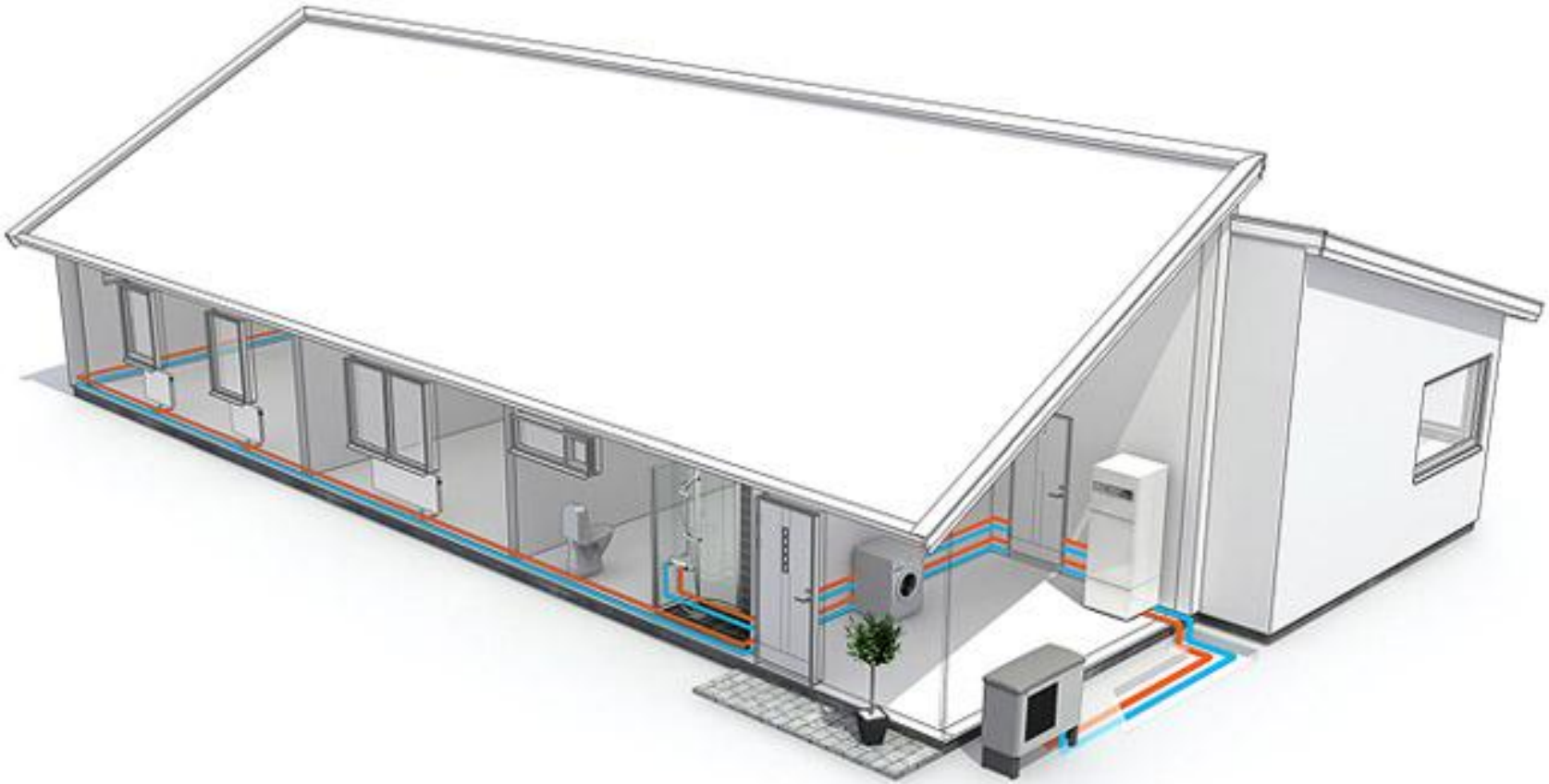
MAKING MODERN LIVING POSSIBLE

Heat Pumps

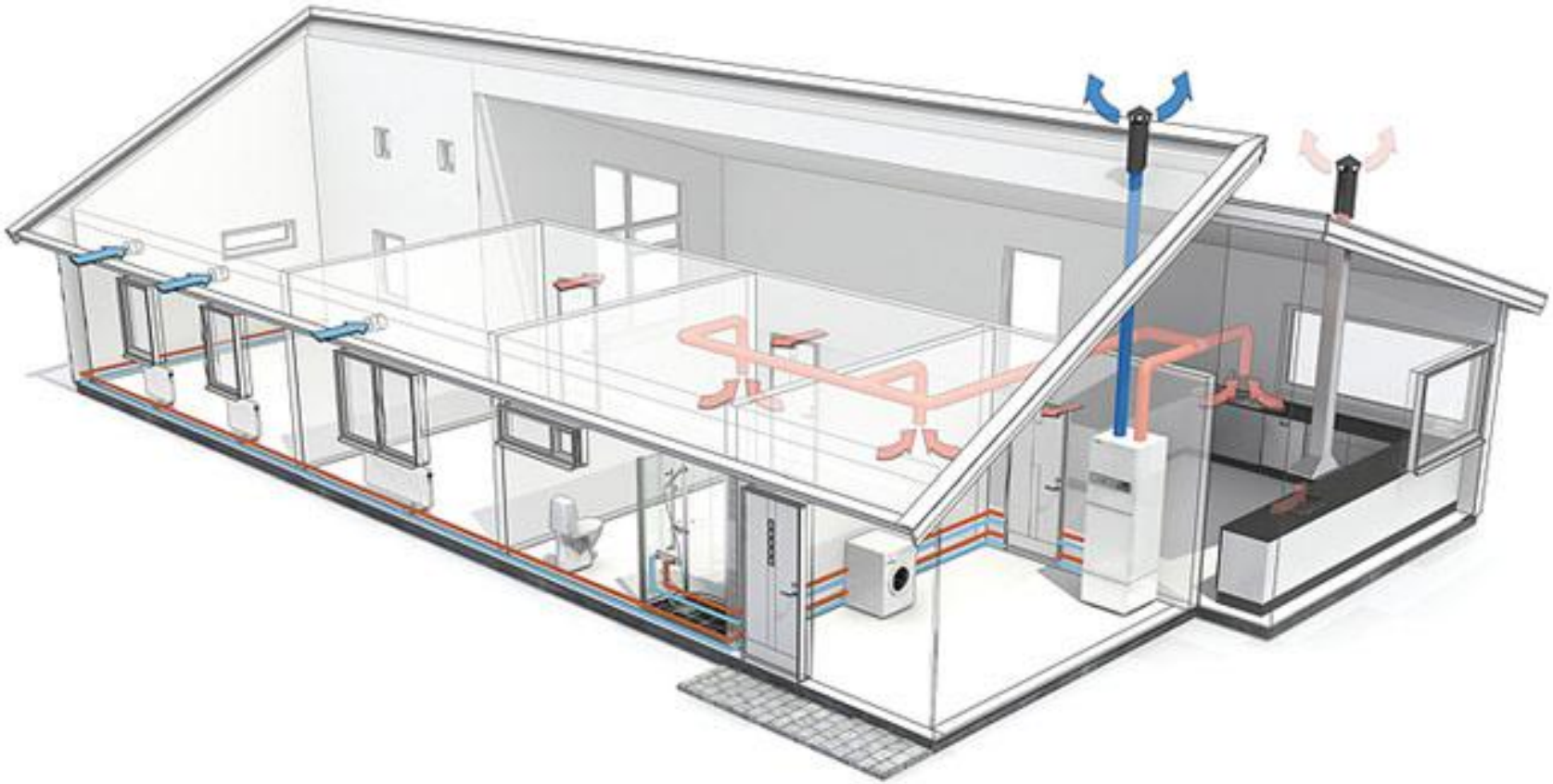
REFRIGERATION & AIR CONDITIONING DIVISION

Air-water



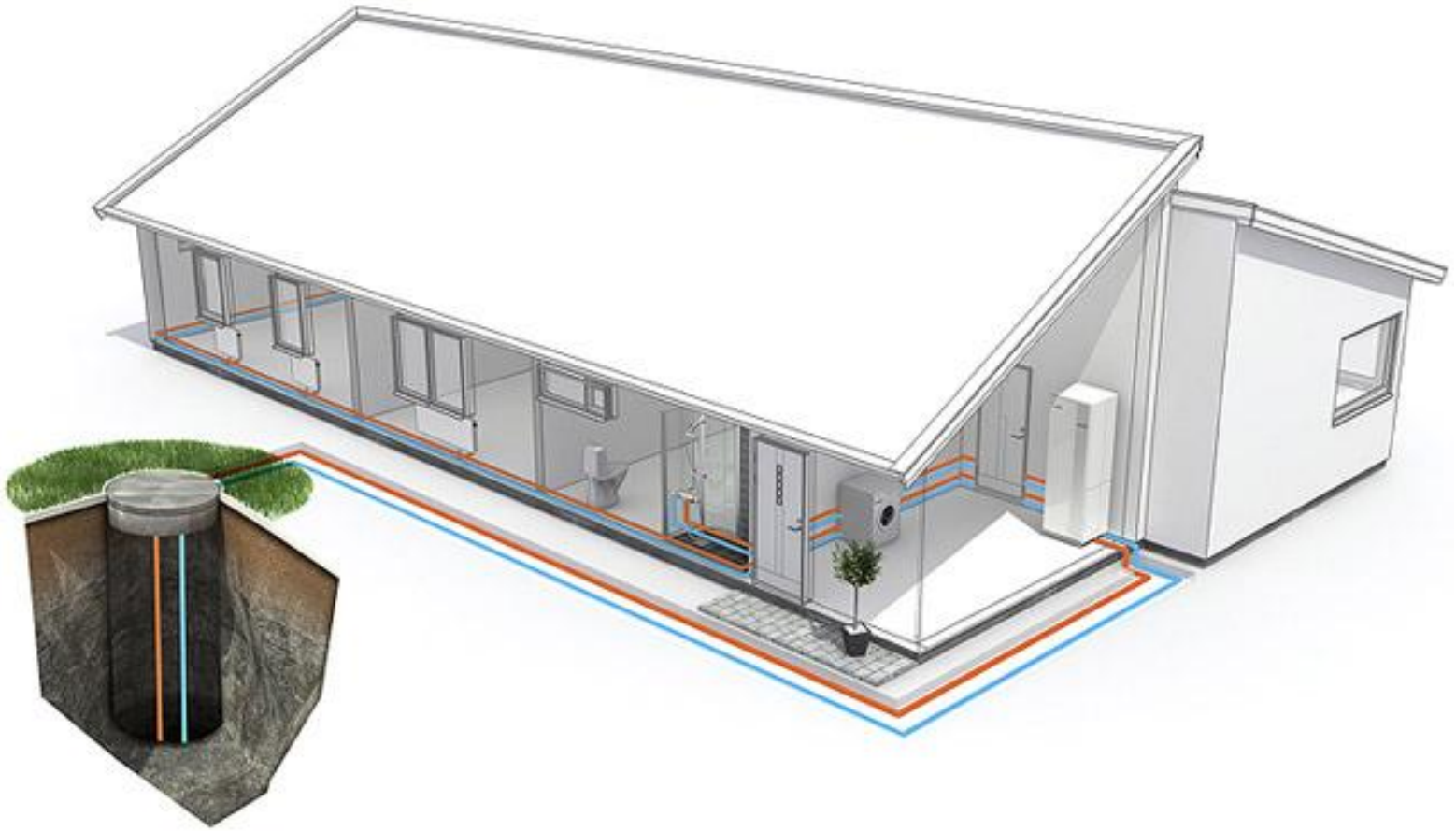
Source: Nibe

Exhaust air-water



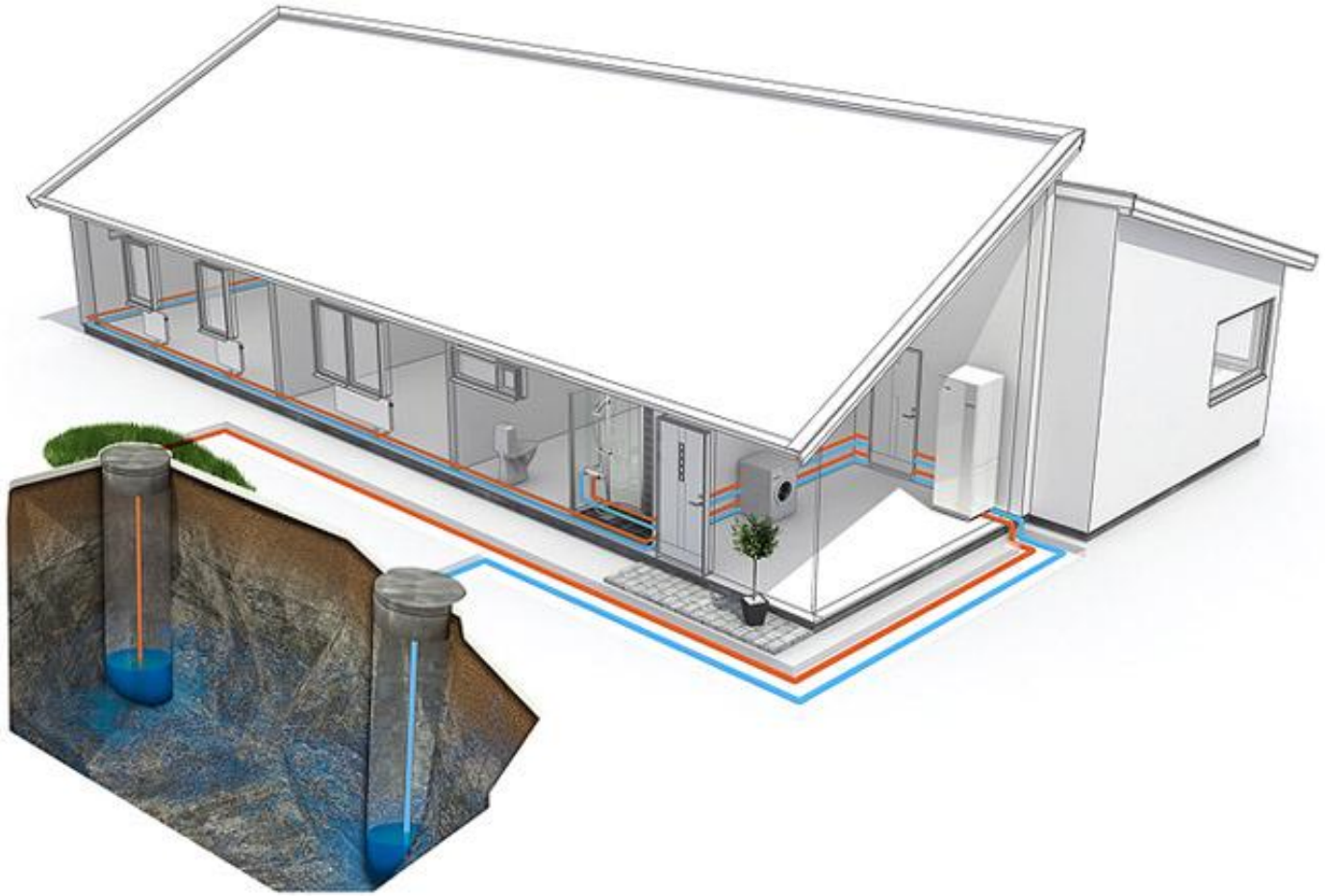
Source: Nibe

Ground probe-water



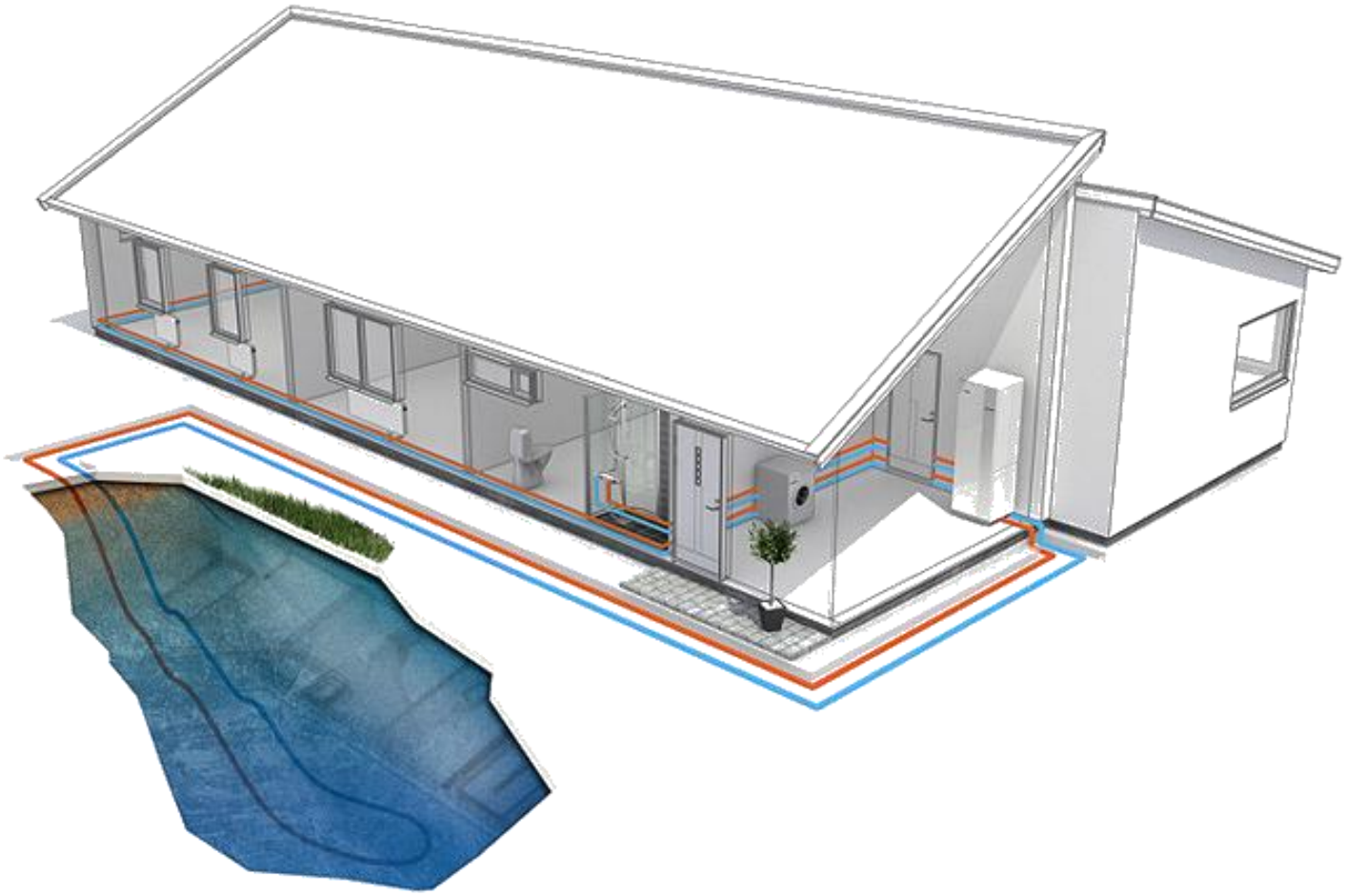
Source: Nibe

Ground water-water



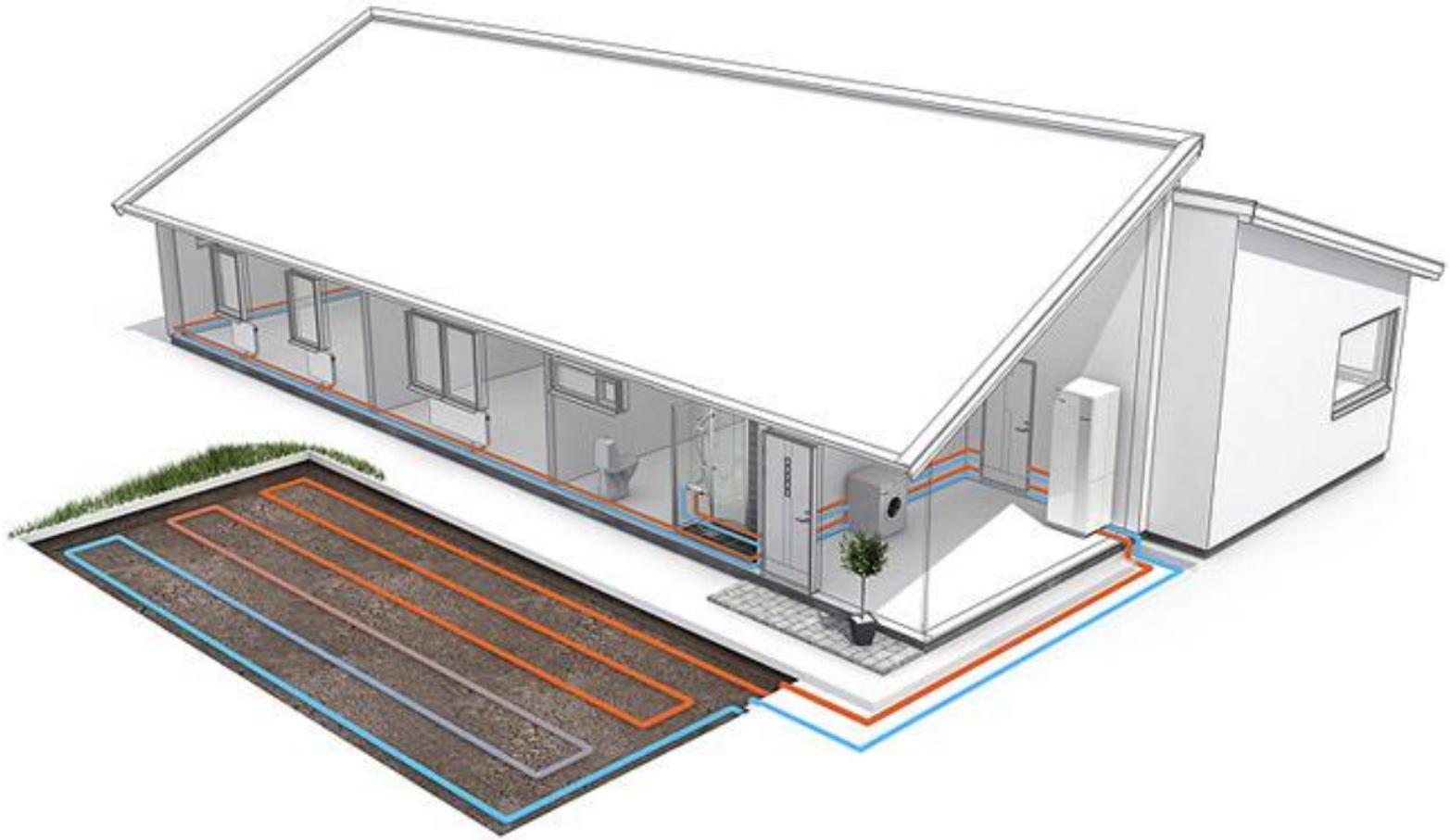
Source: Nibe

Sea water-water



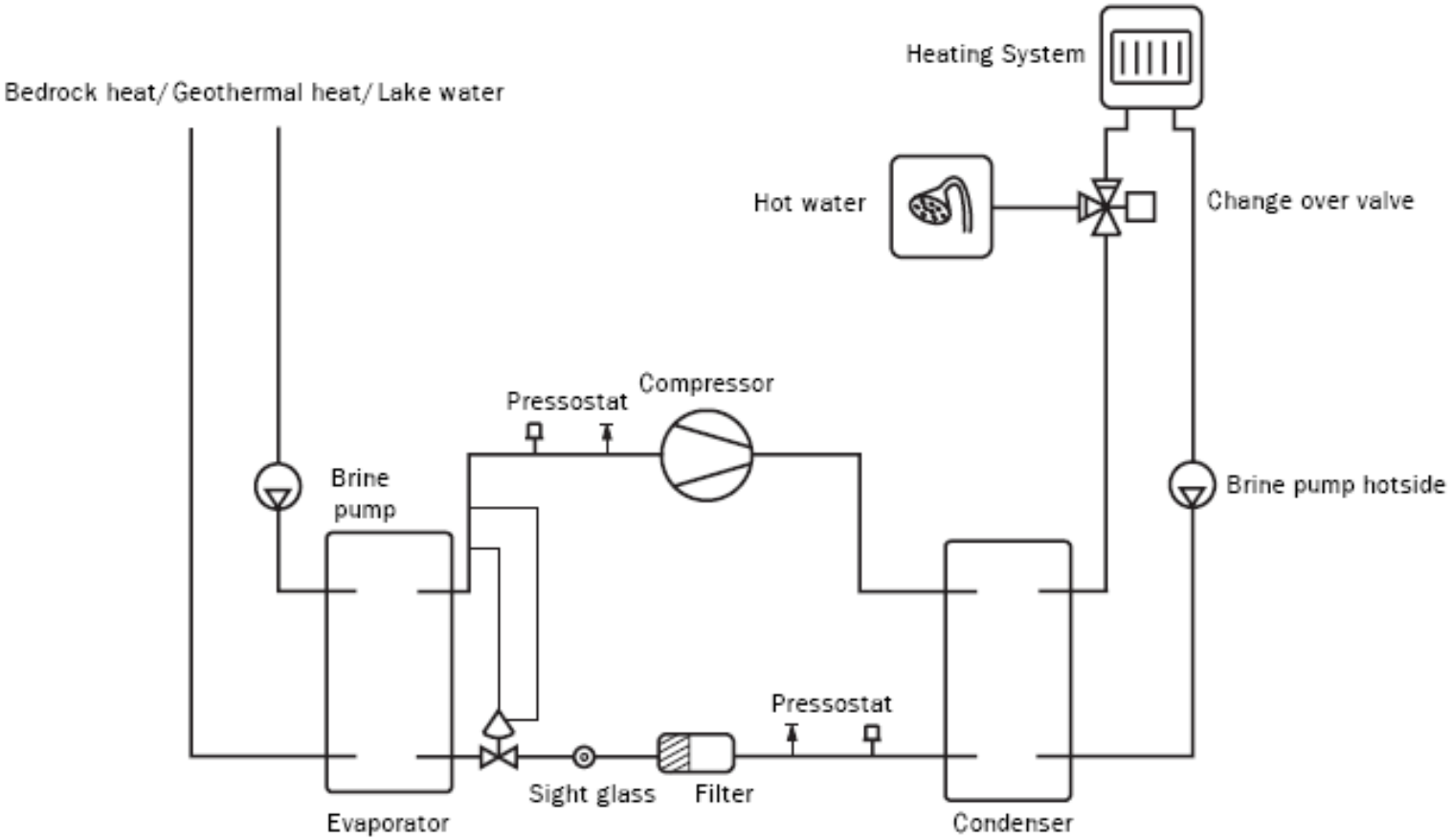
Source: Nibe

Surface collector-water



Source: Nibe

Water-Water Heat Pump Principle



Condenser

Temperature range:

Water in 30 – out 35°C for heating floor

Cond temp 40 - 45 °C Floor heating

Water in 40 – out 45°C for fan heating/radiators

Cond temp 50 °C for fan heating/radiators

Low pressure drop, water side – less pump capacity

Low pressure drop, refrigerant side

Counter flow

Water inlet in the bottom

Refrigerant inlet on top

Reversible pumps

Main objective, heating or cooling (cold-warm climate)?

Define how we select and connect the exchanger to the circuit

Check how it works for the secondary mode

Evaporator

Temperature range:

Water inlet depend on source, outlet 3-8°C

Refrigerant evap. temp. -2/+3°C

Brine: 0/-3°C

Refrigerant evap. temp. ~ -7°C

Important is type of brine and concentration in %.

Water circuit, use filter if it is an open circuit

Counter flow

Refrigerant inlet in the bottom (prevent liquid from leaving evap.)

Water inlet on top

In reverse system , also check how it works as condenser

Heat pump producers

- **IVT Industrier AB (Bosch group)**

- **NIBE AB**

- **Thermia Värme AB (Danfoss Heat Pum**

Product examples

NIBE

Thermia

IVT

Main Players

Names	Country	Heat pump type
IVT	SWEDEN	Ground/Water Air/Water
NIBE	SWEDEN	Ground/Water Air/Water
GDD	GERMANY	Ground/Water
SOFATH	FRANCE	Ground/Water
THERMIA	SWEDE	Ground/Water Air/Water
CIAT	FRANCE	Water/Water
AIRWELL	FRANC	Water/Water
AERMEC	ITALY	Water/Water
VIESSMANN	GERMANY	Water/Water
DAIKIN	JAPAN	Air/Water
HITACHI	JAPAN	Air/Water