Heat Pump – Air to Water

EC directives: Low-voltage directive 2006/96/EC
EMC directive 004/108/EC Pressure equipment directive 97/23/EC

Applied standards:
EN 60335-1:2002+A11+A1+A12+Corr.+A2:2006 EN 60335-1/A13:2008
EN 60335-2-40:2003+A11+A12+A1+Corr.+A2:2009 EN 55014-1:2006
EN 55014-2:1997+A1:2001
EN 61000-3-2:2006 EN 61000-3-3:1996+A1:2001+A2:2005
EN 378-1:2008
EN 378-2:2008+A1:2009 EN 378-3:2008
EN 378-4:2008
EN 14511-1:2007
EN 14511-2:2007
EN 14511-3:2007 + EN 14511-3:2007/AC 2008
EN 14511-4:2007
DIN 8901:2002
BGR 500 (D), SVTI (CH)

Conformity assessment procedure according to pressure equipment directive: Module A1

Our consistent high quality is guaranteed through certification in accordance with DIN EN ISO 9001 and DIN EN ISO 14001.

An energy management system in accordance with the DIN ISO 50001:2011 standard was also introduced to help us implement our goals.

Casing:
Compact casing in white aluminium (similar to RAL 9006).
Sound-optimised casing through the use of an encapsulated compressor housing, two slow-running EC-3D fans, and a free-swinging compressor baseplate for solid-borne sound insulation.

Compressor:
The scroll compressor has a compressor coil which moves on a circular path dictated by a corresponding stationary coil. The stationary coil is mounted on the compressor body.
The moving coil coupled with the crankshaft does not turn, but follows a circular path. This movement creates a series of gas pockets that move between the two coils. On the outer area of the coils, the pockets suck up gas that is transported to the centre of the coils and discharged there. While the gas moves into the ever smaller inner pockets, the pressure and temperature increase until the desired evaporation pressure is reached.
This compressor has 70% fewer moving parts than other compressor technologies and offers simple servicing and maintenance due to the compact size and light-weight, streamlined structure.
Because no complex internal inlet and outlet valves are installed, the compressor is extremely quiet and very reliable.

Evaporator:
The evaporator consists of a core tube with mounted fins for efficient energy absorption from the air.
The fin structure enables a large active external surface to be accommodated in a small volume.
Two slow running EC-3D fans guarantee sound-optimised operation and efficient flow of the evaporator.
Optimised for good air flow and simple defrosting.
Liquefier:
The liquefier has been optimised for high performance and runs in counterflow. It consists of stainless steel and is soldered with copper. It combines compact dimensions with a specially developed plate design in a high efficiency heat exchanger with unique thermal length.

Refrigerant circuit:

Hermetically sealed copper pipe refrigeration circuit with the required refrigeration fittings such as liquid isolating valve with filling connection, sight glass with liquid indicator, filter dryer, low pressure monitor, high pressure monitor, pressure transducer high pressure, pressure transducer low pressure, electronic expansion valve, COP booster, fully piped at the factory. The electronic expansion valve enables operation with low condensation pressure to optimize the degree of efficiency. The dynamic overheating management improves the utilisation of the evaporator heat exchanger interface and therefore also the partial load degree of efficiency. The refrigeration system is pressure-tested at the factory, leak-tested, dried, evacuated and filled with refrigerant.

Control Cabinet:
With separate control and power unit, fully wired, equipped with the following components:
- Terminal strip for main power input (400V/3Ph/PE/50Hz)
- Terminal strip for control current input (230V/1Ph/N/PE/50Hz)
- Fuses and transformer for control current, power contactors and fuses for compressor motor, fan motor and primary pump
- Soft starter with bypass switching for the compressor
- Auxiliary relay and control contactors, as well as transformer for pro-dialogue relay module, operating elements with display
- Safety chain consisting of: Pressure transducer high pressure High pressure monitor Pressure transducer suction pressure Low pressure monitor Internal fan motor protection Sensors for temperature transmission on the microprocessor module

Control:
The control system is a robust and user-friendly, auto-adaptive, microprocessor-based electronic control and regulating system in modular design with corresponding electronic expansion valve and includes the following main equipment:
- Display and control panel, user-friendly arrangement, with input field for reading, changing and acknowledging operating information
- Sensors for registering water inlet / outlet temperatures, condensation pressure and evaporation pressure, as well as suction gas overheating temperature
- Control module with integrated microprocessor, analogue-digital converter for the connected measuring transducers and relevant control and regulating modules for the other components
- Recording and output of the following energy quantities: recorded environmental energy emitted heat energy
- The following functions are available as standard: Domestic hot water/cold water temperature control via a PID algorithm that carries out the power adjustment depending on the domestic hot water/cold water temperature and the selected setpoint. The heating operation can be optionally controlled as a fixed-setpoint or outside temperature. For cooling (silent cooling), a dew-point dependent setpoint determination takes place to prevent condensate (accessories required). A dew point monitor is essential here.
- Control and regulation of two mixed heating/cooling circuits and an unmixed heating/cooling circuit.
- Refrigeration circuit management system with liquefier pressure control
- Dynamic overheating management for the electronic expansion valve
- Logging and storage of the last 10 fault messages, 10 alarm messages and all runtimes
- The following digital signals / messages are available for communication with a higher-level control Operating message Collective fault message Switching heating/cooling (for reversible heat pumps)
- The following communication protocols are possible via interface cards available as accessories: BacNet, Modbus (TCP), Modbus (RTU), MBus, Ethernet, KNX, EIP