

SPECIFICATION GUIDE

ECOLEAN™



**Air-cooled Liquid Chiller for indoor or outdoor installation (EAC)
Nominal cooling capacity: 20 to 200 kW**

**Air-to-water Heat Pump for indoor or outdoor installation (EAR)
Nominal cooling capacity: 20 to 200 kW
Nominal heating capacity: 20 to 205 kW**



SPECIFICATIONS

1. Packaged air-cooled chiller (or Air to water heat-pump)

- The contractor shall furnish and install an ECOLEAN packaged air-cooled scroll liquid chiller (or Heat-pump) from Lennox or an equivalent unit.
- The air-cooled scroll liquid chiller (or Heat-pump) shall be operating with R410A HFC-based refrigerant.
- The unit shall be designed and installed in strict accordance with this specification.
- The unit shall be certified and rated in accordance with Eurovent standard.
- The unit shall be designed to be integrated into urban or residential environments.
- The unit shall offer **adjustable sound level performances** during day and night to satisfy local environmental constraints.

2. Performances and dimensions

- The air-cooled scroll liquid chiller (or Heat-pump) shall have following characteristics:

Cooling mode

- Cooling capacity:kW
- Minimum EER:
- Minimum ESEER:.....
- In/outlet water temperature: °C
- Glycol rate:%
- Outside air temperature:°C
- Maximum sound power/pressure level:
Daytime (07:00-23:00 hrs): dB(A)
Night-time (23:00-07:00 hrs): dB(A)

Heating mode (Heat-pump only)

- Heating capacity:kW
- Minimum COP:
- In/outlet water temperature: °C
- Outside air temperature:°C

Unit dimensions:

Length*width*height: * * mm

Unit type or equivalent:

Cooling only : EAC _____

Heat-pump : EAR _____

3. Casing/Chassis

- Casing made of galvanized steel sheet metal painted with a white RAL 9002 powdered polyester paint and a RAL3003 red stripe.
- Rigid, hot dipped galvanized chassis.
- Unit lifting and handling via the base frame
- State of the art design with hidden compressors, fans and pump for perfect architectural integration.
- Side grilles as option to protect the unit during transportation and against human aggressions.

4. Compressor

- ***Exclusive Compliant Scroll® design with both axial and radial compliance to increase compressor operation tolerance to liquid refrigerant, substantially improving durability and reliability.***
- Motor cooled by suction gas.
- Electronic control of the compressor discharge temperature.
- Motor protection device against high temperature or over current situations.
- Discharge non-return valve.
- Crankcase heater.
- Direct on line start.
- Low noise scroll compressors insulated with a compressor acoustic jacket (LN version) or mounted in a sound-proofed technical cabinet (SLN version) to reduce noise emissions.
- Compressors mounted on high efficiency cellular polyurethane vibration absorbers.

5. Water heat exchanger

- Stainless steel plate brazed.
- Thermal insulation by top grade 10 mm plastic foam.
- Copper brazed Stainless steel plate heat exchanger.
- ***Water heat exchanger located in a technical cabinet protecting the insulation against climatic conditions (UV light, rain).***

6. Air heat exchanger

- High performance coil with expanded copper tubes and high efficiency aluminium fins.

7. Fans

- Standard version: ***fan-motor assembly using external rotor technology associated with OWLET™ high performance aluminium fan blades of the latest generation.*** Two speed axial fans 700/550 rpm or 900/700 rpm according to models, direct coupling, with available static pressure up to 75 Pa. For low noise and super low noise versions, the fans shall be running in low fan speed.
- Pressure version: two speed axial fans 1450/900 rpm, direct coupling, with available static pressure up to 250 Pa. For fan pressure low noise and super low noise versions, the fans shall be running in low fan speed.
- ***Noise setting capability per time zone (Performance mode, Quiet Mode or Quiet++ Mode). As an example, fan speed shall be able to be locked through the Climatic™ control to operate only in low speed during night or unoccupied periods.***

8. Refrigerant circuit

The ECOLEAN or equivalent unit shall be using R410A refrigerant. Each circuit shall include:

- Thermostatic expansion valve.
- Filter drier.
- High-pressure switch with automatic reset.
- Low-pressure switch with automatic reset (Heat pump units incorporate two of them, one for cooling cycle and one for heating cycle).
- Suction piping with thermal insulation.
- Temperature sensors and pressure transducers.
- Four-way valve and liquid receiver (heat pump units only).
- Leak-tight refrigerant circuit with brazing carried out under nitrogen by certified engineers.
- Pressure transducers (heat pump units only).
- Each refrigerant circuit shall be pressure and leak tested with a Hydrogen/Nitrogen mixture, and vacuumed before being charged with refrigerant. All units shall be then subjected to a complete functional and operational run test to guarantee perfect sealing before leaving the factory.

9. Water circuit

The ECOLEAN or equivalent unit shall include:

- Water flow switch.
- Water filter.
- Hydraulic module with single pump and all necessary hydraulic devices (HY version).
- Hydraulic module with single pump, buffer tank and all necessary hydraulic devices (HN version).
- Twin pump as an option with operating time equalization and automatic change-over in case of a pump fault.
- ***Variable speed pump as an option to reduce annual pumping energy consumption based on a constant delta P or a constant delta T management.***

10. Electrical box

- Unit electrical cabinet, components and wiring in compliance with EN 60204-1 electrical directive.
- 400V, 50 Hz, 3 phases power supply (without neutral) with a single point of power connection.
- IP54 protection class.
- Recognized brand electrical components for ease of maintenance.
- Compressor, fan and water pump working contactors.
- Main on/off switch mounted on the front panel.
- DC60 user interface mounted on the front panel.
- Door interlocked main on/off switch.
- 400/24 V transformer to supply the control circuit.
- Numbered electrical wires to facilitate maintenance and diagnostic.
- ***Variable Frequency Drive (VFD) to control the water pump speed (option).***

11. Control

CLIMATIC™ 60 microprocessor based control or equivalent control shall be providing the following functions:

- **7 scheduling time zones per day over 7 days to allow energy consumption and sound level management according to the building use and environmental constraints.**
- PI control of the water temperature with operating time equalization of the compressors.
- Water set-point offset based on outdoor air temperature.
- **Noise setting capability per time zone (Performance mode, Quiet Mode or Quiet++ Mode).**
- Intelligent advanced control algorithm to protect the compressors against excessive short-cycling and to allow operation of the unit without buffer tank in most comfort air conditioning applications (e.g. unit with fan-coils). Refer to minimum installation water loop volume recommendations.
- **Dynamic defrost to limit the number and the duration of the defrost cycles in winter for high performance of the unit (Dynamic Defrost patented).**
- Automatic compressor unloading in case of excessive condensing pressure allowing the operation of the machine at high outdoor air temperature (operation extended up to 48°C ambient).
- Water pump control with operating time equalization and automatic change-over in case of a pump fault (Twin pump only).
- Variable water flow pump control to reduce annual pumping energy consumption based on a constant delta P or a constant delta T management.
- Master/slave or cascade control of 2, up to 8 chillers operating in parallel with operating time equalization and automatic change-over in case of a unit fault.

The DC60™ user interface or equivalent display shall be supplied as standard mounted on the front panel and shall be protected from rain and UV by a plastic cover.

The DC60™ user interface with graphical display shall be easy to use, intuitive. Main customer parameters shall be able to be read or modified without main power shut-off.

The DC60™ user interface shall be providing the following functions:

- Display and setting of hot and cold water temperatures.
- Display and setting of operating mode (cooling, heating, automatic).
- Display of occupancy mode (occupied, unoccupied).
- Main component status display.
- Alarm code and symbol display.
- Refrigerant LP and HP Display.

A remote DC60™ user interface or equivalent remote display shall be able to be supplied for remote control of the unit (option).

The DS60™ service display (optional) or equivalent service display shall be a “plug and play” controller that allows service people to read and modify all unit parameters (Unit settings, operating time and number of compressor starts, low and high pressure reading, read the history of last 32 faults...).

12. Communication

The control board shall be equipped with a RS485 serial communication port to allow remote management through communication bus.

According to the wished communication protocol, our control board shall be able to be fitted with ModBUS®, LonWorks® or BacNET® communication interface or Adalink™ supervision (options).

The main control board shall have free dry contacts that allow remote control of the unit by wired cable:

- Remote ON/OFF of the unit.
- Remote alarm reset to re-start the unit.
- Alarm or alert indications.
- Free customer contact.

13. Directives

The unit shall be built to meet European norms and standards & Eurovent certification performance standards.

- DI 97/23/CE Pressure Equipment Directive.
- DI 98/37/CE Machinery Directive.
- DI 73/23/CE Low Voltage Directive.
- DI 89/336/CE Electro Magnetic Compatibility Directive
- EN 378-2 Safety and Environmental Directive.
- ***The European Restriction of the Use of Certain Hazardous Substances (RoHS).***