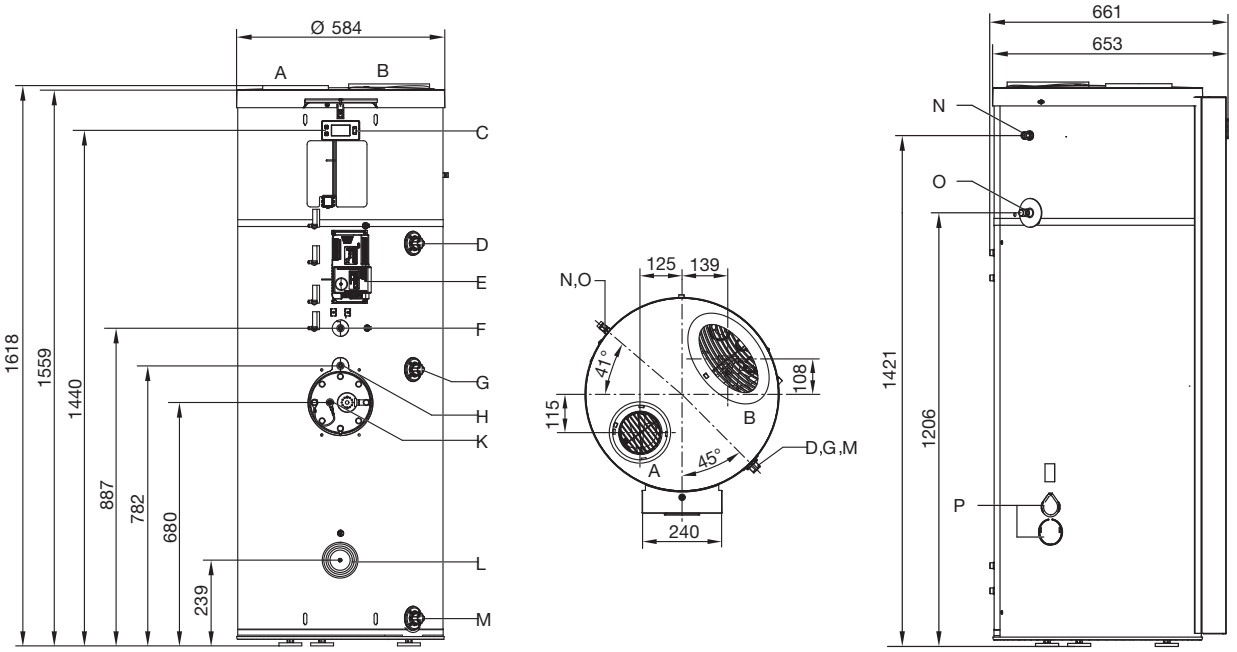
Pressure drop on sanitary side



Connection diagram

Connection diagram

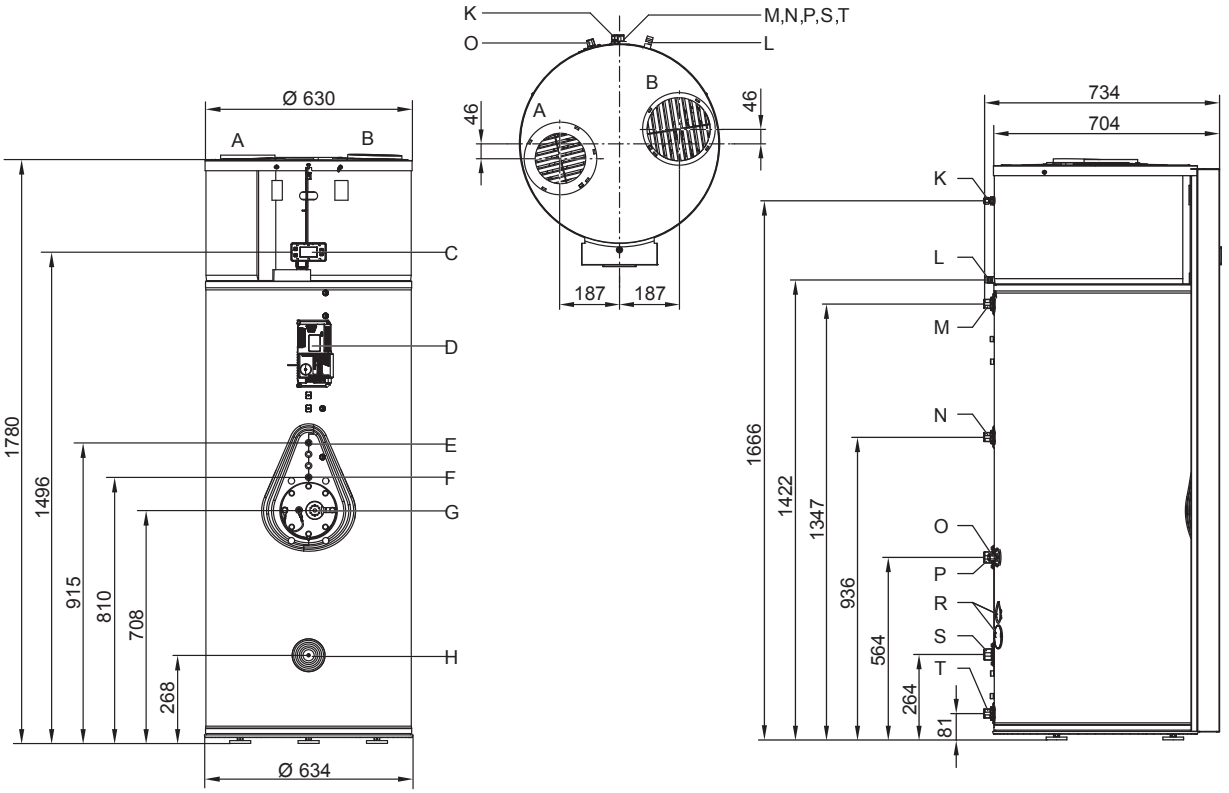
180 ACS MODEL



A	Air outlet: - With protective grille: for recirculated air operation. - With external air adapter DN 160: for recirculated air operation with air outlet to the outside and external air operation.
B	Air inlet: -With protective grille: for recirculated air operation. -With external air adapter DN 160: for recirculated air operation with air outlet to the outside and external air operation.
C	Service unit.
D	Hot water R ¾.
E	Heat pump regulation.
F	Immersion sleeve for M-tap profile.
G	Recirculation R ¾.
H	Immersion sleeve for L-tap profile.
K	Factory-fitted temperature sensors: - Boiler temperature sensor and Manual reset safety thermostat of the air heat pump for domestic hot water production. - Inspection opening. - Protective magnesium anode. - Anode powered by external energy (accessory). - EHT electric resistance (supplied condition).
L	Immersion sleeve for sampling profile recognition.
M	Cold water/drain R ¾.
N	Network cable (3 m long).
O	Condensate drain Ø20 mm.
P	Process injection cap (do not open, do not insert anything).

Connection diagram

250 ACS and 250 S ACS MODELS

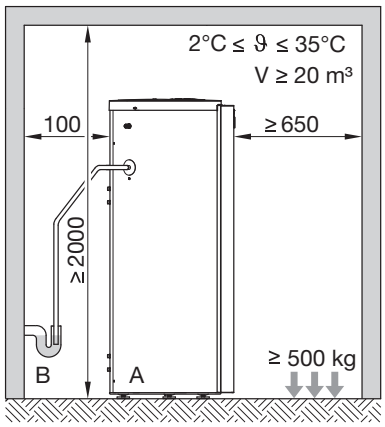


A	Air outlet: - With protective grille: for recirculated air operation. - With external air adapter DN 160: for recirculated air operation with air outlet to the outside and external air operation.
B	Air inlet: -With protective grille: for recirculated air operation. -With external air adapter DN 160: for recirculated air operation with air outlet to the outside and external air operation.
C	Service unit.
D	Heat pump regulation.
E	Immersion sheath for L sampling profile Factory-mounted temperature sensors: - Boiler temperature sensor. - Manual reset safety thermostat of the air heat pump for domestic hot water production.
F	Immersion sheath for XL sampling profile.
G	Factory-mounted temperature sensors: - Inspection opening. - Protective magnesium anode. - Anode powered by external energy (accessory). - EHT electrical resistance (accessory HP-N 250 ACS S, included in the scope of delivery of the HP-N 250 ACS).
H	Immersion sleeve for sampling profile recognition.
K	Network cable (3 m long).
L	Condensation water Ø 20 mm.
M	Hot water R ¾.
N	Recirculation R ¾.
O	Only HP-N 250 ACS S: External heat generator temperature sensor or manual reset safety thermostat for deactivating the solar circuit pump.
P	Only HP-N 250 ACS S: External heat generator/solar collector flow G 1.
R	Process injection cap (do not open, do not introduce anything).
S	Only HP-N 250 ACS S: - External heat generator: return G 1. - Solar collector: return G 1 and threaded connection (accessory) for lower boiler temperature sensor.
T	Cold water/drain R ¾.

How the air works

Recirculated air operation

WARNING - *If the room volume is < 20 m³, the achievement of the indicated power of the appliance is not guaranteed.*



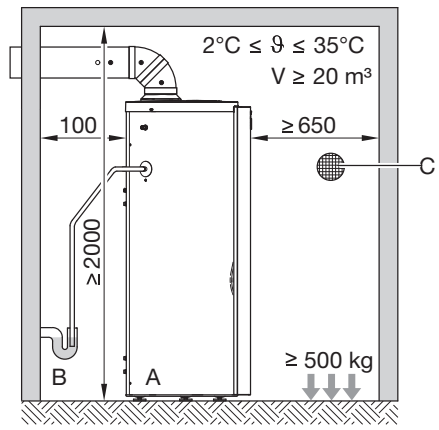
Minimum local installation height

In recirculated air operation, the appliance can be installed from a ceiling height of 2000 mm. A higher ceiling height reduces the risk of air circulation in the heat pump and ensures optimum performance.

A	Air heat pump for domestic hot water production
B	Pipe for condensate water discharge

Recirculated air operation with air outlet to the outside

WARNING - *If the room volume is < 20 m³, the achievement of the indicated power of the appliance is not guaranteed. This operating program is only permitted in unheated rooms.*



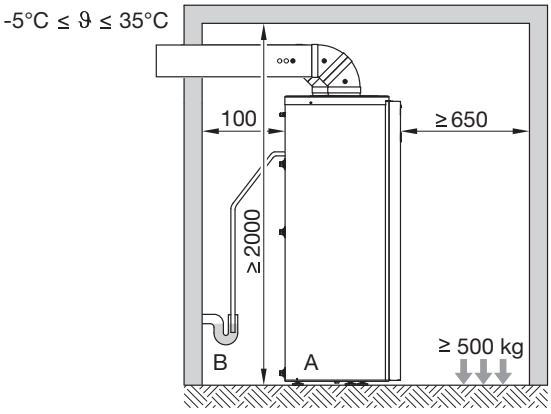
Minimum local installation height

In recirculated air operation with air outlet to the outside, the appliance can be installed from a ceiling height of 2000 mm.

A	Air heat pump for domestic hot water production
B	Pipe for condensate water discharge
C	External air opening: With external air adapter DN 160: ≥ DN 160

How the air works

External air operation



Minimum local installation height

In external air operation, the appliance can be installed from a ceiling height of 2000 mm.

A	Air heat pump for domestic hot water production
B	Pipe for condensate water discharge

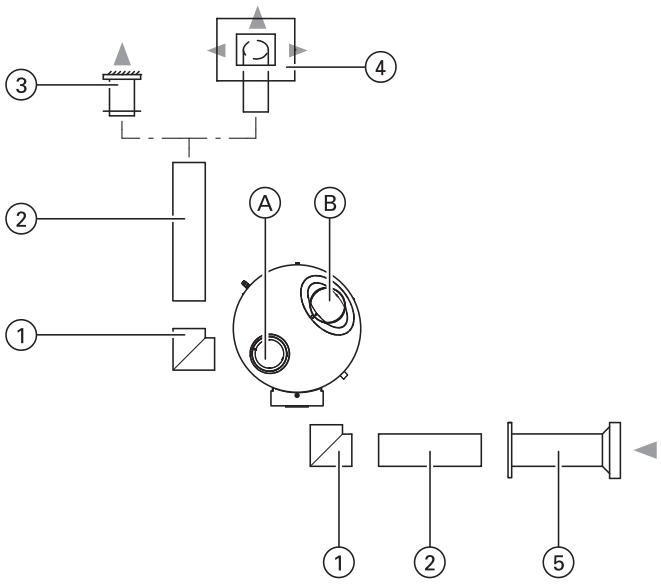
Air connections

If the installation of air ducts is necessary, ensure that these:

- do not weigh down the unit.
- allow maintenance operations on the unit, access and disassembly of any accessories.
- avoid air recirculation between the machine's intake and delivery.
- are adequately protected to prevent accidental intrusion of materials into the machine.

Assembly of the air inlet/air outlet piping system

System representation



A	Air outlet
B	Air inlet

How the air works

	Piping system		DN
1	Curve	90°	160
		45°	160
2	Rigid circular wound tube Flexible tube EPP (expanded polypropylene) tube	Length 3,0 m	160
3	Circular wall pass-through for air intake/expulsion with wall pass-through function for the air outlet pipe		160
4	Roof air exhaust duct	Round, with protective grille and insulating sleeve, for air outlet pipe	160
5	Air supply element	Wall/external connection, for air inlet pipe	160
Check valve (to be provided on site)			

Design Guidelines

Distribution system for air intake/air exhaust (accessory)

Air supply elements

To avoid depression in the rooms, use air supply elements for controlled ventilation of the aforementioned rooms.

Placement in the premises:
- To avoid drafts, do not place air supply elements in the immediate vicinity of seating areas and bedrooms.
- To preheat the outside air in the winter season, install the air supply elements in the air convection field of the radiators.

Sizing:
- Size the air supply elements according to the nominal air flow rate (according to DIN 1946).
- The max. air flow rate (during domestic hot water production) must be able to flow through the air supply elements.
- The pressure imbalance between the supply air flow rate and the return air flow rate must be max. 8 Pa.
- It is recommended to size the air supply elements for a pressure drop of max. 8 Pa at maximum air flow rate.

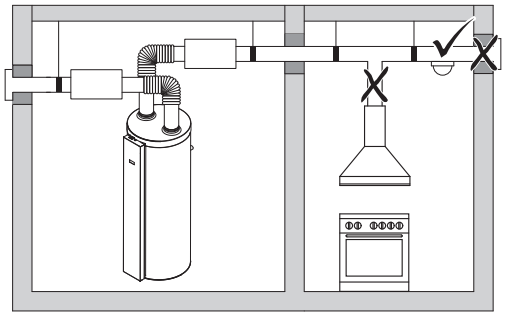
Circular air intake terminals

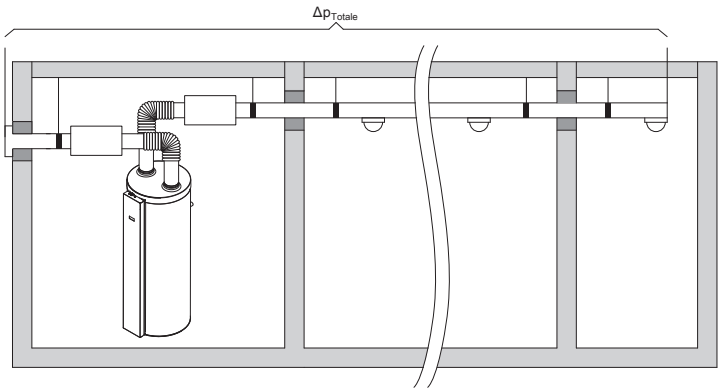
The exhaust air valves are adjustable for different air volume flows. The sum of the air volume flows of all exhaust air valves used must be 360 m^3/h.

How the air works

Air intake and exhaust pipes

- To avoid complicated pipework, the air distribution system must be laid before the ductwork is installed.
- Lay the return air and exhaust air pipes in the immediate vicinity of the heat pump horizontally or with a slight slope to the air connections of the ducted air cover. This ensures that the condensation water is conveyed via the heat pump into the waste water.
- To avoid flow noise and high energy consumption due to pressure losses, reduce the pipe cross-sections only after the volumetric flow has been divided (e.g. using T-pieces).
- The connection of kitchen hoods with ventilation pipes to the return air distribution system is not permitted.
- The maximum recommended total pressure loss ΔpTotal for all components, including external wall bushings, in the air distribution system is 100 Pa.





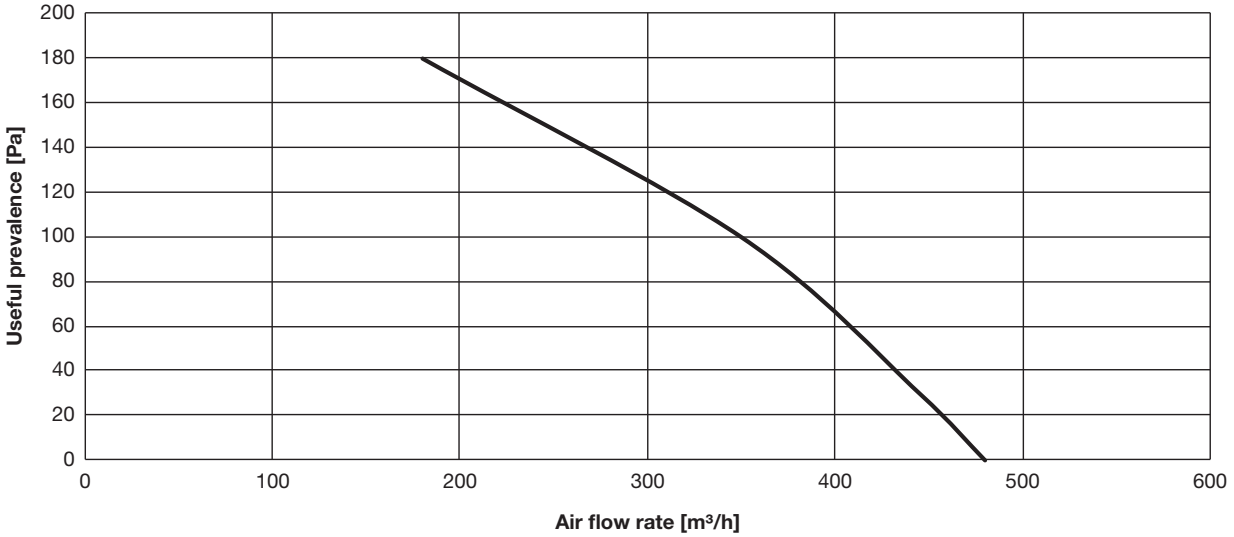
How the air works

Pressure loss in air piping system

The maximum permissible total pressure drop Δptotal in the air piping system is 100 Pa. Only then does the air heat pump for domestic hot water production reach its maximum volumetric flow rate.
As an indication, the length of the piping (sum of suction + delivery) can reach 10 m using a diameter of 160 mm. For a precise check, it is recommended to calculate the circuit pressure drops according to the example below:

Example:
Piping system used:
- 2 external wall loops.
- 3 90° bends.
- 14.5 m of EPP piping.

Example for calculating the pressure drop in the piping system:
1. Example for HP-N 250 ACS with DN 160 and with an air volume flow rate of max. 375 m³/h:
2 x 30 Pa + 3 x 2,7 Pa + 2,2 Pa/m x 14,5 m = 100 Pa.



Thermal insulation for air distribution system

- To prevent condensation, insulate the exhaust air pipes and the connections of the ducted air cover with a vapour-tight thermal coating of at least 50 mm thick.
- Insulate all return air pipes in accordance with DIN 1946-6 in a vapour-tight manner. Observe the insulation thicknesses specified in DIN 1946-6, see the following table.
- To ensure optimum heat generation in the ducted air appliance, heat losses from the air distribution system must be kept to a minimum: Insulate all pipes in unheated areas in a vapour-tight manner in accordance with DIN 1946-6, see the following table.

Isolation measures:
- Insulation must be carried out in accordance with the applicable technical standards.
- Cover the joints well with adhesive tape.
- Avoid gaps.
- Decoupling the roof and wall penetrations using insulating strips.
- As an insulating material we recommend e.g. Armaflex.

WARNING - *No additional thermal insulation is required for EPP pipes or bends.*
Insulation thicknesses of air distribution systems according to DIN 1946-6

Type and temperature of air in the pipeline	Pipeline installation outside the thermal insulation, inside the building ϑUL < 18°C	Pipeline installation inside thermal insulation ϑUL ≥ 18°C
	Minimum insulation thickness in mm	Minimum insulation thickness in mm
Return air ϑAr. repr.	≥ 25	0
Exhaust air ϑFL (vapor-tight)	50	50

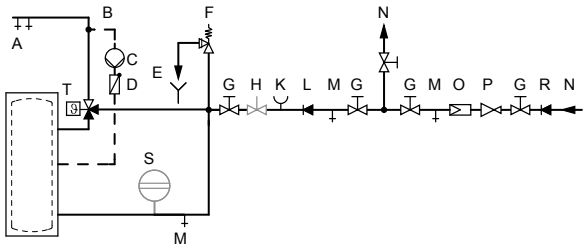
ϑUL Ambient air temperature
ϑFL Air temperature in the air exhaust duct
ϑAr. repr. Air temperature in the air return duct

How the air works

Sanitary side connections

The air heat pump for domestic hot water production is designed to be permanently connected to the domestic hot water network. For the domestic hot water connection, comply with DIN 1988, DIN 4753 and EN 806.
In addition, the following must be observed:

- Connect all pipes with detachable fittings.
- Equip the recirculation pipe with a recirculation pump, check valve and programmer clock. Natural circulation is only possible to a limited extent.



A	Hot water.
B	Recirculation pipe If the recirculation is not connected, seal the connection provided.
C	Recirculation pump.
D	Spring-loaded check valve.
E	Inspectable end of the discharge pipe.
F	Safety valve.
G	Shut-off valve.
H	Flow rate control valve.
K	Pressure gauge connection
L	Check valve.
M	Drain tap.
N	Cold water.
O	Dirt filter.
P	Pressure reducer.
R	Check valve/disconnector.
S	Expansion vessel, for domestic water (not CH).
T	Automatic thermostatic mixing device (to be provided on site, for hot water temperatures > 60°C).

The safety group according to DIN 1988 is available as an accessory. The safety group comprises the following components:

- Shut-off valve.
- Diaphragm safety valve.
- Check valve and test connections.
- Pressure gauge connections.

Warning regarding the impurity filter

According to DIN 1988-2, it is mandatory to equip systems with metal pipes with a dirt filter. Even if the pipes are made of plastic, DIN 1988 requires, and we recommend, the installation of a dirt filter to prevent the penetration of dirt into the system for the production of sanitary water.

Warning on automatic thermostatic mixing device

The air heat pump for domestic hot water production is capable of heating domestic hot water to temperatures above 60°C. For this reason, as a protection against burns, an automatic thermostatic mixing device must be installed in the hot water pipe.

Safety valve warnings

A safety group in accordance with DIN 1988 (DN 15 (R ¾)/1 MPa) must be installed on the cold water connection. If the safety group in accordance with DIN 1988 is not installed, the system must be equipped with an approved diaphragm safety valve to protect it from overpressure.
Installation instructions:

- The safety valve must be located on the cold water supply. There must be no shut-off devices between the safety valve and the boiler.
- No kinks in the pipework between the safety valve and the boiler are permitted.
- The safety valve discharge pipe must not be closed. The outgoing water must be led safely and visibly into a drain funnel. Attach a sign near the safety valve discharge pipe, or possibly on the valve itself, stating the following: "For safety reasons, water may escape from the discharge pipe during heating! Do not block."
- Install the safety valve above the upper edge of the air-source heat pump for domestic hot water production.
- The safety valve must be installed in a frost-free location and must be connected to a discharge pipe with a constant downward slope.

Technical requirements:

- Permissible temperature: 3 to 65°C.
- Max. operating pressure: 1 to 10 bar (0,1 to 1 MPa).

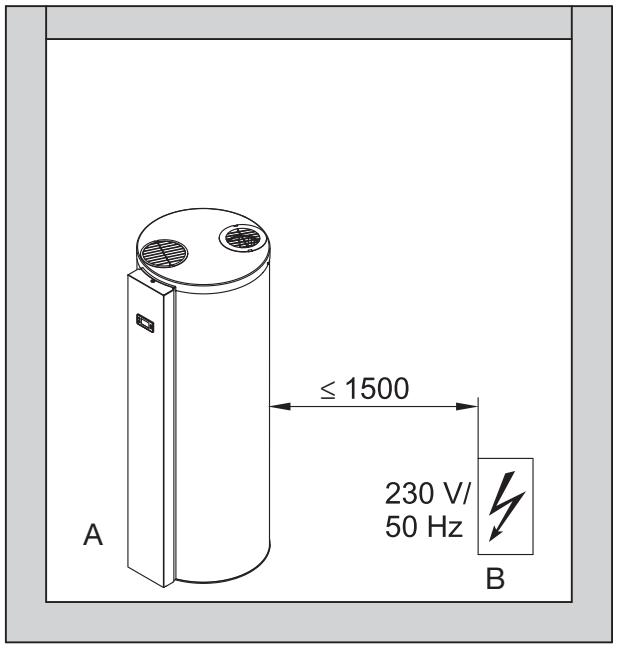
Electrical connection

The air heat pump for the production of domestic hot water is designed for connection with a 3-wire network cable:
- H05VV-F 3G 1,5.
- Color white.
- Conductors: L1: brown, N: blue, PE: green/yellow

For the mains connection, a Schuko socket with earthing and separate protection is required:
- 230 V /50 Hz.
- Max. protection fuse 16 A.

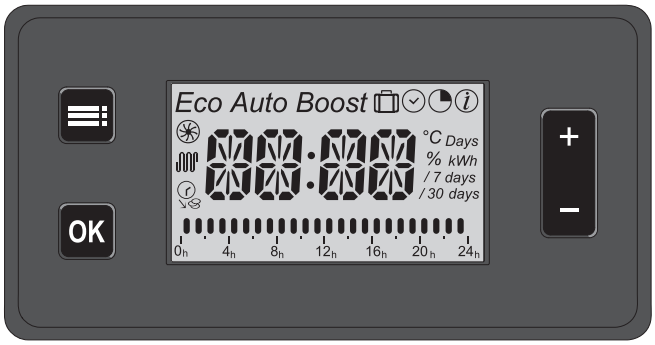
Damaged connection cables

If the connection cables of the appliance or accessories are damaged, replace them with special cables. Use only Beretta cables for replacement.



A	Air heat pump for domestic hot water production
B	Network connection

Control panel



+/-	To browse the menu or set values
OK	To confirm the selection or save the setting made
	To select the operating program
	To call up the time slot programming
	To display information
	To return to the previous menu step
	aborts a setting in progress

Indication	Meaning
Eco	The ECO operating program is set
Eco + Auto	The SMART operating program is set
Auto	The AUTO operating program is set
Boost	The BOOST operating program is set
	The OUT operating program is set
	View and set times
+PROG	The PROGRAM operating program is set
+Night	The NIGHT operating program is set
	View information
	The heat pump is active
flashing	The heat pump starts after the minimum switch-off time has elapsed
	The electric heating element is active
	The high/low tariff is enabled
flashing	The low tariff is active
The asterisk rotates	Enhanced domestic water hygiene is active.
	Display of the set time slots

In the operating programs “ECO” / “AUTO” / “PROGRAM” / “NIGHT” and “BOOST” you can set the normal hot water temperature.
In the operating program “SMART” you can set the comfort level.

Guide to the specifications

Description

HP-N 180-250 ACS

Beretta HP-N ACS heat pumps use the thermal energy of the air to produce domestic hot water.
The ease of installation, the silent and reliable operation and the very low maintenance requirement complete the advantages of this highly ecological and economical system. The module produces domestic hot water using heat pump technology.
Highest efficiency energy class: A+ (energy class range F→A+)*.
The unit is suitable for indoor installation and uses a 1,5 kW single-phase electric resistance as a replacement energy source as standard. The boiler is of the vertical type in steel with Ceraprotect enamel, magnesium anode, external coating in painted sheet metal.
The operating principle of the heat pump is as follows:

- the refrigerant changes state in the evaporator, taking heat from the low-temperature source (the outside air).
- the compressor, which is the beating heart of the system, raises the energy level of the heat taken: the refrigerant, in fact, by increasing pressure, reaches temperatures close to 90°C.
- in the condenser it becomes possible to transfer thermal energy to the sanitary water, heating it up to 62°C.
- the accumulation allows the heat to be stored and conserved for a long time, thanks to the polyurethane insulating jacket, finally passing through the thermostatic valve, the fluid returns to low pressure, cools down and is once again available to "load" other "ecological" heat from the outside air.
- the solenoid valve allows the pressures to be equalized during the start-up phase and, if necessary, allows the evaporator to be defrosted.

Construction features

The main construction features of the HP-N ACS heat pumps are:

- vertical steel boiler with Ceraprotect enamelling.
- aluminium condenser wrapped externally to the storage tank, free from scale and gas/water contamination.
- available in three versions: without auxiliary coils (HP-N 180 ACS and 250 ACS) and a lower auxiliary coil for use in combination with a boiler or solar (HP-N 250 ACS S).
- integrated NTC probe for water temperature control with the possibility of being inserted in two separate wells (L profile or XL profile).
- NTC external air probe for automatic insertion of the resistance with temperatures not favourable to the heat pump.
- evaporating coil inlet/outlet NTC probes.
- thermostatic valve type lamination organ.
- solenoid valve for hot gas injection and pressure equalisation.
- anti-corrosion magnesium anode.
- hydraulic connections.
- condensate drain integrated into the insulation.
- high thickness expanded polyurethane thermal insulation (45mm for size 180) (50 mm for size 250).
- external coating in sheet metal painted white RAL 9010.
- use of refrigerant gas R1234ze (GWP 7).
- 1,5 kW electric resistance (accessory for the HP-N 250 S ACS version).
- high pressure safety devices.
- high efficiency Hitachi rotary compressor.
- radial fan with flow regulation.

The management, completely electronic, is equipped with:

- user display for setting the operating mode and the various parameters with different levels of accessibility, via password.
- self-diagnostics with high pressure alarm display, water overtemperature, disconnected probes.
- recording of operating hours and clock function.
- water setpoint adjustment for Automatic and/or Manual operation.
- external air temperature detection.
- Smart Grid function with photovoltaic that allows thermal energy to be stored if there is a minimum production of electricity.
- heat request function for an external generator.

* The energy efficiency class range of this product category is from F up to A+.

Beretta

SCAN AND DISCOVER
HP-N ACS

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Carrier