Outline principle

Application

Houses with water-borne heating systems.

Alternative

Select the desired configuration by highlighting the boxes below.

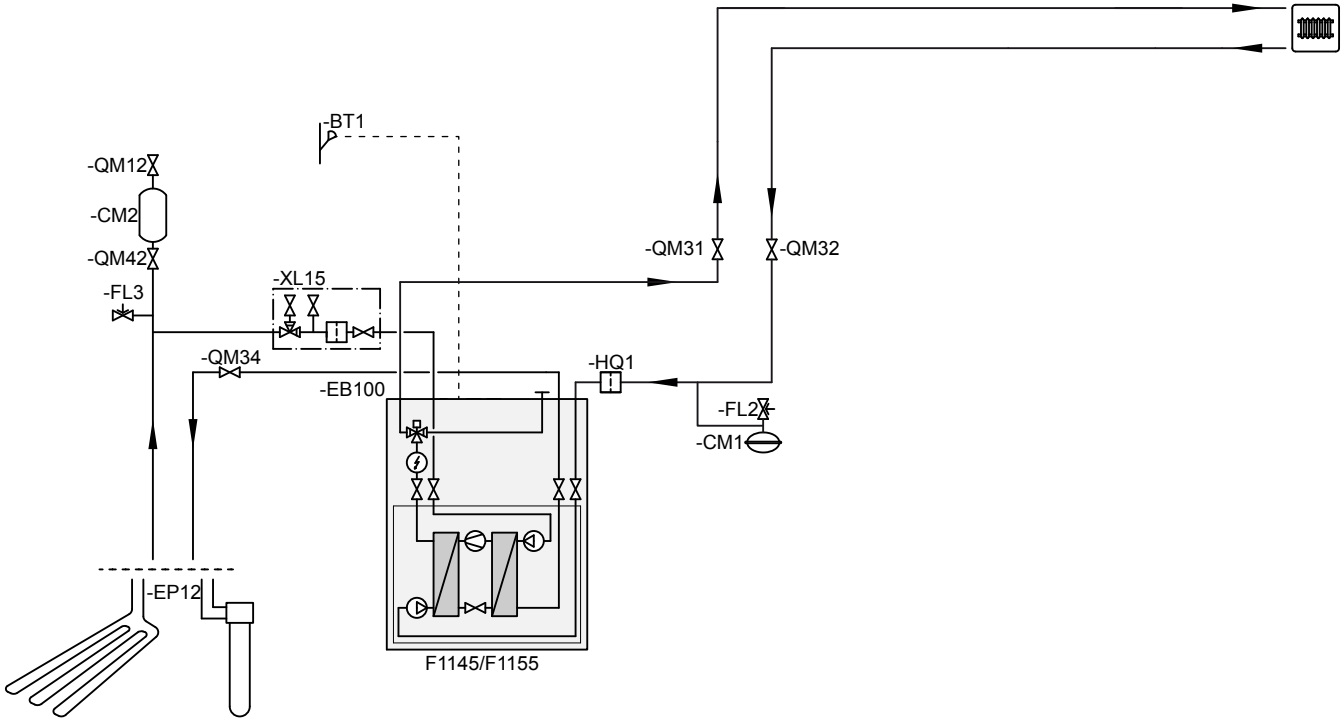
- ☐ Ground water collector
- ☐ Extra climate system
- ☐ Domestic hot water
- ☐ Extra Hot Water
- ☐ Hot water circulation
- ☐ FLM
- ☐ Passive cooling
- ☐ UKV
  - ☐ 2 pipe, Low tempered balanced flow
  - ☐ 3 pipe, Low tempered unbalanced flow
- ☐ External Electrical addition
- ☐ Oil addition
- ☐ District heating addition
- ☐ POOL

Start again

NOTE! This is an outline diagram. Actual installation must be designed according to applicable norms.

NOTE! NIBE does not supply all components in this outline diagram.

See the appropriate installer manual for more information.



Designations according to standard IEC 61346-2

Operate modes

Heat production

F1145/1155 is equipped with an outdoor temperature-controlled heating control system. This means that the supply of heat to the house is regulated in accordance with the chosen setting of the regulating curve (curve slope and offset). After adjustment, the correct amount of heat for the outside temperature is supplied. The supply temperature of the heat pump will hunt around the required value. For subnormal temperatures the control system calculates a heating deficit in the form of "degree-minutes", which means that heating production is accelerated. The larger the subnormal temperature, the greater the heat production. The internal immersion heater is connected automatically when the energy requirement exceeds the heat pump's capacity.

Hot water production

If the water heater is docked to F1145/1155 when there is a demand for hot water, the heat pump gives this priority and devotes its entire output to water heating. No room heat is produced in this mode. Maximum time for hot water charging can be adjusted in the menu system. Hot water charging starts when the hot water sensor has fallen to the set start temperature. Hot water charging stops when the hot water temperature on the hot water sensor (BT6) has been reached. For occasional higher demand for hot water, the temporary lux can be used to raise the temperature for 3 – 12 hours (selected in the menu system). Periodic hot water increase is factory set to every 14 days.

Cooling production

Passive cooling, cooling function without the compressor running, is achieved by connecting a cooling system to the heat pump's collector circuit. The collector's low temperature can be utilised for comfort cooling.

When cooling is required (activated from the outdoor sensor and any room sensor) the circulation pump is activated and the shunt valve provides the correct supply temperature.

Functions/accessories

Heat pump

The compressor in a F1145 is the on/off type. The entire compressor output is routed to heating, hot water or any pool heating. If the output is not sufficient, additional heat engages automatically.

The compressor in a F1155 is the inverter type. The compressor output is adjusted according to the demand and routed to heating, hot water or any pool heating. If the output is not sufficient, additional heat engages automatically.

AUX inputs

F1145/1155 has software-controlled inputs for connecting the switch function or sensor. This means that when an external switch function or sensor is connected to one of five AUX connections, the correct function must be selected for the correct connection. For further information see the Installer's manual.

The following functions can be controlled:

- Temperature sensor, hot water top
- Temperature sensor, cooling/heating
- Blocking of additional heat and/or compressor
- Blocking heating
- Tariff blocking
- Switch for "SG ready"
- Forced control of brine pump
- Activating temporary lux (extra hot water)
- External adjustment of the supply temperature
- Activating fan speed (requires accessory NIBE FLM)
- NV 10, pressure/level/flow monitor brine

All control signals should occur with potential-free relays.

AUX outputs

It is possible to have an external connection through the relay function via a potential-free variable relay (max 2 A) on the input card (AA3), terminal block X7.

Optional functions for external connection:

- Indication of buzzer alarm (preselected at the factory).
- Controlling ground water pump.
- Cooling mode indication (only applies if cooling accessories are available).
- Control of circulation pump for hot water circulation.
- External circulation pump (for heating medium).
- External, reversing valve for hot water.

If any of the above is installed to terminal block X7 they must be selected in the control system.

The accessory card is required if two or more of the above functions are to be connected to terminal block X5 at the same time.

Room control

F1145/1155 can be supplemented with a room sensor (BT50).

The room temperature sensor has up to three functions:

- Show current room temperature in the heat pump's display.
- Option of changing the room temperature in °C.
- Makes it possible to change/stabilise the room temperature.

Install the sensor in a neutral position where the set temperature is required. A suitable place is on a free inner wall in a hall approx. 1.5 m above the floor. It is important that the sensor is not prevented from measuring the correct room temperature by being located, for example, in a recess, between shelves, behind a curtain, above or close to a heat source, in a draft from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.

The heat pump operates without the sensor, but if one wishes to read off the accommodation's indoor temperature in the display for F1145/1155, the sensor must be installed.

External circulation pump

With the AXC 40 accessory (an AXC 40 for each accessory function that is to be used) an external circulation pump (for the climate system) can be connected to the heat pump if the alarm relay (AUX output) is activated for another function. The function is already included in the following accessory functions:

- Step controlled additional heat
- Shunt controlled additional heat
- Pool

Pool

This function requires accessory POOL 40.

A three-way valve can be connected to control all of the heating medium flow to a pool exchanger. The reversing valve is installed on the heating medium circuit, which normally runs to a radiator system. External circulation pump (GP10) must be installed for pool operation.

During pool heating the heating medium is circulated between the heat pump and the pool exchanger using the heat pump's internal circulation pump.

The external circulation pump circulates the heating medium water in the climate system and the external supply sensor meters the heating demand of the house. Up to two different pool systems can be connected to F1145/1155 and controlled individually, it does require two POOL 40 accessories.

Function cont.

Extra climate system

This function requires accessory ECS 40/ECS 41. A shunt valve, supply and return sensor and a circulation pump are connected to a second heating circuit with a lower temperature demand (e.g. underfloor heating system). The temperature in the extra climate system is controlled by the heat pump and the shunt valve by offsetting the heating curve (each climate system has its own heating curve), room sensor or room unit. Up to 3 extra climate systems can be connected to the heat pump.

Passive cooling (4-pipe)

This function requires the PCS 44 accessory. The cooling system is connected to the heat pump collector circuit, through which cooling is supplied from the collector via the circulation pump and the shunt valve.

When cooling is required (activated from the outdoor sensor and any room sensor) the shunt valve and the circulation pump are activated.

The shunt valve regulates so that the cooling sensor reaches the current set point value corresponding to the outdoor temperature and the set min. value for the cooling temperature (to prevent condensation).

If the FLM accessory is installed with PCS 44, the cooling output is reduced.

Groundwater pump

With the AXC 40 accessory (an AXC 40 for each accessory function that is to be used) a ground water pump can be connected to the heat pump if the software controlled output (AUX output) is used for something else. This connection enables the use of ground water as heat source. The ground water is pumped up to an intermediate heat exchanger. An intermediate heat exchanger is used to protect the heat pump's exchanger from dirt and freezing. The water is released into a buried filtration unit or a drilled well.

The ground water pump runs at the same time as the brine pump.

External electrical addition heating

With the AXC 40 accessory (an AXC 40 for each accessory function that is to be used) a further three potential-free relays can be used for additional control, which then gives max 3+3 linear or 7+7 binary steps. The externally controlled additional heat is automatically switched on (in different steps) if the output is not sufficient to reach the temperature levels requested by the control computer. F1145/1155 sends 230 V control signals for the additional heating, that is signals to control external relays, contactors etc, but not to supply them with power. Step in occurs with at least 1 minute interval and step outs with at least 3 seconds interval.

Oil addition

With the AXC 40 accessory (an AXC 40 for each accessory function that is to be used) the shunt controlled additional heat can be connected to the heat pump. This connection enables an external additional heater, e.g. an oil boiler, to aid with heating. The heat pump controls a shunt valve and a circulation pump via AXC 40. If the heat pump does not manage to keep the correct supply temperature, the addition starts. When the boiler temperature has been increased to about 55 ˚C, the heat pump sends a signal to the shunt to open from the addition. The shunt adjusts so the true supply temperature corresponds with the control system's theoretical calculated set point value. When the heating requirement drops sufficiently so the additional heat is no longer required the shunt closes completely. The boiler will be kept warm for a further 12 hours to be prepared for any increase in the heating requirement.

District heating addition

With the AXC 40 accessory (an AXC 40 for each accessory function that is to be used) the shunt controlled additional heat can be connected to the heat pump. This connection enables an external additional heater, e.g. district heating, to aid with heating.

The heat pump controls a shunt valve and a circulation pump via AXC 40. If the heat pump does not manage to keep the correct supply temperature, the addition starts. The shunt adjusts so the true supply temperature corresponds with the control system's theoretical calculated set point value.

When the heating requirement drops sufficiently so the additional heat is no longer required the shunt closes completely.

Exhaust air recovery

The NIBE FLM accessory is required for this function. The integrated fan in NIBE FLM extracts the air from the wet areas of the house to the recovery unit. Here the energy is transferred to the heat pump's brine, whereby the temperature increases and raises the heat pump's heating factor. Energy is stored in the ground or rock collector even if the heat pump is not in operation, which fully utilises the exhaust air energy.

List of Components

F1145/F1155 for heating systems and any accessories

Pos	Name	Product name	Supplier	Art no.	Remarks
EB100	Heat pump	F1145/F1155	NIBE		
XL15	Filling set, HTF	HTF R25/G32	NIBE	089 368/089 971	HTF R25 (max 12 kW), HTF G32 (max 30 kW)
CM2	Level vessel HTF		NIBE		Level vessel at open system. Level vessel included in F1145/F1155.
FL3	Valve, Safety, HTF		NIBE		Included in F1145/F1155
HQ1	Particle filter HM		NIBE		Included in F1145/F1155
BT1	Temp.sensor, Outdoor		NIBE		Included in F1145/F1155
CM3	Expansion vessel HTF				Expansion vessel at closed system.
EP12	Collector, HTF				
BP6	Manometer, HTF				
QM12	Filling valve, HTF				
QM21	Venting valve, HTF				
QM34	Shut off valve, HTF-f				
QM42	Shut off valve, HTF-r				
CM1	Expansion vessel, closed, HM				
FL2	Safety valve, HM				
QM31	Shut off valve, HM-f				
QM32	Shut off valve, HM-r				
	Hot water				
CP1	Water heater	VPB 200/VPB 300/VPB 500	NIBE		VPB 200/VPB 300, max 12 kW
BT6	Temp. sensor, HW charging		NIBE		Included in F1145/F1155
BT7	Temp. sensor, HW top		NIBE		Included in F1145/F1155
	Extra Hot Water				
EB2	Water heater	Compact / Eminent	NIBE		
FQ1	Mixer valve				Thermal

List of Components cont.

Pos	Name	Product name	Supplier	Art no.	Remarks
	Hot water circulation				
GP11	Circulation pump, HWC				
AA5	Accessory card	AXC 40	NIBE	067 060	Required if the ground water pump or hot water circulation pump is to be connected to F1145/F1155 at the same time as the buzzer alarm. The relay outputs on the accessory card can have a max load of 2A (230V) in total.
	Ground water collector				
AA5	Accessory card	AXC 40	NIBE	067 060	Required if the ground water pump or hot water circulation is to be connected to F1145/F1155 at the same time as the buzzer alarm. The relay outputs on the accessory card can have a max load of 2A (230V) in total.
EP4	Heat exchanger, groundwater				Dimensioning see http://www.nibe.se/Fastighets-guiden/Bergvarmepumpar/VP-DIM/Plattvarmevaxlare/
EP12	Collector, HTF				
HQ2	Particle filter HTF				
	UKV				
CP5	Buffer vessel (UKV)	UKV 100/200/300/500	NIBE		Size varies depending on heat pump and system volume.
	Passive cooling				
EQ1	Passive cooling system	PCS 44	NIBE	067 296	
AA5	Accessory card		NIBE		Included in PCS 44
GP13	Circulation pump, cooling		NIBE		Included in PCS 44
QN18	Mixing valve, cooling		NIBE		Included in PCS 44
RM5	Reversing valve,		NIBE		Included in PCS 44
BT64	Temp. sensor, Cooling supply line		NIBE		Included in PCS 44
BT65	Temp. sensor, Cooling return line		NIBE		Included in PCS 44
EP13	Supply air coil/Fan convector				

List of Components cont.

Pos	Name	Product name	Supplier	Art no.	Remarks
	System 2 Present				
EP21	Climate system 2	ECS40/ECS41	NIBE	067 287/067 288	
AA5	Accessory card		NIBE		Included in ECS 40/41
GP20	Circulation pump, Heating medium, Lower shunt		NIBE		Included in ECS 40/41
QN11	Shunt valve, heating system 2		NIBE		Included in ECS 40/41
BT2	Temp.sensor, HM, Supply		NIBE		Included in ECS 40/41
BT3	Temp.sensor, HM, Return		NIBE		Included in ECS 40/41
	FLM				
AZ1	Air unit	NIBE FLM	NIBE	067 011	
RM6	Non-return valve		NIBE		Included in NIBE FLM
RN11	Control valve		NIBE		Included in NIBE FLM
	Pool				
CL11	Pool kit	POOL 40	NIBE	067 062	
AA5	Accessory card		NIBE		Included in POOL 40
QN19	Reversing valve		NIBE		Included in POOL 40
BT25	Temp.sensor, HM, Supply, External		NIBE		Included in POOL 40
BT51	Temp.sensor, Pool		NIBE		Included in POOL 40
EP5	Exchanger pool				
GP9	Pool, pump				
HQ4	Particle filter Pool				
GP10	Circulation pump, HM external				
RM2	Non-return valve				
	External Electrical heating addition				
EB1	Immersion heater	ELK 15, ELK 213	NIBE	069 022/069 500	
AA5	Accessory card	AXC 40	NIBE	067 060	
BT25	Temp.sensor, HM, Supply, External				Included in AXC 40
GP10	Circulation pump, HM external				
CM4	Expansion vessel, closed, HM				

List of Components cont.

Pos	Name	Product name	Supplier	Art no.	Remarks
FL2	Safety valve, HM				
RM5	Non-return valve				
RN11	Control valve				
QM40	Venting valve				
QM41	Venting valve				
	External Oil addition				
EM1	Oil, gas, pellets or wood boiler				
EM1	Accessory card, AA5	AXC 40	NIBE	067 060	
KA1	Auxiliary relay	HR10	NIBE	067 309	
BT25	Temp.sensor, HM, Supply, External				Included in AXC 40
BT52	Temp.sensor, Boiler				Included in AXC 40
QN11	Mixing valve, addition				230 volts, increase/decrease
GP10	Circulation pump, HM external				
CM4	Expansion vessel, closed, HM				
FL2	Safety valve, HM				
RM5	Non-return valve				
	External District heating addition				
EP7	Exchanger, District heating				
EM1	Accessory card, AA5	AXC 40	NIBE	067 060	
BT25	Temp.sensor, HM, Supply, External				Included in AXC 40
BT52	Temp.sensor, Boiler				Included in AXC 40
QN11	Mixing valve, addition				230 volts, increase/decrease
GP10	Circulation pump, HM external				
CM4	Expansion vessel, closed, HM				
FL2	Safety valve, HM				
RM5	Non-return valve				