TECHNICAL DOCUMENTATION
INSTALLATION INSTRUCTIONS

DIE ENERGIEFAMILIE

AERO ILM 2-7
AERO ILM 4-13

Additional Model:
HGL

with NAVIGATOR 2.0 Control

Modulation air-water-heat pumps
for Indoor Installation

QUALITÄT SEIT 1977

HEAT PUMPS FROM AUSTRIA

www.idm-energie.at

812583 Rev.2 - Translation of original instructions

Subject to changes with regard to engineering and design!

Important information on assembly and operation of the heat pump. These instructions must be observed!

Space for the customer service phone No.

1. General description

1.1. General information

By purchasing this system you have decided in favor of a modern and cost-effective heating system. Continuous quality controls and improvements as well as functional checks at our production facilities guarantee technically error-free equipment.

Please read this documentation carefully. It contains important instructions for a correct installation, for the reliable and an economical operation of the system.

1.2. Safety instructions

Installation and maintenance operations can be associated with dangers resulting from high system pressures, high temperatures and voltaged parts.

Heat pumps may only be installed by competent specialist and exclusively put into operation by a customer service specialist trained for that purpose by IDM-Energiesysteme GmbH.

If maintenance work is being done on the heat pump, disconnect the system and ensure that it is volt-free and provided with a safeguard to prevent unintentional restarting. Furthermore all safety instructions in the respective documentation or on instruction plates affixed to the heat pump itself resp. all other pertinent safety regulations shall be observed.

1.3. Transport and storage

In transporting the heat pump ensure that it is never tilted by more than 30°. Do not remove the transport packaging until the heat pump has reached its installation location. Heat pump components must not be stored outside. Heat pumps must not be stored in humid rooms or dusty environments. The transport fixtures as described in the following assembly instructions are used to transport the heat pump manually. The transport fixtures must not be used for transporting the components with a crane or similar hoisting equipment.

1.4. Sound emission

AERO heat pumps run extremely smoothly due to their construction. It is nevertheless important to ensure that the heating room is located beyond the noise-sensitive living area and furnished with a well-closing door.

1.5. Construction drying and floating screed heating

Floor screed heating with the heat pump can only take place if the air suction temperature continuously lies over +5°C, as otherwise a correct defrosting of the air evaporator cannot be guaranteed due to the low flow temperatures. Otherwise the floor screed has to be heated with the electric heating element!

1.6. Service and maintenance

Regular maintenance as well as an inspection and maintenance of all important system components guarantees a reliable and low-price operation of the system in the long term. We recommend you to sign a maintenance contract with your competent customer service.

1.7. Cleaning

If necessary, the AERO heat pump can be cleaned using a moist cloth. The use of cleaning agents is not recommended.

The air vent package in the air heat exchanger has to be inspected regularly and cleared of any impurities (e.g. leaves,...), if necessary.

The condensate run off hose can be disconected by opening the tube clamp on the condensate bin. Now the bin and the tube can be inspected and cleaned.

To prevent water damage, the condensate bin and the condensate hose have to be checked regularly for contamination.

1.8. Ice-covering weather-shield grilles

Depending on the weather and outdoor humidity, it may happen that there will be formed an icy coverng on the wheather-shield grilles of the heat pump. This effect is common occuring in nature. This covering must be removed by the heat pump operator during this weather periods.

1.9. Installation area

- The AERO ILM heat pump has to be installed in a frost-proof room! (room temperature must lie between 5°C and 25°C!)

- In order to minimize oscillations and sounds within buildings, heat pumps should be decoupled as far as possible from the building mass. It is principally recommended to avoid installing heat pumps on ceilings and floors in lightweight construction. In the case of floating floor screed, floor screed and impact sound insulation should be omitted around the heat pump.
- The installation in wet or damp environments or in areas exposed to dust or explosion hazards is non-permissible.
- If refrigerant escapes from the installation site, this must not enter adjacent rooms, stairways, yards, corridors or drainage systems and a hazard-free drainage must be ensured.
- In the case of danger, leave the installation site immediately.If the size of the installation site falls below the requested minimum size, this has to be designed as machinery room in compliance with EN 378.
- If the emergency ventilation is not sufficient, mechanical ventilation must be provided. A mechanical ventilation shall be installed with an independent emergency control beyond the installation site and near the door to that area.
- Heat pumps must not be installed in rooms with high EMC load!Air intakes and outlets have to be safeguarded against theft by appropriate on-site measures.

1.10. Information on environmental protection

Heat pumps are electronic devices of high-quality material which must not be disposed of in the same way as household waste. They must be disposed of in a professional and appropriate manner pursuant to the regulations of the local authorities. Disposal contrary to the regulations may lead damage the environment and health with the exception of sanctions imposed on law breakers.

1.11. Piping and pipe-wall-ducts

All pipelines and wall ducts must be discharged in compliance with standards, according heat-insulation, sound-decoupling and water-carrying pipes in a frost-proof manner.

1.12. Installation of additional components

The installation of additional components which have not been verified with the equipment may impair the function. No warranty or liability shall be assumed for any damage resulting therefrom.

For the installation of the heat pump all pertinent national and international laying, installation, accident prevention and safety regulations in connection with the installation of pipeline systems and electric components and equipment as well as instructions in this assembly manual must be observed.

1.13. Standards and guidelines

These comprise among others:

- the generally valid accident prevention and safety regulations
- the provisions regarding environmental protection
- the regulations of the professional associations
- the pertinent laws, standards, regulations and provisions, e.g. DIN, EN, DVGW, VDI and VDE.
- Provisions of the local public utilities.

1.14. Description

AERO ILM is a compact air-water-heat pump with modulating scroll capsule compressor with largely dimensioned multi-row Al/Cu finned tube evaporator.

By a special speed-controlled radial fan large volume flows can be achieved at low speeds.

A copper-welded stainless steel plate heat exchanger is used as condenser. The machine frame consists of a strong metal profile. The cover panels are insulated perfectly. The housing is thus completely without a thermal bridge and thus features optimum sound insulation values.

The heat pump is complete from a hydraulic viewpoint and features a high-efficiency loading pump, the safety device, an expansion container, the electric heating rod, the priority valve respectively the HGL-technology, a flow switch and all necessary sensors.

The heating controller (Navigator 2.0) developed especially for this system offers a variety of additional applications, e.g. Smart Grid, Remote Control or operation via a smart phone.

The heat pump is designed in compact construction, the evaporator is mounted in the top part of the heat pump casing. The heat pump is filled with refrigerant and is tested in the plant to ensure its perfect function.

1.15. Application range

For monovalent heating and cooling of detached and semi-detached houses in appropriate climatic environments. The building should be furnished with a low-temperature heating (e.g. underfloor heating, wall heating, low-temperature radiator heating ...).
The heat pump must be used only for domestic, but not for commercial operation, eg production of process heat.

The lower the maximum flow temperature is, the higher the coefficient of performance (COP) of the heat pump will be.

AERO ILM heat pumps function with the safety refrigerant R410A which, if in the event of a proper assembly and installation circulates in a closed circuit, represents practically no environmental impact.

1.16. Scope of delivery

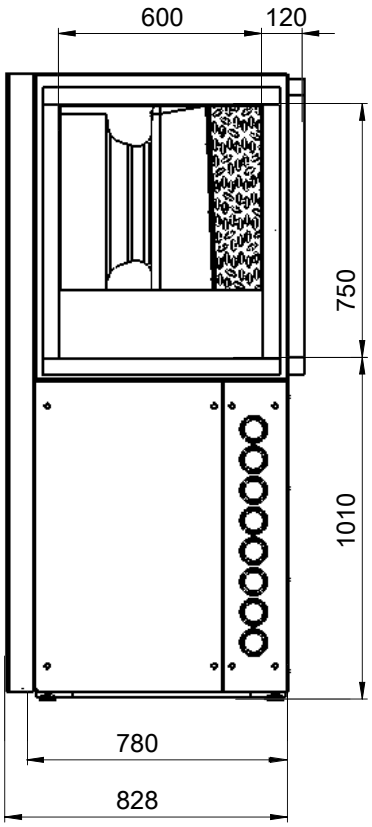
- Heat pump aggregate with modulating scroll capsule compressor (AERO ILM 4-13) or rolling piston compressor (AERO ILM 2-7)
- Inverter with patented CIC-technology
- Copper-welded stainless steel plate heat exchanger as condenser
- HGL-plate heat exchanger (only ILM HGL type)
- Finned tube Al/Cu evaporator package
- Speed-controlled radial fan
- Refrigerant collection and dehydration
- Liquid separator
- 2 pcs. electronic expansion valves
- Refrigerant level indicator
- Pressure sensors for high and low-pressure monitoring
- Cartridge pressure control switch for high-pressure monitoring
- Installed switching valve for cooling/defrosting
- Suction air sensor
- High-efficiency loading pump
- 3-way valve for priority mode (ILM type) orHGL-valve for HGL-mode (ILM HGL type)
- Flow switch
- Electrical heating rod 6 kW for possible subsequent heating
- Heat and sound-insulated cover panels
- colored 7” touch display
- 3 pcs. flexible connection hoses
- Condensate drain tube
- nonreturn valve (loose)
- 2 pcs. sound reduction mats to place below the heat pump
- network connector for myIDM integration

1.17. Accessories

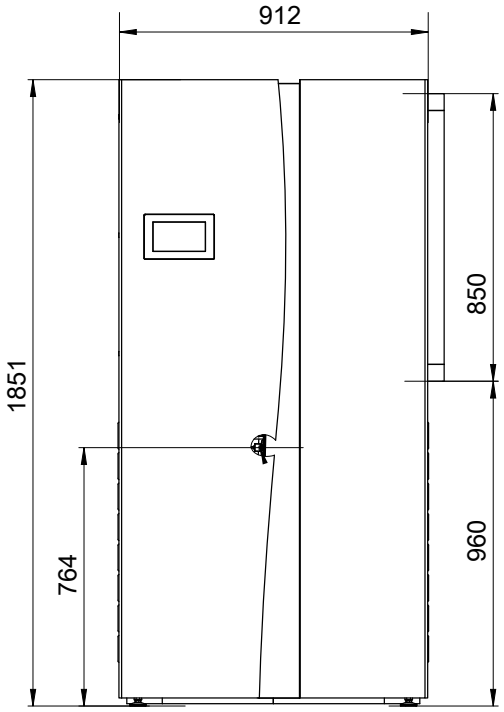
see IDM price list

2.1. Dimensions of AERO ILM 2-7 and AERO ILM 4-13

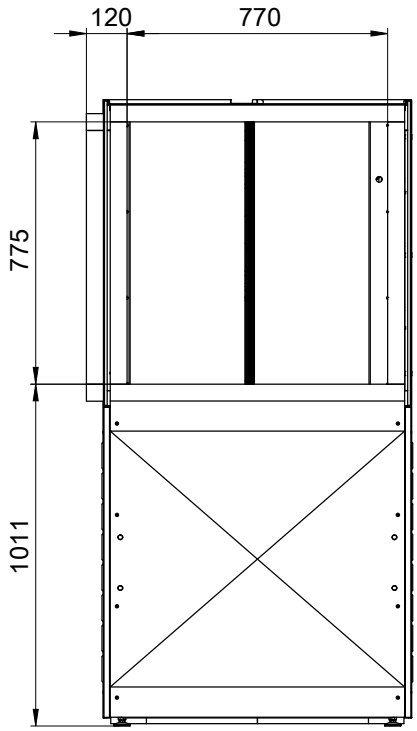
outlet



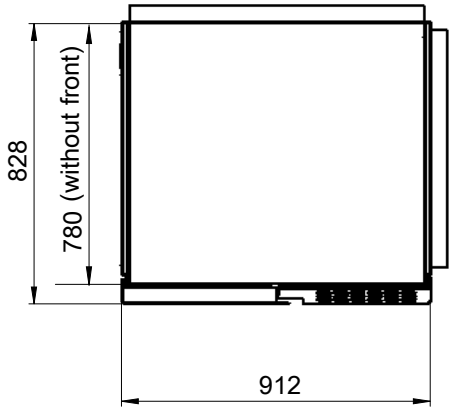
front



inlet



from above



2.2. Technical data

Heatpump type		AERO ILM 2-7	AERO ILM 4-13
Additional model		- without HGL	HGL without HGL
Energy efficiency class		A+ 35 °C / A+ 55 °C	A+ 35 °C / A+ 55 °C
Performance data heating with nominal speed	**Unit**		
Heating capacity at A2°C/W35°C	kW	3.87	7.11
Heating capacity A7°C/W35°C	kW	4.51	8.28
Heating capacity A-7°C/W35°C	kW	2.84	5.50
Power consumption at A2°C/W35°C	kW	0.89	1.73
Power consumption at A7°C/W35°C	kW	0.89	1.74
Power consumption at A-7°C/W35°C	kW	0.86	1.68
COP at A2°C/W35°C	-	4.32	4.11
COP at A7°C/W35°C	-	5.06	4.76
COP at A-7°C/W35°C	-	3.28	3.27
Performance data cooling with nominal speed			
Cooling cpacity at A35°C/W18°C	kW	5.09	9.48
Cooling cpacity at A35°C/W7°C	kW	3.44	6.76
Power consumption at A35°C/W18°C	kW	1.13	2.31
Power consumption at A35°C/W7°C	kW	1.09	2.23
EER at A35°C/W18°C	-	4.50	4.10
EER at A35°C/W7°C	-	3.16	3.03
Sound data according EN12102 [1]			
Outside air inlet - nominal	dB(A)	48	55
Outside air inlet - maximum	dB(A)	55	59
Outside air outlet - nominal	dB(A)	48	53
Outside air outlet - maximum	dB(A)	53	57
Night mode	dB(A)	-2	-2
Indoor - nominal	dB(A)	44	42
Indoor - maximum	dB(A)	49	53
The sound pressure level can be calculated with the iDM-sound calculation tool			
Dimensions HxWxD	mm	1850/910/830	1850/910/830
Tilt hight	mm	2028	2028
Weight	kg	280	295

[1] Sound data with weather shield-grilles, without air hose and without air duct. If the fan speed will be raised, the sound power level raises too.

With the HGL Model, the specified heat output is composed of the heating- and the HGL-heating-output.

Detailed data according the energy efficiency are shown in the appendix.

Heatpump type	unit	AERO ILM 2-7	AERO ILM 4-13
Maximum heatpump flow temperature	°C	62	60
Nominal flow rate heating water (A7°C/W35°C, ΔT=5 K)	m³/h	0.8	1.42
Flow rate heating water (A7°C/W55°C, ΔT=8 K)	m³/h	0.42	0.77
Integrated loading pump		Yonos Para 7.0	Stratos Para 25/1-9
Free residual pressure loading pump at nominal flow rate	kPa	49	77
Pressure loss heating side	kPa	15	11
Flow- and return connections heating side	R	1“ AG	1“ AG
Flow domestic hot water heater or HGL-flow	R	1“ AG	1“ AG bzw. 5/4“ AG
Condensate run-off connection	R	35 mm	35 mm
Maximum operating pressure heating side	bar	3	3
Integrated fan-type		Radialventilator	Radialventilator
Residual pressure at maximum speed [1]	Pa	150	110
Nominal air flow rate (A7°C/W35°C and nominal Compressor speed)	m³/h	1,250	2,200
diameter flexible air outlet hose (accessory)	mm	560	560
Refrigerant		R410A (GWP[3] 2088)	R410A (GWP[3] 2088)
Quantity of refrigerant [2]	kg	3.2	6.2
CO_2-Equivalent [3]	t	6.7	12.9
Minimum size of installation room	m³	7.3	14.1
Quantity of compressor oil (FV50S)	lt.	0.35	1.9
Quantity of compressors	qty	1	1

[1] If the fan speed will be raised, the sound power level raises too

[2] *AERO ILM heat pumps work with the by the Kyoto protocol detected safety refrigerant R410A, with a global warming potential of 2088.*

[3] CO_2-equivalent filling quantity (GWP x refrigerant filling quantity)

Electrical data	unit	AERO ILM 2-7	AERO ILM 4-13
Electrical power supply compressor	V/Hz	1~ 230/50	3~ 400/50
Electrical power supply heating element	V/Hz	3~ 400/50 or 1~ 230/50	3~ 400/50
Electrical power supply controller	V/Hz	1~ 230/50	1~ 230/50
Maximum operating (starting) current of compressor	A	15.8	19.0
Maximum power consumption electric heating element	A	8.7	8.7
Fuse of control supply	A	B/Z 13	B/Z 13
Fuse of electrical heating element	A	if 3~ 400/50 B/Z 13 if 1~ 230/50 B/Z 32	B/Z 13
Fuse of main power supply compressor	A	C/K 16	C/K 20
Maximum operating current of fan	A	0.24	0.5
Maximum power consumption fan	W	56	115

An air/water-heat pump should be dimensioned in such a way that the bivalence point lies between -3 and -10 °C. This guarantees that more than 90 % of the annual heating requirement (Austria, Germany, Switzerland) will be covered by the heat pump.

In dimensioning the system the maximum heating output of the house including the water for domestic use is calculated.

The standard outside temperature is additionally required. This is determined by the geographical location and can be found on the IDM homepage and obtained from various institutions.

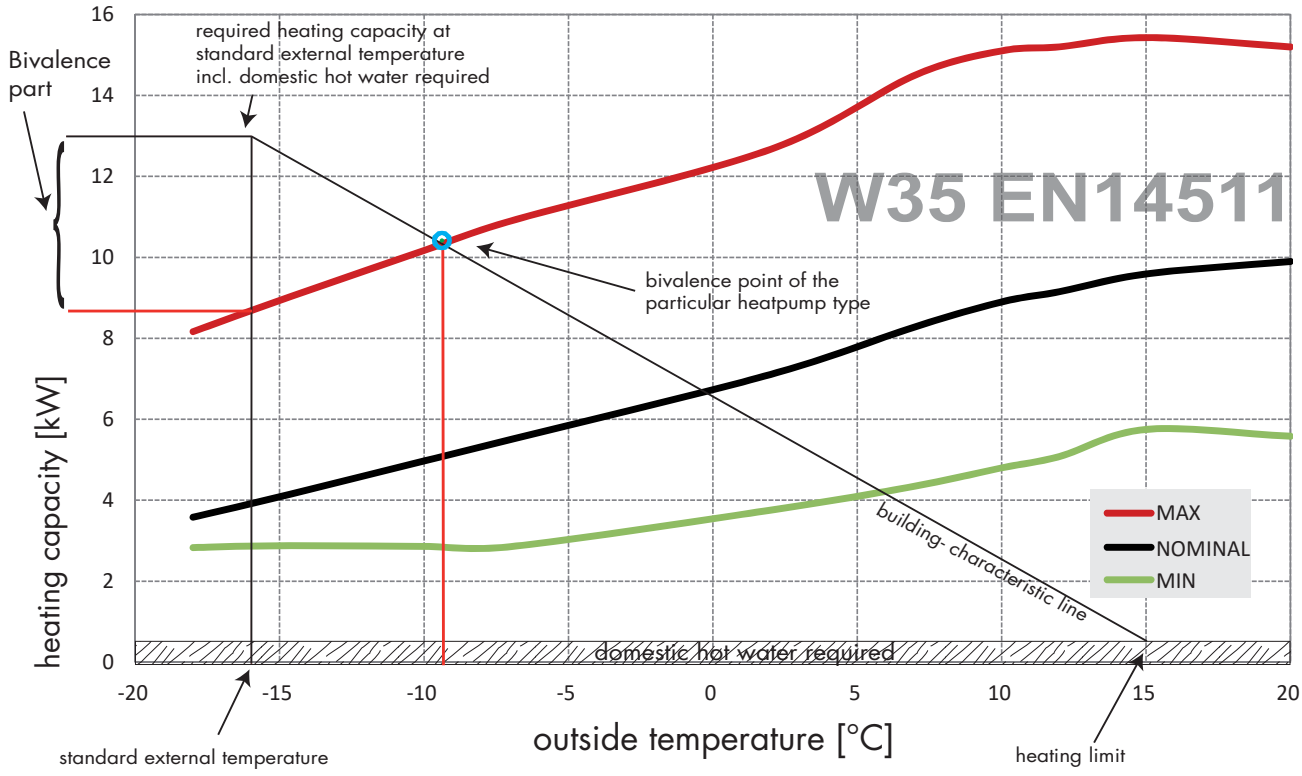
Example:
Detached single-family house in Germany
4 person-household

Domestic water requirements:	4 x 0.25 kW = 1 kW
Heating output requirements	11 kW
Standard outside temperature Germany:	- 16 °C
Off-period factor:	1.1

Heating energy required:

(domestic water requirements + heating output requirements) x off-period factor = 13.2 kW

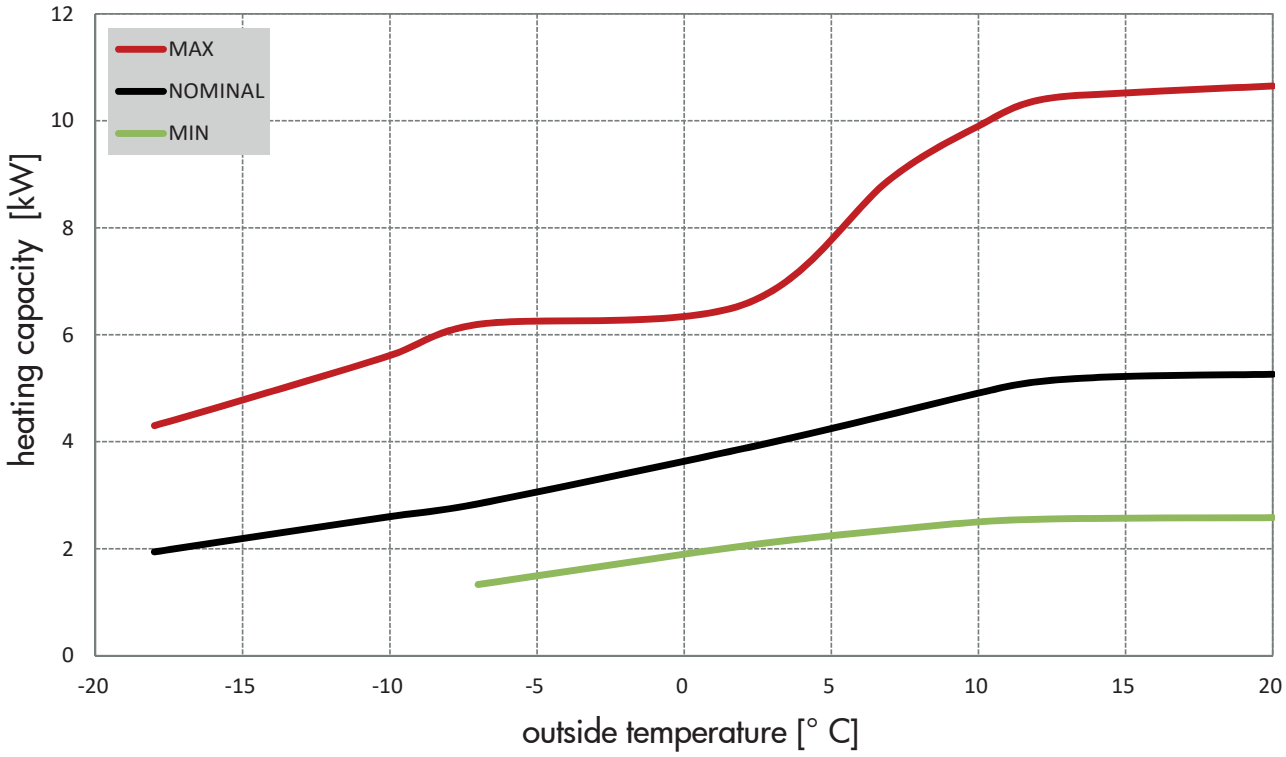
Heating performance diagram AERO ILM 4-13



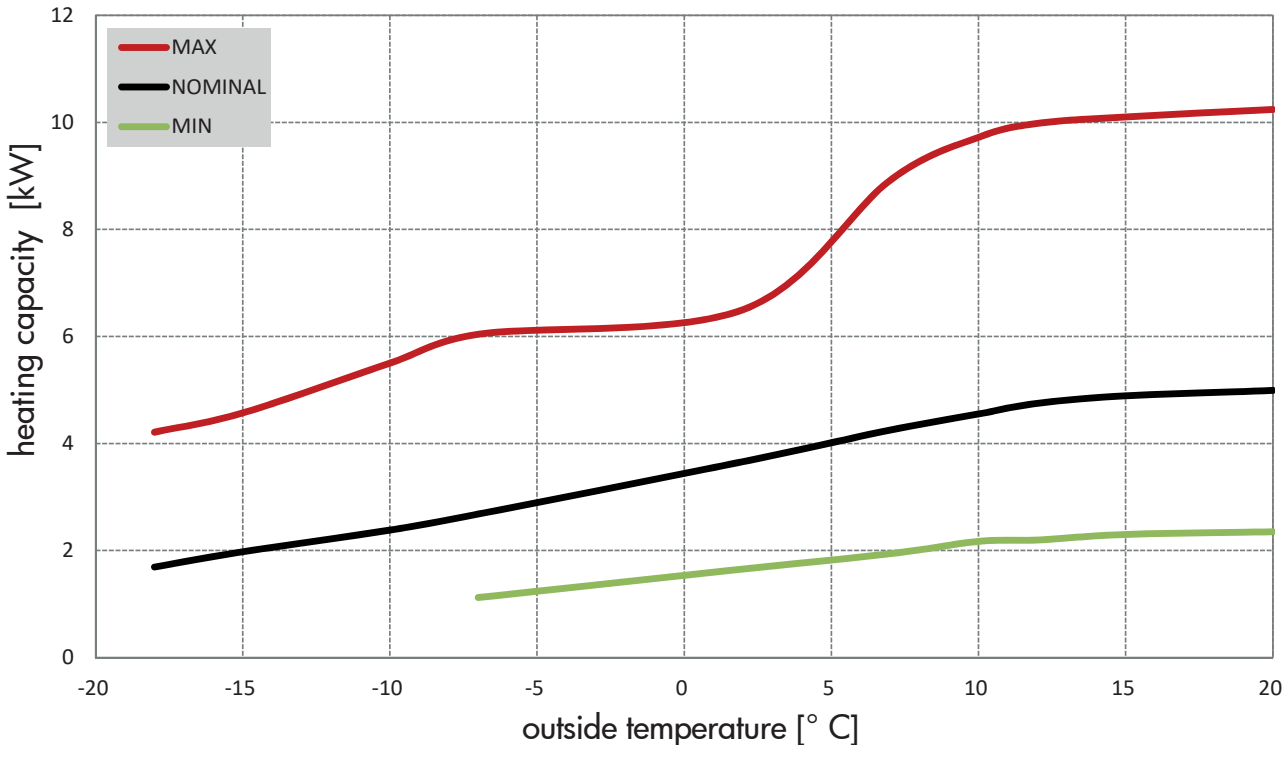
Notes

3.1. Heating performance diagrams AERO ILM 2-7, according EN14511

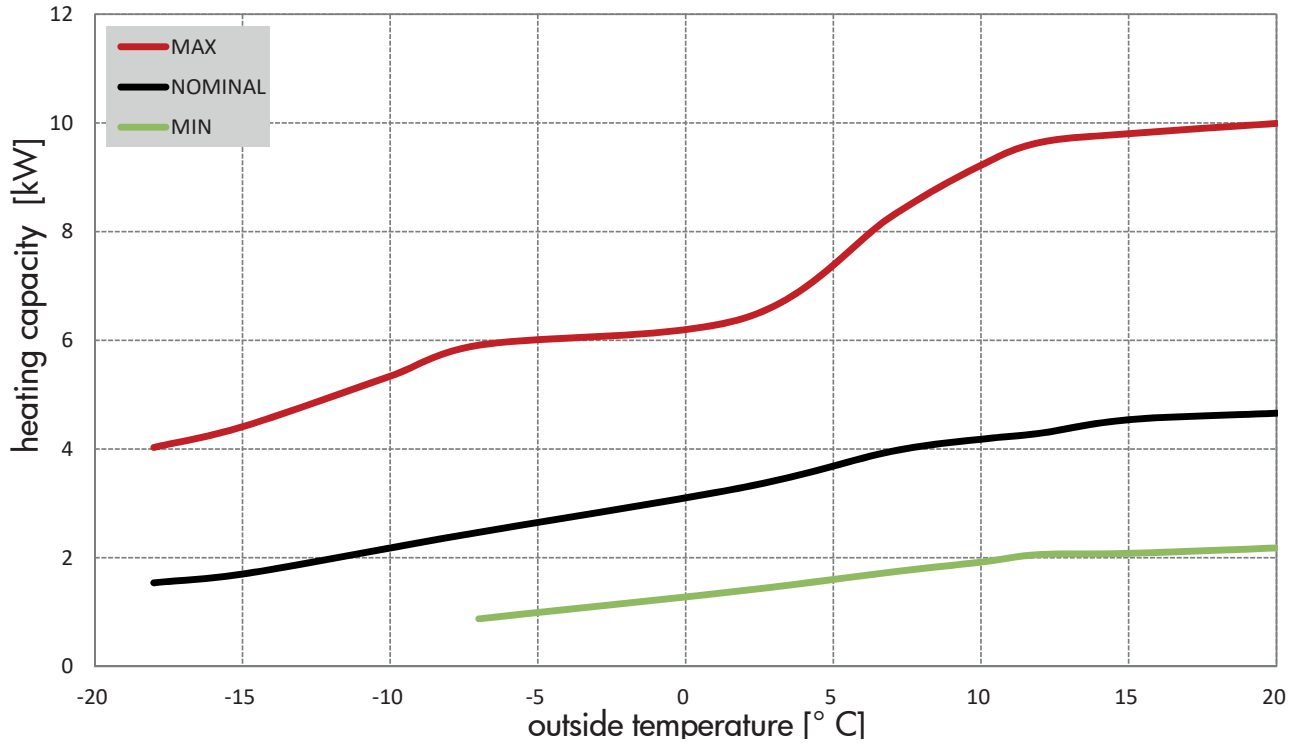
Heat output with flow temperatures of 35 °C



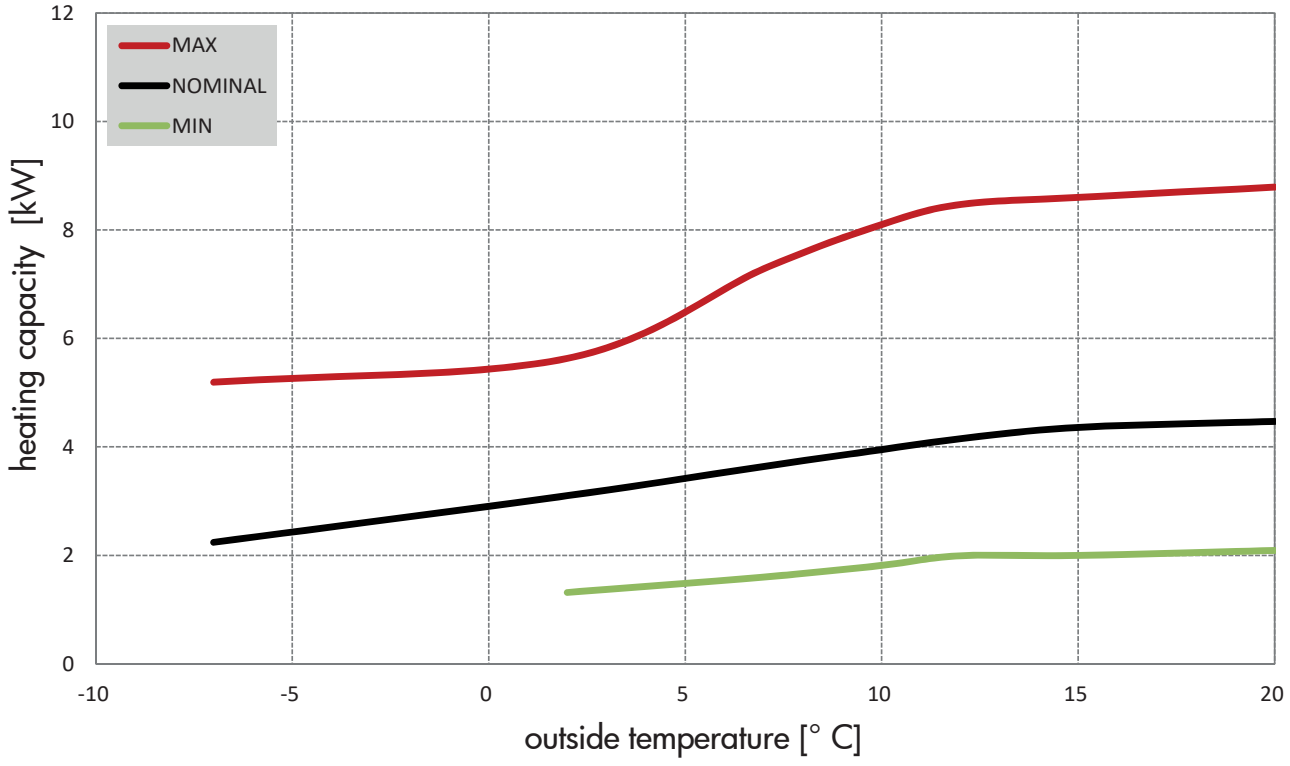
Heat output with flow temperatures of 45 °C



Heat output with flow temperatures of 55 °C

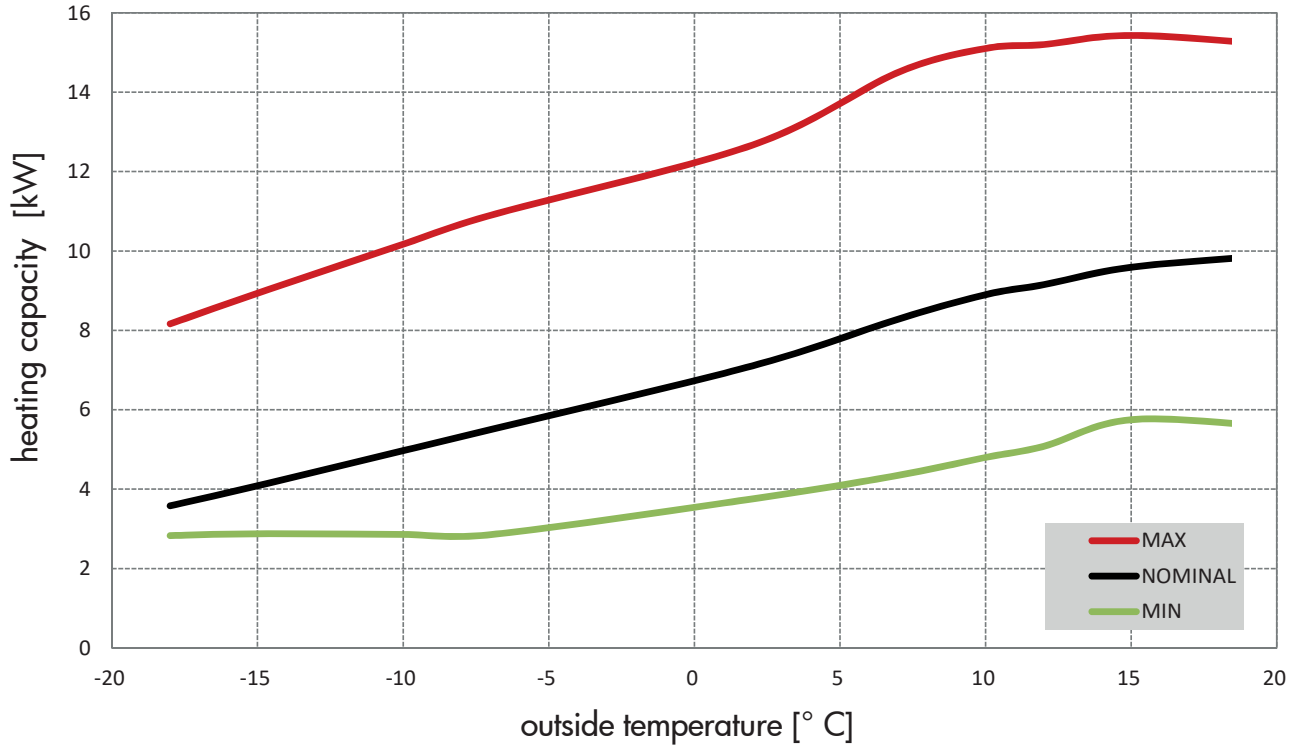


Heat output with flow temperatures of 60 °C

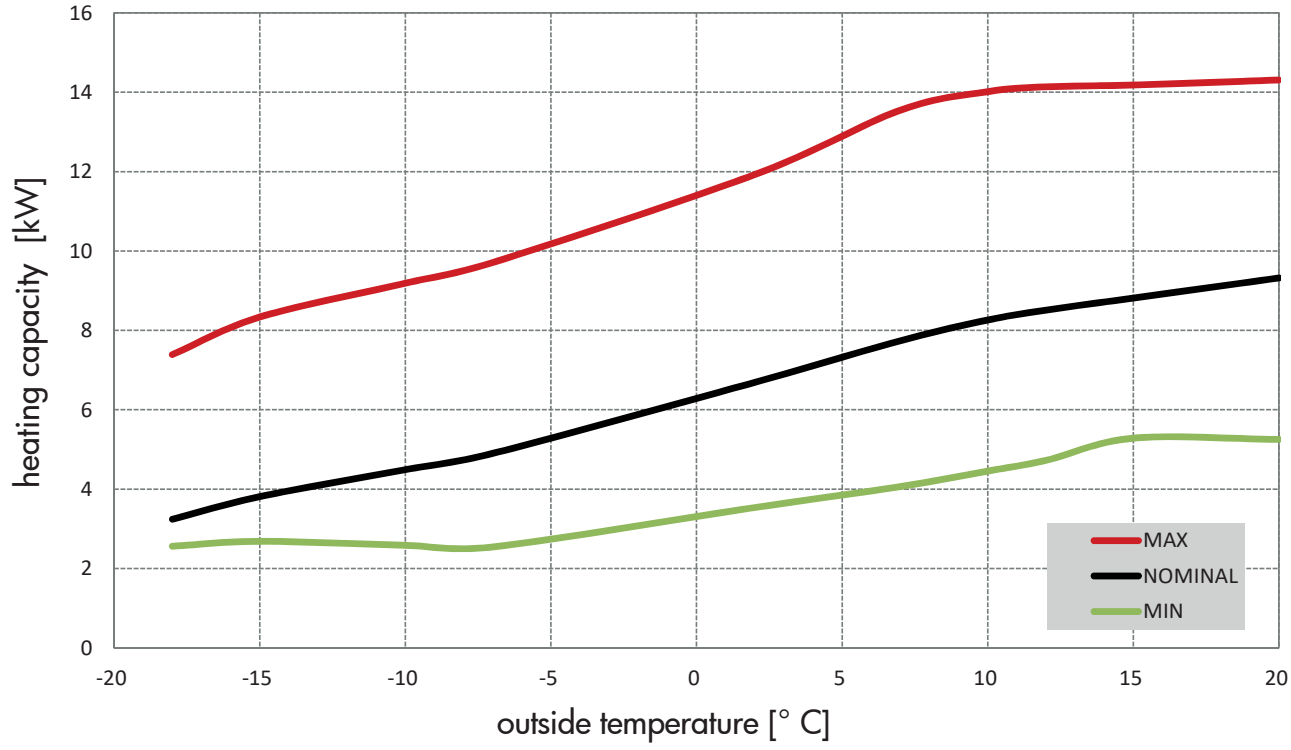


3.2. Heating performance diagrams AERO ILM 4-13, according EN14511

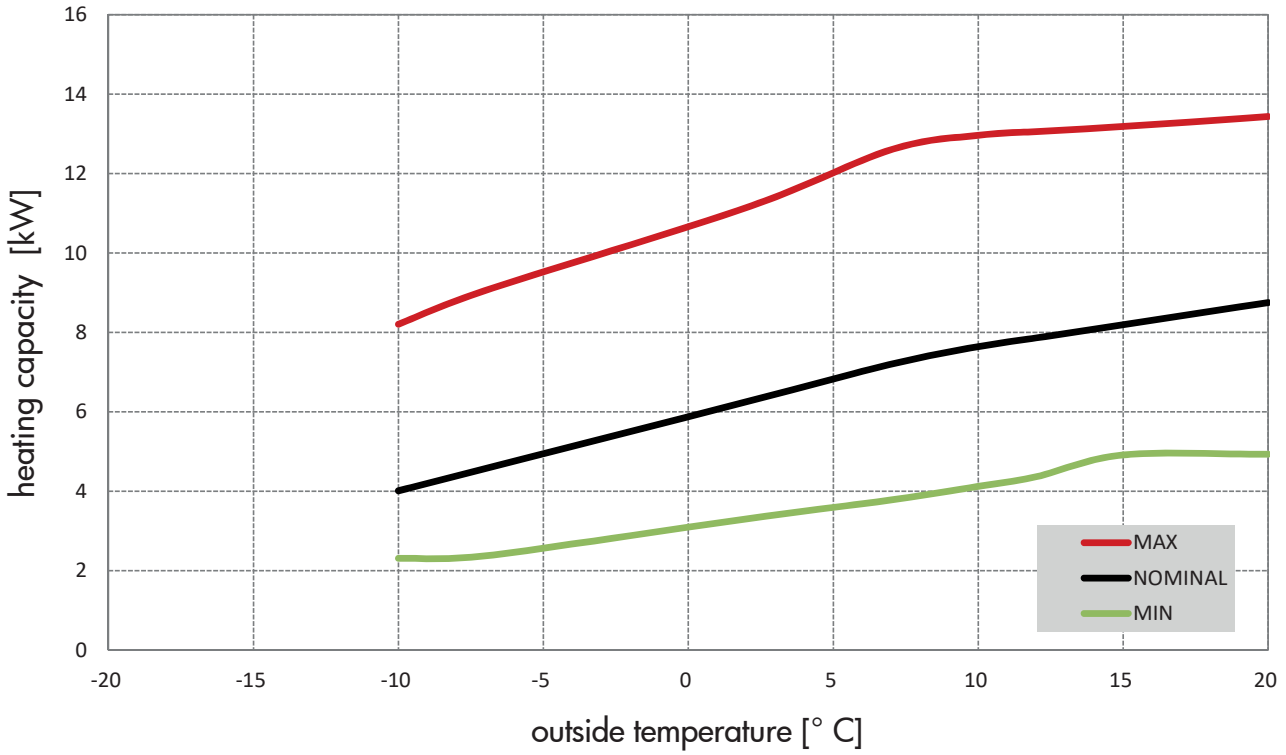
Heat output with flow temperatures of 35 °C



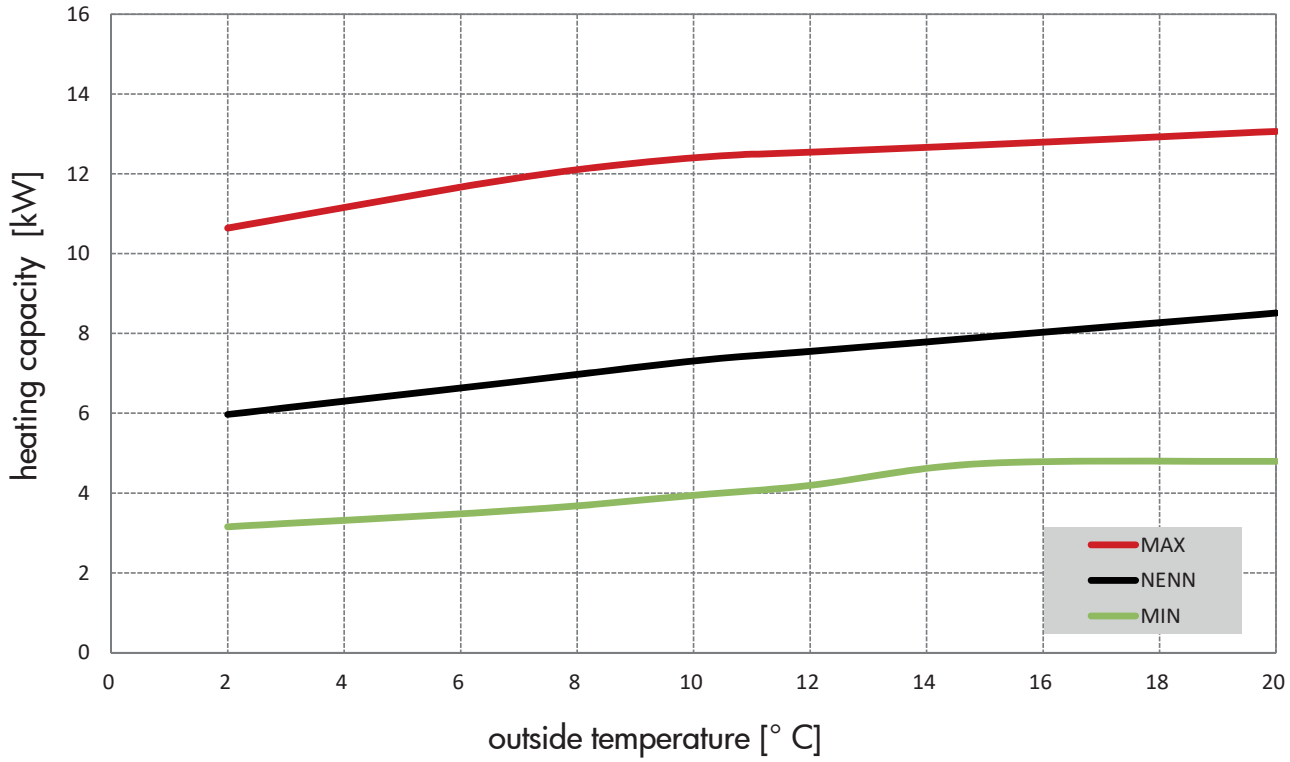
Heat output with flow temperatures of 45 °C



Heat output with flow temperatures of 55 °C

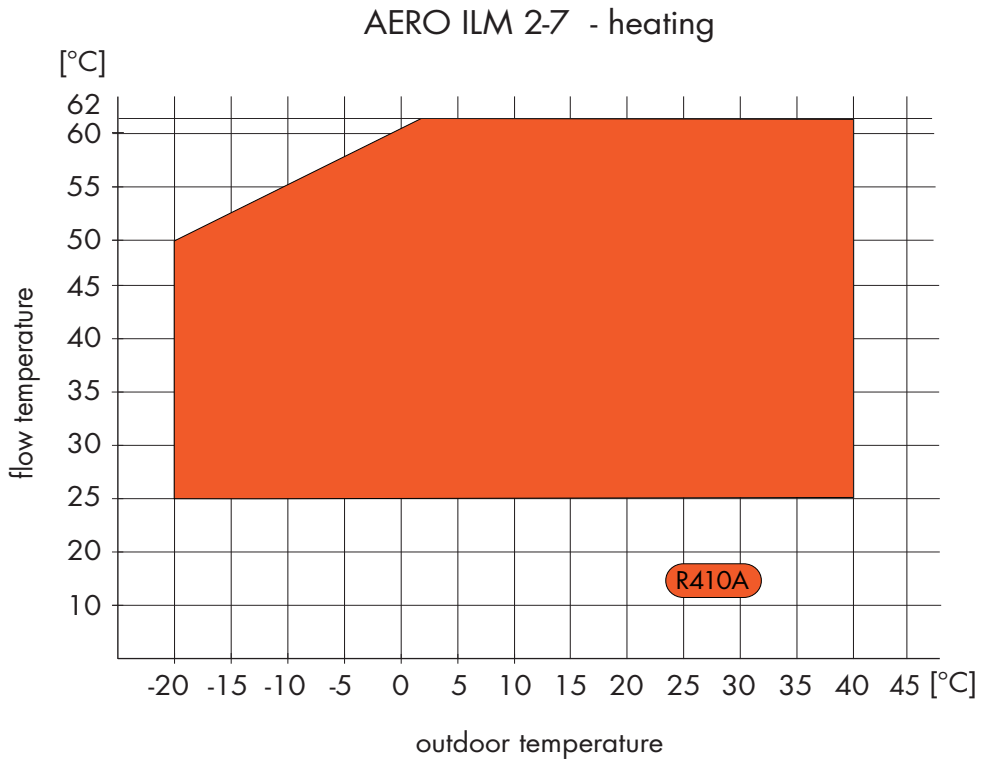


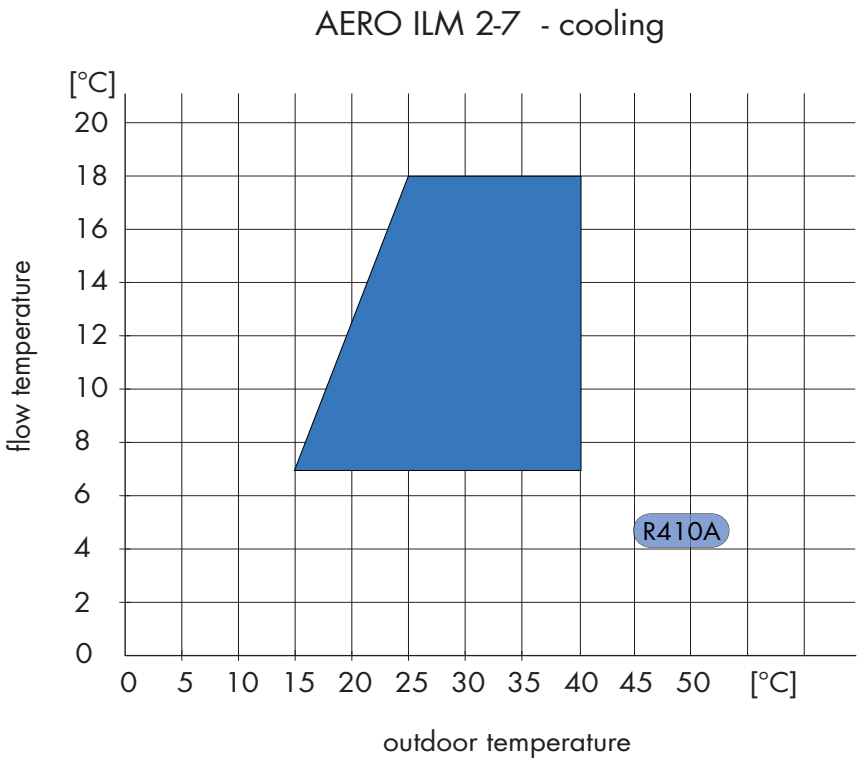
Heat output with flow temperatures of 60 °C



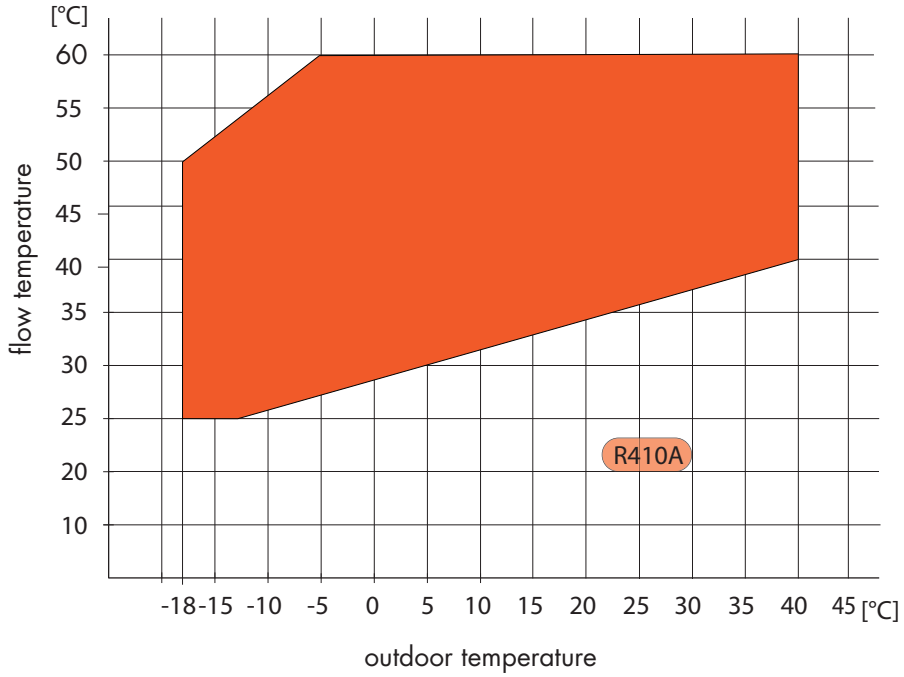
3.3. Limitations of use

The heating of liquids other than heating water is not permitted (see heating water quality). Heat pumps are naturally subject to pressure or temperature-dependent operating limits (see diagram below). Operation outside these limits is not permitted.

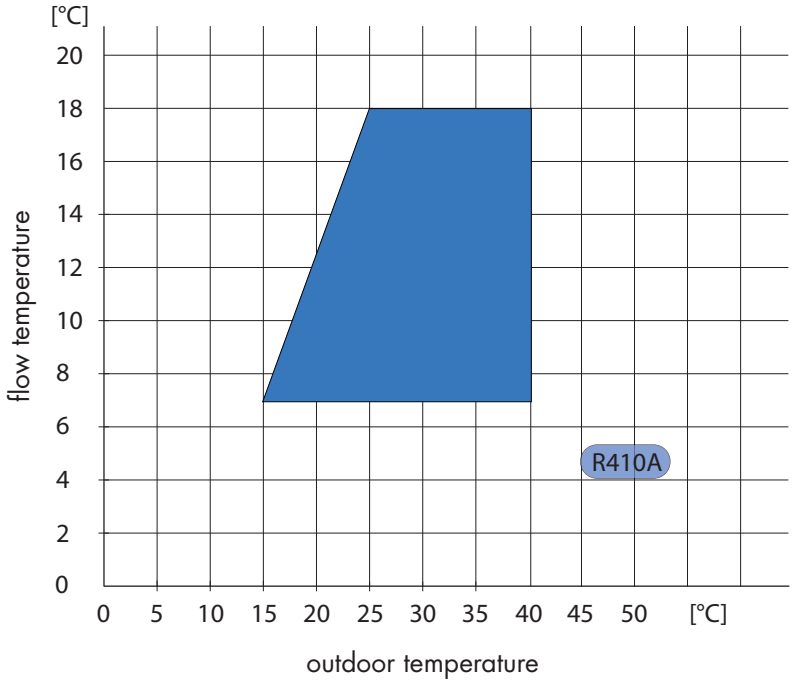




AERO ILM 4-13 - heating

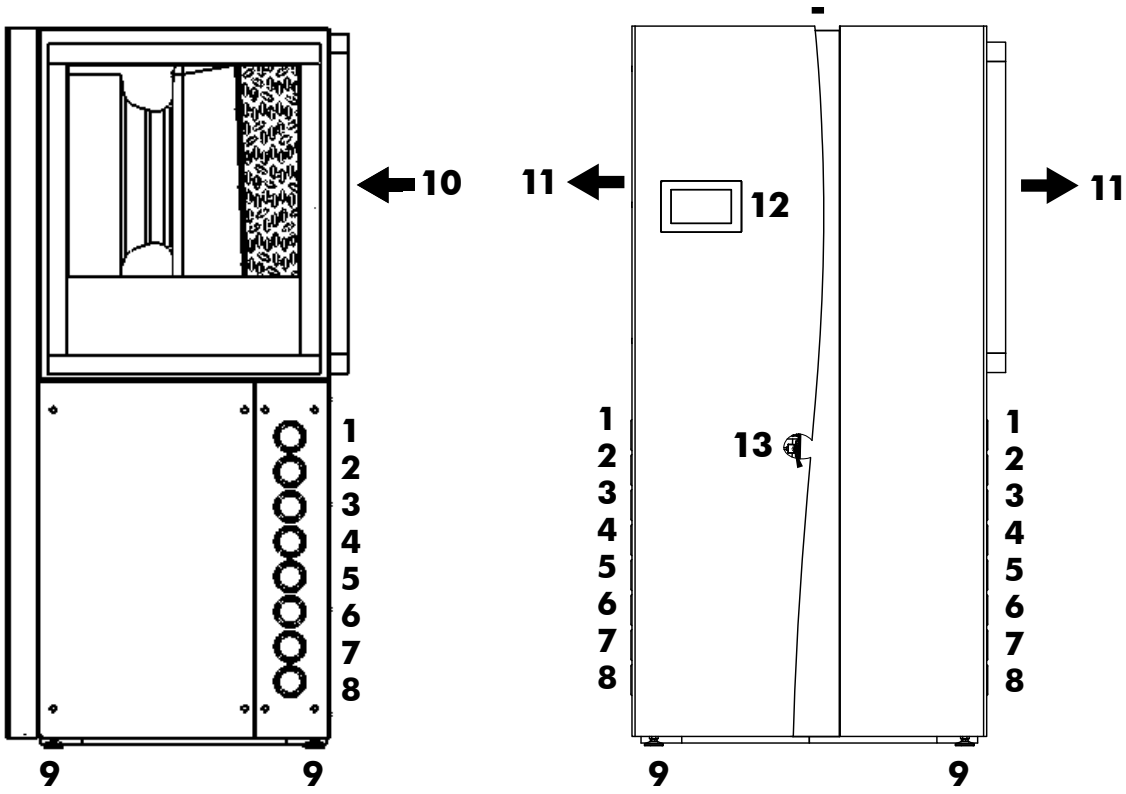


AERO ILM 4-13 - cooling



If the outside temperatures falls below or exceeds the application range , the heat pump turns off. If a bivalence system exists and is configured in the Navigator, the bivalence will start.

4. Connections and cable ducts



ducts AERO ILM HGL

1	HGL-flow for domestic hot water heater (flex. connection hose)
2	HGL-return (only for HGL-usage in cooling mode)
3	not used
4	Condensate run off
5	Heat pump flow (flex. connection hose)
6	Heat pump return (flex. connection hose)
7	Main current
8	Sensor and control lines
9	height-adjustable feet (50 mm)

ducts AERO ILM

1	not used
2	Flow domestic hot water heater (flex. connection hose)
3	not used
4	Condensate run off
5	Heat pump flow (flex. connection hose)
6	Heat pump return (flex. connection hose)
7	Main current
8	Sensor and control lines
9	height-adjustable feet (50 mm)

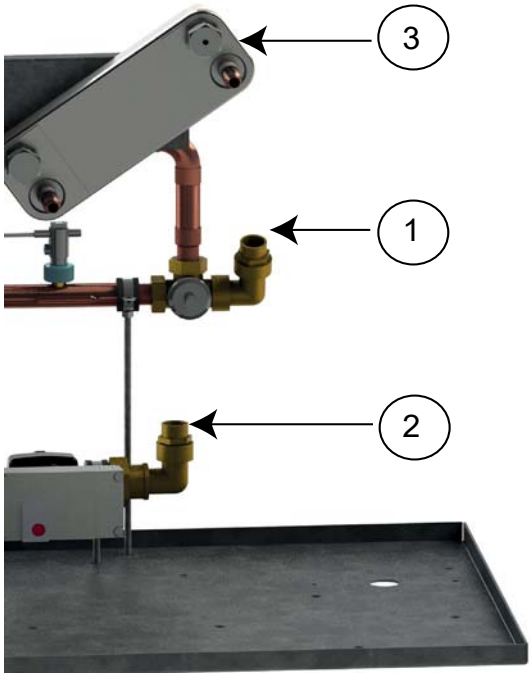
4.1. Cable and piping ducts

The hydraulic and electric connections can be accomplished on the left-hand side or on the right-hand side.

The 3 flexible connection hoses enclosed are connected as shown in the diagram and led through the protective sleeve provided. The electric cables are also connected as shown in the diagram.

4.2. Hydraulic connections to the heat pump

AERO ILM HGL

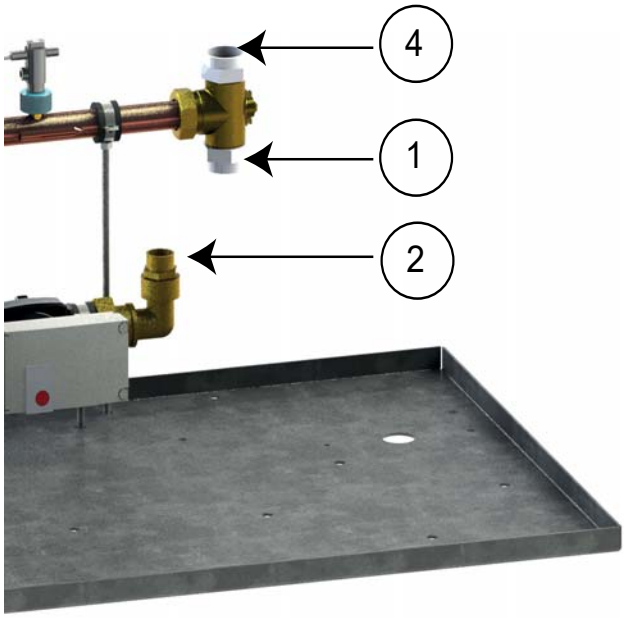


1 ... heat pump flow

2 ... heat pump retur

3 ... HGL-flow
(backside of HGL-condenser)

AERO ILM (without HGL)



1 ... heat pump flow

2 ... heat pump retur

3 ... flow domestic hot water heater

5. Installation

5.1. Installation instructions

The AERO ILM (HGL) is only designed for interior installation. By installing this system in the interior the expenses for frost protection and condensation run-off heating can be reduced. There are various installation options to ensure that the inlet air / outlet air is fed to the heat pump with a minimum loss. These are described in detail in the following chapters.

All components of the heat pump are insulated in such a way to ensure that even in the event of outlet temperatures of -22°C no condensed water develops on the outer parts. It is nevertheless recommended to ventilate the room regularly.

The heat pump is decoupled by a vibration dampers. The installation location must have a solid surface. The heat pump can be leveled by the 4 height adjustable feet (up to 50 mm).

2 pieces of insulating mat are also included in the delivery contents with the heat pump in order to avoid noise. These 2 mats are placed under the heat pump. They are both furnished with 2 openings for the adjustable feet of the heat pump.

The effective noise pressure level at the installation location depends on various factors, such as room size, absorption capacity, reflection, unobstructed sound propagation etc. It is therefore important to ensure that the heat pump is installed, if possible, beyond the noise-sensitive area. The heating room should be furnished with a sound-insulating door.

In coastal installation, a minimum distance of 5 km from the coast must be observed. If this safety distance is not observed, there could occur increased corrosion. These cases are excluded from the guarantee.

5.2. Heating connections

The heating connections must be installed with a flexible hoses which are included as a standard.

5.3. Condensation run-off

Air source heat pumps generate condense water during operation. Per defrosting cycle, i.e. within 2 minutes up to 10 l of condensate can accumulate. The factory-provided and pre-mounted condensate run-off must be laid on site into the sewage drain and must be checked regularly for contamination. See chapter connections and cable ducts

If the run-off, of the condensation water is not possible properly, damage to the heat pump itself and water damage to the building can occur.

To prevent water damage, the condensate bin and the condensate hose have to be checked regularly for contamination.

Even when installing with light shaft, the condensate drain must be checked for contamination. The discharge hose can be separated from the run-off bin by opening the hose clamp. This allows to inspect and clean the bin and the hose.

5.4. Air duct

The air duct on the inlet side must always be led through the wall. The air duct on the outlet side can either be led directly through the wall, or via an air hose (see accessories). The wall openings have to be performed as described later on in this document. Only if the appropriately dimensioned connection elements are used, can an efficient and error-free operation be guaranteed.

Air inlet and air outlet can be performed via an air hose in various different ways. The following list contains rules and regulations for the configuration:

- The air inlet side and the air outlet side should, if possible, be performed on two different sides of the building.
- If the air intake side and the air outlet side are designed on the same side of the building, an air short-circuit must be prevented by a structural separation.
- Wall openings have to be protected against foreign matters (foliage, small animals) from penetrating. Mesh grilles and protective grating must be installed in light shafts and on visible walls. The mesh size of these grids is 12 mm.
- The wall openings must be insulated according to specifications using a closed porous insulating material (density 50 mm) to prevent a penetration of humidity.
- If the light shafts are too small that will increase the pressure loss in the air duct. It is therefore necessary to ensure that they are sufficiently dimensioned!
- Light shafts must be equipped with a rainwater run-off!
- On the air outlet exists an increased risk of frost. Rain pipes, water-carrying pipes or water-carrying containers must not be located next to the outlet side.

5.5. Acoustic evaluation

Sound-power-level

The sound power is the sound energy per second emitted of a noise source. The sound power level is specific to the source of sound, independent of distance and direction and enables an easy comparison of different sound emitting devices. The sound power can only be determined via mathematical calculation according to international standards of the series ISO 3740 - based on sound pressure level measurements - as well as ISO 9614, which is based on the measurement of sound intensity. The sound power level of the heat pumps can be found in the technical specifications.

Sound-pressure-level

In contrast to the sound power level, the sound pressure level, which is caused by a noise source can be measured. The measured sound pressure is dependent on the distance from the noise source and the receiver location (geometrical divergence) as well as the local conditions. As the sound pressure level is a measure of the loudness of noise sensed by humans, the legislation defines limit values, that must not be exceeded.

Sound-propagation-outdoor

With increasing distance from a point noise source, the sound power is distributed on an increasing area due to spherical spreading. Therefore, the sound pressure level is continuously decreasing with increasing distance from the noise source to receiver location. Doubling the distance leads to a reduction of the sound pressure level of 6 dB(A). Besides the distance from the installation site of the heat pump the sound, the installation situation and local conditions also have significant impact on the resulting sound pressure level at the relevant place of immission.

Major factors of influence are:

• sound attenuation by massive barriers e.g. buildings, walls or different terrain.
• reflection on acoustically hard ground e.g. glass facade and stone surfaces
• attenuation due to sound absorbing porous surfaces e.g. grass, trees
• reinforcement/reduction of by wind speed/direction

Noise-Immission

The noise caused by an source at a certain place is expressed as Immission, the corresponding sound pressure level is called Immission level.The immission level at the relevant place of immission can either be determined by measurements or calculation e.g. forecasting method according „TA Lärm“ (German Noise Prevention Code) especially, which is especially useful at the stage of planning.

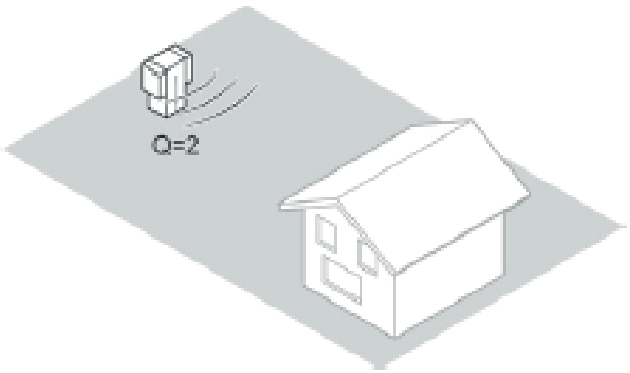
According to this method of calculation, the expected sound pressure level is calculated on the basis of the sound power level of the heat pump, the distance of the heat pump to the receiver location and the installation situation (directivity correction Dc) of the relevant place of immission according the following formula:

$$L_{Aeq(sm)} = L_{WAeq} + D_C - 20 \cdot log(s_m) - 11\ dB$$

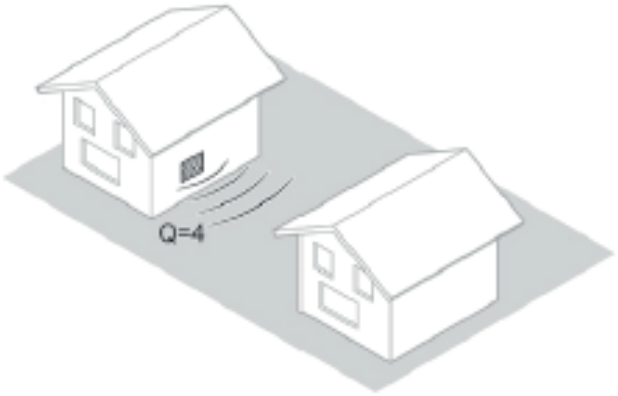
L_{WAeq} = mean A-weighted sound pressure level [dB]
D_C = directionality correction [-]
S_m = distance from noise source to receiver location [m]

The following figures show the different installation situations of heat pumps and the corresponding directivity correction.

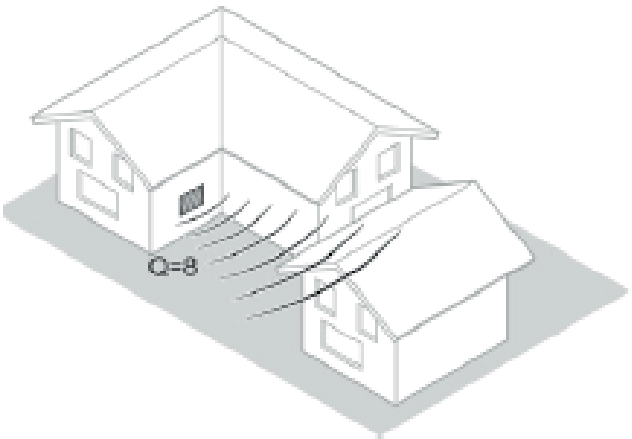
1: Spherical spreading into 1/2 space



2: Spherical spreading into 1/4 space



3: Spherical spreading into 1/8 space:



Relevant place of Immission

The sound immission have to be determined 0.5 m in the middle in front of the open window (outside the building) of the most affected rooms, which need particular protection. According DIN 4109:1989 rooms needing particular protection are:

- living- and bed rooms
- children rooms
- work spaces/offices
- classrooms/seminar rooms

Rating level Lr

The rating level corresponds to an equivalent continuous sound pressure level associated with a specific period. The rating level is determined for both rating periods „day“ (6am-10pm) and „night“ (10pm-6am) separately. The operation time of the heat pump has particular impact on the resulting equivalent continuous sound pressure level. Reducing the operation time from 16 h per day to 4 h per day the rating level is reduced by 6 dB(A).

But the equivalent continuous sound pressure level alone is not sufficient in order to determine the disturbing effect of noise. In general noise is perceived very disruptive, if individual tones are clearly discernable or the noise is irregular (impulsiveness). These noise characteristics will be taken into account by applying a surcharge. Additionally, daytimes with increased sensitivity are taken into consideration. According the „TA Lärm“ the following corrections are applied:

information incorporation	0.3 or 6 dB
impulsiveness	0.3 or 6 dB
daytimes with increased sensitivity	6 dB

The rating level Lr shall be obtained by summing the calculated immission level and the applied corrections of the specific periods.

Finally, the determined rating level can be compared with legal limit values (e.g. „TA Lärm“).

Standard Immission Values (SIV) - relevant place of immission outside the building:

Territory	SIV-day	SIV-night
Industrial area	70 dB(A)	70 dB(A)
business park, commercial areas	65 dB(A)	50 dB(A)
village areas and mixed areas	60 dB(A	45 dB(A)
settlement area	55 dB(A)	40 dB(A)
residential area	50 dB(A)	35 dB(A)
spa area, hospitals	45 dB(A)	35 dB(A)

In case of sound propagation inside buildings or structure-borne sound transmission the Standard Immission Values for the rating level of rooms needing particular protection are as following:

SIV - day: 35 dB(A)
SIV - night: 25 dB(A)

For the calculation of the rating level according „TA Lärm“ a calculation tool is provided at the homepage: http://www.idm-energie.com

Tips for the installation of heat pumps

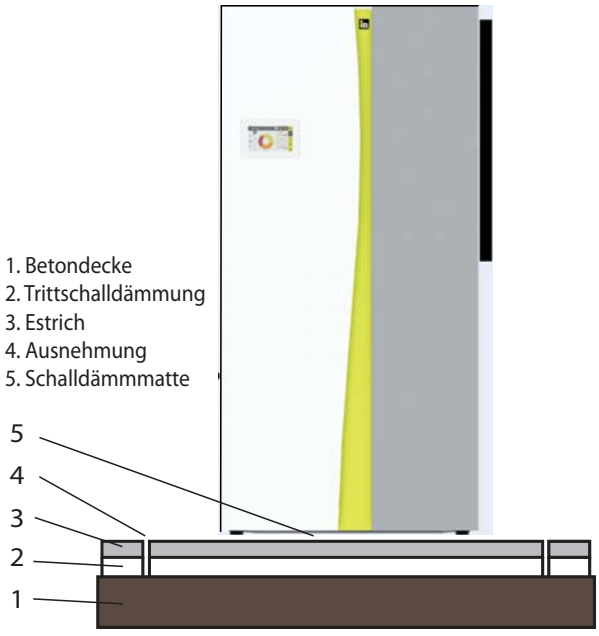
- Sound reflections areas should be kept as low as possible
- The installation on acoustically hard ground and areas with depression in the terrain should be avoided
- The distance from the heat pump and the relevant place of immission should be as big as possible
- In case of outdoor installation the blow out of air in direction to the neighbour or relevant receiver location should be avoided
- The airflow should not be blown directly against walls as sound reflections lead to increased sound pressure levels accordingly.

The following shall be taken into account:

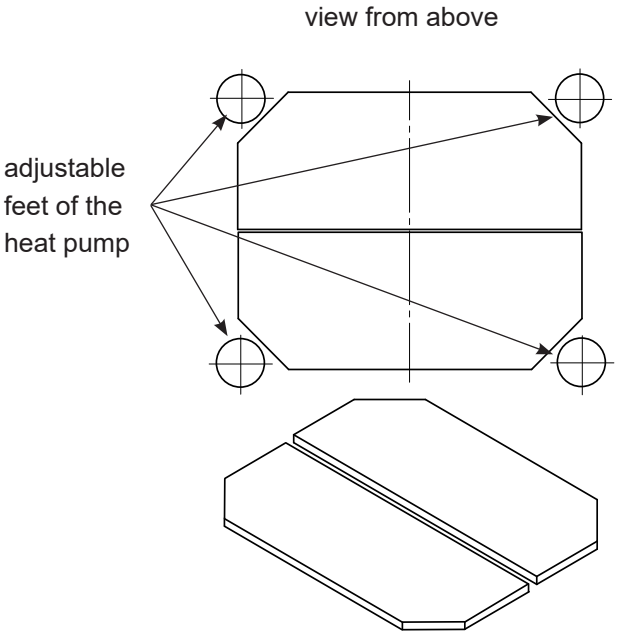
- Occurring obstructions and their effect
- Object reflections
- Ground reflections
- Absorption caused by plants
- Effect of wind and temperature layers

5.6. Decoupling of buildings

If vibrations of the heat pump are transmitted via floors, ceilings, walls or other solids, this is referred to as structure-borne noise. In order to minimize this in, heat pumps should be decoupled from the structure in so far as possible. The installation of heat pumps on ceilings or floors in lightweight construction should be principally avoided. In the case of floating floor screed the floor screed and impact sound insulation should be omitted around the heat pump (as shown in the illustration).



To the heat pump are enclosed two sound insulation mats. If the heat pump is at the final installation site, the mats must be placed under the heat pump. For this purpose, the four feet can be adjusted in height.



5.7. Installation location

- The heat pump has to be installed in a frost-proof room! (room temperature must lie between 5 °C and 25°C!)

- In order to minimize oscillations and sounds within buildings, heat pumps should be decoupled as far as possible from the building mass. It is principally recommended to avoid installing heat pumps on ceilings and floors in lightweight construction. In the case of floating floor screed, floor screed and impact sound insulation should be omitted around the heat pump.

- The installation in wet or damp environments or in areas exposed to dust or explosion hazards is non-permissible.

- If refrigerant escapes from the installation site, this must not enter adjacent rooms, stairways, yards, corridors or drainage systems and a hazard-free drainage must be ensured.

- In the case of danger, leave the installation site immediately.

- If the size of the installation site falls below the requested minimum size, this has to be designed as machinery room in compliance with EN 378.

- If the emergency ventilation is not sufficient, mechanical ventilation must be provided. A mechanical ventilation shall be installed with an independent emergency control beyond the installation site and near the door to that area.

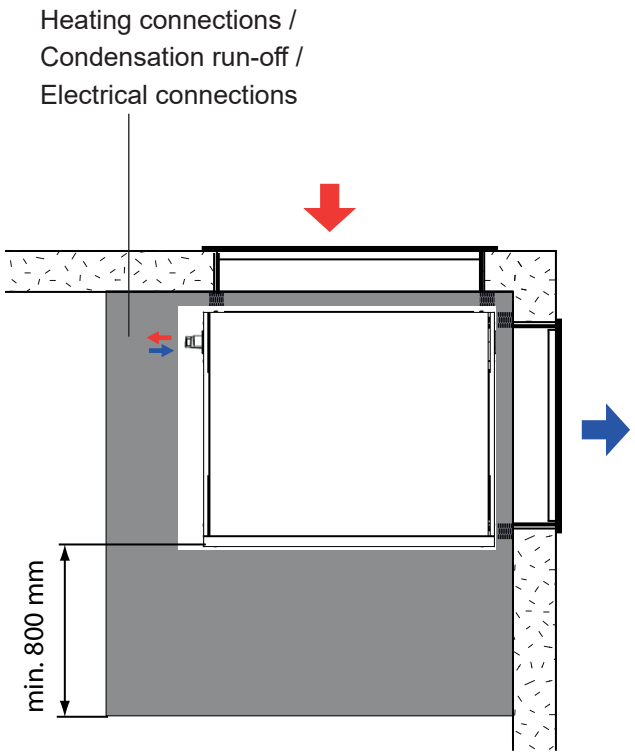
- Heat pumps must not be installed in rooms with high EMC load!

- Air intakes and outlets have to be safeguarded against theft by appropriate on-site measures.

5.8. Space requirements and accessibility

In order to guarantee maintenance and operation of the heat pump, a minimum distance of 800 mm has to be observed on the front side (for operation and maintenance).

By observing this distance an unobstructed system maintenance and operation can be guaranteed.



Opposite the outlet opening in the heat pump the pre-installed condensate hose must be positioned to drain off condensate. For this purpose a drainage must be provided.

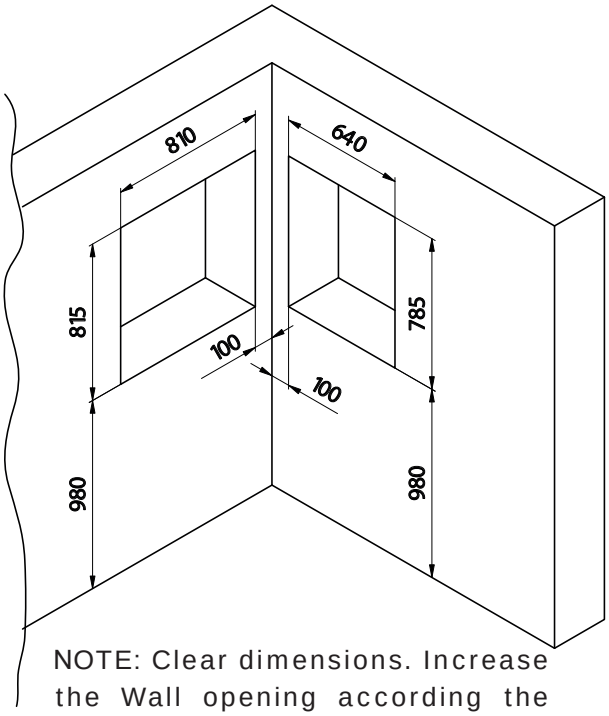
5.9. Corner installation

Optimum results are achieved if the heat pump is installed in a corner! The wall openings can be implemented by the building contractor. The wall openings must be insulated with closed porous insulating material (density 50 mm).

5.9.1. Preparation on the construction side - clearance dimensions

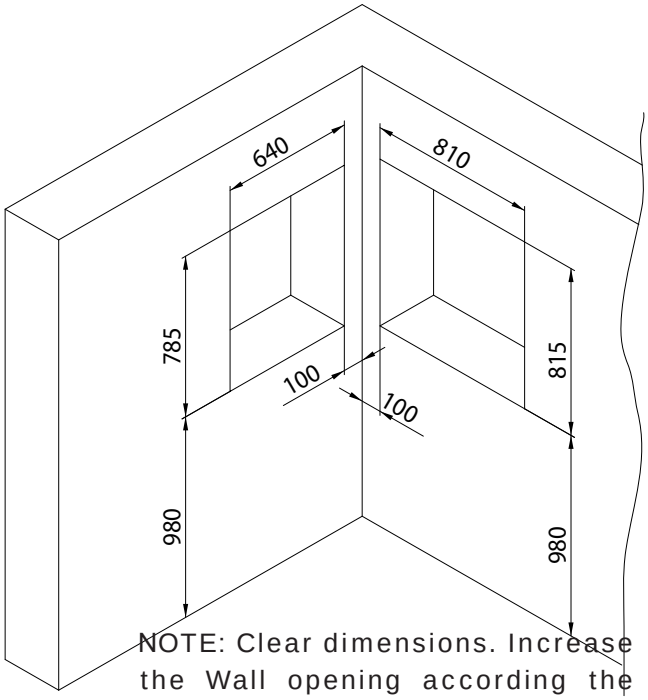
A plane and firm assembly space must be selected. After positioning the heat pump it has to be leveled. Adjustable feet under the heat pump are provided for this purpose.

Outlet opening to the right



NOTE: Clear dimensions. Increase the Wall opening according the insulation.

Outlet opening to the left



NOTE: Clear dimensions. Increase the Wall opening according the insulation.

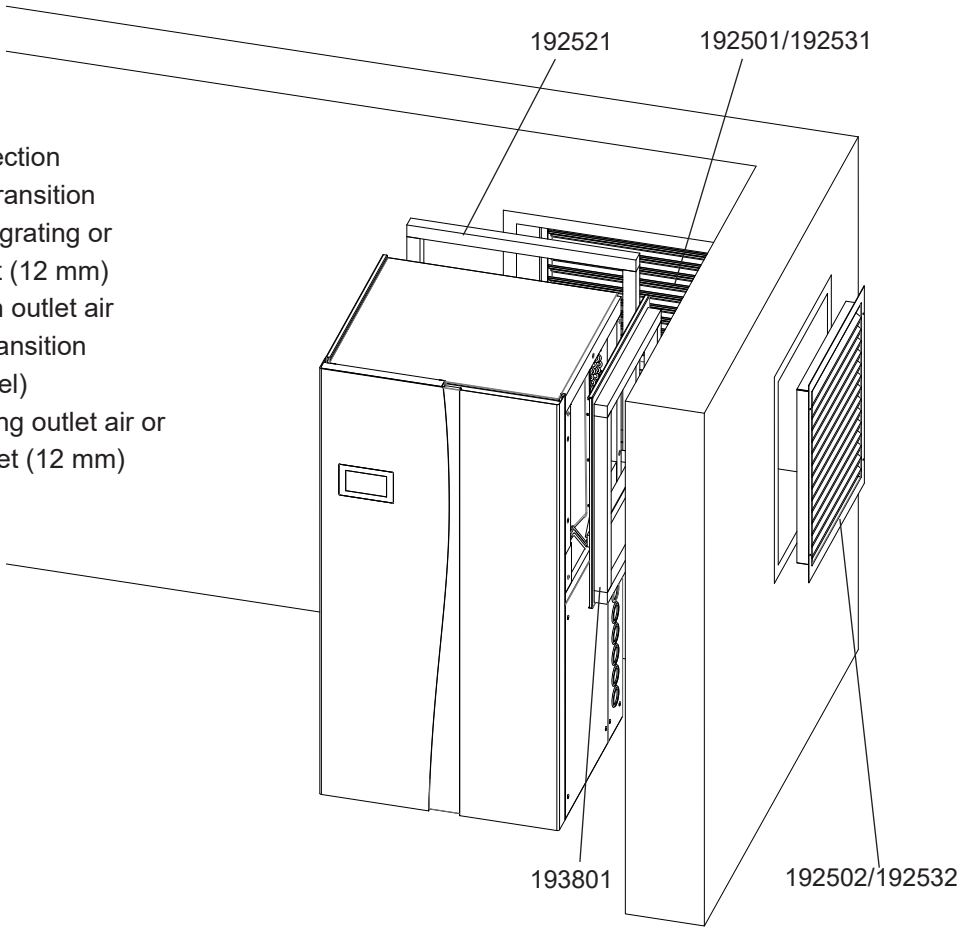
The dimensions specified are clear dimensions. Ensure that the wall opening is 50 mm larger around the wall insulation.

To facilitate accessibility the outlet opening on the right-hand side should be given preference!

When using a light shaft this must be at least as wide as the wall opening. The depth must be at least 400 mm.

5.9.2. Accessories for corner installation

192521 ... Wall inlet connection
for water-tight transition
192501 ... Protective inlet grating or
192531 ... Mesh grille inlet (12 mm)
193801 ... Wall connection outlet air
for watertight transition
(incl. outlet panel)
192502 ... Protective grating outlet air or
192532 ... Mesh grille outlet (12 mm)



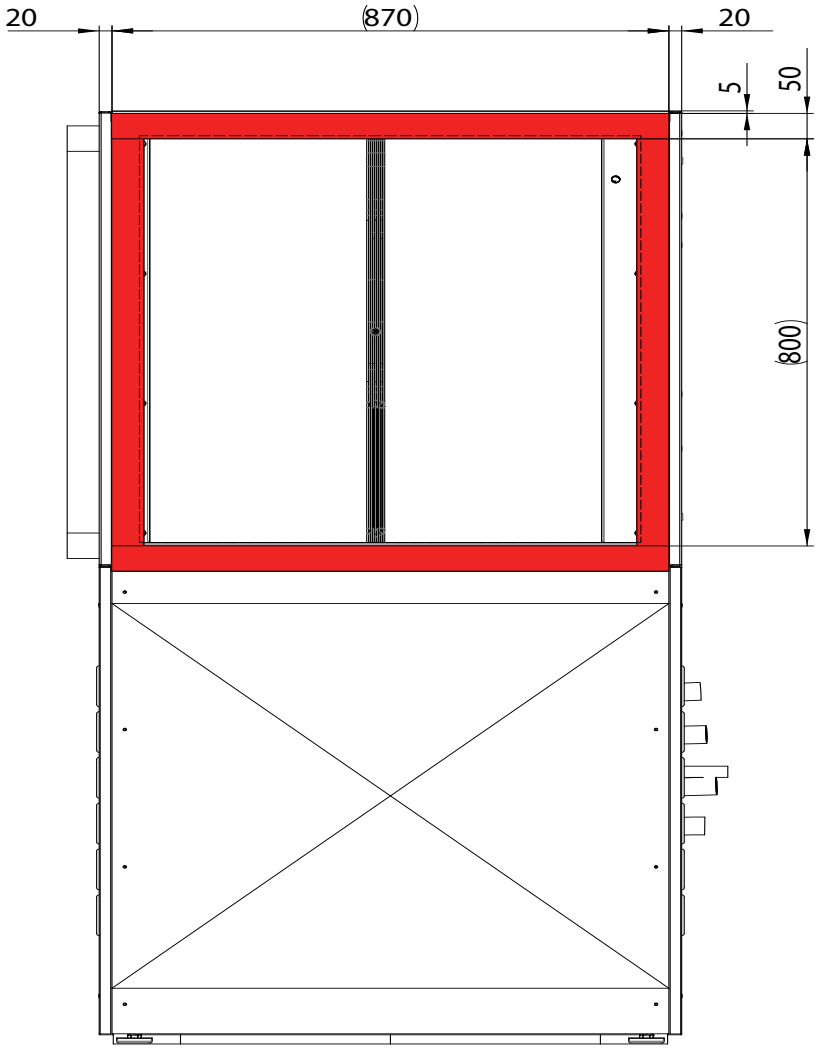
Only move the heat pump with mounted panels!

Avoid intensive pressure against the wall!

5.9.3. Assembly instructions air inlet

The wall connection set on the inlet side consists of 4 rubber strips. These are included in the delivery contents as loose items! First affix the vertical connection elements. Remove the foil on the rear side. The rubber strips must be affixed so that they are flush with the factory-mounted cellular rubber on the inner side of the frame so that the surround the frame.

The horizontal elements are principally laminated on the front side. This guarantees an optimum leak tightness!



The bottom horizontal cellular rubber has to be affixed and flush with the projection on the condensate collecting tray. The remaining cellular rubber strips have to be affixed and be flush with the cellular rubber on the inner side! The metal frame is thus surrounded completely with insulating material and cold bridge free!

5.9.4. Assembly instructions air outlet

The wall connection site on the outlet side consists of the outlet panel and the already affixed cellular rubber to ensure a watertight transition on the outlet side.

The outlet panel is equipped with a trapeze-shaped insulation with adhesive tape on both sides. This has to be affixed on the evaporator side (to the left or to the right) to the panel.

Example outlet side on the right

The outlet panel is mounted to the desired side using the 4 screws which are included in the delivery contents.

The screws on the panel have to be carefully tightened manually.

The panel opposite the outlet side is also equipped with a trapeze-shaped insulation with adhesive tape on both sides. This insulation has to be affixed on the condenser side.

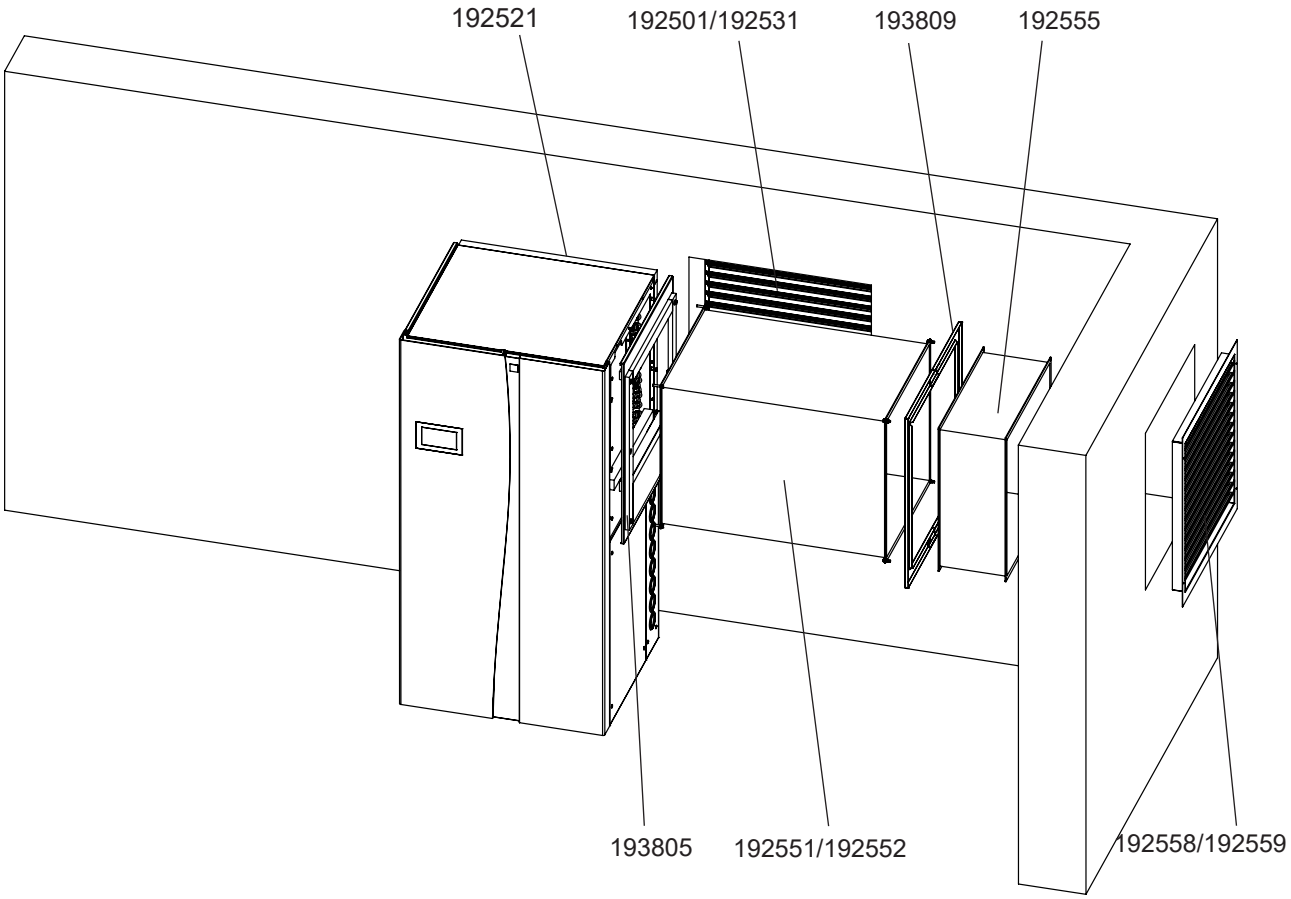
Example of outlet side o the right

Before positioning the machine in the corner, it is necessary to check whether the wall opening has been insulated by the building contractor with a 50 mm insulation. The machine can then be positioned in the corner.

If there is any gap at the outlet or inlet opening due to any floor unevenness, this can be corrected using the adjustable machine feet.

5.10. Installation with a straight air duct

This variant is similar to the corner installation and can be used if the direct corner installation without channels from on-site conditions can not be implemented.



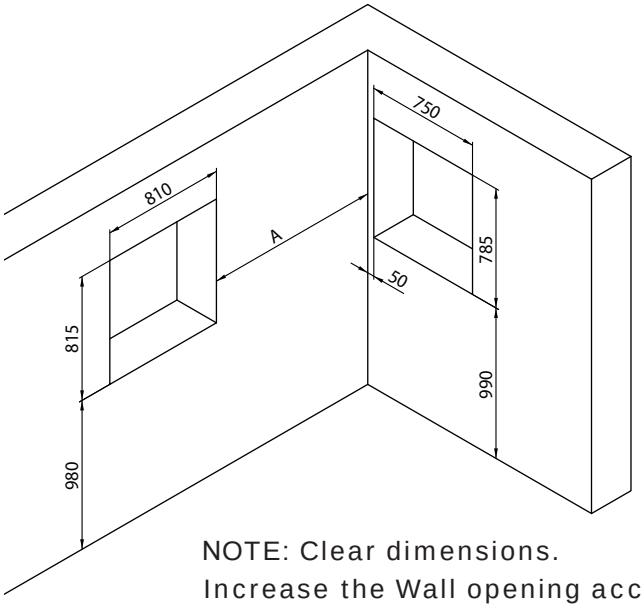
192521 ... Wall connection intake for airtight changeover
192501 ... Weather-shield grilles inlet
192531 ... Mesh grilles inlet (12 mm)
193805 ... outlet panels for air duct
192551 ... air duct outlet isolated 1.0 m
192552 ... air duct outlet isolated 1.5 m
193809 ... cover for wall breakthrough for air duct
192555 ... air duct wall connection, isolated
192558 ... Weather-shield grilles outlet via air duct
192559 ... Mesh grilles outlet via air air duct (12 mm)

The air ducts can be connected to the left or to the right side of the heat pump. In consequence this means that heating connections and electrical connections can be either on the left-hand side or on the right-hand side.

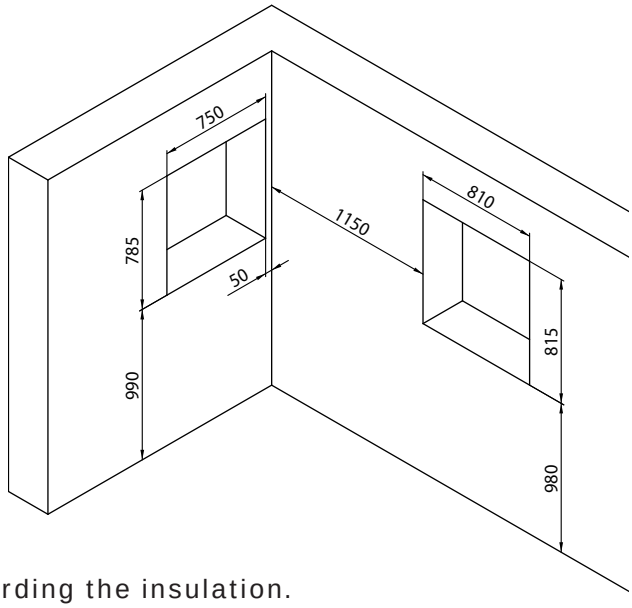
When using a light shaft this must be at least as wide as the wall opening. The depth must be at least 400 mm.

5.10.1. Wall openings for straight air duct

Air outlet to the right



Air outlet to the left



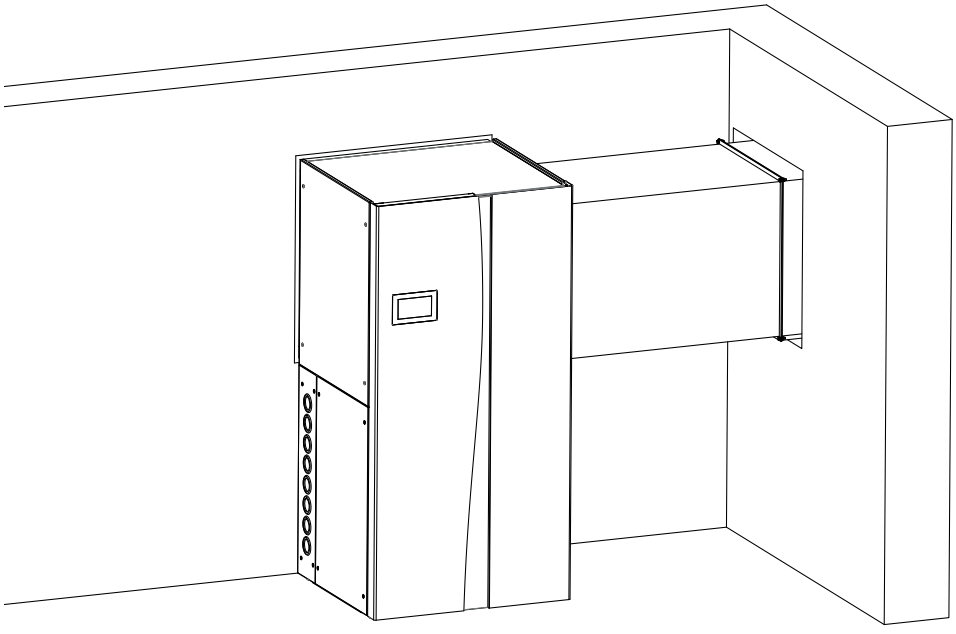
NOTE: Clear dimensions.
Increase the Wall opening according the insulation.

A depends on the air duct:

Length duct:	A
1,000 mm	1,150 mm
1,500 mm	1,650 mm

The air duct can be cut to length as required, the length A is the length of the air duct plus 150 mm.

The dimensions specified are clear dimensions. The wall opening must be enlarged around the wall insulation! The minimum width of the wall insulation must be 50 mm.

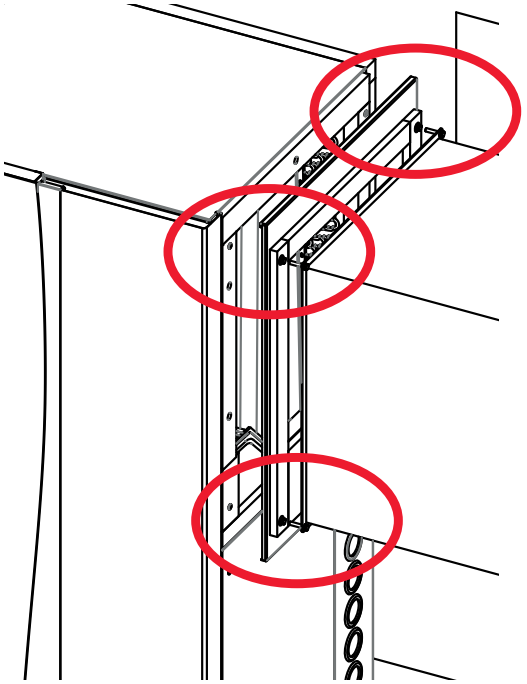


5.10.2. Mounting of straight air duct

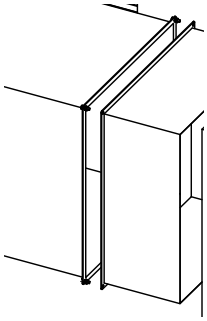
Air intake side same as the corner installation.

The air-duct has a mounting flange on both sides. On one side this is mounted fix. On the other side, the flange is supplied loose. If necessary, the duct can be cut to length. Afterwards the flange has to be mounted on the duct again.

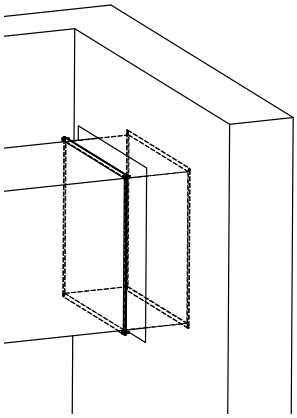
On the heat pump side, the duct, together with the exhaust panel, is mounted in the frame of the heat pump by the 4 supplied screws.



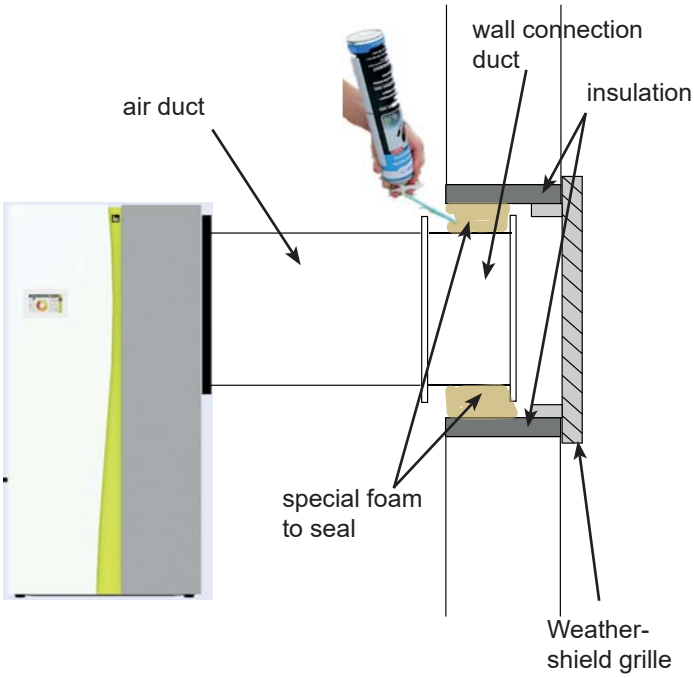
On the other side, the air duct has to be flanged together with the 4 supplied screws to the duct wall connection piece.



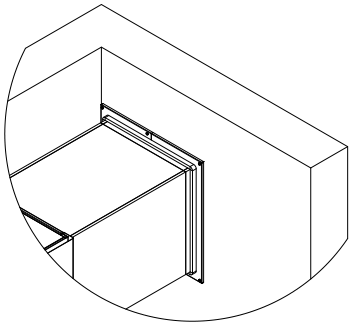
As shown in the picture below, the flange connection (duct wall connection) lies in front of the wall. At the other end of the duct wall connection is also a flange, which ensures the stability of the wall socket.



This flange should lie directly in the wall opening. After the duct is installed, it must be insulated with the supplied insulation. Then the wall connection duct is filled with clean and airtight foam.

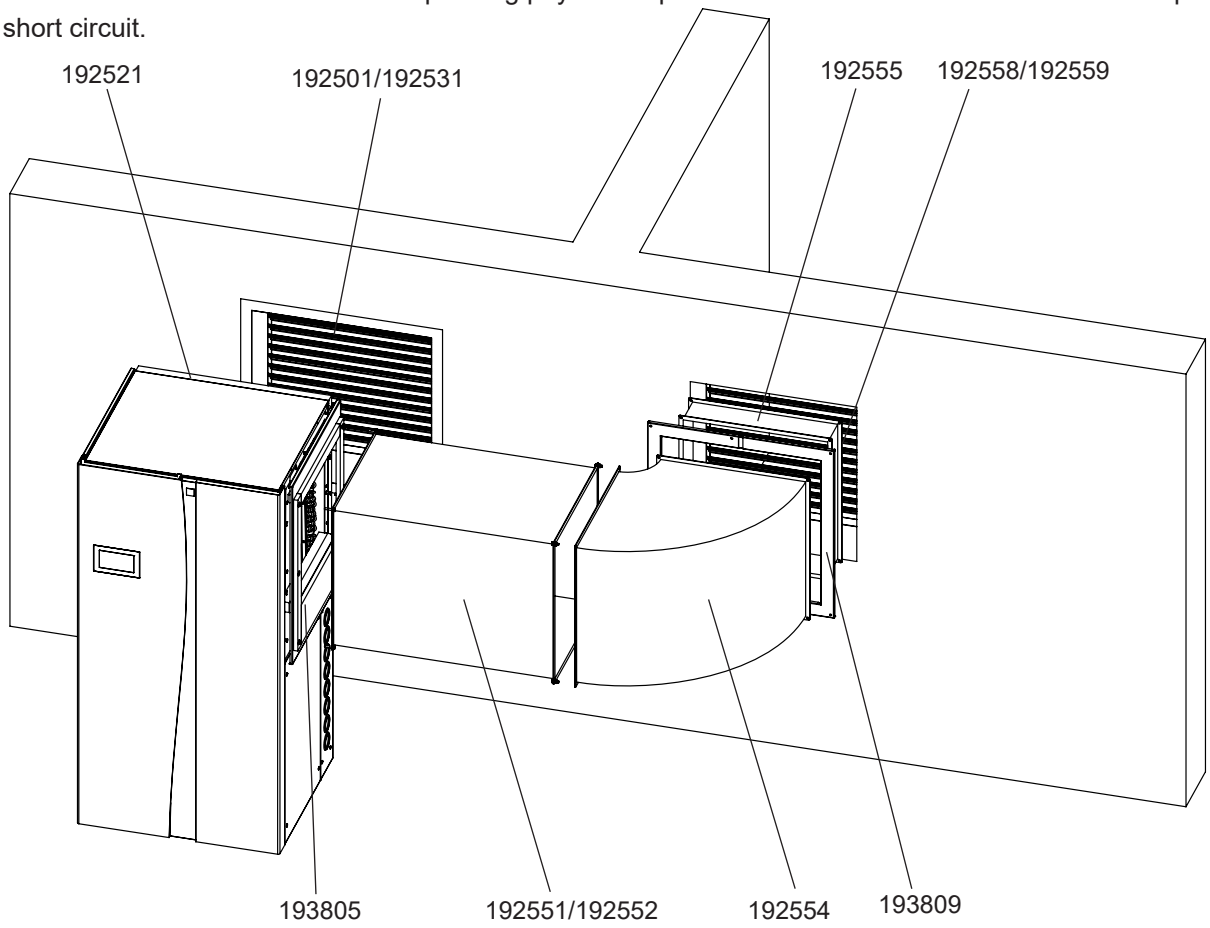


On the outside of the wall, the weather shield grille (or mesh grille) is mounted directly to the insulation of the wall opening by means of the provided dowels. Finally, the foamed area of the wall breakthrough must be covered with the panel



5.11. Installation with 90 ° air duct

This variant is required if the intake and exhaust can not be made corner-wise as a result of structural reasons. The air inlet and air outlet are thus parallel to each other and there is a risk that a short circuit between air inlet and air outlet is created. A corresponding physical separation between inlet and outlet air should prevent a short circuit.

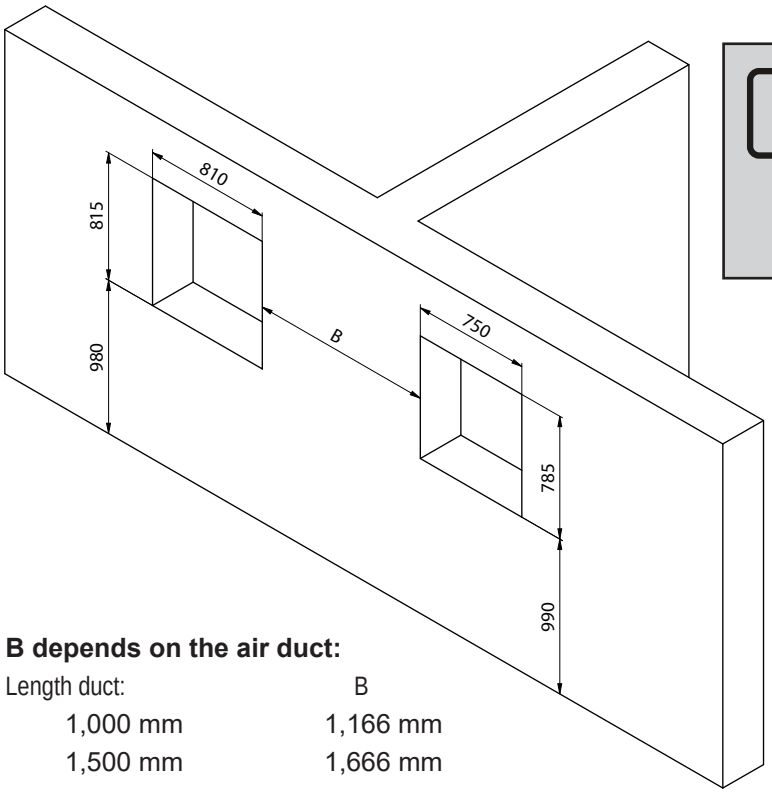


192521 ... Wall connection intake for airtight changeover
192501 ... Weather-shield grilles inlet
192531 ... Mesh grilles inlet (12 mm)
193805 ... outlet panels for air duct
192551 ... air duct outlet isolated 1.0 m
192552 ... air duct outlet isolated 1.5 m
192554 ... air duct 90° curve, isolated
193809 ... cover for wall breakthrough for air duct
192555 ... air duct wall connection, isolated
192558 ... Weather-shield grilles outlet via air duct
192559 ... Mesh grilles outlet via air air duct (12 mm)

The air ducts can be connected to the left or to the right of the heat pump. Heating and electrical connections can also be made on both sides.

The air ducts can be connected to the left or to the right of the heat pump. Heating and electrical connections can also be made on both sides.

5.11.1. Wall openings for 90 °air duct



The outlet opening can also be carried out on the left side. Then the two breakthrough dimensions and the two heights must be changed.

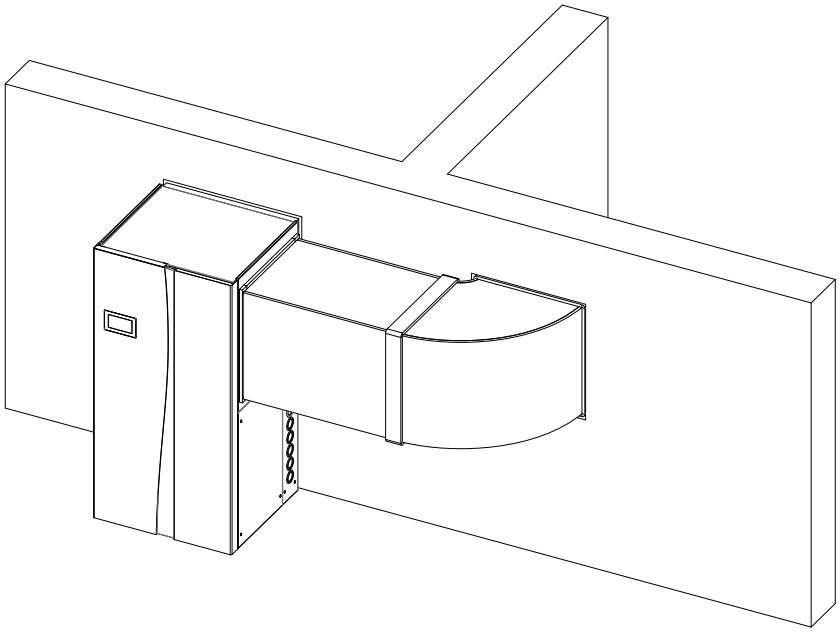
NOTE: Clear dimensions. Increase the Wall opening according the insulation.

B depends on the air duct:

Length duct:	B
1,000 mm	1,166 mm
1,500 mm	1,666 mm

The air duct can be cut to length as required, the length B is the length of the air duct plus 166 mm.

The dimensions specified are clear dimensions. The wall opening must be enlarged around the wall insulation! The minimum width of the wall insulation must be 50 mm.



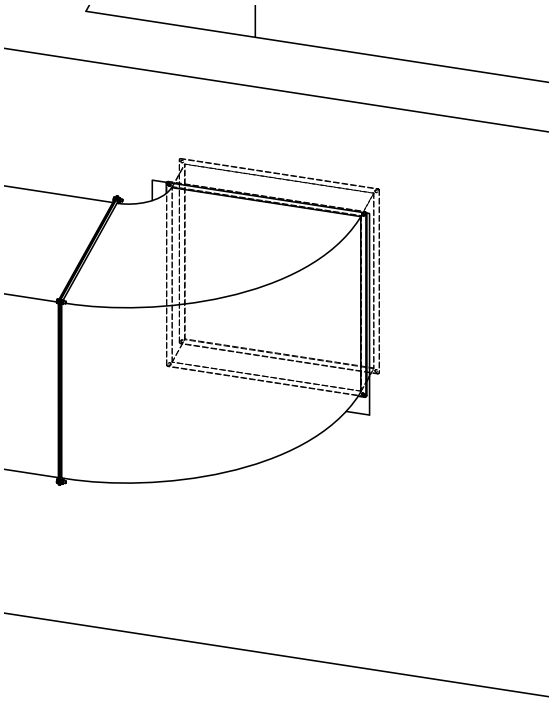
5.11.2. Mounting air duct with 90 °

Air intake side same as the corner installation.

The channel and the 90 ° bend are mounted the same way as for the straight channel installation. See point “Mounting straight air duct”

Also, the air duct wall connection is mounted as described in the point “Installation straight air duct”.

In this case, the entire air duct wall connection (including both flanges) lies within the wall recess.

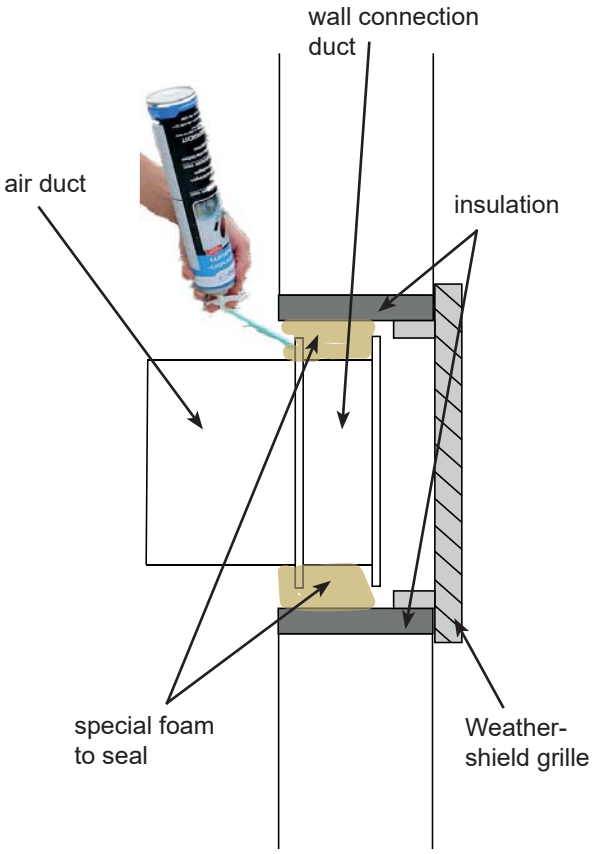


One side of the 90 ° arc lies directly in the wall.

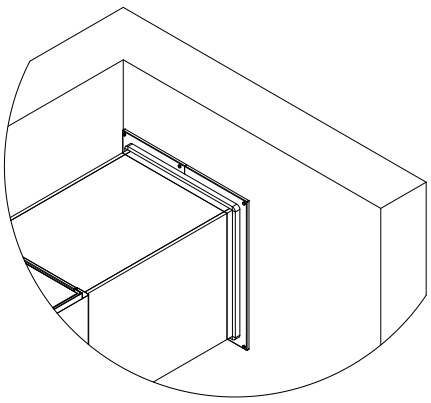
After the channel has been set up, it must be insulated with the provided insulation.

The air outlet is usually about 4-5 K under the intake air temperature in heating mode. Thus, the blown air sinks and moves down to the lowest point. This is especially important when installing with rising or falling terrain.

Then the wall connection duct has to be filled cleanly and airtight (see also point “Installation straight air duct”)



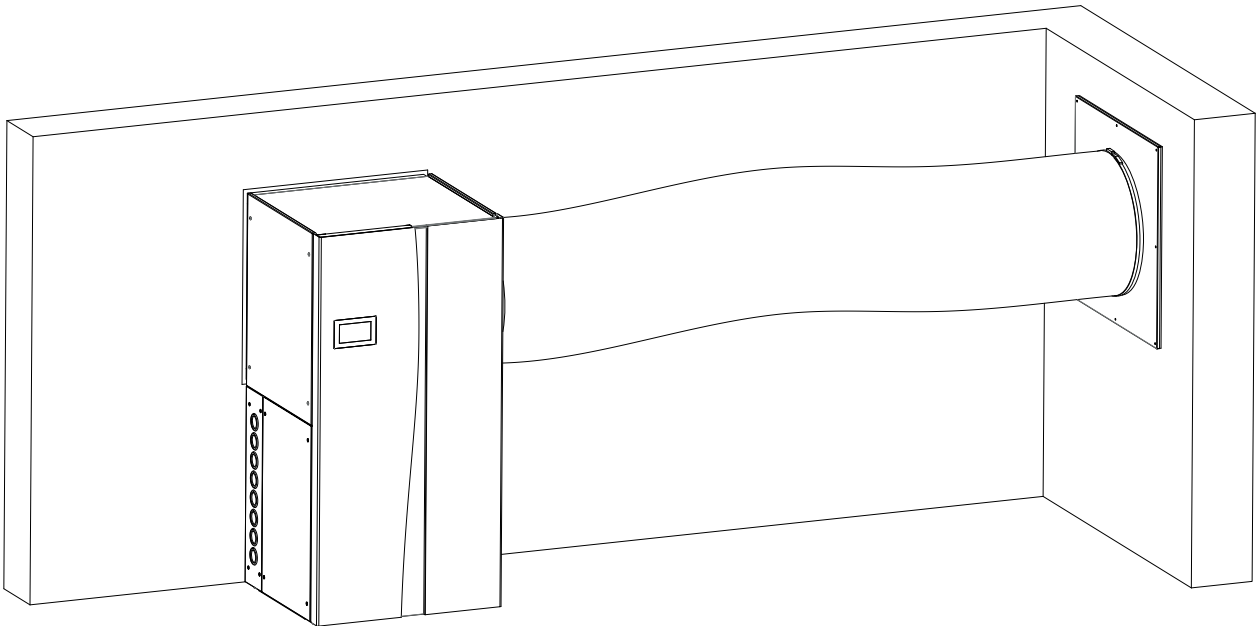
On the outside wall, the weather-shield grille (or mesh grille) is mounted directly in the insulation of the wall opening by the provided dowels. Finally, the foamed area of the wall breakthrough must be covered with the panel.



The air ducts are supplied including mounting material (screws, washers, nuts)!

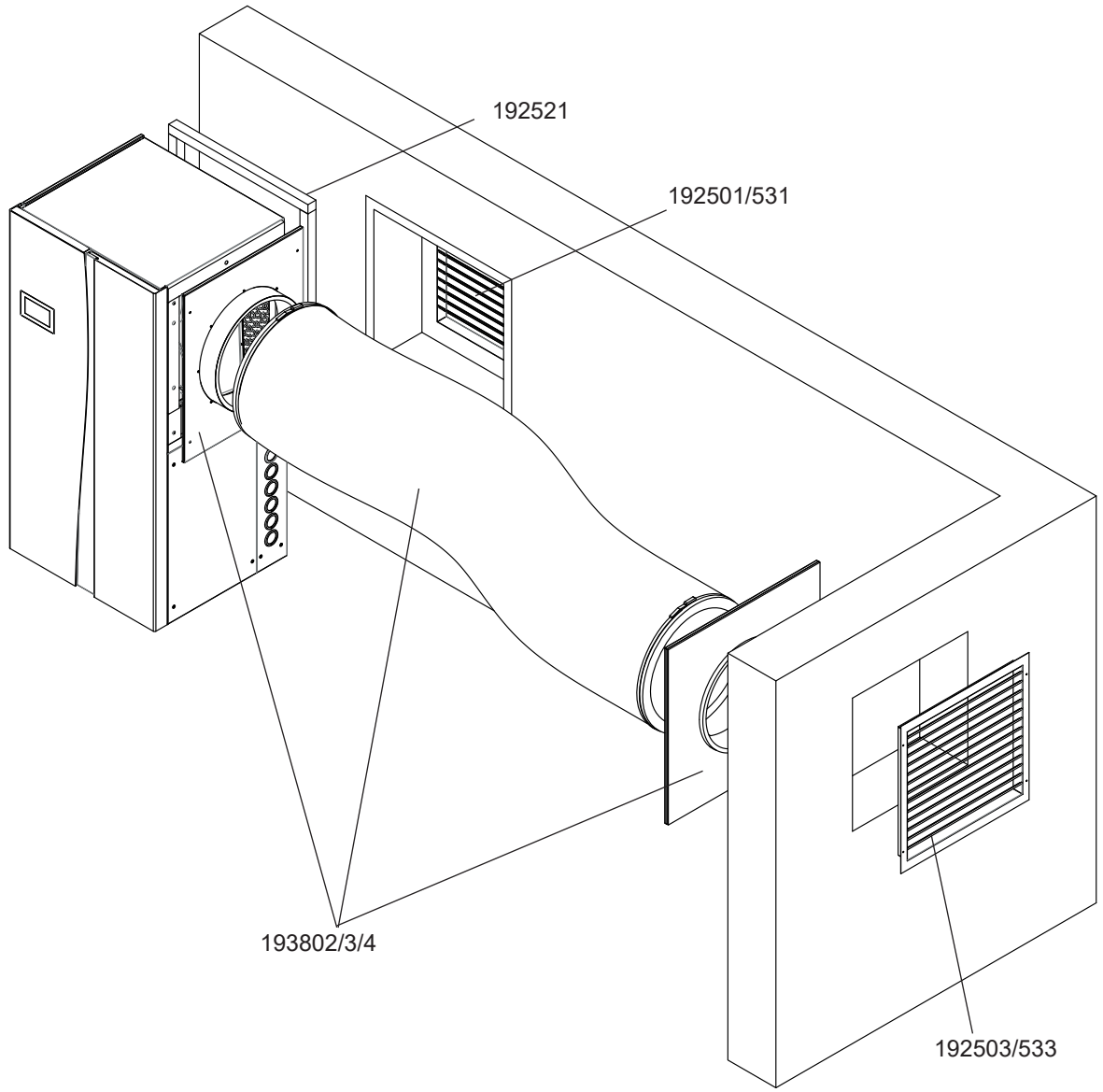
5.12. Installation of flexible air hose - air outlet sideways

This variant is especially suitable to bypass windows resp. to compensate on-site inaccuracies, differences in height and radius. The air hose is supplied in 3 different lengths and can be cut to length as needed!



The air connections can be connected to the left or right side of the heat pump. In consequence this means that heating connections and electrical connections can be either on the left-hand side or on the right-hand side.

5.12.1. Accessories - flexible air hose - air outlet sideways



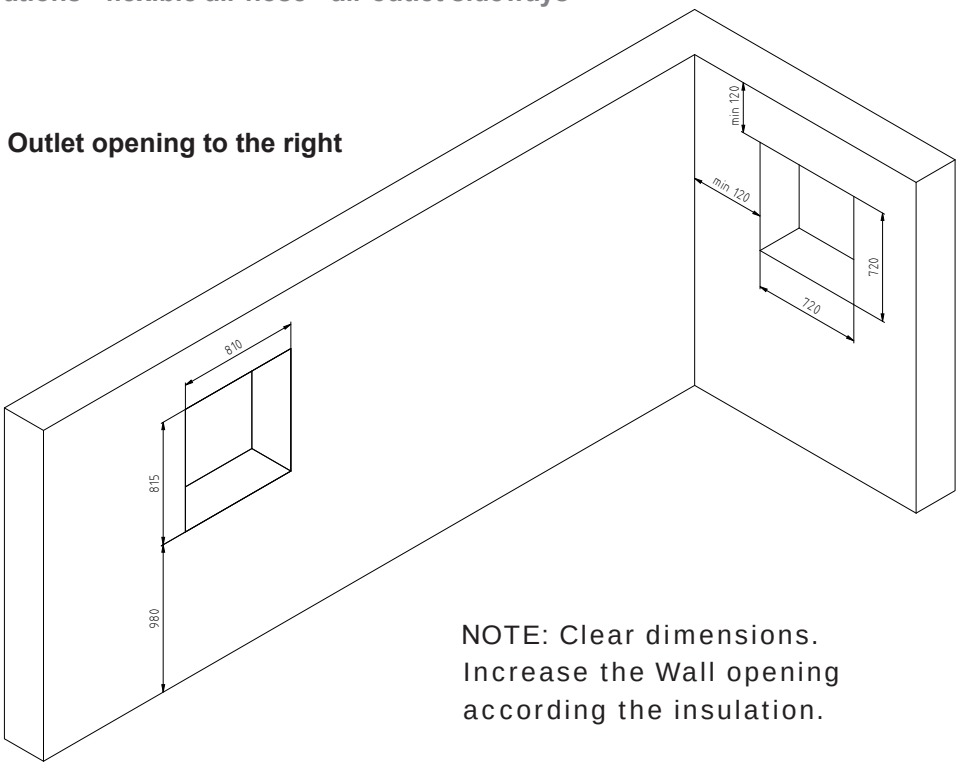
192521 ... Wall connection inlet for watertight transition.
192501 ... Protective grating air intake
192531 ... Mesh grille inlet (12 mm)

193802 ... Air shaft assembly set - sideways 2 m
193803 ... Air shaft assembly set - sideways 3 m
193804 ... Air shaft assembly set - sideways 5 m
192503 ... Protective grating outlet
192533 ... Mesh grille outlet (12 mm)

The air hose mounting set includes an air hose with 560 mm diameter in a length of 2 m, 3 m or 5 m, the outlet panel, a wall mounting panel and 2 pieces hose clamps for assembly of the hose to the outlet panel and to the wall mounting panel. (min. bend radius is 600 mm)

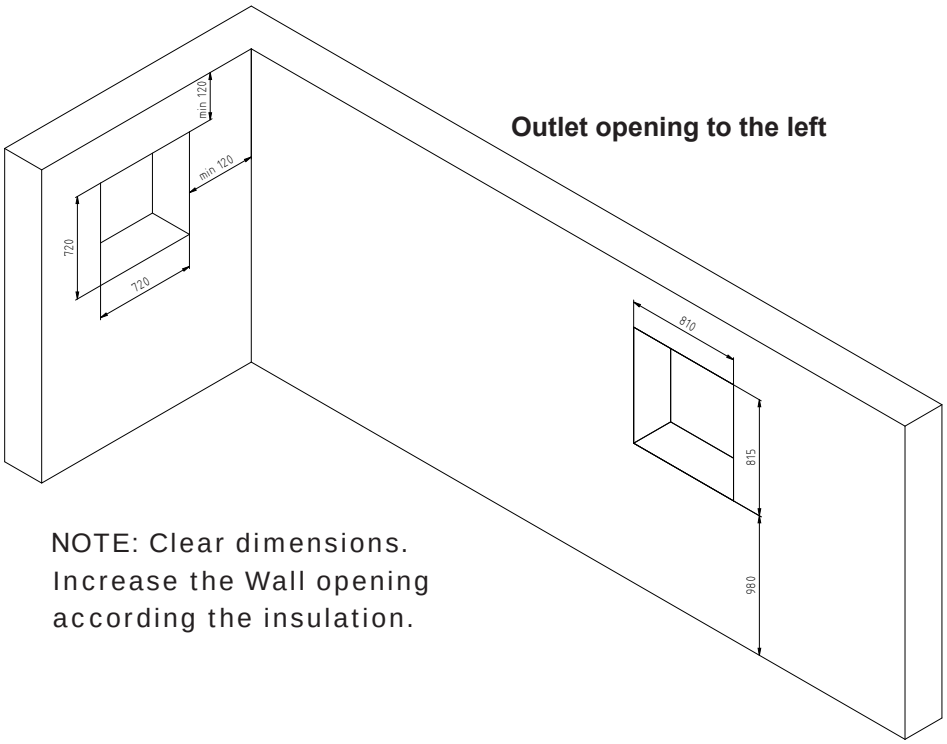
5.12.2. On-site preparations - flexible air hose - air outlet sideways

Outlet opening to the right



NOTE: Clear dimensions.
Increase the Wall opening
according the insulation.

Outlet opening to the left



NOTE: Clear dimensions.
Increase the Wall opening
according the insulation.

The dimensions specified are clear dimensions. The wall opening must be enlarged around the wall insulation! The minimum width of the wall insulation must be 50 mm.

When using a light shaft this must be at least as wide as the wall opening. The depth must be at least 400 mm.

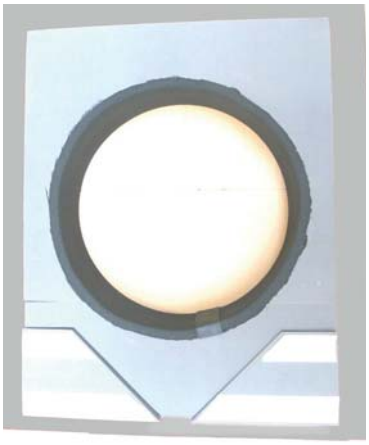
5.12.3. Assembly instructions - flexible air hose - air outlet sideways

Air inlet side

Procedure as in corner installation

Outlet panel:

The outlet panel is mounted to the desired side using the 4 screws included in the delivery contents.



Example of outlet side on the right

A trapeze-shaped insulation with adhesive tape on both sides is included with the outlet panel. This has to be affixed to the panel on the evaporator side.

Wall flange:

The wall flange has to be mounted to the air outlet opening using suitable assembly material. Four bore holes in the corners of the flange are provided for that purpose!

Flexible hose:

The hose can be cut to length as desired! In connecting the hose with the two flanges the hose insulation is telescoped at the two ends.

The hose is mounted to the flange using a hose clamp. This enables the insulation to be extended over the flange again!

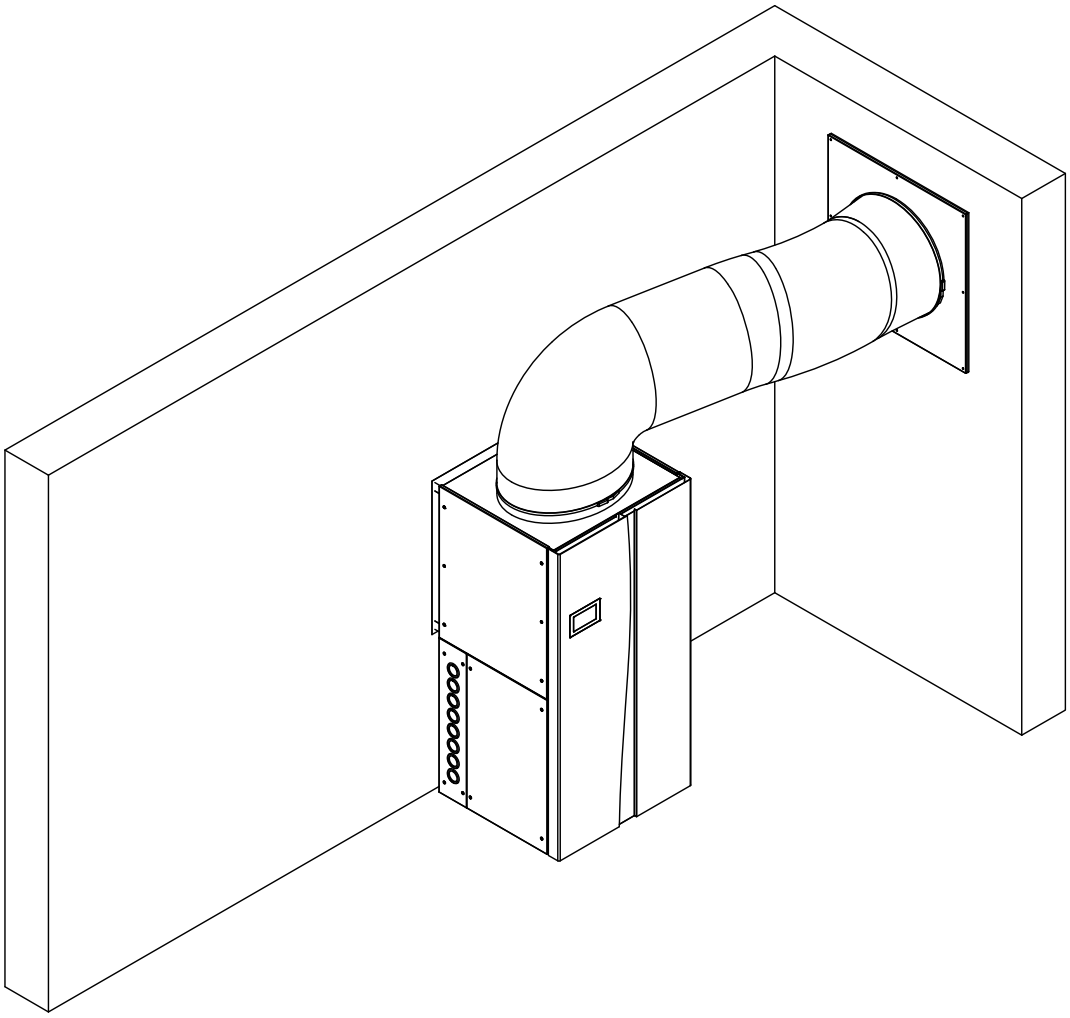
The air hose is flexible and enables an outlet in all directions. The minimum bending radius is 600 mm!!

The air hose should be straight as far as possible and should not make any unnecessary changes in direction . The air hose should be suspended every 0.5 m with an assembly tape (perforated tape)!

The heat pump must only be moved using the mounted panels!

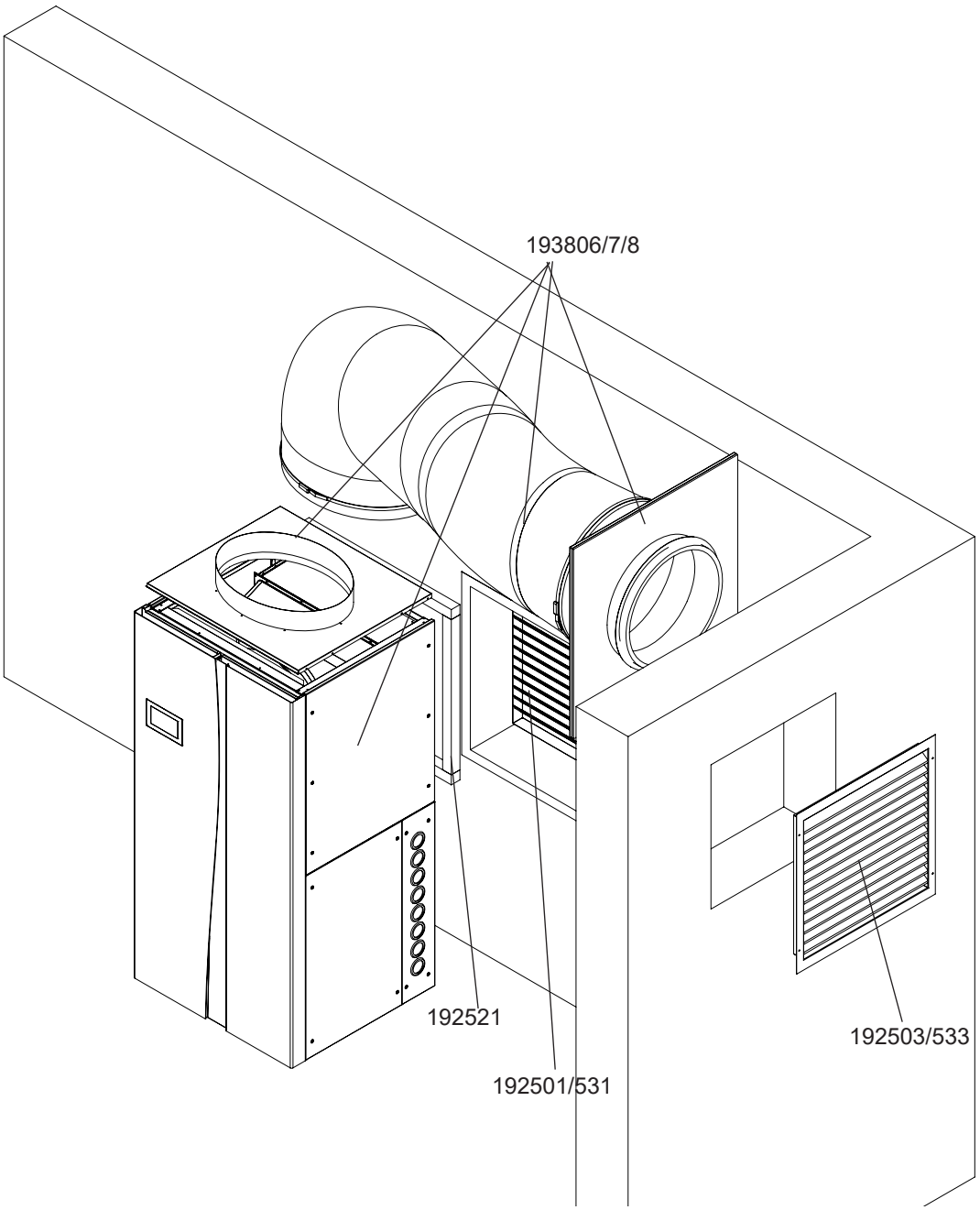
5.13. Installation of flexible air hose - air outlet to the top

If it is easier to guide the air blow upwards due to structural conditions, this is also possible with an air hose. The air hose is supplied in 3 different lengths (2 m, 3 m und 5 m) and can be cut to length as needed!



When using a light shaft this must be at least as wide as the wall opening. The depth must be at least 400 mm.

5.13.1. Accessories - flexible air hose - air outlet to the topp



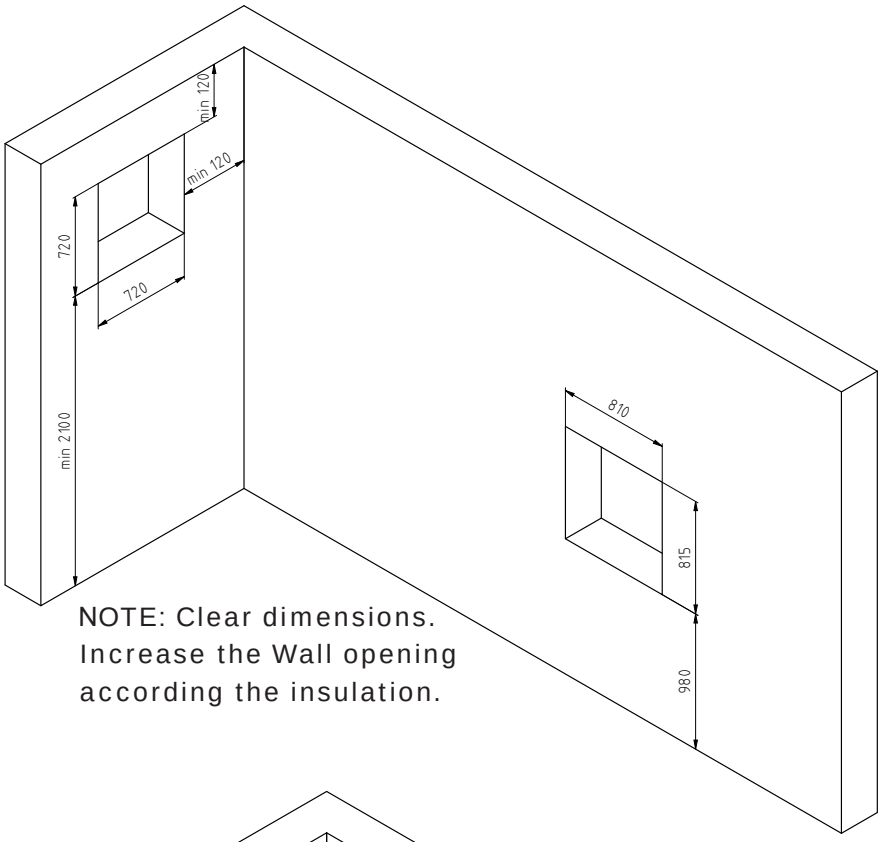
192521 ... Wall connection inlet for watertight transition.
192501 ... Protective grating air intake
192531 ... Mesh grille inlet (12 mm)

193806 ... Air shaft assembly set - to the top 2 m
193807 ... Air shaft assembly set - to the top 3 m
193808 ... Air shaft assembly set - to the top 5 m
192503 ... Protective grating outlet
192533 ... Mesh grille outlet (12 mm)

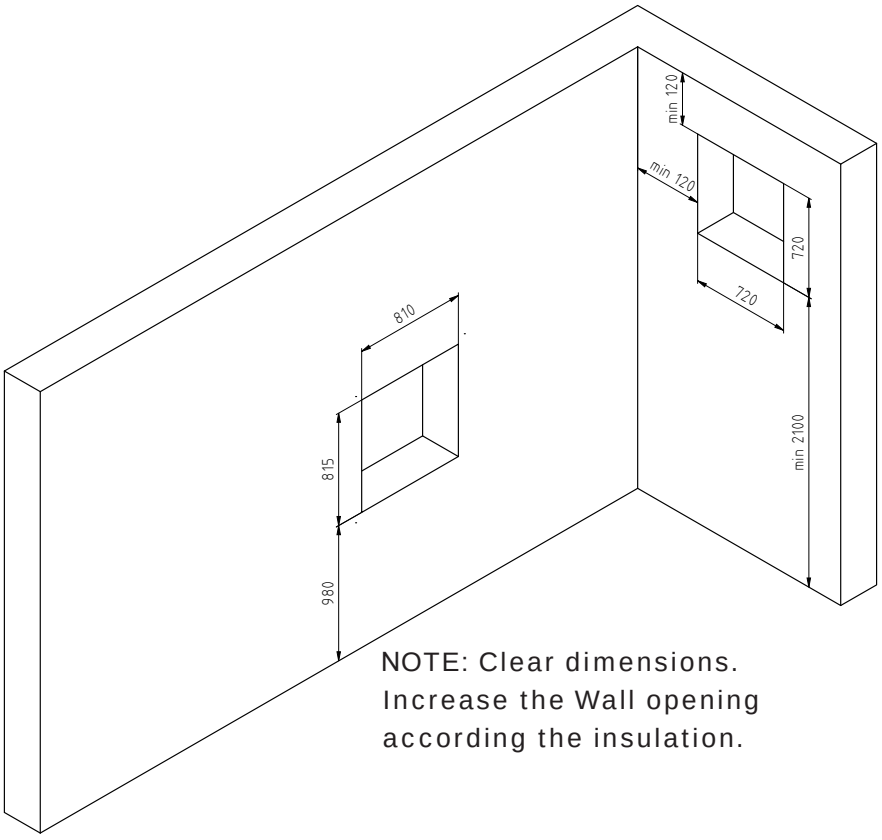
This air hose mounting set includes an air hose with 560 mm diameter in a length of 2 m, 3 m or 5 m, the outlet panel, a wall mounting panel and 2 pieces hose clamps for assembly of the hose to the outlet panel and to the wall mounting panel and the cover panel sideways for free cutting. (min. bend radius is 600 mm)

5.13.2. On-site preparations - flexible air hose - air outlet to the top

Outlet opening to the left



NOTE: Clear dimensions.
Increase the Wall opening
according the insulation.



Outlet opening to the right

NOTE: Clear dimensions.
Increase the Wall opening
according the insulation.

The dimensions specified are clear dimensions. The wall opening must be enlarged around the wall insulation! The minimum width of the wall insulation must be 50 mm.

5.13.3. Assembly instructions - flexible air hose - air outlet upwards

Air inlet side

Procedure as in corner installation

Outlet panel:

The top cover panel of the AERO ILM must be removed. For this, the side panels must be dismounted. Then, on each side, two screws must be loosened under the insulation. After that, the heatpump top-cover can be removed.

When inserting the new blowout element upwards, care must be taken to ensure that the insulation of the panel is neatly closed. Then tighten the screws again.

When replacing the panel, ensure that the insulation of the cover is cleanly closed at all times. If this is not the case, condensation can occur on the heat pump cover and also on the remaining panel.

5.14. Modification from the right-hand to left-hand outlet side

The AERO ILM heat-pumps are supplied according to the manufacturer's specifications for a right-hand side outlet. The electric and hydraulic connections are therefore on the left-hand side.

If necessary, the connection side can be altered.

In the case of an outlet on the left-hand side, the upper, left-handed panel (panel opposite the outlet) has to be mounted on the right-hand side. In this case remove the 4 fixing screws. The trapeze-shaped insulation has to be affixed as shown in the illustration below.

If it is necessary to change the hydraulic pipework itself, no changes to the heat pump are necessary. The protective sleeves for the hydraulics and cables are provided by the manufacturer on both sides.

The flexible connection hoses. the condensation run-off hose, the safety valve hose and the cabling have to be installed as shown in the diagram below.

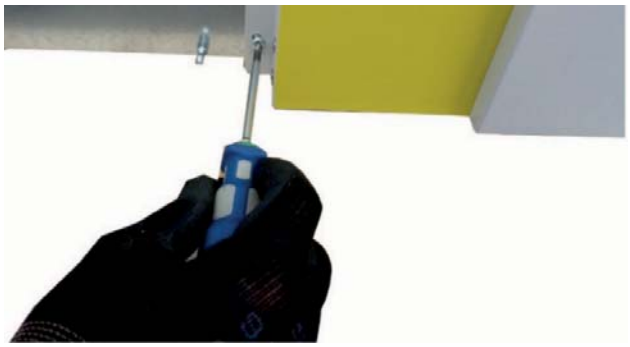
In the next step the connecting cables next to the 50 l heating buffer are laid to the electric switch box and fastened with cable binders. All cover panels are then remounted.

> The screws on the panel have to be carefully tightened manually.

5.15. Opening front panel

The front panel consists of the left and the right part. At the bottom of the left part there is a handle. At this, the left side is pulled forward, and then unhooked on the top.

The right part is fixed on the bottom left with a screw in the frame. Open this screw and the right side panel can be removed.



5.16. Transport provisions

If the heat pump has to be transported by hand on site, first the 2 bottom panels on the left and right hand side have to be removed. There are slots in the frame of the heat pump. 2 pipes each with a diameter of one inch can be inserted through these. In any case these have to be secured with four slip guards.

To ensure that the transport pipes can be pushed through and the factory wiring is not damaged, the wiring must be removed from the left under the electrical system as shown in the picture.

1“ pipe slip-protection

The heat pump has to be furnished in any case with four anti-skid fixtures when transporting it by hand!

After the heat pump is placed in the place of installation, the wiring is put back in the holder and the panels can be closed again.

6. Heating connections

6.1. Requirements heating connections

The pertinent laws, regulations and standards for boiler house pipework and also for heat pump systems must be observed.

- Before the heatpump in the heating return a magnetic dirt trap must be installed.
- The safety and expansion devices for closed heating systems pursuant to EN 12828 must be provided.
- In case an electrical heating element will be installed in the thermal storage tank, an additional safety device must be installed at the thermal storage tank!
- The line dimensioning must comply with the required flow volumes.
- The connection hoses for heat pump inlet, return flow and warm water inlet must be installed. The connection hoses can be shortened to the desired length, however, not shorter than 60 cm. Furthermore the connection hoses must not be bent!
- At the highest points of the connection lines venting options must be provided, and at the lowest points outlet options.
- In order to avoid energy losses the connection lines must be insulated with suitable material.

Oxygen diffusion
In the case of non diffusion-resistant underfloor heating with plastic pipes or open heating systems, corrosion may occur in the steel parts if steel pipes, steel radiators or storage heating systems are used.

Corrosion products can deposit in the condenser and lead to a capacity loss of the heat pump or high-pressure disturbances.

Therefore avoid open heating systems or steel pipe installations in conjunction with non- diffusion-resistant plastic pipes in underfloor heating.

Incorrect flow volumes due to incorrect pipework, false fixtures or improper pump operation can cause damage!

Heating water quality
For filling heating systems, very clear guidelines apply relating to the heating water quality Specifically, European standard EN 12 828, ÖNORM H 5195 and in particular VDI Guideline no. 2035-1 must be observed and represent the latest technological standards. For example, the hardness of the filling water must be taken into account. This is because 1 °dH means 17 mg of lime per litre that can be separated. For a heating system with 1,500 l of water content (buffer reservoir), this represents 520 grammes of lime at 20 °dH (in other words, half a kilogram). As the lime deposits itself at the hottest and narrowest parts in the system, this means that gas thermals, heat exchanger for solar plants, etc. are the most affected. The plate exchanger for the hot water heating (especially with wood-fired boilers and solar plants) and the hot gas heat exchanger in the HGL heat pump can also become calcified with very hard heating water in some circumstances.

For this reason,the heating water must be treated according to the standards (softened/demineralised).
The pH value of the heating water should also be checked;this should be between
8.2 and 9.5.

Hydraulic drain
For easier emptying a drain valve is installed before the loading pump in the hydraulic piping.

The inspection and the preparation of the heating water, belongs to the responsibility of the competent heating engineer.

6.2. Safety device

When working with higher temperatures by a bivalent system than 80 °C, an appropritate safety device have to be installed on sit

Incorrect flow rates due to incorrect piping, incorrect fittings or improper pump operation can cause damage!.

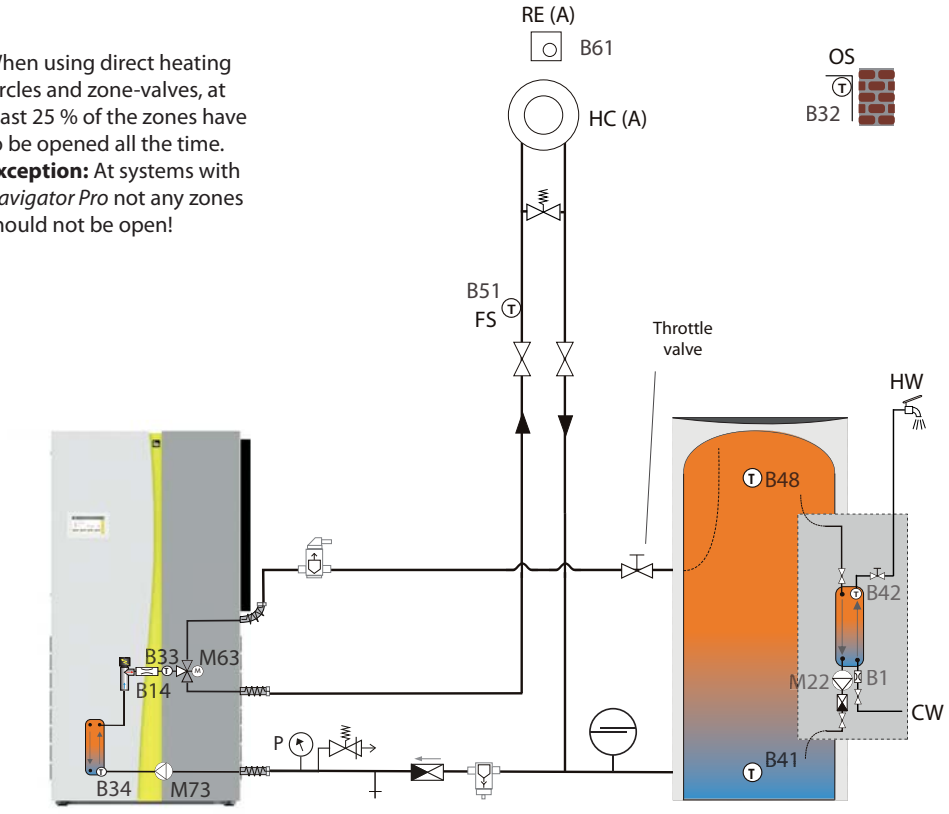
6.3. AERO ILM with unregulatet direct heating circuit and Hygienik without separating plate

As the AERO ILM is am modulatig heatpump, it is possible to supply direct heating circuits. That means, no additional heating circuit pump or heating mixer is required.

The Hygienik tank is supplied via the priority line with the preset priority charging temperature. The expansion container heating side must be mounted on site.

The overflow valve in the heating circuit has to be set so that a proportionate throughput in relation to the number of closed zone valves is achieved.

When using direct heating circles and zone-valves, at least 25 % of the zones have to be opened all the time.
Exception: At systems with *Navigator Pro* not any zones should not be open!



AERO ILM | Direct heating circle | Hygienik 2.0 (without separating plate)

Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

When using direct heating circuits, an additionel heating circuit flow sensor has to be installed. At least 25 % of the zones have to be opened all the time. In cooling mode an additional dew-point switch and an additional humidity sensor have to be installed.

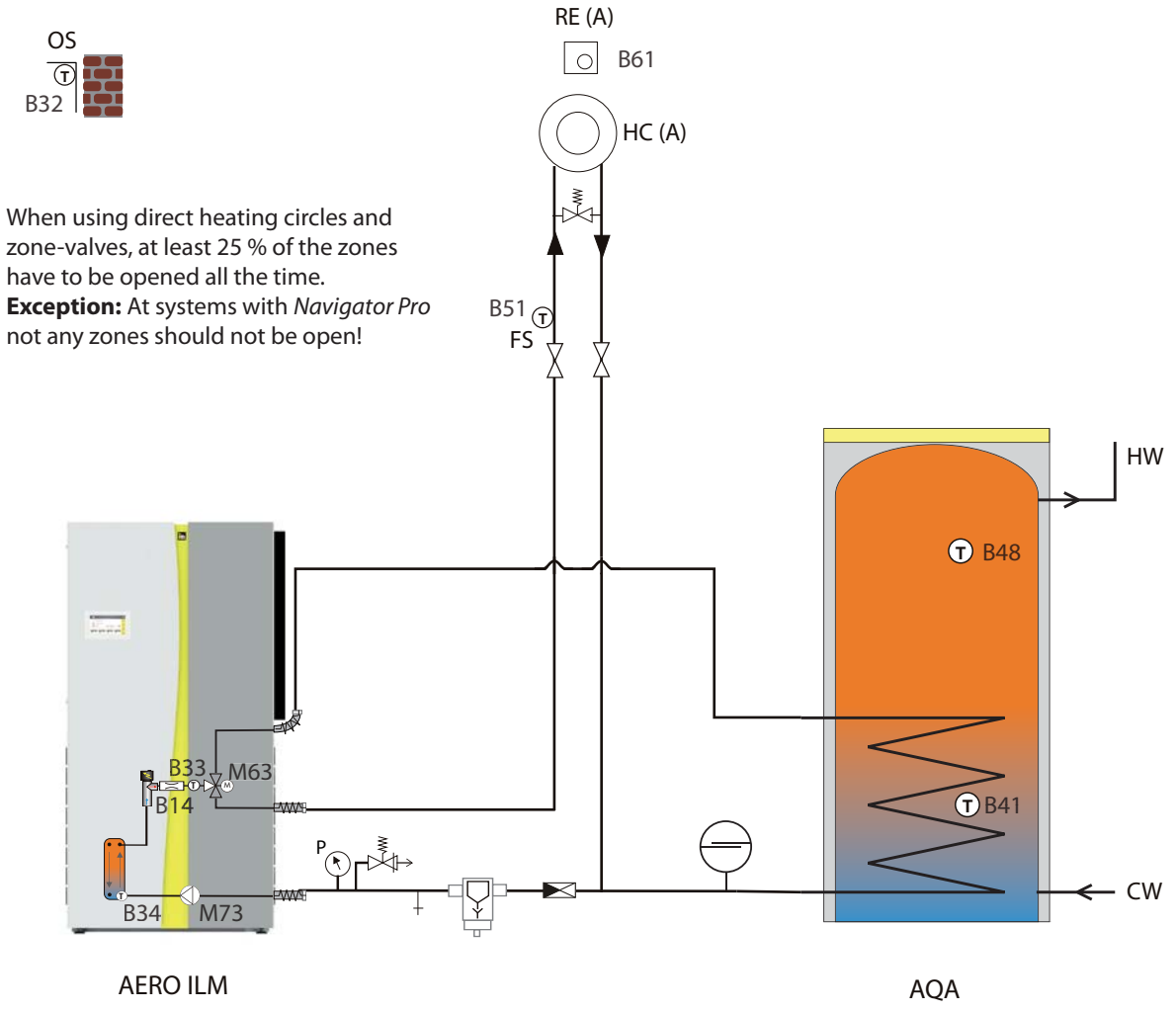
6.4. AERO ILM with unregulated direct heating circuit and AQA

As the AERO ILM is am modulatig heatpump, it is possible to supply direct heating circuits. That means, no additional heating circuit pump or heating mixer is required.

The AQA tank is supplied via the priority line with the preset priority charging temperature.

The expansion container heating side must be mounted on site.

The overflow valve in the heating circuit has to be set so that a proportionate throughput in relation to the number of closed zone valves is achieved.



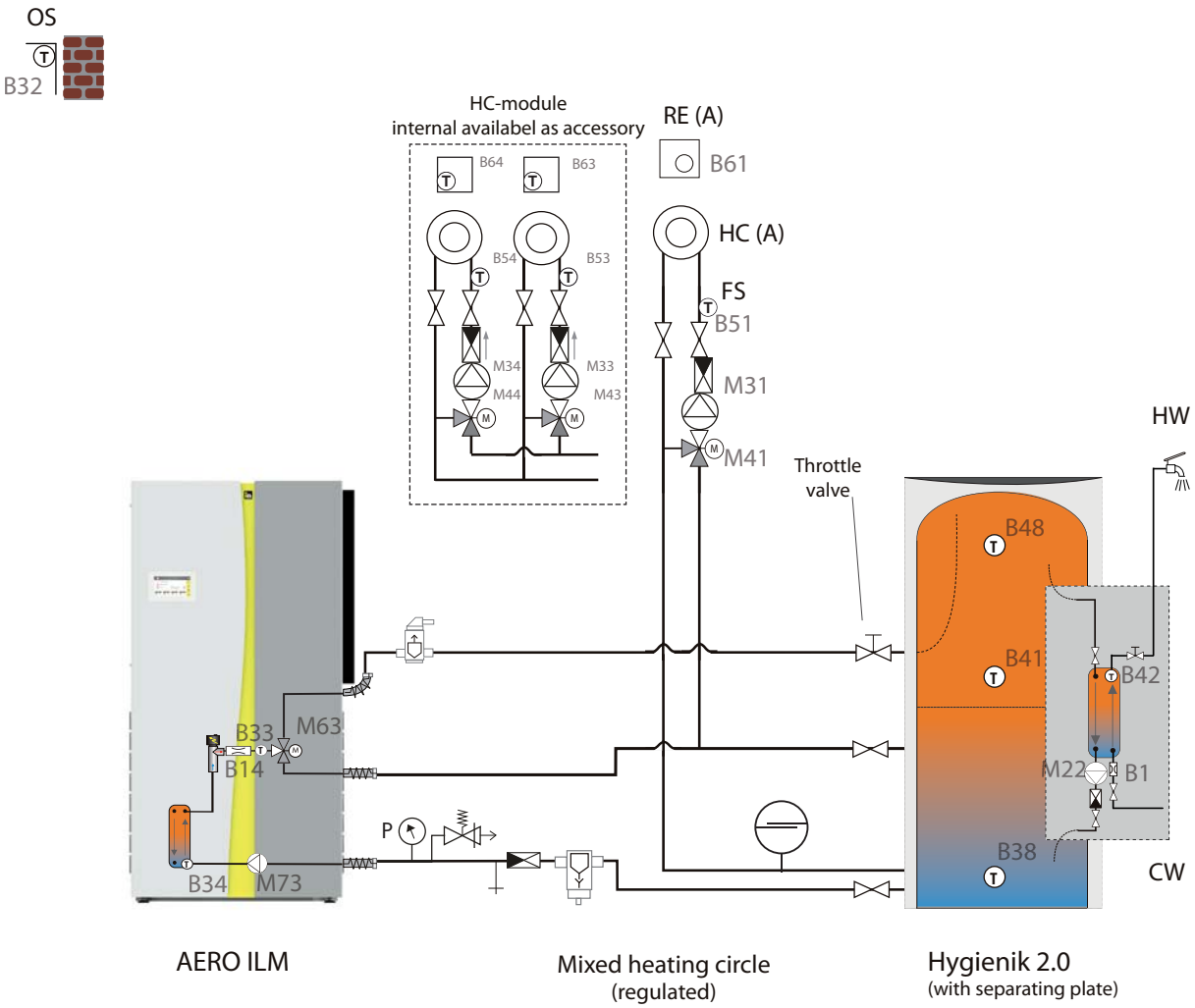
Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

When using direct heating circuits, an additionel heating circuit flow sensor has to be installed. At least 25 % of the zones have to be opened all the time. In cooling mode an additional dew-point switch and an additional humidity sensor have to be installed.

6.5. AERO ILM with Hygienic with separating plate and mixer circuits

The heating circuit is configured as mixer circuit.

The heating circuit return is not connected with the heat pump return, it is connected only direct to the heating puffer.

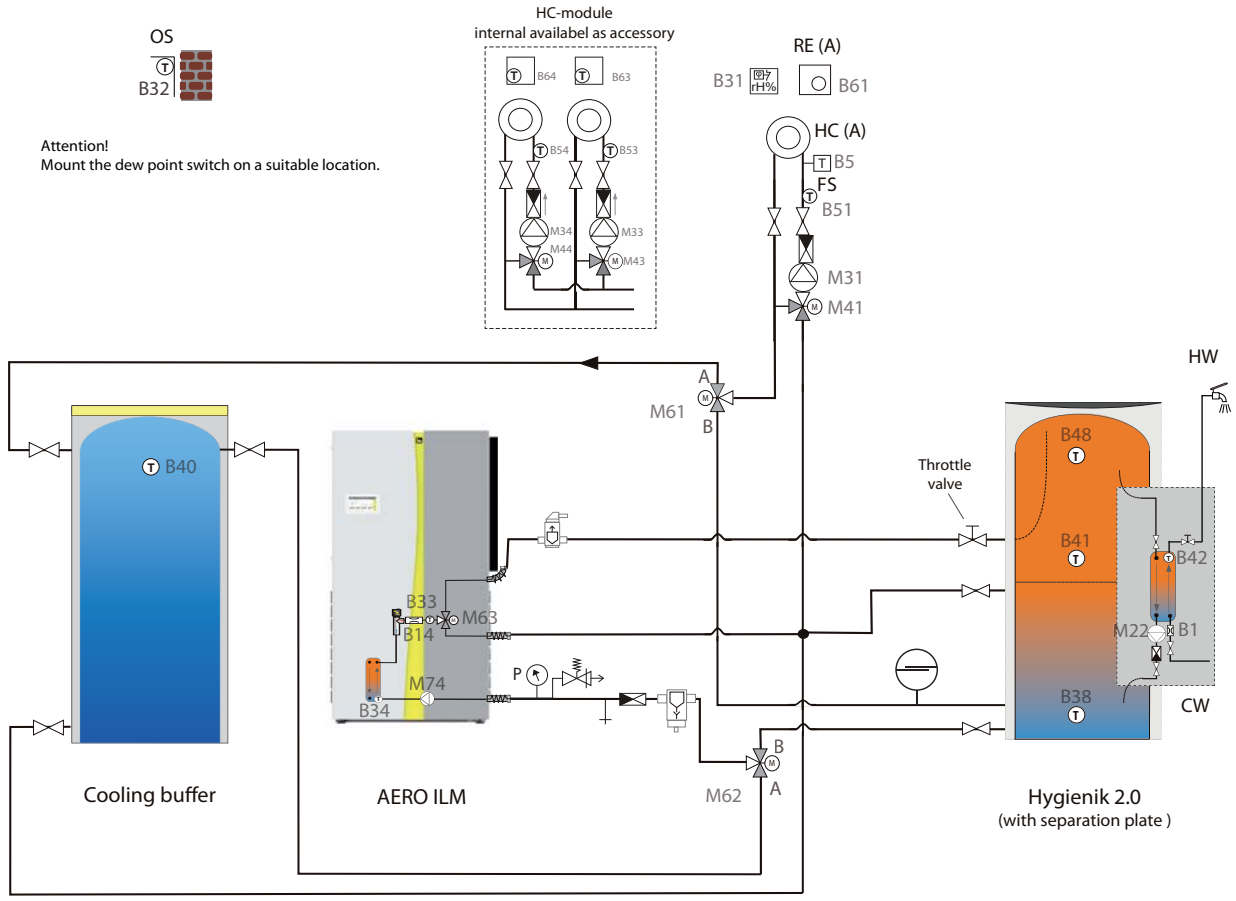


Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

One heating circuit can be regulated as standard. For 2 or more heating circuits an appropriate additional regulation module has to be installed.

6.6. AERO ILM with cooling buffer and hygienic with layer separate plate

To switch the operation of the heat pump from heating to cooling a cooling valve has to be installed in the heat pump inlet and heat pump outlet. It is additionally necessary to install a cooling valve in the heating circuit supply.



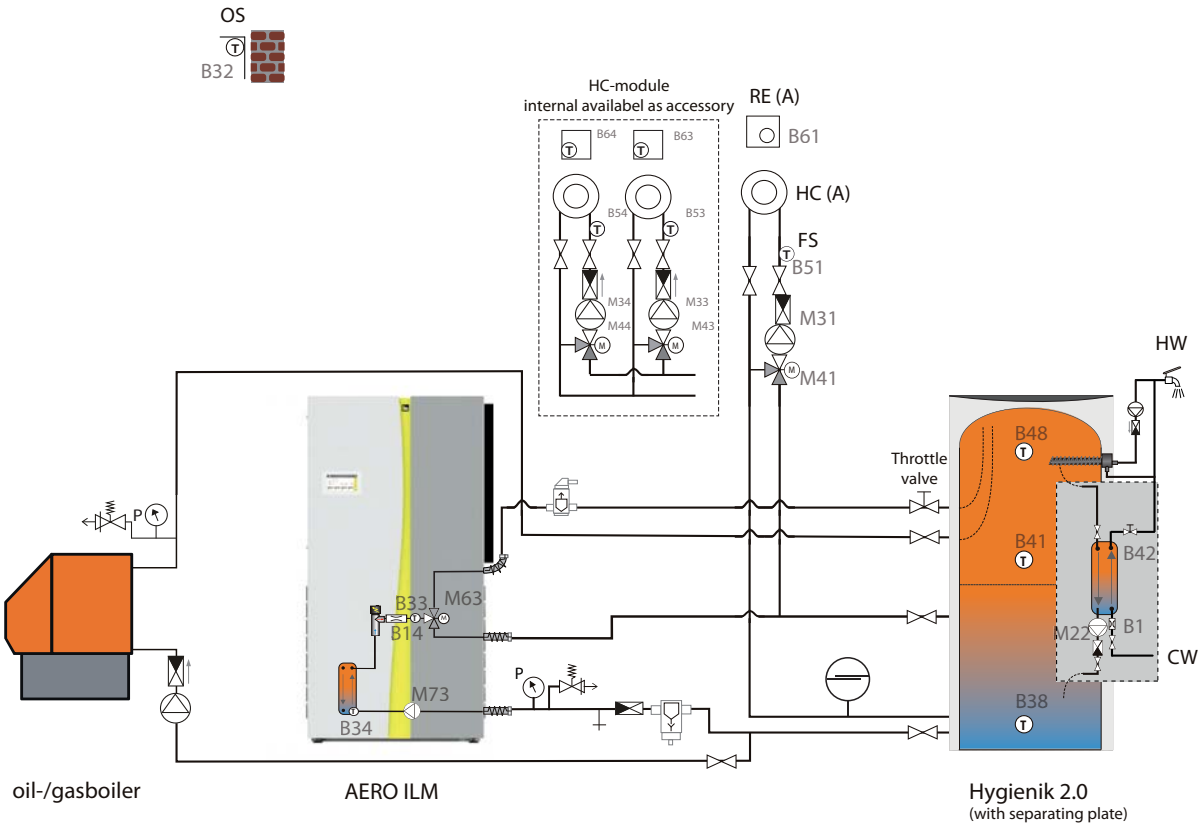
Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

In cooling with the AERO ILM a cooling buffer can be integrated. An air humidity sensor and a dew point switch has to be installed to monitor the dew point.

6.7. AERO ILM with hygienic with layer separate plate and oil-/gas burner

The heating circuit is configured as mixer circuit.

When working with higher temperatures by a bivalent system than 80 °C, an appropritate safety device have to be installed on site.



Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

The start of the oil-/gas burner is done by the potential-free contact for the 2. (or 3.) heat generator. It is possible to start two additional, independent heat generators. eg. Bivalence 1 starts at -10 °C in parallel mode, Bivalence 2 starts at -20 °C in alternative mode.

6.8. AERO ILM HGL with unregulated direct heating circuit and Hygienik without separating plate

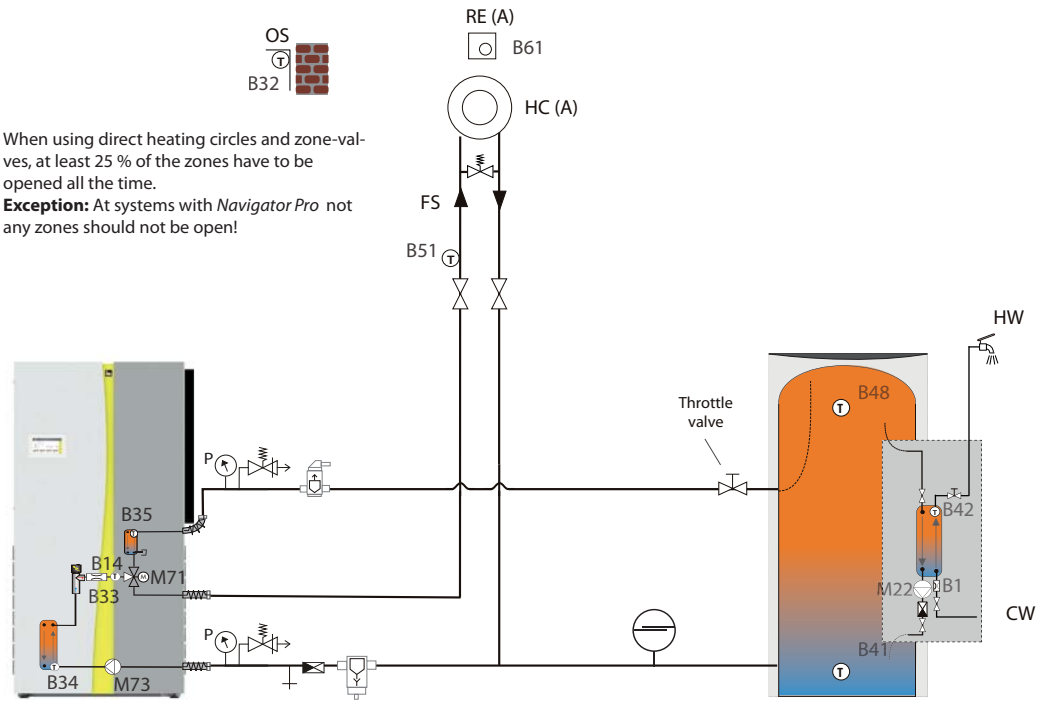
As the AERO ILM HGL is am modulatig heatpump, it is possible to supply direct heating circuits. That means, no additional heating circuit pump or heating mixer is required.

The Hygienik tank is supplied via the priority line with the preset priority charging temperature.

The expansion container heating side must be mounted on site.

The overflow valve in the heating circuit has to be set so that a proportionate throughput in relation to the number of closed zone valves is achieved.

By installing this hydraulic piping, the modulating oparation mode and a accurate dimensioning of the heating/cooling system it is possible to work in cooling mode without a cooling buffer.



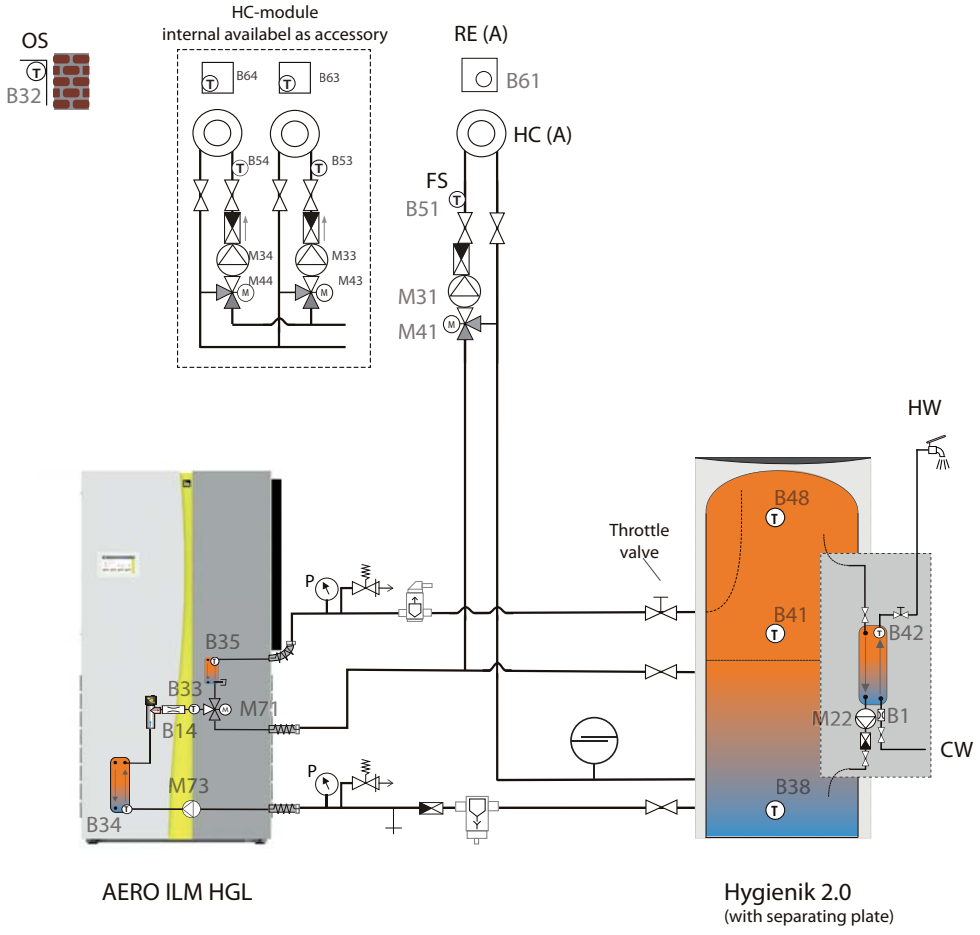
Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

When using direct heating circuits, an additionel heating circuit flow sensor has to be installed. At least 25 % of the zones have to be opened all the time. In cooling mode an additional dew-point switch and an additional humidity sensor have to be installed.

6.9. AERO ILM HGL with Hygienic with separating plate and mixer circuits

The heating circuit is configured as mixer circuit.

The heating circuit return is not connected with the heat pump return, it is connected only direct to the heating puffer.



Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

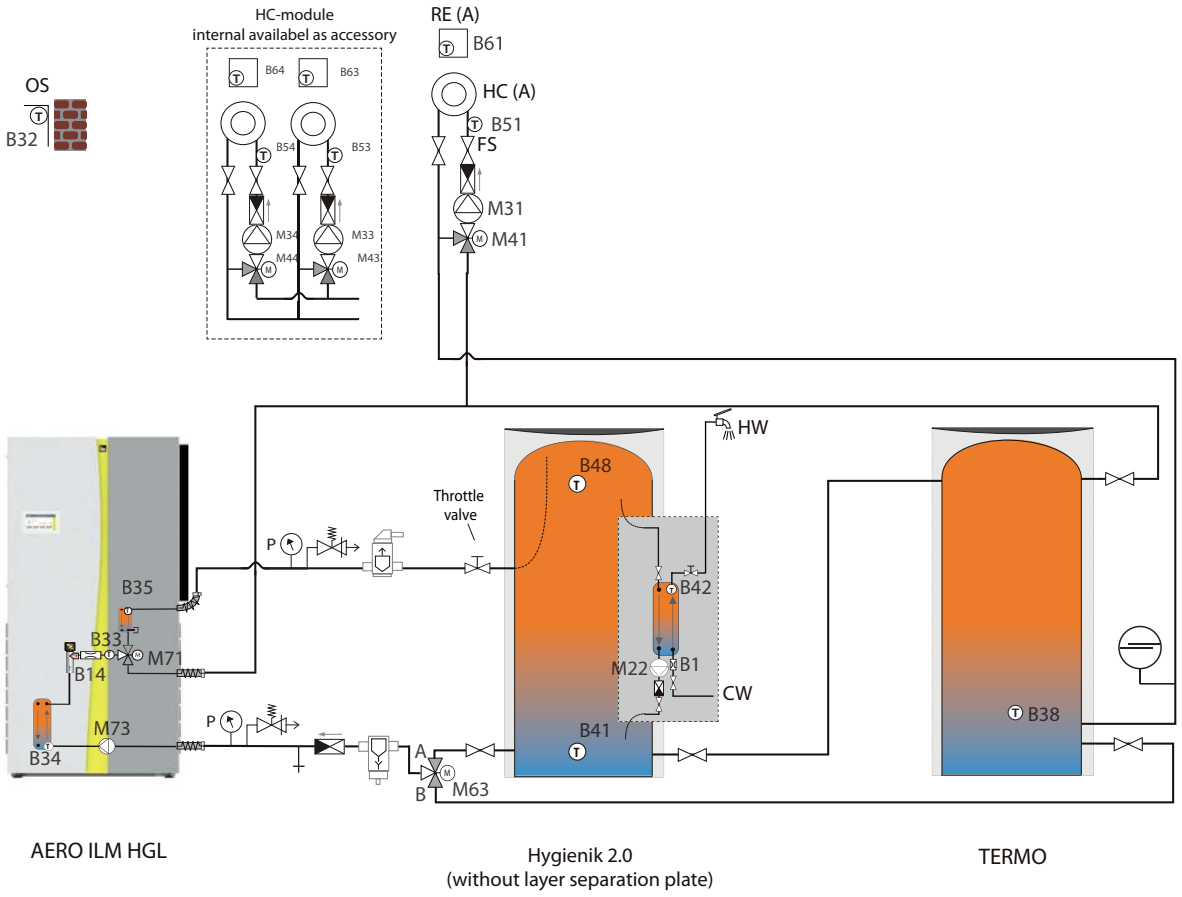
One heating circuit can be regulated as standard. For 2 or more heating circuits an appropriate additional regulation module has to be installed.

6.10. AERO ILM HGL with Hygienik without separating plate and heating buffer

A saparate Hygienik without separating plate and a separate heating puffer is used.

Even during heating mode, the HGL is able to load the Hygienik tank with e.g. 55 °C hot water.

Due to the 3-way-valve in the return to the heatpump, the heating heating buffer is not supplied during summer.



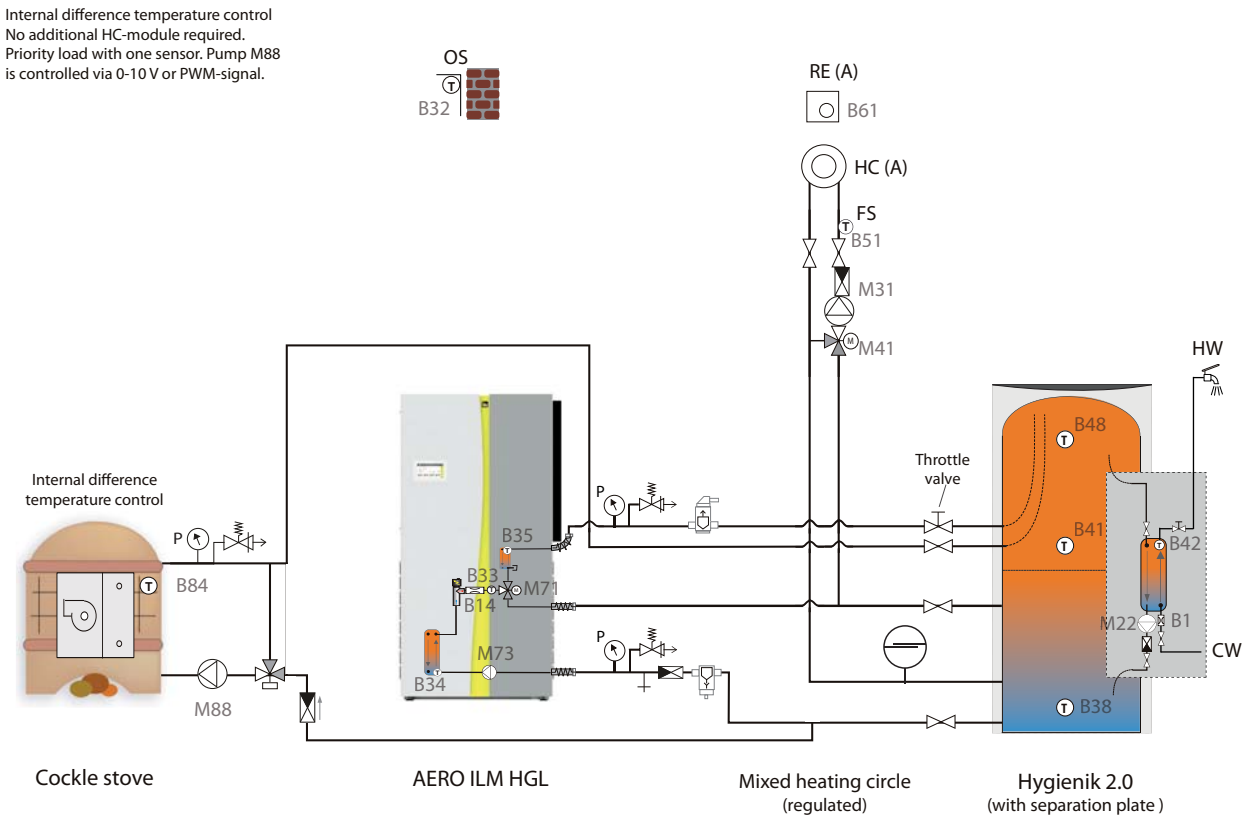
Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

One heating circuit can be regulated as standard. For 2 or more heating circuits an appropriate additional regulation module has to be installed.

6.11. AERO ILM HGL with Hygenik with separating plate and cockle stove

The heating circuit is configured as mixer circuit.
The heating circuit return is not connected with the heat pump return, it is connected only direct to the heating puffer.

The cockle stove is fed into the Hygienik system via the integrated differential temperature control.



Note: This is only a tentative suggestion for installing an IDM heat pump in the heating system. This suggestion replaces no professional planning of an executing companie! On part of IDM-Energiesysteme can no warrenty be taken concerning the function of the whole system! General instructions for iDM system schemes must be noted!

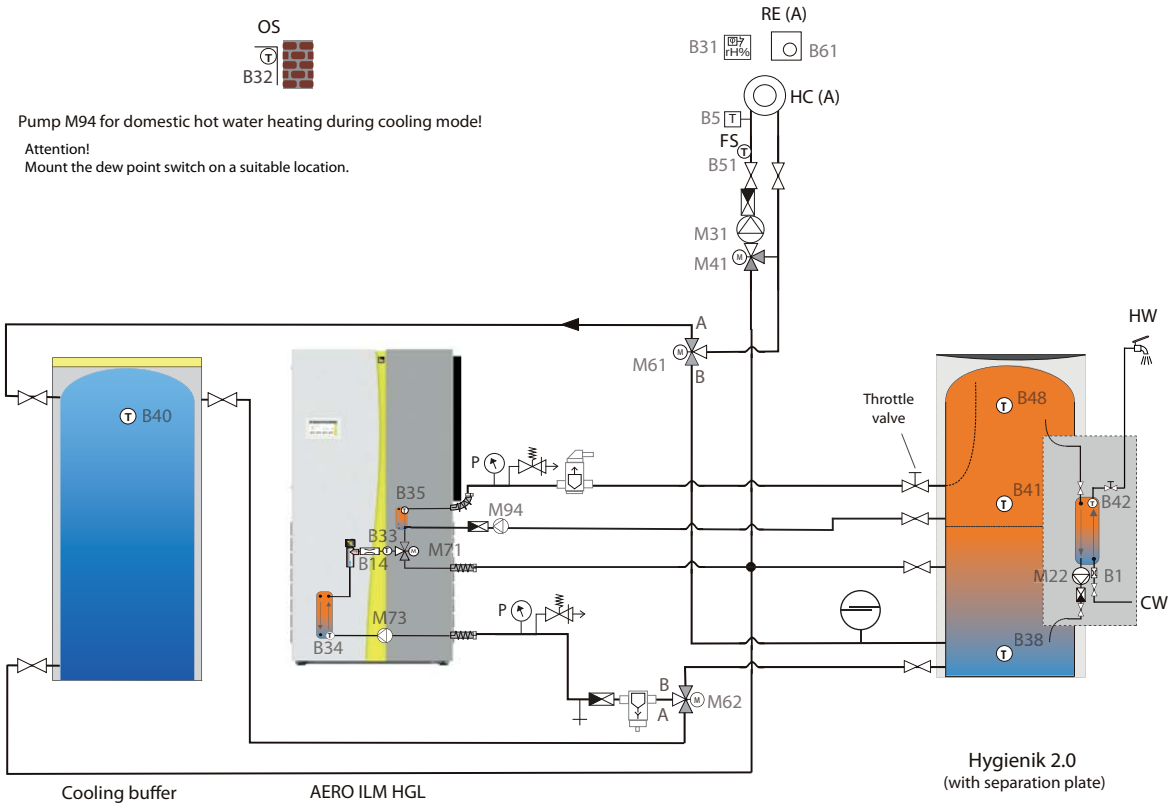
One heating circuit can be regulated as standard. For 2 or more heating circuits an appropriate additional regulation module has to be installed.

6.12. AERO ILM HGL with cooling and HGL usage in one step

When the heat pump works in cooling mode, the waste heat is used for hot water supply. For this, the hydraulic needs to be extended with a HGL return and the associated pump (accessory).

To switch the operation of the heat pump from heating to cooling a cooling valve has to be installed in the heat pump inlet and heat pump outlet.
It is additionally necessary to install a cooling valve in the heating circuit supply.

The heating circuit is configured as mixer circuit.

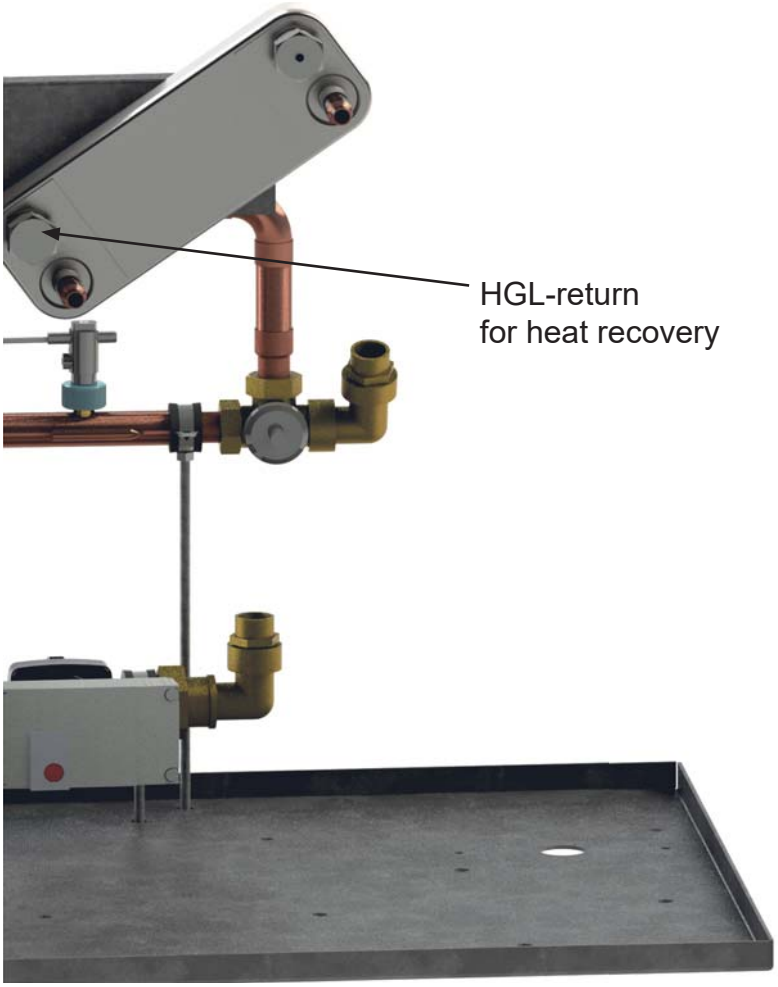


In cooling mode with the AERO ILM HGL a cooling buffer can be integrated. An air humidity sensor and a dew point switch has to be installed to monitor the dew point.

6.13. Additional hydraulic connection for heat recovery

In cooling mode it is possible to recover the waste heat. If installing heat recovery in cooling mode, there have to be set an additional piping for the HGL-return.

The available accessory includes a flexible hose connection and a high efficiency charging pump.



7. Electrical connection

7.1. Power supply

The electrical connection must be made by a qualified person and must be registered with the local electricity company. The executive electrical company, is responsible for the norm-compliant connection to the electrical installation and the applied safety measure.

The mains voltage at the terminals of the heat pump must be 230V respectively 400V ± 10%. The dimensions of the connecting cables must be checked by the executive electric company.

A fault-current circuit breaker for the heat pump is not required. The connection to the protective measure „protective multiple earthing“ is sufficient. If nevertheless the protective measure „fault-current circuit breakers,“ dispatched by the executive electric company, a separate fault-current circuit breaker for the heat pump is recommended.

This must be designed as an all current sensitive Type B time-delayed (IΔN ≥ 300mA).

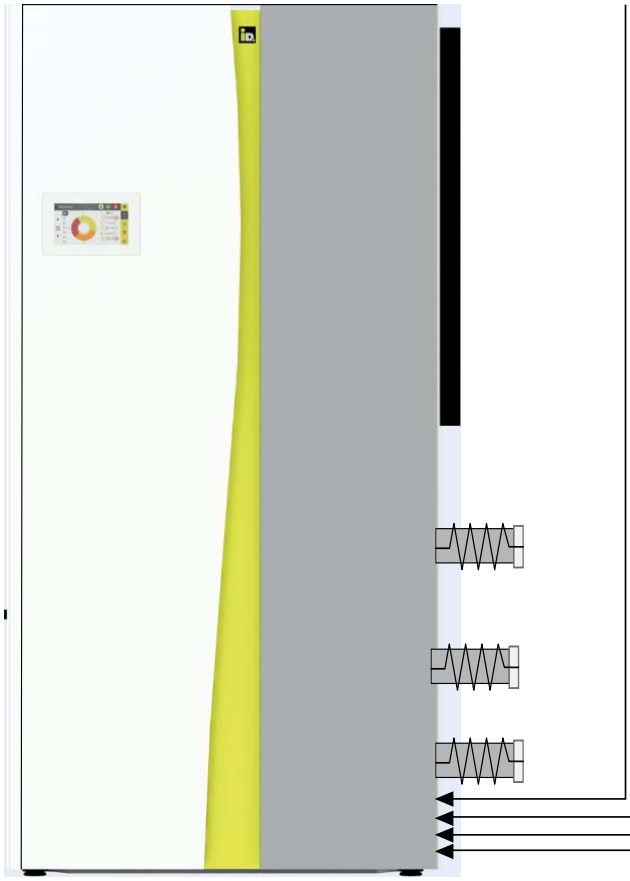
The specified FI-types related to the heat pump excluding externally connected components (see Installation instructions, data sheets).

For the main current circuit as a result of the occurring starting currents, circuit breakers with a tripping characteristic curve Type „C“ or „K“ must be used.

For the control circuit and the optional electric auxiliary heater, circuit breakers with a tripping characteristic Type „B“ or „Z“ are sufficient.

The electrical connection- and supply cables must be designed as copper cables.

For electrical details see the wiring diagram.



Primary current electric immersion heater

AERO ILM 4-13	3x400V/50Hz - 5G1,5 mm²
AERO ILM 2-7	1x230V/50HZ - 3G6,0 mm² or 3x400V/50Hz - 5G1,5 mm²

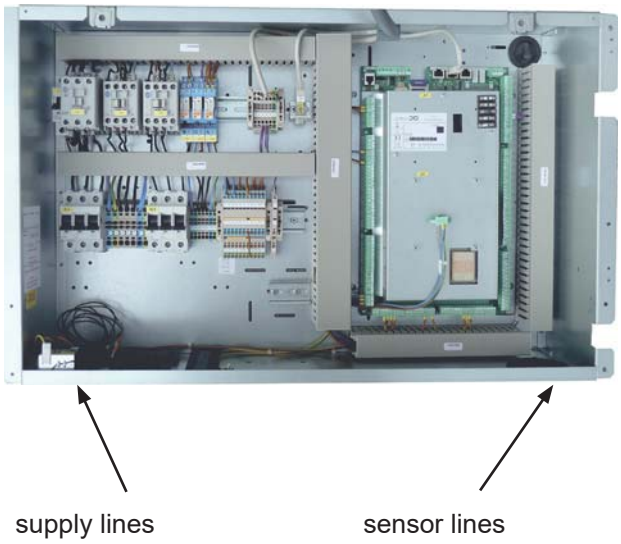
Primary current compressor

AERO ILM 4-13	3x400V/50Hz - 5G4,0 mm²
AERO ILM 2-7	1x230V/50HZ - 3G2,5 mm²

Control current
1x230V/50Hz - 3G1,5 mm²

Network cable
(optional)

All electrical details can be derived from the appropriate circuit diagram.



7.3. Configuration of outputs and inputs

The configuration of outputs and inputs on the central unit is derived from the electric circuit diagram relating to the system.

The electric switching cabinet is positioned below the fan. Both front panels including the touch display have to be removed. Then the lower cover of the refrigerant part has to be removed. Finally it is possible to remove the cover of the electrical cabinet itself.

The sensor lines must be laid separately from the feed lines. (see EMC problems)

Together with each heat pump a standard sensor set is supplied. This is included and stored in the control cabinet of the heat pump.

7.2. Feedthrough for wiring

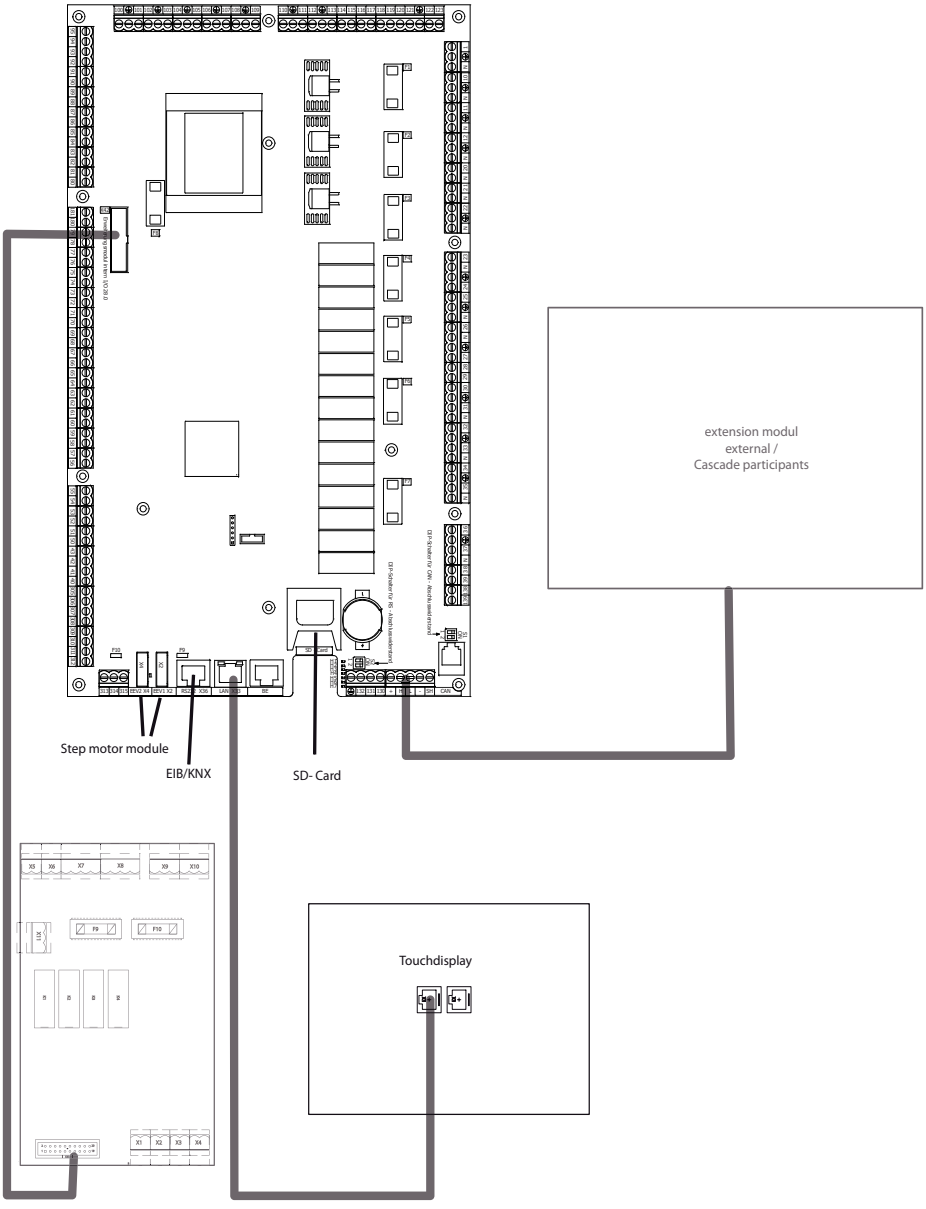
The feedthrough for the supply lines into the cabinet is carried out by the free grommet on the left side.

The sensor cables which have to be installed on site, have to be feed through the grommet on the right side.

7.4. Connection diagram for the electric components

The central controller unit is located below the front panel (below the operating unit). All connections on the central unit are disconnectable.

Additional modules such as the internal extension module for two further heating circuits, as well as the extension module for three heating circuits and the operating unit are connected as shown in the diagram below.



7.5. Configuration of sensors

Sensor lines are furnished as standard with a line cross-section of 0.75 mm².

The sensor positions are shown in the respective installation layout. A perfect function can only be guaranteed by a correct position and optimal thermal transition (heat-conductive paste).

If necessary, the sensors can be extended by using suitable cabling. Ensure a clean corrosion-free connection.

7.5.1. Sensor configuration

The following sensors are included in the delivery contents or already mounted and in any case necessary (see piping scheme).

- Heat exchange sensor (B72)
  factory-provided and already mounted
- Air inlet sensor (B37),
  factory-provided and already mounted
- Heat pump flow sensor (B33)
  factory provided and already mounted
- Heat pump return sensor (B34)
  factory provided and already mounted
- HGL-flow sensor (B35) - only HGL model
  factory provided and already mounted
- Space heating storage tank sensor (B38)
- Cooling buffer sensor (B40)
- Flow sensor heating circuit A (B51)
- Hygienic sensor bottom (B41)
- Hygienic sensor top (B48)
- Warm water station sensor (B42)
- Outer sensor (B32)

(all other sensors are optional depending on the system configuration)

The sensor lines must be laid separately from the feed lines. (see EMC problems)

7.5.2. Flow temperature sensor

The flow temperature sensor for the heating circuits used have to be installed as shown in the piping shemes. They are mounted to the appropriate flow lines and connected according to the electrical connection diagram.

The flow sensors for the heating circuits C-G are connected to the respective heat circuit extension module. (see assembly instructions extension module)

7.6. Connecting the outputs

The assignment of the outputs on the central unit can be found in the electrical wiring diagram of the heat pump.

7.7. Grounding the system

If the protective conductor is connected properly that means that the control panel and the housing of the heat pump are grounded properly.

In the case of maintenance operations, ensure that the potential equalization is restored properly once the maintenance has been finished.

7.8. Maximum delimitation in underfloor heating

In underfloor heating circuits an additional application thermostat has to be mounted and the appropriate heating circuit feed has to be switched in series above that.

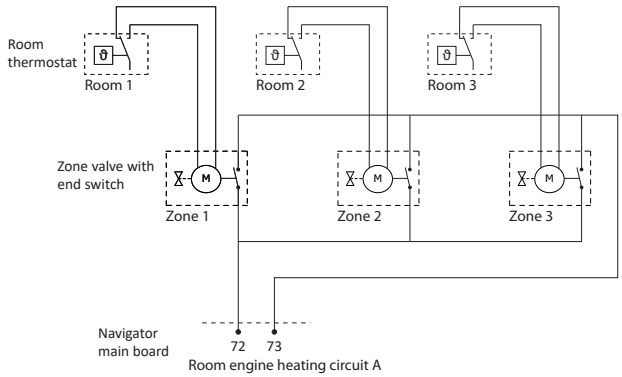
If the heating circuit does not have its own heating circuit pump (unregulated direct heating circuit), no contact thermostat is required. The safety shutdown of the charge pump operates in this case directly via the heat pump.

7.9. Connecting external specifications 0-10V

To connect the reference value input 0-10 V, the input of the air humidity sensor is used. Via this 0-10 V signal the regulation of the target temperature is specified.

7.10. Sum signal zone valves

In setting the sum signal zone valve a requirement is generated if one of the zone valves is open. The difference to the room thermostat function is that irrespective of heating or cooling operation a requirement in the closed contact of a zone valve is generated.



If zone valves are used, a sum signal of all zone valves can be generated to be able to switch the heating and cooling circuit ON resp. OFF with the thermostat function.

7.11. EMC compatibility

Some remarks regarding problems with EMC: Electromagnetic compatibility requires all manufactures and operators of modern electrical engineering and electronics to invest higher amounts of money and more know-how from year to year.

As the number of electronic devices in use is continuously rising, the number of potential disturbance sources also rises. Together with the lines of the energy supply companies, of transmission equipment and other communication facilities §electromagnetic pollution" that is invisible for us is created.

These disturbances have an effect on all systems, not only on biological (on creatures), but also on electrotechnical systems. They lead to undesired error flows which can have diverse effects.

The effects on biological systems are extremely difficult to fathom, the effects on electrotechnical systems are, however, measurable, and in the most unfavorable case also visible.

The disturbances can have various effects:

- Short-term measurement errors
- Long-term measurement errors
- Short-term interruption of data connections
- Long-term interruption of data connections
- Data loss
- Damage to the equipment

In principle, all electrotechnical systems can represent possible sources of interference, e.g. contactors, electric motors, transmitters, line voltage or high voltage lines, etc. whereby the influence of the equipment can take place on the various coupling paths (galvanic, inductive, capacitive, by radiation).

We have undertaken everything possible to make the navigator regulation as fail-safe as possible (hardware design, EMC--proof control panel, network filter etc). It now lies within the field of responsibility of the electrician in setting up the electronic installation to avoid possible coupling paths.

Information on the electric details are found in the circuit diagram attached.

8.1. Information regarding the start-up

Before starting up the IDM heat pump ensure water tightness on the heating side, rinse the heat pump thoroughly, fill and ventilate the heat pump carefully.

Start-up requirements

- The heating and a possibly existing storage tank have to be filled and ventilated.
- At the start-up the complete heating buffer has to be heated up to min. 20 °C. This can be performed e.g. with the electric heating rod.
- The electrical installation must be completed and fused properly.
- The heat pump may only be switched on if it is properly filled on the coolant side as well as on the heating side and if the electrical connections are in place.
- At the start-up the maximum temperature limit has to be set. The switch-off point at 60 °C must be checked and, if applicable, the shut-down temperature then adapted.
- The heat pump is furnished with a delay time of 10 minutes, so that the compressor only starts after this start-up delay.
- If the heat pump is to be drained on the heating side in a frost-proof way, the connection hose has to be loosened at the heat pump return (plate heat exchanger).

8.1.1. Switching the heat pump on for the very first time.

After pressing the main switch on the heat pump, the start-up assistant is started after selecting the desired language.

8.1.2. Operation

The AERO heat pump is independently switched on and off via the fully automatic navigator regulation. See the separate operation and start-up instructions for information on Operation and Start-up.

An annual inspection and maintenance of the system by customer service is recommended, in particular with regard to protecting the guarantee claims.

In accordance with Regulation (EU) No. 517/2014 of 01/01/2015 on certain fluorinated greenhouse gases and in accordance with Regulation (EU) No. 1516/2007, the operator of a heat pump system is obligated to carry out regular leak tests by a certified professional. The interval may vary depending upon the CO_2 equivalent capacity. The inspection intervals are indicated in the Check- and servicebook.

8.2. Errors

The AERO heat pump is furnished with a multitude of safety switching device so that in the event of disturbances no damage will take place to the equipment.

If contrary to expectations the heat pump fails to function, please check the error message shown on the display on the navigator regulation.

See the operating instructions of the navigator regulation!

If an error occurs several times in sequence, please contact your IDM customer service!

Customer service phone No.: ___

9.1. AERO ILM 2-7 - Performance data heating - detailed

		outdoor temperature [°C]									
	W 35 °C	20	15	12	10	7	2	-7	-10	-15	-18
MAX	heat capacity [kW]	10,65	10,52	10,38	9,90	8,91	6,56	6,19	5,61	4,78	4,30
	power consumption [kW]	2,24	2,22	2,22	2,21	2,19	2,05	2,01	1,92	1,84	1,89
	COP	**4,75**	**4,74**	**4,68**	**4,48**	**4,07**	**3,20**	**3,08**	**2,92**	**2,60**	**2,28**
NOMINAL	heat capacity [kW]	5,26	5,22	5,12	4,91	4,51	3,87	2,84	2,60	2,19	1,94
	power consumption [kW]	0,88	0,89	0,89	0,89	0,89	0,89	0,87	0,86	0,83	0,84
	COP	**5,98**	**5,87**	**5,75**	**5,52**	**5,06**	**4,32**	**3,28**	**3,02**	**2,64**	**2,31**
MIN	heat capacity [kW]	2,58	2,57	2,55	2,50	2,35	2,05	1,33	-	-	-
	power consumption [kW]	0,41	0,41	0,42	0,43	0,44	0,46	0,45	-	-	-
	COP	**6,29**	**6,27**	**6,07**	**5,81**	**5,34**	**4,46**	**2,96**	**-**	**-**	**-**

		outdoor temperature [°C]									
	W 45 °C	20	15	12	10	7	2	-7	-10	-15	-18
MAX	heat capacity [kW]	10,24	10,10	9,98	9,72	8,92	6,50	6,04	5,50	4,57	4,21
	power consumption [kW]	2,69	2,68	2,66	2,64	2,59	2,24	2,36	2,27	2,15	2,10
	COP	**3,81**	**3,77**	**3,75**	**3,68**	**3,44**	**2,90**	**2,56**	**2,42**	**2,13**	**2,00**
NOMINAL	heat capacity [kW]	4,99	4,89	4,75	4,55	4,25	3,66	2,68	2,38	1,98	1,69
	power consumption [kW]	1,12	1,12	1,12	1,11	1,10	1,11	1,03	1,02	0,98	0,96
	COP	**4,46**	**4,37**	**4,24**	**4,10**	**3,86**	**3,30**	**2,60**	**2,33**	**2,02**	**1,76**
MIN	heat capacity [kW]	2,35	2,30	2,20	2,17	1,94	1,65	1,12	-	-	-
	power consumption [kW]	0,53	0,55	0,56	0,56	0,57	0,58	0,55	-	-	-
	COP	**4,43**	**4,18**	**3,93**	**3,88**	**3,40**	**2,84**	**2,04**	**-**	**-**	**-**

		outdoor temperature [°C]									
	W 55 °C	20	15	12	10	7	2	-7	-10	-15	-18
MAX	Heizleistung [kW]	9,99	9,80	9,64	9,22	8,29	6,41	5,91	5,34	4,41	4,03
	Leistungsaufnahme [kW]	3,01	3,01	2,98	2,96	3,07	2,62	2,65	2,58	2,44	2,38
	COP	**3,32**	**3,26**	**3,23**	**3,11**	**2,70**	**2,45**	**2,23**	**2,07**	**1,81**	**1,69**
NOMINAL	Heizleistung [kW]	4,66	4,54	4,29	4,18	3,96	3,30	2,47	2,18	1,70	1,54
	Leistungsaufnahme [kW]	1,33	1,32	1,31	1,30	1,32	1,28	1,23	1,20	1,15	1,13
	COP	**3,50**	**3,44**	**3,27**	**3,22**	**3,00**	**2,58**	**2,01**	**1,82**	**1,48**	**1,36**
MIN	Heizleistung [kW]	2,18	2,08	2,06	1,92	1,74	1,40	0,88	-	-	-
	Leistungsaufnahme [kW]	0,73	0,71	0,71	0,71	0,71	0,71	0,68	-	-	-
	COP	**2,99**	**2,93**	**2,90**	**2,70**	**2,45**	**1,97**	**1,29**	**-**	**-**	**-**

		outdoor temperature [°C]									
	W 60 °C	20	15	12	10	7	2	-7	-10	-15	-18
MAX	Heizleistung [kW]	8,79	8,60	8,47	8,10	7,28	5,63	5,19	-	-	-
	Leistungsaufnahme [kW]	2,90	2,89	2,90	2,87	2,98	2,54	2,57	-	-	-
	COP	**3,03**	**2,98**	**2,92**	**2,82**	**2,44**	**2,22**	**2,02**	**-**	**-**	**-**
NOMINAL	Heizleistung [kW]	4,47	4,36	4,15	3,95	3,64	3,10	2,24	-	-	-
	Leistungsaufnahme [kW]	1,44	1,44	1,44	1,43	1,45	1,44	1,35	-	-	-
	COP	**3,10**	**3,03**	**2,88**	**2,76**	**2,51**	**2,15**	**1,66**	**-**	**-**	**-**
MIN	Heizleistung [kW]	2,09	2,00	1,99	1,81	1,60	1,32	-	-	-	-
	Leistungsaufnahme [kW]	0,79	0,77	0,78	0,78	0,78	0,80	-	-	-	-
	COP	**2,65**	**2,60**	**2,55**	**2,32**	**2,05**	**1,65**	**-**	**-**	**-**	**-**

9.2. AERO ILM 2-7 - Performance data cooling - detailed

		outdoor temperature [°C]					
W18		40	35	30	25	20	15
MAX	cooling capacity [kW]	7,32	8,04	8,72	9,37	-	-
	power consumption [kW]	3,36	3,12	2,85	2,47	-	-
	EER	2,18	2,58	3,06	**3,79**	**-**	**-**
NOMINAL	cooling capacity [kW]	4,76	5,09	5,62	5,75	-	-
	power consumption [kW]	1,29	1,13	1,01	0,94	-	-
	EER	**3,70**	**4,50**	**5,57**	**6,09**	**-**	**-**
MIN	cooling capacity [kW]	2,51	2,60	2,58	2,56	-	-
	power consumption [kW]	0,57	0,48	0,46	0,47	-	-
	EER	**4,39**	**5,46**	**5,60**	**5,42**	**-**	**-**

		outdoor temperature [°C]					
W12		40	35	30	25	20	15
MAX	cooling capacity [kW]	6,45	6,89	7,44	8,00	8,60	-
	power consumption [kW]	3,16	2,87	2,64	2,41	2,28	-
	EER	**2,04**	**2,40**	**2,82**	**3,32**	**3,77**	**-**
NOMINAL	cooling capacity [kW]	3,95	4,31	4,63	4,97	5,10	-
	power consumption [kW]	1,25	1,13	1,00	0,89	0,83	-
	EER	**3,16**	**3,81**	**4,63**	**5,58**	**6,14**	**-**
MIN	cooling capacity [kW]	2,00	2,15	2,20	2,20	2,24	-
	power consumption [kW]	0,58	0,51	0,45	0,41	0,38	-
	EER	**3,43**	**4,19**	**4,89**	**5,37**	**5,89**	**-**

		outdoor temperature [°C]					
W7		40	35	30	25	20	15
MAX	cooling capacity [kW]	5,58	6,10	6,58	7,06	7,44	7,95
	power consumption [kW]	2,94	2,70	2,48	2,26	2,06	1,95
	EER	**1,90**	**2,26**	**2,65**	**3,12**	**3,61**	**4,08**
NOMINAL	cooling capacity [kW]	3,25	3,44	3,81	4,22	4,44	4,50
	power consumption [kW]	1,22	1,09	1,00	0,89	0,79	0,73
	EER	**2,66**	**3,16**	**3,81**	**4,76**	**5,65**	**6,16**
MIN	cooling capacity [kW]	1,58	1,69	1,77	1,95	2,06	2,14
	power consumption [kW]	0,57	0,52	0,46	0,48	0,46	0,44
	EER	**2,77**	**3,25**	**3,85**	**4,06**	**4,48**	**4,86**

To guarantee a correct cooling mode, when working with unregulated direct-heating circles (without cooling buffer) following 3 points have to be met.

1) To ensure the minimum volume of heating site, appropriate zones have to remain open all the time. Minimum volume 60 lt.

2) To ensure the minimum fl ow rate of heating site, appropriate zones have to remain open all the time. Minimum fl ow rate 0.75 m³/h

3) To ensure the minimum cooling output rate of distribution system, appropriate zones have to remain open all the time. The minimum cooling output rate is 70 % of the minimum cooling output power of the heatpump at A35/W18. Minimum cooling consumption 1.80 kW

All 3 points must be fulfi lled independently. This is possible via the Navigator Pro. The entire distribution system has to fulfi ll the 3 mentioned points.

To ensure a large cooling demand, the cooling limit has to be set as high as possible.

9.3. AERO ILM 4-13 - Performance data heating - detailed

		outdoor temperature [°C]									
	Flow temperature 35 °C	**20**	**15**	**12**	**10**	**7**	**2**	**-7**	**-10**	**-15**	**-18**
MAX	heat capacity [kW]	15,20	15,43	15,20	15,10	14,50	12,67	10,90	10,17	8,94	8,17
	power consumption [kW]	3,44	3,67	3,81	3,89	3,94	3,99	4,15	4,19	4,26	4,27
	COP	**4,42**	**4,20**	**3,99**	**3,88**	**3,68**	**3,18**	**2,63**	**2,43**	**2,10**	**1,91**
NOMINAL	heat capacity [kW]	9,90	9,59	9,15	8,90	8,28	7,11	5,50	4,97	4,08	3,58
	power consumption [kW]	1,69	1,76	1,77	1,79	1,74	1,73	1,68	1,68	1,69	1,74
	COP	**5,86**	**5,45**	**5,17**	**4,97**	**4,76**	**4,11**	**3,27**	**2,96**	**2,42**	**2,06**
MIN	heat capacity [kW]	5,58	5,75	5,08	4,80	4,35	3,76	2,85	2,86	2,88	2,83
	power consumption [kW]	0,83	0,84	0,85	0,84	0,82	0,82	0,80	0,93	1,15	1,34
	COP	**6,72**	**6,85**	**5,98**	**5,71**	**5,30**	**4,58**	**3,57**	**3,08**	**2,50**	**2,11**

		outdoor temperature [°C]									
	Flow temperature 45 °C	**20**	**15**	**12**	**10**	**7**	**2**	**-7**	**-10**	**-15**	**-18**
MAX	heat capacity [kW]	14,31	14,18	14,14	14,01	13,55	11,93	9,71	9,19	8,33	7,39
	power consumption [kW]	3,81	4,11	4,37	4,48	4,62	4,52	4,62	4,61	4,56	4,37
	COP	**3,76**	**3,45**	**3,24**	**3,13**	**2,93**	**2,64**	**2,10**	**1,99**	**1,83**	**1,69**
NOMINAL	heat capacity [kW]	9,32	8,81	8,51	8,26	7,74	6,69	4,90	4,49	3,81	3,24
	power consumption [kW]	1,87	1,97	2,03	2,06	2,04	1,96	1,87	1,85	1,81	1,78
	COP	**4,98**	**4,47**	**4,19**	**4,01**	**3,79**	**3,41**	**2,62**	**2,43**	**2,10**	**1,82**
MIN	heat capacity [kW]	5,25	5,28	4,72	4,45	4,06	3,54	2,54	2,58	2,68	2,56
	power consumption [kW]	0,92	0,94	0,97	0,97	0,96	0,93	0,89	1,02	1,23	1,37
	COP	**5,72**	**5,62**	**4,85**	**4,61**	**4,23**	**3,81**	**2,86**	**2,52**	**2,18**	**1,87**

		outdoor temperature [°C]									
	Flow temperature 55 °C	**20**	**15**	**12**	**10**	**7**	**2**	**-7**	**-10**	**-15**	**-18**
MAX	heat capacity [kW]	13,43	13,18	13,06	12,96	12,60	11,14	9,06	8,21	-	-
	power consumption [kW]	4,74	4,94	5,14	5,28	5,57	5,63	6,00	6,06	-	-
	COP	**2,83**	**2,67**	**2,54**	**2,45**	**2,26**	**1,98**	**1,51**	**1,35**	-	-
NOMINAL	heat capacity [kW]	8,75	8,19	7,86	7,64	7,20	6,25	4,57	4,01	-	-
	power consumption [kW]	2,33	2,37	2,39	2,43	2,46	2,44	2,43	2,43	-	-
	COP	**3,76**	**3,46**	**3,29**	**3,14**	**2,93**	**2,56**	**1,88**	**1,65**	-	-
MIN	heat capacity [kW]	4,93	4,91	4,36	4,12	3,78	3,30	2,37	2,31	-	-
	power consumption [kW]	1,14	1,13	1,15	1,14	1,16	1,16	1,16	1,35	-	-
	COP	**4,31**	**4,35**	**3,80**	**3,61**	**3,26**	**2,86**	**2,05**	**1,72**	**-**	**-**

		outdoor temperature [°C]									
	Flow temperature 60 °C	**20**	**15**	**12**	**10**	**7**	**2**	**-7**	**-10**	**-15**	**-18**
MAX	heat capacity [kW]	13,07	12,73	12,54	12,40	11,90	10,64	-	-	-	-
	power consumption [kW]	5,33	5,52	5,73	5,87	6,07	6,23	-	-	-	-
	COP	**2,45**	**2,31**	**2,19**	**2,11**	**1,96**	**1,71**	-	-	-	-
NENN	heat capacity [kW]	8,51	7,91	7,55	7,31	6,80	5,97	-	-	-	-
	power consumption [kW]	2,62	2,65	2,66	2,70	2,68	2,70	-	-	-	-
	COP	**3,25**	**2,99**	**2,84**	**2,71**	**2,54**	**2,21**	-	-	-	-
MIN	heat capacity [kW]	4,80	4,74	4,19	3,94	3,57	3,15	-	-	-	-
	power consumption [kW]	1,29	1,26	1,28	1,27	1,26	1,28	-	-	-	-
	COP	**3,73**	**3,76**	**3,28**	**3,11**	**2,83**	**2,47**	**-**	**-**	**-**	**-**

9.4. AERO ILM 4-13 - Performance data cooling - detailed

		outdoor temperature [°C]					
	W18	**40**	**35**	**30**	**25**	**20**	**15**
MAX	cooling capacity [kW]	12,61	13,94	15,12	16,14	-	-
	power consumption [kW]	4,55	4,07	3,71	3,45	-	-
	EER	**2,77**	**3,43**	**4,07**	**4,69**	**-**	**-**
NOMINAL	cooling capacity [kW]	8,78	9,48	10,02	10,38	-	-
	power consumption [kW]	2,64	2,31	2,12	1,99	-	-
	EER	**3,33**	**4,10**	**4,73**	**5,21**	**-**	**-**
MIN	cooling capacity [kW]	6,56	6,94	7,16	7,22	-	-
	power consumption [kW]	2,39	2,10	1,90	1,74	-	-
	EER	**2,74**	**3,30**	**3,77**	**4,15**	**-**	**-**

		outdoor temperature [°C]					
	W12	**40**	**35**	**30**	**25**	**20**	**15**
MAX	cooling capacity [kW]	10,94	12,27	13,45	14,48	15,34	-
	power consumption [kW]	4,87	4,36	3,97	3,63	3,46	-
	EER	**2,25**	**2,82**	**3,38**	**3,99**	**4,43**	**-**
NOMINAL	cooling capacity [kW]	7,04	7,74	8,28	8,65	8,85	-
	power consumption [kW]	2,57	2,20	2,00	1,86	1,78	-
	EER	**2,74**	**3,51**	**4,14**	**4,64**	**4,98**	**-**
MIN	cooling capacity [kW]	4,91	5,29	5,52	5,58	5,49	-
	power consumption [kW]	2,14	1,85	1,65	1,52	1,40	-
	EER	**2,29**	**2,86**	**3,35**	**3,68**	**3,93**	**-**

		outdoor temperature [°C]					
	W7	**40**	**35**	**30**	**25**	**20**	**15**
MAX	cooling capacity [kW]	8,59	9,79	10,85	11,77	12,55	13,18
	power consumption [kW]	4,15	3,71	3,39	3,02	2,86	2,80
	EER	**2,07**	**2,64**	**3,20**	**3,89**	**4,39**	**4,70**
NOMINAL	cooling capacity [kW]	6,01	6,76	7,34	7,74	7,95	8,00
	power consumption [kW]	2,66	2,23	2,01	1,86	1,77	1,70
	EER	**2,25**	**3,03**	**3,65**	**4,15**	**4,49**	**4,69**
MIN	cooling capacity [kW]	4,12	4,56	4,83	4,90	4,79	4,50
	power consumption [kW]	1,74	1,49	1,33	1,20	1,09	0,98
	EER	**2,36**	**3,06**	**3,64**	**4,09**	**4,41**	**4,57**

To guarantee a correct cooling mode, when working with unregulated direct-heating circles (without cooling buffer) following 3 points have to be met.

1) To ensure the minimum volume of heating site, appropriate zones have to remain open all the time. Minimum volume 144 lt.

2) To ensure the minimum flow rate of heating site, appropriate zones have to remain open all the time. Minimum flow rate 1.4 m³/h

3) To ensure the minimum cooling output rate of distribution system, appropriate zones have to remain open all the time. The minimum cooling output rate is 70 % of the minimum cooling output power of the heatpump at A35/W18. Minimum cooling consumption 5.1 kW

All 3 points must be fulfilled independently. This is possible via the Navigator Pro. The entire distribution system has to fulfill the 3 mentioned points.

To ensure a large cooling demand, the cooling limit has to be set as high as possible.

9.5. AERO ILM 2-7 - Product data sheet

Product fiche

according EU-Regulation No. 811/2013

(Rev.1, valid with 07th May, 2018)

1. Space heating heat pump

Name of supplier				IDM Energiesysteme	
Name of product				AERO ILM 2-7	
Heat source				ambient air	
Parameter	Symbol	Unit	Climate	35 °C	55 °C
energy efficiency class	-	-	cold	A^{++}	A^{+}
			average	A^{++}	A^{++}
			warm	A^{++}	A^{++}
seasonal space heating energy efficiency	η_s	%	cold	166	124
			average	181	130
			warm	236	181
Seasonal Coefficient of Performance	SCOP	-	cold	4.21	3.18
			average	4.61	3.33
			warm	5.96	4.60
rated heat output	P_{rated}	kW	cold	6	5
			average	6	4
			warm	7	6
annual energy consumption	Q_{HE}	kWh	cold	3,421	3,605
			average	2,512	2,733
			warm	1,628	1,855
sound power level	L_{WA}	dB(A)	indoor	44	44
			outdoor	51	51
specific precautions that shall be taken when the space heater is assembled, installed or maintained:				see installation instructions	

2. Space heating heat pump and temperature control

Name of supplier	IDM Energiesysteme
Name of product	NAVIGATOR 2.0
class of control (I-VIII)	VI
correction factor of control [%]	4
seasonal space heating energy efficiency of package [%]	134
energy efficiency class of package	A^{++}

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9.6. AERO ILM 4-13 - Product data sheet

Product fiche

according EU-Regulation No. 811/2013

(Rev.1, valid with 7th May, 2018)

1. Space heating heat pump

Name of supplier				IDM Energiesysteme	
Name of product				AERO ILM 4-13	
Heat source				ambient air	
Parameter	Symbol	Unit	Climate	35 °C	55 °C
energy efficiency class	-	-	cold	A^{++}	A^{+}
			average	A^{++}	A^{++}
			warm	A^{++}	A^{++}
seasonal space heating energy efficiency	η_s	%	cold	163	121
			average	182	137
			warm	219	177
Seasonal Coefficient of Performance	SCOP	-	cold	4.14	3.11
			average	4.63	3.51
			warm	5.56	4.49
rated heat output	P_{rated}	kW	cold	11	13
			average	13	13
			warm	13	14
annual energy consumption	Q_{HE}	kWh	cold	6,775	10,075
			average	5,963	7,788
			warm	2,973	4,029
sound power level	L_{WA}	dB(A)	indoor	42	42
			outdoor	55	55
specific precautions that shall be taken when the space heater is assembled, installed or maintained:				see installation instructions	

2. Space heating heat pump and temperature control

Name of supplier	IDM Energiesysteme
Name of product	NAVIGATOR 2.0
class of control (I-VIII)	VI
correction factor of control [%]	4
seasonal space heating energy efficiency of package [%]	141
energy efficiency class of package	A^{++}

IDM-Energiesysteme GmbH
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Notes

9.7. Declaration of conformity

IDM-Energiesysteme GmbH
Seblas 16-18, A-9971 Matrei in Osttirol
Phone: 0043 4875/6172-0, Fax: 0043 4875/6172-85
E-Mail: team@idm-energie.at, Homepage: www.idm-energie.at
UID-Nr.: ATU 433 604 0

CE Declaration of Conformity (Original copy)

IDM-Energiesysteme GmbH, Seblas 16-18, A-9971 Matrei East Tyrol, confirms, that device(s) referred to below in the version put into circulation by us satisfies/satisfy the requirements of the EU Directives, EU Safety Standards and product-specific EU Standards.
The basic components of IDM heat-pumps are condenser, evaporator, pipelines, liquid receiver, valves, surge drum and compressors. General technical Data you can find on the nameplate. A change to the device(s) not authorized by us will render this declaration invalid.

EU Directives

Low Voltage Directive
(2014/35/EU)

EMC Directive
(2014/30/EU)

Ecodesign Directive
(2009/125/EU)

Pressure Equipment Directive
(2014/68/EU)

EU Regulation

Regulation on fluorinated greenhouse gases
(EU regulation 517/2014)

Energy Labeling
(EU regulation 2017/1369/EU)

Details EU-PED (2014/68/EU)

Fluid group:	2
Categorie:	I
Valuation procedure:	Modul A

Amongst others, the following harmonized standards have been considered analogously
EN 378-1/2/3/4: 2012
EN 14511-1/2/3/4: 2015
EN 12102: 2013
EN 9614-2: 1996
EN 60335-1 +Appendix ZE: 2012
EN 60335-2-40: 2014
EN 62233: 2008
EN 55014-1/2: 2006/1997
EN 61000-3-11/12: 2000/2011
EN 14825: 2013

Concerning following products:

Air to water heat pump
AERO ILM 4-13 incl. model HGL
AERO ILM 2-7

Documentation officer:
IDM-Energiesysteme GmbH
A-9971 Matrei i.O., Seblas 16-18

Details on the type, year, serial number and other technical data you can find on the name plate.

IDM-ENERGIESYSTEME
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Matrei i.O, June 27, 2018

Andreas Bachler, Technical Director

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Revision 1.0

ALWAYS THERE FOR YOU:

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